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Contents

Chapter 1: Introduction	1
Key Features	2
Unpacking the Mainboard & Static Electricity Precautions.....	4
Chapter 2: Hardware Configuration	5
CPU Installation	6
Installation Procedures.....	8
Mainboard Component Locations	13
Connectors.....	14
PWR1 – AT Power Connector.....	14
COM1/2 – Serial Port #1/ #2	14
PRN – Parallel Printer Connector.....	14
FDC – Floppy Disk Drive Connector	14
IDE1/IDE2 – Primary/Secondary IDE Connectors .	14
KBD – Keyboard Connector	14
J1/PS2 – PS/2 Mouse Pin/ Head Connectors.....	14
J3 – ATX Form Card Connector	14
J5 (2, 4, 6, 8, 10) (KLOCK) – Keylock & Power LED Connector.....	15
J5 (1, 3, 5, 7) (SPKR) – Speaker Connector	15
J5 (15, 16) (HDD-LED) – HDD LED Connector	15
J5 (17, 18) (RST) – Reset Switch Connector	15
J6 (FAN2) – Chassis Fan Connector	16
J7 (FAN1) – CPU Fan Connector	16
Sound Pro Connectors:.....	16
CD1/CD2 – Analog Audio for Sony/Panasonic	16
J9 – Sound and Game	16
J10– Digital Audio IN.....	16
J11 – Digital Audio OUT	16
Jumper Settings	17
JP3 – DIMM Voltage Selectors	17
JP2 – Microphone Type Selector.....	17
JP1 – Sound Pro Selector	17
Memory Installation.....	18
Chapter 3: ACPI Functions & Connectors with ATX Power	19
PWR2 – ATX Style Power Connector	19
Software Power-Off	20
J5 (19, 20) (PWR_ON) – ATX Power Button and Suspend Switch Connector	20

	iii
Chapter 4: BIOS Setup	21
Entering WinBIOS Setup	22
Default	23
Setup Window	23
Standard Setup	24
Advanced Setup	25
Chipset Setup	27
Power Management Setup	29
PCI/PnP Setup	31
Peripheral Setup	32
Security	34
User	34
Anti-Virus	34
CPU PnP	34
Utility	35
Detect IDE	35
Exit WinBIOS Setup	35
Save Changes and Exit	35
Do Not Save Changes and Exit	35
Continue	35

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/EX 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/EX AGPset** chipset for AT Form Factor
- Supports Pentium® II 233 ~ 333 MHz CPUs at Slot1
- Provides 2 DIMMs and 4 SIMMs to support SDRAM/EDO memory modules up to 256MB
- Supports Accelerated Graphics Port (AGP) v1.0
- Supports 512KB or 256KB Pipelined Burst L2 cache in Pentium® II Single Edge Contact (SEC) cartridge.
- Supports Advanced Configuration Power Interface (ACPI) and Legacy PMU, fully compliant to PC97 and 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 0 to 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 1 AGP, 3 PCI Local, and 2 ISA Bus slots
- Provides AT/ATX power connectors, and the ATX power which supports various functions, such as Suspend/Shutdown
- Onboard PCI Bus Master IDE interface supports 4 IDE devices with 2 channels; BIOS supports 4 IDE harddisk drives which do not need device driver for S/W application and the capacity of each harddisk can be larger than 528MB and up to 8.4 GB

- 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 which the data transfer rate is 1MB/s
- Supports PS/2 Mouse Socket/Pin Header connector and **ATX Form Card which containing PS/2 Mouse, 2 USB interface, and Infrared connectors**
- BIOS supports “Plug & Play” Flash ROM
- **Onboard Sound Pro supports the following features:**
 - Sound Blaster 16/PRO compatible with stereo voice up to 48KHz sampling rates, HRTF 3D Positional Audio Technology
 - Windows Sound System V2.0 compatible, Accelerates Direct Sound 3D in Win95, and Windows 95/31 & DOS drivers supported
 - Supports 44.1K digital audio (SPDIF) IN/OUT, HSP-23 Wavetable synthesizer, full duplex 16-bits CODEC with filters, and high quality 3D sound (ON/OFF controllable)
 - Device supports SB16, WSS, & Game
 - Stereo Mixer supports analog mixing from CD-Audio & Line-In and digital mixing from Voice, FM/Wave-table, and digital CD-Audio.

