

Preface

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Version 7.0

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

About the Manual

The manual consists of the following:

Chapter 1 Introducing the Mainboard	Describes features of the mainboard, and provides a shipping checklist. Go to ⇒ page 1
Chapter 2 Installing the Mainboard	Describes installation of mainboard components. Go to ⇒ page 6
Chapter 3 Using BIOS	Provides information on using the BIOS Setup Utility. Go to ⇒ page 24
Chapter 4 Using the Mainboard Software	Describes the mainboard software. Go to ⇒ page 36

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Chapter 1

Introducing the Mainboard

Introduction

Congratulations on purchasing this mainboard. This mainboard has a Socket-478 processor socket for Intel Pentium 4 type of processors supporting front side bus (FSB) speeds up to 533 MHz.

This mainboard integrates the **SiS650/650GL/651** Northbridge along with **SiS961/962/962L** Southbridge chipsets that supports built-in AC97 Codec, 2 DDR + 2 SDR modules up to 2GB system memory, and provide Ultra DMA 33/66/100 function. This mainboard integrates a 256-bit 3D/2D Graphics Engine, Video Accelerator and Advanced Hardware Acceleration MPEG1/MPEGII Video Decoder for the Intel Pentium 4 series based PC systems. It has the external AGP slot with AGP 4X 266MHz capability, one AMR (Audio Modem Riser) slot to support Audio and Modem application, and built-in 10BaseT/100BaseTX Network Interface. In addition, this mainboard has a full set of I/O ports including two PS/2 ports for mouse and keyboard, two serial ports, one parallel port, one MIDI/game port and four USB ports—two back-panel ports, onboard USB header JUSB1 providing two extra ports (which support USB 2.0 if SiS962L Southbridge is integrated on the mainboard).

This mainboard is Micro ATX size and has power connectors for an ATX power supply and measures 244 x 244mm.

Checklist

Compare the mainboard's package contents with the following checklist:

Standard Items

- One mainboard
- One diskette drive ribbon cable
- One IDE drive ribbon cable
- Software support CD
- This User's Manual

Features

Processor	<ul style="list-style-type: none"> • The mPGA Socket 478 • Supports Intel Pentium 4 series CPUs • Supports up to 533 MHz system bus 															
Chipset	<p>The SiS650/SiS650GL/SiS651 Northbridge (NB) and SiS961/SiS962/SiS962L Southbridge (SB) chipsets are based on an innovative and scalable architecture with proven reliability and performance.</p> <p>The mainboard may support either of the Northbridge and Southbridge chipset mentioned above. Refer below for the combination and respective details:</p> <table border="1"> <thead> <tr> <th><u>NB</u></th> <th><u>SB</u></th> <th><u>Function</u></th> </tr> </thead> <tbody> <tr> <td>SiS650</td> <td>SiS961</td> <td>Support 400 MHz FSB, Ultra DMA ATA 100 and DDR266</td> </tr> <tr> <td>SiS650GL</td> <td>SiS961</td> <td>Support 400/533 MHz FSB, Ultra DMA ATA 100 and DDR266</td> </tr> <tr> <td>SiS650GL</td> <td>SiS962/962L</td> <td>Support 400/533 MHz FSB, Ultra DMA ATA 100, DDR266 and USB 2.0</td> </tr> <tr> <td>SiS651</td> <td>SiS962/962L</td> <td>Support 533 MHz FSB, Ultra DMA ATA 133, DDR333 and USB 2.0</td> </tr> </tbody> </table>	<u>NB</u>	<u>SB</u>	<u>Function</u>	SiS650	SiS961	Support 400 MHz FSB, Ultra DMA ATA 100 and DDR266	SiS650GL	SiS961	Support 400/533 MHz FSB, Ultra DMA ATA 100 and DDR266	SiS650GL	SiS962/962L	Support 400/533 MHz FSB, Ultra DMA ATA 100, DDR266 and USB 2.0	SiS651	SiS962/962L	Support 533 MHz FSB, Ultra DMA ATA 133, DDR333 and USB 2.0
<u>NB</u>	<u>SB</u>	<u>Function</u>														
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SiS650GL	SiS962/962L	Support 400/533 MHz FSB, Ultra DMA ATA 100, DDR266 and USB 2.0														
SiS651	SiS962/962L	Support 533 MHz FSB, Ultra DMA ATA 133, DDR333 and USB 2.0														
Memory	<ul style="list-style-type: none"> • Two 168-pin DIMM slots for SDRAM memory modules • Two 184-pin DIMM slots for DDR memory modules • Support SDRAM up to 133 MHz and DDR up to 266 MHz memory bus • Maximum installed memory is 2GB <p>Note: You cannot use SDRAM and DDR simultaneously.</p>															
Expansion Slots	<ul style="list-style-type: none"> • One AMR slot for a special audio/modem riser card • One 2x/4xAGP slot for AGP 2.0-compliant interface • Two 32-bit PCI slots for PCI 2.2-compliant bus interface 															
Onboard IDE channels	<ul style="list-style-type: none"> • Primary and Secondary PCI IDE channels • Support for PIO (programmable input/output) modes • Support for Multiword DMA modes • Support for Bus Mastering and Ultra DMA ATA 100/133 modes 															
Power Supply and Power Management	<ul style="list-style-type: none"> • ATX power supply connector • Meets ACPI 1.0b and APM 1.2 requirements, keyboard power on/off • Supports RTC Alarm, Wake On Modem, AC97 Wake-Up and USB Wake-Up 															
AC'97 Audio Codec (CMI9738)	<ul style="list-style-type: none"> • Compliant with AC'97 2.2 specification • Full-duplex Codec with independent and variable sampling rate • Earphone Buffer Built-In, SNR up to 90db • 4Ch DAC, support 4-channel speak-out 															

	<ul style="list-style-type: none"> Advanced power management support
Onboard VGA	<ul style="list-style-type: none"> Supports AGP V2.0 Compliant Supports AGP 4X/2X interface and Fast Write Transaction Supports high performance & high quality 3D Accelerator— A built-in 256-bit 3D engine, up to 143 MHz 3D engine clock speed Supports high performance 128-bit 2D Accelerator— Ultra-AGP II™ 2GB/s data read for all 2D engine functions Maximum Share Memory size is 64MB
Built-in Ethernet LAN (optional)	<ul style="list-style-type: none"> Built-in 10BaseT/100BaseTX Ethernet LAN SiS961/962/962L Embedded Fast Ethernet MAC and onboard Realtek VT6103 LAN PHY compliant with IEEE802.3u 100BASE-TX, 10BASE-T and ANSI X3.263 TP-PMD standards Compliant with ACPI 1.0 and the Network Device Class Power Management 1.0 High Performance provided by 100Mbps clock generator and data recovery circuit for 100Mbps receiver
USB 2.0 (for SiS962/962L SB only)	<ul style="list-style-type: none"> Compliant with Universal Serial Bus Specification Revision 2.0 Compliant with Intel's Enhanced Host Controller Interface Specification Revision 0.95 Compliant with Universal Host Controller Interface Specification Revision 1.1 PCI multi-function device consists of two UHCI Host Controller cores for full-/low-speed signaling and one EHCI Host Controller core for high-speed signaling Root hub consists 4 downstream facing ports with integrated physical layer transceivers shared by UHCI and EHCI Host Controller Support PCI-Bus Power Management Interface Specification release 1.1 Legacy support for all downstream facing ports
Onboard I/O Ports	<ul style="list-style-type: none"> Two PS/2 ports for mouse and keyboard Two serial ports One parallel port One MIDI/game port Four USB ports (two backpanel ports, onboard USB header providing two extra ports) Audio jacks for microphone, line-in and line-out
Hardware Monitoring	Built-in hardware monitoring for CPU & System temperatures, fan speeds and mainboard voltages.
Onboard Flash ROM	Supports Plug and Play configuration of peripheral devices and expansion cards

