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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. Please be noted there are some USB2.0 limitations while installing the driver, and it is necessary to execute the manual installation. Please refer to the details and follow the steps as Appendix of USB2.0 Driver Limitations and Manual Installation on Page 39.

Table of Contents

Chapter 1

Introduction

This mainboard has a **Socket-478** supporting **Intel Pentium 4/Hyper Threading Technology** processors with front-side bus (FSB) speeds up to **533**/400 **MHz**. Hyper Threading Technology, designed to take advantage of the multitasking features in Windows XP, gives you the power to do more things at once.

This mainboard has the **Intel 845GE/GL/GV** chipset that contains Intel 82845 Memory Controller Hub and Intel 82801 I/O Controller Hub. It supports built-in **USB 2.0** providing higher bandwidth.
It implements **Universal Serial Bus Specification Revision 2.0** and is compliant with **UHCI 1.1** and **EHCI 0.95**. This mainboard supports **AC 97 audio codec** and provides **Ultra DMA** 33/66/**100** function.
This mainboard has one **CNR** (Communications and Networking Riser) and two 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 VGA port, one parallel port and six USB ports (**USB2.0**)– four back-panel ports and onboard USB header USB3 providing two extra ports by connecting the Extended USB Module to the mainboard.

This mainboard is an **Micro ATX** mainboard that uses a 4-layer printed circuit board and measures 244 x 220mm.

Note: You must initiate the HT CPU function through BIOS setup. It is strongly recommended you refer to the Appendix (page 41) for relative details.

Key Features

This mainboard has these key features:

Socket-478 Processor
♦ Supports **Intel Pentium 4 series** CPU with/without **Hyper Threading** Technology
♦ Supports up to **533**/400 **MHz** Front-Side Bus

Chipset
There are **Intel 845GE/GL/GV** chipset that contains Intel 82845 Memory Controller Hub and Intel 82801 I/O Controller Hub in accordance with an innovative and scalable architecture with proven reliability and performance. Here is a list of the chipset arrangement and their respective features:

Northbridge	Function
845**GE**	Support: CPU FSB: **533**/400MHz, **Hyper-Threading Technology**, DDR**333**/266, USB2.0, Ultra ATA 100/66/33
845**GV**	Support: CPU FSB: **533**/400MHz, **Hyper-Threading Technology**, DDR**333**/266, USB2.0, Ultra ATA 100/66/33
845**GL**	Support: CPU FSB: **533**/400MHz, USB2.0, Ultra ATA 100/66/33, DDR**266** Doesn't support: Hyper-Threading Technology

Memory Support
♦ Two 184-pin DIMM slots for DDR SDRAM memory modules
♦ Support DDR up to **333**MHz (845**GE/GV**) or DDR266MHz (845GL) memory bus
♦ Maximum installed memory is 2GB

AC97 Audio Codec

- ♦ Compliant with AC'97 2.2 specification
- ♦ Full-duplex Codec with independent and variable sampling rate
- ♦ Earphone Buffer Built-In, SNR up to 90db
- ♦ 4Ch DAC, support 4-channel speak-out
- ♦ Advanced power management support

Expansion Options

The mainboard comes with the following expansion options:

- ♦ Two 32-bit PCI slots
- ♦ Supports IDE Ultra DMA bus mastering with transfer rates of 33/66/100 MB/sec
- ♦ One CNR (Communications and Networking Riser) slot

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 VGA port
- ♦ One parallel port
- ♦ Six USB ports (four back-panel ports, onboard USB headers providing two extra ports)— **USB2.0**
- ♦ Audio jacks for microphone, line-in and line-out

Fast Ethernet LAN (optional)

- ♦ **10 Mb/s and 100 Mb/s operation**
- ♦ Integrated Fast Ethernet MAC
- ♦ PCI local bus single-chip Fast Ethernet controller
  - • Compliant to PCI Revision 2.2
  - • Supports ACPI, PCI power management
- ♦ Compliant to PC99/PC2001 standard
- ♦ Supports a 32-bit general-purpose timer with the external PCI clock as clock source, to generate timer-interrupt
- ♦ Supports Full Duplex Flow Control (IEEE 802.3x)

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
- ♦ **MediaRing Talk** provides PC to PC or PC to Phone internet phone communication
- ♦ **3Deep** delivers the precise imagery and displays accurate color in your monitor
- ♦ **PC DJ** is a dual-MP3 player that enables users to actually mix music right on their own personal computers.
- ♦ **Adobe Acrobat Reader V5.0** is the software to help users read .PDF files.

Dimensions

♦ Micro ATX form factor of 244 x 220mm

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
❑ Software support CD

Optional Accessories

You can purchase the following optional accessories for this mainboard.

