VX98

MAINBOARD
USER   MANUAL

MANUAL REVISION : **B0**

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Overview

Based on the new highly integrated VIA Apollo 580VPX® chipset, the VX98 mainboard combines blistering Intel Pentium® processor performance with support for intelligent diagnostic and notebook-class power management features to provide a powerful and versatile Baby-AT-size platform for leading-edge multi-media systems.

With its voltage regulator, the VX98 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 VX98 takes up to 512KB Pipeline Burst Level II cache and up to 512MB DRAM via four 72-pin SIMM sockets and one 168-pin DIMM socket which accepts high-speed EDO, and lightning-fast SDRAM memory types.

Built on the highly concise Baby-AT form factor, the VX98 comes with a full set of I/O features. 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.

This chapter gives a you a brief overview of the VX98 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. Congratulations on your decision to adopt the VX98 mainboard. With its high-speed ISA/PCI local Bus architecture and ultra-fast I/O connections, the VX98 provides the ultimate solution for optimizing the performance of your high-end system.

Main Features

The VX98 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® 6x86MX™ PR166-PR200 processors.
Cyrix® 6x86™ PR133+ - PR200+ (Rev 2.7 and later) processors.
AMD-K6™ 166/200MHz processors.
AMD-K5™ 90-200MHz processors.

■ **Various External Bus and CPU to Bus Frequency Ratio Support**
The mainboard supports the Bus frequency for 50 / 55 / 60 / 66 / 75 MHz and CPU to Bus frequency ratio of 1x / 1.5x / 1.75x / 2x / 2.5x / 3x / 3.5x / 4x. (Refer to Select Frequency and Voltage of Chapter 2 for more information.)

■ **Leading Edge Chipset**
VIA Apollo 580VPX® chipset, including a CPU interface controller, advanced cache controller, integrated DRAM controller, synchronous ISA/PCI Bus controller, integrated notebook-class power management unit.

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

■ **Versatile Main Memory Support**
Accepts up to 512MB RAM in four banks using 72-pin Fast Page Mode (FPM) or Extended Data Out (EDO) SIMMs of 4, 8, 16, 32, 64, 128MB or using one 168-pin 3.3Volt DIMM for SDRAM or EDO memory modules up to 128MB. SIMMs and DIMM cannot be used at the same time.

■ **ISA/PCI Expansion Slot**
Three 16-bit ISA and four PCI expansion slots provide all the room you need to install a full range of add-on cards.

■ **USB Support** (optional)
Onboard support for two Universal Serial Bus connectors via plug-in riser card.

■ **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 FDC37C669 Plug and Play Super I/O chipset features two high-speed 16550A UART compatible serial connectors, one EPP/ECP capable parallel connector, one IR connector, and one Floppy Disk Drive connector.

■ **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 Apollo 580VPX® to optimize the unrivaled performance of the Intel Pentium® processor with MMX™ technology, allowing you to enjoy a richer video, audio, digital imaging and communications experience from the latest generation of multimedia software.

■ **Lightning-Fast SDRAM Performance**
The mainboard supports the new generation of lightning-fast SDRAM (Synchronous Dynamic Random Access Memory) via its onboard 168-pin DIMM socket. 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 VX98 is further boosted by the mainboard 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   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   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-on cards for long system life,
built-in scalability and the flexibility to adapt your system for future applications.

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.

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 VX98 mainboard
- ☑ This user   manual
- ☑ One floppy disk drive ribbon cable
- ☑ One IDE hard disk drive ribbon cable
- ☑ One COM1 ribbon cable
- ☑ One COM2 and printer ribbon cable
- ☑ One USB riser card (optional)

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) 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.

Highly Convenient Integrated I/O Connectors

This mainboard features a full set of I/O connectors 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, display 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 an optional USB riser card that is connected to the onboard USB pinhead. 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.

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.

Installation Procedures

The VX98 has a user-adjustable jumper on the board that allows you to configure your system to suit your requirements. This chapter contains information on the jumper setting on your mainboard. Before using the computer, you must complete the following steps: Step 1 - **Set system jumper.** 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.**

> **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.
> Wear an anti-static wrist strap which fits around the wrist.

