Contents

Chapter 1 Specification

Introduction

This series features an integration of the powerful processor Intel Pentium 4 and the single-chip North Bridge of VIA P4X533 plus South Bridge VT8237. The Intel P4 processor is a rapid execution engine providing 800/533/400MHz FSB, while North Bridge P4X533 is a high performance integrated chipset providing DDR *400/333/266/200 SDRAM memory interface, Hub interface, and AGP interface.

Integrated with P4X533, South Bridge VT8237 supports the LPC Super I/O, the USB 2.0 interface, ATA 133/100/66 data transfer rate, SATA RAID interface and AC'97 6 channel Audio interface. This chapter is to introduce to users every advanced function of this high performance integration.

Topics included in this chapter are:
1-1 Component Locations
1-2 Chipset Diagram
1-3 Mainboard Specifications**

** If any difference is found between the mainboard description and the Mainboard you are using, please look up the <u>Errata/ Update Slip</u> enclosed inside for the correction or updated information, or else contact the mainboard Dealer or visit our Web Site for the latest manual update.

1-1 85ERV4-R / 85ERV4-RL Components Locations

LAN Controller ⎫
RJ45 LAN Connector ⎬ for 85ERV4-RL only
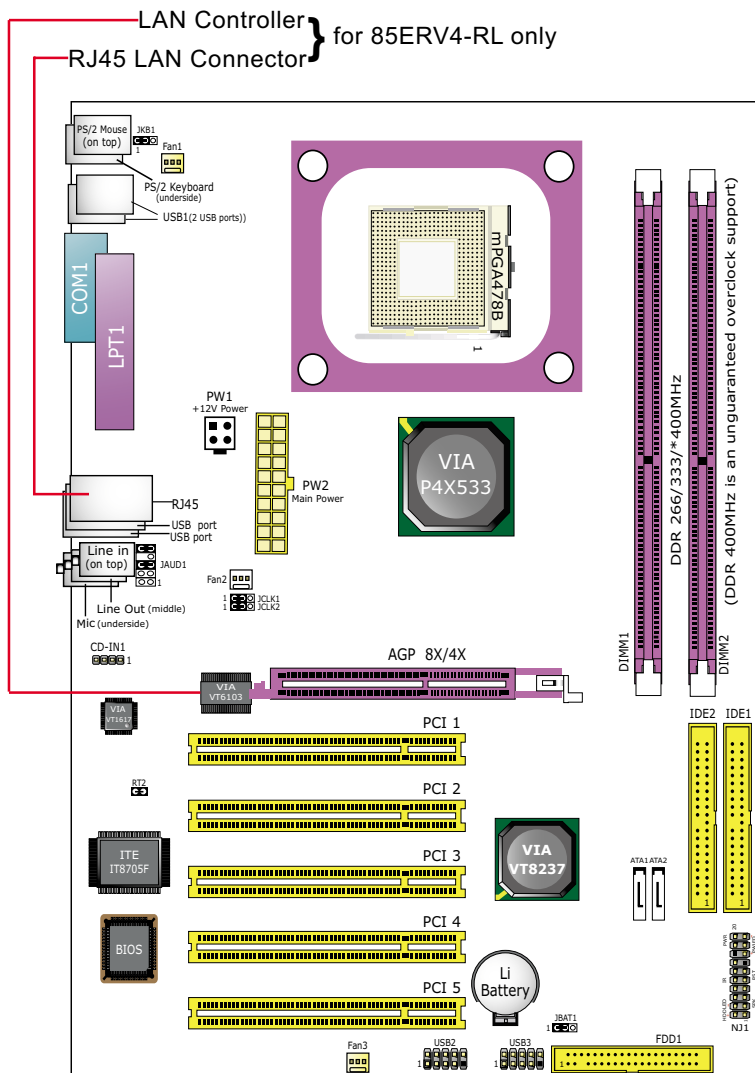
*FSB800 and DDR400 are unguaranteed overclock support.

1-2 Chipset System Block Diagram

```
                    Intel Pentium 4 CPU
                    (HT & Prescott CPUs
                      up to 3.0 GHz)

                      System Bus 400/533/*800MHz

                      North Bridge          Single Channel      System
  AGP Slot   AGP 8X/4X                      DDR 266/333/*400     Memory
                      VIA P4X533            SDRAM

                          8X V-Link
                          533MB/s
                                                            PCI Slots
  2 IDE      ATA 133/100/66                    PCI Bus
  Connector                    South
                               Bridge
  Audio      AC'97 2.2                      (Optional)
  Connectors (6-channel)
                               VT8237        VT6103      RJ45
  USB        USB Bus V2.0                    (LAN)
  Ports

  Keyboard  & Mouse                         SATA RAID    2 SATA
                                                         Connectors

  IR
  FDD
  Serial Ports   LPC I/O                                BIOS
  Printer Port   IT8705F
  H/Monitor
```

*FSB800 and DDR400 are unguaranteed overclock support.

Intel Pentium 4 + VIA P4X533 + VT8237 Diagram

1-3 Mainboard Specifications

1-3.1 CPU Socket

CPU Socket 478B on board, supporting Intel® Pentium 4 processors (including Intel Hyper-Threading and Prescott CPUs up to 3.0GHz) in the 478-pin package for :

-- 400/533/800MHz System Bus ;

    512KB L2 Advanced Transfer Cache

-- Hyper-pipelined technology; Advanced dynamic execution;

-- Rapid Execution Engine; Streaming SIMD Extensions 2

-- 128 Bit Enhanced Floating Point Unit; Execution Trace Cache

1-3.2 System Chipsets

North Bridge VIA P4X533:

• Supporting 400/533/*800MHz Front Side Bus
• Supporting DDR 266/333/*400 SDRAM memory interface(DDR400 unguaranteed overclock support), HUB interface, AGP 8x/4X interface as well as Hyper Threading Technology.
• Showing Hyper Threading Logo when booting with a Hyper Threading CPU.

South Bridge VT8237:

• Supporting the 8X V-Link, LPC Super I/O, Upstream Hub interface, PCI interface, IDE interface, LAN interface, USB V2.0 interface, SATA RAID interface as well as the AC'97 6-channel Audio interface.

1-3.3 Memory

2 DDR DIMM 184-pin slots on board for non-ECC DDR 400/333/266 SDRAMs:

• Installation of mixed volumes yet same type of DDR SDRAM modules supported .

1-3.4 AGP (Accelerated Graphics Port) interface

AGP Controller is embedded on board, supporting:

• 1.5V (8x/4x) power mode
• 8X 66MHz AD and SBA signaling; AGP pipelined split-transaction longburst transfers up to 2GB/sec.
• One AGP Slot on board, AGP v3.0 compliant

1-3.5 BIOS

Flash Memory for easy upgrade, supporting Year 2000 compliant, and sup-
porting various hardware configuration during booting system (See Chapter
4 BIOS Setup):
• Standard CMOS Features (Times, Date, Hard Disk Type etc,)
• Advanced BIOS Features (Password Check, Boot Sequence etc.)
• Advanced Chipset Features (AT Clock, DRAM Timing etc.)
• Power Management Features (Sleep Timer, Suspend Timer etc.)
• PNP/PCI Configurations (IRQ Settings, Latency Timers etc.)
• Integrated Peripherals (Onboard I/O, IRQ, DMA Assign. etc.)
• Hardware Monitor Status (CPU/System Temp., Fan speed etc.)
• Frequency/Voltage Control (CPU clock, Voltage of CPU, DIMM, AGP etc.)

1-3.6 Multi-I/O Functions:
• PCI EIDE Controller, supporting:
   -- 2x Ultra ATA 133/100 / 66 / 33 IDE Connectors supporting up to 4 IDE
   devices;
• Dedicated IR Functions:
    -- Third serial port dedicated to IR function either through the two complete
   serial ports or the third dedicated port Infrared-IrDA (HPSIR) and ASK
   (Amplitude Shift Keyed) IR.
• Multi-mode parallel Data transfer:
   -- Standard mode, ECP and EPP support;
• Floppy Disk connector:
   -- One FDD connector with drive swap support;
• Universal Serial Bus Transfer Mode:
   -- USB V2.0 compliant, 480 Mb/s USB Bus, supporting Windows 98 and later
      operating systems; USB drivers provided in Support CD for installation
   -- 4 built-in USB connectors and 2 USB Headers which require 2 additional
      USB cables to provide 4 more optional USB ports;
• PS/2 Keyboard and PS/2 Mouse
• UARTs (Universal Asynchronous Receiver / Transmitter):
   -- 1x Serial Port COM1 on board;

1-3.7 SATA RAID Interface

Serial ATA RAID Interface supported by VT8237:
• Supporting 2 Serial ATA RAID connectors for 2 SATA Hard Disks Array
   configuration with 150Mb/s transfer rate
• Serial ATA RAID Drivers enclosed in Support CD/Floppy Diskette for user's
   installation

1-3.8 Hardware Monitor on board
 • Hardware Monitor in IT8705F, providing monitoring and alarm for flexible
   desktop management of hardware voltage, temperatures and fan speeds.
 • Utility Software Soltek Hardware Monitor for displaying Monitoring status
   is enclosed in Support CD for user's installation.

1-3.9 AC'97 Audio Codec on board
 AC'97 Audio Codec Version 2.2 compliant on board
 • Supporting up to 6 channels of PCM audio output
 • 6 channel audio consists of Front Left, Front Right, Back Left, Back
   Right, Center and Subwoofer for complete surround sound effect
 • AC'97 Audio Codec Driver enclosed in Support CD for user's installation

1-3.10 Advanced System Power Management
 • ACPI 1.0B compliant (Advanced Configuration and Power Interface), in-
   cluding ACPI Suspend mode support (See "Power management Features"
   in BIOS Setup)
 • APM V1.2 compliant (Legacy Power Management)
 • Wake On LAN supported (See "Power Management Features" in BIOS
   Setup)
 • Real Time Clock (RTC) with date alarm, month alarm, and century field

1-3.11 LAN on board (for 85ERV4-RL only)
 PCI local bus single-chip Fast Ethernet Controller VT6103 on board:
 • Supporting 10/100Mb data transfer
 • Supporting Wake On LAN function through the on-board RJ45 LAN
   Connector

1-3.12 Form Factor
 • ATX Form Factor, ATX Power Supply Version 2.03 compliant, supported
   by one Main Power Connector, one +12V Power Connector
 • Mainboard size: 215mm x 305mm

Chapter 2 Hardware Setup
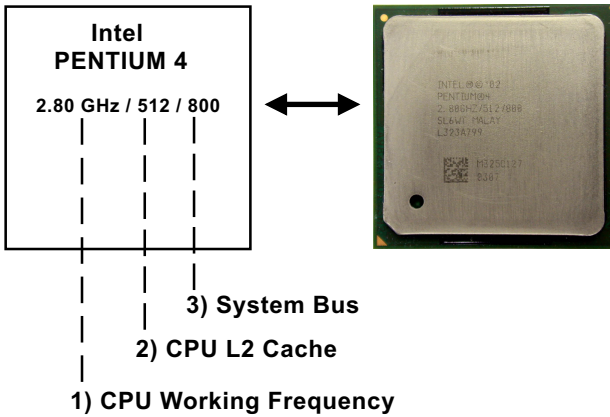
To Get things ready for Hardware setup !

1. We recommend to install your CPU before any other components. For detailed installation instructions of processor, you can also refer to the pamphlet enclosed in your CPU package.
2. Installing a cooling fan with a good heatsink is a must for proper heat dissipation for your CPU. Get ready an appropriate fan with heatsink for proper installation. Improper fan and installation will damage your CPU.
3. In case CPU Vcore, CPU clock or Frequency Ratio is adjustable on board, please follow the instructions described in the User manual for proper setup. Incorrect setting will cause damage to your CPU.

The following topics are included in this chapter:

2-1 CPU Installation with Socket 478B

2-1.1 To Identify a Pentium 4 CPU

**Intel
PENTIUM 4**

2.80 GHz / 512 / 800

3) System Bus

2) CPU L2 Cache

1) CPU Working Frequency

On the heatsink side of a Pentium 4 CPU, there printed a line of figures to identify its specifications. The line consists of 4 parts:

1. CPU Working Frequency: this part depicts the working frequency of the CPU. The Intel P4 processor with three differeent System Bus mode provides a variety of speeds ranging from 2A Ghz to 3.2GHz.
   400MHz System Bus: 2.60, 2.50, 2.40, 2.20, 2A GHz
   533MHz System Bus: 3.06, 2.80, 2.66, 2.53, 2.40, 2.26 GHz
   800MHz System Bus: 3.20, 3, 2.80C, 2.60C, 2.40C GHz

2. CPU L2 Cache: this part depicts the L2 Cache size. For example,
    512 stands for 512 KB L2 Cache; 256 stands for 256 KB L2 Cache

3. System Bus: this part depicts the System Bus (Front Side Bus) is provided by CPU clock x 4. For example,
   800MHz = 200MHz(CPU clock) x 4; 533MHz = 133MHz x 4
   400MHz = 100MHz x 4

Note: System Bus vs CPU Clock
P4 CPU is a quad-pumped CPU. The system bus is provided by the CPU clock x 4. Therefore, users can figure out the P4 CPU clock by the System Bus divided by 4.

Pentium 4 with Hyper Threading Technology :
The new P4 processors at 2.40C, 2.60C, 2.80C, 3, 3.20GHz with an advanced 800MHz system bus and P4 processor at 3.06Ghz with 533MHz system bus all support Hyper Threading Technology.

2-1.2 CPU Installation with Socket 478B

This mainboard is built with CPU Socket 478B (478-pin) supporting the Intel Pentium 4 CPU:

- Follow the steps described in this section to install the 478-pin Pentium 4 CPU into the on board Socket 478.
- After installation of Pentium 4 CPU, you must also install the specific Pentium 4 CPU fan designed in tandem with this CPU. This CPU Fan installation is described in next section.
- This mainboard supports Hyper-threading dual-in-one CPU, the function of which can be enabled by Windows XP. (See illustration on the right.)
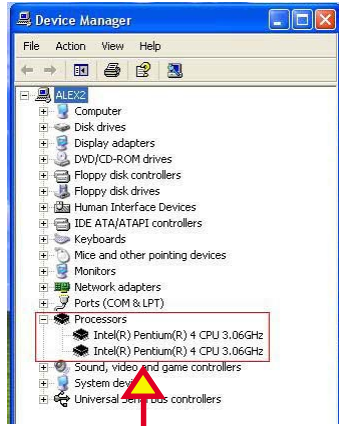

(If Hyper Threading CPU is installed successfully with O/S Windows XP, the O/S will enable the dual-in-one CPU function.)

