PAK-2005

MAINBOARD
USER'S MANUAL

Handling Precautions

WARNING:

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

Observe the following basic precautions when handling the mainboard or other computer components:

■ 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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Chapter 3   Setting BIOS Feature

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Overview

Based on the new highly integrated VIA VT82C590 VP2, the PAK-2005 mainboard combines blistering Intel Pentium® processor performance with support for intelligent diagnostic and power management features to provide a powerful and versatile LPX-size platform for leading-edge PC '97 compliant multi-media systems.

With its switching voltage regulator, the PAK-2005 runs a complete range of Intel Pentium® processors, including the Intel Pentium processor with MMX™ technology, as well as the AMD-K5™/-K6™ and Cyrix/IBM 6x86™/6x86MX™ processors. For added power and performance, the PAK-2005 takes up to 1MB Pipeline Burst Level II cache and up to 256MB DRAM via two 72-pin SIMM sockets and two 168-pin DIMM sockets which accepts high-speed EDO, and lightning-fast SDRAM memory types.

Built on the highly concise LPX form factor, the PAK-2005 comes with a full set of I/O features conveniently integrated on the rear I/O panel. 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/sec 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 PAK-2005 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.

The S3® Trio64 V2/DX™ VGA controller offers 135MHz output pixel data rates with non-interlaced screen resolutions of up to 1280x1024x256 colors at 75Hz (2MB video RAM). The S3 Trio64 enables the system to have a higher performance under Windows and other GUI (Graphics User Interface) environments.

This chapter gives a you a brief overview of the PAK-2005 mainboard. In addition to basic information on the board's main components and features, it also provides advice on how to upgrade and expand it. For updated BIOS, drivers, or product release information, please visit FIC's home page at: http://www.fic.com.tw. Congratulations on your decision to adopt the PAK-2005 mainboard. With its high-speed EISA local bus architecture and ultra-fast I/O connections, the PAK-2005 provides the ultimate solution for optimizing the performance of your high-end system.

Main Features

The PAK-2005 mainboard comes with the following high-performance features:

■ **Easy Installation**
Award BIOS with support for Plug and Play, auto detection of Hard Drive and IDE features, MS Windows 95®, and Windows NT® compatible to make setup of hard drives, expansion cards, and other devices virtually automatic.

■ **Flexible Multi-Processor/Multi-Speed Support**
Onboard 321-pin ZIF socket and switching voltage regulator supports a complete range of leading-edge processors:
Intel Pentium® with MMX™ technology (P55C) 166/200/233 MHz processors.
Intel Pentium® (P54C/P54CS) 90/100/120/133/150/166/200 MHz processors.
Cyrix® 6x86™ PR133+ - PR166+ (Rev 2.7 and later) processors.
Cyrix® 6x86MX™ PR166-PR266 processors.
AMD-K5™ 90-200MHz processors.
AMD-K6™ 166-300MHz processors.

■ **Various External Bus and CPU to Bus Frequency Ratio Support**
The mainboard supports the Bus frequency for 55 / 60 / 66.6 MHz and CPU to Bus frequency ratio of 1x / 1.5x / 1.75x / 2x / 2.5x / 3x / 3.5x / 4x / 4.5x. (Refer to Select Frequency and Voltage of Chapter 2 for more information.)

■ **Leading Edge Chipset**
VIA VT82C590 VP2 chipset, including a CPU interface controller, advanced cache controller, integrated DRAM controller, synchronous EISA bus controller, integrated power management unit.

■ **Ultra-fast Level II Cache**
Supports 256KB/512KB/1MB (onboard 512KB) synchronous Pipelined Burst SRAM direct-mapped write-back cache memory.

■ **Versatile Main Memory Support**
Accepts up to 256MB RAM in two banks using 72-pin Fast Page Mode (FPM) or Extended Data Out (EDO) SIMMs of 4, 8, 16, 32, 64MB or using two 168-pin 3.3Volt DIMMs for SDRAM or EDO memory modules up to 128MB. SIMMs and DIMMs cannot be used at the same time.

■ **EISA Expansion Slot**
One 32-bit EISA expansion slot provides all the room you need to install a full range of add-on cards by first inserting a riser card.

■ **USB Support**
Onboard support for two Universal Serial Bus connectors via a plug-in connector.

■ **Enhanced Master Mode PCI IDE Controller**
Comes with an onboard **Ultra DMA/33 Bus Master IDE** controller with two connectors that supports four IDE devices such as Hard Disk via two channels for high speed (33MB/sec) data throughput. This controller supports PIO Modes 3 and 4, and Bus Master IDE DMA Mode 2 for optimized system performance.

■ **Super Multi I/O**
Integrated SMC FDC37C932 Plug and Play Super I/O chipset features two high-speed 16550A UART compatible serial ports, one EPP/ECP capable parallel port, one IR port, and one Floppy Disk Drive connector. UART2 can also be directed from COM2 to the Infrared Module for wireless connections.

■ **Onboard IrDA Connector**
An optional infrared port module for wireless interface 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 VT82C590 VP2 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 PAK-2005 is further boosted by the mainboard's integrated IC controller, which optimizes the memory timing settings.

■ **Blistering Ultra DMA/33 Hard Disk Drive Performance**

With its integrated Enhanced PCI Bus Master IDE controller that supports the new Ultra DMA/33 protocol, this mainboard doubles Hard Disk Drive 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 Hard Disk Drive 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 for 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 supports 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.

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 PAK-2005 mainboard

☑ This user's manual

☑ Support software drivers and utilities

☑ One floppy disk drive ribbon cable

☑ One IDE hard disk drive ribbon cable

☑ One COM2 cable (optional – if the current mainboard has an onboard USB port)

☑ One USB cable (optional – if the current mainboard has an onboard COM1 and COM2 port)

Mainboard Layout
(with onboard COM1 and COM2 ports)

Flash ROM BIOS | Integrated I/O Connectors | EISA Bus Slot | DIMM Sockets | SIMM Sockets

[PAK-2005 photo]
A

CPU Socket | 512KB Cache RAM | VIA VT82C590 VP2 Chipset

Mainboard Layout (with onboard USB port)

Flash
ROM
BIOS

Integrated
I/O
Connectors

EISA
Bus
Slot

DIMM
Sockets

SIMM
Sockets

[PAK-2005 photo]
B

CPU
Socket

512KB
Cache
RAM
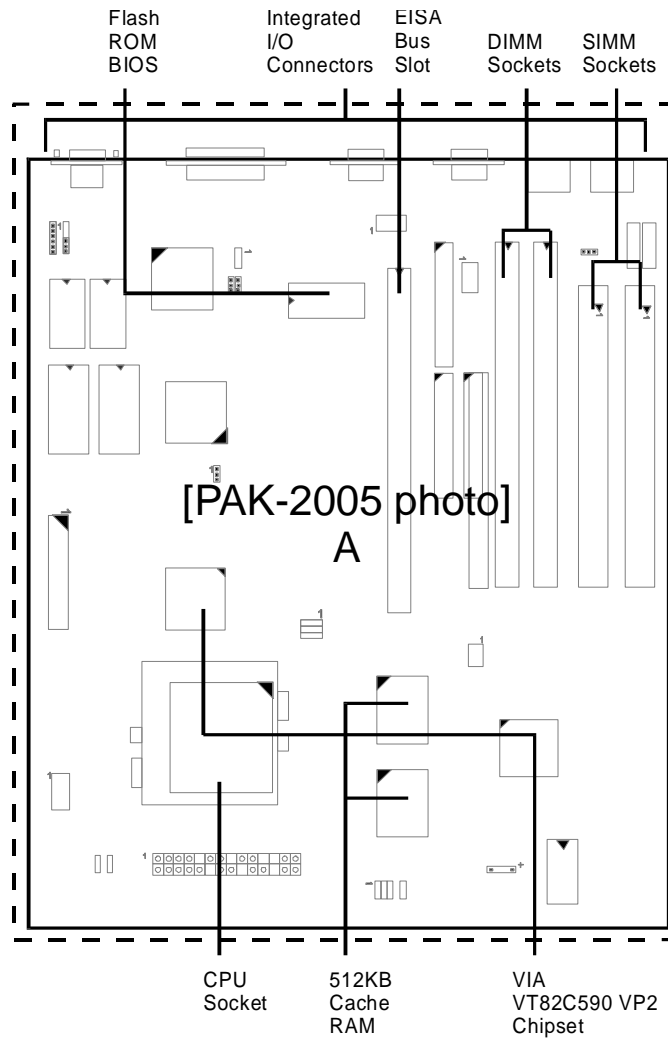
VIA
VT82C590 VP2
Chipset
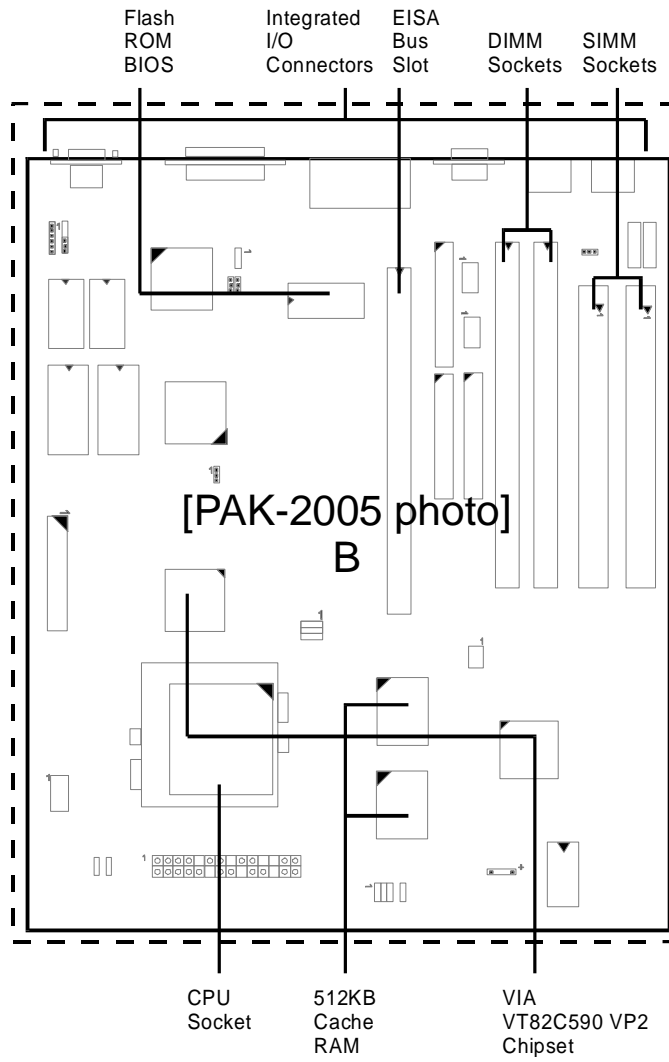
This User's Manual

This manual is designed to guide you and facilitate your use of the PAK-2005 mainboard. It contains a description of the design and features of the mainboard, and also includes useful information for changing the configuration of the board and the system it is installed in. The manual is divided into three chapters, which contain the main body of information normally referred to by users.

■   Chapter 1 — **Overview**
    gives an overview of the mainboard and describes its major components and features.

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

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

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

Something Interesting

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

The BIOS Setup Utility

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

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

When you buy your computer, the system configuration record will already be set and may in some cases differ from the basic defaults. The first time you use your computer or when you need to re-configure your system, you should run the Setup Utility and write down the settings. Please see Chapter 3 for an explanation on how to run the Setup Utility.

IRQ Functionality

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

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

A large number of add-on cards, such as sound cards and LAN cards, require the use of an IRQ line to function. Some number of IRQs may already be in use by components in the system such as the keyboard and mouse. Add-on cards that need to use an IRQ draw from the unused group of IRQs. When installing a card that uses an IRQ, it will have a default IRQ setting which you might have to change if that IRQ is already in use and cannot be shared.

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

DMA Channels of ISA Cards

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

Enhanced IDE

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

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

Infrared 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 (SIR and FIR) interface that is fully compliant with the IrDA standard. An IrDA device can be installed via a 9-pin D-SUB connector in the rear panel of the computer which is linked by a cable to the onboard IrDA pinhead.

The serial port COM2 on this mainboard is designed to be an IR compliant port. If you wish to install the IR connection feature, you need to adjust the BIOS option for high-speed performance.
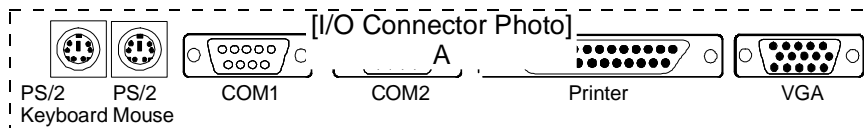
Highly Convenient Integrated I/O Connectors

This mainboard features 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. It supports state-of-the-art USB technology which provides high-speed and easy-to-use Plug & Play connections to the future generation of external peripherals, such as keyboards, mouse, monitors, game devices, scanners, printers, and fax/modems.
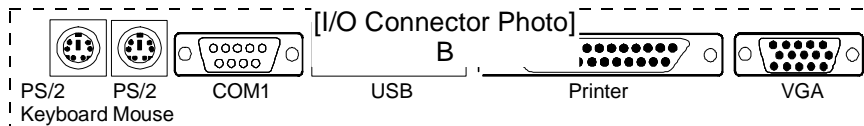
USB overcomes conventional I/O bottlenecks by combining the I/O ports into a single dual-channel connector that supports up to 120 devices. For optimum ease of use and flexibility, USB not only allows the automatic detection and configuration of peripherals after installation, but also enables the simultaneous connection of up to 63 devices.