1). Set System Jumper

Jumper

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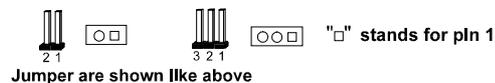
Mainboard Layout
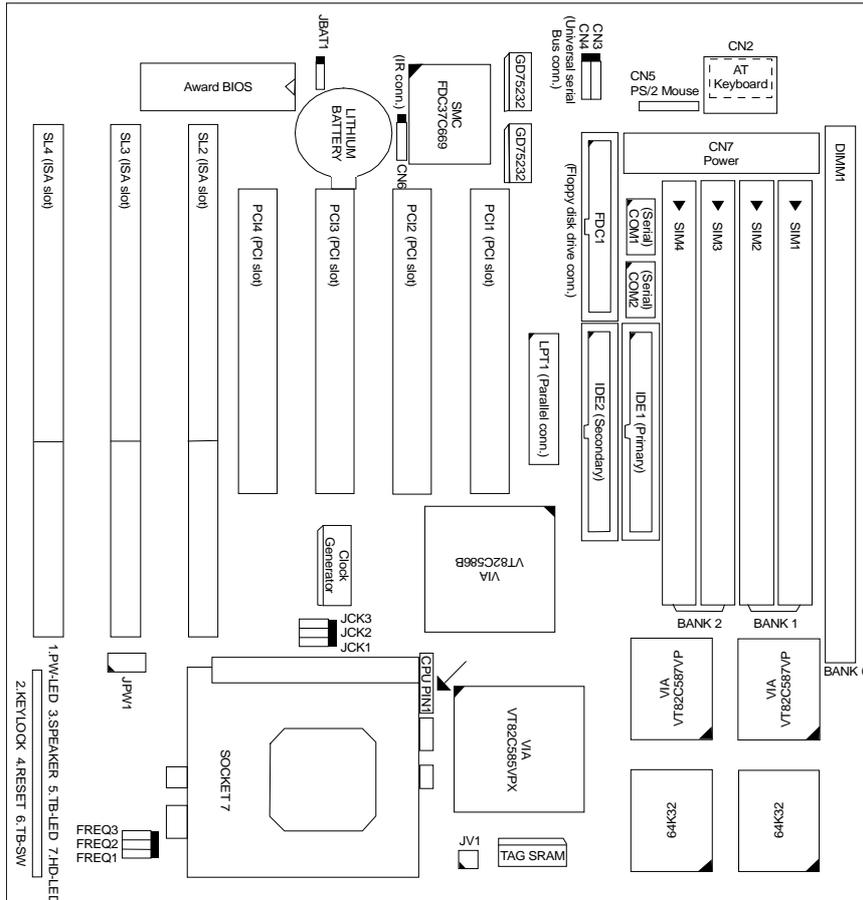
NOTE : Users are not encouraged to change the jumper setting not listed in this manual. Changing the jumper setting improperly may adversely affect system performance.

Clear CMOS: JBAT1

This jumper allows you to clear data in CMOS.

(Default)

Clear
CMOS
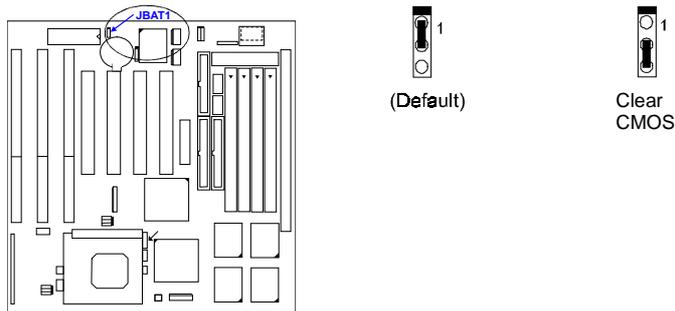
2). Install System RAM Modules

DRAM Memory

The VX98   RAM is comprised of four industry standard 72-pin Single In-line Memory Modules (SIMMs) and one 168-pin Dual In-line Memory Module (DIMM). Each SIMM socket supports from 4 to 128MB, either 60ns or 70ns FPM (Fast Page Mode) (asymmetric or symmetric) and high-speed EDO (Enhanced Data Out) DRAM (parity is not supported). The DIMM socket is able to support up to 128MB EDO DRAM or lightning-fast SDRAM.

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**
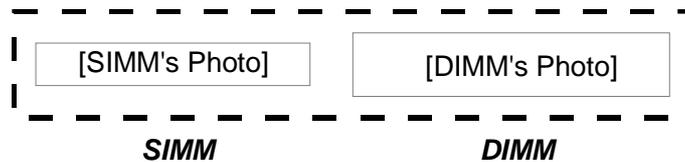
DRAM Module Configuration

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 DIMM1 (168-pin)	BANK 1 SIM1 (72-pin)	BANK 1 SIM2 (72-pin)	BANK 2 SIM3 (72-pin)	BANK 2 SIM4 (72-pin)
8MB		4MB	4MB		
				4MB	4MB
	8MB				
16MB		4MB	4MB	4MB	4MB
		8MB	8MB		
				8MB	8MB
	16MB				
32MB		8MB	8MB	8MB	8MB
		16MB	16MB		
				16MB	16MB
	32MB				
64MB		16MB	16MB	16MB	16MB
		32MB	32MB		
				32MB	32MB
	64MB				
128MB		32MB	32MB	32MB	32MB
		64MB	64MB		
				64MB	64MB
	128MB				
256MB		64MB	64MB	64MB	64MB
		128MB *	128MB *		
				128MB *	128MB *
512MB		128MB *	128MB *	128MB *	128MB *

This configuration has not been tested as of this writing.

NOTE : DIMM1 only supports 3.3V (unbuffered) EDO and SDRAM modules. SIMMs and DIMM are not to be installed at the same time on this mainboard or else you will burn your memory. Mixing SIMMs and DIMM 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 DIMM with latency time of 10ns, 12ns is allowed on this mainboard.

