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# Chapter 1

## Introduction

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This mainboard is a high-performance mainboard based on the advanced Pentium™ microprocessor and featuring, **100MHz CPU external clock speed capability**, PCI Local Bus and the high-end AGP chipset. The mainboard offers a high degree of flexibility in configuration and is fully IBM PC / AT compatible.

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## Key Features

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The advanced features of this mainboard include:

- Supports P54C/P55C Pentium™ (MMX) CPUs and Cyrix/IBM 6x86L/6x86MX/MII, AMD K6/**K6-2** (3.2V & **2.2V**), IDT C6 90~350MHz CPUs with Frequency at 60/66/75/83/**100 MHz** and **selectable 66/100MHz clock for SDRAM while the external frequency of CPU is running at 100MHz;**
- Provides three DIMMs for SDRAM/EDO/FPM memory modules, memory expandable up to 384MB;
- Supports 64M-bit (8Mx8, 4Mx16) EDO DRAM/SDRAM;
- **Supports 1MB Pipeline Burst synchronous L2 cache;**
- Provides both ATX/AT power connector, and supports various ATX power functions, such as: Modem Ring On, ATX Power Button, Suspend Switch, and Alarm Wake Up;
- Supports ACPI and Legacy PMU, and the Ultra DMA/33, fully compliant to PC97 & PC98;
- **Supports Accelerated Graphics Port (AGP) v1.0,** 3 PCI Bus slots, 2 ISA Bus slots;
- PCI Bus Master IDE interface with 2 connectors which supports 4 IDE devices in 2 channels;
- Super Multi-I/O chip supports 2 serial ports with 16550 compatible fast UART, 1 parallel port with EPP and ECP capabilities, and one floppy disk drive interface with 1Mb/s transfer rate;
- Provides PS/2 Mouse connector/pin header, and **ATX Form Card containing PS/2 Mouse, 2 USB interface, and Infrared connectors (optional);**

- **3D Sound Pro** meets PC98' SPEC and supports HRTF Positional Audio, Direct Sound 3D with **Aureal 3D** driver, Software Wave-table Synthesizer, and Digital Audio Interface (SPDIF) IN/OUT;
- System BIOS Supports Trend's **ChipAway Virus** function to ensure the entire boot process is virusfree, no installation and configuration worries;
- Bundled **PC-cillin97** (OEM) provides automatic virus protection for Window95 and the Internet.

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## Unpacking the Mainboard & Static Electricity Precautions

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This Mainboard package contains the following items:

1. This Mainboard
2. The Device Driver for this mainboard
3. This User's Guide
4. Sound & Game ribbon cables/bracket
5. ATX Form Card (optional)

The mainboard is easily damaged by static electricity. Follow the precautions below while unpacking or installing the mainboard.

1. Do not remove the mainboard from its original package until you are ready to install it.
2. Frequently ground yourself to discharge any static electric charge that may build up in your body while working on installation and/or configuration. For example, you may ground yourself by grasping an unpainted portion of the system's metal chassis.
3. Remove the mainboard from its anti-static packaging and place it on a grounded surface, component side up.
4. Handle the mainboard by its edges or by the mounting bracket to avoid touching its components.
5. Check the mainboard for damage. If any integrated circuit appears loose, press carefully to seat it firmly in its socket.
6. Do not apply power if the mainboard appears damaged. If there is damage to the board contact your dealer immediately.

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## **Chapter 2**

# **Hardware Configuration**

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Before you install this mainboard into the system chassis, you may find it convenient to first configure the mainboard's hardware. This chapter describes how to set jumpers and install memory modules, and where to attach components.



