The information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. Specifications are subject to change without notice.

Trademarks

Contents

Chapter 1
Introduction

This mainboard is a 100 MHz highly integrated high-performance mainboard based on the advanced Pentium® II microprocessor and featuring the high-end AGPset chipset. The mainboard offers high flexibility in configuration and is fully IBM PC/AT compatible.

Key Features

The advanced features of the mainboard include:

- Supports Pentium® II 233 ~ **450** MHz and Celeron 266 ~ **300** MHz CPUs with Frequency at 66/**100**MHz in Slot1 for AT Form Factor

- Provides 3 DIMMs for SDRAM/EDO/FPM memory modules (**PC100 SDRAM** specification needed and EDO/FPM DRAM is not recommended if using **100MHz** clock speed), memory expandable up to 384MB

- **Built in high performance 64bit 3D AGP Graphics Accelerator with 4MB frame buffer**

- Supports Advanced Configuration Power Interface (ACPI) and Legacy PMU and the Ultra DMA/33, fully compliant to PC97 and PC98

- Provides both AT/ATX power connectors, and supports various functions of ATX power, such as Suspend/Shutdown, Alarm Wake Up, Modem Ring On, and Wake On LAN

- Provides 3 PCI, 2 ISA slots, and PCI Bus Master IDE interface supports 4 IDE devices with 2 channels,

- Onboard super Multi-I/O chip supports 2 serial ports with 16550 compatible fast UART, 1 IR, 1 parallel port with EPP and ECP capabilities, and one floppy disk drive interface with 1Mb/s transfer rate

- Provides **ATX Form Card** which containing PS/2 Mouse, 2 USB interface, and Infrared connectors

- Bundled **PC-cillin97** (OEM) provides automatic Virus Protection for Windows 95 and the Internet

- **Onboard 3D Sound Pro** meets PC98' specification and supports HRTF Positional Audio, Direct Sound 3D with **Aureal 3D** driver, Software Wave-table Synthesizer, and Digital Audio Interface (SPDIF) IN/OUT.

Unpacking the Mainboard & Static Electricity Precautions

This Mainboard package contains the following items:

1. This Mainboard and the Device Driver

2. The Slot1 holder and AT cables

3. This User's Guide

4. Sound & Game ribbon cables/bracket and SPDIF/IN cable

5. ATX Form Card and VGA cable/bracket

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 refered 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:
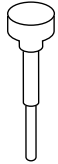
2) 1 retention clip:
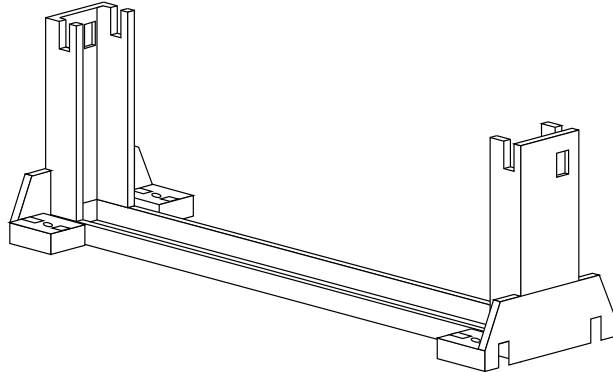
Installation Procedures