NOTE : SIMMs in each bank must be of the same type; System BIOS
automatically configures the memory size.
When populating SIMMs in Bank 1, insert the SIMM module first in
SIM2 slot before inserting in the SIM1 slot. Likewise when populating
Bank 2, insert the SIMM module first in SIM4 slot before inserting in the
SIM3 slot. In the event that Banks 1 and 2 will all be populated, insert
the first SIMM module at SIM4, SIM3, SIM2, then SIM1.

Install DIMM

Dual In-Line Memory Modules (DIMM   ) can be used when the SIMM sockets are
not used. One socket is available for a 3.3Volt (power level) Unbuffered
Synchronous DRAM (SDRAM) or Extended Data Out (EDO) DRAM of either 8, 16,
32, 64, or 128MB 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 slot on the mainboard. (See figure below.)
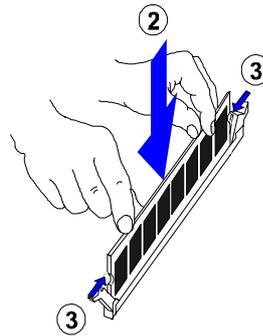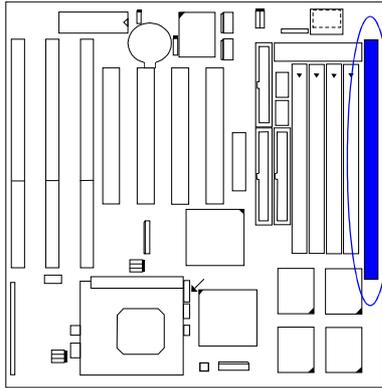
2. Install the DIMM straight down into the DIMM slot with both hands.

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

Remove DIMM

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   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
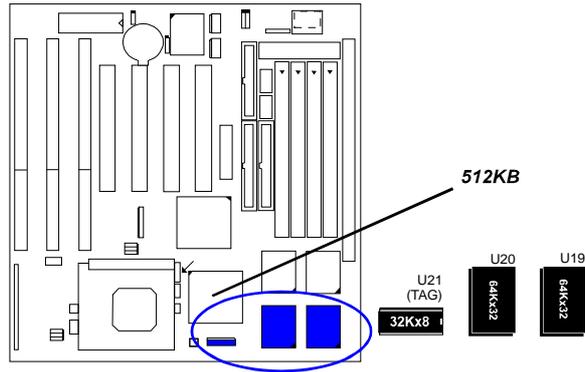
Option 2: 256KB Cache SRAM
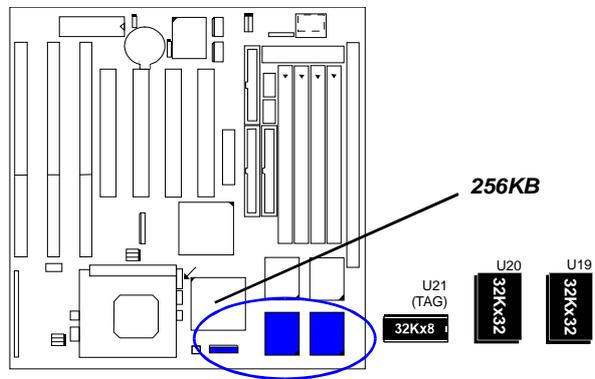
3). Install the CPU

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.
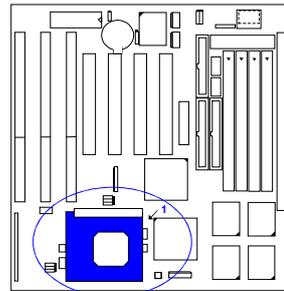
NOTE : Without a fan circulating air on the CPU and heat sinks, the CPU and/or heat sinks can overheat and cause damage to both the CPU and the mainboard.

To install the CPU, first turn off the system power 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 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   PU to Bus Frequency Ratio" and   PU External Clock (Bus) Frequency" depending on the CPU that you install.

Socket Without CPU   Socket With CPU
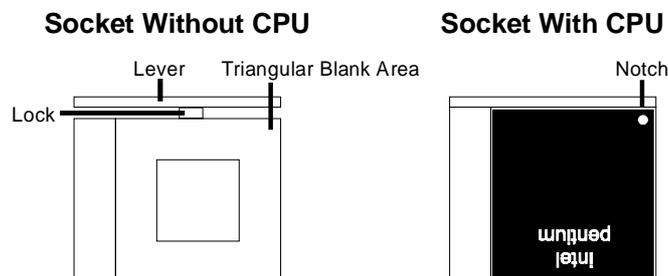
Select Frequency and Voltage