# Mainboard Component Locations

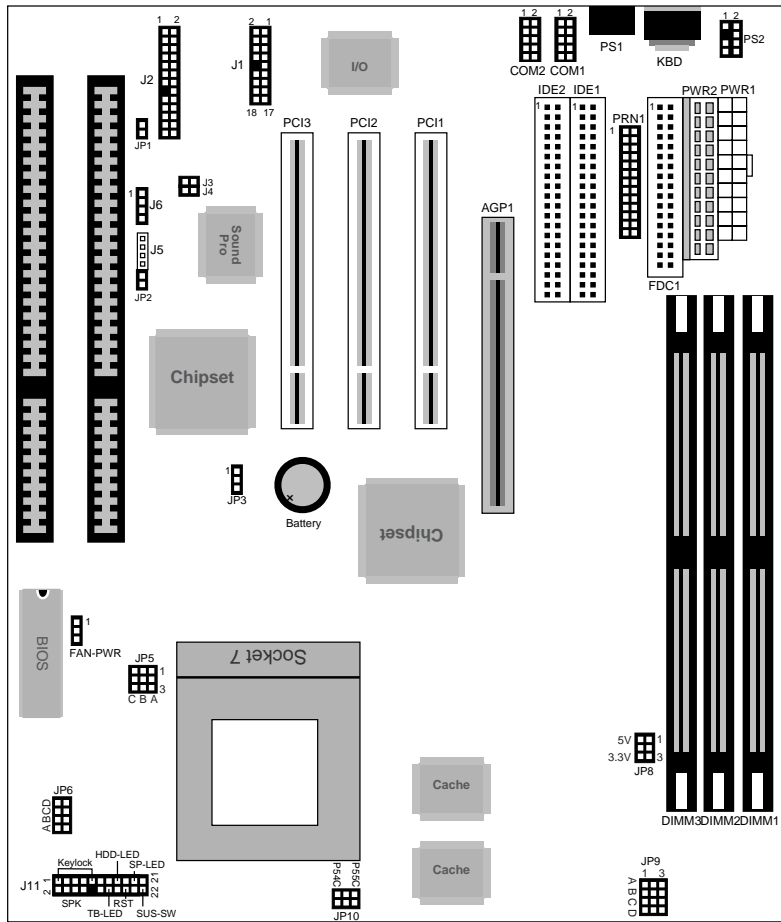


Figure 2-1. Mainboard Component Locations

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## Connectors

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Attach system components and case devices to the mainboard via the mainboard connectors. A description of each connector follows. See Figure 2-1 for the location of the connectors on the mainboard.

*Note: Make sure that the power is turned off before making any connection to the board.*

### **PWR2 – AT Power Supply Connectors**

### **COM1/2 – Serial Port #1/#2**

### **PRN1 – Parallel Port**

### **FDC1 – Floppy Disk Port**

### **IDE1/IDE2 – Primary/Secondary IDE Ports**

### **KBD – Keyboard Connector**

### **PS1 – PS/2 Mouse Connector**

### **PS2 – PS/2 Mouse Pin Header**

### **J1 – ATX Form Card Connector:**

This connector contains 2 sets of USB interface, PS/2 Mouse, and Infrared connectors. Connect the ATX Form Card cable to this connector.

### **J11 (1, 3, 5, 7, 9) (KEYLOCK) – Keylock & Power LED Connector**

Pin	Description
1	LED Output
3	N.C.
5	Ground
7	Keylock
9	Ground

**J11 (2, 4, 6, 8) (SPK) – Speaker Connector**

Pin	Description
2	Data Out
4	N.C.
6	Ground
8	+5V

**J11 (13, 14) (TB-LED) – Turbo LED Connector**

Pin	Description
13 (+)	+5V
14 (-)	Active Low

**J11 (15, 16) (HDD-LED) – HDD LED Connector**

Pin	Description
+	+5V
-	Active Low

**J11 (17, 18) (RST) – Reset Switch Connector**

Pin	Description
Open	Normal Mode
Close	Reset System

### J11 (19, 20) (SP-LED) – Suspend LED Connector

Pin	Description
19 (+)	+5V
20 (-)	Active Low

### FAN-PWR – Fan Power Connector

Pin	Description
1	Sense
2	+12V
3	Ground

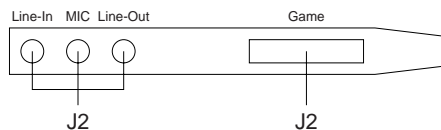
### Sound Pro Connectors:

#### J5/J6 – Analog Audio for Sony/Panasonic

Connect to “AUDIO” on the CD-ROM drive.

#### J2 – Sound and Game

Sound contains Line-in/MIC (Microphone), and Line-out (Speaker). Game connector is also the Joystic connector. Connect this connector to the Sound & Game ribbon cable/bracket as the following drawing:


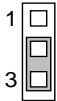


#### J3/J4 – Digital Audio OUT/IN

Connect this connector to the Digital Audio device/DIGITAL AUDIO on the CD-ROM drive (depending on the type of your CD-ROM drive).