❑ Extended USB module
❑ CNR v.90 56K Fax/Modem card
❑ Card Reader (You can buy your own Card Reader from the third party, but please contact your local Card Reader vendor on any issues of the specification and compatibility.)

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 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.

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 connecting headers on the mainboard
❑   Install other devices and make the appropriate connections to the mainboard connecting headers

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.
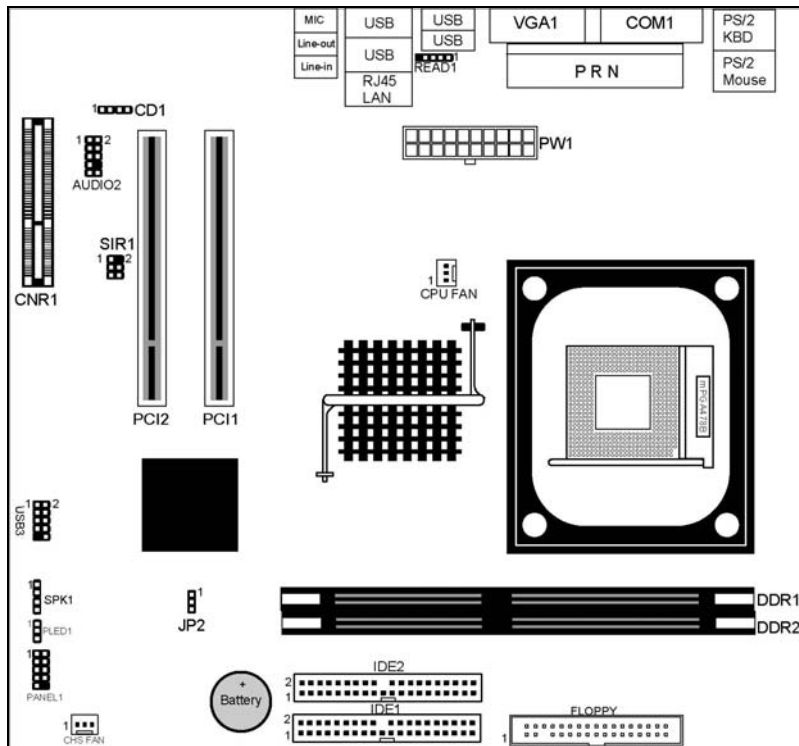
> **Note:** Any jumpers on your mainboard not appearing in this illustration are for testing only.

I/O Ports

The illustration below shows a side view of the built-in I/O ports on the mainboard.
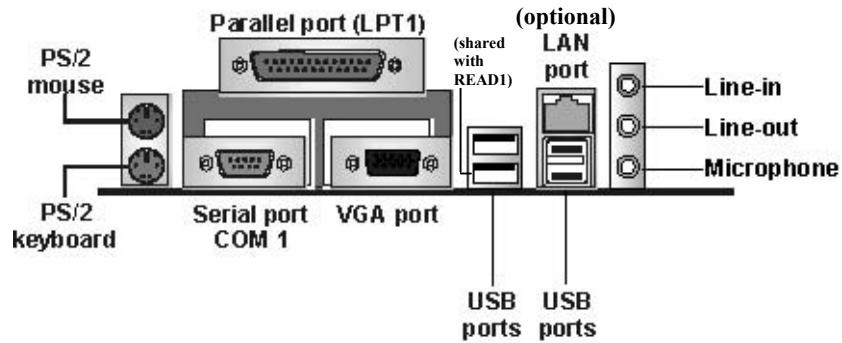
PS/2 Mouse	Use the upper PS/2 port to connect a PS/2 pointing device.
PS/2 Keyboard	Use the lower PS/2 port to connect a PS/2 keyboard.
LPT1	Use LPT1 to connect printers or other parallel communications devices.
COM1	Use the COM port to connect serial devices such as mice or fax/modems. COM1 is identified by the system as COM1.
VGA	Use the VGA port to connect VGA devices.
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 READ1 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 CPU socket's locking lever by pulling it away from socket and raising it to the upright position.
2. Match the pin 1 corner of CPU socket to the one of processor, and insert the processor 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. Lower the CPU fan/heatsink unit onto the CPU and CPU socket, and then use the retention module clamps to snap the fan/heatsink into place.
6. Plug the CPU fan power cable into the CPU cooling fan power supply connector 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 200/266 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 or 2.1 GB/s data transfer rate depending on whether the bus is 100 MHz or 133 MHz. DDR SDRAM uses additional power and ground lines and requires 184-pin 2.5V unbuffered DIMM module.

