Trademarks

M781+ Series, V3.0
V133X/February 2001

Table of Contents

Chapter 1

Introduction

This mainboard has a **Socket-370** processor socket for an **Intel PPGA/FCPGA Celeron** or **FCPGA Pentium III** processor. You can install any one of these processors on the mainboard. The mainboard supports front-side bus speeds of **66MHz**, **100MHz** or **133MHz**.

This mainboard uses the **VIA PM133 Pro Savage** chipset which provides **CPU Plug & Play** through firmware and **Ultra DMA** 33/66/**100** (VT82C686B chip only) function. A **4X AGP** slot for highly graphics display, and integrates a **S3 Savage4 Pro 2D/3D/Video Accelerator**. The mainboard has a built-in **AC97 Codec**, provides an **AMR** (Audio Modem Riser) slot to support Audio and Modem application. In addition, the mainboard has an extended set of **ATX I/O Ports** including PS/2 keyboard and mouse ports, two USB ports, a parallel port, a VGA port, a serial port, a game port and audio ports.

This mainboard has all the features you need to develop a powerful multimedia workstation. The board is **Micro ATX** size and has power connectors for an **ATX** power supply.

Key Features

The key features of this mainboard include:

Socket-370 Processor Support

- Supports **PPGA/FCPGA Celeron** CPUs
- Supports **FCPGA Pentium III** CPUs
- Supports 66MHz, 100MHz or 133MHz Front-Side Bus.

All processors are automatically configured using firmware and a synchronous Host/DRAM Clock Scheme.

Memory Support

- Two DIMM slots for 168-pin SDRAM memory modules
- Support for 100/133 MHz memory bus
- Maximum installed memory is 2 x 512MB = 1GB.

Expansion Slots

- One AMR slot for a special audio/modem riser card
- One AGP4X slot for AGP 2.0-compliant interface
- Two 32-bit PCI slots for PCI 2.2-compliant bus interface
- One 8/16-bit ISA slot.

Onboard IDE channels

- Primary and Secondary PCI IDE channels
- Support for PIO modes, Bus Mastering and Ultra DMA 33/66/100 (optional VT82C686B) modes.

Power Supply and Power Management

- ATX power supply connector
- ACPI and previous PMU support, suspend switch
- Supports Wake on LAN and Wake on Alarm.

Built-in Graphics System

- Onboard **Savage4 Pro 128-bit 2D/3D/Video Accelerator**
- 2 to 32 MB frame buffer use system memory
- Supports high resolutions up to 1920x1440 16-bit colors, S3 DX7 texture compression (S3TC)
- Full AGP 4x, full speed hardware DVD Accelerator.

AC97 Codec

- Compliant PC97 2.1 specification
- Supports 18-bit ADC (Analog Digital Converter) and DAC (Digital Analog Converter) as well as 18-bit stereo full-duplex codec.

Onboard I/O Ports

- Provides PC99 Color Connectors for easy peripheral device connections
- Floppy disk drive connector with 1Mb/s transfer rate
- Two serial ports with 16550-compatible fast UART
- One parallel port with ECP and EPP support
- Two USB ports, optional two USB ports module
- Two PS/2 ports for keyboard and mouse
- One infrared port connector for optional module.

Onboard Flash ROM

- Automatic CPU and board configuration support Plug and Play of peripheral devices and expansion cards
- Built-in hardware monitoring for CPU & System temperatures, fan speeds and mainboard voltages
- Built-in virus protection using **Trend's ChipAwayVirus** provides boot process virus protection.

Bundled Software

- **PC-Cillin2000** provides automatic virus protection under Windows 95/98/NT/2000
- **Gamut2000** provides professional audio features included MP3 encoding/playback
- **3Deep** delivers the precise imagery and displays accurate color in your monitor
- **Corel WordPerfect Suite 8** is a Microsoft Windows® office application suite (optional)
- **WinDVD2000** is a DVD playback application (optional).

Dimensions

- ATX form factor (24.4cm x 22cm).

Package Contents

Attention: This mainboard series includes two different models. They are M781MR+ (Modem Ready) and M781+ (without Modem).
Please contact your local supplier for your purchase model.
Each model will support different specification, list as below:

Model	Specification
M781MR+	Support an AMR v.90 56K Fax/Modem card
M781+	---

Your mainboard package ships with the following items:

- The mainboard
- This User's Guide
- 1 UDMA/66 IDE cable
- 1 Floppy disk drive cable
- Support software on CD-ROM disk.

Optional Accessories

You can purchase the following optional accessories for this mainboard.

- Extended USB module.

Static Electricity Precautions

Components on this mainboard can be damaged by static electricity. Take the following precautions when unpacking the mainboard and installing it in a system.

1. Keep the mainboard and other components in their original static-proof packaging until you are ready to install them.
2. During installation, wear a grounded wrist strap if possible. If you don't have a wrist strap, discharge static electricity by touching the bare metal of the system chassis.
3. Handle the mainboard carefully by the edges. Avoid touching the components unless it is absolutely necessary. During installation put the mainboard on top of the static-protection packaging it came in with the component side facing up.

Pre-Installation Inspection

1. Inspect the mainboard for damage to the components and connectors on the board.
2. If you suspect that the mainboard has been damaged, do not connect power to the system. Contact your mainboard vendor and report the damage.

Chapter 2

Mainboard Installation

To install this mainboard in a system, follow the procedures in this chapter:

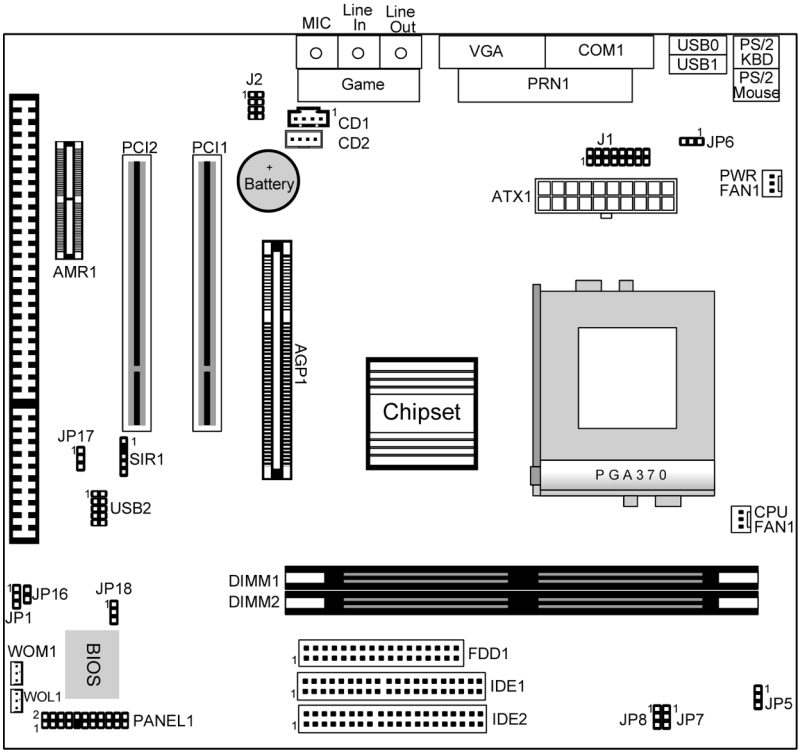
Identify the mainboard components
Install a CPU
Install one or more system memory modules
Verify that any jumpers or switches are set correctly
Install the mainboard in a system chassis (case)
Connect any extension brackets or cables to the mainboard connector headers
Install any other devices and make the appropriate connections to the mainboard connector headers.

Note:

1. Before installing this mainboard, make sure jumper JP1 is set to Normal setting. See this chapter for information on locating JP1 and the setting options.
2. Never connect power to the system during installation. Doing so may damage the mainboard.