Choosing a Computer Case

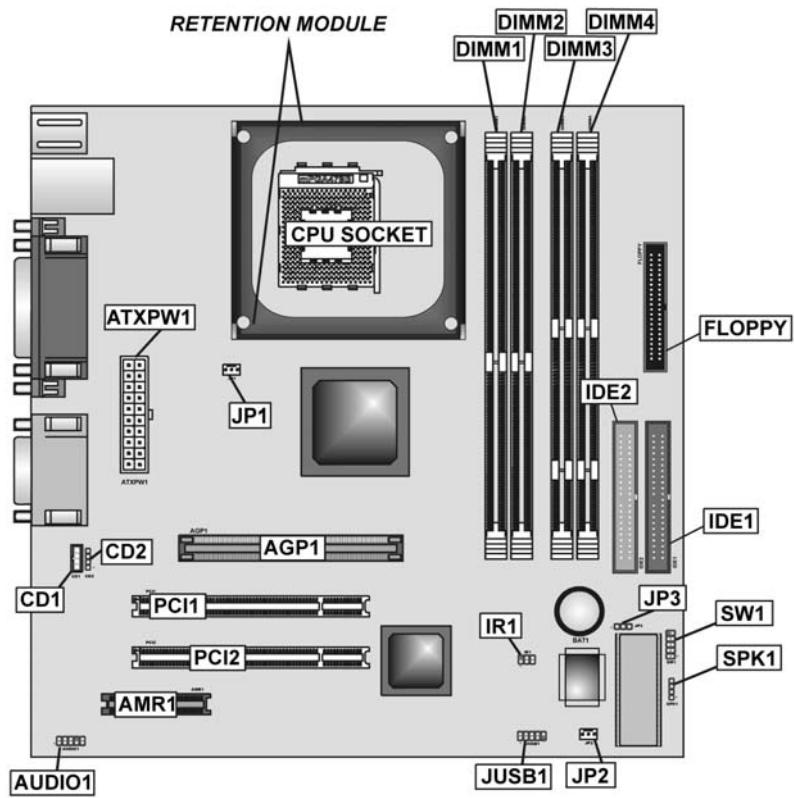
There are many types of computer cases on the market. The mainboard complies with the specifications for the micro-ATX system case. Some features on the mainboard are implemented by cabling connectors on the mainboard to indicators and switches on the system case. Ensure that your case supports all the features required. The mainboard can support one floppy diskette drive and four enhanced IDE drives. Ensure that your case has sufficient power and space for all the drives that you intend to install.

Most cases have a choice of I/O templates in the rear panel. Make sure that the I/O template in the case matches the I/O ports installed on the rear edge of the mainboard.

This mainboard has a micro-ATX form factor of 244 x 244 mm. Choose a case that accommodates this form factor.

This concludes Chapter 1. The next chapter explains how to install the mainboard.

Mainboard Components



Chapter 2

Installing the Mainboard

Safety Precautions

Follow these safety precautions when installing the mainboard:

- Wear a grounding strap attached to a grounded device to avoid damage from static electricity.
- Discharge static electricity by touching the metal case of a safely grounded object before working on the mainboard.
- Leave components in the static-proof bags they came in.
- Hold all circuit boards by the edges. Do not bend circuit boards.

Quick Guide

This Quick Guide suggests the steps you can take to assemble your system with the mainboards.

The following table provides a reference for installing specific components:

Locating Mainboard Components	Go to page 5
Installing the Mainboard in a Case	Go to page 7
Setting Jumpers	Go to page 7
Installing Case Components	Go to page 9
Installing the CPU	Go to page 11
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Installing an HDD and CD-ROM Drive	Go to page 15
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Installing the Mainboard in a Case

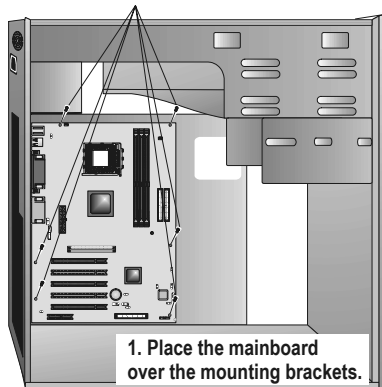
Refer to the following illustration and instructions for installing the mainboard in a case:

This illustration shows an example of a mainboard being installed in a tower-type case:

Note: Do not overtighten the screws as this can stress the mainboard.

Most system cases have mounting brackets installed in the case, which correspond to the holes in the mainboard. Place the mainboard over the mounting brackets and secure the mainboard onto the mounting brackets with screws.

2. Secure the mainboard with screws where appropriate.



Ensure that your case has an I/O template that supports the I/O ports and expansion slots on your mainboard.

Checking Jumper Settings

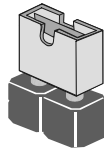
This section explains how to set jumpers for correct configuration of the mainboard.

Setting Jumpers

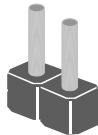
Use the mainboard jumpers to set system configuration options. Jumpers with more than one pin are numbered. When setting the jumpers, ensure that the jumper caps are placed on the correct pins.

The illustrations below show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN.

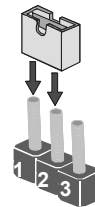
This illustration shows a 3-pin jumper. Pins 1 and 2 are SHORT.



Short

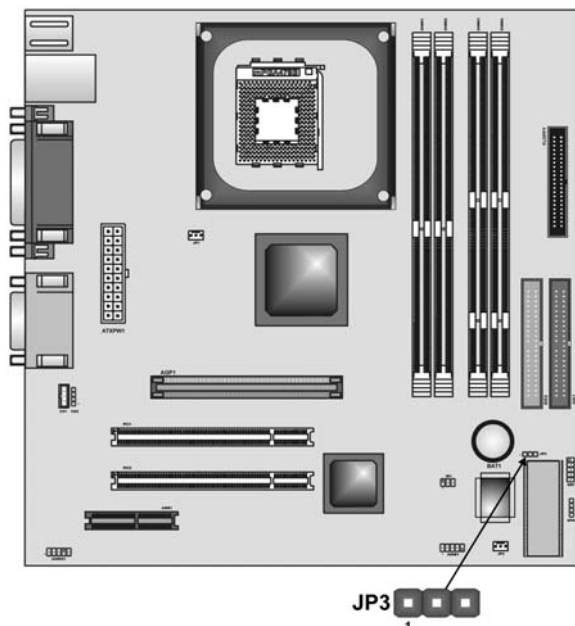


Open



Checking Jumper Settings

The following illustration shows the location of the mainboard jumpers. Pin 1 is labeled.