DDR1

DDR2
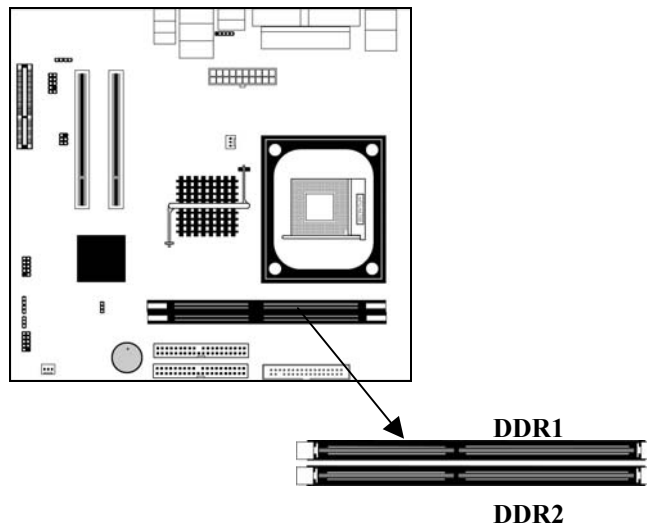
Installation Procedure

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

1. Push the latches on each side of the DIMM socket down.
2. Align the memory module with the socket. The DIMM sockets are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
3. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM socket.
4. 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.
5. Install any remaining DIMM modules.

Jumper Settings
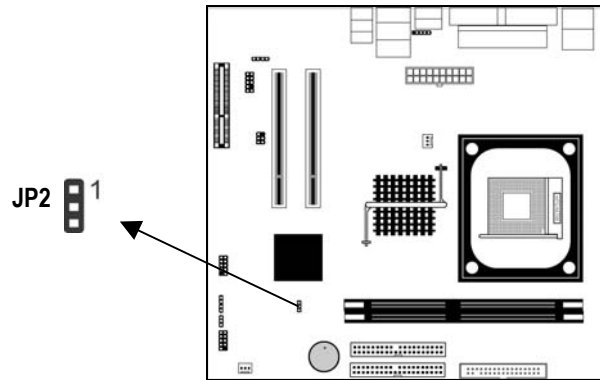
JP2: Clear CMOS Jumper

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
Normal	Short Pins 1-2
Clear CMOS	Short Pins 2-3

Install the Mainboard

Install the mainboard in a system chassis (case). The board is an Micro-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 instructions provided by the case manufacturer using the hardware and internal mounting points on the chassis.
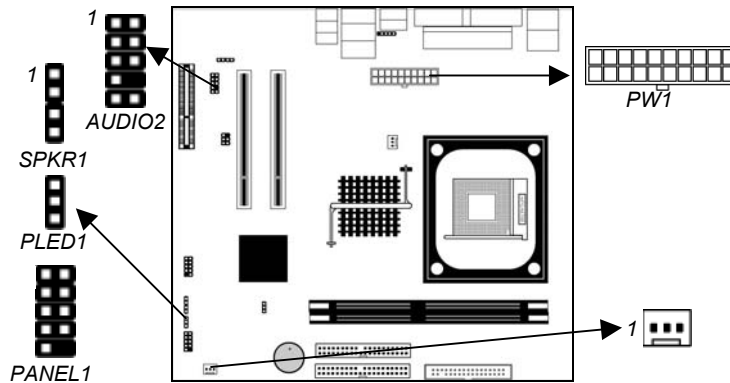
Connect the power connector from the power supply to the **PW1** connector on the mainboard.

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

Connect the cable from the PC speaker to the **SPKR1** header on the mainboard.

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

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Connect the case switches and indicator LEDs to the **PANEL1** header. Here is a list of the PANEL1 header's 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

If there are a headphone jack or/and a microphone jack on the front panel, connect the cables to the **AUDIO2** header on the mainboard. Here is a list of the AUDIO2 header's pin assignments.

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

If there is another power-on indicator LED installed in the system chassis, connect the LED to the **PLED1** header.

Pin	Signal
1	GROUND
2	NC
3	POWER

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Optional Extension Brackets

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

Note: All the ribbon cables used on the extension brackets have a red stripe on the Pin-1 side of the cable.

Extended USB Module
This module bracket makes two extra USB 2.0 ports for more USB devices.
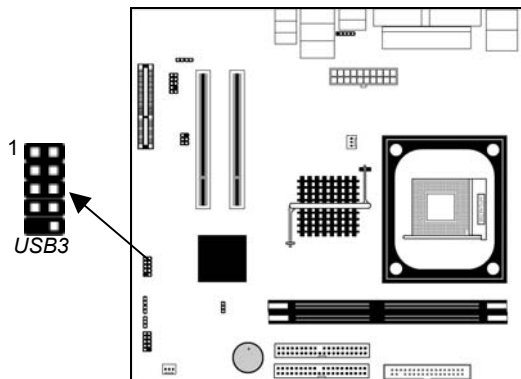
Pin	Signal	Pin	Signal
1	VERG_FP_USBPWR0	2	VERG_FP_USBPWR0
3	USB_FP_P0-	4	USB_FP_P1-
5	USB_FP_P0+	6	USB_FP_P1+
7	GROUND	8	GROUND
9	KEY	10	USB_FP_OC0

1. Locate the USB3 header on the mainboard.
2. Plug the bracket cable onto the USB3 header.
3. In the system chassis, remove a slot cover from one of the expansion slots and install the extension bracket in the opening. Secure the extension bracket to the chassis with a screw.

