Trademarks

MS9377C+ Series, V3.0
S648/February 2004

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Static Electricity Precautions

Static electricity could damage components on this mainboard. Take the following precautions while unpacking this mainboard and installing it in a system.

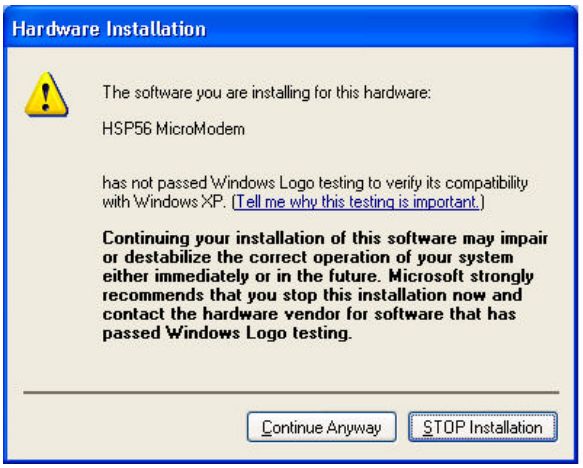
1. Don't take this mainboard and components out of their original static-proof package until you are ready to install them.
2. While installing, please wear a grounded wrist strap if possible. If you don't have a wrist strap, discharge static electricity by touching the bare metal of the system chassis.
3. Carefully hold this mainboard by its edges. Do not touch those components unless it is absolutely necessary. Put this mainboard on the top of a static-protection package with component side facing up while installing.

Pre-Installation Inspection

1. Inspect this mainboard whether there are any damages to components and connectors on the board.
2. If you suspect this mainboard has been damaged, do not connect power to the system. Contact your mainboard vendor about those damages.

Notice:

1. Owing to Microsoft' s certifying schedule is various to every supplier, we might have some drivers not certified yet by Microsoft. Therefore, it might happen under Windows XP that a dialogue box (shown as below) pop out warning you this software has not passed Windows Logo testing to verify its compatibility with Windows XP. Please rest assured that our RD department has already tested and verified these drivers. Click the "Continue Anyway" button and go ahead the installation.



2. USB 2.0 Driver Limitations:
   2-1. The USB 2.0 driver only supports Windows XP and Windows 2000.
   2-2. If you connect a USB 2.0 hub to the root hub, plugging USB devices into this hub, the system might not successfully execute certain USB devices' connection because it could not recognize these devices.

Chapter 1

Introduction

This mainboard has a **Socket-478** to support **Intel Pentium 4 / Prescott / Hyper Threading Technology** processors with Front-Side Bus (FSB) speeds up to **800 MHz**. The Prescott CPU provides higher power, better voltage regulator tolerance and thermal solution, performing better graphics and audio, speeding up the processor. Hyper Threading Technology, designed to take advantage of the multitasking features in Windows XP, gives you the power to do more things at once.

It integrates the **SiS648FX** Northbridge and **SiS964/964L** Southbridge that support the **Serial ATA (only for SiS964 Southbridge)**—a new interface for high-performance and mainstream desktop PCs,and the built-in **USB 2.0** providing higher bandwidth, implementing **Universal Serial Bus Specification Revision 2.0** and is compliant with **UHCI 1.1** and **EHCI 0.95**.

It supports **AC 97 Audio Codec** and provides **Ultra DMA** 33/66/100/**133** function. It has one **8x AGP**, one **CNR** and five 32-bit **PCI** slots. There is a full set of I/O ports including two PS/2 ports for mouse and keyboard, one serial port, one parallel port and maximum eight USB2.0 ports – four back-panel ports and onboard USB connectors USB2/USB3 providing four extra ports by connecting the Extended USB Module to the mainboard.

It is an **ATX** mainboard and has power connectors for an ATX power supply.

***Note**: You must initiate the HT CPU function through BIOS setup. It is strongly recommended you refer to Page 35 for relative details.*

Key Features

This mainboard has these key features:

Socket-478 Processor

- Supports **Intel Pentium 4 / Prescott series** CPU with **Hyper Threading** Technology
- Supports up to **800 MHz** Front-Side Bus

> ***Hyper-Threading*** *technology enables the operating system into thinking it' s hooked up to two processors, allowing two threads to be run in parallel, both on separate ' logical' processors within the same physical processor.*

Chipset

There are **SiS648FX** Northbridge and **SiS964/964L** Southbridge in the chipsets in accordance with an innovative and scalable architecture with proven reliability and performance.

Chipset	Function
SiS648FX NB + 964 SB	Support Serial ATA
SiS648FX NB + 964L SB	Doesn' t support Serial ATA

- Accelerated Graphics Port (AGP) Interface: Supports AGP v2.0 Compliant and AGP 8x/4x/2x interface with Fast Write Transaction
- Integrated Multi-threaded I/O link ensures concurrency of upstream/down stream data transfer with 1.2GB/s bandwidth
- PCI 2.2 Specification Compliance
- Integrated Multithreaded I/O Link Mastering with Read Pipelined Streaming

Memory Support

- Two 184-pin DIMM sockets for DDR SDRAM memory modules
- Supports DDR**400** memory bus
- Maximum installed memory is 2GB

AC97 Audio Codec

- 6-CH hardware architecture allows multi-channel south bridge to playback 6CH audio
- Intel® AC' 97 (REV. 2.2) compatible, meeting Microsoft® PC2001 requirements
- Built-in earphone buffer and internal PLL, the latter saving additional crystal
- Line-in/rear out share the same jack; Center/bass share the MIC jack
- Digital S/PDIF OUT Support
- CRL® 3D: HRTF based BS3D compatible audio engine