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.
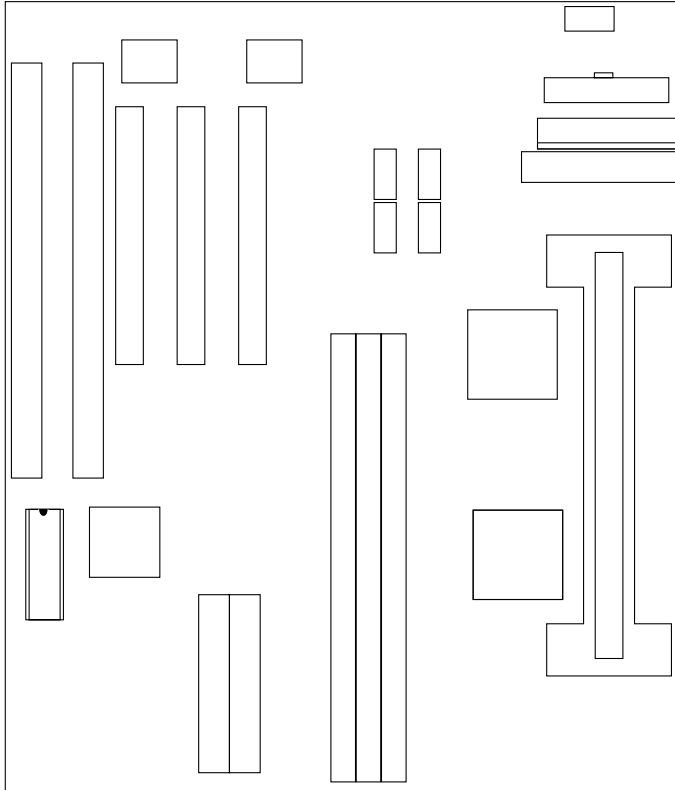
Step 2:

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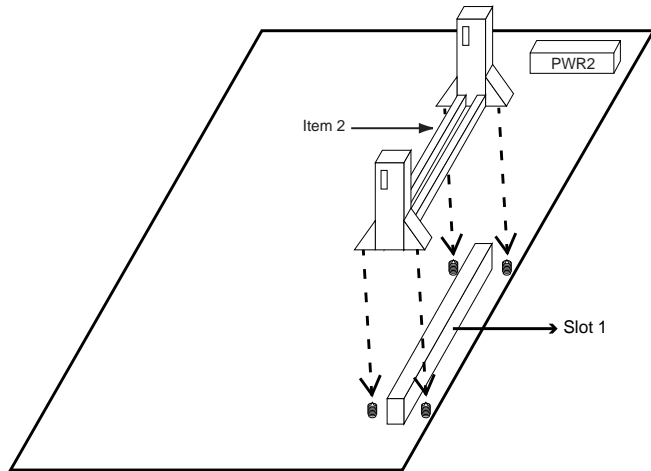
If the retention clip is installed incorrectly, you will not be able to insert the retention clip into the CPU and in this situation you might need to rotate the retention clip by 180°.

Step 3:

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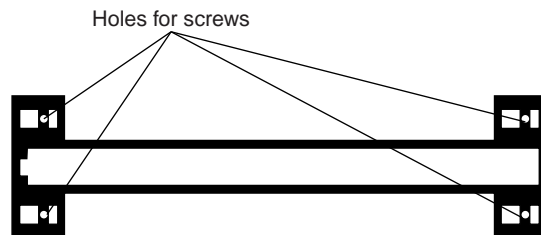
Step 4:

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

Push in to secure.
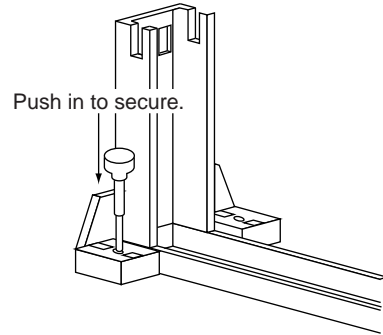
Step 5:

Flatten the two latches on the side of CPU. Insert the CPU into the retention clip. Lock the two latches to secure the CPU.
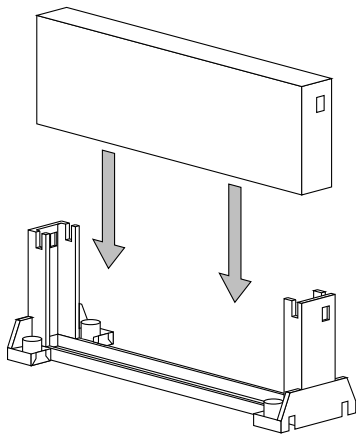
Mainboard Component Locations
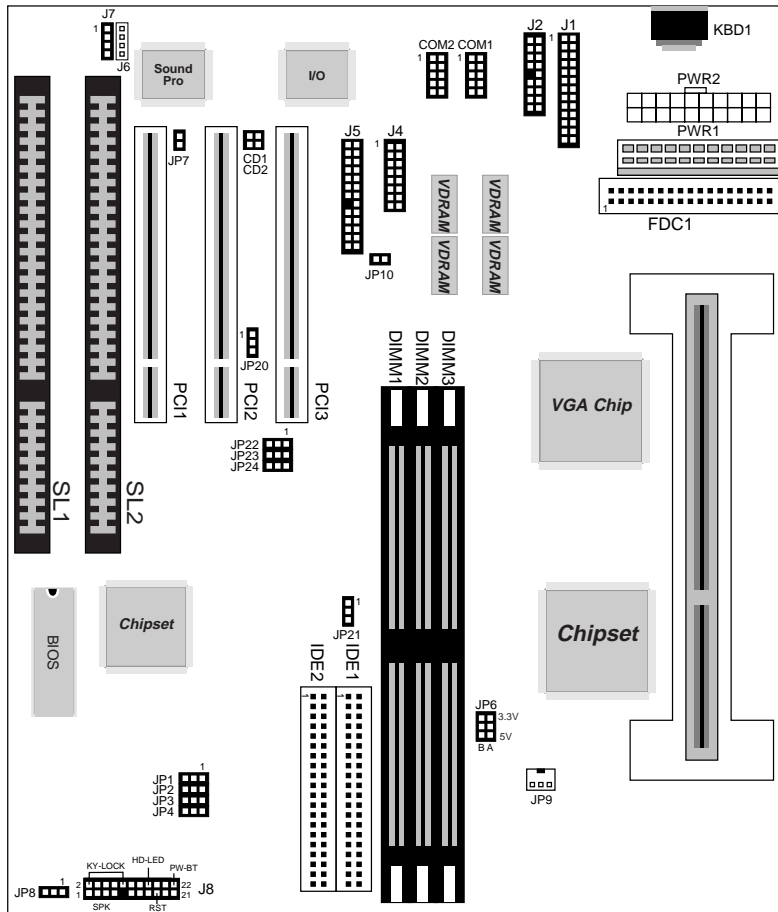
Figure 2–1. Mainboard Component Locations

Connectors

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

J1 – Parallel Printer Connector

FDC1 – Floppy Disk Drive Connector

IDE1/IDE2 – Primary/Secondary IDE Connectors

KBD1 – Keyboard Connector

J4 – VGA Connector

J2 – 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.

J8 (2, 4, 6, 8, 10) (KY-LOCK) – 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

J8 (1, 3, 5, 7) (SPK) – Speaker Connector

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

J8 (15, 16) (HD-LED) – HDD LED Connector

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

J8 (17, 18) (RST) – Reset Switch Connector

Setting	Description
Open	Normal Mode
Close	Reset System

J8 (21, 22) (PW-BT)

Refer to Chapter 3.

JP20 (Wake on LAN)

Refer to Chapter 3.

JP9 – CPU Fan Connector

Sound Pro Connectors:

J6/J7 – Analog Audio for Panasonic/Sony

Connect to "AUDIO" on the CD-ROM drive, and the signal for Panasonic jack is G-S-G-S and S-G-G-S for Sony.

J5 – Sound and Game

Sound contains Line-in/MIC (Microphone), and Line-out (Speaker). Game connector is also used as the Joystic. Connect this connector to the Sound & Game ribbon cable/bracket as the following drawing:
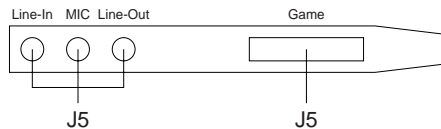
CD2/CD1 – Digital Audio OUT/IN

Connect Digital Audio In to "DIGITAL AUDIO" on the CD-ROM drive (depending on the type of your CD-ROM drive) by using SPDIF/IN cable, and using optional SPDIF/OUT cable (or bracket) for the external Audio Amplifier or Minidisk connection.