Unpacking the Mainboard & Static Electricity Precautions

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.

Chapter 2

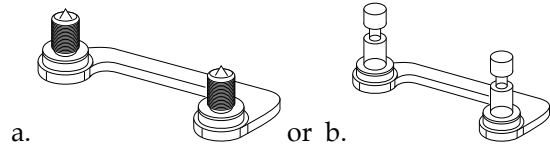
Hardware Configuration

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.

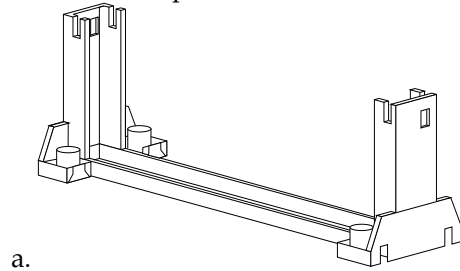
CPU Installation

This mainboard supports Intel Pentium® II CPU using 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 by the Installation Procedures section. And, item 1 and 2 together are the retention mechanism which the manufacture ships in two different types (a or b), refer to the proper procedures according to the type you received.

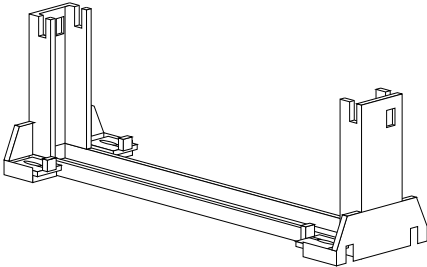
- 1) 2 screws:



- 2) 1 retention clip:

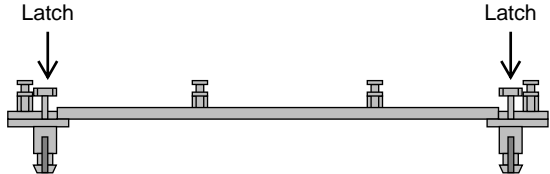


or



b.

3) 1 heatsink support base and clip:



Side View of CPU Supporter Base



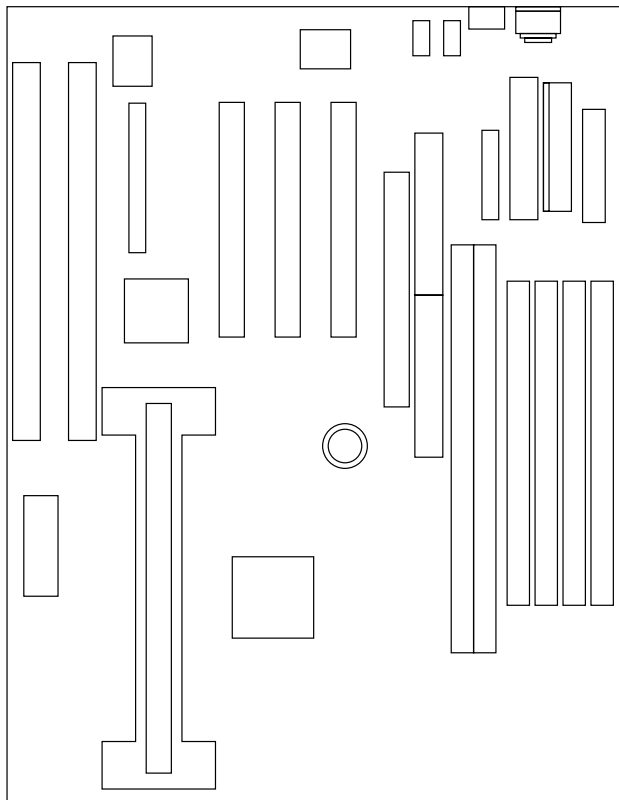
Top View of CPU Support Clip

Installation Procedures

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

Step 1:

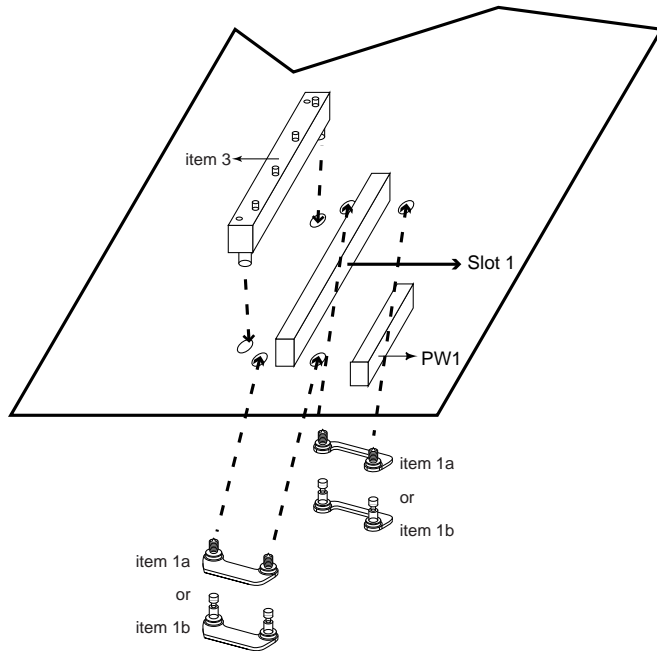
Make sure that the mainboard is set the same direction as the following drawing before doing any installation.



Insert the 2 pairs of screws (1a or 1b, depending on the type you received) from the bottom of the motherboard upward onto the mainboard.

Step 2:

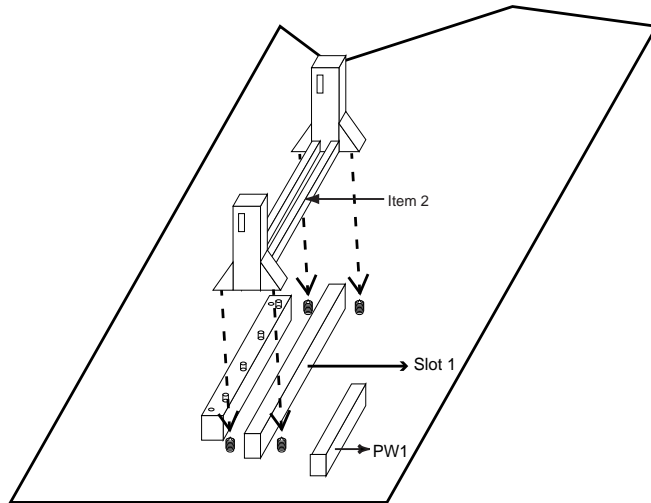
Insert the supporting base (3), which is shown below, into the two holes directly to the left of the 2 sets of screws that have just been inserted on to the board.



Insert the 2 latches into the two holes of the supporting base and then turn them 90° to secure the CPU.

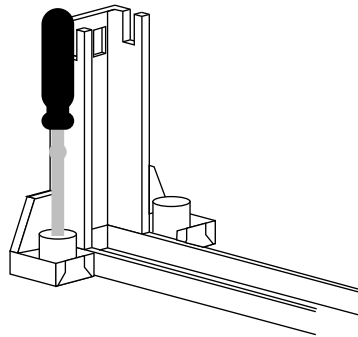
Step 3:

Set the retention clip (2) right on the top of the 2 sets of screws which are along the sides of Slot1.

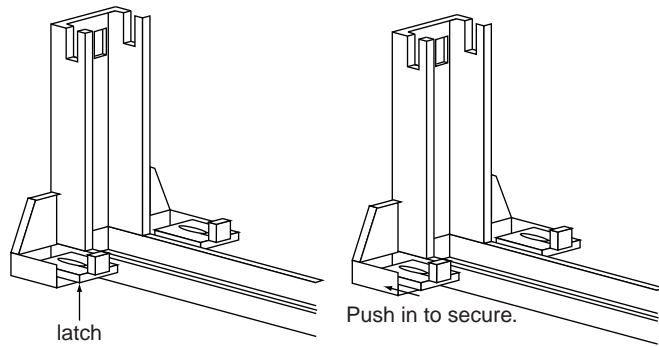


If the retention clip is installed incorrectly, you will not be able to insert the CPU into the retention clip and in this situation you might need to rotate the retention clip by 180°.

For the retention mechanism 1a and 2a, you need to tighten the 4 screws on the retention clip till the neck of the screws can not be seen from the bottom of the board

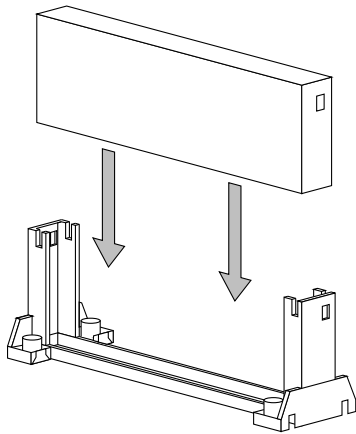


And for 1b and 2b retention mechanism, simply push the latches in to secure the screws.