Expansion Options

The mainboard comes with the following expansion options:

- Five 32-bit PCI slots
- One 8x AGP slot
- One CNR slot

Onboard IDE

- Two IDE Connectors
- Supports PIO (Programmable Input/Output) and DMA (Direct Memory Access) modes
- Supports IDE Ultra DMA bus mastering with transfer rates of 33/66/100/**133** MB/sec

Serial ATA (only for SiS964 Southbridge)

- Two Serial ATA Connectors
- Transfer rate exceeding best ATA (~150 MB/s) with scalability to higher rates
- Low pin count for both host and devices

Onboard I/O Ports

The mainboard has a full set of I/O ports and connectors:

- Two PS/2 ports for mouse and keyboard
- One serial port
- One parallel port

- Eight USB2.0 ports (four back-panel ports, onboard USB connectors USB2/USB3 providing four extra ports
- Audio jacks for microphone, line-in and line-out

Fast Ethernet LAN (optional)

- Built-in **100Base-TX/10Base-T Physical Layer solution**
- Dual Speed – 100/10 Mbps
- MII Interface to Ethernet Controller and Configuration & Status
- Auto Negotiation: 10/100, Full/Half Duplex
- Meet All applicable IEEE 802.3, 10Base-T and 100 Base-TX Standards

USB 2.0

- 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

BIOS Firmware

This mainboard uses AMI BIOS that enables users to configure many system features including the following:

- Power management
- Wake-up alarms
- CPU parameters and memory timing
- CPU and memory timing

The firmware can also be used to set parameters for different processor clock speeds.

Bundled Software

- **PC-Cillin 2002** provides automatic virus protection under Windows 98/ME/NT/2000/XP
- **Adobe Acrobat Reader V5.0** is the software to help users read .PDF files.

Dimensions

- ATX form factor of 305 x 220 mm

Note: *Hardware specifications and software items are subject to change without notification.*

Package Contents

Your mainboard package contains the following items:

- The mainboard
- The User's Manual
- One diskette drive ribbon cable (optional)
- One IDE drive ribbon cable
- The Software support CD

Optional Accessories

You can purchase the following optional accessories for this mainboard.

- The Extended USB module
- The Card Reader

Note: *You can purchase your own optional accessories from the third party, but please contact your local vendor on any issues of the specification and compatibility.*

Chapter 2

Mainboard Installation

To install this mainboard in a system, please follow these instructions in this chapter:

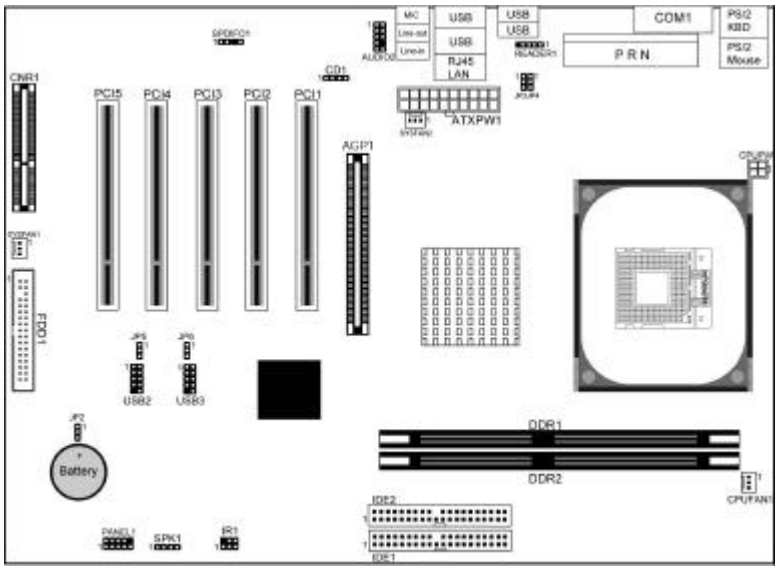
- Identify the mainboard components
- Install a CPU
- Install one or more system memory modules
- Make sure all jumpers and switches are set correctly
- Install this mainboard in a system chassis (case)
- Connect any extension brackets or cables to connectors on the mainboard
- Install peripheral devices and make the appropriate connections to connectors on the mainboard

Note:

1. Before installing this mainboard, make sure jumper JP2 is under Normal setting. See this chapter for information about locating JP2 and the setting options.
2. Never connect power to the system during installation; otherwise, it may damage the mainboard.

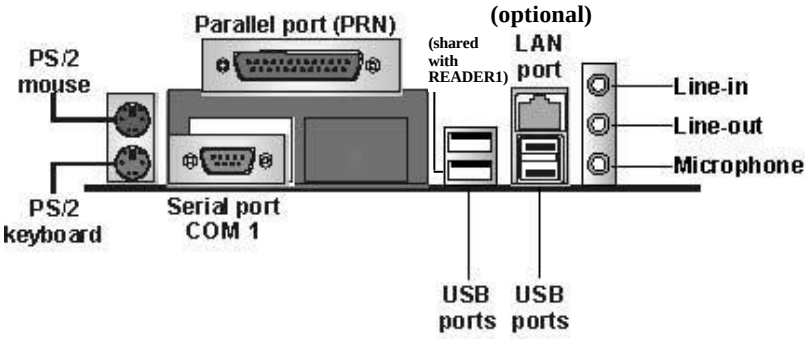
Mainboard Components

Identify major components on the mainboard via this diagram underneath.