1. First pull sideways the lever of Socket 478, and then turn it up 90^0 so as to raise the upper layer of the socket from the lower platform.
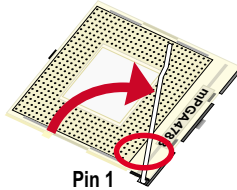
Pin 1

2. Configure Pin 1 of CPU to Pin 1 of the Socket, just as the way shown in the diagram on the right. Adjust the position of CPU until you can feel all CPU pins get into the socket with ease.

Pin 1
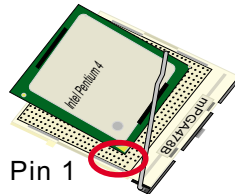
3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.

16
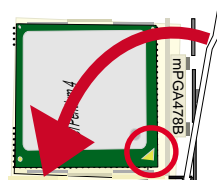
2-2 Pentium 4 CPU Fan Installation:

CPU Fan Connector   Pentium 4 Fanbase
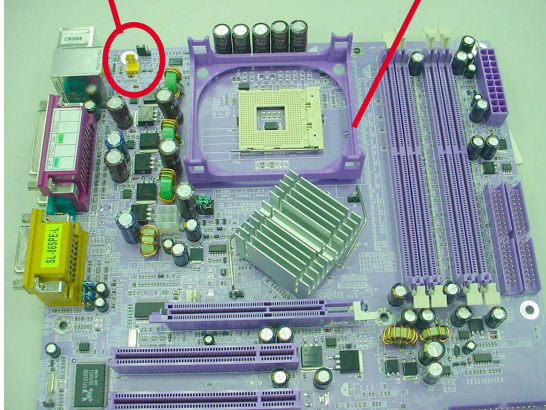
Press down 2 Spring Locks to lock fan to fanbase

Connect Fan Connector to CPU FAN connector

The above pictures are taken from sample mainboards as installation illustration. The layout in the pictures may be different from your mainboard.

2-3 Memory Installation

2-3.1 How to tackle with the memory Modules

• Make sure to unplug your Power Supply before adding or removing memory module. Failure to do so may cause severe damage to both your mainboard and the memory module.

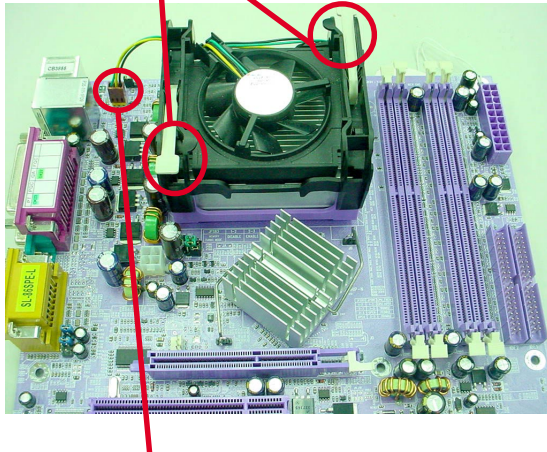• Pay attention to the orientation of the DIMM slots. Forcing a DIMM in a socket improperly will damage the memory module and slot.

• Make sure you have the right type of memory module for your mainboard.

2-3.2 To Install DDR SDRAM Module

• DDR DIMM slot has 184 pins and one notch. Insert a DDR SDRAM vertically into the 184-pin slot with the notch-to-rib matching.

184-Pin DIMM Notch Key Definition

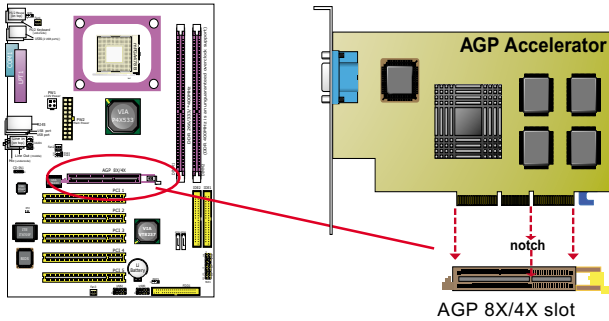(2.5V Voltage Key) DDR Notch   Slot Rib

DIMM1
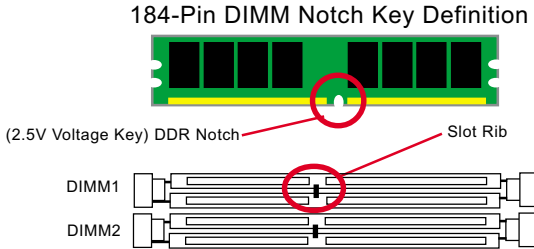
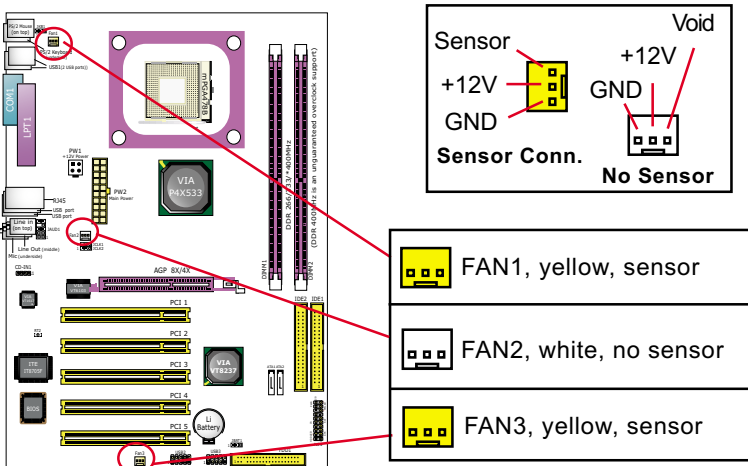DIMM2

2-3.3 To remove a DDR SDRAM Module from mainboard

Before removing a DIMM from mainboard, you must first power off system and then press down the DIMM slot latches at both side to release the DIMM.

2-4 AGP slot Installation

To install a VGA card into AGP 8X/4X slot on board, users can install 8X or 4X AGP card with its only card driver. An AGP 8X card will support a data transfer rate up to 2GB/sec., and an 4X card supports a date transfer rate up to 1GB/sec..

AGP Accelerator

notch

AGP 8X/4X slot

2-5 On Board FAN Connectors

Void

Sensor

+12V

+12V

GND

GND

Sensor Conn.

No Sensor

FAN1, yellow, sensor

FAN2, white, no sensor

FAN3, yellow, sensor
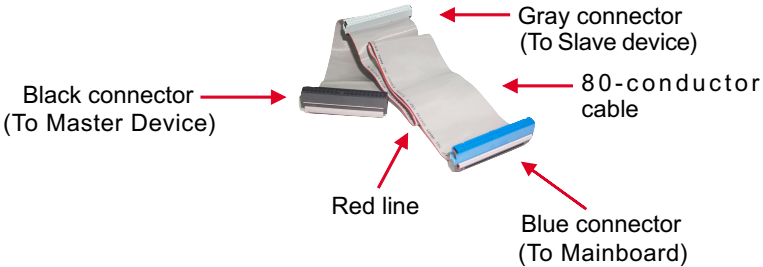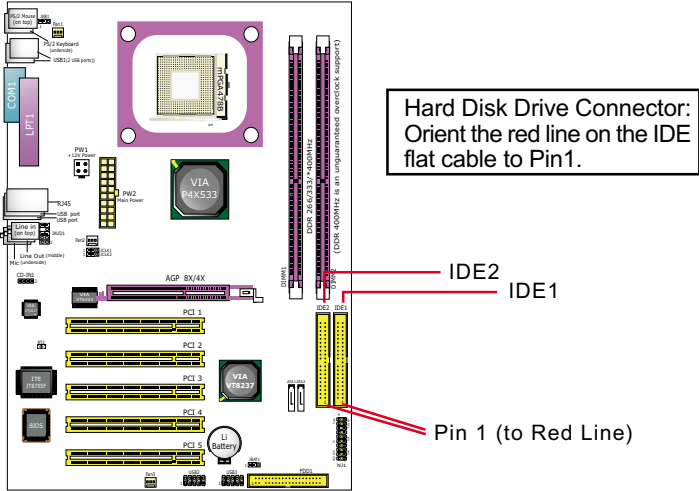
Both Sensor and No-sensor Fan Connectors support CPU/AGP/System/Case cooling fan with +12V mode. A Hardware Monitor chipset is on board, with which users can install a Hardware Monitor Utility and read the fan speed transmitted from the sensor fan. Otherwise, users can read the fan speed from the "Hardware Monitor Status" via BIOS.

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2-6 IDE Connector Installation

To install IDE Connector, you may connect the blue connector of IDE cable to the primary (IDE1) or secondary (IDE2) connector on board, and then connect the gray connector to your slave device and the black connector to your master device. If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers correctly. Please refer to your hard disk documentation for the jumper settings.

Hard Disk Drive Connector: Orient the red line on the IDE flat cable to Pin1.

IDE2

IDE1

Pin 1 (to Red Line)

Gray connector
(To Slave device)

Black connector
(To Master Device)

80-conductor
cable

Red line

Blue connector
(To Mainboard)

IDE Flat Cable

2-7 Floppy Drive Connector Installation

To install FDD, you should connect the end of FDD cable with single connector to the board, and connect the other end with two connectors to the floppy drives.
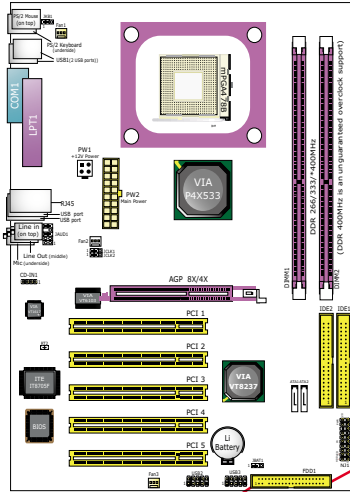
FDD
**Floppy Disk Drive Connector:
Orient the red line on the floppy
Flat cable to Pin1.**

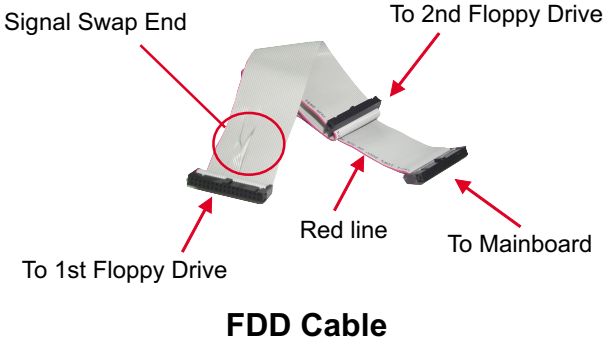**Pin 1 (to Red Line)**

Signal Swap End

To 2nd Floppy Drive

Red line

To Mainboard

To 1st Floppy Drive

FDD Cable

2-8 SATA RAID Connectors Installation

2 Serial ATA connectors for 2 SATA Hard Disks with RAID mode are supported by the South Bridge VIA VT8237. Please see Chapter 5 Disk Array Installation for detail RAID installaion.

ATA1   ATA2

SATA RAID Connector

To Power Supply

SATA Power Connector

Serial ATA Hard Disk

Serial ATA Power Cable (optional)
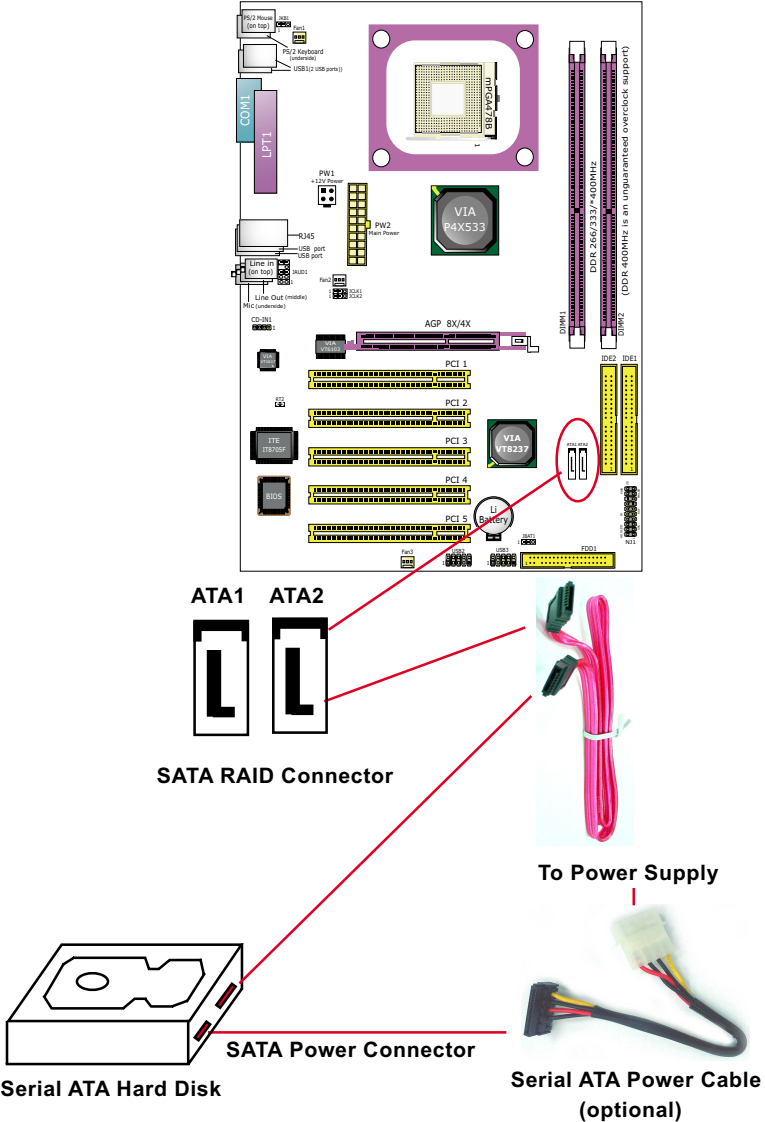
2-9 ATX V2.03 Power Supply Installation
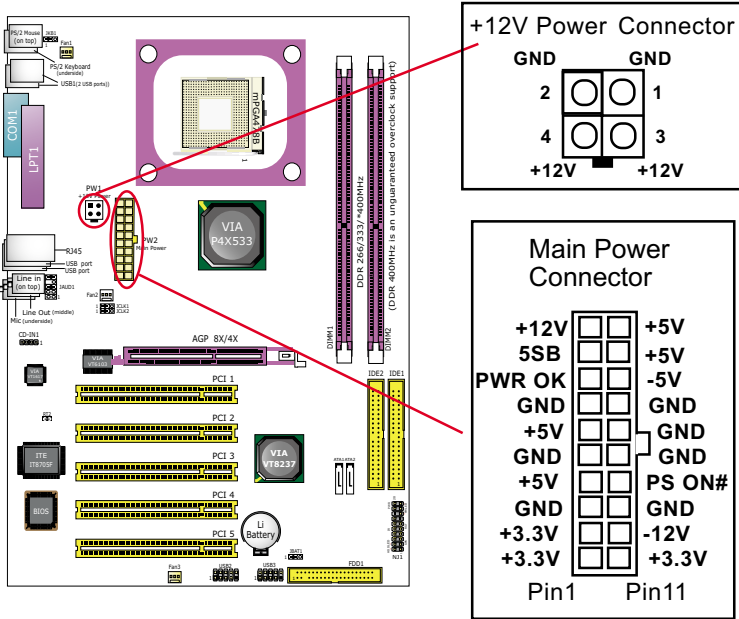
To set up Power Supply on this mainboard:

1. Both the Main Power Connector and the +12V Power Connector should be connected to Power Supply; otherwise, the system may either not start or be damaged.