Install Other Devices

Install and connect any other devices in the system following the steps below.
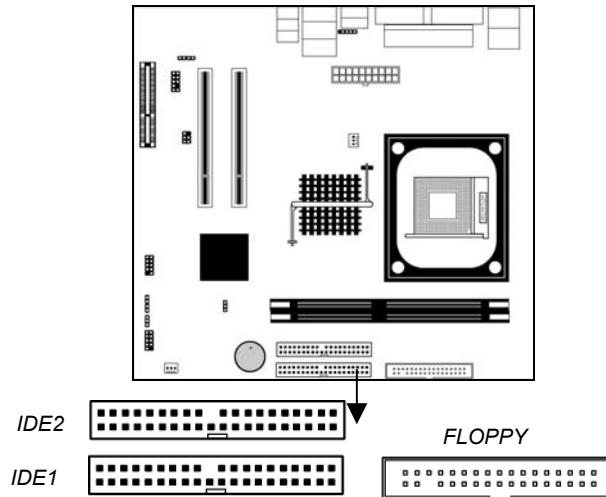
Floppy Disk Drive
The mainboard ships with a floppy disk drive cable that can support one or two drives. Drives can be 3.5" or 5.25" wide, with capacities of 360K, 720K, 1.2MB, 1.44MB, or 2.88MB.
Install your drives and connect power from the system power supply. Use the cable provided to connect the drives to the floppy disk drive connector **FLOPPY**.

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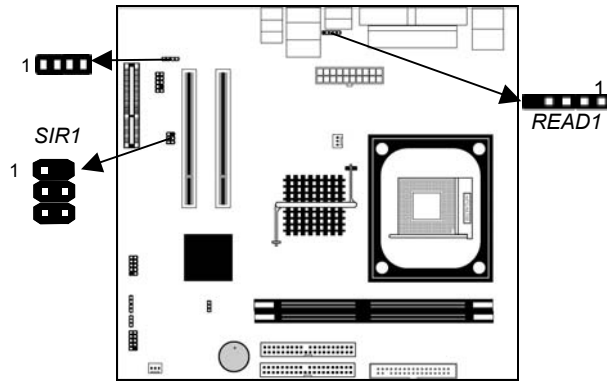
When you first start up your system, the BIOS should automatically detect your CD-ROM/DVD drive. If it doesn't, enter the Setup Utility and configure the CD-ROM/DVD drive that you have installed. On the mainboard, locate the 4-pin connector **CD1**.

CD1

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

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READ1: 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	Pin	Signal
1	VCC	2	USB-
3	USB+	4	GND
5	KEY		

The READ1 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 header 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.

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 IR header and then secure the port to an appropriate place in your system chassis.

Pin	Signal	Pin	Signal
1	NC	2	KEY
3	+5V	4	GND
5	IRTX	6	IRRX

Expansion Slots

This mainboard has one CNR and two 32-bit PCI slots.

CNR1

PCI2   PCI1
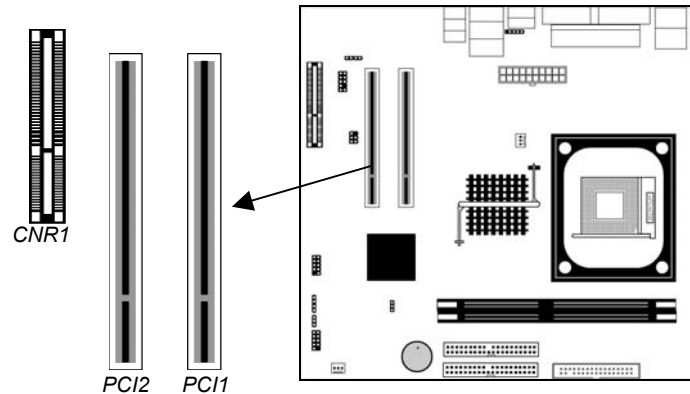
Follow the steps below to install a CNR/PCI expansion card.
1. Locate the CNR or PCI slots on the mainboard.
2. Remove the slot cover for this slot from the system chassis.
3. Insert the expansion card edge connector into the slot and press it firmly down into it so that it is fully inserted.
4. Secure the expansion card bracket to the system chassis with a screw.

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

CNR Slot
This slot is used to insert CNR (Communications and Networking Riser) cards including LAN, Modem, and Audio functions.

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 those 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.