I/O Ports

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



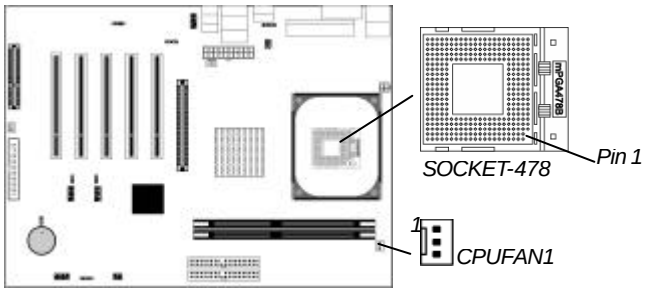
PS/2 Mouse	Use the upper PS/2 port to connect a PS/2 pointing device.
PS/2 Keyboard	Use the lower PS/2 port to connect a PS/2 keyboard.
Parallel Port (PRN)	Use the Parallel port to connect printers or other parallel communications devices.
COM1	Use the COM port to connect serial devices such as mice or fax/modems. COM1 is identified by the system as COM1.
LAN Port (optional)	Connect an RJ-45 jack to the LAN port to connect your computer to the Network.
USB Ports	Use the USB ports to connect USB devices. ***Note**: The lower USB port located beside the VGA port is shared with the READER1 connector.*
Audio Ports	Use the three audio ports to connect audio devices. The first jack is for stereo Line-In signal. The second jack is for stereo Line-Out signal. The third jack is for Microphone.

Installing the Processor

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.

CPU Installation Procedure

Follow these instructions to install the CPU:



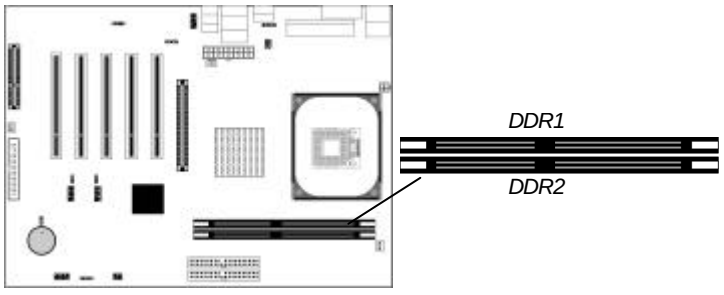
1. Unhook the locking lever of the CPU socket. Pull the locking lever away from the socket and raising it to the upright position.
2. Match the pin1 corner marked as the beveled edge on the CPU with the pin1 corner on the socket. Insert the CPU into the socket. Do not use force.
3. Push the locking lever down and hook it under the latch on the edge of socket.
4. Apply thermal grease to the top of the CPU.
5. Install the cooling fan/heatsink unit onto the CPU, and secure them all onto the socket base.
6. Plug the CPU fan power cable into the CPU fan connector (CPUFAN1) on the mainboard.

Installing Memory Modules

This mainboard accommodates two 184-pin 2.5V unbuffered Double Data Rate SDRAM (DDR SDRAM) Dual Inline Memory Module (DIMM) sockets, and supports up to 2.0 GB of **400** MHz DDR SDRAM.

DDR SDRAM is a type of SDRAM that supports data transfers on both edges of each clock cycle (the rising and falling edges), effectively doubling the memory chip's data throughput. DDR DIMMs can synchronously work with 100 MHz or 133 MHz memory bus.

DDR SDRAM provides 1.6 GB/s, 2.1 GB/s or 3.2 GB/s data transfer rate when the bus is 100 MHz, 133 MHz or 200 MHz, respectively.



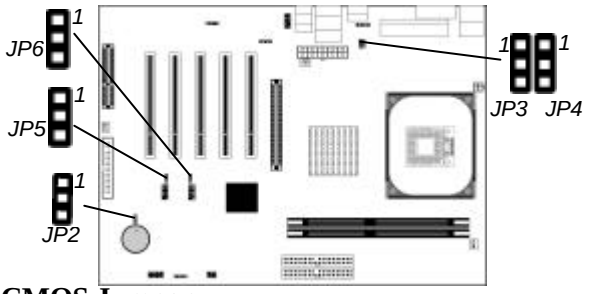
Memory Module Installation Procedure

These modules can be installed with up to 2 GB system memory. Refer to the following to install the memory module.

1. Push down the latches on both sides of the DIMM socket.
2. Align the memory module with the socket. There is a notch on the DIMM socket that you can install the DIMM module in the correct direction. Match the cutout on the DIMM module with the notch on the DIMM socket.
3. Install the DIMM module into the socket and press it firmly down until it is seated correctly. The socket latches are levered upwards and latch on to the edges of the DIMM.
4. Install any remaining DIMM modules.

Jumper Settings

Connecting two pins with a jumper cap is SHORT; removing a jumper cap from these pins, OPEN.



JP2: 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.