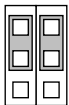
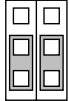
## Jumper Settings

### JP3 – CMOS RAM Clear Selector

Description	Setting
Normal Mode	
Clear CMOS	

- Note:
1. Make sure that this jumper is set to Normal Mode before installing the mainboard and the power is off before clearing the CMOS.
  2. If using the ATX power, you need to unplug the power cable and then plug the cable back on after clearing the CMOS.

### JP10 – CPU Type Selectors

CPU	Setting	Example
P55C (Dual Voltage)		Intel MMX, AMD K6/K6-2, IBM/Cyrix 6x86L/6x86MX (MII)
P54C (Single Voltage)		Intel P54C, IDT C6, AMD K5, IBM/Cyrix 6x86

**JP8 – DIMM Voltage Selectors**

Voltage	Setting
5V	
3.3V	

**JP1 – Microphone Type Selector**

Description	Setting
Special Mode	
Normal Mode (Default)	

**JP6 – CPU Core Voltage Selectors**

Vcc	Setting	Vcc	Setting	Vcc	Setting
2.1V		2.7V		3.2V	
2.2V		2.8V		3.3V	
2.5V		2.9V		3.5V	

**JP5 – CPU Multiplier Selectors**

Mul.	Setting	Mul.	Setting	Mul.	Setting
1.5X/ 3.5X	 C B A	3.0X	 C B A	5.0X	 C B A
2.0X	 C B A	4.0X	 C B A	5.5X	 C B A
2.5X	 C B A	4.5X	 C B A		

**JP9 – CPU Frequency Selectors**

Fre.	Setting	Fre.	Setting	Fre.	Setting
60MHz	 A B C D	75MHz (PCI 30M)	 A B C D	95MHz (SDRAM 95M)	 A B C D
66MHz	 A B C D	83MHz	 A B C D	100MHz (SDRAM 66M)	 A B C D
75MHz (PCI 37.5M)	 A B C D	95MHz (SDRAM 66M)	 A B C D	100MHz (SDRAM 100M)	 A B C D

## Memory Installation

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The mainboard lets you add up to 384MB of system memory. Three DIMM sockets are divided into three banks: Bank 0, Bank 1, and Bank 2.

The mainboard supports the following memory configurations.

Bank	Memory Module
Bank 0 DIMM1	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Bank 1 DIMM2	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Bank 2 DIMM3	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Total System Memory = Bank 0 + Bank 1 + Bank 2	

*Notes: The speed of all DIMMs and SIMMs modules have to be faster than 70ns.*



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# Chapter 3

## ACPI Functions & Connectors with ATX Power

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### PWR1 – ATX Power Connector

The ATX power supply provides a single 20-pin connector and supports the ACPI specification.

Pin	Description	Pin	Description
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	Ground	13	Ground
4	+5V	14	PS-ON
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	Power OK	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

The functions and connectors described below work with the ATX power supply.

### Software Power-Off

Follow the steps below to use the “Software Power-Off Control” function in Windows 95 with ATX power supply.

1. Click the **START** button on the Windows 95 task bar.
2. Select **Shut Down The Computer** to turn off the computer. The message “**It is now safe to turn off your computer.**” will not be shown when using this function.

### Modem Ring Power-On

While in Soft-off/Suspend state, if an external modem ring-up signal occurs, the system wakes up and can be remotely accessed. Make sure that the Ring Resume From Soft Off option is set to Enabled in the BIOS setup section (Refer to the Power Management section in Chapter 4.)

### Alarm Wake Up

If you want to autoboot the system at a certain time, set the function of RTC Alarm time properly and the function of RTC Alarm Resume From Soft Off option in the BIOS Setup section will be set to Enabled.

**J11 (21, 22) (SUS–SW) – ATX Power Button and Suspend Switch Connector**

Attach the ATX Power Button or Suspend Switch cable to this connector.

In the AT power system, this connector will act as a suspend switch; and in the ATX power system, this connector will be not only an ATX power button but a Suspend switch as well. Details are described below:

When the system is off, push the power button to turn the system on. When the system is on, push the power button rapidly to switch the system to the Suspend mode, and, by pushing and holding the button for more than 4 seconds, it will turn the system completely off. When the system is in the Suspend mode, push the power button rapidly to turn the system on.