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 following jumpers (CPU external clock Bus frequency).
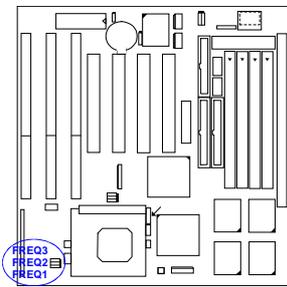
FREQ1	FREQ2	FREQ3	Ratio			
			P54C	P55C M2/K6	K5	M1
(jumper)	(jumper)	(jumper)	1.5 x	3.5x	1.5 x	3 x
(jumper)	(jumper)	(jumper)	2 x	2 x		2 x
(jumper)	(jumper)	(jumper)	2.5 x	2.5 x	1.75 x	1 x
(jumper)	(jumper)	(jumper)	3 x	3 x	2 x	4 x

CPU External Clock (Bus) Frequency: JCK1, JCK2, JCK3

The table below shows the jumper settings for the different CPU speed configurations.
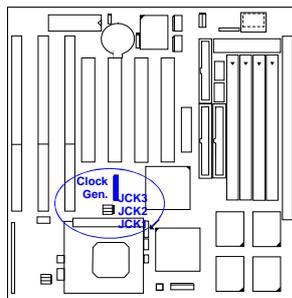
CPU Speed	JCK1	JCK2	JCK3
75 MHz	(jumper)	(jumper)	(jumper)
66 MHz	(jumper)	(jumper)	(jumper)
60 MHz	(jumper)	(jumper)	(jumper)
55 MHz	(jumper)	(jumper)	(jumper)
50 MHz	(jumper)	(jumper)	(jumper)

Intel Pentium CPUs

Frequency

CPU Speed	External (CPU/CLK)	JCK1	JCK2	JCK3	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.			
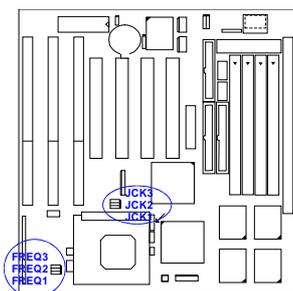
Voltage

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.
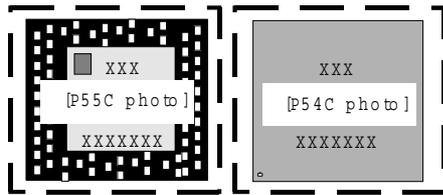
A Pentium P55C Processor

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

JPW1   JV1
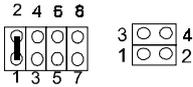
**Core : 3.5V
IO   : Same
P54C VRE**
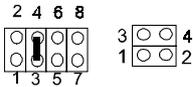
**Core : 3.3V
IO   : Same
P54C STD**

**Core : 2.8V
IO   : 3.3V
P55C**
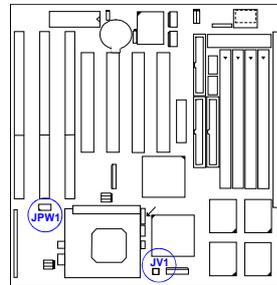
AMD-K5/-K6 CPUs

Frequency

Model Name	CPU Speed	External (CPU/CLK)	JCK1	JCK2	JCK3	CPU Clock Rate			
						Internal	FREQ1	FREQ2	FREQ3
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			
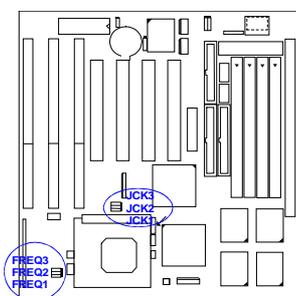
Voltage

An AMD-K6 Processor

An AMD-K5 Processor

AMD-K5 CPU Top Side Marking

AMD-K5
AMD-K5-PRXXXA<u>B</u>Q

V (Identifier for Operational Voltage)
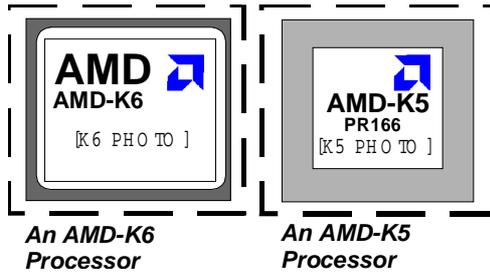
JPW1   **JV1**

Core : **3.5V**
IO   : **Same**
AMD-K5 - B
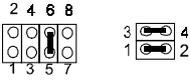
Core : **2.9V**
IO   : **3.3V**
AMD-K6 (below 200MHz)

AMD-K6 CPU Top Side Marking

AMD-K6
AMD-K6-XXXA<u>V</u>Q

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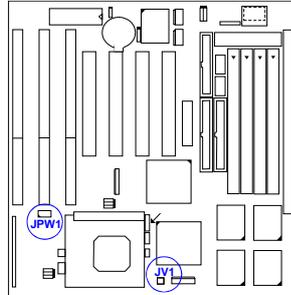
Cyrix 6x86/6x86MX / IBM 6x86/6x86MX CPUs