Jumper Settings

Jumper	Type	Description	Setting (default)
JP3	3-pin	Clear CMOS jumper	1-2: Clear CMOS 2-3: Normal



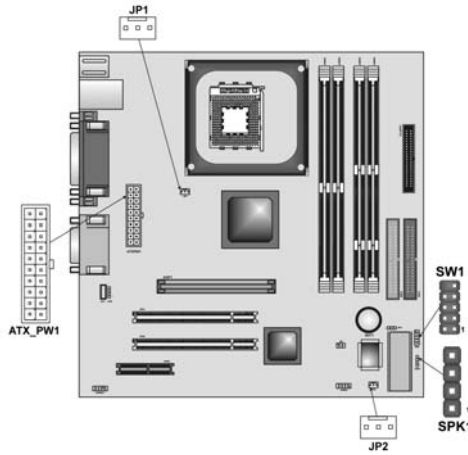
JP3: Clear CMOS Jumper

Use this jumper to clear the contents of the CMOS memory. You may need to clear the CMOS memory if the settings in the Setup Utility are incorrect and prevent your mainboard from operating. To clear the CMOS memory, disconnect all the power cables from the mainboard and then move the jumper cap into the CLEAR setting for a few seconds.

Connecting Case Components

After you have installed the mainboard into a case, you can begin connecting the mainboard components. Refer to the following:

1. Connect the power connector from the power supply to the **ATX_PW1** connector on the mainboard.
2. Connect the CPU cooling fan cable to **JP1**.
3. If there is a cooling fan installed in the system chassis, connect the cable from the cooling fan to the **JP2** fan power connector on the mainboard.
4. Connect the case switches and indicator LEDs to the **SW1** header.



5. Connect the case speaker cable to **SPK1**.

ATX_PW1: ATX 20-pin Power Connector

Pin	Signal Name	Pin	Signal Name
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	PWRGD	18	+5V
9	+5VSB	19	+5V
10	+12V	20	+5V

JP1/JP2: FAN Power Connectors

Pin	Signal Name	
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor

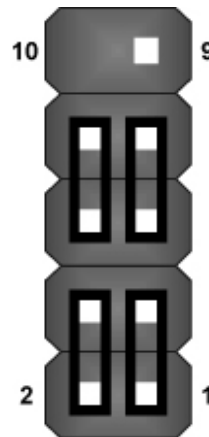
SPK1: Internal speaker

Pin	Signal Name
1	SPKR
2	NC
3	Ground
4	+5V

The SW1 Connector

This panel connector provides a set of switch and LED connectors found on ATX case. Refer to the table below for information.

Device	Pins
HDDLED_P	1
FP ACPI LED	2, 4
HDDLED_N	3
RST_SW_N	5
PW_BT_P	6
RST_SW_P	7
PW_BT_N	8
RSVD_DNU	9
KEY	10



Note: The plus sign (+) indicates a pin which must be connected to a positive voltage.

Installing Hardware

Installing the Processor

Caution: When installing a CPU heatsink and cooling fan make sure that you **DO NOT** scratch the mainboard or any of the surface-mount resistors with the clip of the cooling fan. If the clip of the cooling fan scrapes across the mainboard, you may cause serious damage to the mainboard or its components.

On most mainboards, there are small surface-mount resistors near the processor socket, which may be damaged if the cooling fan is carelessly installed.

Avoid using cooling fans with sharp edges on the fan casing and the clips. Also, install the cooling fan in a well-lit work area so that you can clearly see the mainboard and processor socket.

Before installing the Processor

This mainboard automatically determines the CPU clock frequency and system bus frequency for the processor. You may be able to change these settings by making changes to jumpers on the mainboard, or changing the settings in the system Setup Utility. We strongly recommend that you do not overclock processors or other components to run faster than their rated speed.

Warning: Overclocking components can adversely affect the reliability of the system and introduce errors into your system. Overclocking can permanently damage the mainboard by generating excess heat in components that are run beyond the rated limits.

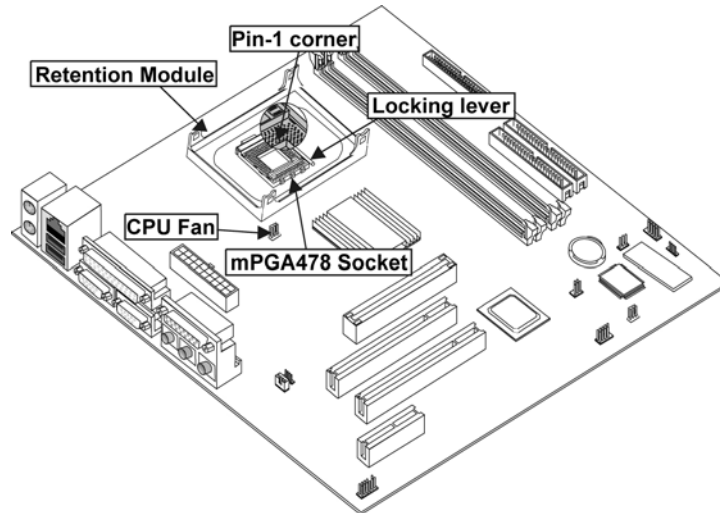
This mainboard has a Socket 478 processor socket. When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.

The following processor is currently supported by this mainboard.

Intel P4 478: 1.4GHz ~ 2.2GHz, FSB: 400/533MHz

CPU Installation Procedure

The following illustration shows CPU installation components:



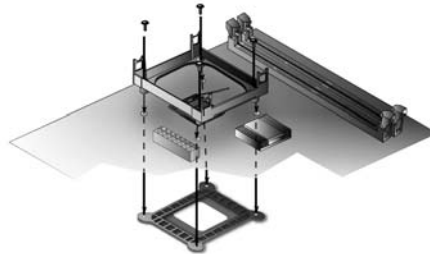
Note: The pin-1 corner is marked with an arrow ▼

Follow these instructions to install the Retention Module and CPU:

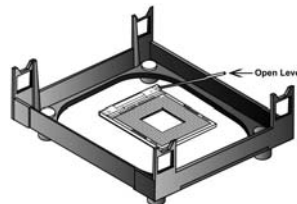
1. Remove the existing retention module (if applicable).

2. Position the backplate against the underside of the mainboard, secure the 4 screws firmly on the retention module.

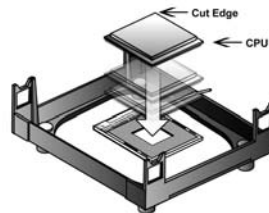
Note: Do not over tighten the screws.



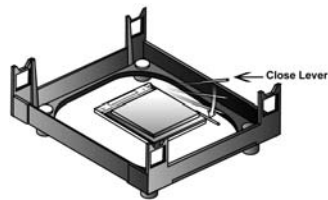
3. Install your CPU. Pull up the lever away from the socket and lift up to 90-degree angle.