This mainboard comes with either an onboard USB port (for the exact location see page 42 of chapter 2) or an optional USB connector bracket that is connected by a cable to the onboard USB pinhead. The bracket can be installed in one of the I/O expansion slots on the rear panel of the system. It provides fast and convenient Plug and Play peripheral connections outside the computer, allowing you to take full advantage of the universal functionality and flexibility of USB technology.

I/O Connector With Onboard COM1 and COM2 Ports

[I/O Connector Photo]
A

PS/2 Keyboard | PS/2 Mouse | COM1 | COM2 | Printer | VGA

I/O Connector With Onboard USB Port

[I/O Connector Photo]
B

PS/2 Keyboard | PS/2 Mouse | COM1 | USB | Printer | VGA

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Installation Procedures

The PAK-2005 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.

Before using the computer, you must complete the following steps:

■   Step 1 -
    Set system jumpers

■   Step 2 -
    Install system RAM modules

■   Step 3 -
    Install the Central Processing Unit (CPU)

■   Step 4 -
    Install expansion cards

■   Step 5 -
    Connect ribbon cables, cabinet wires, and power supply

■   Step 6 -
    Set up BIOS software (Please read Chapter Three)

WARNING: Excessive torque may damage the mainboard. When using an electric screwdriver on the mainboard, make sure that the torque is set to the allowable range of 5.0 ~ 8.0kg/cm.
Mainboard and components contain very delicate Integrated Circuit (IC) chips. To prevent static electricity from harming any of the mainboard's sensitive components, you should follow some precautions whenever working on the computer:
1. Unplug the computer when working on the inside.
2. Hold components by the edges and try not to touch the IC chips, leads, or circuitry.
3. Wear an anti-static wrist strap which fits around the wrist.
4. Place components on a grounded anti-static pad or on the bag that came with the component whenever the components are separated from the system.
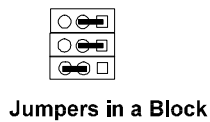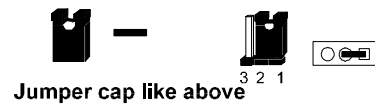

Mainboard Layout
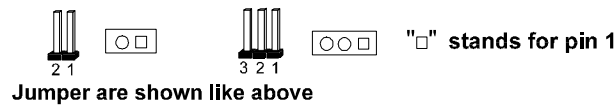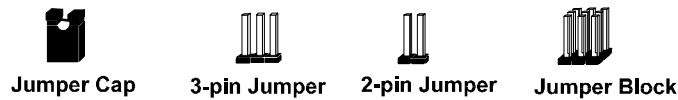# (with onboard COM1 and COM2 ports)
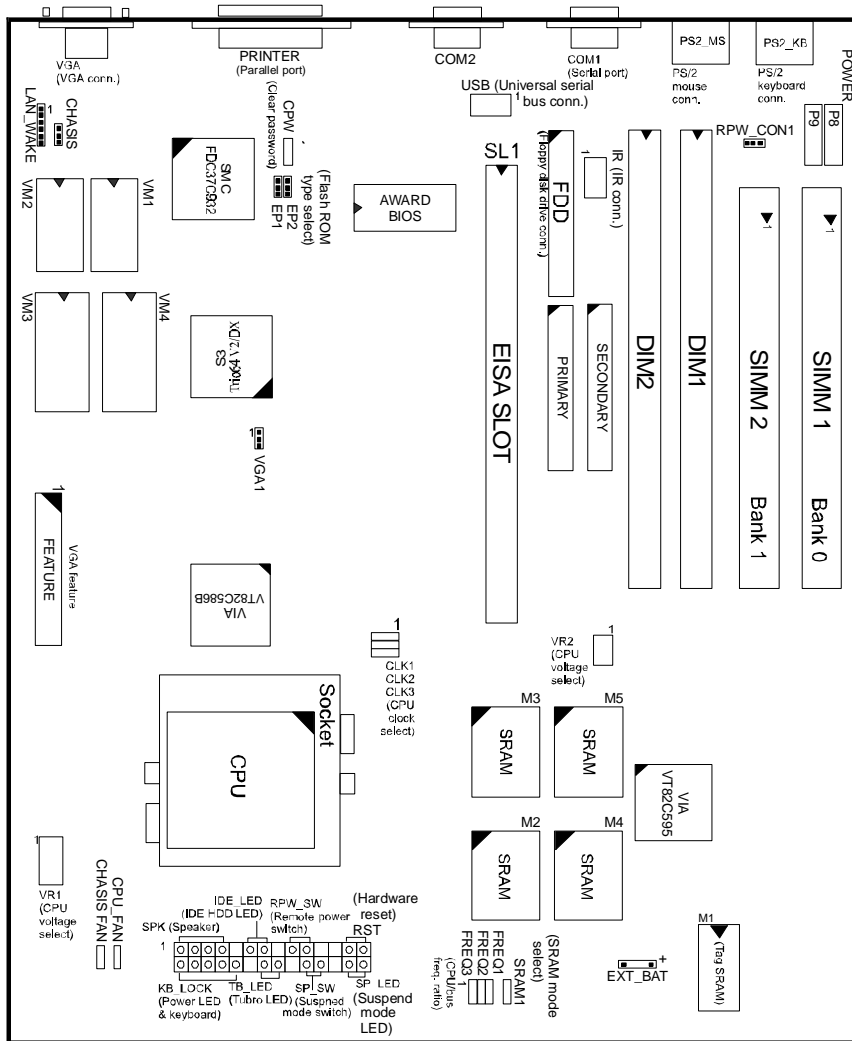
Mainboard Layout (with onboard USB port)
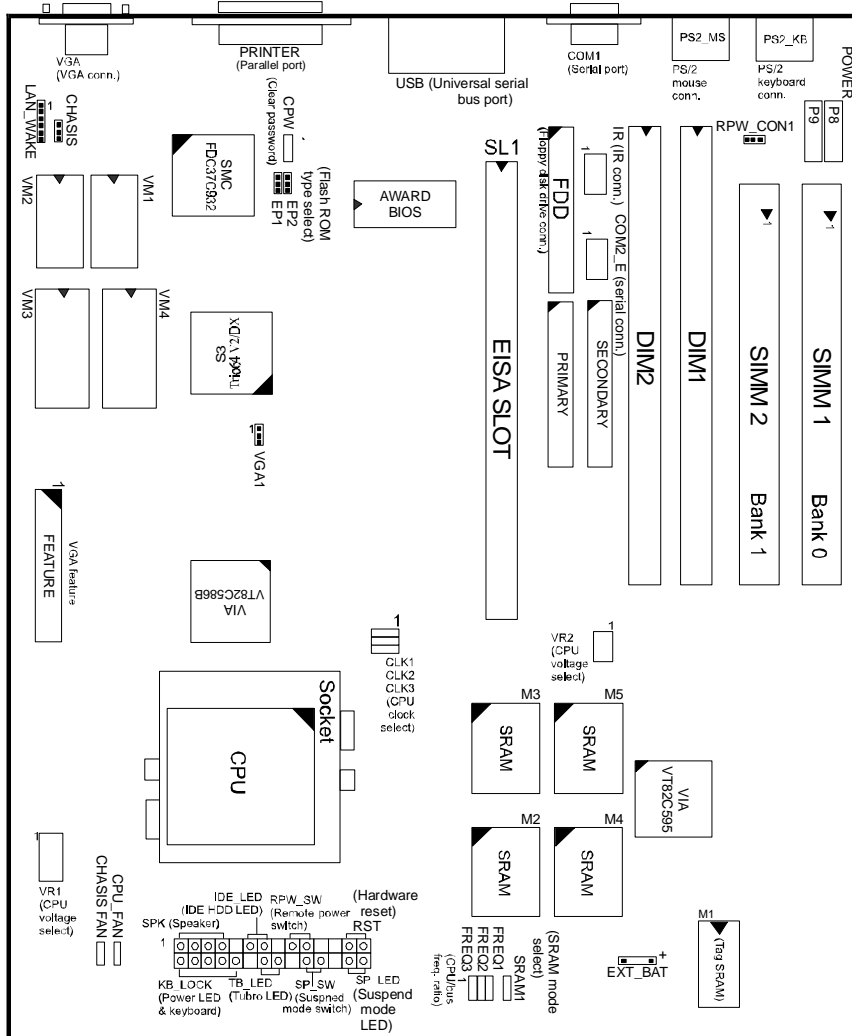
1). Set System Jumpers

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. A "1" is written besides pin 1 on jumpers with three pins. To **set** a jumper, a black cap containing metal contacts is placed over the jumper pin/s according to the required configuration. A jumper is said to be **shorted** when the black cap has been placed on one or two of its pins. The types of jumpers used in this manual are shown below:

Jumper Cap   **3-pin Jumper**   **2-pin Jumper**   **Jumper Block**

Jumper are shown like above

"□" stands for pin 1

Jumper cap like 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.
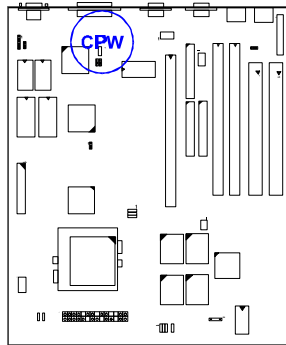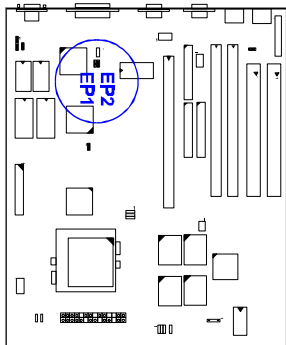

Enable

**Disable
(Default)**

NOTE : The SMC® FDC37C932 I/O chip does not support the Clear Password feature, only the SMC® FDC37C932FR chip.

Flash EPROM Type Selection: EP1, EP2

These two jumpers allow you to configure the Flash EPROM chip.

1M Flash ROM	EP1	EP2
INTEL 28F001 MXIC 28F1000P	1	1
AMD 28F010A ATMEL 29C010A SST 29EE010	1	1

2M Flash ROM	EP1	EP2
INTEL 28F002 MXIC 28F2000P	1	1
AMD 28F020 ATMEL 29C020 SST 29EE020	1	1

CPU to SRAM Data Transaction Mode Selection: SRAM1

This jumper allows you to select the CPU to SRAM data read/write mode. If you install a Cyrix or IBM processor please set the jumper at 2-3 and also set the Linear Burst feature of the Chipset Features Setup, Chapter 3.
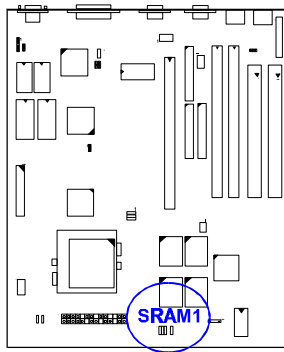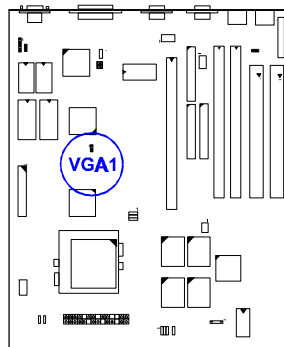
Intel Burst
(Default)
For
Intel Pentium CPUs,
AMD CPUs,
Cyrix CPUs,
IBM CPUs

Linear Burst

For
Cyrix CPUs,
IBM CPUs

(Cache RAM Module
must support
linear burst mode)

VGA Selection: VGA1

This jumper allows you to enable onboard VGA.

Enable
(Default)

Disable

2). Install System RAM Modules

DRAM Memory

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

The PAK-2005's RAM is comprised of two 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, either 60ns or 70ns FPM (Fast Page Mode) (asymmetric or symmetric) and high-speed EDO (Enhanced Data Out) DRAM (parity is not supported). Each DIMM socket is able to support up to 128MB EDO DRAM or lightning-fast SDRAM.

Occasionally the system must break apart data files because the entire file does not fit into the RAM area. Consequently, when the system needs data that is not in RAM, it must access the disk where the balance of the data is stored. Compared to the lightning speed access of the system has to RAM, accessing a mechanical disk drive is a slow process.

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.

[SIMM's Photo]   [DIMM's Photo]

SIMM   **DIMM**
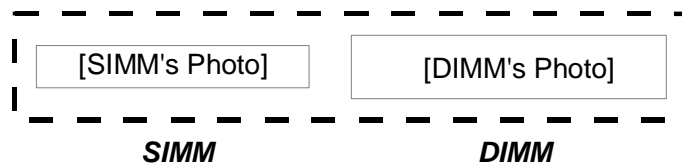
DRAM Module Configuration

DRAM modules in Bank 0, Bank 1, and Bank 2 can be installed in many combinations. Some of them are listed in the following table.

TOTAL MEMORY	BANK 0 SIMM 1 (72-PIN)	BANK 0 SIMM 2 (72-PIN)	BANK 1 DIM1 (168-PIN)	BANK 2 DIM2 (168-PIN)
8MB	4MB	4MB		
			8MB	
				8MB
16MB	8MB	8MB		
			8MB	8MB
			16MB	
				16MB
32MB	16MB	16MB		
			16MB	16MB
			32MB	
				32MB
64MB	32MB	32MB		
			32MB	32MB
			64MB	
				64MB
128MB	64MB	64MB		
			64MB	64MB
			128MB	
				128MB
256MB			128MB	128MB
	128MB *	128MB *		

*This configuration has not been tested as of this writing.*

> **NOTE :** DIM1 and DIM2 only support 3.3V (unbuffered) EDO and SDRAM modules but can support different memory configurations at the same time (e.g., BANK 1 is 16MB and BANK 2 is 8MB).
> SIMMs and DIMMs are not to be installed at the same time on this mainboard or else you will burn your memory. Mixing SIMMs and DIMMs require 5.0Volt (signal level) tolerant memory chips which are currently unavailable.
> SIMMs (ECC memory or parity check is not supported) with latency time of 60ns, 70ns and DIMMs with latency time of 10ns, 12ns are allowed on this mainboard.