Mainboard Components

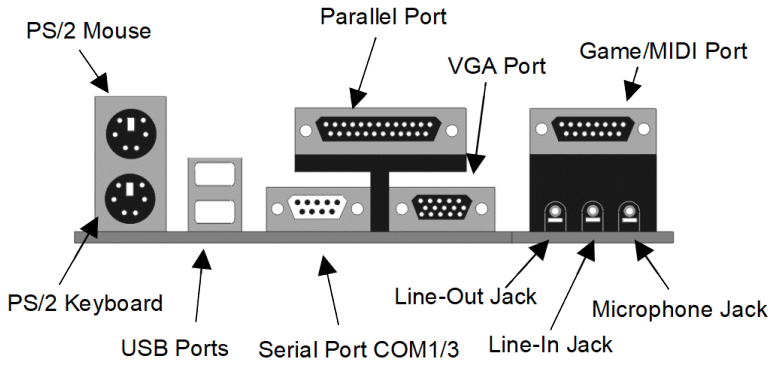
Use the diagram below to identify the major components on the mainboard.



Note: Any jumpers on your mainboard that do not appear in this illustration are for testing only.

I/O Ports

The illustration below shows a side view of the built-in I/O ports on the mainboard.



Install A CPU

This mainboard has a Socket-370 which supports Celeron PPGA and FCPGA Pentium III processors.

Do not try to install a Socket 7 processor in the Socket-370. A Socket 7 processor such as the Pentium-MMX, or the AMD K5/K6 does not fit in the Socket 370.

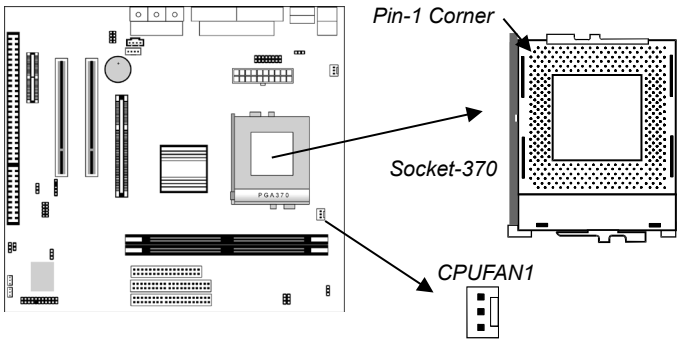
The following list notes the processors that are currently supported by this mainboard.

FCPGA Pentium III: 500~1130MHz, FSB: 100MHz, 133MHz
PPGA/FCPGA Celeron: 300~700MHz, FSB: 66 MHz

Installing a Socket-370 Processor

A processor installs into the ZIF (Zero Insertion Force) Socket-370 on the mainboard.

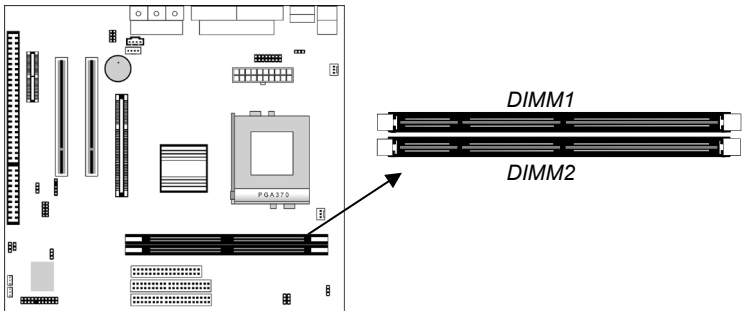
1. Locate the Socket-370 and CPUFAN1. Pull the locking lever out slightly from the socket and raise it to the upright position.



2. On the processor, identify the Pin-1 corner by its beveled edge.
3. On the Socket-370, identify the Pin-1 corner. The Pin-1 corner is at the top of the locking lever when it has locked.
4. Match the Pin-1 corners and insert the processor into the socket. No force is required and the processor should drop into place freely.
5. Swing the locking lever down and hook it under the catch on the side of the socket. This secures the CPU in the socket.
6. All processors should be installed with a combination heatsink/ cooling fan, connect the cable from the fan to the CPU fan power connector CPUFAN1.

Install Memory

The mainboard has two DIMM sockets for system memory modules. You must install at least one memory module in order to use the mainboard.



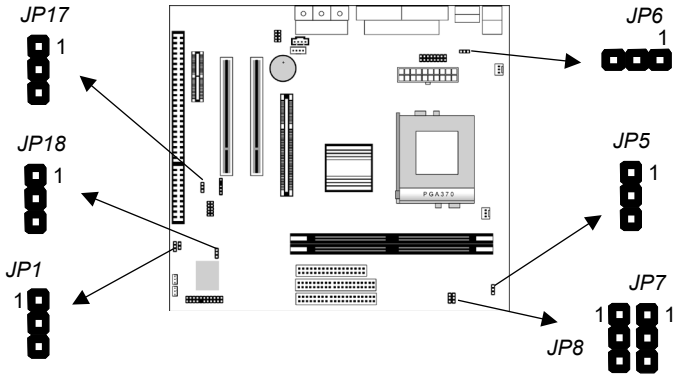
For this mainboard, you must use 168-pin, 3.3V unbuffered PC100 or PC133 SDRAM memory modules. You can install any size memory module from 16 MB to 512MB, so the maximum memory size is 2 x 512MB = 1GB.

The edge connectors on the memory modules have cut outs, which coincide with spacers in the DIMM sockets so that memory modules can only be installed in the correct orientation.

To install a module, push the retaining latches at either end of the socket outwards. Position the memory module correctly and insert it into the DIMM socket. Press the module down into the socket so that the retaining latches rotate up and secure the module in place by fitting into notches on the edge of the module.

Setting Jumper Switches

Jumpers are sets of pins which can be connected together with jumper caps. The jumper caps change the way the mainboard operates by changing the electronic circuits on the mainboard. If a jumper cap connects two pins, we say the pins are SHORT. If a jumper cap is removed from two pins, the pins are OPEN.



Jumper JP1: Clear CMOS Memory

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.

Function	Jumper Setting
Normal Operation	Short Pins 1-2
Clear CMOS Memory	Short Pins 2-3

Jumper JP5: Suspend to RAM Function Selector

Use this jumper to enable or disable the Suspend to RAM (STR) function that keeps the system data in Suspend power saving mode. You must also enable this function in the BIOS Setup Utility. Refer to Chapter 3.

Function	Jumper Setting
Enable	Short Pins 1-2
Disable	Short Pins 2-3

Jumper JP6: USB1 Wake up Selector

Use this jumper to enable or disable the USB1 (located on the I/O port panel) Wake up function that wake up the system from power saving mode.

Function	Jumper Setting
Disable	Short Pins 1-2
Enable	Short Pins 2-3

Jumper JP7: Set System Bus 100 MHz Forced

Use this jumper to set the system bus frequency. In the normal setting, the system will automatically select the correct frequency according to the kind of processor installed. In the Force 100 MHz setting, the system will use a 100 MHz system bus even if the processor has designed to operate with a 66 or 133 MHz bus.

Function	Jumper Setting
Normal Operation	Short Pins 1-2
Force 100 MHz	Short Pins 2-3

Jumper JP8: Set System Bus 133 MHz Forced

Use this jumper to set the system bus frequency. In the normal setting, the system will automatically select the correct frequency according to the kind of processor installed. In the Force 133 MHz setting, the system will use a 133 MHz system bus even if the processor is designed to operate with a 66 or 100 MHz bus.

Function	Jumper Setting
Normal Operation	Short Pins 1-2
Force 133 MHz	Short Pins 2-3

Jumper JP17: USB2 Wake up Selector

Use this jumper to enable or disable the USB2 (extra USB ports) Wake up function that wake up the system from power saving mode.