4. Locate the CPU cut edge (the corner with the pinhole noticeably missing). Align and insert the CPU correctly.



5. Press the lever down.



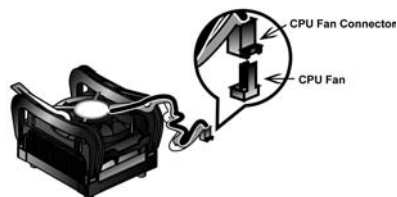
6. Apply thermal grease on top of the CPU.

7. Put the CPU Fan down on the retention module and snap the four retention legs of the cooling fan into place.



8. Flip the levers over to lock the heat sink in place.

9. Connect the CPU Cooling Fan power cable to the CPUFAN1 connector. This completes the installation.



Note: CPU fan and heatsink installation procedures may vary with the type of CPU fan/heatsink supplied. The form and size of fan/heatsink may also vary.

Installing Memory Modules

This mainboard accommodates 168-pin 3.3V/184-pin 2.5V unbuffered SDRAM memory modules. The memory chips must be standard or registered SDRAM (Synchronous Dynamic Random Access Memory).

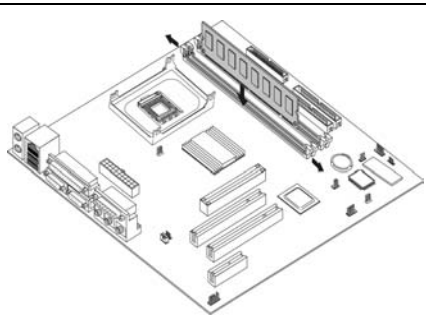
It can support SDRAM up to 133MHz/DDR up to 333MHz (for SiS651 NB) memory bus.

SDRAM provides 800 MB/s or 1 GB/s data transfer rate corresponding with the bus 100 MHz or 133 MHz. It doubles the rate to 1.6 GB/s and 2.1 GB/s by transferring data on both the rising and falling edges of the clock. DDR SDRAM uses additional power and ground lines and requires 184-pin 2.5V unbuffered DIMM module rather than the 168-pin 3.3V unbuffered DIMMs used by SDRAM.

Installation Procedure

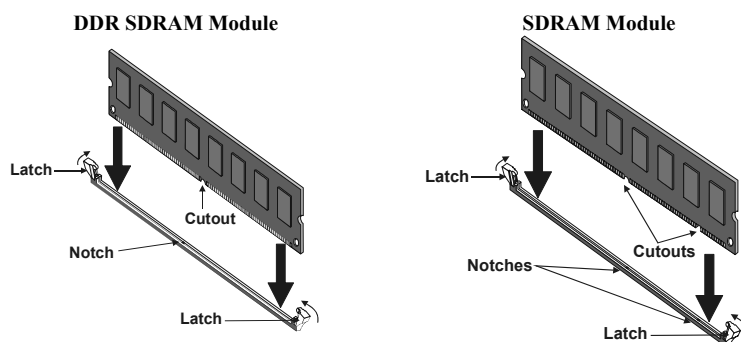
You must install at least one memory module (SDRAM or DDR SDRAM) in order to use the mainboard.

Note: You cannot use DDR SDRAM and SDRAM simultaneously.



Refer to the following to install the memory modules.

1. Push the latches on each side of the DIMM slot down.
2. Align the memory module with the slot. The DIMM slots are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
3. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot:



4. Install the DIMM module into the slot and press it firmly down until it seats correctly. The slot latches are levered upwards and latch on to the edges of the DIMM.
5. Install any remaining DIMM modules.

Installing a Hard Disk Drive/CD-ROM

This section describes how to install IDE devices such as a hard disk drive and a CD-ROM drive.

About IDE Devices

Your mainboard has a primary and secondary IDE channel interface (IDE1 and IDE2). An IDE ribbon cable supporting two IDE devices is bundled with the mainboard.

If you want to install more than two IDE devices, get a second IDE cable and you can add two more devices to the secondary IDE channel.

IDE devices have jumpers or switches that are used to set the IDE device as MASTER or SLAVE. Refer to the IDE device user's manual. When installing two IDE devices on one cable, ensure that one device is set to MASTER and the other device is set to SLAVE. The documentation of your IDE device explains how to do this.

About UltraDMA

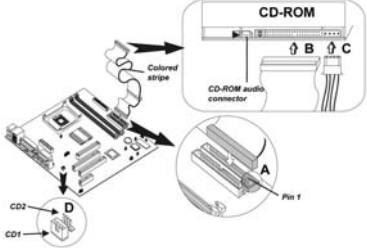
This mainboard supports UltraDMA 66/100/(133). UDMA is a technology that accelerates the performance of devices in the IDE channel. To maximize performance, install IDE devices that support UDMA and use 80-pin IDE cables that support UDMA 66/100/(133).

Installing a Hard Disk Drive

<ol style="list-style-type: none"> 1. Install the hard disk drive into the drive cage in your system case. 2. Plug the IDE cable into IDE1 (A): Note: Ribbon cable connectors are usually keyed so that they can only be installed correctly on the device connector. If the connector is not keyed, make sure that you match the pin-1 side of the cable connector with the pin-1 side of the device connector. Each connector has the pin-1 side clearly marked. The pin-1 side of each ribbon cable is always marked with a colored stripe on the cable. 	
<ol style="list-style-type: none"> 3. Plug an IDE cable connector into the hard disk drive IDE connector (B). It doesn't matter which connector on the cable you use. 	
<ol style="list-style-type: none"> 4. Plug a power cable from the case power supply into the power connector on the hard disk drive (C). 	

When you first start up your system, the BIOS should automatically detect your hard disk drive. If it doesn't, enter the Setup Utility and use the IDE Hard Disk Auto Detect feature to configure the hard disk drive that you have installed.

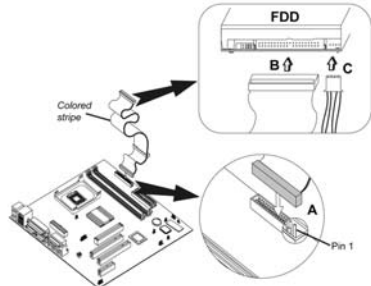
Installing a CD-ROM/DVD Drive

<p>1. Install the CD-ROM/DVD drive into the drive cage in your system case.</p> <p>2. Plug the IDE cable into IDE1 (A). If you have already installed an HDD, use the other connector on the IDE cable.</p> <p>Note: Ribbon cable connectors are usually keyed so that they can only be installed correctly on the device connector. If the connector is not keyed, make sure that you match the pin-1 side of the cable connector with the pin-1 side of the device connector. Each connector has the pin-1 side clearly marked. The pin-1 side of each ribbon cable is always marked with a colored stripe on the cable.</p>	
<p>3. Plug an IDE cable connector into the CD-ROM/DVD drive IDE connector (B). It doesn't matter which connector on the cable you use.</p>	
<p>4. Plug a power cable from the case power supply into the power connector on the CD-ROM/DVD drive (C).</p>	
<p>5. Use the audio cable provided with the CD-ROM/DVD drive to connect to the mainboard CD-in connector CDIN1 or CDIN2 (D).</p>	

When you first start up your system, the BIOS should automatically detect your CD-ROM/DVD drive. If it doesn't, enter the Setup Utility and configure the CD-ROM/DVD drive that you have installed.