The Cyrix CPU supported on this mainboard that is labeled Cyrix 6x86 PR133+/PR150+/PR166+/PR200+ 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)	JCK1	JCK2	JCK3	CPU Clock Rate			
						Internal	FREQ1	FREQ2	FREQ3
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-PR200 6x86L-PR200+	150 MHz	75 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			

Voltage

A Cyrix 6x86MX Processor

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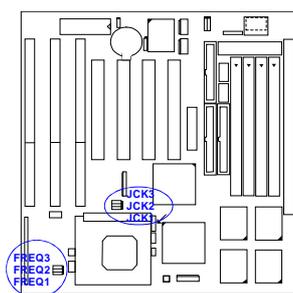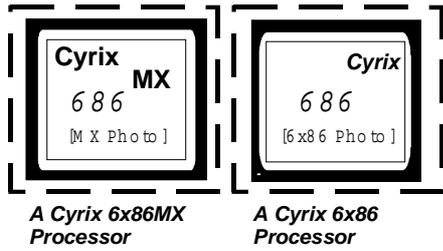
Cyrix 6x86 CPU Top Side Marking

6x86-PR166⁺GP
133 MHz
3.52V (028)

JPW1   JV1

2 4 6 8
1 3 5 7

3 ○ ○ 4
1 ○ ○ 2
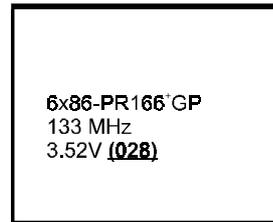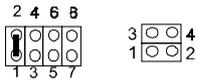
Core : 3.5V
IO   : Same
Cyrix 6x86

2 4 6 8
1 3 5 7

3 4
1 2
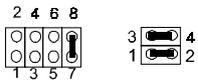
Core : 2.8V
IO   : 3.3V
Cyrix 6x86L

2 4 6 8
1 3 5 7

3 4
1 2
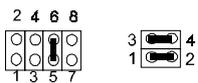
Core : 2.9V
IO   : 3.3V
Cyrix 6x86MX
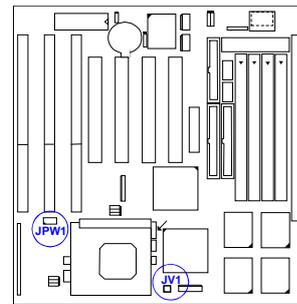
NOTE : The same specifications may be observed for IBM 6x86/6x86MX CPUs. Only Cyrix Rev 2.7 or later is supported on this mainboard. Bootup screen will show 6x86-P166+ with the Cyrix 166+ installed on this mainboard.

4). Install Expansion Cards

The mainboard features three 16-bit ISA Bus expansion slots and four PCI Bus expansion slots.

This section describes how to connect an add-on (expansion) card to the system's expansion slots. An add-on ISA/PCI expansion card is a printed circuit board that, when connected to the mainboard, allows you to increase the capabilities of the system. For example, an expansion card can provide video and sound capabilities.
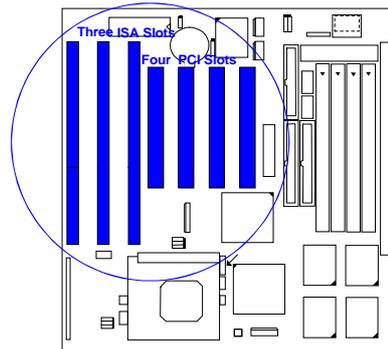
NOTE : Before installing an expansion card, make sure to unplug the power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both the mainboard and expansion cards.

To install an expansion card, do the following:

1. Remove the computer chassis cover and locate an empty ISA/PCI expansion slot.
2. Read the expansion card documentation on any hardware and software settings that may be required to setup the specific card.
3. Set any necessary jumpers on the expansion card.
4. Holding the edge of the peripheral card, carefully align the edge connector with the expansion slot. (See figure on right.)
5. Push the card firmly into the slot. Push in on one end of the expansion card, then the other. Use this ocking" 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.
6. Replace the computer system cover.
7. Setup the BIOS if necessary.
8. Install the necessary software drivers for the expansion card.
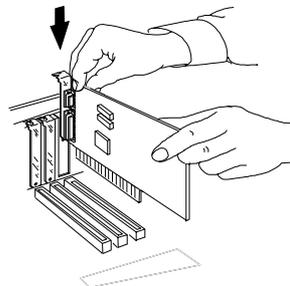
Assigning IRQs for Expansion Cards

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   egacy" ISA cards, requires that you configure the card jumpers manually and then install it in any available slot on the ISA Bus. You may use Microsoft   Diagnostic (MSD.EXE) utility included in the Windows directory to see a map of the used and free IRQs. For Windows 95 users, the   ontrol Panel" icon in   y Computer" contains a   ystem" icon which gives you a   evice Manager" tab. Double clicking on a specific device gives you a   esources" 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.

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.