2. This ATX Power Supply should be able to provide at least 720mA/ +5V standby power for Wake On Lan function.

2-10 Jumper Settings

The following diagrams show the locations and settings of jumper blocks on the mainboard.

JCLK1&JCLK2: CPU Frequency Select			
(default) CPU Auto- Detection	100MHz (FSB400)	133MHz (FSB533)	*200MHz *(FSB800)
JCLK1	JCLK1	JCLK1	JCLK1
JCLK2	JCLK2	JCLK2	JCLK2

JKB1:
Keyboard / Mouse Wake Up

1-2 closed (default)
Disabled

2-3 closed
Enabled

JBAT1:
Clear CMOS

1-2 closed (default)
To hold data

2-3 closed
To clear CMOS

*FSB800 is unguaranteed overclock support.

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How to tackle the Jumpers:

A 3-pin Jumper

If a pin-header (of 2 or more pins) is designed in such a way that its pins can be closed or linked together to set up a specific function, this header is called a jumper in this manual.

A 2-pin Jumper Cap

The conductor inside the cap links two header-pins together.
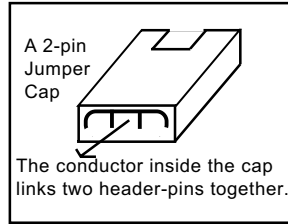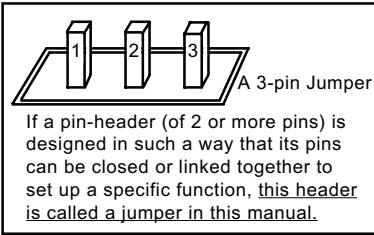
- A Jumper is usually but not necessarily given a "JpX" legend.
- In the Jumper setting diagram, the jumper pins covered with black marks stand for closed pins with jumper cap.

Jp X

1 3
Jumper with Pin 2-3 closed

1 3
Jumper with all Pins open

1 3
Jumper with Pin 1-2 closed

- Do not remove any jumper cap when power is on. Always make sure the power is off before changing any jumper settings. Otherwise, the mainboard will be damaged.

2-10.1 JCLK1&JCLK2: CPU Frequency Select

JCLK1 and JCLK2 are designed on board for CPU frequency select.
1. Setting JCLK1 1-2 closed and JCLK2 to 1-2 closed will allow CPU on board to Auto Detect its own frequency and apply it to the System Bus.
2. Setting JCLK1 2-3 closed and JCLK2 2-3 closed is for 100 MHz CPU.
3. Setting JCLK1 2-3 closed and JCLK2 opened is for 133 MHz CPU.
4. Setting JCLK1 opened and JCLK2 2-3 closed is to select a CPU clock at 200 MHz for your CPU. If 200MHz is an overclock for your CPU, it may or may not boot your system. If an overclok fails to boot system, you should restore the default setting and then clear CMOS to reboot your system. (See Clear CMOS in next paragraph.)

JCLK1&JCLK2: CPU Frequency Select			
(default) CPU Auto-Detection	100MHz (FSB400)	133MHz (FSB533)	200MHz (FSB800)
JCLK1	JCLK1	JCLK1	JCLK1
1	1	1	1
1	1	1	1
JCLK2	JCLK2	JCLK2	JCLK2

Further Notes on CPU Overclocking:
1. If you have successfully booted system, with or without CPU overclock, you still can try another CPU overclock in BIOS Setup. Please enter BIOS Setup, choose "Frequency/Voltage Control" menu, and then configure the "CPU Clock" item to raise your CPU clock.
2. CPU overclocking should take all components on board into account. If you fail in BIOS overclocking, you will not be able to restart system. In such case, Power off system and clear CMOS by JBAT1 and then restart your system. And remember to reconfigure whatever should be reconfigured.
3. If your system is already fixed in a cabinet or case, you may not like to take the trouble to clear CMOS. Then power on your system with the power button on the PC case and simultaneously press down the "Insert" key on the keyboard until you see the initial bootup screen appear. And remember you should also enter CMOS BIOS Setup instantly and choose "Load Optimized Defaults" to restore default BIOS .

2-10.2 JBAT1: Clear CMOS

When you have problems with rebooting your system, you can clear CMOS data and restore it to default value. To clear CMOS with Jumper JBAT1, please follow the steps below:
1. Power off system;
2. Set JBAT1 to Pin 2-3 closed.
3. After 2 or 3 seconds, return the JBAT1 setting to Pin1-2 closed.
4. CMOS data are restored to default. Remember never clear CMOS when system power is on.

JBAT1:
Clear CMOS
1 [jumper]
1-2 closed
(default)
To hold data
1 [jumper]
2-3 closed
To clear CMOS
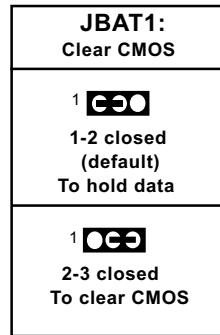
2-10.3 JKB1: Keyboard / Mouse Wake Up

JKB1 is designed on board as a jumper to enable/disable the PS/2 keyboard/mouse Wake Up from suspend mode.
USB keyboard/mouse Wake Up function is not supported on this mainboard.

JKB1:
Keyboard / Mouse Wake Up
[jumper] **1-2 closed (default)**
1   Disabled
[jumper] **2-3 closed**
1   Enabled
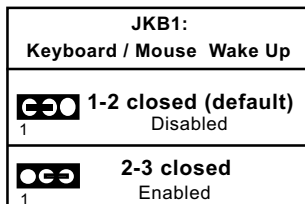
2-11 Other Connectors Configuration

2-11.1 Chassis Panel Connector
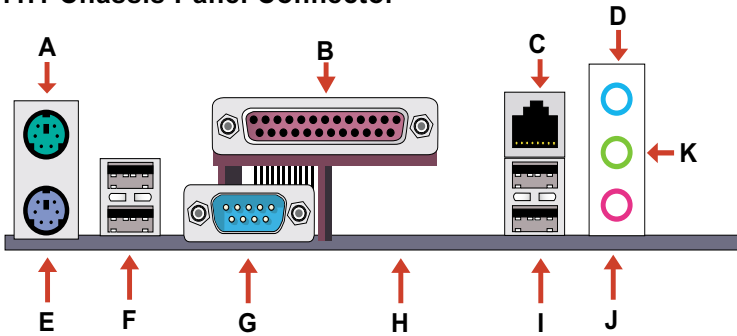
A : PS/2 Mouse	**G : COM1 Connector**
B : LPT1 Port	**H : (COM2 not available)**
C : RJ45 (85ERV4-RL only)	**I : 2 USB ports**
D : Line in/	**J : Microphone Input /**
** Rear Speaker Out**	** Center Subwoofer Out**
E : PS/2 Keyboard	**K : Line Out /**
F : 2 USB ports	** Front Speaker Out**

2-11.2 RJ45 Connector (for 85ERV4-RL only)

One RJ45 connector is on board for LAN connection.

Yellow LED "On" to indicate Network hub is in connection with the system.

Green LED blinks to indicate that data transmission is undergoing in 10/100 Base T mode.
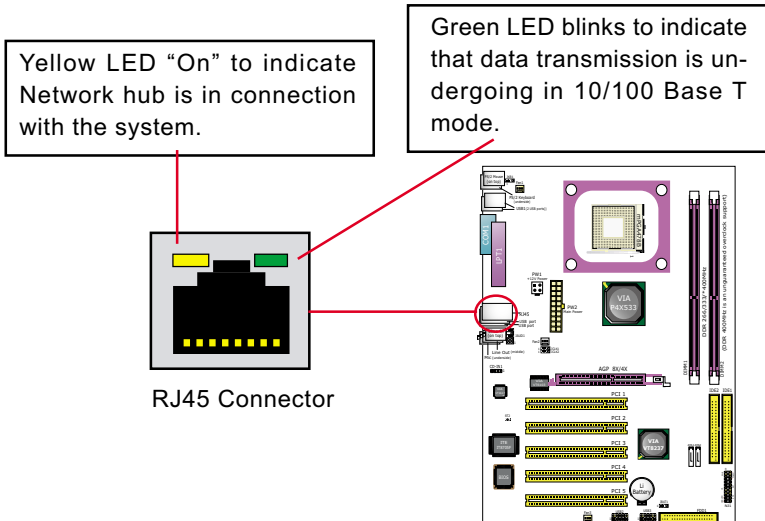
RJ45 Connector

2-11.3 Complex Header

This complex Header consists of 6 connectors providing various supports:

Connect thiese connectors
to PC Front Panel

(1)Power Switch — PWRBT# ▢ ▢ PLED-
              PWRBT ▢ ▢ NC
                    ▢ ▢ PLED+ ⎫ Power LED (4)

              IR_VCC ▢ ▢
              NC ▢ ▢ RSTGND
(2)Infrared(IR) — IRRX ▢ ▢ RST1 ⎬ Reset Switch (5)
              IRGND ▢ ▢ SP1
              IRTX ▢ ▢ NC
(3)HDD LED — HDLED- ▢ ▢ SP3 ⎬ Speaker (6)
              HDLED+ ▢ ▢ SPVCC
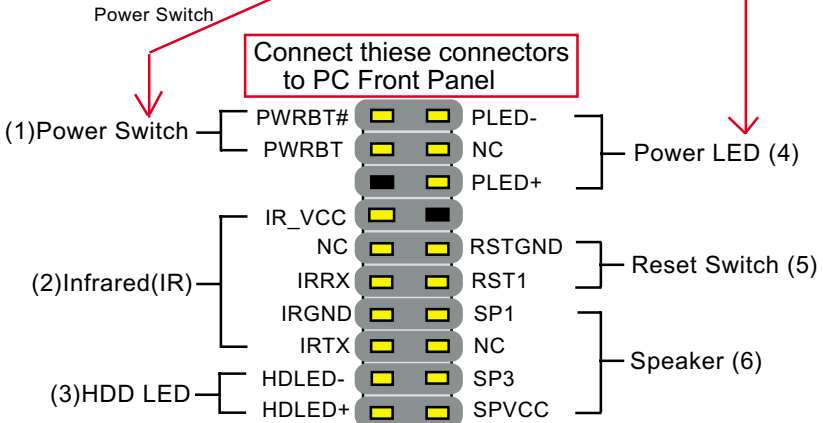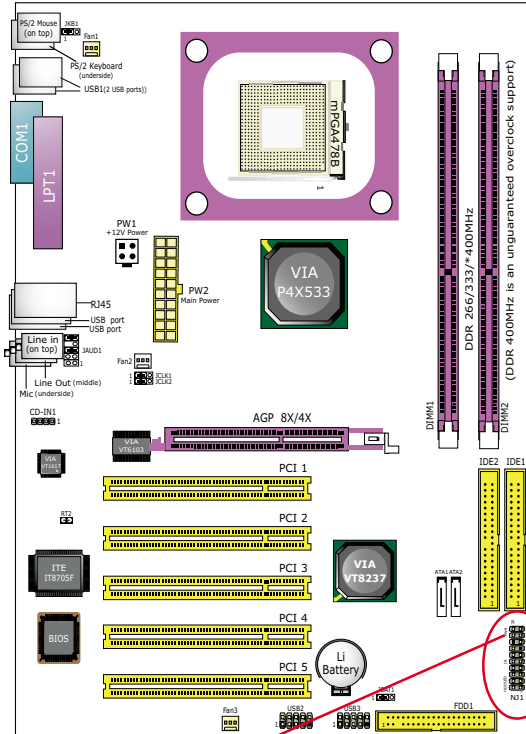
2-11.4 Thermal Detector
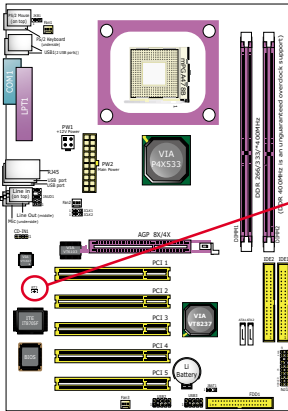
Thermal Detector RT2

RT2

RT2 is mounted
with Thermal Resistor
by default for detecting
system temperature.

Detector RT2: A thermal Detector is mounted by default to connector
RT2 so as to detect the temperature of the system. What RT2 does
is to transmit the thermal signal to Hardware Monitor.

2-11.5 CD-ROM Audio Connector
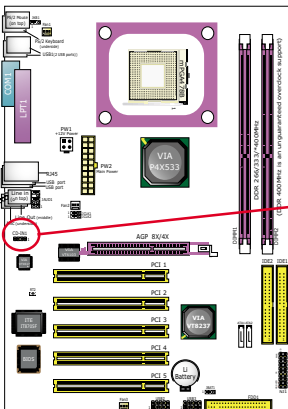
CD-ROM Audio Pin Assignment

CD-IN 1	Pin 4	Pin 3	Pin 2	Pin 1
1	Right Channel	GND	GND	Left Channel

2-11.6 USB Ports and USB Pin-headers

This series provides four USB ports USB0 to USB3 on board supporting various USB devices. In addition, two USB pin-headers are added on board to provide expansion of four more optional USB ports by using two additional USB Cables. Users can order the optional USB cables from your mainboard dealer or vender.