Install SIMMs

Complete the following procedures to install SIMMs:

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

1. Locate the SIMM slots on the mainboard. (See figure below.)
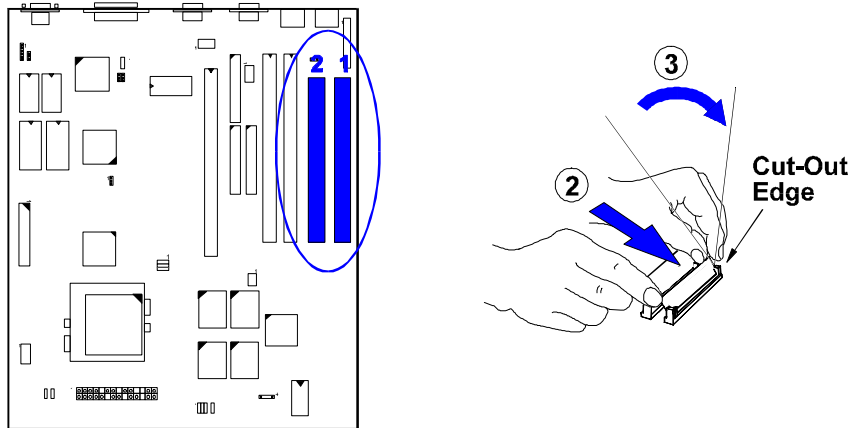
NOTE : SIMMs in each bank must be of the same type; System BIOS automatically configures the memory size.

2. Carefully fit a SIMM at a 45 degree angle into each empty socket to be populated, making sure that all the contacts are aligned with the socket. The SIMM memory modules will only fit in one orientation as shown because of a "Plastic Safety Tab" on one end of the SIMM sockets which requires the "Notched End" of the SIMM memory modules.

3. With your fingers, swing each SIMM into its upright, locked position so that it clicks into place. When locking a SIMM in place, push on each end of the SIMM - do not push in the middle, as shown above.

4. The plastic guides should go through the two "Mounting Holes" on the sides and the "Metal Clips" should snap on the other side.

Remove SIMMs

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

Install DIMMs

Dual In-Line Memory Modules (DIMM's) can be used when the SIMM sockets are not used. Two sockets are available for 3.3Volt (power level) Unbuffered Synchronous DRAMs (SDRAM) or Extended Data Out (EDO) DRAM of either 8, 16, 32, or 64MB to form a memory size between 8MB to 128MB. One side (with memory chips) of the DIMM module takes up one row on the mainboard. Because the number of pins are different on either side of the breaks, the module will only fit in one orientation. DRAM SIMM modules have the same pin contact on both sides. SDRAM DIMM modules have different pin contact on each side and therefore, have a higher pin density. Complete the following procedures to install DIMMs:

NOTE : Do not use memory modules with more than 24 chips per module.
Modules with more than 24 chips exceed the design specifications of
the memory subsystem and will be unstable.
The notch on the DIMM module will shift between left, center, or right
to identify the type and also to prevent the wrong type from being
inserted into the DIMM slot on the mainboard. Ask your retailer for the
specifications before purchasing.

1. Locate the DIMM slots on the mainboard. (See figure below.)
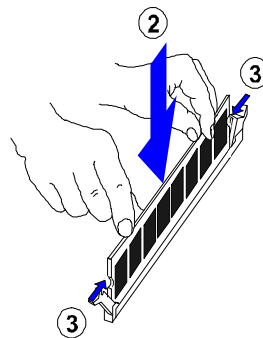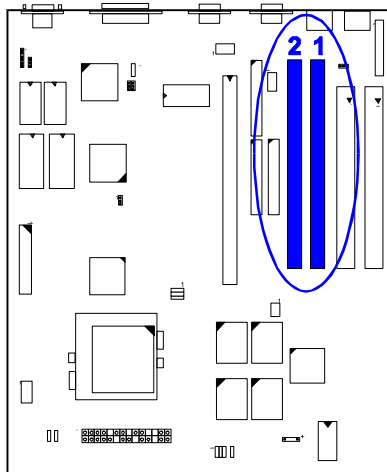
2. Install the DIMM straight down into the DIMM slot with both hands.

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 mainboard comes with onboard 512KB 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.
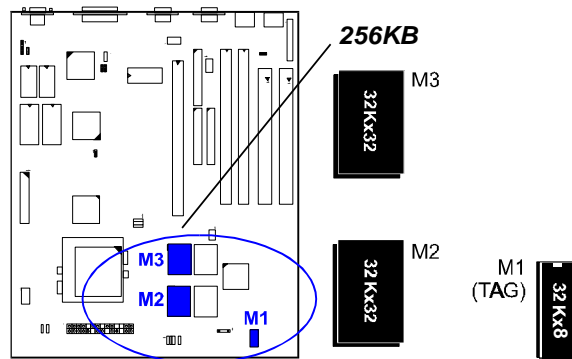
Pentium mainboards may implement various types of L2 cache SRAMs. Pipeline Burst SRAM is one of them, delivering the best price performance ratio. They perform much better than asynchronous SRAMs.

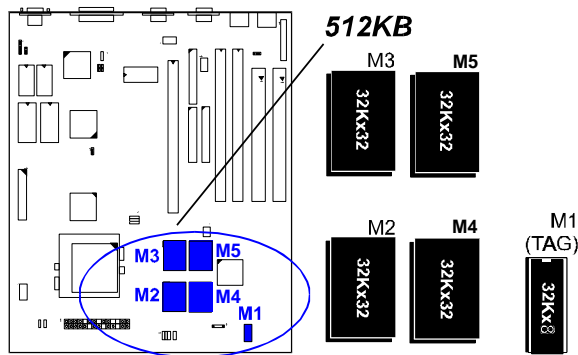**NOTE:** The cache memory is not user upgradeable.

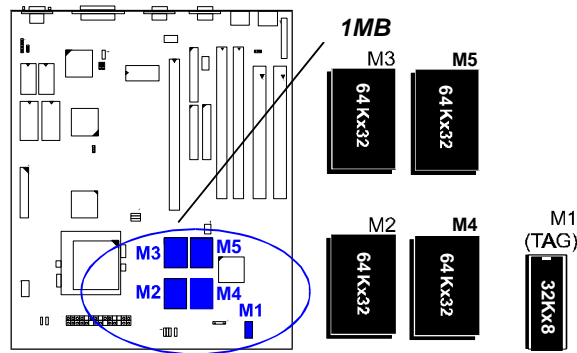### Option 1: 512KB Cache SRAM
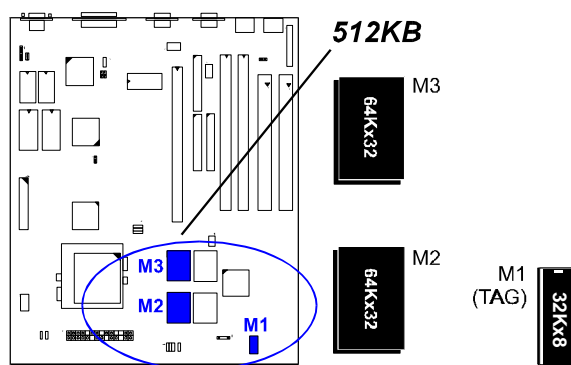
Option 2: 256KB Cache SRAM

## Option 3: 512KB Cache SRAM

Option 4: 1MB Cache SRAM

3). Install the Central Processing Unit (CPU)

The CPU module resides in a 321-pin Zero Insertion Force (ZIF) Socket 7 on the mainboard that is backwards compatible with ZIF Socket 5 processors. The CPU that came with the mainboard should have a fan attached to it to prevent overheating. If this is not the case then purchase a fan before turning on the system. Apply thermal jelly to the CPU top and then install the fan onto the CPU.

NOTE : Without a fan circulating air on the CPU and heat sinks, the CPU and/or heat sinks can overheat and cause damage to both the CPU and the mainboard.
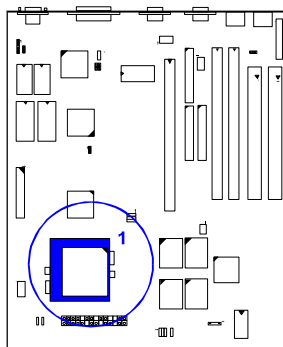
CAUTION: Always turn the system power off before installing or removing any device.
Always observe static electricity precautions. See "Handling Precautions" at the start of this manual.
Inserting the CPU chip incorrectly may damage the chip.

To install the CPU, first turn off the system and remove its cover before doing the following:

1. Locate the ZIF socket and open it by first pulling the lever sideways away from the socket then upwards to a 90-degree right angle.

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 notched corner with the white dot to correctly orient the chip. Align the notch with pin one of the socket by pointing the white dot towards the end of the lever. Pin one is located in the blank triangular area where one hole is missing from that corner of the square array of pin holes. Do not force the chip as the CPU has a corner pin for three of the four corners, the CPU will only fit in the one orientation. With the added weight of the CPU fan, the CPU should slide easily into the socket.

4. Once completely inserted, hold down on the fan and 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.

NOTE : You must set jumpers for "CPU to BUS Frequency Ratio" and "CPU External Clock (BUS) Frequency" depending on the CPU that you install.

Socket Without CPU   **Socket With CPU**
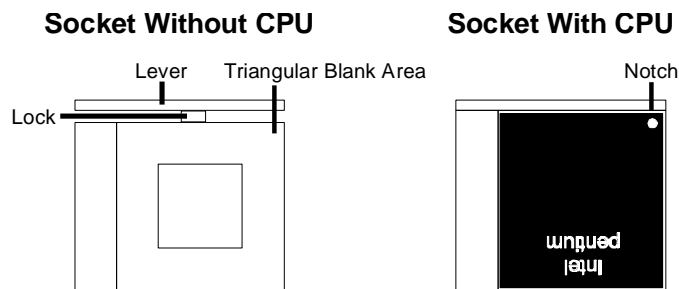
Select Frequency and Voltage

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 external frequency (called the BUS clock) within the CPU. These must be set together with the jumpers on the next page (CPU external clock BUS frequency).
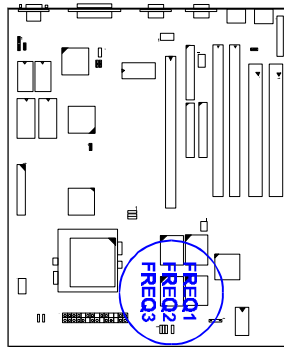
FREQ1	FREQ2	FREQ3	Ratio			
			P54C	P55C/ M2/K6	K5	M1
			1.5 x	3.5x	1.5 x	3 x
			2 x	2 x		2 x
			2.5 x	2.5 x	1.75 x	1 x
			3 x	3 x	2 x	4 x
				4 x		
				4.5 x		

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

The table below shows the jumper settings for the different CPU speed configurations.
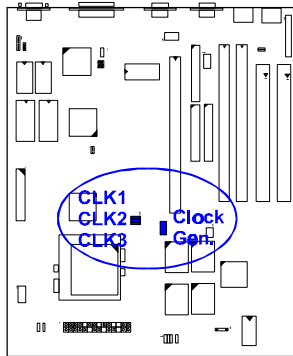
For ICW48C67-1/ PhaseLink PLL52C62-01XC Clock Generator

ICW48C67-1 External (CPU/CLK)	CLK1	CLK2	CLK3
66.6 MHz			
60 MHz			
55 MHz			

For IMI671 / CY2277 / W48567-71 (CLK3)

60 MHz   66 MHz

NOTE : This mainboard contains only one of the two different types of clock generators listed above; either ICW, or PhaseLink. Please check the onboard clock generator before setting CPU jumpers.

Intel Pentium CPUs

Frequency

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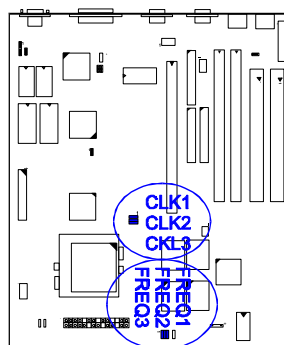
Voltage

These jumpers set the voltage supplied to the CPU. The voltage regulators will automatically detect and switch between Single Power Plane and Dual Power Planes.