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

JP3/JP4/JP5/JP6: USB Power Selector
Use these jumpers to select the voltage for USB ports:

- **USBLAN1 Power Selector: JP3**

Function	Jumper Setting
VCC5V	Short pins 1-2
SB5V	Short pins 2-3

- **USB1 Power Selector: JP4**

Function	Jumper Setting
VCC5V	Short pins1-2
SB5V	Short pins2-3

- **USB2 Power Selector: JP5**

Function	Jumper Setting
VCC5V	Short pins1-2
SB5V	Short pins2-3

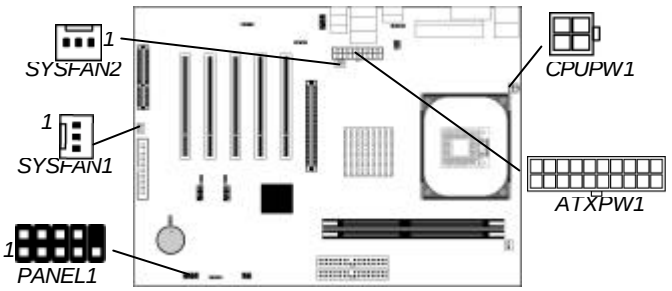
- **USB2 Power Selector: JP6**

Function	Jumper Setting
VCC5V	Short pins1-2
SB5V	Short pins2-3

***Note**: Make sure the power supply provides enough SB5V voltage before selecting the SB5V function.*

Install the Mainboard

Install the mainboard in a system chassis (case). The board is an ATX size mainboard. You can install this mainboard in an ATX case. Make sure your case has an I/O cover plate matching the ports on this mainboard.
Install the mainboard in a case. Follow the case manufacturer's instructions to use the hardware and internal mounting points on the chassis.



Connect the power connector from the power supply to the **ATXPW1** connector on the mainboard. **CPUPW1** is the CPU Vcore power connector.

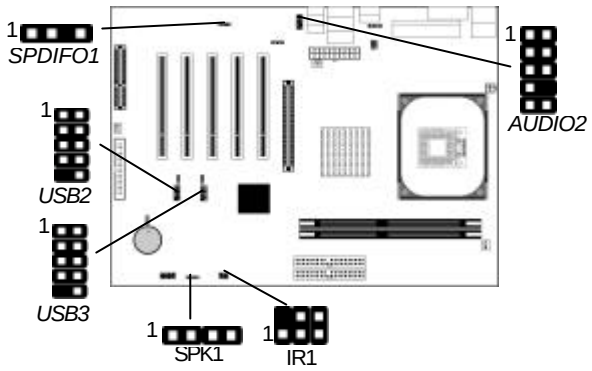
If there is a cooling fan installed in the system chassis, connect the cable from the cooling fan to the **SYSFAN1/2** fan power connector on the mainboard *(SYSFAN2 is an optional connector)*.

Connect the case switches and indicator LEDs to the **PANEL1** connector. Here is a list of the PANEL1 pin assignments.

Pin	Signal	Pin	Signal
1	HD_LED_P	2	FP PWR/SLP
3	HD_LED_N	4	FP PWR/SLP
5	RESET_SW_N	6	POWER_SW_P
7	RESET_SW_P	8	POWER_SW_N
9	RSVD_DNU	10	KEY

Connecting Optional Devices

Refer to the following information to connect the mainboard' s optional devices:



SPK1: Speaker Connector

Connect the cable from the PC speaker to the SPK1 connector on the mainboard.

Pin	Signal	Pin	Signal
1	SPKR	2	NC
3	GND	4	+5V

AUDIO2: Front Panel Audio Connector

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

Pin	Signal	Pin	Signal
1	AUD_MIC	2	AUD_GND
3	AUD_MIC_BIAS	4	AUD_VCC
5	AUD_FPOUT_R	6	AUD_RET_R
7	HP_ON	8	KEY
9	AUD_FPOUT_L	10	AUD_RET_L

USB2/USB3: Front panel USB Connector

The mainboard has USB ports installed on the rear edge I/O port array. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connectors USB2/USB3 to connect the front-mounted ports to the mainboard.

Pin	Signal	Pin	Signal
1	VERG_FP_USBPWR0	2	VERG_FP_USBPWR0
3	USB_FP_P0-	4	USB_FP_P1-
5	USB_FP_P0+	6	USB_FP_P1+
7	GROUND	8	GROUND
9	KEY	10	USB_FP_OC0

1. Locate the USB2/3connector on the mainboard.
2. Plug the bracket cable onto the USB2/3 connector.
3. Remove a slot cover from one of the expansion slots on the system chassis. Install an extension bracket in the opening. Secure the extension bracket to the chassis with a screw.

READER1: USB Card Reader Connector (optional)

This connector is for connecting internal USB card reader. You can use a card reader to read or transfer files and digital images to your computer.

Pin	Signal
1	VCC
2	USB-
3	USB+
4	GND
5	KEY

The READER1 is shared with one of the USB ports of the I/O back panel. The USB port is located beside the VGA port connector. See "I/O Ports" for more information.

Please check the pin assignment of the cable and the USB connector on the mainboard. Make sure the pin assignment will match before plugging in. Any incorrect usage may cause unexpected damage to the system. The vendor won't be responsible for any incidental or consequential damage arising from the usage or misusage of the purchased product.

IR1: Infrared Port

The infrared port allows 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	Pin	Signal
1	NC	2	KEY
3	+5V	4	GND
5	IRTX	6	IRRX

1. Locate the infrared port **IR1** connector on the mainboard.
2. If you are adding an infrared port, connect the ribbon cable from the port to the IR1 connector and then secure the port to an appropriate place in your system chassis.

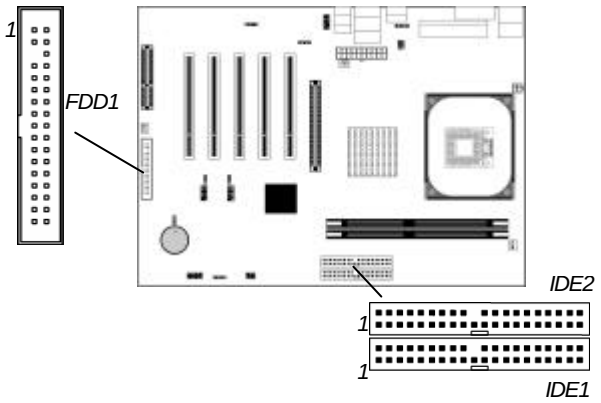
SPDIFO1: SPDIF Out Connector

S/PDIF (Sony/Philips Digital Interface) is a standard audio transfer file format and allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format. Via a specific audio cable, you can connect the SPDIFO1 connector (S/PDIF output) on the mainboard to the S/PDIF digital input on the external speakers or AC Decode devices.