Jumper Settings

JP6 – DIMM Voltage Selectors

Voltage	Setting
5V	A B 5V 3.3V
3.3V (default)	A B 5V 3.3V

JP7 – Onboard Sound Selector

Description	Setting
Enabled	
Disabled	

JP10 – Microphone Type Selector

Description	Setting
Standard (default)	
Special	

JP8 – CMOS RAM Clear Selector

Description	Setting
Clear CMOS	1
Normal Mode	1

JP21~JP24 – Frequency Selectors

(For Version 1.3 only)

JP21 is the selector for 66/100MHz CPU.

Fre.	JP21, JP22, 23, 24
66MHz	
100MHz	

JP1~JP4 – Multiplier Selectors

(For Version 1.3 only)

Mul.	JP1, 2, 3, 4	Mul.	JP1, 2, 3, 4	Mul.	JP1, 2, 3, 4
3.5X		5.5X		7.5X	
4.0X		6.0X		8.0X	
4.5X		6.5X			
5.0X		7.0X			

Memory Installation

The mainboard lets you add up to 384MB of system memory through DIMM sockets on the board. Three DIMM sockets are divided into three banks: Bank 0, Bank 1, and Band 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: 1. The speed of SDRAM DIMM modules have to be faster than 12ns ("-12" parts), while 100MHz clock speed used, the speed of SDRAM DIMM should meet the PC100 SDRAM specification (8ns or "-8" SDRAM at least).

2. The EDO/FPM DRAM are not recommended for the performance purpose of the system.

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.

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.

J8 (21, 22) (PW-BT) – 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.

JP20 – Wake On LAN Connector

While in Soft-off/Suspend state, if an external LAN signal occurs, the system wakes up and can be accessed with the LAN card.