Function	Jumper Setting
Disable	Short Pins 1-2
Enable	Short Pins 2-3

Jumper JP18: BIOS Write Protection Selector

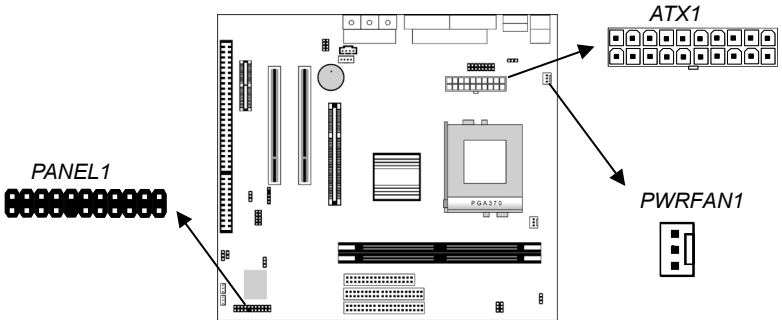
Use this jumper to enable or disable the BIOS write protection that make the BIOS read-only on the mainboard. You should disable this jumper when you want to flash the BIOS.

Function	Jumper Setting
Disable	Short Pins 1-2
Enable (read only)	Short Pins 2-3

Install the Mainboard

Install the mainboard in a system chassis (case). The board is an Micro ATX size mainboard with a twin-tier of I/O ports. Ensure that your case has an I/O cover plate that matches the ports on this mainboard.

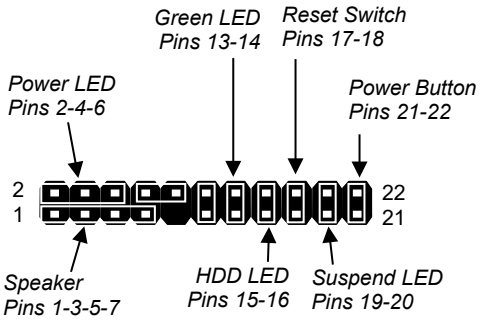
Install the mainboard in a case. Follow the instructions provided by the case manufacturer using the hardware and internal mounting points on the chassis.



Connect the power connector from the power supply to the **ATX1** connector on the mainboard.

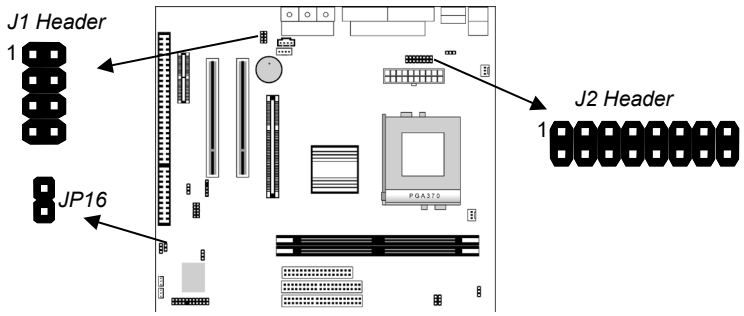
If there is a cooling fan installed in the system chassis, connect the cable from the cooling fan to the **PWRFAN1** fan power connector on the mainboard.

Connect the case switches and indicator LEDs to the **PANEL1** switch and LED connector header. See the illustration below for a guide to the header pin assignments.



Dual Color LED header

This **JP16** header allows the user to install red and green LED indicators to indicate when the computer is in Suspend to RAM (STR) or normal. Although the values are not predefined, red usually indicates STR and green indicates normal.



Extra IR/keyboard/mouse header

This mainboard provides second infrared, keyboard and mouse header **J2**, giving the option of installing second infrared, keyboard and mouse ports on the front panel. Depending on your case and system configuration this connector may be more suitable as the sole IR port connector.

Extra MIC/Line-out header

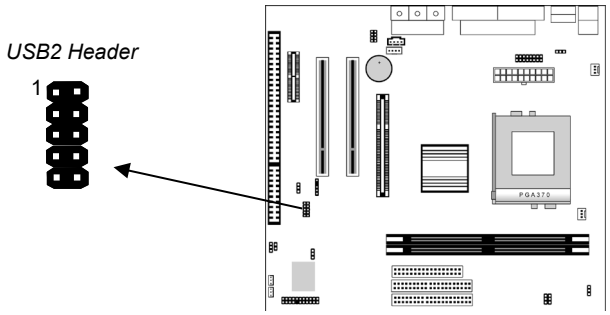
This **J1** header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Optional Extension Brackets

For this mainboard, you can also obtain a USB module extension bracket. Install them by following the steps below.

Extended USB Module

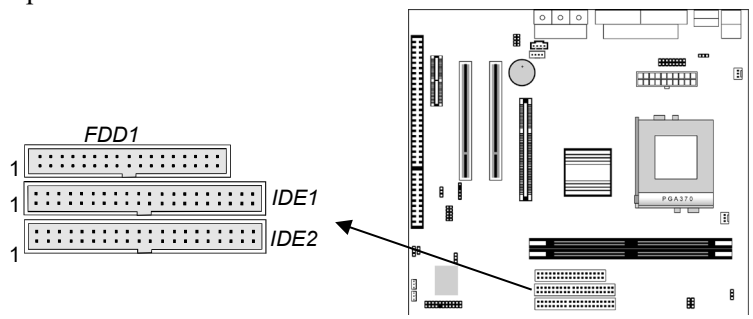
This module bracket has two USB ports for more USB devices.



1. Locate the **USB2** header on the mainboard.
2. Plug the bracket cable onto the header.
3. In the system chassis, remove a slot cover from one of the expansion slots and install the extension bracket in the opening. Use the screw that held the slot cover in place to secure the extension bracket to the chassis.

Install Other Devices

Install and connect any other devices in the system following the steps below.



Floppy Disk Drive

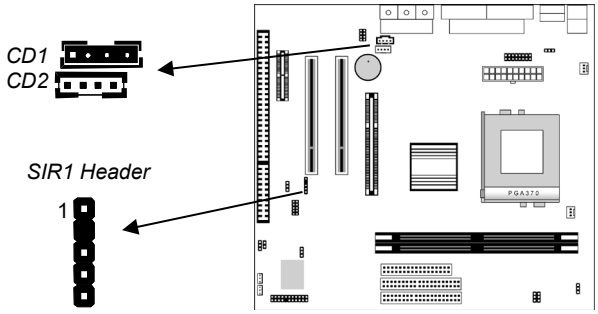
The mainboard ships with a floppy disk drive cable that can support one or two drives. Drives can be 3.5" or 5.25" wide, with capacities of 360K, 720K, 1.2MB, 1.44MB, or 2.88MB.
Install your drives and connect power from the system power supply. Use the cable provided to connect the drives to the floppy disk drive header **FDD1**.

IDE Devices

IDE devices include hard disk drives, high-density diskette drives, and CD-ROM or DVD-ROM drives, among others.
The mainboard ships with an IDE cable that can support one or two IDE devices. If you connect two devices to a single cable, you must configure one of the drives as Master and one of the drives as Slave. The documentation of the IDE device will tell you how to configure the device as a Master or Slave device. The Master device connects to the end of the cable.
Install the device(s) and connect power from the system power supply. Use the cable provided to connect the device(s) to the Primary IDE channel connector **IDE1** on the mainboard.
If you want to install more IDE devices, you can purchase a second IDE cable and connect one or two devices to the Secondary IDE channel connector **IDE2** on the mainboard. If you have two devices on the cable, one must be Master and one must be Slave.

Internal Sound Connections

If you have installed a CD-ROM drive or DVD-ROM drive, you can connect the drive audio cable to the onboard sound system. On the mainboard, locate the two 4-pin connectors **CD1** and **CD2**. There are two kinds of connector because different brands of CD-ROM drive have different kinds of audio cable connectors. Connect the cable to the appropriate connector.



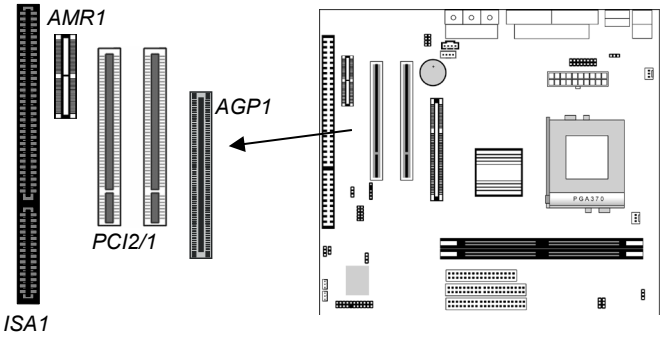
Infrared Port

You can connect an infrared port to the mainboard. You can purchase this option from third-party vendors.