Pin	Signal	Pin	Signal
1	SPDIFOUT	2	+5VA
3	NC	4	GND

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 connector **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.

Serial ATA Devices (only for SiS964 Southbridge)

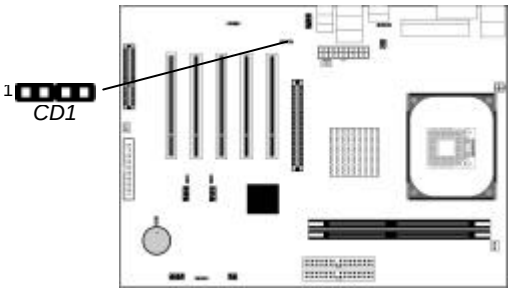
The **Serial ATA (Advanced Technology Attachment)** is the standard interface for the IDE hard drives, which is designed to overcome the design limitations while enabling the storage interface to scale with the growing media rate demands of PC platforms. It provides you a faster transfer rate of **150 Mbytes/ second**. If you have installed a Serial ATA hard drive, you can connect the Serial ATA cables to the Serial ATA hard drive or the connecter on the mainboard.

On the mainboard, locate the Serial ATA connectors **SATA1/2**, which support new Serial ATA devices for the highest data transfer rates, simpler disk drive cabling and easier PC assembly.

It eliminates limitations of the current Parallel ATA interface, but maintains register compatibility and software compatibility with Parallel ATA.

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.

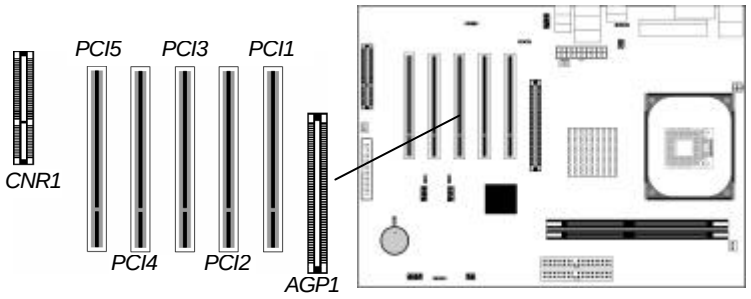


When you first start up your system, the BIOS should automatically detect your CD-ROM/DVD drive. If it doesn't, enter the Setup Utility and configure the CD-ROM/DVD drive that you have installed. On the mainboard, locate the 4-pin connector **CD1**.

Pin	Signal
1	CD IN L
2	GND
3	GND
4	CD IN R

Expansion Slots

This mainboard has one AGP, CNR and five 32-bit PCI slots.



Follow the steps below to install an AGP/CNR/PCI expansion card.

1. Locate the AGP, CNR or PCI slots on the mainboard.
2. Remove the blanking plate of the slot from the system chassis.
3. Install the edge connector of the expansion card into the slot. Ensure the edge connector is correctly seated in the slot.
4. Secure the metal bracket of the card to the system chassis with a screw.

8x AGP Slot

You can install a graphics adapter that supports the 8x AGP specification and has a 8x AGP edge connector in the AGP slot.

CNR Slot

You can install the CNR (Communications and Networking Riser) cards in this slot, including LAN, Modem, and Audio functions.

PCI Slots

You can install the 32-bit PCI interface expansion cards in the slots.

Chapter 3

BIOS Setup Utility

Introduction

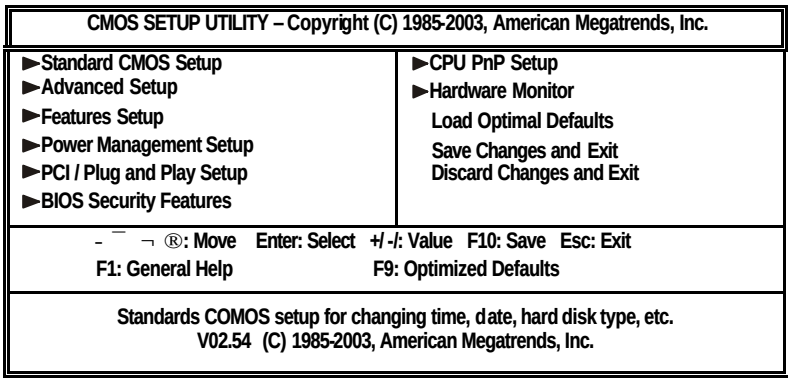
The BIOS Setup Utility records settings and information of your computer, such as date and time, the type of hardware installed, and various configuration settings. Your computer applies the information to initialize all the components when booting up and basic functions of coordination between system components.

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

You can run the setup utility and manually change the configuration. You might need to do this to configure some hardware installed in or connected to the mainboard, such as the CPU, system memory, disk drives, etc.

Running the Setup Utility

Every time you start your computer, a message appears on the screen before the operating system loading that prompts you to "*Hit <DEL>if you want to run SETUP*". Whenever you see this message, press the **Delete** key, and the Main menu page of the Setup Utility appears on your monitor.