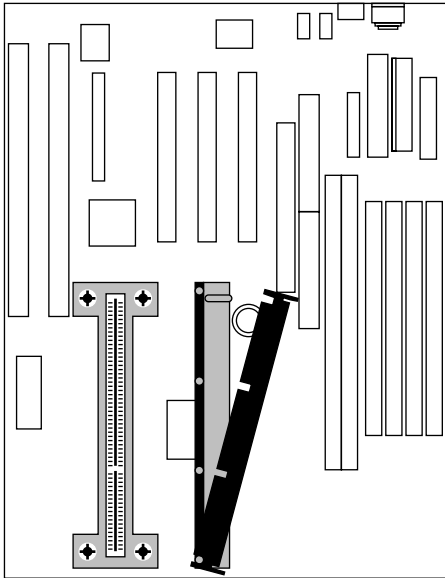
Step 4:

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



Step 5:

Insert the clip portion of the CPU supporter (3b) so that the heat sink can sit on the top of the whole CPU supporter.



Mainboard Component Locations

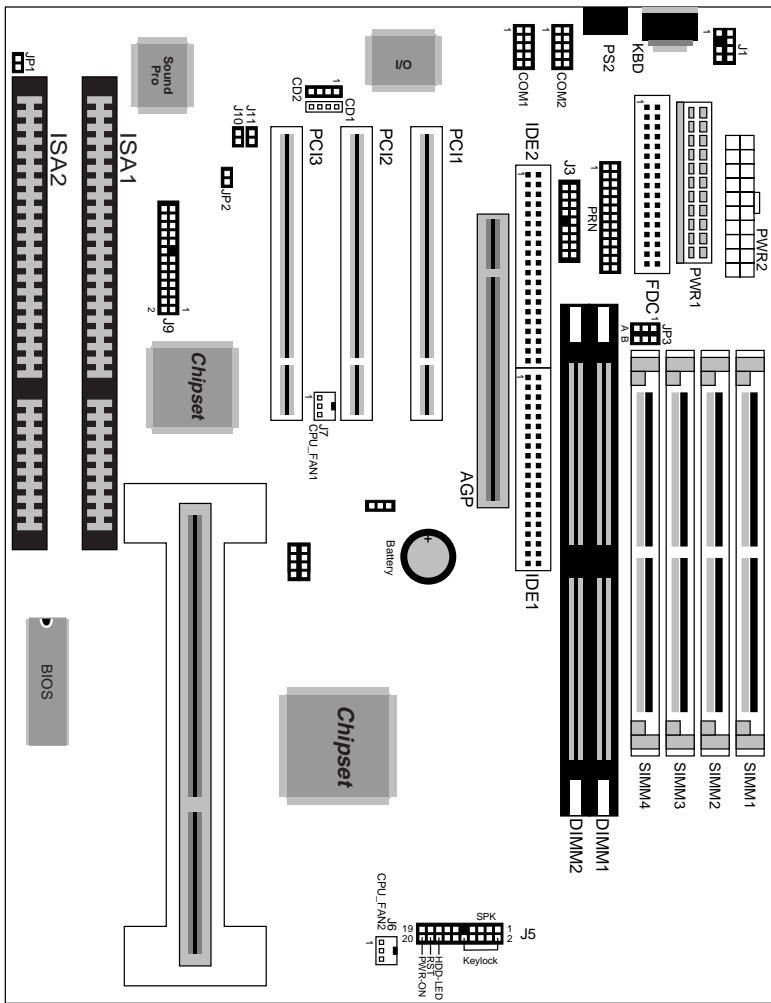


Figure 2-1. Mainboard Component Locations

Connectors

Attach system components and case devices to the mainboard via the mainboard connectors. A description of each connector and its connector pins 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.

PWR1 – AT Power Connector

COM1/2 – Serial Port #1/#2

PRN – Parallel Printer Connector

FDC – Floppy Disk Drive Connector

IDE1/IDE2 – Primary/Secondary IDE Connectors

KBD – Keyboard Connector

J1/PS2 – PS/2 Mouse Pin/Head Connectors

J3 – 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.