Installing a Floppy Diskette Drive

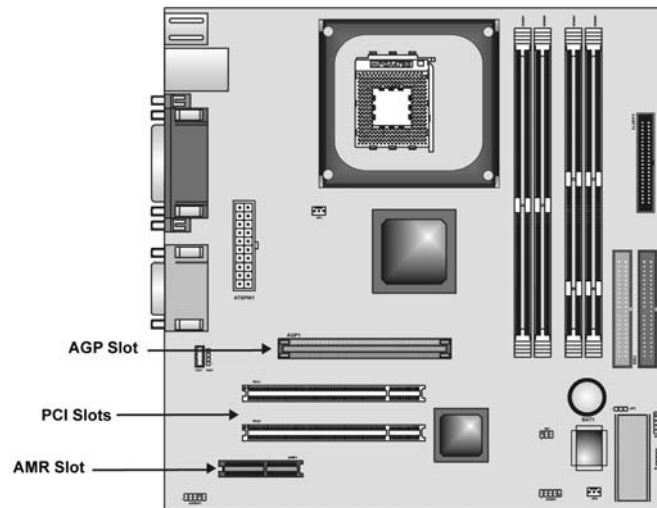
The mainboard has a floppy diskette drive (FLOPPY) interface and ships with a diskette drive ribbon cable that supports one or two floppy diskette drives. You can install a 5.25-inch drive and a 3.5-inch drive with various capacities. The floppy diskette drive cable has one type of connector for a 5.25-inch drive and another type of connector for a 3.5-inch drive.

<p>1. Install the FDD into the drive cage in your system case.</p> <p>2. Plug the FDD cable into FLOPPY1 (A):</p> <p>Note: Ribbon cable connectors are usually keyed so that they can only be installed correctly on the device connector. If the connector is not keyed, make sure that you match the pin-1 side of the cable connector with the pin-1 side of the device connector. Each connector has the pin-1 side clearly marked. The pin-1 side of each ribbon cable is always marked with a colored stripe on the cable.</p>	
<p>3. Plug the correct connector on the FDD cable for the 5.25-inch or 3.5-inch drive into the FDD connector (B).</p>	
<p>4. Plug a power cable from the case power supply into the power connector on the FDD (C).</p>	

When you first start up your system, go immediately to the Setup Utility to configure the floppy diskette drives that you have installed.

Installing Add-on Cards

This mainboard has two 32-bit PCI (Peripheral Components Interconnect) expansion slots, one 4xAGP slot, and one AMR (Audio Modem Riser) slot.



AGP Slot The 4xAGP slot is used to install a graphics adapter that supports the 4xAGP specification and has a 4xAGP edge connector.

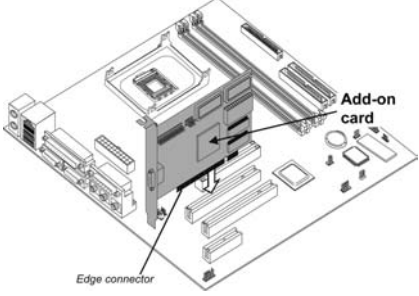
Note: The above layout is for reference only. The AGP slot may be different from your mainboard. Please refer to actual shipment.

PCI Slots PCI slots are used to install expansion cards that have the 32-bit PCI interface.

AMR Slot The AMR (Audio Modem Riser) slot is an industry standard slot that allows for the installation of a special audio/modem riser card. Different territories have different regulations regarding the specifications of a modem card. You can purchase an AMR card that is approved in your area and install it directly into the AMR slot.

Note: Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

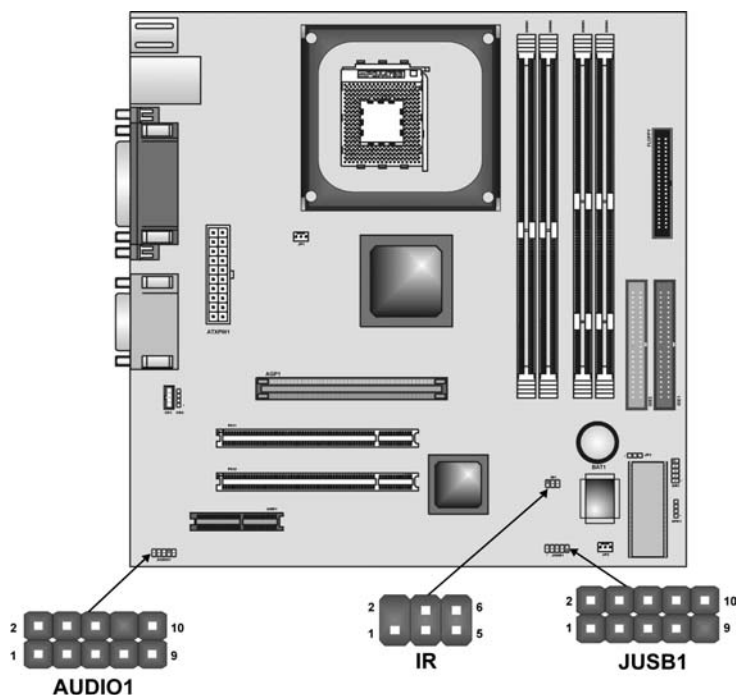
Follow these instructions to install an add-on card:

1. Remove a blanking plate from the system case corresponding to the slot you are going to use.	
2. Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.	 An isometric diagram of a computer motherboard showing an expansion slot. An add-on card is being inserted into the slot. A label 'Edge connector' points to the bottom edge of the card, and another label 'Add-on card' points to the card itself. The diagram shows the card being pushed into the slot until it is fully seated.
3. Secure the metal bracket of the card to the system case with a screw.	

Note: For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.

Connecting Optional Devices

Refer to the following for information on connecting the mainboard's optional devices:



AUDIO1: Front Panel Audio header

This header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Pin	Signal Name	Function
1	AUD_MIC	Front Panel Microphone input signal
2	AUD_GND	Ground used by Analog Audio Circuits
3	AUD_MIC	Microphone Power
4	AUD_VCC	Filtered +5 V used by Analog Audio Circuits
5	AUD_FPOUT_R	Right Channel Audio signal to Front Panel
6	AUD_RET_R	Right Channel Audio signal to Return from Front Panel
7	NC	Reserved for future use to control Head-phone Amplifier
8	KEY	No Pin
9	AUD_FPOUT_L	Left Channel Audio signal to Front Panel
10	AUD_RET_L	Left Channel Audio signal Return from Front Panel

JUSB1: Extended USB module

The mainboard has USB ports installed on the rear edge I/O port array. Some computer cases have a special module that mounts USB ports at the front of the case. If you have this kind of case, use auxiliary USB connectors JUSB1 to connect the front-mounted ports to the mainboard.