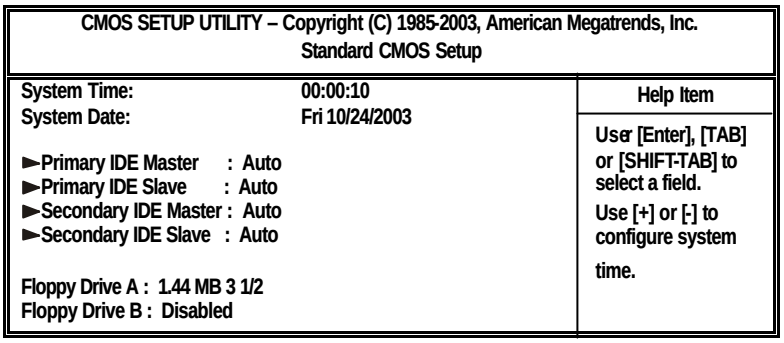
You can use cursor arrow keys to highlight anyone of options on the main menu page. Press **Enter** to select the highlighted option. Press the **Escape** key to leave the setup utility. Press **+/-/** to modify the selected field's values.

Some options on the main menu page lead to tables of items with installed values that you can use cursor arrow keys to highlight one item, and press **PgUp** and **PgDn** keys to cycle through alternative values of that item. The other options on the main menu page lead to dialog boxes requiring your answer Yes or No by hitting the **Y** or **N** keys.

If you have already changed the setup utility, press **F10** to save those changes and exit the utility. Press **F1** to display a screen describing all key functions. Press **F9** to install the setup utility with a set of default values.

Standard CMOS Setup Page

This page displays a table of items defining basic information about your system.



Date & Time	These items set up system date and time.
IDE **Primary Master** **Primary Slave** **Secondary Master** **Secondary Slave**	These items 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**	These items set up size and capacity of the floppy diskette drive(s) installed in the system.

Advanced Setup Page

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.

CMOS SETUP UTILITY – Copyright (C) 1985-2003, American Megatrends, Inc. Advanced Setup		
		Help Item
Quick Boot	Enabled	Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
1st Boot Device	PM-IC35L040AVVN07	
2nd Boot Device	SS-Pioneer DVD-R0	
3rd Boot Device	1st Floppy Drive	
Try Other Boot Device	Yes	
Bootup Num-Lock	On	
Boot To OS/2 > 64MB	No	
Graphic Win Size	64MB	
DRAM CAS# Latency	By SPD	
Performance Mode Select	Disabled	
MA 1T/2T Select	Auto	
Hyper Threading Function	Disabled	
Auto Detect DIMM/PCI Clk	Enabled	
Spread Spectrum	Disabled	
DRAM Voltage Control	Auto	
CPU Vcore Voltage Adjustment	Auto	

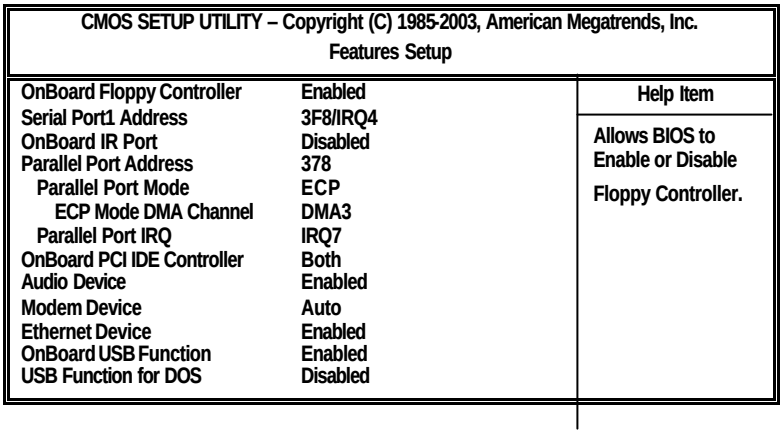
Quick Boot	If you enable this item, the system starts up more quickly be elimination some of the power on test routines.
1st Boot Device **2nd Boot Device** **3rd Boot Device**	Use these items to determine the device order the computer uses to look for an operating system to load at start-up time.
Try Other Boot Device	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.

BootUp Num-Lock	This item determines if the Num Lock key is active or inactive at system start-up time.
Boot To OS/2> 64MB	Enable this item if you are booting the OS/2 operating system and you have more than 64MB of system memory installed.
Graphic Win Size	This item defines the size of aperture if you use a graphic adapter.
DRAM CAS# Latency	This item determines the operation of SDRAM memory CAS (column address strobe). It is recommended that you leave this item at the default value. The 2T setting requires faster memory that specifically supports this mode.
Performance Mode Select	You can enable this item to achieve a better performance; however, it is necessary to use a better DDR SDRAM going with this function.
MA 1T/2T Select	This item adjusts timing 1T/2T latency. We recommend you to leave this item at the default value.
Hyper Threading Function	If your P4 CPU is not HT CPU, this item will be hidden. If your P4 CPU is HT CPU, BIOS will show this item. You can set "Disabled" or "Enabled" to control HT CPU support in O.S. Set “Enabled” to test HT CPU function.
Auto detect DIMM/PCI Clock	When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.
Spread Spectrum	If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.
DRAM Voltage Control	Use this item to adjust the voltage of the DRAM memory.

CPU Vcore Voltage Adjustment	Use this item to adjust the Vcore voltage of the CPU.