XXX
[P55C photo]
XXXXXXX

XXX
[P54C photo]
XXXXXX

A Pentium P55C Processor

A Pentium P54C Processor
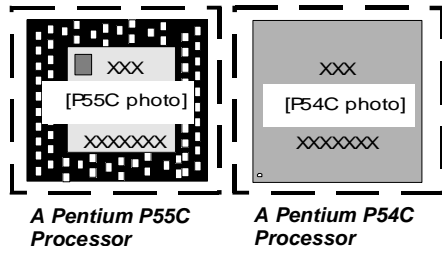
Intel Pentium CPU Bottom Side Marking

XXXXXXXXX
XXXXXXXXX

BP80502-SSS
SXXXX/RSS
XXX
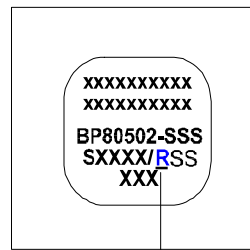
R (Identifier for Voltage Range) :

V for VRE Voltage Range
or
S for Standard Voltage Range

VR1   VR2
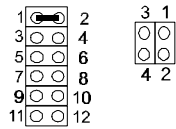
Core : 3.5V
IO   : Same
P54C VRE
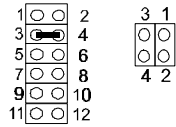
Core : 3.3V
IO   : Same
P54C STD
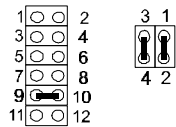
Core : 2.8V
IO   : 3.3V
P55C

VR2

VR1
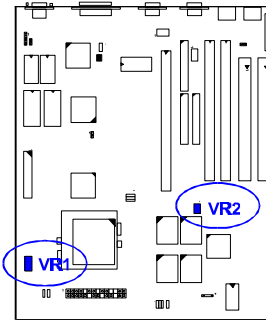
AMD-K5/K6 CPUs

Frequency

Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CLK3	CPU Clock Rate Internal	FREQ1	FREQ2	FREQ3
K6-300 *	300 MHz	66 MHz				4.5 x			
K6-266 *	266 MHz	66 MHz				4 x			
K6-233	233 MHz	66 MHz				3.5 x			
K6-200	200 MHz	66 MHz				3 x			
K6-166	166 MHz	66 MHz				2.5 x			
K5-PR200	133 MHz	66 MHz				2 x			
K5-PR166	116 MHz	66 MHz				1.75 x			
K5-PR150	105 MHz	60 MHz				1.75 x			
K5-PR133	100 MHz	66 MHz				1.5 x			
K5-PR120	90 MHz	60 MHz				1.5 x			
K5-PR100	100 MHz	66 MHz				1.5 x			
K5-PR90	90 MHz	60 MHz				1.5 x			

* This CPU setting has not been tested.

Voltage

An AMD-K6 Processor

An AMD-K5 Processor
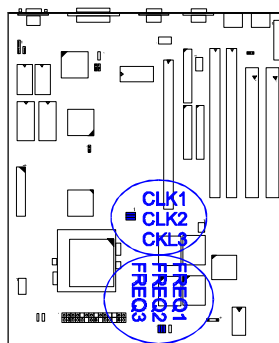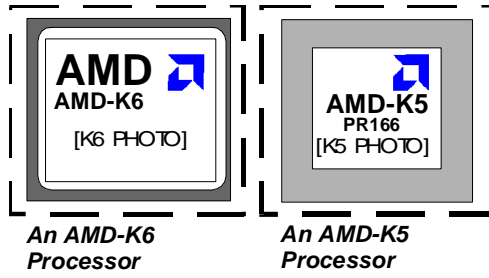
AMD-K5 CPU Top Side Marking

AMD-K5
AMD-K5-PRXXXABQ
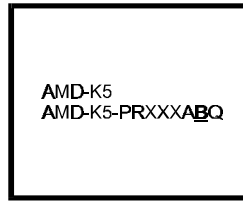
V (Identifier for Operational Voltage)

AMD-K6 CPU Top Side Marking

AMD-K6
AMD-K6-XXXAVQ

V (Identifier for Operational 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

VR1   VR2

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

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

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

Core : 2.1V
IO   : 3.3V
AMD-K6 (266/300MHz)

VR2

VR1
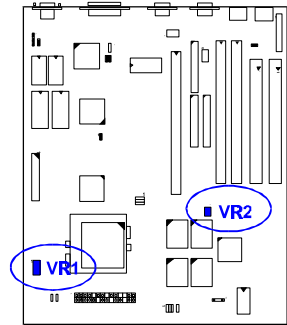
Cyrix 6x86/6x86MX / IBM 6x86/6x86MX CPUs

The Cyrix CPU supported on this mainboard that is labeled Cyrix 6x86 PR133+/PR150+/PR166+ must be Revision 2.7 and later. Look on the underside of the CPU for the serial number. The number should read G8DC6620A or larger.

Frequency

Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CLK3	CPU Clock Rate			
						Internal	FREQ1	FREQ2	FREQ3
6x86MX-PR266 *	233 MHz	66 MHz				3.5 x			
6x86MX-PR233 *	200 MHz	66 MHz				3 x			
6x86MX-PR200	180 MHz	60 MHz				3 x			
6x86MX-PR200	166 MHz	66 MHz				2.5 x			
6x86MX-PR200	165 MHz	55 MHz				3 x			
6x86MX-PR166	150 MHz	60 MHz				2.5 x			
6x86MX-PR166	138 MHz	55 MHz				2.5 x			
6x86MX-PR166	133 MHz	66 MHz				2 x			
6x86-PR166+ 6x86L-PR166+	133 MHz	66 MHz				2 x			
6x86-PR150+ 6x86L-PR150+	120 MHz	60 MHz				2 x			
6x86-PR133+ 6x86L-PR133+	110 MHz	55 MHz				2 x			

* These CPUs have not been verified as of this writing.

Voltage

Cyrix
686 MX
[MX Photo]

A Cyrix 6x86MX Processor

Cyrix
686
[6x86 Photo]

A Cyrix 6x86 Processor
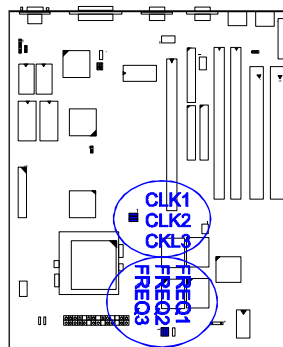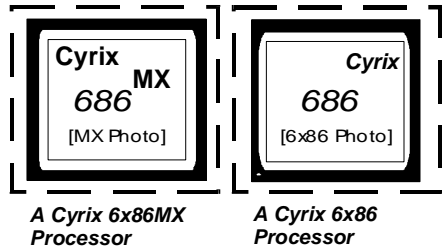
Cyrix 6x86 CPU
Top Side Marking

6x86-PR166⁺GP
133 MHz
3.52V **(028)**

VR1   VR2
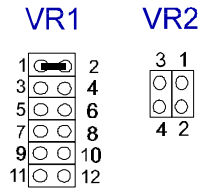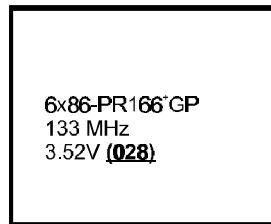
Core : 3.5V
IO   : Same
Cyrix 6x86
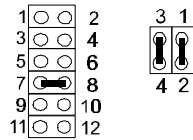
Core : 2.9V
IO   : 3.3V
Cyrix 6x86MX
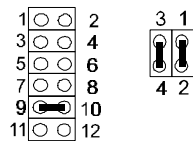
Core : 2.8V
IO   : 3.3V
Cyrix 6x86L

VR2

VR1
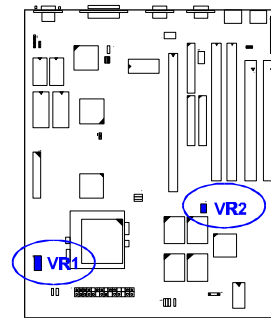
NOTE : The same specifications may be observed for IBM 6x86/6x86MX CPUs. Only Cyrix Rev 2.7 or later is supported on this mainboard. Bootup screen will show 6x86-P166+ with the Cyrix 166+ installed on this mainboard.

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4). Install Expansion Cards

NOTE : Before installing an expansion card, a riser card has to be installed in the one available EISA slot (SL1). Make sure to unplug the power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both the mainboard and expansion cards.

The mainboard features one 32-bit EISA Bus expansion slots.
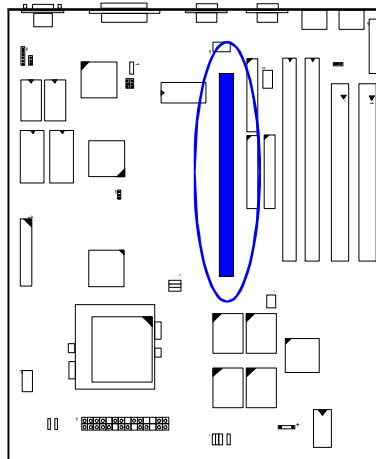
This section describes how to connect a riser card to the system's expansion slot. A riser card is a printed circuit board that, when connected to the mainboard, allows you to install additional ISA/PCI expansion cards which increases the capabilities of the system. For example, an expansion card can provide video and sound capabilities.

CAUTION: Always turn the system power off before installing or removing any device.
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 computer chassis cover and locate the empty EISA expansion slot (SL1).
2. Holding the edge of the riser card, carefully align the edge connector with the expansion slot.

3. Push the riser card firmly into the slot. Push down on one end of the riser card, then the other. Use this "rocking" motion until the riser card is firmly seated inside the slot.

4. Read the expansion card documentation on any hardware and software settings that may be required to setup the specific card.

5. Set any necessary jumpers on the expansion card.

6. Select an empty expansion slot on the riser card.

7. Holding the edge of the peripheral card, carefully align the edge connector with the expansion slot.

8. Push the card firmly into the slot. Push in on one end of the expansion card, then the other. Use this "rocking" motion until the add-on card is firmly seated inside the slot. Make sure that the card has been placed evenly and completely into the expansion slot.

9. Replace the computer system's cover.

10. Setup the BIOS if necessary.

11. Install the necessary software drivers for the expansion card. The photo below shows an add-on card that was installed in a system.

[System with an add-on card Photo]
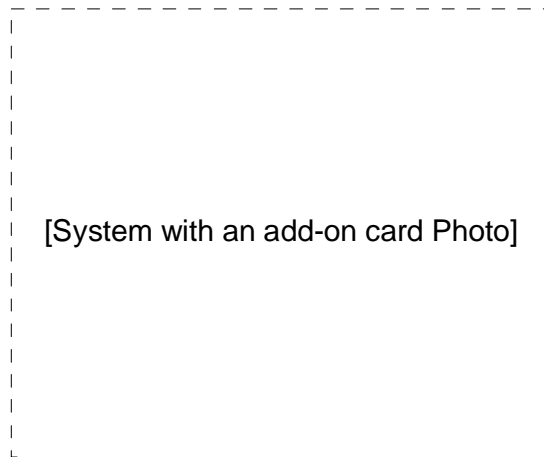
Assigning IRQs for Expansion Cards

Some expansion cards need to use an IRQ to operate. Generally an IRQ must be exclusively assigned to one use. In a standard design there are 16 IRQs available but most of them are already in use by parts of the system which leaves 6 free for expansion cards.

Currently, there are two types of ISA cards. The original ISA expansion card design, now referred to as "Legacy" ISA cards, requires that you configure the card's jumpers manually and then install it in any available slot on the ISA bus. You may use Microsoft's Diagnostic (MSD.EXE) utility included in the Windows directory to see a map of the used and free IRQs. For Windows 95 users, the "Control Panel" icon in "My Computer" contains a "System" icon which gives you a "Device Manager" tab. Double clicking on a specific device gives you a "Resources" tab which shows the Interrupt number and address. Make sure that no two devices use the same IRQs or the computer will experience problems when two devices are in use at the same time.

To simplify this process the mainboard has complied with the Plug and Play (PnP) specification which was developed to allow automatic system configuration whenever a PnP-compliant card is added to the system. For PnP cards, IRQs are assigned automatically from those available. For older Legacy cards that does not work with the BIOS, contact your vendor for an ISA Configuration Utility.

Assigning DMA Channels for ISA Cards

Some ISA cards, both Legacy and PnP may also need to use a DMA (Direct Memory Access) channel. DMA assignments for the mainboard are handled the same way as the IRQ assignment process described above. You can select a DMA channel in the PnP configuration section of the BIOS Setup utility.

5). Connector Cables and Power Supply

Connectors

> **NOTE :** Some pins are used for connectors or power sources. These are clearly separated from jumpers. Placing jumper caps over these will cause damage to the mainboard.

Ribbon cables should always be connected with the red stripe on the Pin 1 side of the connector. The four corners of the connectors are labeled on the mainboard. Pin 1 is the side closest to the power connector on hard drives and floppy drives. IDE ribbon cable must be less than 18in. (46cm), with the second drive connector no more than 6in. (15cm) from the first connector.

Connectors allow the mainboard to link electronically with other parts of the system. Some malfunctions encountered may be caused by loosed or improper connections. Ensure that all connections are in place and firmly attached.

Floppy Diskette Drive Connector (34-pin block): FLOPPY

This 34-pin block connector connects to your floppy disk drive using the cable that is provided with this mainboard. After connecting the single end to the board, connect the two plugs on the other end to the floppy drives. Pin 5 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 5 plugged.
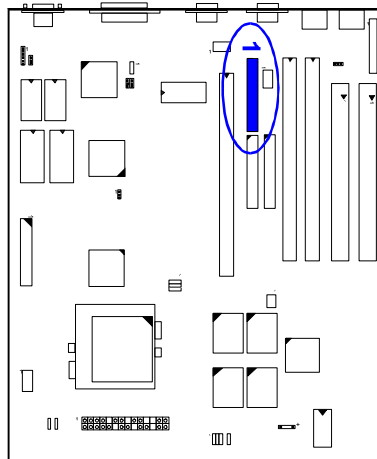
Infrared Connector: IR

This 10-pin male connector is used for connecting to the infrared (SIR/FIR) port and allows the data transaction with another system which also supports the SIR/FIR feature.
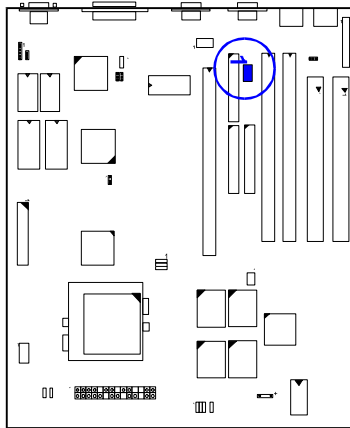
Serial Port Connectors (Two 9-pin Male): COM1, COM2
(for mainboard with onboard COM1 and COM2 ports)

These two connectors allow you to connect with devices that take serial ports, such as a serial mouse or a modem. Usually, it is recommended to connect the serial mouse to COM1 and the 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.