Pin	Signal Name	Pin	Signal Name
1	VCC	2	VCC
3	DATA1-	4	DATA2-
5	DATA1+	6	DATA2+
7	GROUND	8	GROUND
9	KEY	10	NC

Note: Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

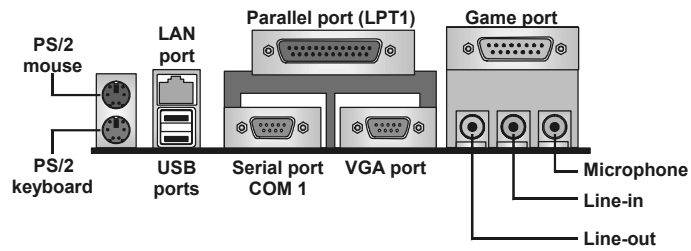
IR1: Serial infrared port

The mainboard supports an Infrared (IR1) data port. Infrared ports allow the wireless exchange of information between your computer and similarly equipped devices such as printers, laptops, Personal Digital Assistants (PDAs), and other computers.

Pin	Signal Name	Function
1	FIR	Fast InfraRed
2	KEY	No pin
3	+5V	IR Power
4	GND	Ground
5	IRTX	IrDA serial output
6	IRRX	IrDA serial input

Connecting I/O Devices

The backplane of the mainboard has the following I/O ports:



PS/2 Mouse	Use the upper PS/2 port to connect a PS/2 pointing device.
PS/2 Keyboard	Use the lower PS/2 port to connect a PS/2 keyboard.
LAN Port (optional)	Use the LAN port to connect to the network.
USB Ports	Use the USB ports to connect USB devices.
LPT1	Use LPT1 to connect printers or other parallel communications devices.
COM1	Use the COM ports to connect serial devices such as mice or fax/modems. COM1 is identified by the system as COM1/3
VGA Port	Use the VGA port to connect an external monitor.
Game Port	Use the game port to connect a joystick or a MIDI device.
Audio Ports	Use the three audio ports to connect audio devices. The left side jack is for a stereo line-out signal. The middle jack is for a stereo line-in signal. The right side jack is for a microphone.

External Connector Color Coding

Many connectors now use standard colors as shown in the table below.

Connector	Color
Audio line-in	Light blue
Audio line-out	Lime
Digital monitor/flat panel	White
IEEE 1394	Grey
Microphone	Pink
MIDI/game	Gold
Parallel	Burgundy
PS/2-compatible keyboard	Purple
PS/2-compatible mouse	Green
Serial	Teal or Turquoise
Speaker out/subwoofer	Orange
Right-to-left speaker	Brown
USB	Black
Video out	Yellow
SCSI, network, telephone, modem	None

This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3

Using BIOS

About the Setup Utility

The computer uses the latest AMI BIOS with support for Windows Plug and Play. The CMOS chip on the mainboard contains the ROM setup instructions for configuring the mainboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Running the Setup Utility

Each time your computer starts, before the operating system loads, a message appears on the screen that prompts you to “Hit if you want to run *SETUP*”. When you see this message, press the **Delete** key and the Main menu page of the Setup Utility appears on your monitor.

AMIBIOS SIMPLE SETUP UTILITY – VERSION 1.21.12
(C) 2000 American Megatrends, Inc. All Rights Reserved

Standard CMOS Setup Advanced Setup Power Management Setup PCI / Plug and Play Setup Load Optimal Settings Load Best Performance Settings	Features Setup CPU PnP Setup Hardware Monitor Change Password Exit
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.	

BIOS Navigation Keys

The BIOS navigation keys are listed below:

Key	Function
Up arrow	Move to previous item.
Down arrow	Move to next item.
Left arrow	Move to the item on the left (menu bar)
Right arrow	Move to the item on the right (menu bar)
Move enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ Key	Increase the numeric value or make changes
- Key	Decrease the numeric value or make changes
Esc Key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu – Exit Current page and return to Main Menu
F1	General help on Setup navigation keys
F5	Load previous values from CMOS
F6	Load the fail-safe defaults from BIOS default table
F7	Load the optimized defaults
F10	Save all the CMOS changes and exit

Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ►) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ►.

Standard CMOS Setup Page

Use this page to set basic information such as the date, the time, the IDE devices, and the diskette drives. If you press the F3 key, the system will automatically detect and configure the hard disks on the IDE channels.

AMIBIOS SETUP – STANDARD CMOS SETUP										
(C) 2000 American Megatrends, Inc. All Rights Reserved										
Date (mm/dd/yy) : Thu Nov 15, 2001										
Time (hh/mm/ss) : 17:24:25										
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit Mode
Pri Master	: Auto									On
Pri Slave	: Auto									On
Sec Master	: Auto									On
Sec Slave	: Auto									On
Floppy Drive A : 1.44 MB 3 1/2										
Floppy Drive B : Not Installed										
Month : Jan – Dec										
Day : 01 – 31										
Year : 1901 – 2099										
ESC : Exit										
↑↓ : Select Item										
PU/PD/+/- : Modify										
(Shift)F2 : Color										
F3 : Detect All HDD										

Date & Time

Use these items to set the system date and time.

Pri Master/Pri Slave/Sec Master/Sec Slave

Use these items to configure devices connected to the Primary and Secondary IDE channels. To configure an IDE hard disk drive, choose *Auto*. If the *Auto* setting fails to find a hard disk drive, set it to *User*, and then fill in the hard disk characteristics (Size, Cyls, etc.) manually. If you have a CD-ROM

drive, select the setting *CDROM*. If you have an ATAPI device with removable media (e.g. a ZIP drive or an LS-120) select *Floptical*.

Floppy Drive A/Floppy Drive B

Use these items to set the size and capacity of the floppy diskette drive(s) installed in the system.

Advanced Setup

Use this page to set more advanced information about your system. Take some care with this page. Making changes can affect the operation of your computer.

AMIBIOS SETUP – ADVANCED SETUP (C) 2000 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	
1 st Boot Device	IDE-0	
2 nd Boot Device	Floppy	
3 rd Boot Device	CDROM	
Try Other Boot Devices	Yes	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
Password Check	Setup	
Boot To OS/2 > 64MB	No	
L2 Cache	Enabled	
System BIOS Cacheable	Disabled	ESC : Quit ↑↓←→ : Select Item
Share Memory Size	32 MB	F1 : Help PU/PD/+/- : Modify
Graphic Win Size	4 MB	F5 : Old Values (Shift)F2 : Color
DRAM CAS# Latency	3T	F6 : Load BIOS Defaults
Timing Setting Mode	Normal	F7 : Load Setup Defaults
MA 1T/2T Select	MA 2T	
Advanced Read Prefetch	Enabled	

Quick Boot (Enabled)

If you enable this item, the system starts up more quickly by elimination of some of the power on test routines.

1st Boot Device/2nd Boot Device/3rd Boot Device (IDE-0/Floppy/CDROM)

Use these items to determine the device order the computer uses to look for an operating system to load at start-up time.

Try Other Boot Device (Yes)

If you enable this item, the system will also search for other boot devices if it fails to find an operating system from the first two locations.

S.M.A.R.T. for Hard Disks (Disabled)

Enable this item if any IDE hard disks support the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) feature.

BootUp Num-Lock (On)

This item determines if the Num Lock key is active or inactive at system start-up time.

Floppy Drive Swap (Disabled)

If you have two diskette drives installed and you enable this item, drive A becomes drive B and drive B becomes drive A.