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

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

```
Esc :   Quit      ↑ ↓ ← →: Select Item  (Shift)F2 : Change Color  F5 : Old Values
F6   :   Optimal values              F7 : Best  performance values   F10 : Save&Exit
```

```
Standards COMOS setup for changing time, date, hard disk type, etc.
```

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. Hold down the **Shift** key and press **F2** to cycle through the Setup Utility's optional color schemes.

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 **F5** to reset the changes to the original values. Press **F6** to install the setup utility with a set of default values. Press **F7** to install the setup utility with a set of high-performance values.

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Standard CMOS Setup Page

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

```
┌─────────────────────────────────────────────────────────────────────┐
│              AMIBIOS SETUP – STANDARD CMOS SETUP                     │
│        (C) 2000 American Megatrends, Inc. All Rights Reserved        │
├─────────────────────────────────────────────────────────────────────┤
│ Date  (mm/dd/yy) : Wed Apr 23, 2003                                 │
│ Time  (hh/mm/ss) :  17:48:17                                        │
│                                          LBA   Blk   PIO   32Bit     │
│           Type        Size Cyln Head WPcom Sec Mode  Mode  Mode  Mode│
│ Pri Master  : Auto                                              On    │
│ Pri Slave   : Auto                                              On    │
│ Sec Master : Auto                                               On    │
│ Sec Slave   : Auto                                              On    │
│ Floppy Drive A :  1.44 MB 3 1/2                                     │
│ Floppy Drive B :  Not Installed                                     │
├─────────────────────────────────────────────────────────────────────┤
│ Month :  Jan – Dec                           ESC  :  Exit           │
│   Day :  01 – 31                             ↑↓  :  Select Item     │
│   Year :  1901 – 2099                        PU/PD/+/-  :  Modify    │
│                                              (Shift)F2  :  Color     │
│                                              F3  :  Detect All HDD   │
└─────────────────────────────────────────────────────────────────────┘
```

Date & Time	These items set up system date and time.
IDE Pri Master **Pri Slave** **Sec Master** **Sec 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.

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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.

```
┌─────────────────────────────────────────────────────────────────────┐
│                  AMIBIOS SETUP – ADVANCED SETUP                       │
│          (C) 2000 American Megatrends, Inc. All Rights Reserved       │
├───────────────────────────────────┬─────────────────────────────────┤
│ Quick Boot                Enabled  │                                 │
│ 1st Boot Device           IDE-0    │                                 │
│ 2nd Boot Device           Floppy   │                                 │
│ 3rd Boot Device           CD/DVD-0 │                                 │
│ Try Other Boot Devices    Yes      │                                 │
│ S.M.A.R.T. for Hard Disks Disabled │                                 │
│ Floppy Drive Swap         Disabled │                                 │
│ Floppy Drive Seek         Disabled │                                 │
│ Password Check            Setup    │                                 │
│ L2 Cache                  Enabled  │ ESC : Quit      ↑↓←→ : Select Item│
│ System BIOS Cacheable     Enabled  │ F1  : Help      PU/PD/+/- : Modify│
│ SDRAM Frequency           133MHz   │ F5  : Old Values (Shift)F2 : Color│
│ SDRAM Timing by SPD       Enabled  │ F6  : Load BIOS Defaults         │
│   SDRAM CAS#  Latency     3 Clocks │ F7  : Load Setup Defaults        │
│   SDRAM RAS# Precharge    3 Clocks │                                 │
│   SDRAM RAS# to CAS# Delay 3 Clocks│                                 │
│   SDRAM Precharge Delay   7 Clocks │                                 │
│ Hyper Threading Function  Disabled │                                 │
│ Spread Spectrum           Disabled │                                 │
│ Auto Detect DIMM/PCI Clk  Enabled  │                                 │
└───────────────────────────────────┴─────────────────────────────────┘
```

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.

S.M.A.R.T. for Hard Disks	Enable this item if any IDE hard disks support the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) feature.
Floppy Drive Swap	If you have two diskette drives installed and you enable this item, drive A becomes drive B and drive B becomes drive A.
Floppy Drive Seek	If you enable this item, your system will check all floppy disk drives at start up. Disable this item unless you are using an old 360KB drive.
Password Check	If you have entered a password for the system, use this item to determine, if the password is required to enter the Setup Utility (*Setup*) or required both at start-up and to enter the Setup Utility (*Always*).
L2 Cache	Leave these items enabled since all the processors that can be installed on this board have internal L2 cache memory.
System BIOS Cacheable	If you enable this item, a segment of the system BIOS will be copied to main memory for faster execution.
SDRAM Frequency	This item determines frequency of SDRAM memory.
SDRAM Timing By SPD	This item allows you to enable or disable the SDRAM timing defined by the Serial Presence Detect electrical.
SDRAM 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.