Floppy Diskette Drive Connector: FDC1

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.
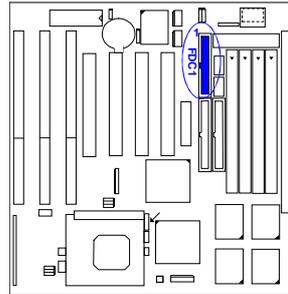
Infrared Connector (4-pin Male): CN6

This 4-pin male connector is used for connecting to the infrared (SIR) port and allows the data transaction with another system which also supports the SIR feature.
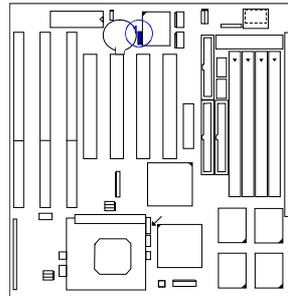
Serial Port Connectors: COM1, COM2

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.
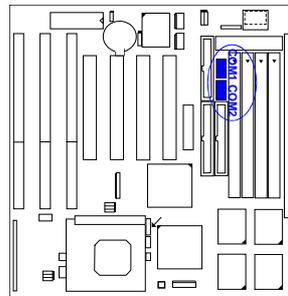
Standard Power Connector: CN7

This 12-pin block connector is used for connecting to the standard 5V power supply. In the picture below, notice that, in most cases, there are two marks 8" and 9" on the surface of the connector. You have to insert the 8" plug into the 8" section of the connector, and so forth for 9". Two black wires must be facing each other.

+5V +5V +5V –5V GND GND GND –12V +12V +5V PG

Power Connector

P9   P8

Red Red Red White Black Black Black Black Blue Yellow Red Orange
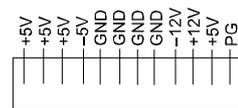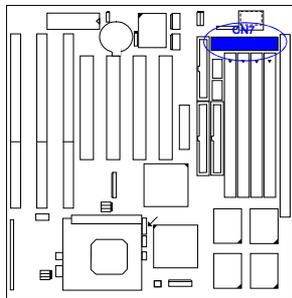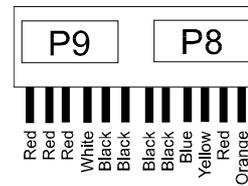
**Power Plugs
of Power Connector**

IDE HDD Device Connector: IDE1, IDE2

These two 40-pin block connector are used for your IDE hard disks. If you have one IDE hard disk, connect it to the IDE1 connector using the IDE HDD flat cable provided with the mainboard. The BIOS auto detection sets it to be a rimary Master" disk. If you want to install another IDE hard disk or CD-ROM drive, please use the IDE2 connector. If two hard disks are connected to IDE1 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.
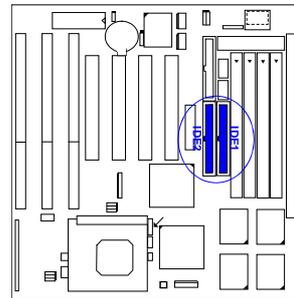
You may configure two hard disks to be both Masters using one ribbon cable to the primary IDE connector and another ribbon cable on the secondary IDE connector. You may install one operating system on an IDE drive and another on a SCSI drive and select the boot disk through the BIOS Setup.

Universal Serial Bus Connector: CN3, CN4

The onboard USB connectors allow the system to link with USB peripheral devices.
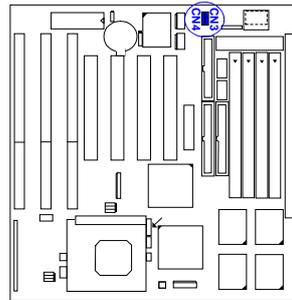
AT Keyboard Connector: CN2

This connector is used to connect a standard keyboard using an AT plug (large DIN) to the system. This connector will not allow standard PS/2 size (mini DIN) keyboard plugs. You may use a mini DIN to DIN adapter on PS/2 keyboards.
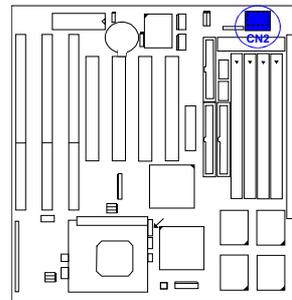
PS/2 Mouse Connector: CN5

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.
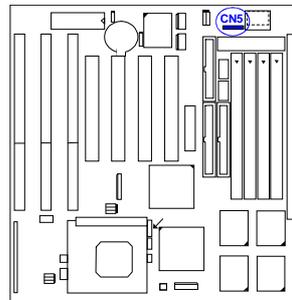
Front Panel Block Connector:

