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Chapter 1

Introduction

This mainboard is a high-performance mainboard based on the advanced Pentium® II microprocessor and featuring Accelerated Graphics Port (AGP) and the **i440LX AGPset** chipset. The mainboard offers a high degree of flexibility in configuration and is fully IBM PC/AT compatible.

Key Features

The advanced features of the mainboard include:

- **Intel i440LX AGPset** chipset
- Supports Dual Pentium® II 233 ~ 533 MHz CPUs at Slot1 x 2
- Supports upgradable I/O APIC module to operate Dual Pentium II® processor
- Provides 4 DIMM sockets to support 8MB/16MB/32MB/64MB/128MB SDRAM/EDO memory modules up to 512MB
- Supports Accelerated Graphics Port (AGP) v1.0
- Supports Advanced Configuration Power Interface (ACPI) and Legacy PMU, fully compliant to PC97 & PC98
- PCI Bus Master IDE controller supports PIO Mode 0 to Mode 4, and the Ultra DMA/33 is at the maximum transfer rate of 33MB/sec and Bus Master IDE DMA Mode 2
- Supports 2.88MB, Iomega ZIP-100M, and IDE LS-120 FDD, bootable from floppy, HDD, CD-ROM, SCSI, NetWork, LS-120, ZIP, or others
- Provides one AGP Bus slot, four PCI Local Bus slots and three ISA Bus slots
- Provides ATX power which supports various functions, such as Suspend/Shutdown
- Onboard PCI Bus Master IDE interface supports 4 IDE devices with 2 channels
- Onboard super Multi-I/O chip supports 2 serial ports with 16550 fast UART compatible, 1 parallel port with EPP and ECP capabilities, and one floppy disk drive interface with 1Mb/s data transfer rate

- Supports PS/2 Mouse and Keyboard connectors, Universal Serial Bus (USB) interface, and Infrared connector
- Supports Fan Status Monitoring and Alarm, Temperature Monitor and Alert, Voltage Monitor and Alert, System Resources Alert, and Virus Write Protection through the optional LM78 compatible Hardware Monitor and Intel® LANDESK Client Manager (LDCM) software
- System BIOS supports ChipAway Virus Designed by Trend that
 - guarantees a virus-free boot and a virus-free operating system;
 - guards against viruses hidden in preinstalled software and pre-shipped products;
 - offers built-in, hardware-based protection (no installation and configuration worries);
 - detects known and unknown boot viruses using Trend Micro's patented rule-based technology – no after service required
- Provides PC-cillin97 that
 - supports Macro Trap automatically detects and cleans all word macro viruses;
 - continuous protection from all possible virus sources; up-to-the-minute virus news and information;
 - automatic on-line pattern fileupdates; NCSA certified

Unpacking the Mainboard & Static Electricity Precautions

This Mainboard package contains the following items:

1. This Mainboard
2. Device Driver
3. This User's Guide
4. The Slot1 holder

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.

Chapter 2

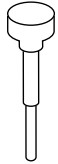
Hardware Configuration

Before you install the 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.

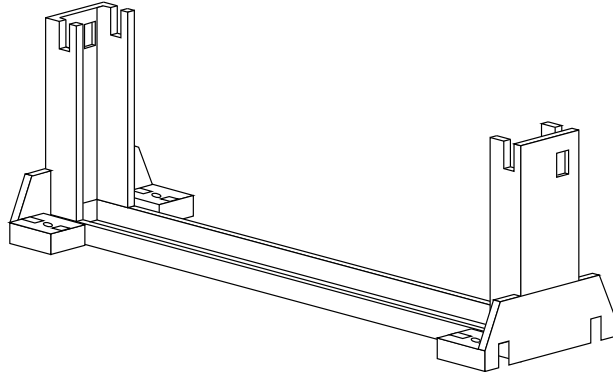
CPU Installation

This mainboard supports Intel Pentium® II CPU using a Single Edge Contact (SEC) slot. Make sure that you have the following items (which should be included in the package) before doing any installation. All parts are labeled here with item numbers which will be referred to in the Installation Procedures section. Item 1 and 2 together are the retention mechanism, please refer to following procedures to complete your CPU installation.