1. Locate the infrared port **SIR1** header on the mainboard.
2. If you are adding an infrared port, connect the ribbon cable from the port to the header and then secure the port to an appropriate place in your system chassis.

Expansion Slots

This mainboard has two 32-bit PCI expansion slots, one AGP, one AMR slot and one 8/16-bit ISA slot.



Follow the steps below to install a PCI/AMR/AGP/ISA expansion card.

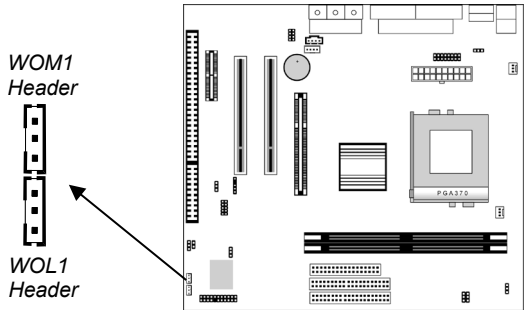
1. Locate the AGP, AMR, PCI or ISA slots on the mainboard.
2. Remove the slot cover for this slot from the system chassis.
3. Insert the expansion card edge connector into the slot and press it firmly down into it so that it is fully inserted.
4. Secure the expansion card bracket to the system chassis using the screw that held the slot cover in place.

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.

Wake On LAN (WOL)

If you have installed a LAN adapter expansion card, connect the card to the Wake On LAN connector **WOL1**. This allows incoming traffic to resume the system from a software power down. You need to enable this feature in the BIOS setup utility.



Wake On Modem

If you have installed a fax/modem card, connect the fax/modem to the Wake On Modem connector **WOM1**. You can then use the setup utility to program your computer to resume from a power saving mode whenever there is an incoming call to the fax/modem.

Chapter 3

BIOS Setup Utility

Introduction

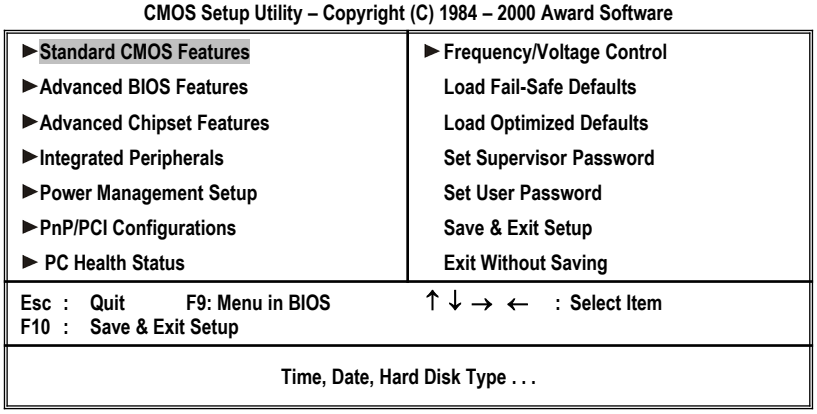
The BIOS Setup Utility records settings and information about your computer such as the date and time, the kind of hardware installed, and various configuration settings. Your computer uses this information to initialize all the components when booting up and functions as the basis for coordination between system components.

If the Setup Utility configuration is incorrect, it may cause the system to malfunction. It can even stop your computer from booting properly. If this happens, you can use the clear CMOS jumper to clear the CMOS memory used to store the configuration information, or you can hold down the **Page Up** key while you reboot your computer. Holding down the **Page Up** key also clears the setup information.

You can run the setup utility and manually make changes to the configuration. You might need to do this to configure some of the hardware that you install on or connect to the mainboard, such as the CPU, system memory, disk drives, etc.

Running the Setup Utility

Each time your computer starts, before the operating system loads, a message appears on the screen that prompts you to "*Press <DEL> to enter SETUP*". When you see this message, press the **Delete** key and the Main menu page of the Setup Utility appears on your monitor.

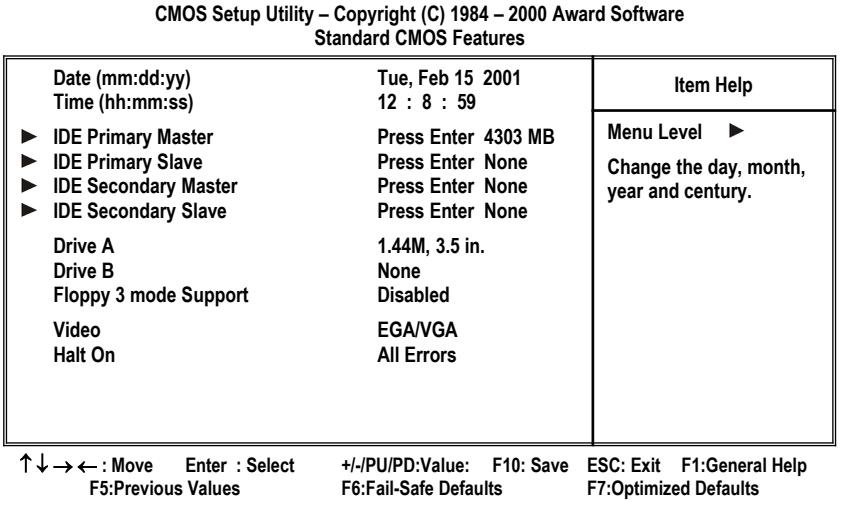


Listed below are explanations of the keys displayed at the bottom of the screens:

Key	**Function**
Esc	**Escape key:** Exits the current menu
←↓↑→	**Cursor keys:** Scroll through the items on a menu
+/–/PU/ PD	**Plus, minus, Page Up and Page Down keys:** Modify the selected field's values
F10	**F10 key:** Saves the current configuration and exits setup
F1	**F1 key:** Displays a screen that explains all key functions
F5	**F5 key:** Loads previously saved values to CMOS
F6	**F6 key:** Loads a fail-safe configuration for the normal system.
F7	**F7 key:** Loads an optimum set of values for peak performance

Standard CMOS Features Page

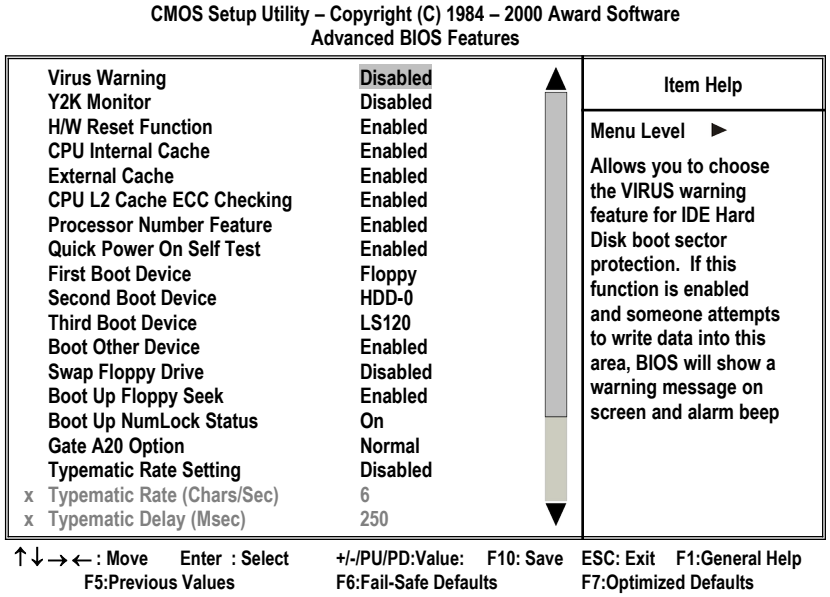
Use this page to set basic information such as the date and time, the IDE devices, and the diskette drives.