Features Setup Page

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

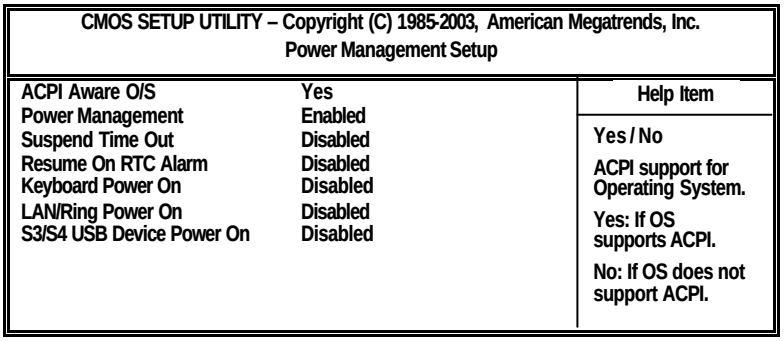


OnBoard Floppy Controller	Use this item to enable or disable the onboard floppy disk drive interface.
Serial Port1 Address	Use this item to enable or disable the onboard COM1/2 serial port, and to assign a port address.
OnBoard IR Port	Use this item to enable or disable the onboard infrared port, and to assign a port address.
Parallel Port Address	Use this item to enable or disable the onboard Parallel port, and to assign a port address.
Parallel Port Mode	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.

ECP Mode DMA Channel	Use this item to assign a DMA channel to the paralle l port.
Parallel Port IRQ	Use this item to assign IRQ to the parallel port.
OnBoard PCI IDE Controller	Use this item to enable or disable either or both of the onboard Primary and Secondary IDE channels.
Audio Device	This item enables or disables the AC'97 audio chip.
Modem Device	This item enables or disables the MC'97 modem chip.
Ethernet Device	This item enables or disables the onboard Ethernet LAN.
OnBoard USB Function	Enable this item if you plan to use the USB ports on this mainboard.
USB Function For DOS	Enable this item if you plan to use the USB ports on this mainboard in a DOS environment.

Power Management Setup Page

This page sets some parameters for system power management operation.



ACPI Aware O/S	This item supports ACPI (Advanced Configuration and Power management Interface). Use this item to enable or disable the ACPI feature.

Power Management	Use this item to enable or disable a power management scheme. If you enable power management, you can use the items below to set the power management operation. Both APM and ACPI are supported.
Suspend Time Out	This item sets up the timeout for Suspend mode in minutes. If the time selected passes without any system activity, the computer will enter power-saving Suspend mode.
Resume On RTC Alarm	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.
Keyboard Power On	If you enable this item, system can automatically resume by pressing hot keys on the keyboard or typing in the password. You must enable the Keyboard Power On jumper and use an ATX power supply in order to use this feature.
LAN/Ring Power On	Your system can enter the software power down. If you enable this item, the system can automatically resume if there is traffic on the network adapter.
S3/S4 USB Device Power On	If you enable this item, only in S3/S4 mode, the system can automatically resume by using the USB device.

PCI / Plug and Play Setup Page

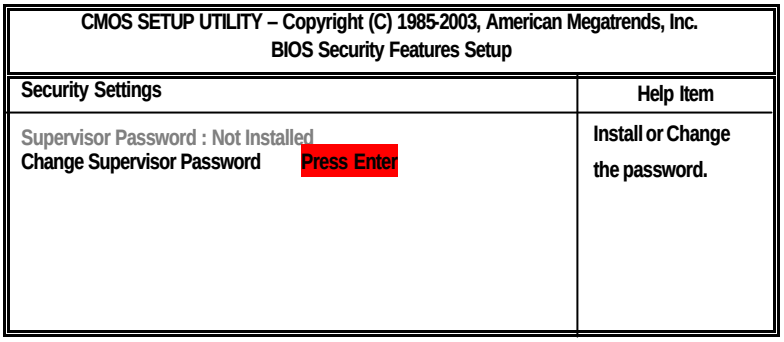
This page sets up some parameters for devices installed on the PCI bus and those utilizing the system plug and play capability.

CMOS SETUP UTILITY – Copyright (C) 1985-2003, American Megatrends, Inc. PCI / Plug and Play Setup		
Primary Graphics Adapter	PCI	Help Item
Allocate IRQ to PCI VGA	Yes	
PCI IDE BusMaster	Disabled	Select which graphics controller to use as the primary boot device.

Primary Graphics Adapter	This item indicates if the primary graphics adapter uses the PCI or the AGP bus. The default AGP setting still lets the onboard display work and allows the use of a second display card installed in an AGP slot.
Allocate IRQ to PCI VGA	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	This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value.

BIOS Security Features Setup Page

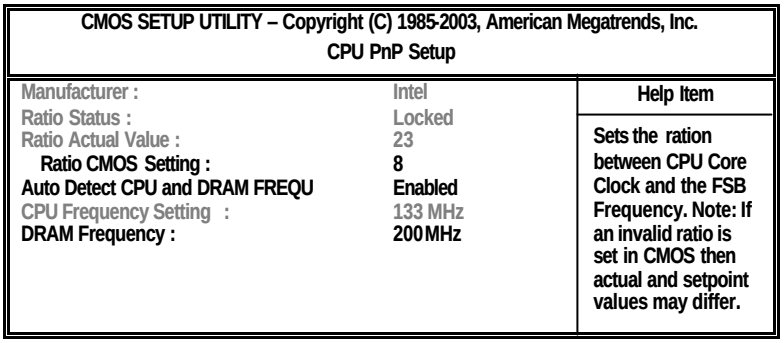
This page helps you install or change a password.