- 1) 4 screws:



- 2) 1 retention clip:

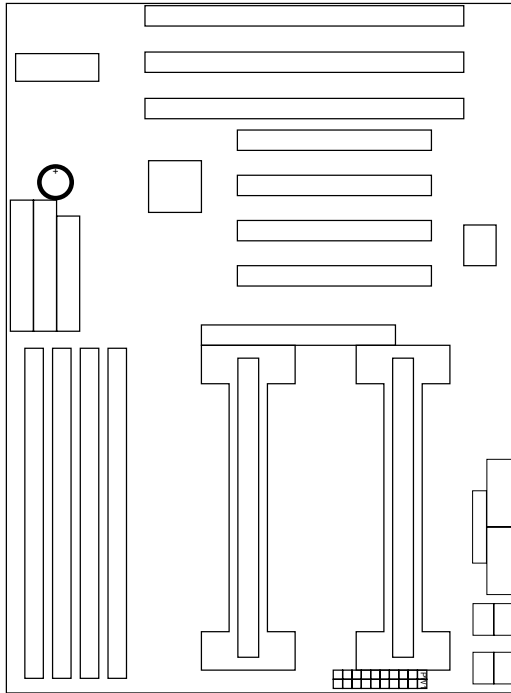


Installation Procedures

Follow the following steps in order to install your Intel Pentium® II properly.

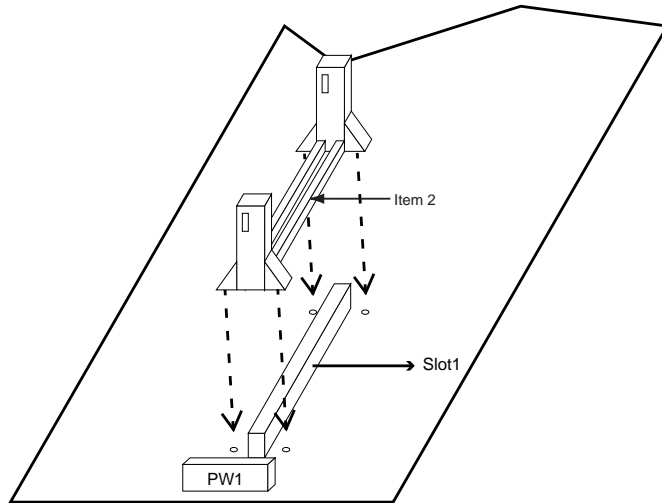
Step 1:

Make sure that the mainboard is set the same direction as the following drawing before doing any installation.



Step 2:

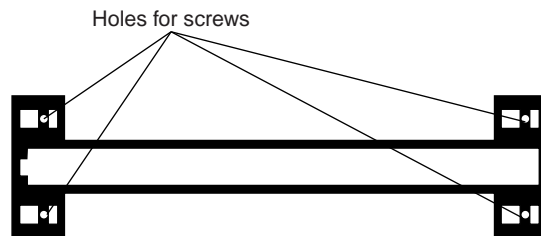
There are 2 sets of small holes along Slot 1 of your mother board: two on the top and two on the bottom. Snap the retention clip (2) right into those 2 sets of holes



If the retention clip is installed incorrectly, you will not be able to insert the retention clip into the CPU and in this situation you might need to rotate the retention clip by 180°.

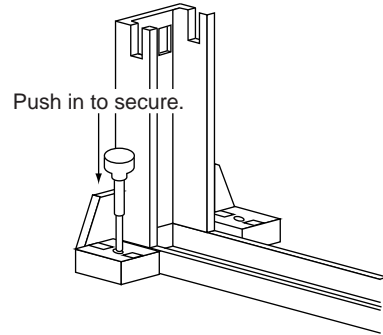
Step 3:

Find the hole in each corner of the retention clip then insert the 4 screws from the top of the motherboard.

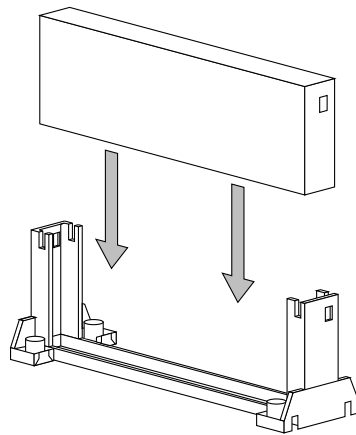


Step 4:

And then simply push the screws downward to secure the retention clip.

**Step 5:**

Flatten the two latches on the side of CPU. Insert the CPU into the retention clip. Lock the two latches to secure the CPU.