Date & Time	Use these items to set the system date and time
IDE Devices	Your computer has two IDE channels (Primary and Secondary) and each channel can be installed with one or two devices (Master and Slave). Use these items to configure each device on the IDE channel. Press **Enter** to display the IDE sub-menu. Press **Esc** to close the IDE device sub-menu and return to the Standard CMOS Features page.
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.
Floppy 3 Mode Support	Floppy 3 mode refers to a 3.5-inch diskette with a capacity of 1.2 MB. Floppy 3 mode is sometimes used in Japan.
Video	This item defines the video mode of the system. This mainboard has a built-in VGA graphics system; you must leave this item at the default value.
Halt On	This item defines the operation of the system POST (Power On Self Test) routine. You can use this item to select which types of errors in the POST are sufficient to halt the system.

Advanced BIOS Features Page

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.



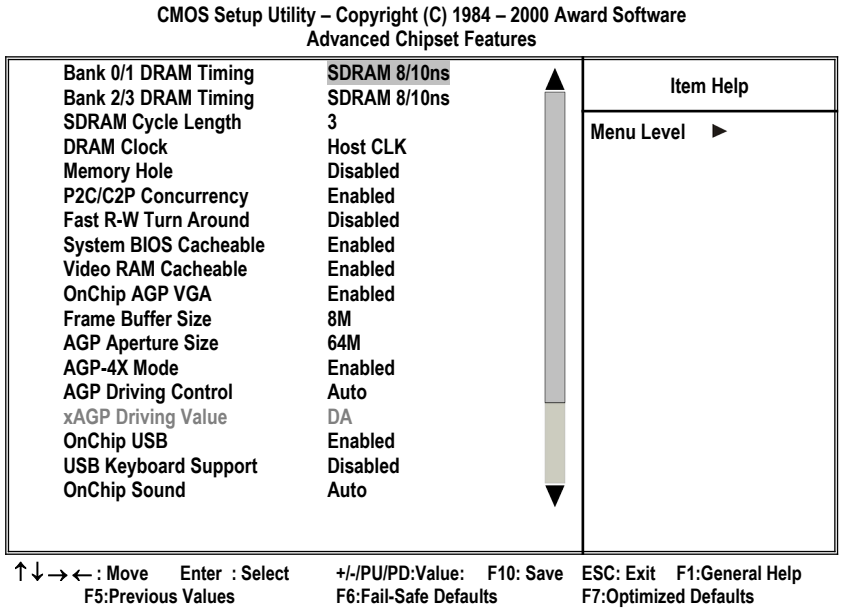
Virus Warning	When this item is enabled, it provides some protection against viruses that try to write to the boot sector and partition table of your hard disk drive. This item is Disabled by default. You need to disable it so that you can install an operating system. We recommend that you enable virus warning protection as soon as you have installed your disk with an OS.
Y2K Monitor	If you enable this item, the system will monitor for errors generated by the year 2000 bug.
H/W Reset Function	Enables or disables the computer's hardware reset button. The default setting is Enabled.
CPU Internal Cache	All the processors that can be installed in this mainboard use internal level 1 (L1) cache memory to improve performance. Leave this item at the default value Enabled for better performance.

External Cache	Most processors that can be installed in this system use external level 2 (L2) cache memory to improve performance.
CPU L2 Cache ECC Checking	This item enables or disables ECC (Error Correction Code) error checking on the CPU cache memory. We recommend that you leave this item at the default value.
Processor Number Feature	Some new processors are installed with a unique processor number. This number may be used for verification in Internet transactions and e-commerce. If you prefer not to use or distribute the unique processor number, set this item to Disabled to suppress the processor number.
Quick Power On Self Test	You can enable this item to shorten the power on testing (POST) and have your system start up a little faster. You might like to enable this item after you are confident that your system hardware is operating smoothly.
1st/2nd/3rd Boot Device	Use these three items to select the priority and order of the devices that your system searches for an operating system at start-up time.
Boot Other Device	If you enable this item, the system will search all other possible locations for an operating system if it fails to find one in the devices specified under the first, second and third boot devices.
Swap Floppy Drive	If you have two floppy diskette drives in your system, this item allows you to swap the assigned drive letters so that drive A becomes drive B, and drive B becomes drive A.
Boot Up Floppy Seek	If this item is enabled, it checks the geometry of the floppy disk drives at start-up time. You don't need to enable this item unless you have an old diskette drive with 360K capacity.
Boot Up NumLock Status	This item defines if the keyboard Num Lock key is active when your system is started.
Gate A20 Option	This item defines how the system handles legacy software that was written for an earlier generation of processors. Leave this item at the default value.
Typematic Rate Setting	If this item is enabled, you can use the following two items to set the typematic rate and the typematic delay settings for your keyboard.
Typematic Rate (Chars/Sec)/ Delay (Msec)	If the item Typematic Rate Setting is enabled, you can use these items to define how many characters per second are generated by a held-down key and

	how many milliseconds must elapse before a held-down key begins generating repeat characters.
Security Option	If you have installed password protection, this item defines if the password is required at system start up, or if it is only required when a user tries to enter the Setup Utility.
OS Select For DRAM > 64 MB	This item is only required if you have installed more than 64 MB of memory and you are running the OS/2 operating system. Otherwise, leave this item at the default Non-OS2.
HDD S.M.A.R.T Capability	The S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. software resides on both the disk drive and the host computer. The disk drive software monitors the internal performance of the motors, media, heads, and electronics of the drive. The host software monitors the overall reliability status of the drive. If a device failure is predicted, the host software, through the Client WORKS S.M.A.R.T applet, warns the user of the impending condition and advises appropriate action to protect the data.
Report No FDD For WIN95	If you are running a system with no floppy drive and using Windows 95, select Yes for this item to ensure compatibility with the Windows 95 logo certification. Otherwise, select No.
Video BIOS Shadow	When enabled this item copies the VGA BIOS into system DRAM.
C8000-CBFFF to DC000-DFFFF Shadow	When enabled, the ROM with the specified address is copied into system DRAM. It will also reduce the size of memory available to the system.

Advanced Chipset Features Page

This page sets some of the parameters of the mainboard components including the memory, and the system logic.



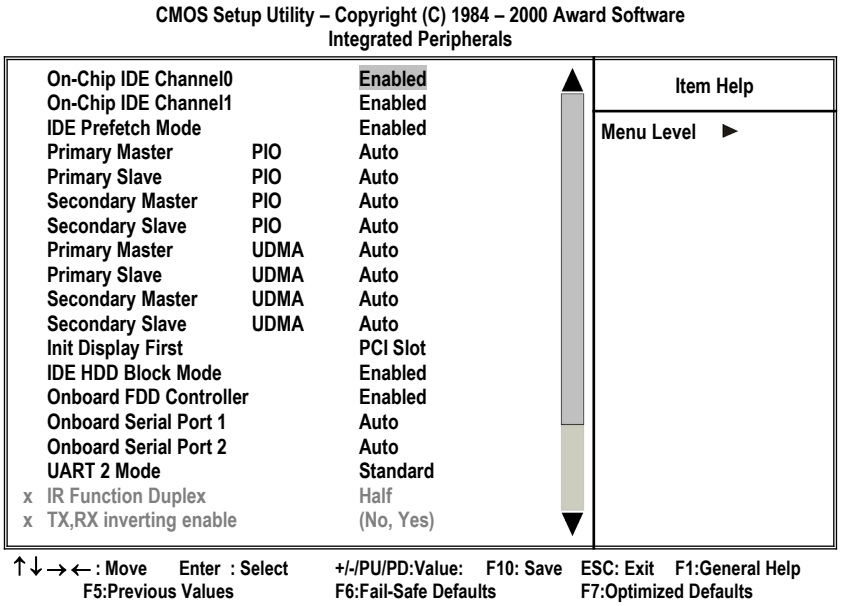
Bank 0/1 2/3 DRAM Timing	This item allows you to select the timing for the DRAM slots, depending on whether the board has paged SDRAMs.
SDRAM Cycle Length	This field enables you to set the CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should have set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.
DRAM Clock	Enables the user to select the DRAM Clock.
Memory Hole	This item can be used to reserve memory space for some ISA expansion cards that require it.
P2C/C2P Concurrency	When disabled, the CPU bus is occupied during the entire PCI operation period.