When plugging the USB cable to USB Header, users must make sure the red wire is connected to Pin 1.

All 8 USB ports are compliant with 1.0 / 2.0 USB Bus. USB 2.0 supports Windows 98 and up . USB 1.0 / 2.0 drivers are provided in Support CD for user's installation.

4 USB Ports

USB cable for 2 USB ports

10-pin connector of this USB cable supports 2 USB ports.

2 USB ports   **10-pin connector**

Red wire

USB Pin-headers USB2 and USB3

Use a 4-pin connector to connect USB pin-header to 1 USB port

First USB Port Wiring for 1 Front USB port

Red   White Green black
+5V   D1-   D1+   GND

USB Header Pin Assignment

Use 4-pin connector to support 1USB port only.

+5V   D2-   D2+   GND
Red   White Green black

Second USB Port Wiring for another Front USB port

2-11.7 External Audio Connector

This Mainboard is designed with an Exter-
nal Audio connector "JAUD1" which pro-
vides connection to your chassis.
1. When JAUD1 is set to 5-6 closed and 9-
   10 closed, this default setting disables
   this connector and leaves the Back
   Panel Audio enabled.
2. To use this Front Panel Audio Connector,
   please open all pins of JAUD1 and
   connect it to your chassis.

JAUD1: External Audio Connector

Pin 10 RET L	**Pin 9 FPOUT L**
	Pin 7 (Key)
Pin 6 RET R	**Pin 5 FPOUT R**
Pin 4 Aud Vcc	**Pin 3 Mic VREF**
Pin 2 Aud GND	**Pin 1 Mic In**
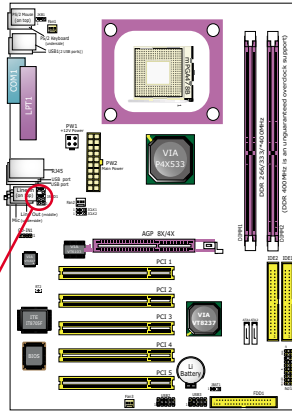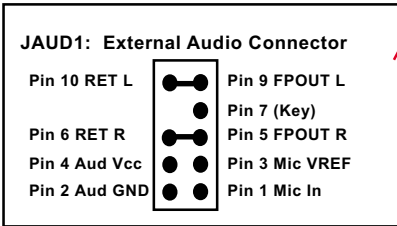
Chapter 3 Software Setup

Drivers, Utilities and Software Installation

Support CD:
This mainboard will be shipped with a Support CD which contains those necessary driver files, Application Softwares and some helpful utilities. It is a user-friendly, auto-run CD which will open itself up in a CD-ROM automatically.

   This chapter is devoted to describing the installations of all these essential drivers and utilities.

3-1 To Open Up Support CD:

1. Please put the Support CD enclosed in your mainboard package into the CD-ROM drive. In a few seconds, the Main Menu will automatically appear, displaying the contents to be installed for this series:

2. In case your system does not open the Support CD automatically, please click to the following path to enter the Main Installation Menu:

   D:\ Autorun.exe (assuming that your CD-ROM Drive is Drive D)

3. We recommand that drivers installation should be started from top to bottom of main menu.

4. Drivers may be updated from time to time in our web site. If you are installing a newer driver than the one illustrated in this chapter, please be aware that the illustration pictures might be different.

3-2 VIA 4-IN-1 Drivers Installation

1. Following the procedures of opening the Support CD, click to " VIA 4-in-1 Drivers" to proceed.

2. The VIA Service Pack InstallShield Wizard will pop up to guide you to the VIA Service pack installation. Click "Next" button to continue.

3. "VIA Service Pack README" screen will appear, please click the "Yes" button to agree with the Licence Agreement and continue.
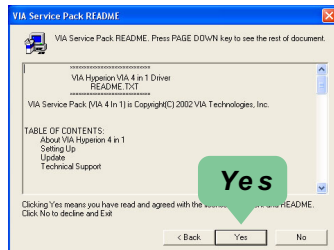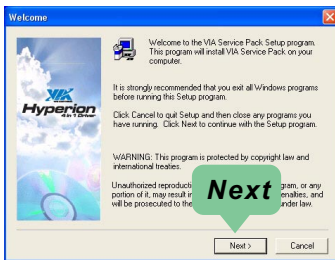
4. On the screen below, check "Normally Install" and click "Next" to continue. (If you check "Quick Install", you will skip the detailed procedures of the VIA 4-in-1 Setup.)

5. Select the checkbox as below and click "Next" to continue:

☑ VIA PCI IDE Bus Driver
☑ AGP Driver (AGP 3.0 Supported)
☑ VIA INF Driver 1.70a
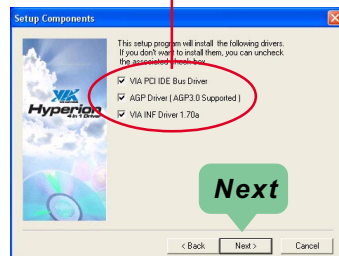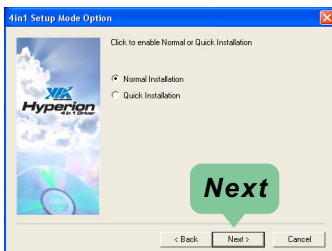
6. Select "Install VIA PCI IDE Driver" checkbox, then click the "Next" button to continue.

7. Select "Install VIA AGP Driver" in turbo mode and press "Next" button to continue.
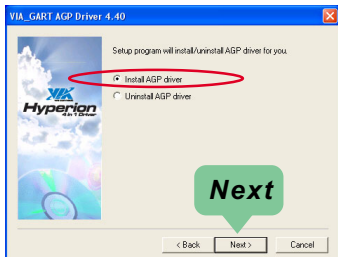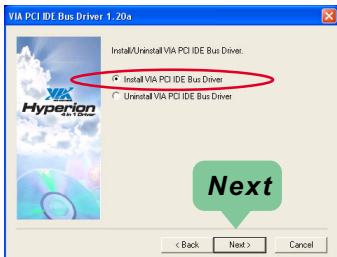
8. After all these setup procedures have finished, you should restart your computer by clicking on **"OK"** so as to put VIA 4-in-1drivers into effect and proceed to next driver installation.
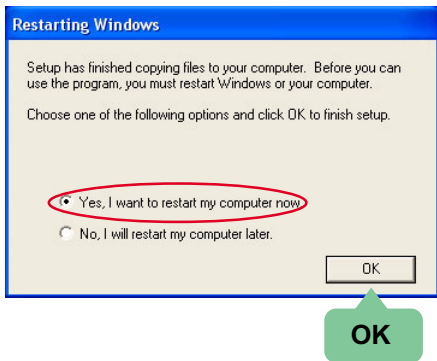
3-3 To Install AC'97 Audio Driver

AC97 Audio Codec VT1617 / VT1616 on board, AC'97 2.2 compatible, supporting 6 channel audio codec for PC multimedia systems. VIA AC'97 Audio Codec Driver is provided in Support CD for user's installation.

3-3.1 Installation

1. Following the procedures of opening the Support CD, click to " AC'97 Audio Driver" to proceed.

2. Instantly, the "VIA Audio Driver Setup Program" screen appears to guide you through the "VIA Audio Driver" Setup, please press "Next" button to continue.
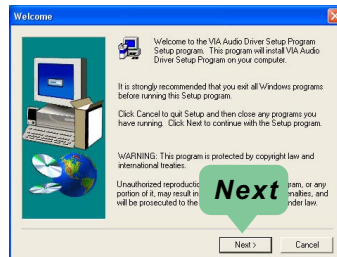
3. Instantly, check " Install Driver" and click "Next" to continue. (If you want to stop setup, click the "Cancel" button.)

4. After the setup process is finished, please check the radial button "Yes, I want to restart my computer now." And click "Finish" to restart your system.

3-3.2 To verify 6-channel Audio

After installation of AC'97 6-channel Codec, you must configure the 5.1 Speaker connection to enable the 6-channel audio.

1. Connect your on-board Audio Connector to your 6-channel speakers as depicted in the figure below:

**Pale Blue Connector
to Rear Speaker**

**Pale Green Connector
to Front Speaker**

**Pale Pink Connector to
Center/Subwoofer Speaker**
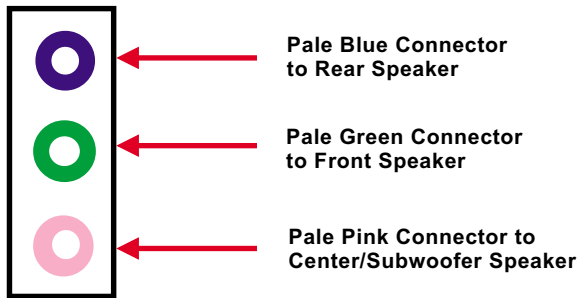
2. After Connection is done, start your Windows system and double click "volume" icon at the taskbar to enter 6-channel configuration:

"Volume" icon
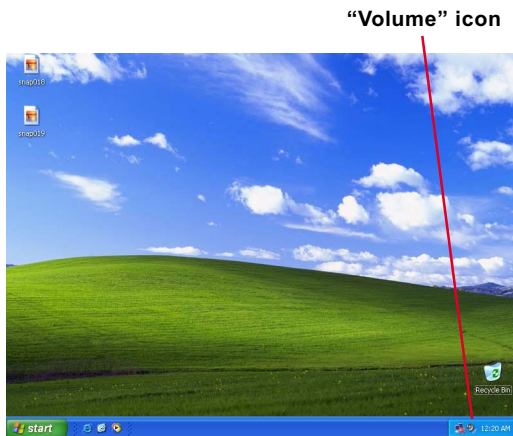
3. Again click "Advanced" button to enter 6 channel configuration.
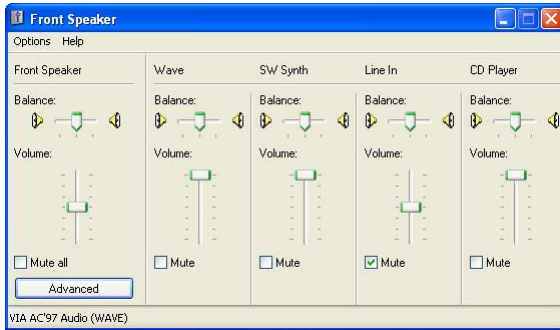
4. At the "Other Controls", pick the item "Smart 5.1 Enable" to activiate 6 channel configuration. Then click "Close" to finish configuration.
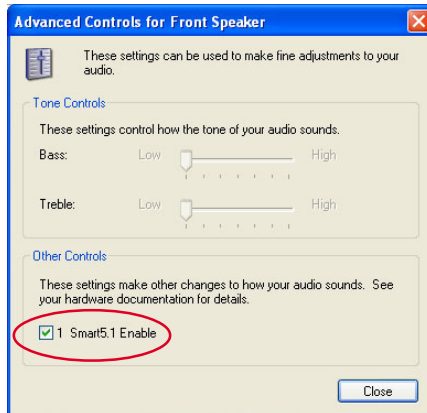
3-4 USB 2.0 Driver installation

USB2.0 Driver is typically for Windows 98SE/ME. For Windows 2000/ XP, users can install their latest Service Pack instead of the USB2.0 driver to gain the USB2.0 support. For the Windows 98se/Me, users must install the USB2.0 driver to activate the USB2.0 support:

1. Following the procedures of opening the Support CD, click to choose "VIA USB 2.0 Driver" to proceed. Please notice that the USB card driver is different from the USB 2.0 driver typically for the on-board USB. Do not use the USB card driver here.

2. Instantly the "USB 2.0 Setup Program" will pop up on screen. Click "Next" to continue.
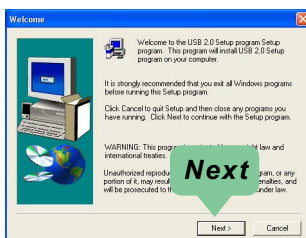
3. Instantly, next screen will pop up to prompt you to select component. Select "Install USB Driver" and click "Next" button to continue.
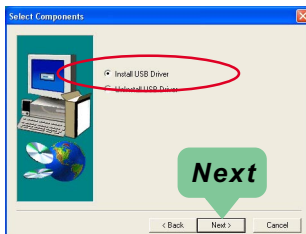
4. The USB 2.0 Setup Program will then guide you through the whole driver setup until the "Finish" screen appears to prompt you to restart your system. Please click "Finish" button to restart system to put the new driver into effect.
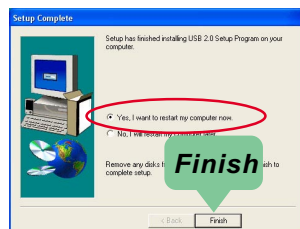
3-5 Install Hardware Monitor Utility

3-5.1 Installation

Hardware Monitor is built on this mainboard. Its installation is pro-
grammed to a fully automated mode on Windows 9X/Me/NT4/2000/
XP. Users can follow the model installation below for its installation
on various Windows System.

1. Following the procedures of opening the Support CD, click to "
   Hardware Monitor Utility" to proceed.

2. The Soltek Hardware
   Monitor InstallShield
   Wizard will pop up to guide
   you to the Intel Service pack
   installation. Press **"Next"**
   button to continue.
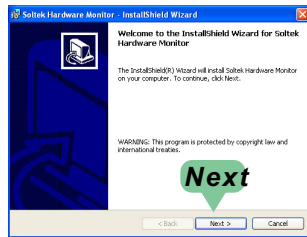
3. The **InstallShield Wizard**
   screen will show the current
   setting, please click the
   "Install" button to continue.

4. After all the setup process
   is finished, click "Finish" to
   exit the wizard.

3-5.2 Verification

1. After installing Soltek Hardware Monitor, double click "SoltekHM" icon on the desktop to open the main window of the Soltek Hardware Doctor.
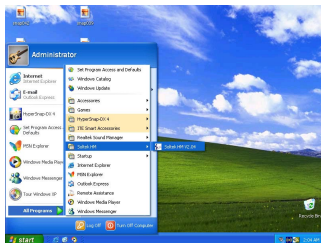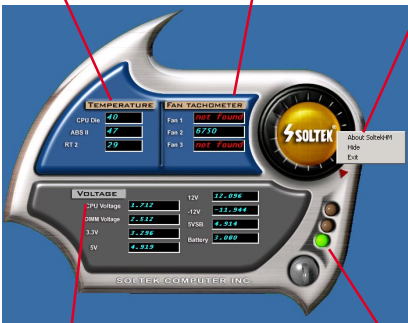
2. Then the pop-up screen will show all information about CPU Temperature, Fan Speed and various Voltages.