PW1 – ATX Style Power Connector

The ATX power supply provides a single 20-pin connector.

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

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.

J7 (19, 20) (PWRBT) – Power Button & Suspend Switch Connector

When the system is turned off, push the power button to turn the system back on.

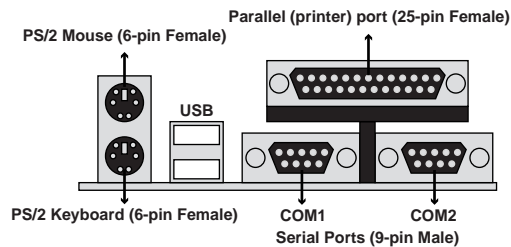
When the system is on, push the power button rapidly to switch the system to the Suspend mode, and, by pushing and holding the button for more than 4 seconds to turn the system completely off.

When the system is in the Suspend mode, push the power button rapidly to turn the system on.

J9 – APIC Slot

While using Dual CPUs, you must insert APIC module into APIC Slot.

External Connectors Location



Side View

FDC1 – Floppy Disk Drive Connector

IDE1/IDE2 – Primary/Secondary IDE Connectors

J7 (2, 4, 6, 8, 10) (KY-LOCK) – Keylock & Power LED Connector

Pin	Description
2	LED Output
4	N.C.
6	Ground
8	Keylock
10	Ground

J7 (1, 3, 5, 7) (SPK) – Speaker Connector

Pin	Description
1	Data Out
3	N.C.
5	Ground
7	+5V

J7 (13, 14) (TB-LED) – Turbo LED Connector

Pin	Description
13 (+)	Anode
14 (-)	Ground

J7 (15, 16) (HD-LED) – HDD LED Connector

Pin	Description
15 (+)	+5V
16 (-)	Active Low

J7 (17, 18) (RST) – Reset Switch Connector

Attach the Reset push button cable to this connector.

Setting	Description
Open	Normal Mode
Close	Reset System

J2 – Wake-on-LAN Connector

Pin	Description
1	5VSB
2	Ground
3	Wake Up

J4/J6 (FAN 1/2) – CPU Fan Connector

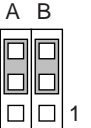
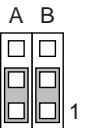
Pin	Description
1	Sensor
2	+12V
3	Ground

IR1 – Infrared Module Connector



Pin	Description
1	IRRXL
2	Ground
3	IRTX
4	+5V
5	IRRXH
6	+5V
7	Ground

Jumper Settings

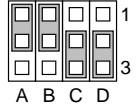
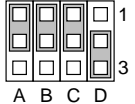
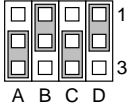
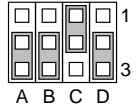
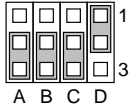
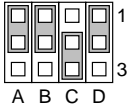
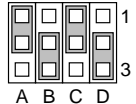

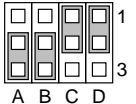

JP2 – DIMM Voltage Selectors

Voltage	Setting
5V	
3.3V (default)	

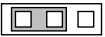

JP3 – CMOS RAM Clear Selector*

Description	Setting
Normal Mode	
Clear CMOS (default)	

JP5 – CPU Speed Selectors

PII	Setting	PII	Setting	PII	Setting
233MHz		366MHz		466MHz	
266MHz		400MHz		500MHz	
300MHz		433MHz		533MHz	
333MHz					

JP4 – CPU SMI Source Selector**

From	Setting
PIIX4	1 
I/O APIC	1 

Note: * Make sure that this jumper is set to Normal Mode before installing the mainboard.

** This selector must be set to PIIX4 setting if there is no APIC module.

Memory Installation

The mainboard lets you add up to 512MB of system memory through DIMM sockets on the board. Four 168-pin DIMM sockets are divided into four banks: Bank 0, Bank 1, and Bank 2, Bank 3. The mainboard supports the following memory configurations.

Bank	Memory Module
Bank 0 DIMM1 (168-pin DIMM)	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Bank 1 DIMM2 (168-pin DIMM)	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Bank 2 DIMM3 (168-pin DIMM)	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Bank 3 DIMM4 (168-pin DIMM)	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Total System Memory = Bank 0 + Bank 1 + Bank 2 + Bank 3	

- Notes:
1. The speed of all DIMM modules have to be faster than 70ns.
 2. Use 2 DRAM types: Extend Data Out (EDO), or Synchronous DRAM (SDRAM) for DIMM socket.