SDRAM RAS# Precharge	Select the number of CPU clocks allocated for the Row Address Strobe (RAS#) signal to accumulate its charge before the SDRAM is refreshed. If insufficient time is allowed, refresh may be incomplete and data lost.
SDRAM RAS# to CAS# Delay	This field lets you insert a timing delay between the CAS and RAS strobe signals, used when SDRAM is written to, read from, or refreshed. Disabled gives faster performance; and Enabled gives more stable performance.
SDRAM RAS# Precharge Delay	The precharge time is the number of cycles it takes for SDRAM to accumulate its charge before refresh.
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.
Spread Spectrum	If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.
Auto detect DIMM/PCI Clock	When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.

Power Management Setup Page

This page sets some parameters for system power management operation.

```
              AMIBIOS SETUP – POWER MANAGEMENT SETUP
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ACPI Aware O/S                Yes
Power Management/APM          Enabled
Suspend Time Out (Minute)     Disabled
Resume On RTC Alarm           Disabled
RTC Alarm Date                15
RTC Alarm Hour                12
RTC Alarm Minute              30
RTC Alarm Second              30         ESC : Quit          ↑↓←→ : Select Item
LAN/Ring Power On             Disabled   F1  : Help          PU/PD/+/- : Modify
Keyboard Power On             Disabled   F5  : Old Values  (Shift)F2  : Color
Specific Key for PowerOn      N/A        F6  : Load BIOS Defaults
                                         F7  : Load Setup Defaults
```

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

Resume On RTC Alarm / Date / Hour / Minute / Second	The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.
LAN/Ring Power On	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.
Keyboard Power On	If you enable this item, you can turn the system on and off by pressing hot keys on the keyboard. You must enable the Keyboard Power On jumper and use an ATX power supply in order to use this feature.
Specific Key for PowerOn	When the Power On function is set to Password, use this item to set the password.

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.

```
AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP
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Primary Graphics Adapter      PCI
OnChip VGA Mode Select        1MB
Allocate IRQ to PCI VGA       Yes
PCI IDE BusMaster             Disabled

                              ESC  : Quit          ↑↓←→ : Select Item
                              F1   : Help          PU/PD/+/- : Modify
                              F5   : Old Values  (Shift)F2  : Color
                              F6   : Load BIOS Defaults
                              F7   : Load Setup Defaults
```

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.
OnChip VGA Mode Select	This item provides the VGA mode with four options of 1MB, 8MB, Disabled or 512KB. We recommend you leave this item at the default value.
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.

Load Optimal Settings

If you select this item and press **Enter** a dialog box appears. If you press **Y**, and then **Enter**, the Setup Utility loads a set of fail-safe default values. These default values are not very demanding and they should allow your system to function with most kinds of hardware and memory chips.
Note : It is highly recommend that users enter this option to load optimal values for accessing the best performance.

Load Best Performance Settings

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

Features Setup Page

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

```
AMIBIOS SETUP – FEATURES SETUP
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OnBoard FDC                 Enabled
OnBoard Serial PortA        3F8/COM1
OnBoard IR Port             Disabled
OnBoard Parallel Port       Auto
   Parallel Port Mode       ECP
   EPP Version              N/A
   Parallel Port IRQ        Auto
   Parallel Port DMA        Auto        ESC : Quit        ↑↓←→ : Select
OnBoard IDE                 Both        Item
Audio Device                Auto        F1   : Help       PU/PD/+/- : Modify
Modem Device                Auto
Ethernet Device             Enabled     F5   : Old Values  (Shift)F2  : Color
Onboard USB Function        Enabled     F6   : Load BIOS Defaults
USB Function For DOS        Disabled    F7   : Load Setup Defaults
ThumbDrive Support For DOS  Disabled
```

OnBoard FDC	This item enables or disables the onboard floppy disk drive interface.
OnBoard Serial PortA	These items enable or disable the onboard COM1 serial port, and to assign a port address.
OnBoard IR Port	This item enables or disables the Infrared port, and assigns a port address. If you select a specific address, the resources are assigned to the IR port, and you can use these items below to determine the operation of the IR port.

Onboard Parallel Port	This item enables or disables the onboard LPT1 parallel port, and to assign a port address. The Auto setting will detect and available address.
Parallel Port Mode	This item sets the parallel port mode. You can select SPP (Standard Parallel Port), ECP (Extended Capabilities Port), EPP (Enhanced Parallel Port), or ECP + EPP.
Parallel Port IRQ	This item assigns IRQ to the parallel port.
Parallel Port DMA Channel	This item assigns a DMA channel to the parallel port.
OnBoard IDE	This item enables or disables the onboard IDE channel.
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 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.
ThumbDrive Support For DOS	Enable this item to make a small portion of memory storage device for the USB ports.