Floppy Drive Seek (Disabled)

If you enable this item, your system will check all floppy disk drives at start up. Disable this item unless you are using an old 360KB drive.

Password Check (Setup)

If you have entered a password for the system, use this item to determine, if the password is required to enter the Setup Utility (*Setup*) or required both at start-up and to enter the Setup Utility (*Always*).

Boot to OS/2 > 64MB (No)

Enable this item if you are booting the OS/2 operating system and you have more than 64MB of system memory installed.

L2 Cache (Enabled)

Leave these items enabled since all the processors that can be installed on this board have internal L2 cache memory.

System BIOS Cacheable (Disabled)

If you enable this item, a segment of the system BIOS will be copied to main memory for faster execution.

Share Memory Size (32 MB)

This item lets you allocate a portion of the main memory for the onboard VGA display application with five options of 4 / 8 / 16 / 32 / 64 MB.

Graphic Win Size (4 MB)

This item defines the size of aperture if you use a graphic adapter.

DRAM CAS# Latency (3T)

This item determines the operation of DRAM memory CAS (column address strobe). It is recommended that you leave this item at the default value. The 3T setting requires faster memory that specifically supports this mode.

Timing Setting Mode (Normal)

This item determines the timing setting mode of the memory. We recommend you leave this item at the default value.

MA 1T/2T Select (MA 2T)

This item adjusts timing 1T/2T latency. We recommend you to leave this item at the default value.

Advanced Read Prefetch (Enabled)

This item enables prefetching for reading data. We recommend you to leave this item at the default value.

Auto Detect DIMM/PCI Clk (Disabled)

When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI

slots.

Spread Spectrum (Disabled)

If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

DOS Flat Mode (Disabled)

This item enables BIOS entering the DOS protected mode without other software supporting under the DOS operating system. We recommend you to leave this item at the default value.

Power Management Setup

This page sets some of the parameters for system power management operation.

AMIBIOS SETUP – POWER MANAGEMENT SETUP (C) 2000 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	Yes	
Power Management	Enabled	
Suspend Time out	Disabled	
Hard Disk Time out	Disabled	
Resume On RTC Alarm	Disabled	
RTC Alarm Date	15	ESC : Quit ↑↓←→ : Select Item
RTC Alarm Hour	12	F1 : Help PU/PD/+/- : Modify
RTC Alarm Minute	30	F5 : Old Values (Shift)F2 : Color
RTC Alarm Second	30	F6 : Load Optimal values
LAN/Ring Power On	Disabled	F7 : Load Best performance values
Keyboard Power On	Disabled	

ACPI Aware O/S (Yes)

Enable this item if you are using an O/S that supports ACPI function such as Windows 98/ME /2000.

Power Management (Enabled)

Use this item to select a power management scheme. Both APM and ACPI are supported.

Suspend Time Out (Disabled)

This sets the timeout for Suspend mode in minutes. If the time selected passes without any system activity, the computer will enter power-saving Suspend mode.

Hard Disk Time Out (Disabled)

This sets the timeout to power down the hard disk drive, if the time selected passes without any hard disk activity.

Resume On RTC Alarm Date / Hour / Minute / Second (15/12/30/30)

The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use

this feature.

LAN/Ring Power On (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the Modem. You must use an ATX power supply in order to use this feature.

KeyBoard Power On (Disabled)

If you enable this item, you can turn the system on and off by pressing hot keys on the keyboard. You must enable the Keyboard Power On jumper and use an ATX power supply in order to use this feature.

PCI / Plug and Play Setup

This page sets some of the parameters for devices installed on the PCI bus and devices that use the system plug and play capability.

AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP (C) 2000 American Megatrends, Inc. All Rights Reserved	
Plug and Play Aware O/S	Yes
Primary Graphics Adapter	PCI
Allocate IRQ for PCI VGA	Yes
PCI IDE BusMaster	Disabled
ESC : Quit ↑↓←→ : Select Item	
F1 : Help PU/PD/+/- : Modify	
F5 : Old Values (Shift)F2 : Color	
F6 : Load BIOS Defaults	
F7 : Load Setup Defaults	

Plug and Play Aware O/S (Yes)

Enable this item if you are using an O/S that supports Plug and Play such as Windows 95/98/ME.

Primary Graphics Adapter (PCI)

This item indicates if the primary graphics adapter uses the PCI or the AGP bus. The default PCI setting still lets the onboard display work and allows the use of a second display card installed in a PCI slot.

Allocate IRQ to PCI VGA (Yes)

If this item is enabled, an IRQ will be assigned to the PCI VGA graphics system. You set this value to No to free up an IRQ.

PCI IDE BusMaster (Disabled)

This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value.

Load Optimal Settings

If you select this item and press **Enter** a dialog box appears. If you press **Y**, and then **Enter**, the Setup Utility loads a set of fail-safe default values. These default values are not very demanding and they should allow your system to function with most kinds of hardware and memory chips.

Note: It is highly recommended that users enter this option to load optimal values for accessing the best performance.

Load Best Performance Settings

If you select this item and press **Enter** a dialog box appears. If you press **Y**, and then **Enter**, the Setup Utility loads a set of best-performance default values. These default values are quite demanding and your system might not function properly if you are using slower memory chips or other low-performance components.

Features Setup

This page sets some of the parameters for peripheral devices connected to the system.

AMIBIOS SETUP – FEATURES SETUP (C) 2000 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	Enabled	ESC : Quit ↑↓←→ : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults
OnBoard Serial Port	3F8h/COM1	
OnBoard IR Port	Disabled	
OnBoard Parallel Port	378h	
Parallel Port Mode	ECP	
Parallel Port IRQ	7	
Parallel Port DMA	3	
OnBoard Game Port	201h	
OnBoard MIDI Port	300h	
MIDI Port IRQ	10	
OnBoard PCI IDE	Both	
Audio Device	Enabled	
Modem Device	Enabled	
Ethernet Device	Enabled	
Onboard USB Function	Enabled	
USB Function for DOS	Disabled	
ThumbDrive for DOS	Disabled	

OnBoard FDC (Enabled)

Use this item to enable or disable the onboard floppy disk drive interface.

OnBoard Serial Port (3F8h/COM1)

Use these items to enable or disable the onboard COM1 serial port, and to assign a port address.

OnBoard IR Port (Disabled)

Use this item to enable or disable the onboard infrared port, and to assign a port address.

Onboard Parallel Port (378h)

Use this item to enable or disable the onboard LPT1 parallel port, and to assign a port address. The Auto setting will detect and available address.

Parallel Port Mode (ECP)

Use this item to set the parallel port mode. You can select SPP (Standard Parallel Port), ECP (Extended Capabilities Port), EPP (Enhanced Parallel Port), or ECP + EPP.

Parallel Port IRQ (7)

Use this item to assign either IRQ 5 or 7 to the parallel port.

Parallel Port DMA (3)

Use this item to assign a DMA channel to the parallel port. The options are 0, 1 and 3.

OnBoard Game Port (201h)

Use this item to enable or disable the onboard Game port.

OnBoard MIDI Port (300h)

Use this item to enable or disable the onboard MIDI port, and to assign a port address.