Chapter 3

BIOS Setup

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: When installing newer BIOS into this mainboard, you must clear CMOS for a moment then set back to Normal Mode, or hold down the <End> key then power on to reboot the system.

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 if you want to run SETUP” appears, press the key to enter the BIOS setup program. The following screen appears:

AMIBIOS SIMPLE SETUP UTILITY - VERSION 1.1X
(C)1997 American megatrends, Inc. All Rights Reserved

Standard CMOS Setup	Peripheral Setup
Advanced CMOS Setup	Change Supervisor Password
Advanced Chipset Setup	Auto-Detect Hard Disks
Power Management Setup	Save Settings and Exit
PCI/Plug and Play Setup	Exit Without Saving
Load Optional Settings	
Load Best Performance Settings	
Esc: Quit ↑ ↓ → ←: Select Item (Shift) F2: Change Color F5: Old Values	
F6: Optional values F7: Best performance values F10 : Save&Exit	
Standard CMOS setup for changing time, date, hard disk type, etc.	

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

Default

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

Load Optimal Settings

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

Load Best Performance Settings

The Best default values provide best performance settings for all devices and system features, but dependent used devices and we aren't guaranty that system run overnight on these settings.

Setup Items

Standard 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.

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

Advanced Setup

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

Quick Boot	Set this option to <i>Enabled</i> to permit BIOS to boot within 5 seconds.
1st Boot Device; 2nd Boot Device; 3rd Boot Device	Set these options to select the boot sequence from different booting devices.
Try Other Boot Devices	Choose <i>Yes</i> or <i>No</i> to search other boot devices to boot up the system when all the options in the previous function failed.
S.M.A.R.T for Hard Disks	Choose <i>Enabled</i> or <i>Disabled</i> . This option allows you to utilize the S.M.A.R.T. function of HDDs.
Floppy Drive Swap	This option allows you to swap floppy drives between A: and B:.
Floppy Drive Seek	Choose <i>Enabled</i> or <i>Disabled</i> . <i>Disabled</i> provides a faster boot and reduces the possibility of damaging the heads.
PS/2 Mouse Support	When this option is set to <i>Enabled</i> , BIOS supports a PS/2-type mouse.

Password Check	<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 BIOS 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 BIOS Setup screen.</p>
Boot to OS/2 Over 64MB	<p>You need to set this option to Enabled when using the OS/2 operating system with installed DRAM which is greater than 64MB.</p>
Internal Cache	<p>This option selects to enable the internal cache or not. Choices are Disabled and Enabled.</p>
System BIOS Cacheable	<p>BIOS always copies the system BIOS from ROM to RAM for faster execution. Set this option to <i>Enabled</i> to permit the contents of the F0000h RAM memory segment to be written to and read from cache memory.</p>

C000, 16K Shadow; C400, 16K Shadow; C800, 16K Shadow; CC00, 16K Shadow; D000, 16K Shadow; D400, 16K Shadow; D800, 16K Shadow; DC00, 16K Shadow	Disabled:	The specified ROM is not copied to RAM.
	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.
	Cached:	The contents of the ROM area are copied from ROM to RAM for faster execution.

Chipset Setup

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

Trend Chip Away Virus	Set this option to enable the Trend Chip Away Virus function.
Auto Configure DRAM Timing	Set this option to enable the Auto Configuration of DRAM Timing.
EDO DRAM Speed (ns)	Based on the type of your EDO RAM, set this option to either 60ns or 70ns.
EDO Read Burst Timing	Set this option to select the proper EDO DRAM Read Timing.
EDO Write Burst Timing	Set this option to select the proper EDO DRAM Write Timing.
SDRAM CAS Latency	Set this option to select the proper SDRAM CAS Latency.

DRAM Integrity Mode	<p>Choose Non-ECC, EC-Only, or ECC.</p> <p>Non-ECC: Has byte-wise write capability but no provision for protecting data integrity in the DRAM array.</p> <p>EC-Only: Data errors are detected but not corrected.</p> <p>ECC: Allows a detection between single-bit and multiple-bit errors and recovery of single-bit errors.</p>
A.G.P. Aperture Size (64MB)	<p>Choose 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, or 256MB. Memory-mapped, graphics data structures can reside in the Graphics Aperture. Use the default setting.</p>
8 bit I/O Recovery Time	<p>This option specifies the length of a delay inserted between consecutive 8-bit I/O operations.</p>
16 bit I/O Recovery Time	<p>This option specifies the length of a delay inserted between consecutive 16-bit I/O operations.</p>
On Board USB Function	<p>Choose Enabled or Disabled. Set this option to enable the system BIOS USB (Universal serial Bus) functions.</p>
USB Function for DOS	<p>Choose Enabled or Disabled. Set this option to enable the passive release on the USB (Universal Serial Bus).</p>

Power Management Setup

Choosing the item from BIOS Setup main menu.