This block connector includes: PW-LED, KEYLOCK, SPEAKER, RESET, TB-LED, TB-SW, and HD-LED connectors.
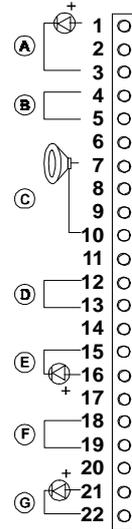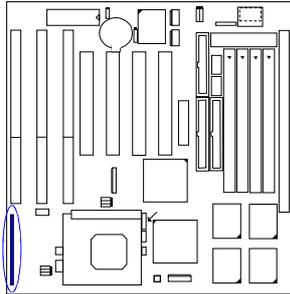
ITEM	CONNECTOR	PIN TYPE	FEATURE
A	PW-LED	2-pin male	The system power LED lights when the system is powered on.
B	KEYLOCK	2-pin male	allows the keyboard to access the system
C	SPEAKER	4-pin male	This connector connects to the case-mounted speaker.
D	RESET	2-pin male	This connector connects to the case-mounted 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 power supply.
E	TB-LED	2-pin male	indicates the system is in Turbo mode when LED is lit.
F	TB-SW	2-pin male	Turbo mode switch which allows user to manually place the system into Turbo mode or back to Normal mode.
G	HD-LED	2-pin male	This connector supplies power to the cabinet 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

Parallel Printer Connector: LPT1

The onboard connector allows the system to link with printer devices via a printer cable. Serial printers must be connected to the serial port.
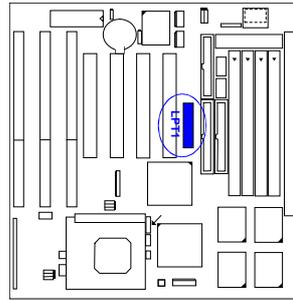
Setting BIOS Feature

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:

```
                    ROM PCI/ISA BIOS (2A51A00G)
                          CMOS SETUP UTILITY
                         AWARD SOFTWARE, INC.

  STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

  BIOS FEATURES SETUP              SUPERVISOR PASSWORD

  CHIPSET FEATURES SETUP           USER PASSWORD

  POWER MANAGEMENT SETUP           IDE HDD AUTO DETECTION

  PNP/PCI CONFIGURATION            SAVE & EXIT SETUP

  LOAD BIOS DEFAULTS               EXIT WITHOUT SAVING

  LOAD SETUP DEFAULTS

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

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   oad BIOS Defaults" option loads the minimized settings for troubleshooting.
   oad 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   tandard 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.
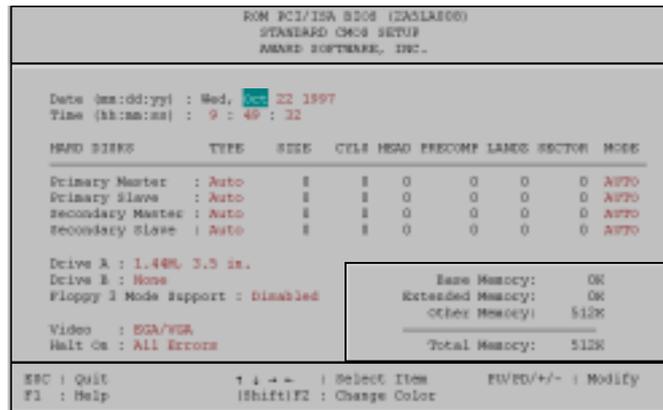
The above screen provides you with a list of options. At the bottom are the control keys for this screen. Take note of these keys and their respective uses. User-configurable fields appear in a different color. If you need information on the selected field, press the <**F1**> key. The help menu will 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   ate" 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   ime" 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   aster" and the second is the   lave".

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   ser" 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 ser" 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: *1.44MB, 3.5 in.* (default for drive A); *None* (default for drive B); *360KB, 5.25 in.; 1.2MB, 5.25 in.; 720KB, 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 GA/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 IOS 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 design to remain in their default settings.
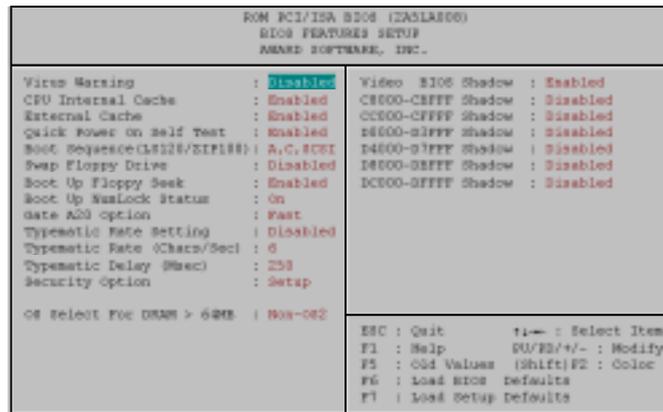
A section at the lower right of the screen displays the control keys you can use. Take note of these keys and their respective uses. If you need information on a particular entry, highlight it and press the <**F1**> key. A pop-up help menu will appear to provide you with the information you need. <**F5**> 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   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

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

Swap Floppy Drive

When enabled, it allows you to switch the order in which the operating system accesses the floppy drives during boot up. The options are *Disabled* (default); *Enabled*.

Boot Up Floppy Seek

When enabled, the BIOS will seek the floppy " 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*.

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

```
                     ROM PCI/ISA BIOS (2A5LA008)
                        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
Sustained 3T Write        : Enabled    PCI Master 0 WS Write    : Enabled
CPU Pipeline              : Enabled    Quick Frame Generation   : Enabled
DRAM Auto Configuration   : Disabled
DRAM Timing Control       : Fast
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*.