Showing the Fan Speed(s) that is supported by the mainboard.

Showing the temperature(s), the function of which is supported by the mainboard.

Click on "Soltek" button to display the function menu.

Showing the Voltage(s) that is supported by the mainboard.

Status Warning LED

*Note: Not all items or functions showing in the above picture will show up. Only those items or functions that are supported by the mainboard will reveal themselves in the above screen.

3-6 LAN Driver Installation (for 85ERV4-RL only)

3-6.1 Installation

1. Following the procedures of opening the Support CD, click to " Onboard LAN Driver" to proceed.

2. Instantly, "The installation is completed" screen appears, indicating that LAN Driver setup is finished.
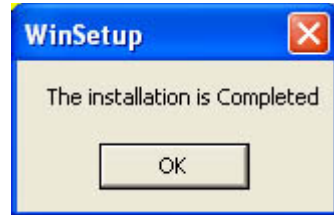
3-6.2 Verification

1. After LAN Driver setup, a new networking icon will appear at the corner of the "Start" screen of your system, indicating that a network channel has been set up.
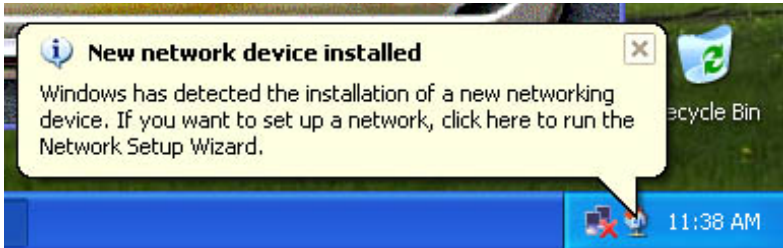
Chapter 4 BIOS Setup

THE BIOS

BIOS stands for Basic Input and Output System. It was once called ROM BIOS when it was stored in a Read-Only Memory(ROM) chip Now manufacturers would like to store BIOS in EEPROM which means Electrically Erasable Programmable Memory. BIOS used in this series of mainboard is stored in EEPROM, and is the first program to run when you turn on your computer.

BIOS performs the following functions:
1. Initializing and testing hardware in your computer (a process called "POST", for Power On Self Test).
2. Loading and running your operating system.
3. Helping your operating system and application programs manage your PC hardware by means of a set of routines called BIOS Run-Time Service.

This Chapter includes the following topics :

4-1 About BIOS Setup

BIOS setup is an interactive BIOS program that you need to run when:

1. Changing the hardware of your system. (For example: installing a new Hard Disk etc.)
2. Modifying the behavior of your computer. (For example: changing the system time or date, or turning special features on or off etc.)
3. Enhancing your computer's behavior. (For example: speeding up performance by turning on shadowing or cache)

4-2 To Run BIOS Setup

First access BIOS setup menu by pressing < DEL > key after "POST" is complete (before OS is loaded). BIOS will then display the following message:

```
Press "DEL" to enter "SETUP"
```

4-3 About CMOS

CMOS is the memory maintained by a battery. CMOS is used to store the BIOS settings you have selected in BIOS Setup. CMOS also maintains the internal clock. Every time you turn on your computer, the BIOS Looks into CMOS for the settings you have selected and configures your computer accordingly. If the battery runs out of power, the CMOS data will be lost and POST will issue a "CMOS invalid" or "CMOS checksum invalid" message. If this happens, you have to replace the battery and do some proper settings in BIOS Setup.

4-4 The POST (Power On Self Test)

POST is an acronym for Power On Self Test. This program will test all things the BIOS does before the operating system is started. Each of POST routines is assigned a POST code, a unique number which is sent to I/O port 080h before the routine is executed.

4-5 To Upgrade BIOS

- System BIOS is incorporated into a Flash memory component. Flash BIOS allows user to upgrade BIOS without the need to replace an EPROM component.
- The Upgrade Utility can be loaded on a floppy diskette to execute saving, verifying, and updating the system BIOS. The Upgrade Utility can also be run from a hard disk drive or a network drive.

4-5.1 Before Upgrading BIOS

- It is highly recommended that you save a copy of the original mainboard BIOS along with a Flash EPROM Programming utility (AWDFLASH.EXE) to a bootable floppy disk so that you can reinstall the BIOS when needed.

4-5.2 Upgrade Process

- Normally, to upgrade BIOS is unnecessary if the system is working fine Users should only upgrade the BIOS when you experience incompatible problems or need to create new features.

- "AWDFLASH.EXE" is a Flash EPROM Programming utility that up dates the BIOS by uploading a new BIOS file to the programmable flash ROM on the mainboard. This program only works in *DOS environment, the utility can not be executed in Windows 95/98, ME, NT, WINDOWS 2000 or Windows XP environment.*

- Please follow the steps below for upgrading the system BIOS:

Step 1. Please visit the board maker's website, download the zip file which contains the latest BIOS file and Award Flash Utility "AWDFLASH. EXE". After unzipping, the BIOS file format will be *.bin, of which " * " stands for the specific BIOS file name.

Step 2. Create a bootable diskette. Then copy the BIOS file and Award Flash Utility "AWDFLASH.EXE" into the diskette.

Step 3. Insert the diskette into drive A, reboot your system and boot from the diskette.

Step 4. Type **awdflash *.bin /sn/py/cc** and then press <Enter> to run BIOS upgrade program. (*.bin depends on your mainboard model and version code. Instead of typing "*", you should type specific file name for your specific mainboard).

Step 5. Please press <F1> or <F10> to exit or reset your system.

Warning ! If the message *" Write Fail "* appears while Award "FLASH MEMORY WRITER" is verifying Flash memory, just repeat the process. Please DO NOT reset or turn off the system. If the award memory flash utility is not able to update the BIOS successfully, your system may not be able to boot up.

Step 6. You will need a message "CMOS checksum error-Default loaded" during booting the system. Press <Del> to run CMOS setup utility, then reload "LOAD SETUP DEFAULTS" or **"Load Optimized Defaults"** and save this change.

The parameters of AWDFLASH.EXE

/sn: No original BIOS backup
/py: Program flash memory
/cc: Clear CMOS data (and update data automatically) after pro-
       gramming

NOTE: Users can type AWDFLASH /? to get further details about
    the parameters. Incorrect usage of the parameter will dam-
    age the BIOS information, so we strongly recommend users
    to leave parameters alone unless you fully understand their
    function.

BIOS Update Illustration:

(1) Executing the "awdflash.exe pt880.bin" in DOS system, Award Flash Memory Writer Start Screen appears: To input BIOS file name.

AwardBIOS Flash Utility V8.24F (C)Phoenix Technologies Ltd. All Rights Reserved
For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003 File Name to Program : PT880.BIN
Message: Input the (BIOS) file name

(2) Press Y if you want to back up your old BIOS. Otherwise, press N to go on without saving.

AwardBIOS Flash Utility V8.24F (C)Phoenix Technologies Ltd. All Rights Reserved
For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003 File Name to Program : PT880.BIN
Message: Do You Want To Save BIOS (Y/N)

(3) Press Y to write the latest BIOS into system.

AwardBIOS Flash Utility V8.24F (C)Phoenix Technologies Ltd. All Rights Reserved
For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003 File Name to Program : PT880.BIN
Message: Press "Y" to Program or "N" to Exit

(4) Updating is in progress. Do not turn off power at this moment.

AwardBIOS Flash Utility V8.24F
(C)Phoenix Technologies Ltd. All Rights Reserved

For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003
Flash Type - SST 39SF020 /5V

File Name to Program : pt880.bin

Writing Flash Memory - 0FE00 OK

▮▮▮▮▮▮▮▯▯▯▯▯▯▯

▯ Write OK   ▌ No Update   ▌ Write Fail

Warning: Don't Turn Off Power Or Reset System !

(5) When the process is complete, remove the Floppy Diskette and press
    F1 to restart the system to put the new BIOS into effect.

AwardBIOS Flash Utility V8.24F
(C)Phoenix Technologies Ltd. All Rights Reserved

For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003
Flash Type - SST 39SF020 /5V

File Name to Program : pt880.bin

Flashing Complete
Remove Floppy Diskette & Hit <F1> to Continue

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
▮▮▮▮▮▮▮▮▮▮▮▮▮▯▯▯▯▯▯▯▯

▯ Write OK   ▌ No Update   ▌ Write Fail

F1 Reset

4-6 BIOS SETUP --- CMOS Setup Utility

Warning and Tips: If changing CMOS Configuration causes difficulty in rebooting system, you can take the following measures:
1. At pressing the power button to reboot, press the "Insert" key at the same time.   As soon as the screen displays the booting message, release the "Insert" key and press "Delete" key to enter CMOS Setup Utility . Then choose the "Load Optimized (Optimal) Defaults" menu to restore the default values for a new start. Or,
2. Open your machine cabinet and clear CMOS with jumper setting. Please refer to the Jumper Setting Section of this User manual.

4-6.1 CMOS Setup Utility

1. Power on your system.
2. At the initial screen, enter CMOS Setup Utility by pressing < Del > key before POST(Power on Self Test) is complete and the main pro-gram screen will appear as follows.

Phoenix - AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features	▶ CPU Ratio/Voltage Control
▶ Advanced BIOS Features	Load Optimized Defaults
▶ Advanced Chipset Features	Set Supervisor Password
▶ Integrated Peripherals	Set User Password
▶ Power Management Setup	Save & Exit Setup
▶ PnP/PCI Configurations	Exit Without Saving
▶ SmartDoc Anti-Burn Shield	

Esc: Quit   ↑↓←→ : Select Item
F1: General Help   F10: Save & Exit Setup

Time, Date, Hard Disk Type...

3. When one main item of the Main Menu is chosen and clicked on, its submenu will appear to display the related items and options. On the other hand, a list of operation guide will appear at the end of the submenu as below:

↑↓ ←→ :Move   Enter: Select   +/-/PU/PD: Value   F10: Save   ESC: Exit   F1: General Help
           F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

(1) Use the arrow keys on your keyboard to select an option, and press <Enter>. Modify the system parameters to reflect the options installed in your system.

(2) Press <Enter> to select item or option.

(3) +/- /PU/PD: To adjust or select value.

(4) F10: Save configuration.

(5) Esc: Press <Esc> key to get out of the menu on screen.

(6) F1: Press F1 to display General Help List.

(7) F5: Press F5 to restore the Previous Value.

(8) F6: Press F6 to load the Fail-Safe default values.

(9) F7: Press F7 to load the Optimized Default Values.

4. You may return to the Main Menu anytime by pressing <ESC>.
5. In the Main Menu, "SAVE AND EXIT SETUP" saves your changes and reboots the system, and "EXIT WITHOUT SAVING" ignores your changes and exits the program.

4-6.2 Standard CMOS Setup

Standard CMOS Setup records some basic system hardware configuration and sets the system clock and error handling. You only need to modify the configuration values of this option if you want to change your system hardware configuration or when the data stored in the CMOS memory gets lost or damaged.

Run the Standard CMOS Setup as follows:
Choose "Standard CMOS Setup" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Wed, Nov 11 2003	Item Help
Time (hh:mm:ss)	9 : 41 : 11	
		Menu Level ▶
IDE Primary Master	WDC WD400BB-00DEA0	
IDE Primary Slave	None	Change the day,
IDE Secondary Master	None	month, year and
IDE Secondary Slave	None	century
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All, But Keyboard	
Base Memory	640K	
Extended Memory	252928K	
Total Memory	253952K	

↑↓ ←→ :Move   Enter: Select   +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Date (mm:dd:yy) The BIOS determines the day of the week from the other date information. This field is for information only.

Press the left or right arrow key to move to the desired field (date, month, year). Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Time (hh:mm:ss) The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the left or right arrow key to move to desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Primary / Secondary This field records the specifications for all non-SCSI **Master / Slave** hard disk drives installed in your system. Refer to the respective documentation on how to install the drives.

Phoenix - AwardBIOS CMOS Setup Utility
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	Menu Level ▶
Access Mode	Auto	
		To auto-detect the
Capacity	40022MB	HDD's size, head...
		on this channel
Cylinder	19158	
Head	16	
Precomp	0	
Landing Zone	19157	
Sector	255	

↑↓←→ :Move   Enter: Select   +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Drive A / Drive B Select this field to the type(s) of floppy disk drive(s)
installed in your system. The choices are:
360KB, 5.25 in.
1.2MB, 5.25 in.
720KB, 3.5 in.
1.44MB, 3.5 in.
2.88MB, 3.5 in.
None

Video Select the type of primary video subsystem in your
computer. The BIOS usually detects the correct video
type automatically. The BIOS supports a secondary
video subsystem, but you do not select it in setup.

Halt On During the power-on self-test (POST), the computer
stops if the BIOS detects a hardware error. You can
tell the BIOS to ignore certain errors during POST
and continue the boot-up process.

Base Memory Typically 640KB. Also called conventional memory.
The DOS operating system and conventional appli-
cations use this area.

Extended Memory Above the 1MB boundary. Early IBM personal
computers could not use memory above 1MB, but
current PCs and their software can use extended
memory.

Total Memory This option shows system memory capacity.

4-6.3 Advanced BIOS Features

Advanced BIOS Features improves your system performance or sets up system features according to your preference.

Run the Advanced BIOS Features as follows:

Choose "Advanced BIOS Features" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

		Item Help
Virus Warning	Disabled	
CPU L1 & L2 Cache	Enabled	Menu Level ▶
CPU L2 Cache ECC Checking	Enabled	
Hyper Threading Technology	Enabled	Allows you to choose
Quick Power On Self Test	Enabled	the VIRUS warning
First Boot Device	Floppy	feature for IDE Hard
Second Boot Device	HDD-0	Disk boot sector
Third Boot Device	CDROM	protection. If this
Boot Other Device	Enabled	functions is enabled
Swap Floppy Drive	Disabled	and someone attempt
Boot Up Floppy Seek	Disabled	to write data into this
Boot Up NumLock Status	On	area, BIOS will show a
Typematic Rate Setting	Disabled	warning message on
x Typematic Rate (Chars/Sec)	6	screen and alarm beep
x Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM > 64MB	Non-OS2	
Video BIOS Shadow	Enabled	

↑↓←→ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

Virus Warning When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive.
You should then run an antivirus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you disable the virus warning.

CPU L1 & L2 Cache Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type up contain internal cache memory (L1), and most, but not all, modern PCs have additional (external) cache memory (L2). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for faster access by the CPU.

CPU L2 Cache ECC Checking To enable/disable Error Checking and Correcting Code on CPU L2 Cache.