Pin	Description
1	5V Stand By
2	Ground
3	Active High

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 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:

```
                AMIBIOS SIMPLE SETUP UTILITY - VERSION 1.1X
            (C)1997 American megatrends, Inc. All Rights Reserved
 ┌─────────────────────────────────────┬───────────────────────────────────┐
 │ Standard CMOS Setup                  │ Peripheral Setup                  │
 │                                      │                                   │
 │ Advanced CMOS Setup                  │ CPU Plug and Play Setup           │
 │                                      │ (for V1.4 or Later)               │
 │ Advanced Chipset Setup               │                                   │
 │                                      │ Change Supervisor Password        │
 │ Power Management Setup               │                                   │
 │                                      │ Auto-Detect Hard Disks            │
 │ PCI/Plug and Play Setup              │                                   │
 │                                      │ Save Settings and Exit            │
 │ Load optimal Settings                │                                   │
 │                                      │ Exit Without Saving               │
 │ Load Best Performance Settings       │                                   │
 ├──────────────────────────────────────────────────────────────────────────┤
 │ Esc: Quit    ↑↓→←: Select Item   (Shift) F2: Change Color   F5: Old Values │
 │ F6: Optimal 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, however depending on the devices used, these settings are not recommend for long hours of work load.

Setup Items

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.

Pri Master; Pri Slave; Sec Master; Sec Slave	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 *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.
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 CMOS 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 *Enabled* 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 *Yes* or *No* 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 Enabled or Disabled. 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 Enabled or Disabled. Disabled
provides a faster boot and reduces the
possibility of damaging the heads.

PS/2 Mouse
Support
When this option is set to *Enabled*, BIOS
supports a PS/2-type mouse.

Password Check   This option specifies the type of BIOS
                        password protection that is implemented.
                        The settings are:
                        Setup: The password prompt appears
                                   only when an end user attempts
                                   to run WinBIOS Setup.
                        Always: A password prompt appears
                                   every time the computer is
                                   powered on or rebooted.
                        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.

Boot to OS/2 Over   You need to set this option to Enabled
64MB   when using the OS/2 operating system
                        with installed DRAM which is greater than
                        64MB.

L1/L2 Cache   This option selects to enable the CPU
                        L1/L2 cache or not. Choices are Disabled
                        and Enabled.

System BIOS   BIOS always copies the system BIOS from
Cacheable   ROM to RAM for faster execution. Set this
                        option to *Enabled* to permit the contents of
                        the F0000h RAM memory segment to be
                        written to and read from cache memory.

C000, 32K Shadow;	Disabled:	The specified ROM is not copied to RAM.
C800, 16K Shadow;		
CC00, 16K Shadow;	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.
D000, 16K Shadow;		
D400, 16K Shadow;		
D800, 16K Shadow;		
DC00, 16K Shadow		
	Cached:	The contents of the ROM area are copied from ROM to RAM for faster execution.

Advanced 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:

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.

SDRAM Speed Set this option to select the proper SDRAM speed.

RAS# Pulse When Refresh Set this option to select the proper RAS# Pulse when DRAM refreshes.

RAS# Precharge Time Set this option to select the proper RAS# precharge time.

RAS to CAS Delay Set this option to select the proper delay time of RAS to CAS.

CAS# Precharge	Set this option to select CAS# precharge time for EDO/FPM DRAM.
CAS# Pulse Width	Set this option to select CAS# pulse width for EDO/FPM DRAM.
SDRAM CAS Latency	This option is designed to select the SDRAM CAS Latency.
Refresh Queue Depth	Set this option to select the proper Refresh Queue Depth.
Graphic Win Size	Set this option to select the proper graphic window size.
VGA Frame Buffer USWC	Set this option to enable USWC for VGA Frame Buffer.
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.
16Bit DMA Wait State; 8Bit DMA Wait State	Set these option to select the proper Wait State for 16Bit/8Bit DMA.
ISA Bus Clock	Set this option to select ISA Bus Clock.
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).

– – – – – System Hardware Mon – – – – –

Current FAN#1 Speed; Current FAN#2 Speed; Vcore; Vio; +5.000V; +12.000V	These options are displayed only show the status of system hardware.

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.

Slow Clock Ratio — This option specifies the speed at which the system clock is running when it is in the power saving states.

Modem Use IRQ — This option is to specify IRQ number for modem device.

Display Activity; IRQ3, 4, 5, 7, 9, 10, 11, 13, 14, 15   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.

Power Button Function   Set this option to specify the operation of Soft-Off by the Power Button. select "Suspend" function to enter "On-Suspend-Off" or select "On/Off" function to enter "On-Off" operation cycle.

Modem Ring Power On   Set this option to enable the modem ring to power on.

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

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

PCI/Plug and Play 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; Sec. OffBoard PCI IDE IRQ
These options specify the PCI interrupt used by the Primary (or secondary) IDE channel on the offboard PCI IDE controller.

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 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 is to specify the Duplex mode of
                        Serial Port 2.

OnBoard Parallel   This option specifies the base I/O port
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   This option is only available if the setting of
                        the Parallel Port Mode option is EPP/ECP.

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

Pri. Master/Slave   These four options enable IDE Prefetch mode
Prefetch;   when the above option, OnBoard PCI IDE, is
Sec. Master/Slave   set to Enabled.
Prefetch

CPU Plug and Play Setup (for V1.4 or later)

Choose this item from the BIOS Setup main menu.

CPU Speed Ratio   This option is to show the CPU speed.

CPU Base   This option is to select the frequency of CPU.
Frequency

CPU Multiple   This option is to select the multiplier of CPU.
Factor

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 clear CMOS memory by holding down the <End> key then powering on to reboot the system.

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.