J5 (2, 4, 6, 8, 10) (KLOCK) – Keylock & Power LED Connector

Keylock connector enables and disables the keyboard key-in function on the case.

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

J5 (1, 3, 5, 7) (SPKR) – Speaker Connector

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

J5 (15, 16) (HDD-LED) – HDD LED Connector

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

J5 (17, 18) (RST) – Reset Switch Connector

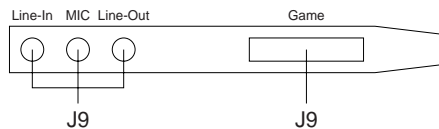
Setting	Description
Open	Normal Mode
Close	Reset System

J6 (FAN2) – Chassis Fan Connector**J7 (FAN1) – CPU Fan Connector****Sound Pro Connectors:****CD1/CD2 – Analog Audio for Sony/Panasonic**

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

J9 – 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:

**J10– Digital Audio IN**

Depending on the type of your CD-ROM drive to connect this connector to “DIGITAL AUDIO” on the CD-ROM drive.

J11 – Digital Audio OUT

Connect to the Digital Audio device.

Jumper Settings

JP3 – DIMM Voltage Selectors

Voltage	Setting
5V	
3.3V (default)	

JP2 – Microphone Type Selector

Description	Setting
Standard	
Special	

JP1 – Sound Pro Selector

Description	Setting
Enabled	
Disabled	

Memory Installation

The mainboard lets you add up to 256MB of system memory through DIMM/SIMM sockets on the board. Each bank consists of 2 SIMMs or 1 DIMM socket which is divided into two banks: Bank 0 and Bank 1. The mainboard supports the following memory configurations.

Bank	Memory Module
Bank 0	
SIMM1 & SIMM2	2 x 4MB/8MB/16MB/32MB/64MB/128MB
or	or
DIMM1	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Bank 1	
SIMM3 & SIMM4	2 x 4MB/8MB/16MB/32MB/64MB/128MB
or	or
DIMM2	4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Total System Memory = Bank 0 + Bank 1	

- Notes:
1. The speed of all DIMMs and SIMMs modules have to be faster than 70ns.
 2. SIMM1 & SIMM2 is the same bank as DIMM1, so is SIMM3 & SIMM4 to DIMM2. You can utilize SIMM and DIMM simultaneously while using this single-side DRAM module, but do remember that the DRAM type (such as EDO/SDRAM) has to be the same. However, SIMM and DIMM can not be utilized simultaneously if the DRAM module is double-sided.

Chapter 3

ACPI Functions & Connectors with ATX Power

PWR2 – 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

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.

J5 (19, 20) (PWR_ON) – 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.

Chapter 4

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.

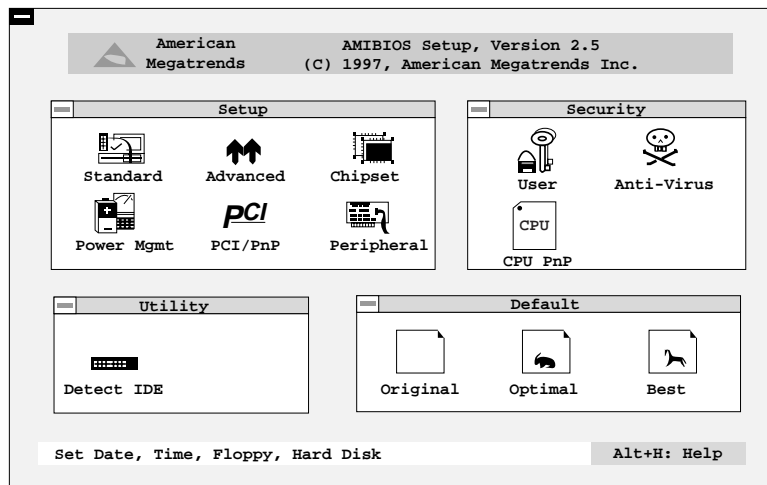
The system setup is also called CMOS setup. Normally, you need to run system setup if either the hardware is not identical with information contained in the CMOS RAM, or if the CMOS RAM has lost power.

Note: Hold down the <End> key then power on to reboot the system when installing newer BIOS into this mainboard .

Entering WinBIOS Setup

To enter the WinBIOS 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:



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

Default

Every option in the BIOS Setup contains three default values: Original default, Best default, and the Optimal default value.