[I/O Connector Photo]

PS/2 Keyboard · PS/2 Mouse · COM1 · COM2 · Printer · VGA
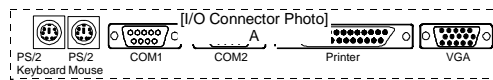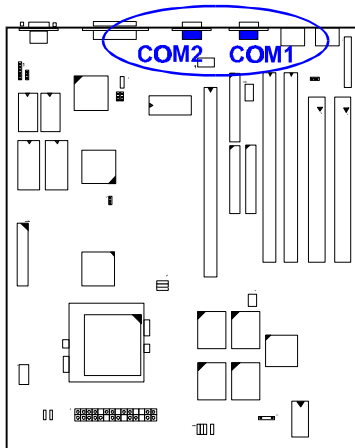
Serial Port (9-pin Male) and Serial Connector (10-pin Male): COM1, COM2_E
(for mainboard with onboard COM1 port and COM2_E connector)

This mainboard comes with an optional COM2 connector that is connected by a cable to the onboard COM2_E pinhead. The bracket can be installed in one of the I/O expansion slots on the rear panel of the system.
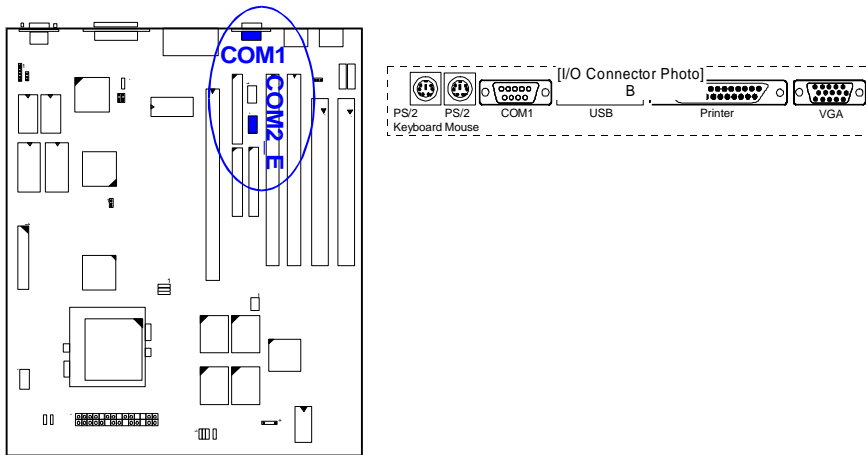
Standard Power Connector: POWER

This 6-pin each 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 facing each other.
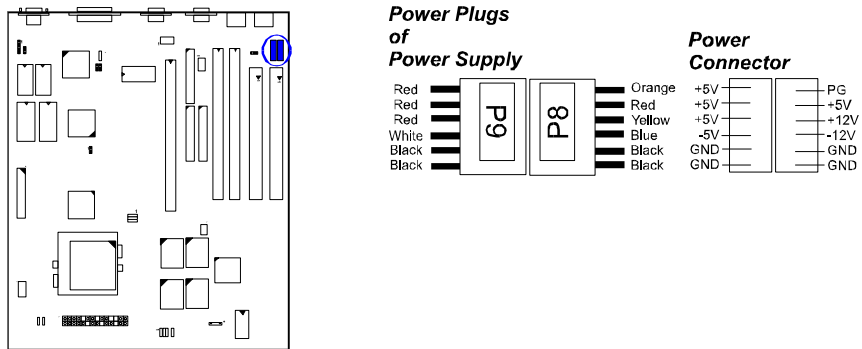
IDE HDD Device Connector (Two 40-pin Block): PRIMARY, SECONDARY

These two 40-pin block connector 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 drive, please use the SECONDARY connector. If two hard disks are connected to 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 hard disk drive manual for details. Pin 20 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 20 plugged.

You may configure two hard disks to be both Masters using one ribbon cable to the primary IDE connector and another ribbon cable on the secondary IDE connector. You may install one operating system on an IDE drive and another on a SCSI drive and select the boot disk through the BIOS Setup.
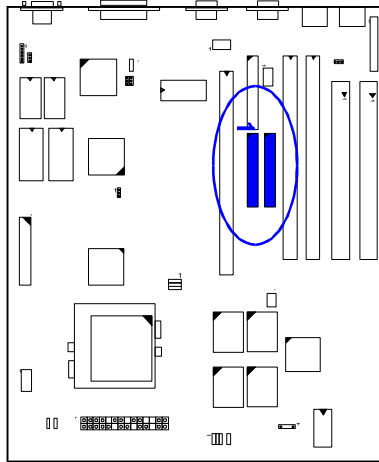
Universal Serial Bus Port: USB (with onboard USB port)

The onboard USB port allows the system to link with USB peripheral devices.
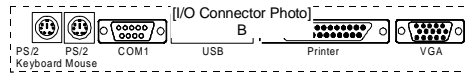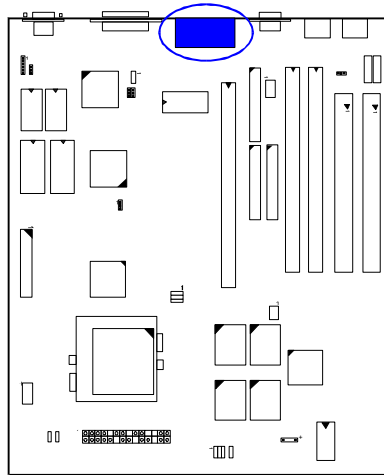
Universal Serial Bus Connector: USB (with onboard COM1 and COM2 port)

This onboard USB connector allows the system to link with USB peripheral devices, such as a USB hub.
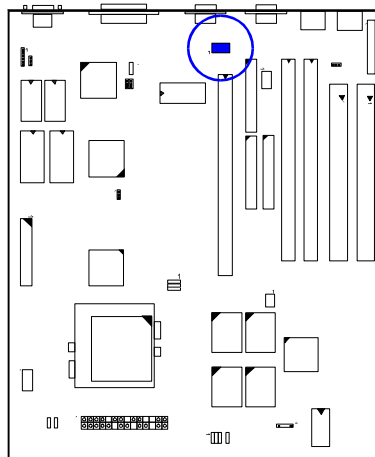
PS/2 Keyboard Connector (6-pin Female): PS2_KB

This connector is used to connect a standard keyboard using a PS/2 plug (mini DIN) to the system. This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.
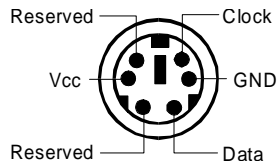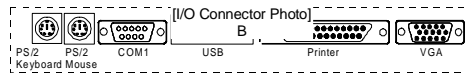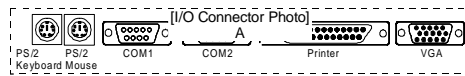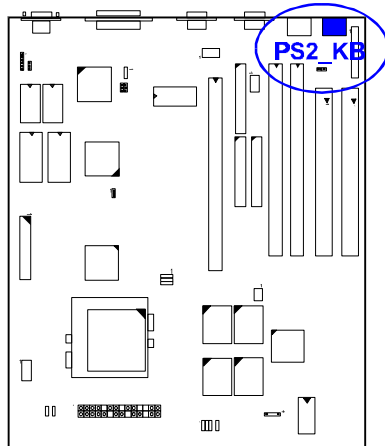
PS/2 Mouse Connector (6-pin Female): PS2_MS

This connector is used to connect the PS/2 mouse to the system. The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, expansion cards can use IRQ12.
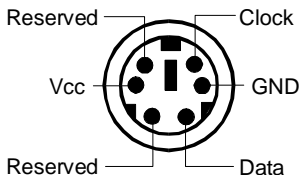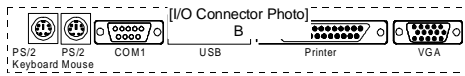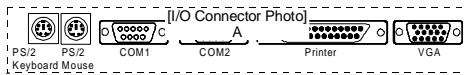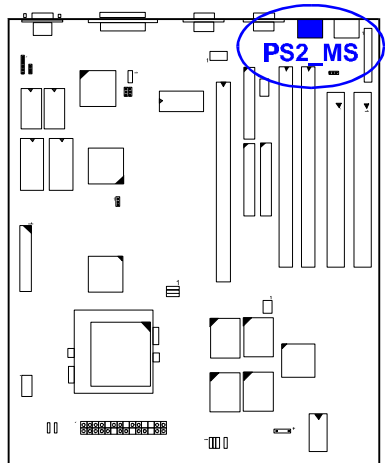
Remote Power Supply Connector: RPW_CON1

This 3-pin male connector allows you to enable (or disable) the system power if the RPW_SW is on (or off) — located at the F_PNL connector.
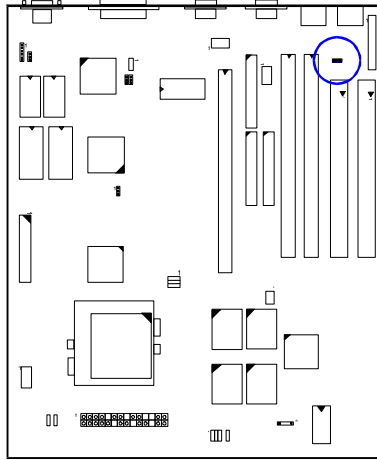
CPU Fan Connector: CHASIS FAN, CPU_FAN

These connectors support cooling fans of 500mAMP (6WATT) or less. Orientate the fans so that the heat sink fins allow airflow to go accross the onboard heat sink(s) instead of the expansion slots. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be positive, while the black wire should be ground. Connect the fan's plug to the board taking into consideration the polarity of the connector. Either one is connected to the CPU fan. CHASIS FAN causes the CPU fan to be activated only when a set temperature is reached. CPU_FAN causes the CPU fan to be activated upon booting the system – for as long as the system is on, irrespective of CPU temperature.

NOTE : The CPU and/or mainboard will overheat if there is no airflow across the CPU and onboard heatsinks. Damage may occur to the mainboard and/or CPU fan if these pins are incorrectly used. These are not jumpers, do not place jumper caps over these pins.

[CPU fan Photo]

CPU FAN
CHASIS_FAN

+ 12V   GND
         GND
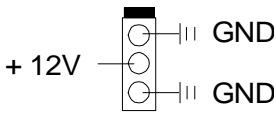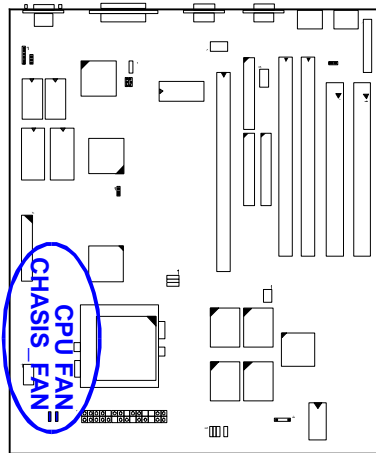
Front Panel Block Connector: F_PNL

This block connector includes: PW_LED, KB_LOCK, TB_LED, SP_SW, SPK, SP_LED, IDE_LED, RPW_SW, and RST connectors.
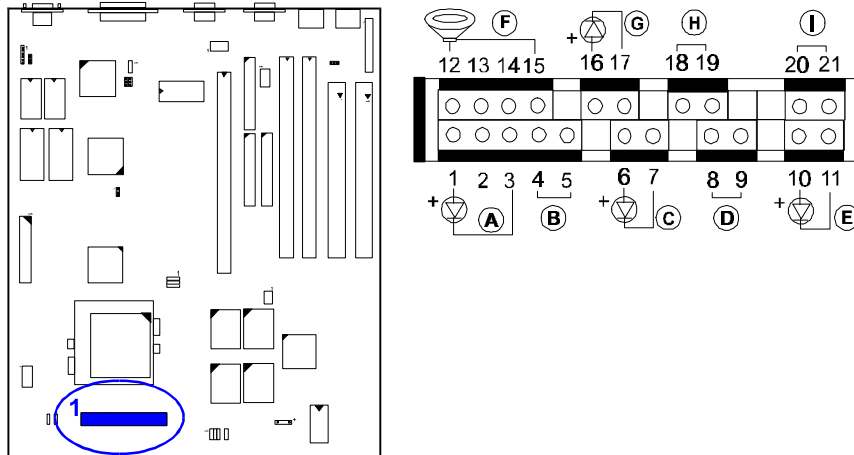
ITEM	CONNECTOR	PIN TYPE	FEATURE
A	PW_LED	2-pin male	The system power LED lights when the system is powered on.
B	KB_LOCK	2-pin male	allows the keyboard to access the system
C	TB_LED	2-pin male	indicates if the system speed is in normal or turbo
D	SP_SW	2-pin male	Suspend mode switch allows user to manually place the system into a suspend mode or "Green" mode where system activity will be instantly decreased to save electricity and expand the life of certain components when the system is not in use. This connector connects to the case-mounted suspend switch. Wake-up can be controlled by settings in the BIOS but the keyboard will always allow wake-up (the SP_SW connector cannot wake-up the system). If you want to use this connector, the corresponding function in the Power Management Setup of the BIOS software section should be on the default setting of Enable.
E	SP_LED	2-pin male	indicates the system is in Suspend mode when LED is lit
F	SPK	4-pin male	This connector connects to the case-mounted speaker.
G	IDE_LED	2-pin male	This connector supplies power to the cabinet's

			IDE activity LED. Indicates the IDE HDD I/O (read and write activity by devices connected to the Primary and Secondary IDE connectors) is being accessed when LED is lit
H	RPW_SW	2-pin male	remote power switch
I	RST	2-pin male	This connector connects to the case-mounted reset switch for rebooting the system without having to turn off power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply.