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## Chapter 4

### BIOS Setup

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This chapter explains how to configure the mainboard's BIOS setup program. The setup program provided with the mainboard is the BIOS from AMI.

After you have configured the mainboard and have assembled the components, turn on the computer and run the software setup to ensure that the system information is correct.

The software setup of the system board is achieved through Basic Input-Output System (BIOS) programming. You use the BIOS setup program to tell the operating system what type of devices are connected to your system board.

The system setup is also called CMOS setup. Normally, you need to run system setup if either the hardware is not identical with information contained in the CMOS RAM, or if the CMOS RAM has lost power.

*Note: Hold down the <End> key or to clear CMOS for a moment then set back to Normal Mode then power on to reboot the system when installing newer BIOS into this mainboard .*

## Entering BIOS Setup

To enter the BIOS Setup program:

1. Turn on or reboot the system. A screen appears with a series of diagnostic checks.
2. When “Hit <DEL> if you want to run SETUP” appears, press the <DEL> key to enter the BIOS setup program. The following screen appears:

ROM PCI/ISA BIOS (2A5LEHOA)  
 CMOS SETUP UTILITY  
 AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	PASSWORD SETTING
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	SAVE & EXIT SETUP
PNP/PCI CONFIGURATION SETUP	EXIT WITHOUT SAVING
LOAD BEST PERFORMANCE DEFAULTS	
LOAD SETUP DEFAULTS	
Esc: Quit	↑ ↓ → ←: Select Item
F10 : Save&Exit	(Shift) F2: Change Color

3. Use your keyboard or mouse to choose options. Modify system parameters to reflect system options. Press Alt-H for Help.

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## Defaults

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Every option in the BIOS Setup contains two default values: Best default and the Setup default value.

### Load Setup Defaults

The Setup default values provide optimum system settings for all devices and system features.

### Load Best Performance Defaults

The Best default values provide best performance settings for all devices and system features, however depending on the devices used, these settings are not recommend for long hours of work load.

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## Setup Items

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### Standard CMOS Setup

Choosing the item from the BIOS Setup main menu.  
All Standard setup options are described in this section.

**Date/Time**      Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

<b>Pri Master; Pri Slave; Sec Master; Sec Slave</b>	Choose these options to configure the hard disk drive named in the option. When you enter an option, the following parameters are listed: Type, LBA /Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters relate to IDE drives except <b>Type</b> . Choose the <b>Type</b> parameter and select Auto BIOS automatically detects the IDE drive parameters and displays them. Choose on <b>LBA Mode</b> and choose <i>On</i> to enable support for IDE drives with capacities greater than 528MB. Click on <b>Blk Mode</b> and choose <i>On</i> to support IDE drives that use Blk Mode. Click on <b>32Bit Mode</b> and click on <i>On</i> to support IDE drives that permit 32-bit accesses.
<b>Floppy Drive A; B</b>	Choose the Floppy Drive A or B option to specify the floppy drive type. The settings are 360KB 5 <sup>1</sup> / <sub>4</sub> ", 1.2MB 5 <sup>1</sup> / <sub>4</sub> ", 720KB 3 <sup>1</sup> / <sub>2</sub> ", 1.44MB 3 <sup>1</sup> / <sub>2</sub> ", or 2.88MB 3 <sup>1</sup> / <sub>2</sub> ".
<b>Video</b>	This option is to select the video display mode.
<b>Halt On</b>	This option is to halt system on a specified error.

## BIOS Features Setup

Choosing the item from the BIOS Setup main menu.  
All advanced setup options are described in this section.

<b>Trend ChipAway Virus</b>	Set this option to enable the Trend ChipAway Virus function.
<b>CPU Internal Cache</b>	This option selects to enable the internal cache or not. Choices are Disabled and Enabled.
<b>External Cache</b>	This option enables/disables the external cache memory.
<b>Quick Power On Self Test</b>	Set this option to <i>Enabled</i> to permit BIOS to boot within 5 seconds.
<b>Boot Swquence</b>	Set these options to select the boot sequence from different booting devices.
<b>Swap Floppy Drive</b>	This option allows you to swap floppy drives between A: and B:.
<b>Boot Up Floppy Seek</b>	Choose Enabled or Disabled. Disabled provides a faster boot and reduces the possibility of damaging the heads.
<b>Boot Up Numlock status</b>	When set to On, allows the BIOS to automatically enable the Num Lock Function when the system boots up.
<b>Boot Up System Speed</b>	Allows to select the speed of booting up the system.