Hyper Threading Technology If a P4 CPU with Hyper Threading technology is installed on board, this item will appear and allow you to enable/disable the function. If not, this item will not appear.

Quick Power On Self Test Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally enable quick POST.

First/Second/Third/ Boot Other Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items. Choices: Floppy; LS/ZIP; HDD; SCSI; CDROM; USB; LAN; Disabled

Swap Floppy Drive When enabled, floppy drives A and B will be exchanging without any physical connection and modification on the cables.

Boot Up Floppy Seek When enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 270KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to disabled to save time.

Boot Up NumLock Status Toggle between On or Off to control the state of the NumLock key when the system boots. If On, the numeric keypad is in numeric mode. If off, the numeric keypad is in cursor control mode.

Typematic Rate Setting When *Disabled*, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystroke repeats at a rate determined by the keyboard controller in your system.
When *Enabled*, you can select a typematic rate and typematic delay.

Typematic Rate (Chars / Sec) When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24, or 30 characters per second.

Typematic Delay (Msec) Choices: 250; 500; 750; 1000. This option sets the time interval for displaying the first and the second characters. If enabled, the time interval is optional.

Security Option If you have set a password, select whether the password is required every time the System boots, or only when you enter setup.
Choices: System; Setup

OS Select For DRAM > 64MB Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on your system.

Video BIOS Shadow Selecting Enabled allows copying Video BIOS to shadow RAM, resulting in better video performance.

4-6.4 Advanced Chipset Features

Advanced Chipset Features is used to modify the values of chipset buffers. These buffers control the system options.

Run the Advanced Chipset Features as follows:

Choose "Advanced Chipset Features" from the Main Menu and a list of option will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		Item Help
▶ DRAM Clock/Drive Control	Press Enter	
▶ AGP & P2P Bridge Control	Press Enter	Menu Level ▶
▶ CPU & PCI Bus Control	Press Enter	
Memory Hole	Disabled	
System BIOS Cacheable	Disabled	
Init Display First	AGP	

↑↓←→ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

4-6.4.1 DRAM Clock/Drive Control

Choose "DRAM Clock/Drive Control" in "Advanced Chipset Features" and press <Enter>. The following sub-screen will appear for DRAM Control configuration:

DRAM Clock/Drive Control

		Item Help
Current FSB Frequency	133MHz	
Current DRAM Frequency	133MHz	
DRAM Clock	By SPD	
DRAM Timing	Auto By SPD	Menu Level ▶ ▶
x SDRAM CAS Latency	2,5	
x Bank Interleave	Disabled	
x Precharge to Active(Trp)	4T	
x Active to Precharge(Tras)	9T	
x Active to CMD(Trcd)	4T	
x REF to ACT/REF to REF(Trfc)	15T	
xACT(0) to ACT(1) (TRRD)	3T	
DRAM Command Rate	2T Command	
Delay Dclk Control	Disable	

Current FSB Frequency   This item is to show the current FSB Frequency.

Current DRAM Frequency   This item is to show the current DRAM Frequency.

DRAM Clock This item allows you to set the DRAM Clock.
SPD (Serial Presence Detect) is located on the memory modules, BIOS reads information coded in SPD during system boot up.
Choices: By SPD; 100MHz;133MHz; 166MHz; 200MHz

DRAM Timing This item allows you to set the DRAM Timing.
Choices: Auto By SPD; Manual

SDRAM CAS Latency With SDRAM Timing by SPD disabled, you can select the SDRAM CAS# (Column Address Strode)latency manually. Choices: 1.5; 2.0; 2.5; 3.0

Bank Interleave This value appears when "DRAM Timing" is set at "Manual". Choices: 2 Bank; 4 Bank; Disabled

Precharge to Active (Trp) This value appears when "DRAM Timing" is set at "Manual". Choices: 2T; 3T; 4T; 5T

Active to Precharge (Tras) This value appears when "DRAM Timing" is set at "Manual". Choices: 6T; 7T; 8T; 9T

Active to CMD(Trcd) This value appears when "DRAM Timing" is set at "Manual". Choices: 2T; 3T; 4T; 5T

REF to ACT/REF to REF(Trfc) This value appears when "DRAM Timing" is set at "Manual". Choices: 12T; 13T; 14T; 15T

ACT(0) to ACT (1) (TRRD) This value appears when "DRAM Timing" is set at "Manual". Choices: 2T; 3T

DRAM Command Rate Allows you to set the DRAM Command Rate.
Choices: 1T Command; 2T Command

Delay Dclk Control Allows you to enable / disable the Delay Dclk Control.

4-6.4.2 AGP & P2P Bridge Control

Choose "AGP & P2P Bridge Control" in "Advanced Chipset Features" and press <Enter>. The following sub-screen will appear for AGP & P2P Bridge Control configuration:

AGP & P2P Bridge Control

		Item Help
AGP Aperture Size	64M	
AGP3.0 Mode	8X	Menu Level ▶ ▶
AGP Driving Control	Auto	
x AGP Driving Value	DA	
AGP Fast Write	Enabled	
AGP Master 1 WS Write	Disabled	
AGP Master 1 WS Read	Disabled	
AGP 3.0 Calibration cycle	Disabled	
DBI Output for AGP Trans.	Disabled	
DBI Output for Frame Trans	Disabled	

AGP Aperture Size Series of options are available: 4, 8, 16, 32, 64, 128 or 256 MB. Memory mapped and graphics data structures can reside in a Graphics Aperture. BIOS will automatically report the starting address of this buffer to the O.S.

AGP3.0 Mode This item allows you to select AGP Mode.
Choices: 1X; 2X; 4X; 8X

AGP Driving Control This item allows you to adjust the AGP driving force. Choose Manual to key in a AGP Driving Value in the next selection.
Choices: Manual; Auto

AGP Driving Value This item allows you to adjust the AGP driving force.
Choices: Min=0000 ~ Max=00FF

AGP Fast Write This item will enable the AGP model into fast write mode.

AGP Master 1 WS Write Leave this field at default.

AGP Master 1 WS Read Leave this field at default.

AGP 3.0 Calibration cycle Leave this field at default.

DBI Output for AGP Trans. Leave this field at default.

DBI Output for Fame Trans. Leave this field at default.

4-6.4.3 CPU & PCI Bus Control

Choose "CPU & PCI Bus Control" in "Advanced Chipset Features" and press <Enter>. The following sub-screen will appear for CPU & PCI Bus Control configuration:

CPU & PCI Bus Control

		Item Help
PCI Master 0 WS Write	Enabled	
VLink mode selection	By Auto	Menu Level ▶ ▶
VLink 8X Support	Enabled	

PCI Master 0 WS Write When Enabled, writing to the PCI bus are executed with zero wait states.
Choices: Enabled, Disabled

VLink mode selection Allows you select VLink mode.
Choices: By Auto; Mode 0; Mode 1; Mode 2; Mode 3; Mode 4

VLink 8X Support Default is enabled to improve the system performance.

● ●

Memory Hole In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.
The choices: 15M-16M; Disabled

System BIOS Cacheable Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance.

Init Display First Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display.

4-6.5 Integrated Peripherals

Integrated Peripherals option allows you to get some information inside your system when it is working.

Run the Integrated Peripherals as follows:

Choose "Integrated peripherals" from the Main Menu and a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

		Item Help
▶ VIA OnChip IDE Device	Press Enter	
▶ VIA OnChip PCI Device	Press Enter	
▶ SuperIO Device	Press Enter	

↑↓←→ : Move　Enter: Select　+/-/PU/PD: Value　F10: Save　Esc: Exit　F1: General Help
F5: Previous Values　　　　　　F6: Fail-Safe Defaults　　　　F7: Optimized Defaults

4-6.5.1 VIA OnChip IDE Device

Choose "VIA OnChip IDE Device" in "Integrated Peripherals" and press <Enter>. The following sub-screen will appear for VIA OnChip IDE Device configuration:

Phoenix - AwardBIOS CMOS Setup Utility
VIA OnChip IDE Device

		Item Help
IDE DMA transfer access	Enabled	
OnChip IDE Channel0	Enabled	
OnChip IDE Channel1	Enabled	
IDE Prefetch Mode	Enabled	
Primary Master　PIO	Auto	
Primary Slave　　PIO	Auto	
Secondary Master　PIO	Auto	
Secondary Slave　PIO	Auto	
Primary Master　UDMA	Auto	
Primary Slave　　UDMA	Auto	
Secondary Master　UDMA	Auto	
Secondary Slave　UDMA	Auto	
IDE HDD Block Mode	Enabled	

IDE DMA transfer access This item is to improved the whole system performance with DMA mode of IDE devices enabled.

On-Chip IDE Channel 0/1 The chipset contains a PCI IDE interface with support from two IDE channels. Select Enabled to activate the first and/or the second IDE interface. Select Disabled to inactivate an interface if you install a primary and/or second add-on IDE interface.

IDE Prefetch Mode The on-board IDE drive supports IDE prefetching for faster drive accesses. If the IDE device doesn't support prefetching, set this field to Disabled.

Primary Master / Slave PIO Secondary Master / Slave PIO Choose Auto or Mode 0~4. The BIOS will detect the HDD mode type automatically when you choose Auto. You need to set to a lower mode than Auto when your hard disk becomes unstable.

Primary Master / Slave UDMA Secondary Master / Slave UDMA Ultra DMA33/66/100/133 implementation is possible only if your IDE hard drive supports it, if the operating environment includes a DMA drive, and if your system software supports Ultra DMA33/66/100/133. Select "Auto" to enable BIOS support.

IDE HDD Block Mode Block mode is also called block transfer, multiple commands, or multiple sector read/write.Select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support.

4-6.5.2 VIA OnChip PCI Device

Choose "VIA OnChip PCI Device" in "Integrated Peripherals" and press <Enter>. The following sub-screen will appear for VIA OnChip PCI Device configuration:

Phoenix - AwardBIOS CMOS Setup Utility
VIA OnChip PCI Device

		Item Help
OnChip SATA/RAID	Enabled	
VIA-3058 AC97 Audio	Auto	
VIA-3043 OnChip LAN	Enabled	
Onboard Lan Boot ROM	Disabled	
OnChip USB Controller	All Enabled	
OnChip EHCI Controller	Enabled	
USB Keyboard Support	Disabled	
USB Mouse Support	DisabledUSB	
Emulation	Off	
x USB Keyboard Support	Disabled	
x USB Mouse Support	Disabled	

On Chip SATA/RAID This item allows you to enable/disable the onchip SATA or RAID interface.

VIA-3058 AC'97 Audio To auto-select or disable the VIA-3058 AC97 audio.

VIA-3043 OnChip LAN Allows you to enable/disable the Onchip LAN.
Choices: Enabled; Disabled

Onboard Lan Boot ROM To enable/disable onboard LAN Boot Rom function.
Choices: Enabled; Disabled

OnChip USB Controller To enable/disable the Onchip USB controller.
Choices: All Disabled; All Enabled

OnChip EHCI Controller Allows you to enable/disable the Onchip EHCI (Enhanced Host Controller Interface) controller.
Choices: Enabled; Disabled

USB Keyboard Support Select Enabled if your system contains a Universal Serial Bus (USB) controller.

USB Mouse Support Select Enabled if your system contains a Universal Serial Bus (USB) controller.

USB Emulation To enable/disable the USB emulation on DOS.
Choices: off; K/B/Ms; On

USB Keyboard Support If USB Emulation is set at K/B / Mouse, this item allows you to enable/disable USB keyboard support.

USB Mouse Support If USB Emulation is set at K/B / Mouse, this item allows you to enable/disable USB Mouse support.

4-6.5.3 SuperIO Device

Choose "SuperIO Device" in "Integrated Peripherals" and press <Enter>.
The following sub-screen will appear for SuperIO Device configuration:

Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device

		Item Help
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	Auto	
Onboard Serial Port 2	Auto	
UART Mode Select	Normal	
x UR2 Duplex Mode	Half	
Onboard Parallel Port	378.IRQ7	
Parallel Port Mode	SPP	
x ECP Mode Use DM A	3	

Onboard FDC Controller	Select Enabled if your system has a floppy drive controller (FDC) installing in the system board and you want to use it. Choices: Enabled; Disabled

Onboard Serial Port 1 / Port 2	Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.
	Choices: Disabled; Auto;
	     3F8/IRQ4; 2F8/IRQ3;
	     3E8/IRQ4; 2E8/IRQ3

UART Mode Select	The serial port 2 on your system may offer a variety of infrared port modes. Click here for a description of various modes. The choices: Normal; IrDA; ASKIR; SCR
UR2 Duplex Mode	If IrDA or ASKIR is selected, UR2 Duplex Mode should be configured to Half or Full. Choices: Half; Full
Onboard Parallel Port	This item allows you to determine onboard parallel port controller I/O address setting. Choices: 378H/IRQ7; 278H/IRQ5; 3BC/IRQ7; Disabled
Parallel Port Mode	Select an operating mode for the on-board parallel (printer) port. Choices: SPP; EPP; ECP; ECP+EPP;
ECP mode Use DMA	Select a DMA channel for the port when you choose ECP or ECP+EPP mode for the Parallel Port Mode. Choices: 1; 3

4-6.6 Power Management Setup

Run the Power Management Setup as follows:
Choose "Power Management Setup" from the Main Menu and a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		Item Help
ACPI function	Enabled	
ACPI Suspend Type	S1(POS)	
Power Management Option	User Define	
HDD Power Down	Disabled	
Suspend Mode	Disabled	
Video Off Option	Suspend -> Off	
Video Off Method	V/H SYNC+Blank	
MODEM Use IRQ	3	
Soft-off by PWRBTN	Instant-off	
AC Loss Auto Restart	Off	
Delay Prior to Thermal	16 Min	
▶IRQ/Event Activity Detect	Press Enter	

↑↓←→ : Move　Enter: Select　+/-/PU/PD: Value　F10: Save　Esc: Exit　F1: General Help
F5: Previous Values　　　　　F6: Fail-Safe Defaults　　　　F7: Optimized Defaults

ACPI Function　Select Enabled(default) only if your computer's operating system supports the Advanced Configuration and Power Interface (ACPI) specification. Currently, Windows 98SE/ME, Windows 2000 and Windows XP supports ACPI.

ACPI Suspend Type　This item allows you to select the ACPI Suspend type. You can select S3(STR) for Suspending To RAM if your system supports this mode. Or you can select S1(POS) for Power On Suspend under ACPI mode.
Choices: S1(POS); S3(STR);

Power Management Option　This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. Choices:
User Define; Max Saving; Min Saving

HDD Power Down　When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Suspend Mode　Allows you to set a suspend time for HDD inactivity.