LAN Sytem Wakeup Connector: LAN_WAKE

The 6-pin male connector allows you to wakeup the system from Suspend mode via a remote workstation or server. This is only possible if both systems are linked in a Local Area Network.
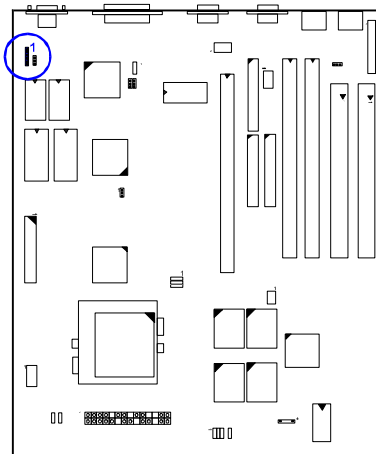
System Chassis Open Alarm Connector: CHASIS

The 3-pin male connector allows you to enable (or disable) system alarm activation if and when the system's outer casing is being removed. A high level signal to the connector will indicate to the system that the chassis has been opened.
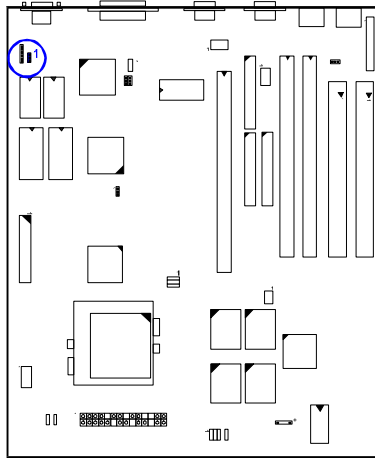
VGA Feature   Connector: FEATURE

The onboard S3® Trio64 V2/DX™ chip provides an interface to a pass-through bidirectional feature connector. The FEATURE connector is a 26-pin male connector for utilizing the VGA feature of the mainboard.
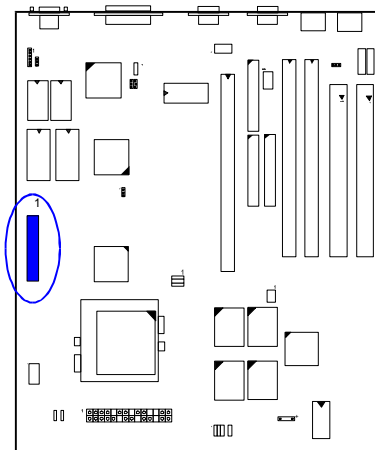
VGA   Connector:

VGA

The 15-hole D-sub female connector is linked to the VGA monitor by a cable.
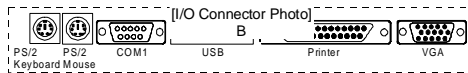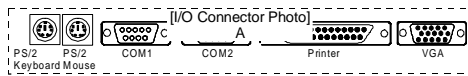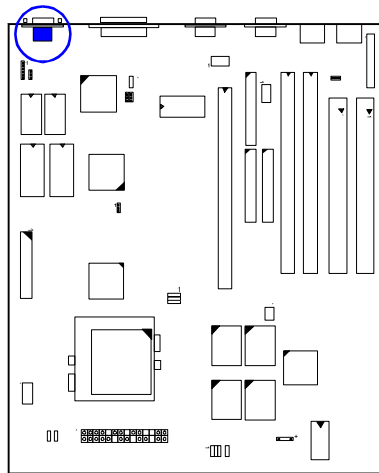
Parallel Printer Connector (25-pin Female): PRINTER

The onboard 26-pin female connector allows the system to link with printer devices via a printer cable. Serial printers must be connected to the serial port.
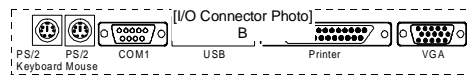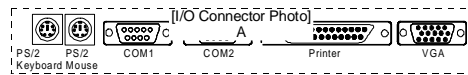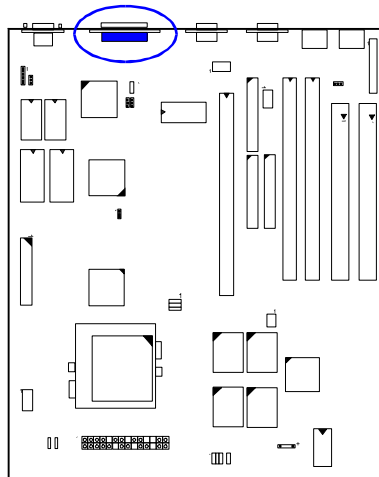
Power Connection Procedures

1. After all jumpers and connections are made, close the system case cover.

2. Make sure that all switches are in the off position.

3. Connect the power supply cord into the power supply located at the back of your system case as instructed by the system user's manual.

4. Connect the power cord into a power outlet that is equipped by a surge protector.

5. You may then turn on your devices in the following order:
   a. The monitor
   b. External SCSI devices (starting with the last device on the chain)
   c. The system power

6. The power LED on the front panel will light. The monitor LED may light after the system's if it complies with "Green" standards or if it has a power standby feature. The system will then run power-on tests. While the tests are running, additional messages will appear on the screen. If you do not see anything within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Recheck the jumper settings and connections or call the retailer for assistance.

7. During power-on, hold down the <Delete> key to enter BIOS Setup. Follow the next chapter for instructions.

Powering Off the Computer

You must first exit or shut down the operating system before switching off the power switch. For Windows 95 users, select shut down the computer from the "Start" button and the system will give three quick beeps after about 30 seconds and power off after Windows shut down.

Setting BIOS Feature

All computer mainboards provide a Setup utility program for specifying the system configuration and settings. If the mainboard came in a computer system, the proper configuration entries may have already been made. If you are installing the mainboard or reconfiguring the system or if you receive a Run Setup message, you will need to enter new setup information.

The mainboard comes with the Award BIOS chip that contains the ROM Setup information of the 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 the system configuration.

A Setup program built into the system BIOS, is stored in the CMOS RAM. This Setup utility program allows changes to the mainboard configuration settings. It is executed when user changes system configuration; user changes system backup battery; or the system detects a configuration error and asks the user to run the Setup program. At power-on RAM testing, the message Press <**Delete**> key to enter Setup appears. If you are a little bit late pressing the mentioned key, POST (Power-On Self Test) will continue with its test routines, thus preventing you from calling up Setup. If you still need to call Setup, reset the system by simultaneously pressing the <**Ctrl**>, <**Alt**> and <**Delete**> keys, or by pushing the Reset button on the system case. You can also restart by turning the system off and then back on again. But do so only if the first two methods fail. Use the arrow keys to select and press <**Enter**> key to run the selected program.

Main CMOS Setup

When you run Setup, the CMOS SETUP UTILITY main program screen will appear with the following options:
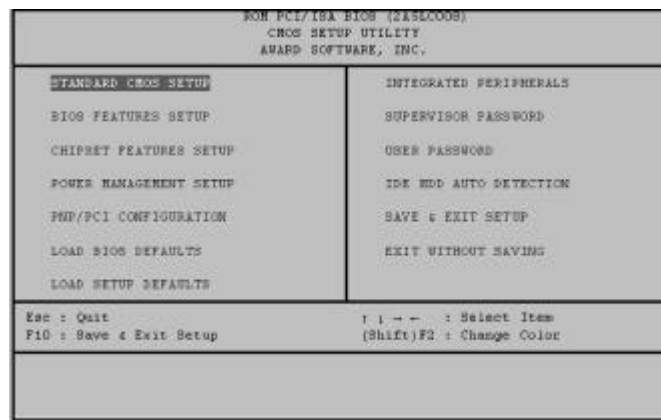
A section at the bottom of the above screen displays the control keys for this screen. Take note of these keys and their respective uses. Another section just below the control keys section displays information on the currently highlighted item in the list.

Load Defaults

The "Load BIOS Defaults" option loads the minimized settings for troubleshooting. "Load Setup Defaults" on the other hand, is for loading optimized defaults for regular use. Choosing defaults at this level will modify all applicable settings.

Standard CMOS Setup

The "Standard CMOS Setup" option allows you to record some basic system hardware configuration and set the system clock and error handling. If the mainboard is already installed in a working system, you will not need to select this option anymore. However, if the configuration stored in the CMOS memory on the mainboard gets lost or damaged, or if you change the system hardware configuration, you will need to re-specify the configuration values. The configuration values usually get lost or corrupted when the power of the onboard CMOS battery weakens.
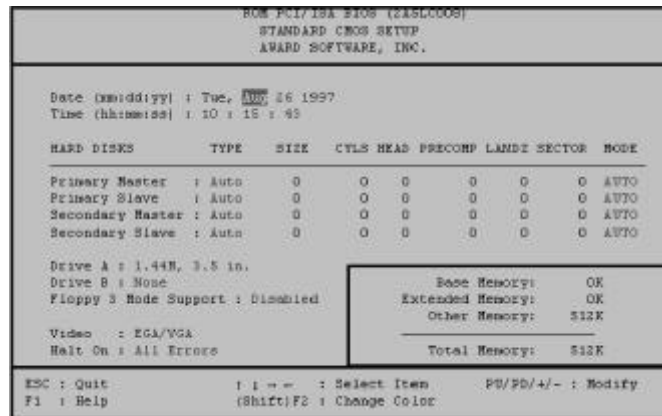
The above screen provides you with a list of options. At the bottom are the control keys for this screen. Take note of these keys and their respective uses. User-configurable fields appear in a different color. If you need information on the selected field, press the <**F1**> key. The help menu will then appear to provide you with the information you need. The memory display at the lower right-hand side of the screen is read-only and automatically adjusts accordingly.

Date

To set the date, highlight the "Date" field and then press the page up/page down or +/– keys to set the current date. Follow the month, day and year format. Valid values for month, day and year are: Month: (1 to 12), Day: (1 to 31), Year: (up to 2099).

Time

To set the time, highlight the "Time" field and then press the page up/page down or +/– keys to set the current time. Follow the hour, minute and second format. Valid values for hour, minute and second are: Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59), just press the <**Enter**> key twice if you do not want to modify the current settings.

Hard Disks

This field records the specifications for all non-SCSI hard drives installed in the system. The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first of which is the "master" and the second is the "slave".

Specifications for SCSI hard disks need not be entered here since they operate using device drives and are not supported by any BIOS. If you installed a SCSI controller card, please refer to their respective documentations on how to install the required SCSI drivers.

For an IDE hard disk drive setup, you can:

- Use the *Auto* setting for detection during bootup.

- Use the IDE HDD AUTO DETECTION in the main menu to automatically enter the drive specifications.

- Enter the specifications yourself manually by using the "User" option.

The entries for specifying the hard disk type include CYLS (number of cylinders), HEAD (number of read/write heads), PRECOMP (write precompensation), LANDZ (landing zone), SECTOR (number of sectors) and MODE. The SIZE field automatically adjusts according to the configuration you specified. The documentation that comes with the hard disk should provide you with the information regarding the drive specifications.

The MODE entry is for IDE hard disks only, and can be ignored for MFM and ESDI drives. This entry provides three options: *Normal*, *Large*, *LBA*, or *Auto*. Set MODE to the *Normal* for IDE hard disks smaller than 528MB; set it to *LBA* for drives over 528MB that support Logical Block Addressing (LBA) to allow large IDE hard disks; set it to *Large* for drives over 528MB that do not support LBA. *Large* type of drives can only be used with MS-DOS and is very uncommon. Most IDE drives over 528MB support the *LBA* mode.

Auto Detection of Hard Disks on Bootup

For each field: Primary Master, Primary Slave, Secondary Master, and Secondary Slave, you can select *Auto* under the TYPE and MODE fields. This will enable auto detection of your IDE drives during Bootup. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard drives which do not support this feature, then you must configure the hard drive in the standard method as described above by the "User" option.

NOTE : After the IDE hard disk information has been entered into BIOS, new IDE hard disks must be partitioned (such as with FDISK) and then formatted before data can be read from and write on. Primary IDE hard drives must have its partition set to *active* (also possible with FDISK).

Drive A / Drive B

These fields record the types of floppy drives installed in the system. The available options for drives A and B are: *None (default); 360KB, 5.25 in.; 1.2MB, 5.25 in.; 720KB, 3.5 in.; 1.44MB, 3.5 in.; 2.88MB, 3.5 in.* To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the left- or right-arrow key.

Floppy 3 Mode Support

This is the Japanese standard floppy drive. The standard stores 1.2MB in a 3.5inch diskette. This is normally disabled but you may choose from either: *Disabled* (default), *Drive A*, *Drive B*, and *Both*.

Video

Set this field to the type of video display card installed in the system. The options are: *EGA/VGA* (default), *Mono* (for Hercules or MDA), *CGA 40*, and *CGA 80*. If you are using a VGA or any higher resolution card, choose the "EGA/VGA" option.

Halt On

This field determines which types of errors will cause the system to halt. Choose from *All Errors* (default); *No Errors*; *All, But Keyboard*; *All, But Diskette*; and *All, But Disk/Key*.