Supervisor Password	This item indicates whether a supervisor password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.
Change Supervisor Password	You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

CPU PnP Setup Page

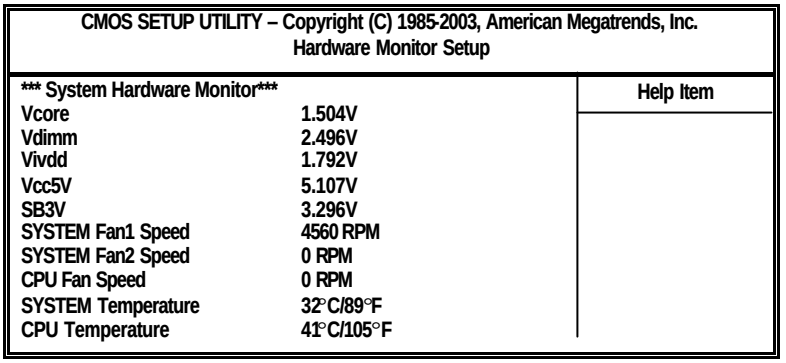
This page helps you manually configure the CPU of this mainboard. The system will automatically detect the type of installed CPU and make the appropriate adjustments to these items on this page.



Manufacturer/ Ratio Status/ Ratio Actual Value	These items show the brand, the Locked/ Unlocked ratio status, and the actual ratio of the CPU installed in your system.
Ratio CMOS Setting	This item shows the current ratio of the CPU installed in your system.
Auto Detect CPU and DRAM FREQU	When this item is enabled, it automatically detects and shows the frequency of the CPU and DRAM memory installed in your system; when disabled, it can adjust the frequency of the CPU and DRAM memory.
CPU Frequency	This item shows the frequency of the CPU installed in your system.
DRAM Frequency	This item shows the frequency of the DRAM in your system.

Hardware Monitor Page

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



CMOS SETUP UTILITY – Copyright (C) 1985-2003, American Megatrends, Inc.
Hardware Monitor Setup

*** System Hardware Monitor***		Help Item
Vcore	1.504V	
Vdimm	2.496V	
Vivdd	1.792V	
Vcc5V	5.107V	
SB3V	3.296V	
SYSTEM Fan1 Speed	4560 RPM	
SYSTEM Fan2 Speed	0 RPM	
CPU Fan Speed	0 RPM	
SYSTEM Temperature	32°C/89°F	
CPU Temperature	41°C/105°F	

CPU/System Temperature	These items display CPU and system temperature measurement.
FAN & Voltage Measurements	These items indicate cooling fan speeds in RPM and the various system voltage measurements.

Load Optimal Defaults

This option opens a dialog box to ask if you are sure to install optimized defaults or not. You press <Y>, and then <Enter>, the Setup Utility loads all default values; or press <N>, and then <Enter>, the Setup Utility does not load default values.

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

Save Changes and Exit

Highlight this item and press <Enter> to save the changes that you have made in the Setup Utility configuration. When the Save Changes and Exit dialog box appears, press Y to save and exit, or press N to return to the main menu.

Discard Changes and Exit

Highlight this item and press <Enter> to discard any changes that you have made in the Setup Utility and exit the Setup Utility. When the Discard Changes and Exit dialog box appears, press <Y> to discard changes and exit, or press <N> to return to the main menu.

Note: *If you have made settings that you do not want to save, use the "Discard Changes and Exit" item and press <Y> to discard any changes you have made.*

Chapter 4

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.

Utility Software Reference

All the utility software available on the CD-ROM is Windows compliant. It is provided only for the convenience of customers. The following software is furnished under license and may only be used or copied in accordance with the terms of the license.

Note: *The software in these folders is subject to change at anytime without prior notice. Please refer to the support CD for available software.*

AMI Flash Memory Utility

This utility enables you to erase the system BIOS stored on a Flash Memory chip on the main board, 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.

PC-CILLIN 2002

The PC-CILLIN software program provides anti-virus protection for your system. This program is available for Windows XP/2000/ME/98SE 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.

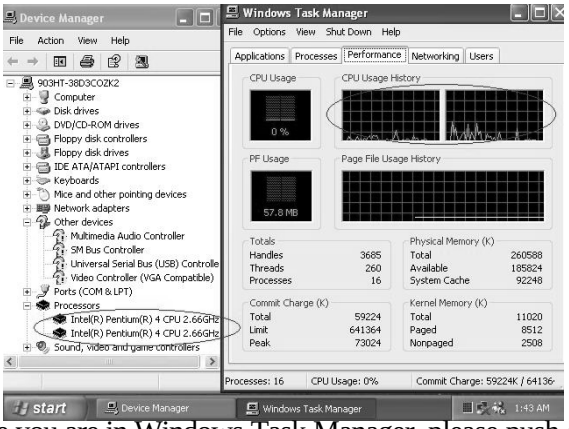
Note: *Update your virus software regularly to protect against new viruses.*

Hyper Threading CPU

You must update BIOS to initiate BIOS Hyper Threading Function and use HT CPU function under WinXP Operating System; if not, please disable this option.

- When BIOS detects the HT CPU, it shows the "Hyper Threading Function (default Disabled)" option, which you must set Enabled if you want to test HT CPU function. If there is no HT CPU, this option is hidden and default Disabled.

- You must re-install WINXP to activate the HT CPU function.



While you are in Windows Task Manager, please push down ctrl+Alt Del keys. A dual CPU appears in the CPU Usage History&Device Manager under WinXP.

***Note**: Hyper Threading Function only works under WINXP Operating System; therefore, disable it under other Operating System.*