Fast R-W Turn Around	When this is enabled, the chipset will insert one extra clock to the turn-around of back-to-back DRAM cycles.
System BIOS Cacheable	When enabled, the System BIOS will be cached for faster execution.
Video RAM Cacheable	When enabled, the graphics card's local memory will be cached for faster execution. However, if any program writes to this memory area, a system error may result.
OnChip AGP VGA	This item allows the user to select the type of VGA used.
Frame Buffer Size	This option determines the frame buffer size shared from the main memory for use by the onboard VGA display.
AGP Aperture Size	This option determines the effective size of the AGP Graphic *Aperture*, where memory-mapped graphic data structures are located.
AGP 4X Mode	This item allows you to enable or disable the caching of display data for the video memory of the processor. Enabling can greatly improve the display speed. If your graphics display card does not support this feature, you need to disable this item.
AGP Driving Control	This item can be used to signal driving current on AGP cards to auto or Manual. Some AGP cards need stronger than normal driving current in order to operate. We recommend that you set this item to Auto by default.
AGP Driving Value	When the previous item AGP Driving Control is set to Manual, you can use this item to set the AGP current driving value.
OnChip USB	This item allows you to enable the USB port, if you have installed a USB device on the system board.
USB Keyboard Support	Enables function when the USB keyboard is being used. Disabled (default) when an AT keyboard is used.
OnChip Sound	Disabling this function turns off the onboard audio chip.
CPU to PCI Write Buffer	When enabled, up to four words of data can be written to the PCI bus without interrupting the CPU. When disabled, a write buffer is not used and the CPU read cycle will not be completed until the PCI bus signals that it is ready to receive the data. The default setting is Enabled.

PCI Dynamic Bursting	When enabled, every write transaction goes to the write buffer. “Burstable” transactions then burst on the PCI bus and “nonburstable” transactions do not.
PCI Master 0 WS Write	When enabled, writes to the PCI bus are executed with zero wait states.
PCI Delay Transaction	The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Enable to support compliance with PCI specification version 2.1.
PCI#2 Access #1 Retry	When enabled, the AGP Bus (PCI#1) access to PCI Bus (PCI#2) is executed with the error retry feature.
AGP Master 1 WS Write	This implements a single delay when writing to the AGP Bus. By default, two-wait states are used by the system, allowing for greater stability.
AGP Master 1 WS Read	This implements a single delay when reading to the AGP Bus. By default, two-wait states are used by the system, allowing for greater stability.
P6 Lock Function	The P6 CPU has a PCI LOCK function to lock the PCI BUS, enabling efficient sharing of the PCI BUS with the PCI DEVICE and CPU.

Integrated Peripherals Page

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



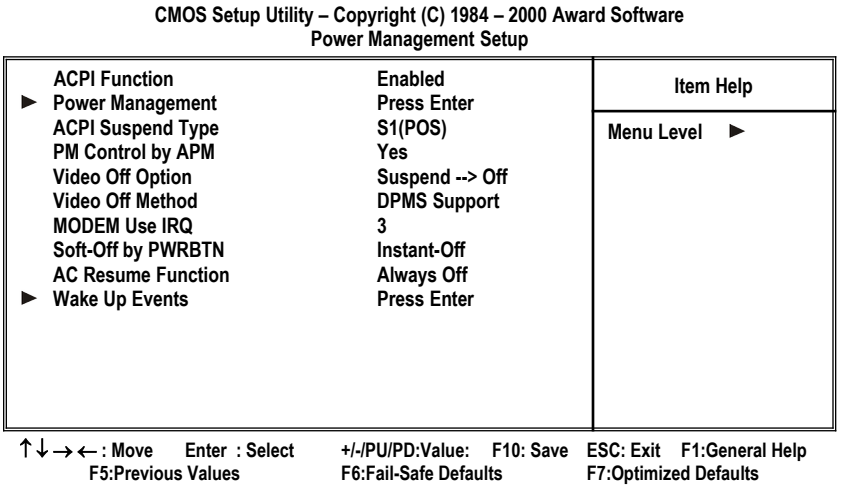
On-Chip IDE Channel 0,1	Use these items to enable or disable the PCI IDE channels that are integrated on the mainboard.
Primary/ Secondary Master /Slave PIO	Each channel supports a master device and a slave device. These four items let you assign which kind of PIO (Programmed Input/Output) is used by IDE devices. You can choose Auto, to let the system auto detect which PIO mode is best, or you can install a PIO mode from 0-4.
Primary/ Secondary Master /Slave UDMA	Each channel supports a master device and a slave device. This motherboard supports UltraDMA and provides faster access to IDE devices. If you install a device that supports UltraDMA, change the appropriate item on this list to Auto. You may have to install the UltraDMA driver.
Init Display First	Use this item to define if your graphics adapter is installed in one of the PCI slots or select Onboard

	if you have a graphics system integrated on the mainboard.
IDE HDD Block Mode	Enable this field if your IDE hard drive supports block mode. Block mode enables BIOS to automatically detect the optimal number of block read and writes per sector that the drive can support and can improve the speed of access to IDE devices.
Onboard FDD Controller	This option enables the onboard floppy disk drive controller.
Onboard Serial Port 1, 2	This option is used to assign the I/O address for the onboard serial ports.
UART2 Mode	This field is available if the Onboard Serial Port 2 field is set to any option but “Disabled.” UART Mode enables you to select the infrared communication protocol—Standard (default), HPSIR or ASKIR. HPSIR is Hewlett Packard’s infrared communication protocol with a maximum baud rate up to 115.2 Kbps. ASKIR is Sharp’s infrared communication protocol with a maximum baud rate up to 57.6 Kbps.
IR Function Duplex	This field is available when UART 2 Mode is set to either ASKIR or HPSIR. This item determines the infrared (IR) function of the onboard infrared chip. Full-duplex means that you can transmit and send information simultaneously. Half duplex is the transmission of data in both directions, but only one direction at a time.
TX, RX inverting enable	Defines the voltage level for Infrared module RxD (receive) mode and TxD (transmit) mode. This setting has to match the requirements of the infrared module used in the system.
Onboard Parallel Port	This option is used to assign the I/O address for the onboard parallel port.
Onboard Parallel Mode	This feature enables you to set the data transfer protocol for your parallel port. Normal allows data output only. Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP) are bi-directional modes, allowing both data input and output. ECP and EPP modes are only supported with EPP and ECP aware peripherals.
ECP Mode Use DMA	When the onboard parallel port is set to ECP mode, the parallel port has the option to use DMA “3” or DMA “1.”

Parallel Port EPP Type	This option sets the Enhanced Parallel Port (EPP) specification.
Onboard Legacy Audio	This option enables the onboard legacy audio function. When enabled the following items become available.
Sound Blaster	This feature is used to enable or disable a Sound Blaster card if installed.
SB I/O Base Address	This item lets you set the I/O base address for the Sound Blaster card.
SB IRQ Select	This item lets you set the Interrupt Request (IRQ) for the Sound Blaster card.
SB DMA Select	This item lets you select the Direct Memory Access (DMA) for the Sound Blaster card.
MPU-401, MPU-401 I/O Address	Use the two items to enable the MPU-401 function and set the I/O address for the game port.
Game Port (200-207H)	This item shows the I/O address for the game port.