BIOS Features Setup

The "BIOS Features Setup" option consists of configuration entries that allow you to improve the system performance, or lets you set up some system features according to your preference. Some entries here are required by the mainboard's design to remain in their default settings.

```
                  ROM PCI/ISA BIOS (2A5LC008)
                      BIOS FEATURES SETUP
                      AWARD SOFTWARE, INC.

 Virus Warning            : Disabled    Video  BIOS Shadow  : Enabled
 CPU Internal Cache       : Enabled     C8000-CBFFF Shadow  : Disabled
 External Cache           : Enabled     CC000-CFFFF Shadow  : Disabled
 Quick Power On Self Test : Enabled     D0000-D3FFF Shadow  : Disabled
 Boot Sequence(LS120/ZIP100): A,C,SCSI  D4000-D7FFF Shadow  : Disabled
 Boot Up Floppy Seek      : Enabled     D8000-DBFFF Shadow  : Disabled
 Boot Up NumLock Status   : On          DC000-DFFFF Shadow  : Disabled
 Gate A20 Option          : Fast
 Typematic Rate Setting   : Disabled
 Typematic Rate (Chars/Sec) : 6
 Typematic Delay (Msec)   : 250
 Security Option          : Setup

 OS Select For DRAM > 64MB  : Non-OS2

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

A section at the lower right of the screen displays the control keys you can use. Take note of these keys and their respective uses. If you need information on a particular entry, highlight it and press the <**F1**> key. A pop-up help menu will appear to provide you with the information you need. <**F5**> loads the last set values, <**F6**> and <**F7**> loads the BIOS default values and Setup default values, respectively.

Virus Warning

This field protects the boot sector and partition table of the hard disk against accidental modifications. Any attempt to write to them will cause the system to halt and display a warning message. If this occurs, you can either allow the operation to continue or use a bootable virus-free floppy disk to reboot and investigate the system. This setting is recommended because of conflicts with new operating systems. Installation of new operating systems require that you disable this to prevent write errors. The options are *Disabled* (default); *Enabled*.

CPU Internal Cache / External Cache

These fields allow you to turn on or off the CPU's Internal and External built-in cache. The options are *Enabled* (default); *Disabled*.

Quick Power On Self Test

This field speeds up the Power-On Self Test (POST) routine by skipping re-testing a second, third, and fourth time. A complete test of the system is done on each test. The options are *Enabled* (default); *Disabled*.

Boot Sequence (LS120/ZIP100)

This field determines where the system looks first for an operating system. The setup default setting is to check first the floppy drive, then the hard drive, and then the SCSI device; that is, *A, C, SCSI*. The options are *A, C, SCSI* (default); *LS/ZIP, C*; *C, only*; *SCSI, C, A*; *SCSI, A, C; F, A, SCSI; E, A, SCSI; D, A, SCSI; CDROM, C, A; C, CDROM, A; C, A, SCSI*.

Boot Up Floppy Seek

When enabled, the BIOS will seek the floppy "A" drive one time. The options are *Enabled* (default); *Disabled*.

Boot Up NumLock Status

This field enables user to activate the Number Lock function upon system boot. The options are *On* (default); *Off*.

Gate A20 Option

When set at *Fast* will allow a faster access response under Protected Mode. The options are *Fast* (default); *Normal*.

Typematic Rate Setting

When enabled, you can set the two typematic controls listed next. The options are *Disabled* (default); *Enabled*.

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Typematic Rate (Chars/Sec)

This field controls the speed at which the system registers repeated keystrokes. The options are *6* (default); *8*; *10*; *12*; *15*; *20*; *24*; and *30*.

Typematic Delay (Msec)

This field sets the time interval for displaying the first and second characters. The options are *250* (default); *500*; *750*; and *1000*.

Security Option

This field determines when the system prompts for the password. The default setting is *Setup*, where the system always boots up, and prompts for the Supervisor Password only when the Setup utility is called up. The other option is *System*, where the system prompts for the User Password every time you boot up. You can specify a password by using the *Supervisor Password* or *User Password* option from the main screen as explained later in this section. The options are *Setup* (default); *System*.

OS Select For DRAM > 64MB

Allows you to specify which operating system you are using when installed DRAM is greater than 64MB. If the operating system you are using is OS2, select *OS2*, otherwise, stay with the default setting of *Non-OS2*. The options are *Non-OS2* (default); *OS2*.

Video BIOS Shadow

This field allows you to change the video BIOS location from ROM to RAM. Relocating to RAM enhances system performance, as information access is faster than the ROM. The options are *Enabled* (default); *Disabled*.

C8000-CBFFF to DC000-DFFFF Shadow

These fields are used for shadowing other expansion card ROMs. If you install other expansion cards with ROMs on them, you will need to know which addresses the ROMs use to shadow them specifically. Shadowing a ROM reduces the memory available between 640KB and 1024KB by the amount used for this purpose. The options are *Disabled* (default); *Enabled*.

Chipset Features Setup

The "Chipset Features Setup" option controls the configuration of the board's chipset. Control keys for this screen are the same as for the previous screen.

```
                    ROM PCI/ISA BIOS (2A5LC008)
                          CMOS SETUP UTILITY
                        CHIPSET FEATURES SETUP

  Video BIOS  Cacheable   : Enabled    CPU to PCI Write Buffer  : Enabled
  System BIOS Cacheable   : Disabled   PCI Dynamic Bursting     : Enabled
  Memory Hole At 15Mb Addr.: Disabled  PCI Burst                : Enabled
                                       PCI Master 0 WS Write     : Enabled
  Sustained 3T Write      : Enabled    Quick Frame Generation   : Enabled
  CPU Pipeline            : Enabled    PCI Peer Concurrency     : Enabled
  Memory ECC Check        : Disable
  Linear Burst            : Disabled
  DRAM Auto Configuration : Disabled
  DRAM Timing Control     : Fast
  SDRAM  Single/Burst Wrte : Burst
  SDRAM  Cycle Length     : 3
  SDRAM  Bank Interleave  : Disabled


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

Video BIOS Cacheable

Allows the video BIOS to be cached to allow for faster execution. Leave on default setting of *Enabled* for better performance, otherwise *Disabled*. The options are *Enabled* (Default), *Disabled*.

System BIOS Cacheable

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

Memory Hole at 15MB Addr.

Enabling this feature reserves 15MB to 16MB memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. The options are *Disabled* (Default), *15M-16M, 14M-16M*.

Sustained 3T Write

When enabled, it allows the CPU to complete the system memory writes in 3 clocks. The options are *Enabled* (default); *Disabled*.

CPU Pipeline

When enabled, this allows the CPU to execute the pipeline function. The options are *Enabled* (default); *Disabled*.

Memory ECC Check

When enabled, allows you to correct 1 bit memory errors that may occur in the memory. The options are *Disabled* (default); *Enabled*.

Linear Burst (available only when Memory ECC Check is enabled)

When enabled, it allows you to configure the CPU to SRAM data read/write mode. If you use a Cyrix or an IBM CPU and want to run it under the linear burst mode, select *Enabled*. If you use an Intel CPU, AMD CPU, Cyrix CPU (running the Intel Burst mode), IBM CPU (running the Intel Burst mode), stay with the default setting of *Disabled*. Refer to page 18, *SRAM1*. The options are *Disabled* (default); *Enabled*.

DRAM Auto Configuration

Allows you to set the type of DRAM used. This is to be set by a technician only. The options are *Disabled* (default); *60ns*; *70ns*.

DRAM Timing Control

Allows you to set the speed of data access of the VIA VT82C586B chip. The options are Fast (default); Normal; Turbo.

SDRAM Single/Burst Write (available only when DIMM modules are used instead of SIMM modules)

Allows you to set the speed of SDRAM data write whether to a single address or continuously. The options are *Burst* (default); *Single*.

SDRAM Cycle Length (available only when DIMM modules are used instead of SIMM modules)

If the CAS latency of the SDRAM DIMM is 2, set it at *2* to enhance the system's performance. If the CAS latency of the SDRAM DIMM is 3, stay with the default setting of *3*. The options are *3* (default); *2*.

SDRAM Bank Interleave (available only when DIMM modules are used instead of SIMM modules)

When the Bank interleave function of the SDRAM is set at *2 Bank* or *4 Bank*, data transaction performance is better. The options are *Disabled* (default); *2 Bank*; *4 Bank*.

CPU to PCI Write Buffer

The default setting of *Enabled* allows data and address access to internal buffer of the VIA VT82C586B chip so that the processor can be released from the wait 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 the same 1KB space. This improves the PCI Bus throughput. The options are *Enabled* (default); *Disabled*.

PCI Burst

When enabled, it allows data transfer on PCI Buses to improve. Disable this item when troubleshooting. The options are *Enabled* (default); *Disabled*.

PCI Master 0 WS Write

When enabled, it 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, it allows the system to start the PCI Bus (by asserting frame) as soon as possible when the Bus cycle is going forward to the PCI Bus. The options are *Enabled* (default), *Disabled*.

PCI Peer Concurrency

Enable this item to allow the CPU to continue its operation even when another PCI Bus is active. The options are *Enabled* (default); *Disabled*.

Power Management Setup

The "Power Management Setup" option allows you to reduce the power consumption of the system. This feature turns off the video display and shuts down the hard drive after a period of inactivity.

```
                    ROM PCI/ISA BIOS (2A5LC008)
                       POWER MANAGEMENT SETUP
                        AWARD SOFTWARE, INC.

 Power Management    : Disable
 PM Control by APM   : Yes
 Video Off Option    : Suspend -> Off    IRQ3   (COM 2)      : Primary
 Video Off Method    : DPMS Support      IRQ4   (COM 1)      : Primary
 MODEM Use IRQ       : NA                IRQ5   (LPT 2)      : Primary
                                         IRQ7   (LPT 1)      : Primary
                                         IRQ8   (RTC Alarm)  : Disabled
 HDD Power Down      : Disable           IRQ9   (IRQ2 Redir) : Disabled
 Doze Mode           : Disable           IRQ10  (Reserved)   : Disabled
 Suspend Mode        : Disable           IRQ11  (Reserved)   : Disabled
                                         IRQ12  (PS/2 Mouse) : Primary
                                         IRQ14  (Hard Disk)  : Primary
 VGA I/O & MEMORY    : OFF               IRQ15  (Reserved)   : Disabled
 LPT & COM I/O       : LPT/COM
 HDD & FDD I/O       : ON
                                     ESC : Quit        ↑↓←→ : Select Item
                                     F1  : Help        PU/PD/+/- : Modify
                                     F5  : Old Values  (Shift)F2 : Color
                                     F6  : Load BIOS  Defaults
                                     F7  : Load Setup Defaults
```

Power Management

This field acts as the master control for the power management modes. *Max Saving* puts the system into power saving mode after a brief period of system inactivity; *Min Saving* is almost the same as *Max Saving* except that this time the system inactivity period is longer; *Disabled* disables the power saving features; *User Defined* allows you to set power saving options according to your preference. The options are *Disabled* (default); *User Defined*; *Min Saving*; *Max Saving*.

PM Control by APM

The option *No* allows the BIOS to ignore the APM (Advanced Power Management) specification. Selecting *Yes* will allow the BIOS wait for APM's prompt before it enters Doze mode, Standby mode, or Suspend mode. If the APM is installed, it will prompt the BIOS to set the system into the power saving mode after all tasks are done. The options are *Yes* (Default); *No*.

Video Off Option

This item allows you to activate the video off feature for the display monitor power management. The options are *Suspend -> Off* (default); *Always On*; *All Modes -> Off.*

Video Off Method

This field defines the video off features. *V/H SYNC + Blank* blanks the screen and turns off vertical and horizontal scanning; *DPMS Support* allows the BIOS to control the video display card if it supports the DPMS feature; *Blank Screen* only blanks the screen. Use the latter for display monitors that do not support the "Green" (no power management) feature. Screensaver softwares does not work with this feature. With the CRT monitor shut off, this software cannot display. The options are *DPMS Support* (default); *Blank Screen*; *V/H Sync + Blank*.

MODEM Use IRQ

This feature allows you to select the IRQ# to meet the modem's IRQ#. The options are *NA* (default); *3*; *4*; *5*; *7*; *9*; *10*; *11*.

HDD Power Down

This option shuts down any IDE hard drives in the system after a period of inactivity. The time period is user-configurable from 1 to 15 minutes. This feature does not affect SCSI hard drives. The options are *Disabled* (default); *1 Min*; *. . . 15 Min*.

Doze Mode/Suspend Mode

Sets the period of time after which Doze/Suspend Mode activates. At *Max Saving*, Doze/Suspend Mode will activate after *10 seconds*. At *Min Saving*, Doze/Suspend Mode will activate after *1 hour*. If Power Management option is set at *User Defined*, user has the option to set it at *10 Sec; 20 Sec; 30 Sec; 40 Sec; 1 Min; 2 Min; 4 Min;*

6 Min; 8 Min; 10 Min; 20 Min; 30 Min; 40 Min; or 1 Hour. The default value is *Disabled*.

VGA I/O & Memory

Selecting *ON* will enable the power management timer when a no activity event is detected in the VGA. Select *OFF* to disable the power management timer even if a no activity event is detected. The options are *OFF* (default), *ON*.

LPT & COM I/O

Selecting *LPT/COM* will enable the power management timer when a no activity event is detected in the LPT and COM ports. Selecting *LPT* or *COM* will enable the power management timer when a no activity event is detected in the LPT or COM port. Selecting *NONE* will disable the power management timer even if a no activity event is detected. The options are *LPT/COM* (default); *NONE*; *LPT*; *COM*.

HDD & FDD I/O

Selecting *ON* will enable the power management timer when a no activity event is detected in the hard disk drive and floppy disk drive. Selecting *OFF* will disable the power management timer even if a no activity event is detected. The options are *ON* (default); *OFF*.

IRQ3 (COM 2), . . . , IRQ7 (LPT 1)

You can individually set each IRQ to be included in the sleep function. The options are *Primary* (default); *Secondary*; *Disabled*.

IRQ8 (RTC Alarm), . . . , IRQ11 (Reserved)

You can individually set each IRQ to be included in the sleep function. IRQ8 (Real Time Alarm) is usually set to *Disabled* so that any software alarm clock or event calendar can wake up the system. The options are *Disabled* (default); *Primary*; *Secondary*.

IRQ12 (PS/2 Mouse)/IRQ14 (Hard Disk)

You can set IRQ12 and IRQ14 to be included in the sleep function. The options are *Primary* (default); *Secondary*.