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.

```
┌────────────────────────────────────────────────────────────────────┐
│                 AMIBIOS SETUP – CPU PnP SETUP                        │
│        ©2000 American Megatrends, Inc. All Rights Reserved           │
├───────────────────────────────┬────────────────────────────────────┤
│  CPU Type              INTEL P4│                                    │
│  CPU Core Voltage      1.728 V │                                    │
│  CPU Ratio Selection   8.0x    │                                    │
│  CPU Speed             133 MHz │                                    │
│                                │                                    │
│                                ├────────────────────────────────────┤
│                                │  ESC : Quit       ↑↓←→ : Select Item│
│                                │  F1  : Help      PU/PD/+/- : Modify │
│                                │  F5  : Old Values (Shift)F2 : Color │
│                                │  F6  : Load Optimal values          │
│                                │  F7  : Load Best performance values │
└───────────────────────────────┴────────────────────────────────────┘
```

CPU Type/ Core Voltage/ Ratio /Speed	These items show the type, core voltage, ratio and speed of CPU installed in your system.

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Hardware Monitor Page

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

```
╔══════════════════════════════════════════════════════════════╗
║              AMIBIOS SETUP – HARDWARE MONITOR                  ║
║        (C) 2000 American Megatrends, Inc. All Rights Reserved  ║
╠═══════════════════════════════╤══════════════════════════════╣
║ *** System  Hardware  ***     │                              ║
║ Vcore                1.728 V   │                              ║
║ Vcc 3.3V             3.312 V   │                              ║
║ Vcc                  5.030 V   │                              ║
║ +12V                 12.045V   │                              ║
║ SB5V                 4.800 V   │ ESC : Quit    ↑↓←→ : Select Item║
║ VBAT                 3.248 V   │ F1  : Help      PU/PD/+/- : Modify║
║ SYSTEM Fan Speed     0 RPM     │ F5  : Old Values (Shift)F2 : Color║
║ CPU Fan Speed        3629 RPM  │ F6  : Load BIOS Defaults      ║
║ SYSTEM Temperature   28°C/82°F │ F7  : Load Setup Defaults     ║
║ CPU Temperature      59°C/138°F│                              ║
║                               │                              ║
╚═══════════════════════════════╧══════════════════════════════╝
```

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

Change Password

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

Exit

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

Chapter 4

Software & Applications

Introduction

This chapter describes the contents of the support CD-ROM that comes with the mainboard package.

The support CD-ROM contains all useful software, necessary drivers and utility programs to properly run our products. More program information is available in a README file, located in the same directory as the software.

To run the support CD, simply insert the CD into your CD-ROM drive. An Auto Setup screen automatically pops out, and then you can go on the auto-installing or manual installation depending on your operating system.

If your operating system is Windows 98/ME/2000/XP, it will automatically install all the drivers and utilities for your mainboard; if Windows NT or manual installation, please follow the instructions described as the Installing under Windows NT or Manual Installation section.

Installing Support Software

1. Insert the support CD-ROM disc in the CD-ROM drive.
2. When you insert the CD-ROM disc in the system CD-ROM drive, the CD automatically displays an Auto Setup screen.
3. The screen displays three buttons of **Setup**, **Browse CD** and **Exit** on the right side, and three others **Setup**, **Application** and **ReadMe** at the bottom. Please see the following illustration.
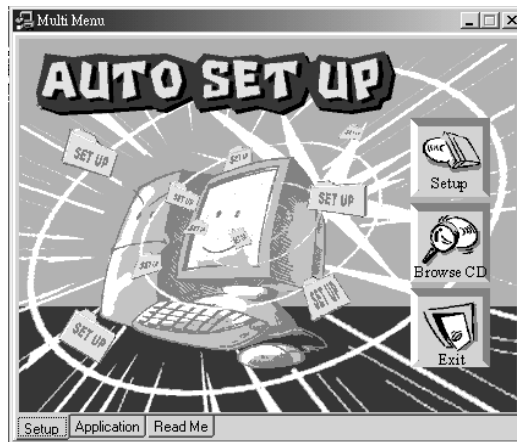
The **Setup** button runs the software auto-installing program as explained in next section.

The **Browse CD** button is a standard Windows command that you can check the contents of the disc with 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 the CD-ROM driver from the Windows Explorer, and click the Setup icon.

The **Application** button brings up a software menu. It shows the bundled software that this mainboard supports.

The **ReadMe** brings you to the Install Path where you can find out path names of software driver.