Video Off Option When enabled, this feature allows the VGA adapter to operate in a power saving mode.

Always On: Monitor will remain on during power saving modes.

Suspend -> Off: Monitor blanked when the system enter the suspend mode.

Video Off Method This determines the manner by which the monitor is blanked.

V/H SYNC+Blank: To turn off the vertical and horizontal snchronization ports and write blanks to the video buffer.

Blank Screen: To write blanks to the video buffer.

DPMS Support: Select this option if your monitor supports the Display Power Management Singaling (DPMS) standard of the Video Electronics Standards to select video power management values.

MODEM Use IRQ Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

The choices: 3; 4; 5; 7; 9; 10; 11; NA.

Soft-Off by PWRBTN When Enabled, turning the system off by pressing the on/off button places the system in a very low-power-usage state.

AC Loss Auto Restart Allows you to automatically restart from AC/Power Loss.

Choices: On; Off; Former-Sts

Delay Prior to Thermal This item allows the system to send the signal to detect the temperature of the mainboard under DOS mode in a regular time.

Choices: 4 mins; 8 mins; 16 mins; 32 mins

IRQ/Event Activity Detect

Choose "IRQ/Event Activity Detect" in "Power Management Setup" and press <Enter>. The following sub-screen will appear for IRQ/Event Activity Detect configuration:

Phoenix - AwardBIOS CMOS Setup Utility
IRQ/Event Activity Detect

		Item Help
PS2KB Wakeup Select	Hot key	
PS2KB Wakeup	Disable	
x Power Button Lock	Disabled	
PS2MS Wakeup	Disabled	
VGA	Off	
LPT & COM	LPT/COM	
HDD & FDD	ON	
PCI Master	OFF	
PowerOn by PCI Card	Disabled	
Modem Ring Resume	Disabled	
RTC Alarm Resume	Disabled	
x Date (of Month)	0	
x Resume Time (hh:mm:ss)	0: 0: 0	
▶ IRQs Activity Monitoring	Press Enter	

PS2KB Wakeup Select Allows you to set the way to wake up the system by PS/2 keyboard.

PS2KB Wakeup Allows you to wake up the system by PS/2 keyboard. Choices: Desabled ; Crtl+(F1~F12); Power ; wake; Any Key.

Power Button Lock Allows you to enable/disable to lock the power button when the system is set to wake up by PS/2 keyboard.

PS2MS Wakeup Allows you to wake up the system by PS/2 mouse.

VGA To set Off/On the VGA Wakeup.

LPT & COM When LPT & COM is ON, any activity from one of the listed system peripheral devices or IRQs wakes up the system.

HDD & FDD When HDD & FDD is ON, any activity from one of the listed system peripheral devices wakes up the system.

PCI Master To set Off/On the PCI Master Wakeup system function.

PowerOn by PCI Card This item allows system wake up by PCI Device.

Modem Ring Resume An input signal on the serial Ring Indicator (RI) Line (in other words, an incoming call on the modem) Awakens the system from a soft off state.

RTC Alarm Resume When Enabled, you can set the data and time at which the RTC (Real Time Clock) alarm awakens the system from suspend mode.
Choices: Disabled; Enabled

Date (of Month) Set a certain date when RTC Alarm Resume option is Enabled to awaken the system. This option is concurrent with Resume Time option.

Resume Time (hh:mm: ss) Set a certain time when RTC Alarm Resume option is Enabled to awaken the system. This option is concurrent with Date option.

IRQ Activity Monitoring

Choose "IRQ Activity Monitoring" in "IRQ/Event Activity Detect" and press <Enter>. The following sub-screen will appear for IRQ Activity Monitoring configuration:

Phoenix - AwardBIOS CMOS Setup Utility
IRQs Activity Monitoring

		Item Help
Primary INTR	ON	
IRQ3 (COM 2)	Disabled	
IRQ4 (COM 1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Disk)	Enabled	
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Reserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Disabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

IRQ Activity Monitoring The following is a list of IRQ's (Interrupt Requests), which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. When set On, activity will neither prevent the system from going into a power management mode nor awaken it.

4-6.7 PnP / PCI Configuration

PnP/PCI Configuration allows you to modify the system's power saving functions.

Run the PnP/PCI Configuration as follows:

Choose "PnP/PCI Configuration" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
PnP PCI Configurations

		Item Help
PNP OS Installed	No	
Reset Configuration Data	Disabled	
Resources Controlled by	Auto(ESCD)	
x IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
Assign IRQ For VGA	Enabled	
Assign IRQ For USB	Enabled	

↑↓←→ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

PNP OS Installed Select Yes if the system operating environment is Plug-and-Play system (e.g., Windows98).

> **NOTE:** BIOS will automatically disable all PnP resources except the boot device card when you select Yes on Non-PnP operating system.

Reset Configuration Normally, you leave this Disabled(default). Select
Data Enabled to reset Extended System Configuration Data (ESCD), when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

Resource Controlled By The Plug and Play Award BIOS can automatically configure all the boot and Plug and Play compatible devices. If you select *Auto*(default), all the interrupt request (IRQ) and DMA assignment fields will not appear, as the BIOS automatically assigns them. If you select Manual, the IRQ Resources item will appear for your configuration (see below).

IRQ Resources Press Enter. Please refer to the list below:

Phoenix - AwardBIOS CMOS Setup Utility
IRQ Resources

IRQ-3 assigned to	PCI Device	Item Help
IRQ-4 assigned to	PCI Device	
IRQ-5 assigned to	PCI Device	
IRQ-7 assigned to	PCI Device	
IRQ-9 assigned to	PCI Device	
IRQ-10 assigned to	PCI Device	
IRQ-11 assigned to	PCI Device	
IRQ-12 assigned to	PCI Device	
IRQ-14 assigned to	PCI Device	
IRQ-15 assigned to	PCI Device	

↑↓←→ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

PCI/VGA Palette Snoop This option allows the BIOS to preview VGA status, and to modify the information delivered from the feature Connector of the VGA card to MPEG card. This option can solve the display inversion to black after you have used a MPEG card.

Assign IRQ for VGA Select *Enabled* if you system has a VGA controller and you have one or more VGA devices connected. If you are not using your system's VGA controller, select *Disabled* to free the IRQ resource.

Assign IRQ for USB Select *Enabled* if you system has a USB controller and you have one or more USB devices connected. If you are not using your system's USB controller, select *Disabled* to free the IRQ resource.

4-6.8 SmartDoc Anti-Burn Shield

This section helps you to get more information about your system in-
cluding CPU temperature, FAN speed and voltage. It is recommended
that you contact your mainboard supplier to get proper values about
the setting of the CPU temperature.

Run the "SmartDoc Anti-Burn Shield" as follows:

Choose "SmartDoc Anti-Burn Shield" from the Main Menu and a screen
with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
SmartDoc Anti-Burn Shield

		Item Help
Vcore	1.45V	
VDIMM	2.57V	
+3.3V	3.20V	
+5V	5.13V	
+12V	11.64V	
-12V	-10.96V	
-5V	-5.355V	
+5Vsb	5.08V	
Voltage Battery	3.10V	
CPU Internal Temp.	55°C	
SYSTEM Temp.	36°C	
CPU Fan Speed	3068 RPM	
SYStem Fan Speed	0 RPM	

↑↓←→ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

Vcore Shows actual CPU core actual voltage value.

VID, +3.3V, +5V, +12V, Shows actual voltage value of all these default volt-
-12V, -5V, +5Vsb, age value on board.
Voltage Battery

CPU Internal Temp. Shows current CPU temperature.

System Temp. Shows current system temperature.

CPU/System Fan These fields display the current speed of the CPU /
Speed System fan.

4-6.9 CPU Ratio/Voltage Control

Run the "CPU Ratio/Voltage Control" as following:

Choose "CPU Ratio/Voltage Control" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
CPU Ratio/Voltage Control

		Item Help
CPU Clock Ratio	10X	
Auto Detect PCI Clk	Enabled	
Spread Spectrum	Disabled	
Async AGP/PCI CLK	Disabled	
CPU Clock	133MHz	
AGP Voltage Select	1.5V	
DIMM Voltage Select	2.6V	

↑↓←→ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

CPU Clock Ratio If CPU onboard is one with an adjustable or un-locked CPU ratio, this item allows you user to adjust the CPU Ratio. If your CPU is one with the CPU Ratio locked, this item will be invalid.

Auto Detect PCI CLK To enable / disable the Auto-detect PCI clock function.

Spread Spectrum When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI.

Async AGP/PCI Clk Toset the Asynchronous AGP/PCI clock. Choices: Disabled; 66/33MHz; 80/40MHz;73/36Mhz

CPU Clock This items allows users to adjust CPU frequency. Choices: 133-165Mhz

AGP Voltage Select Allows you to configure the AGP Voltage. Choices: 1.5V; 1.6V; 1.7V; 1.8V

DIMM Voltage Select Allows you to configure the DIMM Voltage. Choices: 2.6V; 2.7V; 2.8V

4-6.10 Load Optimized Defaults

When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

" **Load Optimized Defaults (Y / N) ?   N** "

Phoenix - AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features	▶ CPU Ratio/Voltage Control
▶ Advanced BIOS Features	Load Optimized Defaults
▶ Advanced Chipset Features	Set Supervisor Password
▶ Integrated Peripherals	Set User Password
▶ Power management	Load Optimized Defaults [Y/N] Y
▶ PnP/PCI Configuration	Saving
▶ SmartDoc Anti-Burn Shield	

Esc: Quit	↑↓→← : Select Item
F10: Save & Exit Setup	

Change CPU Clock & Voltage

"Y" is for "Yes", and "N" is for "No".
Pressing "Y" loads the BIOS Optimized default values to restore the BIOS to its original status.

4-6.11 SET SUPERVISOR / USER PASSWORD

These two options allow you to set your system passwords. Normally, the supervisor has a higher priority to change the CMOS setup option than the users. The way to set up the passwords for both Supervisor and Users are as follows:

1. Choose "Change Password" in the Main Menu and press <Enter>. Then following message appears:

"**Enter Password :   "**

2. The first time you run this option, enter your password up to 8 characters and press <Enter>. (The screen does not display the entered characters.)

3. After you enter the password, the following message appears prompting you to confirm the password:

> `"Confirm Password :   "`

4. Enter the same password "exactly" the same as you have just typed to confirm the password and press <Enter>.
5. Move the cursor to Save & Exit Setup to save the password.
6. If you need to delete the password entered before, choose the Supervisor Password and press <Enter>. It will delete the password that you have entered before.
7. Move the cursor to Save & Exit Setup to save the option you have just configured; otherwise the old password will still be there the next time you turn your system on.
8. Press <Enter> to exit to the Main Menu.

NOTE: If you forget or lose the password, the only way to access the system is to clear the CMOS RAM. All setup information will be lost and you need to run the BIOS setup program again.

4-6.12 SAVE & EXIT SETUP

SAVE & EXIT SETUP allows you to save all modifications you have specified into the CMOS memory. Highlight this option on the Main Menu and the following message appears:

> `"SAVE to CMOS and EXIT (Y/N) ?  Y "`

"Y" is for "Yes", and "N" is for "No".
Press <Enter> key to save the configuration changes.

4-6.13 EXIT WITHOUT SAVING

EXIT WITHOUT SAVING option allows you to exit the Setup Utility without saving the modifications that you have specified. Highlight this option on the Main Menu and the following message appears:

> `"Quit Without Saving (Y/N) ?  N "`

"Y" is for "Yes", and "N" is for "No".
You may change the prompt to "Y" and press <Enter> key to leave this option .

Chapter 5 VT8237 SATA RAID

THE VIA SATA RAID Controller VT8237 & RAID Driver

VIA RAID (Redundant Array of Independent Disks) Controller is built in the South Bridge VT8237. With this RAID Controller, the VIA SATA RAID BIOS is built into the system to help configure the Redundant Disk Array. VT8237 supports RAID 0 and RAID 1 configuration.

This Chapter is to introduce the VT8237 SATA RAID Configurations :

5-0 About Disk Array

5-0-1 Disk Array Interpretation

A "Disk Array" is formed from a group of 2 or more disk drives with the RAID (Redundent Array of Independent Disks) technology. The aim of a Disk Array is to provide better performance and/or data fault tolerance.

5-0-2 Disk Array Member

The individual disk drive in an array is called a "member". Each member of a specific disk array is coded in their "reserved sector" with configuration information that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the system.

5-0-3 Disk Array Types Supported by VT8237

Different types or modes of Disk Array have different formation models and functions. The South Bridge on this mainboard supports only two types of Disk Arrays: RAID 0 and RAID 1, but not RAID 0+1.

1. RAID 0 (or Striping mode):

   RAID 0 is a group of 2 to 4 Disk Drives configured together with RAID technology to provide better data transfer performance than a single drive since the workload is balanced between the array members. Reads and Writes of RAID 0 data are interleaved between multiple drives. When any disk member fails, it affects the entire array. The disk array size is equal to the number of drive members times the smallest member capacity. For example, one 1GB and three 1. 2GB drives will form a 4GB (4x1GB) disk array.

2. RAID 1 (or Mirroring mode):

   RAID 1 is a group of 2 Disk Drives configured together with RAID Technology to provide the fault tolerance function. Writes duplicate data on to RAID 1 while reads are performed in parallel. If one of the mirrored drives suffers a mechanical failure (e.g. spindle failure) or does not respond , the remaining drive will continue to function. This is called Fault Tolerance.

   The drive capacity of RAID 1 is half the total drive capacity of two equal-size drive.

5-1 First Step to Set Up SATA RAID System

2 Serial ATA connectors for 2 SATA Hard Disks with RAID mode are supported by the South Bridge VIA VT8237. Please see Chapter 5 Disk Array Installation for detail RAID installaion.
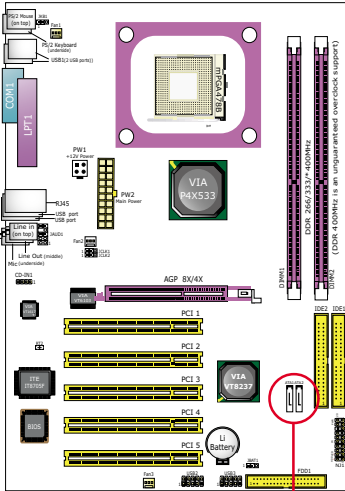
Serial ATA Connectors
SATA Connectors supported by VT8237 for 2 SATA RAID Hard Disks setup.