Power Management Setup Page

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

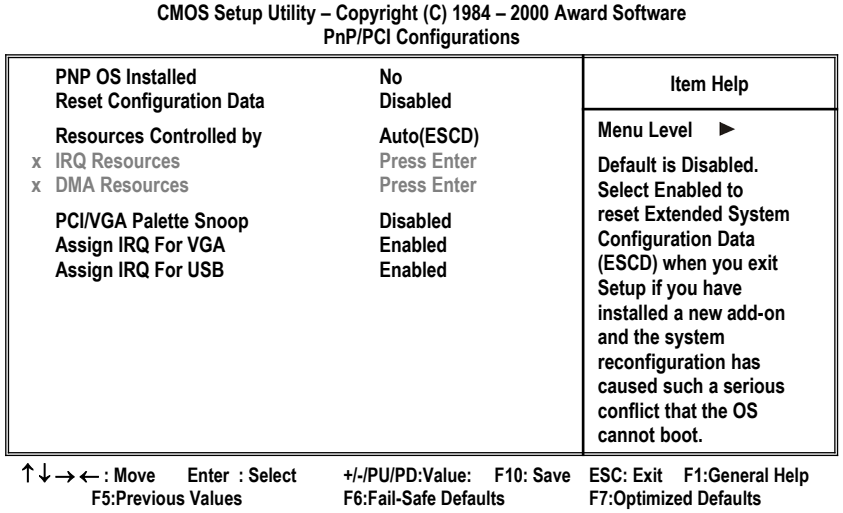


ACPI Function	Use this item to enable or disable the ACPI function.
Power Management	This item acts like a master switch for the power-saving modes and hard disk timeouts. If this item is set to Max Saving, power-saving modes occur after a short timeout. If this item is set to Min Saving, power-saving modes occur after a longer timeout. If the item is set to User Define, you can insert your own timeouts for the power-saving modes.
ACPI Suspend Type	This item defines how your system suspends. S1(POS), the suspend mode is equivalent to a software power down. If you select S3 (STR), the suspend mode is a suspend to RAM – the system shuts down with the exception of a refresh current to the system memory.
PM Control by APM	This field allows you to control the PC Monitor's power management features via Intel-Microsoft Advanced Power Management software. Once you have enabled the APM interface, some settings made in the BIOS Setup program may be

	overridden by APM.
Video Off Option	This option defines if the video is powered down when the system is put into suspend mode.
Video Off Method	This item defines how the video is powered down to save power.
MODEM Use IRQ	If you want an incoming call on a modem to automatically resume the system from a power-saving mode, use this item to specify the interrupt request line (IRQ) that is used by the modem. You might have to connect the fax/modem to the mainboard Wake On Modem connector for this feature to work.
Soft-Off by PWRBTN	Under ACPI (Advanced Configuration and Power management Interface) you can create a software power down. In a software power down, the system can be resumed by Wake Up Alarms. This item lets you install a software power down that is controlled by the normal power button on your system. If the item is set to Instant-Off, then the power button causes a software power down. If the item is set to "Delay 4 Sec." then you have to hold the power button down for four seconds to cause a software power down.
AC Resume Function	Use this item to set a system power state when power restores after sudden AC power loss.
Wake Up Events	This item opens a submenu that enables you to set events that will resume the system from a power saving mode. Select Wake Up Events and press **Enter** to display the following items: VGA, LPT & COM, HDD & FDD, PCI Master, PowerOn by PCI Card, Wake Up On LAN/Ring, RTC Alarm Resume, Primary INTR, and IRQs Activity Monitoring.

PnP/PCI Configurations Page

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

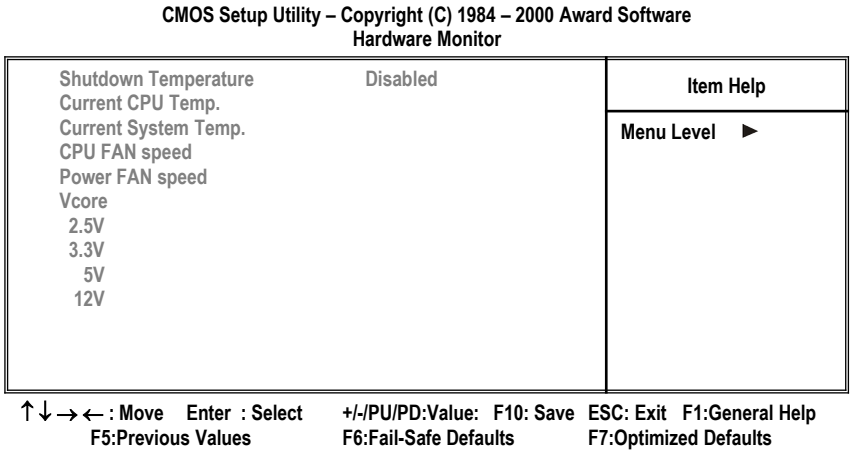


PNP OS Installed	Setting this option to "Yes" allows the PnP OS (instead of BIOS) to assign the system resources such as IRQ and I/O address to the ISA PnP device.
Reset Configuration Data	If you enable this item and restart the system, any PnP configuration data stored in the BIOS setup is cleared from memory. New updated data is created.
Resources Controlled By	You should leave this item at the default Auto (ESCD). Under this setting, the system dynamically allocates resources to plug and play devices as they are required. If you cannot get a legacy ISA (Industry Standard Architecture) expansion card to work properly, you might be able to solve the problem by changing this item to Manual, and then opening up the *IRQ Resources* and *Memory Resources* sub-menus. In the *IRQ Resources* sub-menu, if you change any of the IRQ assignations to Legacy ISA, then

	that Interrupt Request Line is reserved for a legacy ISA expansion card. Press **Esc** to close the IRQ Resources sub-menu.
PCI/VGA Palette Snoop	This item is designed to overcome some problems that can be caused by some non-standard VGA cards. This board includes a built-in VGA system that does not require palette snooping so you must leave this item disabled.
Assign IRQ For VGA	Names the interrupt request (IRQ) line assigned to the VGA (if any) on your system. Activity of the selected IRQ always awakens the system.
Assign IRQ For USB	Names the interrupt request (IRQ) line assigned to the USB (if any) on your system. Activity of the selected IRQ always awakens the system.

PCI Health Status Page

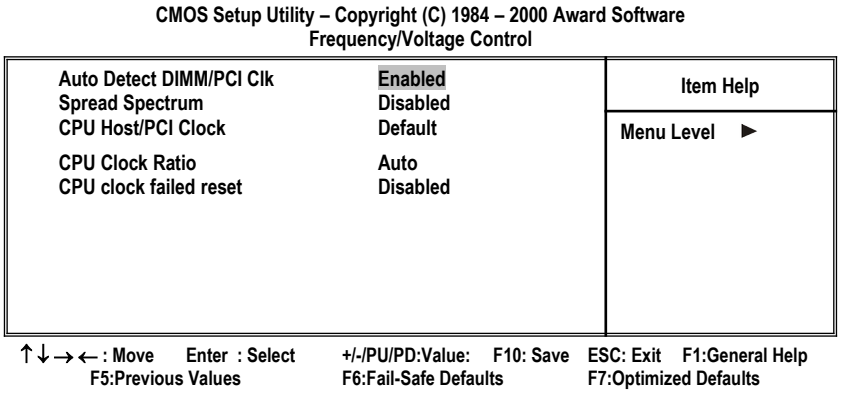
This page displays some of the parameters for the hardware monitoring function of this mainboard.



Shutdown Temperature	Enables you to set the maximum temperature the system can reach before powering down.
System Component Characteristics	These fields provide you with information about the systems current operating status. You cannot make changes to these fields. The following information is displayed: CPU Temperature System Temperature CPU FAN (in RPMs) System FAN (in RPMs) Vcore (CPU Core voltage) 2.5V (onboard 2.5 volt) 3.3V (onboard 3.3 volt) 5V (power supply's 5 volt) 12V (power supply's 12 volt).

Frequency/Voltage Control Page

This page sets some of the parameters for the Frequency/Voltages of this mainboard.