IRQ15 (Reserved)

You can set IRQ15 to be included in the sleep function. The options are *Disabled* (default); *Primary*; *Secondary*.

PNP and PCI Setup

The "PNP and PCI Setup" option configures the PCI Bus slots. All PCI Bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.

```
              ROM PCI/ISA BIOS (2A5LC008)
                 PNP/PCI CONFIGURATION
                  AWARD SOFTWARE, INC.

PNP OS Installed       : No      PCI IRQ Activated By : Level
Resources Controlled By  : Auto    Assign IRQ For VGA    : Disabled
Reset Configuration Data : Disabled
IRQ Sequence:9,10,11,5,7,4,3,12,15,14




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

PNP OS Installed

When Plug and Play operating systems (OS) are installed, interrupts may be reassigned by the OS when *Yes* is selected. When a non-Plug and Play OS is installed or to prevent reassigning of interrupt settings, select *No* here. The options are *No* (Default), *Yes*.

Resources Controlled By

If set at *Auto*, BIOS automatically arranges all system resources for you. If there are conflicts or you are not satisfied with the configuration settings, simply set all the resources by selecting *Manual*. The options are *Auto* (default); *Manual*.

Reset Configuration Data

When enabled, this feature allows the system to clear the last BIOS configuration data and reset them with the default BIOS configuration data. The options are *Disabled* (default); *Enabled*.

IRQ Sequence

Allows you to set the sequence of the IRQ#. The options are *9, 10, 11, 5, 7, 4, 3, 12, 15, 14* (default)*; or 15, 11, 10, 9, 12, 14, 5, 7, 3, 4.*

IRQ-3; -4; -5; -7; -9; -10; -11; -12; -14; -15; DMA-0; -1; -3; -5; -6; -7 Assigned to

These options, which allows you to set whether a particular IRQ# or DMA# is used by a PCI/ISA PNP or Legacy ISA card will only appear on screen if the above item Resources Controlled By is set at *Manual*. The options are *PCI/ISA PNP* (default except for IRQ-3 and IRQ-4); *Legacy ISA*.

PCI IRQ Activated By

If the IDE card you are using is triggered by edge, set it at *Edge*. The options are *Level* (default); *Edge*.

Assign IRQ for VGA

If the PCI VGA card you are using does not need an IRQ, select *Disabled*, thereby releasing an IRQ for system use. The options are *Disabled* (default); *Enabled*.

Load BIOS Defaults

The "Load BIOS Defaults" option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disables all high performance features. To load these default settings, highlight "Load BIOS Defaults" on the main screen and then press the <**Enter**> key. The system displays a confirmation message on the screen. Press the <**Y**> key and then the <**Enter**> key to confirm. Press the <**N**> key and then the <**Enter**> key to abort. This feature does not affect the fields on the Standard CMOS Setup screen.

Load Setup Defaults

The "Load Setup Defaults" option allows you to load the default values to the system configuration fields. These default values are the optimized configuration settings for the system. To load these default values, highlight "Load Setup Defaults" on the main screen and then press the <**Enter**> key. The system displays a confirmation message on the screen. Press the <**Y**> key and then the <**Enter**> key to confirm. Press the <**N**> key and then the <**Enter**> key to abort. This feature does not affect the fields on the Standard CMOS Setup screen.

```
                    ROM PCI/ISA BIOS (2A5LC008)
                         CMOS SETUP UTILITY
                        AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

    BIOS FEATURES SETUP             SUPERVISOR PASSWORD

    CHIPSET FEATURES SETUP          USER PASSWORD

    POWER MANAGEMENT SETUP          IDE HDD AUTO DETECTION

    PNP/PCI CONFIGURA┌─────────────────────────┐ETUP
                     │ Load SETUP Defaults (Y/N)? █ │
    LOAD BIOS DEFAULT└─────────────────────────┘SAVING

    LOAD SETUP DEFAULTS

  Esc : Quit                       ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup          (Shift)F2 : Change Color
```

Integrated Peripherals

```
                    ROM PCI/ISA BIOS (2A5LC008)
                        INTEGRATED PERIPHERALS
                        AWARD SOFTWARE, INC.

  IDE HDD Block Mode       : Enabled   Onboard FDC Controller   : Enabled
  On-Chip Primary   PCI IDE: Enabled   Onboard Serial Port 1    : 3F8/IRQ4
  On-Chip Secondary PCI IDE: Enabled   Onboard Serial Port 2    : 2F8/IRQ3
  IDE Primary Master PIO   : Auto      UART2 Mode               : Standard
  IDE Primary Slave  PIO   : Auto
  IDE Secondary Master PIO : Auto
  IDE Secondary Slave  PIO : Auto      Onboard Parallel Port    : 378/IRQ7
  IDE Primary Master UDMA  : Auto      Parallel Port Mode       : Normal
  IDE Primary Slave  UDMA  : Auto
  IDE Secondary Master UDMA: Auto
  IDE Secondary Slave  UDMA: Auto
  HDD S.M.A.R.T. Capability: Disabled

  USB Controller           : Disabled

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

IDE HDD Block Mode

When *Enabled*, the system executes read/write requests to hard drive in Block Mode. The options are *Enabled* (default); *Disabled*.

On-Chip Primary PCI IDE

When *Enabled*, it allows you to use the onboard primary PCI IDE. The options are *Enabled* (default); *Disabled*.

On-Chip Secondary PCI IDE

When *Enabled*, it allows you to use the onboard secondary PCI IDE. The options are *Enabled* (default); *Disabled*.

IDE Primary Master PIO (available only when On-Chip Primary PCI IDE is enabled)

Allows an automatic or a manual configuration of the PCI primary IDE hard drive (master) mode. The options are *Auto* (default); *Mode 0*; *Mode 1*; *Mode 2*; *Mode 3*; *Mode 4*.

IDE Primary Slave PIO (available only when On-Chip Primary PCI IDE is enabled)

Allows an automatic or a manual configuration of the PCI primary IDE hard drive (slave) mode. The options are *Auto* (default); *Mode 0*; *Mode 1*; *Mode 2*; *Mode 3*; *Mode 4*.

IDE Secondary Master PIO (available only when On-Chip Secondary PCI IDE is enabled)

Allows an automatic or a manual configuration of the PCI secondary IDE hard drive (master) mode. The options are *Auto* (default); *Mode 0*; *Mode 1*; *Mode 2*; *Mode 3*; *Mode 4*.

IDE Secondary Slave PIO (available only when On-Chip Secondary PCI IDE is enabled)

Allows an automatic or a manual configuration of the PCI secondary IDE hard drive (slave) mode. The options are *Auto* (default); *Mode 0*; *Mode 1*; *Mode 2*; *Mode 3*; *Mode 4*.

IDE Primary Master UDMA (available only when On-Chip Primary PCI IDE is enabled)

Allows an automatic configuration of the PCI primary IDE hard drive (master) mode if Ultra DMA is supported both on the mainboard and the hard disk. The options are *Auto* (default); *Disabled*.

IDE Primary Slave UDMA (available only when On-Chip Primary PCI IDE is enabled)

Allows an automatic configuration of the PCI primary IDE hard drive (slave) mode if Ultra DMA is supported both on the mainboard and the hard disk. The options are *Auto* (default); *Disabled*.

IDE Secondary Master UDMA (available only when On-Chip Secondary PCI IDE is enabled)

Allows an automatic configuration of the PCI secondary IDE hard drive (master) mode if Ultra DMA is supported both on the mainboard and the hard disk. The options are *Auto* (default); *Disabled*.

IDE Secondary Slave UDMA (available only when On-Chip Secondary PCI IDE is enabled)

Allows an automatic configuration of the PCI secondary IDE hard drive (slave) mode if Ultra DMA is supported both on the mainboard and the hard disk. The options are *Auto* (default); *Disabled*.

HDD S.M.A.R.T. Capability

Enable this option if the hard disk drive you are currently using supports the S.M.A.R.T. function. The options are *Disabled* (default), *Enabled*.

USB Controller

Disable this option if you are not using the onboard USB feature. The options are *Disabled* (default); *Enabled*.

BIOS Support USB Keyboard (available only when USB Controller is enabled)

When the USB devices cannot be detected automatically by the system BIOS or some driver diskettes came with the USB devices, set it at *DOS* to allow for the installation of the drivers. The options are *Setup* (default); *DOS*.

Onboard FDC Controller

When *Enabled*, the floppy disk drive (FDD) controller is activated. The options are *Enabled* (default); *Disabled*.

Onboard Serial Port 1

If Serial Port 1 uses the onboard I/O controller, you can modify the serial port parameters. If an I/O card needs to be installed, COM3 and COM4 may be needed. The options are *3F8/IRQ4* (default); *3E8/IRQ4*; *2F8/IRQ3*; *2E8/IRQ3*; *Disabled*.

Onboard Serial Port 2

If Serial Port 2 uses the onboard I/O controller, you can modify the 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*.

UART2 Mode (available only when Onboard Serial Port 2 is not set at Disabled)

Allows you to select the IR modes if the serial port 2 is used as an IR port. Set it at *Standard* when you use COM2 as a serial port instead of an IR port. The options are *Standard* (default); *IrDA*; *ASK-IR*.

Duplex Select (available only when UART2 Mode is not set at Standard)

This feature allows you to select the infrared data transaction method. The options are *Half* (default); *Full*.

TxD, RxD Active (available only when UART2 Mode is not set at Standard)

This feature allows you to select the active signals of the reception end and transmission end. This is mainly for technician's use only. The options are *Hi, Lo* (default); *Hi, Hi*; *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 *378/IRQ7* (default); *278/IRQ5*; *3BC/IRQ7*; *Disabled*.

Parallel Port Mode (available only when Onboard Parallel Port not set at Disabled)

Allows you to connect with an advanced printer. The options are *Normal* (default); *EPP1.7*; *SPP*; *EPP1.9; ECP*.

ECP Mode Use DMA (available only when Parallel Port Mode set at ECP)

This feature allows you to select the Direct Memory Access (DMA) channel. The options are *3* (default); *1*.

Supervisor Password and User Password

These two options set the system passwords. "Supervisor Password" sets a password that will be used to protect the system and the Setup utility; "User Password" sets a password that will be used exclusively on the system. By default, the system comes without any passwords. To specify a password, highlight the type you want and then press the <**Enter**> key. A password prompt appears on the screen. Taking note that the password is case sensitive, and can be up to 8 alphanumeric characters long, type in your password and then press the <**Enter**> key. The system confirms your password by asking you to type it again. After setting a password, the screen automatically reverts to the main screen. To implement the password protection, specify in the "Security Option" field of the BIOS Features Setup screen when the system will prompt for the password. If you want to disable either password, press the <**Enter**> key instead of entering a new password when

the "Enter Password" prompt appears. A message confirms the password has been disabled.

IDE HDD Auto Detection

The "IDE HDD Auto Detection" option detects the parameters of an IDE hard drive and automatically enters them into the Standard CMOS Setup screen. Up to four IDE drives can be detected, with parameters for each listed inside the box. To accept the optimal entries, press the <**Y**> key or else select from the numbers displayed under the OPTIONS field; to skip to the next drive, press the <**N**> key. If you accept the values, the parameters will appear listed beside the drive letter on the screen. The process then proceeds to the next drive letter. Pressing the <**N**> key to skip rather than to accept a set of parameters causes the program to enter zeros after that drive letter.

Remember that if you are using another IDE controller that does not feature Enhanced IDE support for four devices, you can only install two IDE hard drives. The IDE controller must support the Enhanced IDE features in order to use Drive E and Drive F.

When auto-detection is completed, the program automatically enters all entries you accepted on the field for that drive in the Standard CMOS Setup screen. Skipped entries are ignored and are not entered in the screen.

If you are auto-detecting a hard drive that supports the LBA mode, three lines will appear in the parameter box. Choose the line that lists LBA for an LBA drive. Do not select Large or Normal.

The auto-detection feature can only detect one set of parameters for a particular IDE hard drive. Some IDE drives can use more than one set. This is not a problem if the drive is new and there is nothing on it.

> **NOTE :** If your hard drive was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard drive.

If the parameters listed differ from the ones used when the drive was formatted, the drive will not be readable. If the auto-detected parameters do not match the ones that should be used for your drive, do not accept them. Press the <**N**> key to reject the presented settings and enter the correct ones manually from the Standard CMOS Setup screen.

Save & Exit Setup

Select this option to save into the CMOS memory all modifications you specified during the current session. To save the configuration changes, highlight the "Save & Exit Setup" option on the main screen and then press the <**Enter**> key.
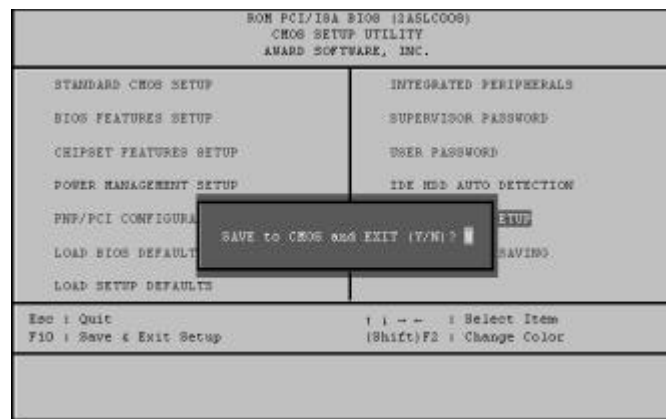
Exit Without Saving

Select this option to exit the Setup utility without saving the modifications you specified during the current session. To exit without saving, highlight the "Exit Without Saving" option on the main screen and then press the <**Enter**> key.