Auto-Installing under Windows 98/ME/2000/XP

If you are under Windows 98/ME/2000/XP, please click the **Setup** button to run the software auto-installing program while the Auto Setup screen pops out after inserting the support CD-ROM:

1. The installation program loads and displays 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.
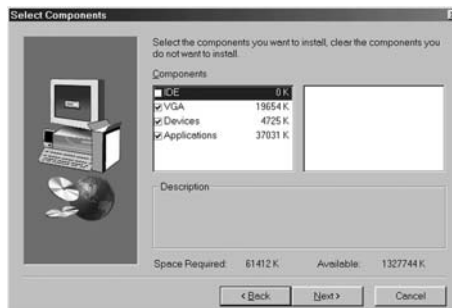
3. The support software will automatically install.

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

Installing under Windows NT or Manual Installation

If you are under Windows NT, the auto-installing program doesn't work out; or you have to do the manual installation, please follow this procedure while the Auto Setup screen pops out after inserting the support CD-ROM:

1. Click the **ReadMe** to bring up a screen, and then click the Install Path at the bottom of the screen.
2. Find out your mainboard model name and click on it to obtain its correct driver directory.
3. Install each software in accordance with the corresponding driver path.

Bundled Software Installation

All bundled software available on the CD-ROM is for users' convenience. You can install bundled software as follows:
1. Click the **Application** button while the Auto Setup screen pops out after inserting the support CD-ROM.
2. A software menu appears. Click the software you want to install.
3. Follow onscreen instructions to install the software program step by step until finished.

Appendix

Intel USB 2.0 Driver Limitations & Manual Installation

♦ USB2.0 Driver only works under the Operating System
  WinXP/Win2K. However, if your Operating System
  Windows XP has the Service Pack, you can directly
  access the driver regardless of the driver limitations.
♦ You must follow these steps to manually install the WinXP
  driver; otherwise, you can't succeed this driver's installation.
  1. Simply install Windows XP with PS2 Keyboard/Mouse.
  2. Install INF Update 4.00.1009 PV.
     - Install IAA 2.1 PV (2124).
     - Install GFX 11.0 PC 1.01 (3051).
     - Install LAN 6.1 PV.
     - Install AC97 Beta.
  3. Install USB 2.0 for XP 3616.
  4. Use **Tools/Folder Options…/View.** to change the items
     below:
     - Enable "Display the full path in the title bar".
     - Enable "Show Hidden files and folders".
     - Disable "Hide extensions of known files types".
     - Disable "Hide protected operating system files
       (Recommended)".
  5. Check USB driver version from:
     C:\Windows\System32\Drivers directory
     USBEHCI.SYS – 3/20/2002.
     USBPORT.SYS – 8/17/2001.
     USBHUB.SYS – 8/17/2001.

6.Go on executing the manual installation as below:

6-1 Disable Windows File Protection (WFP)
- From **Start button/run/Regedit.**
- **Set HKEY_LOCAL_MACHINE\
Software\Microsoft\Windows NT\
CurrentVersion\Winlogon\SFCDisable** = 1

6-2 Copy all USB files from CD to HDD.
- Copy all test drivers to %windir%\driver cache\i386.
- **Copy all test drivers to %windir%\system32\dllcache**
You need to copy file to this directory first. Otherwise, Windows XP will replace file from this directory to system32\drivers.
- Copy all test drivers to %windir%\system32\drivers.

6-3 Check USB driver version again.
**USBEHCI.SYS – 3/20/2002.
USBPORT.SYS – 3/20/2001.
USBHUB.SYS – 3/20/2001.**

6-4 Enable Windows File Protection (WFP)
- Start button/run/Regedit.
- Set HKEY_LOCAL_MACHINE\
Software\Microsoft\Windows NT\
CurrentVersion\Winlogon\SFCDisable = 0

♦ While installing the USB2.0 driver under WinME operating system, a green question mark pops out. Please rest assured it is normal.
♦ Under the Window operating system, the BIOS Setup Utility doesn't support the "USB Function For Dos Enable" feature.
♦ You can't use the USB Keyboard Chicony KU-8933.

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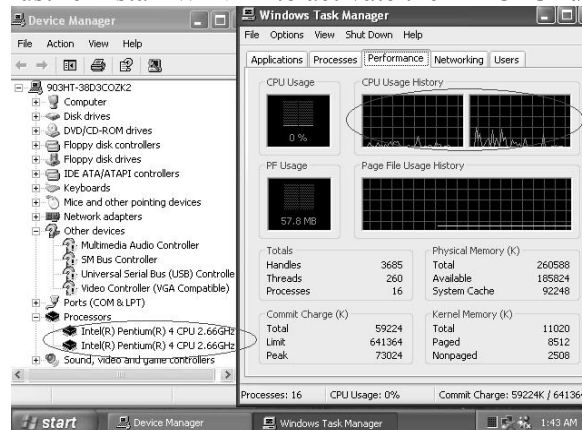
While you are in Windows Task Manager, please push down ctrl+Alt Del keys. A dual CPU appears in the CPU Usage History&Device Manager under WinXP.

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