Auto Detect DIMM/ PCI Clk	When this item is enabled, BIOS will disabled the clock signal of free DIMM and PCI slots.
Spread Spectrum	Eables or disables the spread spectrum for the installed processor.
CPU Host/PCI Clock	This item appears if you have set the *CPU Internal Core Speed* to Manual. Use the *CPU/DIMM/PCI Clock* to set the frontside bus frequency for the installed processor (usually 133 MHz, 100 MHz or 66 MHz). Then use *CPU Clock Ratio* to set a multiple.
CPU Clock Ratio	Use this item to select a multiplier for the system frontside bus (FSB) frequency. The value of the multiplier must be set so that: *Multiplier x Frontside Bus Frequency = CPU Clock Speed* For example, if you have a processor that is rated to run at 450 MHz and the system is running a frontside bus frequency of 100 MHz, you should select a multiplier of 4.5 so that: *4.5 (Multiplier) x 100 MHz (frontside bus) = 450 MHz (CPU clock)*.

CPU Clock failed reset	When this item is enabled and the system crashes three times because the processor has been overclocked, the BIOS will automatically adjust the speed of the processor to the system bus speed multiplied by two.

Load Fail-Safe Defaults

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 defaults place no great demands on the system and are generally stable. If your system is not functioning correctly, try installing the fail-safe defaults as a first step in getting your system working properly again. If you only want to install fail-safe defaults for a specific option, select and display that option, and then press <F6>.

Load Optimized Defaults

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 optimized default values. These default values place demands on the system that may be greater than the performance level of the components, such as the CPU and the memory. You can cause fatal errors or instability if you install the optimized defaults when your hardware does not support them. If you only want to install setup defaults for a specific option, select and display that option, and then press <F7>.

Set Supervisor and User Password

These items can be used to install a password. A Supervisor password takes precedence over a User password, and the Supervisor can limit the activities of a User. To install a password, follow these steps:

1. Highlight the item Set Supervisor/User Password on the main menu and press <Enter>.
2. The password dialog box appears.

```
Enter Password:
```

3. If you are installing a new password, type in the password. You cannot use more than eight characters or numbers. The Set Supervisor/User Password item differentiates between upper case and lower characters. Press <Enter> after you have typed in the password. If you are deleting a password that is already installed just press <Enter> when the password dialog box appears. You see a message that indicates that the password has been disabled.

```
PASSWORD DISABLED !!!
Press any key to continue . . .
```

4. Press any key. You are prompted to confirm the password:

```
Confirm Password:
```

5. Type the password again and press <Enter>, or just press <Enter> if you are deleting a password that is already installed.
6. If you typed the password correctly, the password will be installed.

Save & Exit Setup

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 saving.

Exit Without Saving

Highlight this item and press **Enter** to discard any changes that you have made in the Setup Utility and exit the setup program. When the Exit Without Saving dialog box appears, press **Y** to discard changes and exit, or press **N** to return to the setup main menu.

Chapter 4

Software & Applications

Introduction

The support software CD-ROM that is included in the mainboard package contains all the drivers and utility programs needed to properly run our 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.
If the operating system used in your system is Windows 98, it will automatically install all the drivers and utilities for your board. See the Auto-Installing under Windows 98 section.

Installing Support Software

The software on the support CD-ROM is for Windows 95/NT and Windows 98/ME/2000. The installation procedure differs depending on which Operating System you have, but the automatic installation is now for Win98/ME/2000.

Installing under Windows 95/NT

To install support software for Windows 95/NT/2000 follow this general procedure:

1. Insert the support CD-ROM disc in the CD-ROM drive.

(The system might get an error message from the PnP function. Don't care the message. You don't really need that file to install the drivers)

2. Use My Computer or Windows Explorer to look at the directory structure. You must use the Open command in the right-button menu. Double-clicking on the drive icon will result in an error message because the disc's AutoRun feature doesn't work in Windows 95/NT.
3. Execute the EXE file name given in the description below.

Note: *The correct path name for each software driver is provided, where* ***D:*** *identifies the CD-ROM drive letter – modify if necessary.*

Bus Master IDE Driver

The IDE Bus Master Drivers allows the system to properly manage the IDE channels on the mainboard. You need to install the driver if you are running Windows 9x.

- Windows 9x – D:\IDE\VIA\Setup.EXE

Display Drivers and Software

Find the Display drivers and software here:

- D:\VGA\VIA8605\

Audio Driver

The Audio driver allows the system to use the onboard audio circuitry. Find the driver and audio application here:

- D:\SOUND\Driver\VIA\
- D:\SOUND\Gamut\

AMR Modem Driver

Find the driver here:

- D:\Modem\Driver\AMR\PCtel\

USB Driver

The USB Driver allows the system to recognize the USB ports on the mainboard. You need to install this driver if you are running Windows 95. Windows 95 OSR2 does not require this driver. This driver is available for:

- Win95 – D:\USB\EUSBSUPP\USBSUPP.EXE
- Win95 (Chinese) – D:\USB\CUSBSUPP\CUSBSUPP.EXE

3Deep Software

Find the software here:

- D:\3Deep\3Deep 3.3\Setup.EXE

BIOS Update Utility

The BIOS Update utility allows you to update the BIOS file on the mainboard to a newer version. You can download the latest version of the BIOS setup available for your mainboard from the website.

- D:\UTILITY\AWDFLxxx.EXE

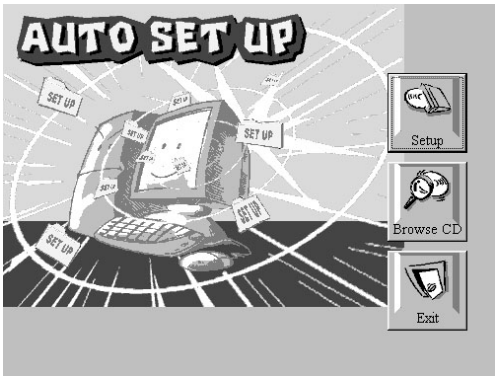
PC-Cillin Software

The PC-cillin software program provides anti-virus protection for your system. Find this software here:

- D:\PC-CILLIN\

Auto-installing under Windows 98/ME/2000

The support software CD-ROM disc loads automatically under Windows 98/ME/2000. When you insert the CD-ROM disc in the system CD-ROM drive the Autorun feature will automatically

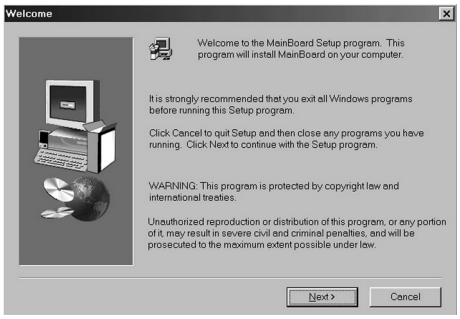


bring up the install screen. The screen has three buttons on it, Setup, Browse CD and Exit. See the following screen illustration.
When you click on the **Setup** button the software installation program will run and you can select what kind of installation you want to do, as explained later in this section.
The **Browse CD** button is the standard Windows command that allows you to examine the contents of the disc using the Windows 98 file browsing interface.
The **Exit** button closes the Auto Setup window. To run the program again, reinsert the CD-ROM disc in the drive or click on AutoRun in the context sensitive menu for the CD-ROM drive icon in a file browser window.

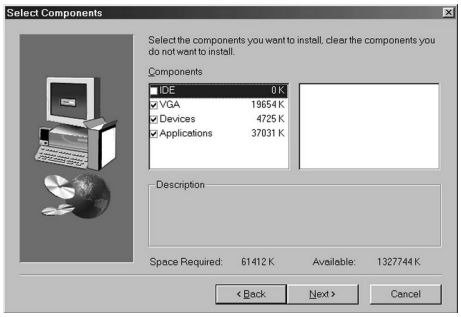
Installing Software with Auto Setup

To install support software for the system board follow this procedure:

1. Click on the **Setup** button. The install program will load and display the following screen. Click the **Next** button.



2. Select the items that you want to setup by clicking on it (the default options are recommended). Click the **Next** button to proceed.



3. The support software will automatically install.

Once any of the installation procedures start, software is automatically installed in sequence. You will need to follow the onscreen instructions, confirm commands and allow the computer to restart as few times as is needed to complete installing whatever software you selected to install. When the process is finished, all the support software will be installed and working.

There are some utilities that you have to manually install if you need, check to the above section.