MIDI Port IRQ (10)

Use this item to assign an IRQ to the MIDI port.

Onboard PCI IDE (Both)

Use this item to enable or disable either or both of the onboard Primary and Secondary IDE channels.

Audio Device (Enabled)

This item enables or disables the onboard AC'97 audio chip.

Modem Device (Enabled)

This item enables or disables the onboard AC'97 modem chip.

Ethernet Device (Enabled)

This item enables or disables the onboard Ethernet LAN.

Onboard USB Function (Enabled)

Enable this item if you plan to use the USB ports on this mainboard.

USB Function for DOS (Disabled)

Enable this item if you plan to use the USB ports on this mainboard in a DOS environment.

ThumbDrive for DOS (Disabled)

Enable this item to make a small portion of memory storage device for the USB ports.

CPU PnP Setup

This page lets you manually configure the mainboard for the CPU. The system will automatically detect the kind of CPU that you have installed and make the appropriate adjustments to the items on this page.

AMIBIOS SETUP – CPU PnP SETUP	
(C) 2000 American Megatrends, Inc. All Rights Reserved	
CPU Type	Intel P4
CPU/DRAM Speed	100/100 MHz
CPU Core Voltage	1.616V
CPU Ratio	H/W TRAP
CPU Frequency	100 MHz
DRAM Frequency	100 MHz
ESC : Quit ↑↓←→ : Select Item	
F1 : Help PU/PD/+/- : Modify	
F5 : Old Values (Shift)F2 : Color	
F6 : Load Optimal values	
F7 : Load Best performance values	

CPU Type/Core Voltage/Ratio/ Frequency

These items show the type, core voltage, ratio and frequency of CPU installed in your system.

CPU/DRAM Speed/Frequency

These items decide CPU/DRAM speed/frequency installed in your system.

Hardware Monitor

This page sets some of the parameters for the hardware monitoring function of this mainboard.

AMIBIOS SETUP – HARDWARE MONITOR (C) 2000 American Megatrends, Inc. All Rights Reserved		
*** System Hardware ***		
Vcore	1.632V	
Vcc 1.8V	2.496V	
Vcc 3.3V	3.392V	
Vcc	4.972V	
+12V	11.968V	
SB3.3V	3.472V	
-12V	-11.885V	
SB5V	5.053V	
VBAT	3.488V	
SYSTEM Fan Speed	0 RPM	ESC : Quit ↑↓←→ : Select Item
CPU Fan Speed	1308 RPM	F1 : Help PU/PD/+/- : Modify
SYSTEM Temperature	31°C/87°F	F5 : Old Values (Shift)F2 : Color
CPU Temperature	37°C/98°F	F6 : Load Optimal values
		F7 : Load Best Performance Values

CPU / System Temperature

These items display CPU and system temperature measurement.

FANs & Voltage Measurements

These items indicate cooling fan speeds in RPM and the various system voltage measurements.

Change Password

If you highlight this item and press **Enter**, a dialog box appears which lets you enter a Supervisor password. You can enter no more than six letters or numbers. Press **Enter** after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press **Enter** after you have retyped it correctly. The password is then required to access the Setup Utility or for that and at start-up, depending on the setting of the Password Check item in Advanced Setup.

Change or Remove the Password

Highlight this item, press Enter and type in the current password. At the next dialog box, type in the new password, or just press Enter to disable password protection.

Exit

Highlight this item and press **Enter** to save the changes that you have made in the Setup Utility configuration and exit the program. When the Save and Exit dialog box appears, press **Y** to save and exit, or press **N** to exit without

Chapter 4

Using the Mainboard Software

About the Software CD-ROM

The support software CD-ROM that is included in the mainboard package contains all the drivers and utility programs needed to properly run the bundled products. Below you can find a brief description of each software program, and the location for your mainboard version. More information on some programs is available in a README file, located in the same directory as the software.

Note: Never try to install software from a folder that is not specified for use with your mainboard.

Before installing any software, always inspect the folder for files named README.TXT, INSTALL.TXT, or something similar. These files may contain important information that is not included in this manual.

Drivers and Software Installation

Insert the CD in the CD-ROM drive and click "Browse the CD title". This contains the mainboard model and information needed to locate the drivers for your mainboard.

Look for the mainboard model; then locate the drivers you want to install. The subfolders contain the README file giving directions to alternate folders for the appropriate software.

Utility Software Reference

All the utility software available from this page is Windows compliant. They are provided only for the convenience of the customer. The following software is furnished under license and may only be used or copied in accordance with the terms of the license.

Note: These software(s) are subject to change at anytime without prior notice. Please refer to the support CD for available software.

AWARD Flash Memory Utility

This utility lets you erase the system BIOS stored on a Flash Memory chip on the mainboard, and lets you copy an updated version of the BIOS to the chip. Proceed with caution when using this program. If you erase the current BIOS and fail to write a new BIOS, or write a new BIOS that is incorrect, your system will malfunction. Refer to Chapter 3, *Using BIOS* for more information.

WinFlash Utility

The Award WinFlash utility is a Windows version of the DOS Award BIOS flash writer utility. The utility enables you to flash the system BIOS stored on a Flash Memory chip on the mainboard while in a Windows environment. This utility is currently available for WINXP\ME\2000\98SE. To install the WinFlash utility, run WINFLASH.EXE from the following directory:

UTILITY\WINFLASH 1.51

PC-CILLIN 2002

The PC-CILLIN 2002 software program provides anti-virus protection for your system. This program is available for Windows 2000/ME/98SE/XP and Windows NT. Be sure to check the readme.txt and install the appropriate anti-virus software for your operating system.

We strongly recommend users to install this free anti-virus software to help protect your system against viruses.

MediaRing Talk – Telephony Software

To install the MediaRing Talk voice modem software for the built-in modem, go to the directory \UTILITY\MEDIARING TALK, then run MRTALK-SETUP72.EXE to install the application software.

Super Voice – Fax/Modem Software

To install the Super Voice voice, fax, data communication application for use with the built-in fax/modem, go the directory \UTILITY\SUPER_VOICE, then run PICSHELL.EXE to install the application software.

CD Ghost

The CD Ghost software enables you to create a virtual cabinet of CD-ROM drives on your system to help you categorize and organize your CD collection. A user-friendly interface assists you in quickly creating images of both CDs and DVDs onto your system. To install the software, run SETUP.EXE from the following directory:

UTILITY\CDGHOST\ENG\CDGHOST

Recovery Genius

The Recovery Genius software program is an innovative windows application system that protects your Hard Disk Drive from virus intrusion, accidental deletions and from system corruption. To install the Recovery Genius software program run SETUP.EXE from the following directory:

UTILITY\RECOVERY GENIUS\ENG\RECOVERYGENIUS

Language Genius

The Language Genius is a software –based product that helps you to learn new languages. To install the Language Genius software program run SETUP.EXE from the following directory:

UTILITY\LANGUAGE GENIUS\ENGLANGUAGEGENIUS

PageABC

The PageABC application software enables you to create your very own home page. To install the PageABC, go to the directory UTILITYPageABC, and then run SETUP.EXE to install the application software.

This concludes Chapter 4.