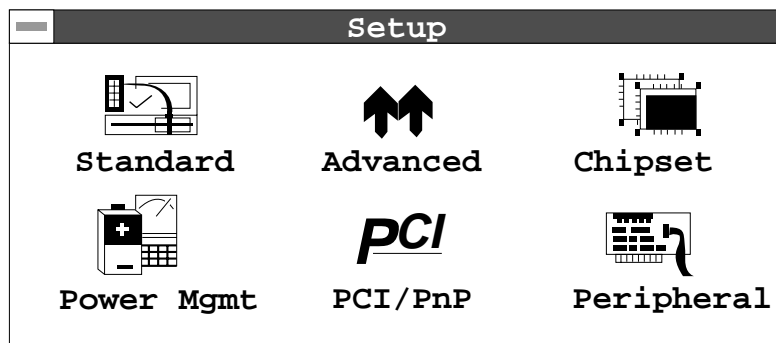
Original: The original default values recover the modified settings to the original values.

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

Best: 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 Window

The Setup window has six icons that allow you to set system configuration options.



Standard Setup

The WinBIOS Setup options described in this section are displayed by choosing the Standard icon from the Setup section on the WinBIOS Setup main menu. All Standard Setup options are described in this section.

- 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:
- Pri Slave**
- Sec Master**
- Sec Slave** 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 *On* to enable support for IDE drives with capacities greater than 528MB. Click on **Blk Mode** and choose *On* to support IDE drives that use Blk Mode. Click on **32Bit Mode** and click on *On* to support IDE drives that permit 32-bit accesses.
- 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.
- Floppy Drive A; B** Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are 360KB 5¹/₄", 1.2MB 5¹/₄", 720KB 3¹/₂", 1.44MB 3¹/₂", or 2.88MB 3¹/₂".

Advanced Setup

The WinBIOS Setup options described in this section are displayed by choosing the Advanced icon from the Setup section on the WinBIOS 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 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>
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 Chipset icon from the Setup section on the WinBIOS Setup main menu. All Chipset Setup options are then displayed and are described in the following section:

Auto Configure EDO 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	This option is designed to select the SDRAM CAS Latency.

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

Power Management Setup

The BIOS Setup options described in this section are selected by choosing the Power Mgmt icon from the Setup section on the WinBIOS Setup main menu.

- | | |
|-------------------------------------|--|
| Power Management/ APM | Set this option to enable power management features and APM (Advanced Power Management). |
| Green PC 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 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.

Device 6 (Serial Port 1);
Device 7 (Serial Port 2);
Device 8 (Parallel Port);
Device 5 (Floppy Disk);
Device 0 (Primary Master IDE);
Device 1 (Primary slave IDE);
Device 2 (Secondary Master IDE);
Device 3 (Secondary Slave IDE)

CPU Critical Temperature System will alarm when the temperature of CPU is over the preset value.

RTC Alarm Resume From Soft Off 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 PCI/PnP icon from the Setup section on the WinBIOS 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.
- OffBoard PCI IDE Primary IRQ;** These options specify the PCI interrupt used by the Primary (or secondary) IDE channel on the offboard PCI IDE controller.
- OffBoard PCI IDE Secondary 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 IO card.
- Reserved Memory Address** This option is designed to be used for reserving memory address for the IO card.

Peripheral Setup

Choose the Peripheral icon from the Setup section on the WinBIOS 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 is to specify the Duplex mode of Serial Port 2.

- 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.

- OnBoard Sound PRO** This option is designed to be used to enable the Sound Pro functions.

Security

User

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.

Anti-Virus

This item protects the boot sectors and partitions table of your hard disk against accidental modifications. Any attempt to write to boot sectors and partitions will cause the system to halt and you need to use a bootable none virus floppy disk to reboot the system and then run the virus checking program to make sure that your system is ok.

The default setting is "Disabled." This setting is recommended due to the conflicts within new operating systems.

CPU PnP

CPU Speed Ratio Select this option to specify the speed of CPU.

Utility

Detect IDE

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.

Exit WinBIOS Setup

Press the <ESC> key to exit the BIOS setup program while in the main menu of the WinBIOS Setup and the following three options will be displayed on the screen.

Save Changes and Exit

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

Do Not Save Changes and Exit

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

Continue

Select this item to return to the WinBIOS setup program.