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 VT82C586A chip. The options are *Fast* (default); *Normal*; *Turbo*.

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 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 VT82C586A 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*.

Power Management Setup

The   ower 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.
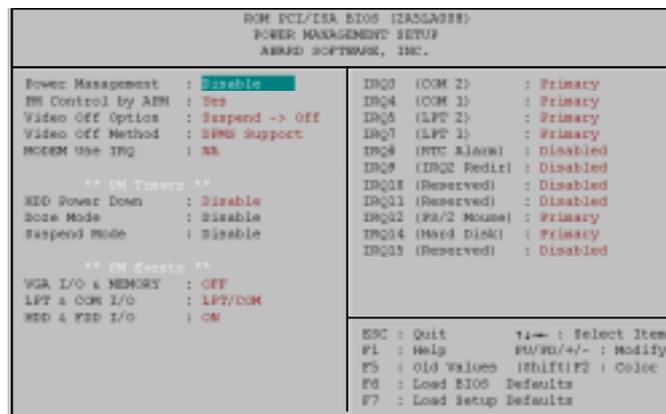
Power Management

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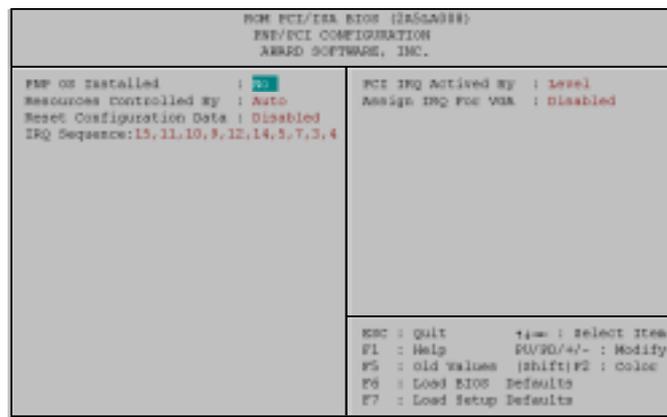
PNP OS Installed
When Plug and Play operating systems (OS) are installed, interrupts may be reassigned by the OS when *Yes* is selected. When a non-Plug and Play OS is installed or to prevent reassigning of interrupt settings, select *No* here. The options are *No* (default), *Yes*.

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*.

Used MEM Base Addr

This option, which allows you to select a base address for the memory area used by any peripheral that requires high memory will only appear on screen if the above item Resources Controlled By is set at *Manual*. The options are *N/A* (default); *DC00*; *D800*; *D400*; *D000*; *CC00*; *C800*.

Used MEM Length

This option will only appear on screen if the above item Used MEM Base Addr is not set at *N/A*. It allows you to select a length for the memory area specified in the previous item. High Memory range will be reserved for Legacy ISA card so that no PCI or PNP card will use this High Memory range. If it is set at *N/A*, PCI or PNP card will use any of the High Memory address which starts from the C800 to EFFF segment. The options are *8K* (default); *64K*; *32K*; *16K*.

Load BIOS Defaults

The   oad 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   oad 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   oad 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   oad 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.

Integrated Peripherals

```
                      ROM PCI/ISA BIOS (2A5LA008)
                         INTEGRATED PERIPHERALS
                          AWARD SOFTWARE, INC.

  IDE HDD Block Mode       : Enabled    Onboard FDC Controller  : Enabled
  On-Chip Primary   PCI IDE: Enabled    Onboard UART 1          : 3F8/IRQ4
  On-Chip Secondary PCI IDE: Enabled    Onboard UART 2          : 2F8/IRQ3
  IDE Primary Master PIO  : Auto        OnBoard UART 2 Mode     : Standard
  IDE Primary Slave  PIO  : Auto
  IDE Secondary Master PIO : Auto       Onboard Parallel Port   : 378/IRQ7
  IDE Secondary Slave  PIO : Auto       Parallel Port Mode      : Normal
  IDE Primary Master UDMA  : Auto
  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 UART 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 UART 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*.

Onboard UART 2 Mode (available only when Onboard UART 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); *HPSIR*; *ASKIR*.

IR Duplex Mode (available only when Onboard UART 2 Mode is not set at Standard)

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

Use IR Pins (available only when Onboard UART 2 Mode is not set at Standard)

Consult your IR peripheral documentation to select the correct settings of the TxD and RxD signals. The options are *IR-RX2TX2* (default); *IR-RX TX*.

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); *ECP+EPP*; *EPP; 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*.

Parallel Port EPP Type

This item only appears when the above option Parallel Port Mode is set at either *EPP* or *ECP+EPP*. The options are *EPP 1.7* (default); *EPP 1.9*.

Supervisor Password and User Password

These two options set the system passwords. upervisor Password" sets a password that will be used to protect the system and the Setup utility; ser 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 ecurity 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 nter 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.

> **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.

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   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   old 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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