<b>Gate A20 Option</b>	When Fast is selected, this option allows the A20G bus line signal generated from the chipset to directly pass to port 92H, instead of the keyboard controller. It will speed up the system performance.
<b>Memory Parity/ECC Check</b>	This option is to enable ECC checking of memory parity.
<b>Typematic Rate Setting</b>	The term typematic means that when a keyboard key is held down, the character is repeatedly entered until the key is released. When this option is enabled, you may change the typematic repeat rate.
<b>Typematic Rate (Chars/Sec)</b>	Sets the repeat rate of a character while the key is held.
<b>Typematic Delay (Msec)</b>	Sets the delay time before a character is repeated.
<b>Security Option</b>	<p>This option specifies the type of BIOS password protection that is implemented. The settings are:</p> <p>Setup: The password prompt appears only when an end user attempts to run WinBIOS Setup.</p> <p>Always: A password prompt appears every time the computer is powered on or rebooted.</p> <p>The BIOS password does not have to be enabled. The end user sets the password by choosing the Password icon on the WinBIOS Setup screen.</p>
<b>IDE Second Channel Control</b>	Allows you to enable or disable the IDE secondary channel.

<b>PCI VGA Palette Snoop</b>	When this option is set to Enabled, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device.
<b>OS Select For DRAM Over 64MB</b>	You need to set this option to OS2 when using the OS/2 operating system with installed DRAM which is greater than 64MB.
<b>Video BIOS Shadow;</b> <b>C8000, 16K Shadow;</b> <b>CC000, 16K Shadow;</b> <b>D0000, 16K Shadow;</b> <b>D4000, 16K Shadow;</b> <b>D8000, 16K Shadow;</b> <b>DC000, 16K Shadow</b>	<p>Disabled: The specified ROM is not copied to RAM.</p> <p>Enabled: The contents of the ROM area are not only copied from ROM to RAM for faster execution, the contents of the RAM area can be written to or read from cache memory.</p> <p>Cached: The contents of the ROM area are copied from ROM to RAM for faster execution.</p>

## Chipset Features Setup

Choose the item from the BIOS Setup main menu. All Chipset Setup options are then displayed and are described in the following section:

<b>Bank 0/1, 2/3, 4/5 DRAM Timing</b>	Set these options to select the speed of used memory bank.
<b>Cache Timing</b>	Set this option to select the speed of cache timing.
<b>Video BIOS Cacheable</b>	Set this option to enable video BIOS reading from cache memory.

- System BIOS Cacheable** Set this option to enable BIOS copying the system BIOS from ROM to RAM for faster execution.
- AGP Aperture Size** Choose 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, or 256MB. Memory-mapped, graphics data structures can reside in the Graphics Aperture. Use the default setting.
- OnBoard USB** Choose Enabled or Disabled. Set this option to enable the system BIOS USB (Universal serial Bus) functions.

## Power Management Setup

Choosing the item from BIOS Setup main menu.

- Power Management** Set this option to select power management features.
- PM Control by APM** Choose Yes for the Advanced Power Management to control power management.
- Video Off Option** This option specifies the power conserving state that the VESA VGA video subsystem enters after the specified period of display inactivity has expired.
- Video Off Method** Set this option to specify the method of video power saving.
- Modem Use IRQ** Set this option to specify IRQ for modem device.
- Soft-Off by PWRBT** Set this option to specify the method of Power Buttons switch to Soft-Off.

<b>HDD Power Down</b>	This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired.
<b>Doze Mode</b>	This option specified the length of system inactivity while in Full power on state. When this length of time expires, the computer enters Doze power state.
<b>Suspend Mode</b>	This option specified the length of a period of system inactivity while in Doze state. When this length of time expires, the computer enters Suspend power state.