Power Management/ APM	Set this option to enable power management features and APM (Advanced Power Management).
Green Monitor Power State	This option specifies the power state that the green PC-compliant video monitor enters when AMIBIOS places it in a power savings state after the specified period of display inactivity has expired.
Video Power Down Mode	This option specifies the power conserving state that the VESA VGA video subsystem enters after the specified period of display inactivity has expired.
Hard Disk Power Down Mode	This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired.
Standby Time out (Minute)	This option specified the length of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state.
Suspend Time out (Minute)	This option specified the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state.

Display Activity; When set to *Yes*, these options enable event monitoring on the specified hardware
Serial Port 1;
Serial Port 2; 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.
Parallel Port;
Floppy Disk;
Primary Master IDE;
Primary slave IDE;
Secondary Master IDE;
Secondary Slave IDE

RTC Alarm Power On Set this option to enable the RTC Alarm to wake up the system which is Soft Off.

RTC Alarm Date; Set these options to specify the RTC Alarm time on Date/Hour/Minute/Second.
RTC Alarm Hour;
RTC Alarm Minute;
RTC Alarm Second

PCI/PnP Setup

Choose the item from the BIOS Setup main menu.

Plug and Play Aware OS Set this option to *Yes* if the operation system in this computer is aware of and follows the Plug and Play specification. Currently, only Windows 95 is PnP-aware.

- PCI VGA Palette Snoop** 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. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled).
- Allocate IRQ to PCI VGA** This option is used to allocate IRQ to PCI VGA. Recommendation is set to *NO*.
- OffBoard PCI IDE Card** This option specifies if an offboard PCI IDE controller adapter card is installed in the computer. You must specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller is installed. If an offboard PCI IDE controller is used, the onboard IDE controller is automatically disabled. If an offboard PCI IDE controller adapter card is installed in the computer, you must also set the **Offboard PCI IDE Primary IRQ** and **Offboard PCI IDE Secondary IRQ** options.
- Pri. OffBoard PCI IDE IRQ;** These options specify the PCI interrupt used by the Primary (or secondary) IDE channel on the offboard PCI IDE controller.
OffBoard PCI IDE IRQ
- DMA Channel 0, 1, 3, 5, 6, 7** These options specify the bus that the specified DMA channel is used on.
- IRQ3, 4, 5, 7, 9, 10, 11, 14, 15** 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.

Reserved Memory Size This option is designed to be used for reserving memory for the I/O card.

Reserved Memory Address This option is designed to be used for reserving memory address for the I/O card.

Peripheral Setup

Choose the item from the BIOS Setup main menu.

OnBoard FDC This option enables the FDC (Floppy Drive Controller) on the motherboard or auto detects the FDC.

OnBoard Serial Port1 This option specifies the base I/O port address of serial port 1.

OnBoard Serial Port2 This option specifies the base I/O port address of serial port 2.

Serial Port2 Mode This option specifies the serial port2 mode.
Normal: The normal serial port mode is being used.
IrDA/ASKIR: The serial port2 will be redirected to support IR function when this option is set to IrDA or ASKIR.

Duplex Mode This option shows up only when either IrDA or ASKIR is chosen in the previous option (Serial Port2 Mode).

OnBoard Parallel Port This option specifies the base I/O port address of the parallel port on the motherboard.

Parallel Port Mode Depends on the type of your external device which connects to this port to choose Normal, EPP, or ECP mode.

Parallel Port IRQ This option specifies IRQ to parallel port.

Parallel Port DMA Channel This option is only available if the setting of the Parallel Port Mode option is EPP/ECP.

OnBoard IDE This option specifies the channel used by the IDE controller on the motherboard.

Change Supervisor Password

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 discharge CMOS memory using Jumper JP3.

Auto-Detect Hard Disks

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 Settings and Exit

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.