ATA1   **ATA2**
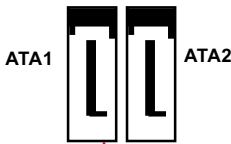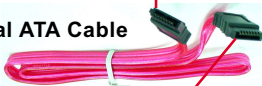
Serial ATA Cable

To Power Supply
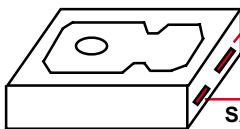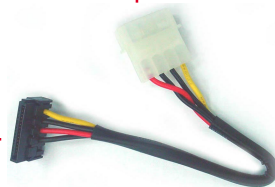
SATA Power Connectors

Serial ATA Hard Disk

5-2 Enable SATA-RAID Interface with System BIOS

(1) Boot system and watch for the following initial screen to appear:

VIA Technologies, Inc. VIA VT6420 RAID BIOS Setting Utility v (xxx)
Copyright (C) VIA Technologies, Inc. All right reserved.

Scan Devices, please wait ....
Press < Tab > key into User Windows!
Channel 0 Master: ST3120023AS
Channel 1 Master: ST380023AS

(The above message indicates that the SATA hard disks on board are
detected by the RAID BIOS.)

(2) As soon as the above screen appears, press < Delete > key (not the
<Tab> key) to enter CMOS BIOS Setup. Choose "Integrated
Peripheral" and "VIA OnChip PCI Device". As soon as you click on
the "VIA OnChip PCI Device", a list of events appears for you to
configure their values. Choose "Enabled" for the "OnChip SATA/RAID"
so as to enable the SATA RAID interface.

Phoenix - AwardBIOS CMOS Setup Utility
VIA OnChip PCI Device

OnChip SATA/RAID	Enabled	Item Help
VIA-3058 AC97 Audio	Auto	
VIA-3043 OnChip LAN	Enabled	
Onboard Lan Boot ROM	Disabled	
OnChip USB Controller	All Enabled	
OnChip EHCI Controller	Enabled	
USB Keyboard Support	Disabled	
USB Mouse Support	Disabled	
USB Emulation	Off	
x USB Keyboard Support	Disabled	
x USB Mouse Support	Disabled	

OnChip To enable/disable the South Bridge SATA/RAID
SATA/RAID interface.

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5-3 To Enter VIA Tech. RAID BIOS Setup

Reboot the system with "OnChip SATA/RAID" enabled in system BIOS Setup and watch for the following initial screen to appear:

VIA Technologies, Inc. VIA VT8237 Serial RAID BIOS Setting Utility V2.10 Copyright (C) VIA Technologies, Inc. All right reserved.

Scan Devices, Please wait ....
Press < Tab > key into User Window!
Channel 0 Master: ST380023AS
Channel 1 Master: ST380023AS

(The above message indicates that the SATA hard disks on board are detected by the RAID BIOS.)

As soon as the above screen appears, <u>press < Tab > key</u> to enter VIA Tech. RAID BIOS Setup.

In a few seconds, the VIA Tech. RAID BIOS Setup Utility appears as shown below:

Press <Enter> to create Array.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array	Create A RAID array with the hard disks attatched to VIA RAID controller
▶ Delete Array	
▶ Create/Delete	
▶ Spare	F1 : View Array/disk Status
▶ Select Boot Array	↓ ↑ : Move to next item
▶ Serial Number View	Enter : Confirm the selection
	ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS		ATA 133	74.53	Hdd
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS		ATA 133	74.53	Hdd
Channel1 Slave	No Drive				

The Hard Disks connected to SATA connectors are detected by RAID BIOS.

5-4 Using VIA RAID BIOS Setup to Create Disk Array

(5-4-1) When you press <Enter> on the "Create Array" bar, the follow-ing screen shows up. Press <Enter>on this bar to select the RAID mode.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Auto Setup For Data Security ▶ Array Mode RAID 1 (Mirroring) ▶ Select Disk Drives ▶ Start Create Process	Create A RAID array with the hard disks attatched to VIA RAID controller F1 : View Array/disk Status ↓ ↑ : Move to next item Enter : Confirm the selection ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS		ATA 133	74.53	Hdd
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS		ATA 133	74.53	Hdd
Channel1 Slave	No Drive				

(5-4-2) When you press <Enter> on the "Array Mode RAID 1 (Mirroring) " bar, the following screen shows up. Press <Enter>on either RAID0 or RAID1 bar to select the RAID mode.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ RAID 0 for performance ▶ RAID 1 for data protection ▶ RAID 0/1 ▶ RAID SPAM for capacity	Create A RAID array with the hard disks attatched to VIA RAID controller F1 : View Array/disk Status ↓ ↑ : Move to next item Enter : Confirm the selection ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS		ATA 133	74.53	Hdd
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS		ATA 133	74.53	Hdd
Channel1 Slave	No Drive				

(5-4-3) The following screen shows that RAID 0 (Striping) is selected. Now, use the "Arrow" key to mark up the "Auto Setup For Performance" bar.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Auto Setup For Performance
Array Mode RAID 0 (Striping)
▶ Select Disk Drives
▶ Block Size 64K
▶ Start Create Process

Create A RAID array with the hard disks attatched to VIA RAID controller

F1   : View Array/disk Status
↓ ↑   : Move to next item
Enter : Confirm the selection
ESC   : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS		ATA 133	74.53	Hdd
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS		ATA 133	74.53	Hdd
Channel1 Slave	No Drive				

(5-4-4) Press <Enter> on the "Auto Setup for Performance" bar, and the following screen shows up to ask you to confirm the RAID Creation. Press <Y> key to continue.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Auto Setup For Performance
▶ Array Mode RAID 0 (Striping)
▶ Select Disk Drives
▶ Block Size 64K
▶ Start Create Process

You will create array automatically, Are you sure? Continue? Press Y/N

Create A RAID array with the hard disks attatched to VIA RAID controller

F1   : View Array/disk Status
↓ ↑   : Move to next item
Enter : Confirm the selection
ESC   : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS		ATA 133	74.53	Hdd
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS		ATA 133	74.53	Hdd
Channel1 Slave	No Drive				

(5-4-5) Instantly, the RAID 0 Striping mode is set up and shown on the screen. Then press <Escape> key to exit the screen.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array
▶ Delete Array
▶ Create/Delete Spare
▶ Select Boot Array
▶ Serial Number View

Set/Clear bootable array

F1   : View Array/disk Status
↓ ↑   : Move to next item
Enter : Confirm the selection
ESC   : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
[ ]Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Stripe 0
Channel0 Slave	No Drive				
[ ]Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Stripe 1
Channel1 Slave	No Drive				

(5-4-6) On the next screen, press the "Arrow" key to mark up the "Select Boot Array" bar and press <Enter> key to set up "Boot Disk" for the system.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array
▶ Delete Array
▶ Create/Delete Spare
▶ Select Boot Array
▶ Serial Number View

Set/Clear bootable array

F1   : View Array/disk Status
↓ ↑   : Move to next item
Enter : Confirm the selection
ESC   : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Stripe 0
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Stripe 1
Channel1 Slave	No Drive				

(5-4-7) Instantly, the Master Hard Disk is marked up. Press <Enter> on the screen to set up the "Boot Disk".

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array
▶ Delete Array
▶ Create/Delete
▶ Spare
▶ Select Boot Array
▶ Serial Number View

Set/Clear bootable array

F1   : View Array/disk Status
↓ ↑   : Move to next item
Enter : Confirm the selection
ESC   : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
[ ]Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Stripe 0
Channel0 Slave	No Drive				
[ ]Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Stripe 1
Channel1 Slave	No Drive				

(5-4-8) Instantly, the bootable hard disks are marked with an "asterisk (star)" , indicating that those hard disks are bootable. You can exit from this screen by pressing the "Escape" key now.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array
▶ Delete Array
▶ Create/Delete Spare
▶ Select Boot Array
▶ Serial Number View

Set/Clear bootable array

F1   : View Array/disk Status
↓ ↑   : Move to next item
Enter : Confirm the selection
ESC   : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
[*] Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel0 Slave	No Drive				
[*]Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel1 Slave	No Drive				

5-5 Using VIA RAID BIOS Setup to change Array mode

(5-5-1) If you wants to change the RAID mode, say, from RAID 0 to RAID 1, you must return to the Initial RAID BIOS Setup screen. Then, press the "Arrow" key to mark the "Delete Array" bar and press <Enter>.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array ▶ Delete Array ▶ Create/Delete Spare ▶ Select Boot Array ▶ Serial Number View	Delete a RAID array contain the hard disks attatched to VIA RAID controller F1 : View Array/disk Status ↓ ↑ : Move to next item Enter : Confirm the selection ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel1 Slave	No Drive				

(5-5-2) Instantly, the Bootable Hard Disk(s) is marked up for deletion. Press <Enter> key on this screen to delete the set-up array.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array ▶ Delete Array ▶ Create/Delete Spare ▶ Select Boot Array ▶ Serial Number View	Delete a RAID array contain the hard disks attatched to VIA RAID controller F1 : View Array/disk Status ↓ ↑ : Move to next item Enter : Confirm the selection ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
[ ]Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel0 Slave	No Drive				
[ ]Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel1 Slave	No Drive				

(5-5-3) When the message "The selected array will be destroied....." appears on screen, press <Y> key to continue.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array ▶ Delete Array ▶ Create/Delete Spare ▶ Select Boot Array ▶ Serial Number View The selected array will be destoried. Are you sure? Continue? Press Y/N	Delete a RAID array contain the hard disks attached to VIA RAID controller F1 : View Array/disk Status ↓ ↑ : Move to next item Enter : Confirm the selection ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
[*] Channel0 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel0 Slave	No Drive				
[*]Channel1 Master	ST380023AS	ARRAY 0	ATA 133	74.53	Boot
Channel1 Slave	No Drive				

(5-5-4) Instantly, the selected array is deleted. You can see that the "Boot" marking on the Hard Disk is changed to HDD (Hard Disk Drive). Only after you have deleted the selected array, are you able to set up a new array mode.

VIA Tech. VT8237 SATA RAID BIOS Ver 2.10

▶ Create Array ▶ Delete Array ▶ Create/Delete Spare ▶ Select Boot Array ▶ Serial Number View	Delete a RAID array contain the hard disks attatched to VIA RAID controller F1 : View Array/disk Status ↓ ↑ : Move to next item Enter : Confirm the selection ESC : Exit

Channel	Drive Name	Array Name	Mode	Size(GB)	Status
Channel0 Master	ST380023AS		ATA 133	74.53	Hdd
Channel0 Slave	No Drive				
Channel1 Master	ST380023AS		ATA 133	74.53	Hdd
Channel1 Slave	No Drive				

5-6 To Install SATA RAID Driver

SATA-RAID Driver is incorporated in Support CD/Floppy Disk for user's installation. The Driver Floppy Disk is needed for SATA RAID installation on Windows 2K/XP. If you cannot find this Driver Floppy Disk in the mainboard package, you can make one by copying the driver from the Driver CD into a Floppy Disk.

5-6-1 To Install SATA RAID Driver on Windows 2000/XP

(1) Get ready the Floppy Diskette holding the RAID Driver.
(2) Check that SATA Hard Disks are connected properly to the SATA Connectors.
(3) Start your PC system and use RAID BIOS Setup Utility to configure RAID 0 or RAID 1 to the hard disks. (For SATA Interface, skip the RAID configuration.)
(4) Restart System and format the bootable hard disks.
(5) Now, apply the Windows 2000/XP CD to CD-ROM for operating system installation.
(6) On the Windows 2000 Setup screen, press "F6" key to set up RAID driver for Windows 2000/XP.

(7) On next screen when you are instructed to insert the RAID Driver Diskette into Floppy drive, follow the instruction to continue and complete the installation.

5-6-2 To Install SATA RAID Driver on Windows 98SE/ME

(1) Get ready the Floppy Diskette holding the SATA RAID Driver.

(2) Check that SATA Hard Disks are connected properly to the SATA Connectors.

(3) Start your system and use RAID BIOS Setup Utility to configure RAID 0 or RAID 1 to the hard disks. (For SATA Interface, skip the RAID configuration.)

(4) Restart System and format the bootable hard disks.

(5) Now, apply the Windows 98SE/Me CD to CD-ROM for operating system installation.

(6) Start the Windows 98SE/Me system.

(7) On the "Start" screen of your system, please click to the following path:

\My Computer\properties\Device manager

(8) In the "Device manager" screen, you can see the item " PCI RAID Controller" with a yellow question mark on its left side, which indicates that the RAID controller is already detected by system but the driver is not installed yet. Please point to this item with your mouse and double click on it (or click the "Properties" button).

The question mark here indicates that RAID Controller Driver is not installed yet.
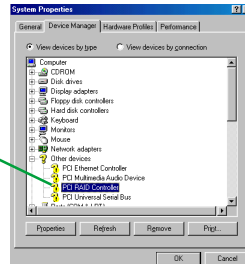

(9) Instantly, the "PCI RAID Controller Properties" screen shows up. Please click the "General" bar to continue.

(10) In the "General" screen, click "Reinstall Driver" button to continue. Please note that the status of "Device Usage" should stay at "Exists in all hardware profiles".
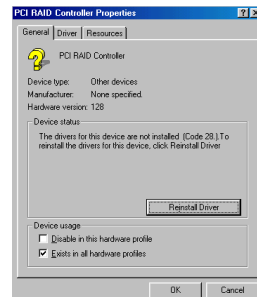
(11) In the "Update device Driver Wizard" screen, click "Next" to continue until you see a dialog box asking you to "Specify a location" for the driver. You should **now** insert the SATARAID Driver CD/Diskette into CD-ROM/Drive A.

(12) As illustrated in the picture below, check the item "Specify a location" and click the "Browse" button to find out the correct path for the driver. As the RAID Driver is in Drive A, please type into the blank bar the correct path and click "Next" to continue:

D:\Driver\VIA\VIA_serial\SATA\Win98-me
    or
A:\Win98-me
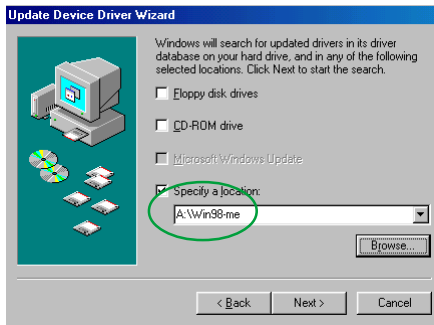
(13) The Update Device Driver Wizard will then go on installing the driver. In a few seconds, installation completes. Please click the "Finish" button on the screen to complete the installation.