**\* \* PM Events \* \***

<b>VGA; LPT &amp; COM; HDD &amp; FDD; DMA/Master; IRQ3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</b>	When these options are not set to OFF or Disabled, they enable event monitoring on the specified hardware interrupt request line and the computer is in a power saving state, BIOS watches for activity on the specified IRQ line. The computer enters the full on power state if any activity occurs.
<b>Modem Ring Resume</b>	Set this option to enable the modem ring to resume from Soft-Off.
<b>RTC Alarm Resume</b>	Set this option to enable the RTC Alarm to wake up the system which is Soft Off.
<b>Date (of Month); Timer (hh:mm:ss)</b>	Set these options to specify the RTC Alarm time on Date/Hour/Minute/Second.
<b>Primary INTR</b>	Set this option ON to enable event monitoring to IRQs.

## PCI/Plug and Play Setup

Choose the item from the BIOS Setup main menu.

<b>PNP OS Installed</b>	Set this option to <i>Yes</i> if the operation system in this computer is aware of and follows the Plug and Play specification.
<b>Resources Controlled By</b>	Set this option to specify resources controlled by <i>Auto</i> or <i>Manual</i> .
<b>IRQ–3, 4, 5, 7, 9, 10, 11, 14, 15 assigned to</b>	These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards.
<b>DMA– 0, 1, 3, 5, 6, 7 assigned to</b>	These options specify the bus that the specified DMA channel is used on.
<b>PCI Master 0 WS Write</b>	Set this option to enable 0 WS write for PCI master.
<b>PCI Master Read Prefetch</b>	Set this option to enable reading prefetch for PCI master.
<b>AGP Master 1 WS Write/Read</b>	Set these options to enable 1 WS write/read for AGP master.
<b>PCI IRQ Activated By</b>	Set this option to specify active mode of PCI IRQ.
<b>Assign IRQ For USB</b>	Set this option to enable assigning IRQ to USB.
<b>Assign IRQ for VGA</b>	This option is used to allocate IRQ to VGA. Recommendation is set to <i>No</i> .

## Peripheral Setup

Choose the item from the BIOS Setup main menu.

<b>OnBoard IDE First/Second Channel</b>	Set these options to enable IDE first/second channel on the motherboard.
<b>IDE Prefetch Mode</b>	Set this option to enable IDE in the prefetch mode.
<b>IDE Primary Master PIO; IDE Primary Slave PIO; IDE Secondary Master PIO; IDE Secondary Slave PIO;</b>	Set these options to select PIO mode or to detect it by BIOS for IDE devices.
<b>IDE Primary Master UDMA; IDE Primary Slave UDMA; IDE Secondary Master UDMA; IDE Secondary Slave UDMA;</b>	Set these options to enable UDMA function for IDE devices.
<b>Init AGP Display First</b>	Set this option to enable fresh initialing the AGP display while the system is rebooting.
<b>OnBoard FDC Controller</b>	This option enables the FDC (Floppy Drive Controller) on the motherboard or auto detects the FDC.
<b>OnBoard Serial Port1</b>	This option specifies the base I/O port address of serial port 1.

<b>OnBoard Serial Port2</b>	This option specifies the base I/O port address of serial port 2.
<b>IR Address Select</b>	set this option to select IR address or to disable IR function.
<b>IR Mode</b>	Set this option to specify IR mode for HPSIR or ASKIR.
<b>IR IRQ Select</b>	Set this option to specify IRQ to IR function.
<b>OnBoard Parallel Port</b>	This option specifies the base I/O port address of the parallel port on the motherboard.
<b>Parallel Port Mode</b>	Depends on the type of your external device which connects to this port to choose Normal, EPP, or ECP mode.
<b>ECP Mode Use DMA</b>	Set this option to specify DMA for ECP when ECP was selected in above Parallel Port Mode option.
<b>OnBoard Sound Chip</b>	This option is designed to be used to enable the Sound Pro functions.

## Password Setting

This item lets you configure the system password which is required every time when the system boots up or an attempt is made to enter the Setup program. The password cannot be longer than six characters.

*Note: Keep a safe record of the new password. If you forget or lose the password, the only way to access the system is to clear CMOS memory by holding down the <End> key then powering on to reboot the system.*

## IDE HDD Auto Detection

If your system has an IDE hard drive, you can use this utility to detect its parameters and automatically enter them into the Standard CMOS Setup. This utility will autodetect up to four IDE devices.

## Save & Exit Setup

Select this item to save the values entered during the current session and then exit the BIOS setup program.

## Exit Without Saving

Select this item to exit the BIOS setup program without saving the values which has been entered during the current session.