

**VIA Mainboard
User's Manual
P4PB ULTRA-URL**

Version 1.0 - - August 30th, 2002

P/N 99-51-011011

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FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

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NOTE

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection and protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people cannot step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening. Doing so could cause damage or electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
 - * The power cord or plug is damaged
 - * Liquid has penetrated into the equipment
 - * The equipment has been exposed to moisture
 - * The equipment does not work well or does not work according to the User's Manual.
 - * The equipment has dropped or damaged
 - * The equipment has been visably damaged
12. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60° C (140°F), IT MAY DAMAGE THE EQUIPMENT.**

Box Contents

- 1 x VIA Mainboard
- 1 x User's Manual
- 1 x Quick Installation Guide
- 1 x Floppy Ribbon Cable
- 2 x ATA-33/66/100/133 IDE Ribbon Cable
- 1 x 4-Port USB 2.0/1.1 Module
- 1 x SPDIF Bracket
- 1 x I/O Bracket
- 1 x Driver Utilities CD
- 1 x Smart Media Reader

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1

Specifications

The VIA P4PB ULTRA mainboard is based around the VIA Apollo P4X400 chipset, which brings support for high-performance DDR SDRAM to the Intel® Pentium® 4 platform. VIA's advanced V-Link controller brings optimal system efficiency by effectively doubling bandwidth between the chipset's north and south bridges. Designed for the latest 478-pin Pentium® 4 processors, these ATX sized mainboards are the perfect choice for Pentium 4 based high- performance PCs, servers and workstations.

This chapter includes the following sections:

Mainboard Specifications	1-2
Mainboard Layout	1-4
Connectors Guide	1-5

Mainboard Specifications

CPU

- Supports Intel® Pentium® 4 Willamette / Northwood and Celeron® processors in the 478 pin package
- Supports 1.5GHz, 1.6GHz, 1.7GHz, 1.8GHz, 1.9GHz, 2GHz, 2.2GHz, 2.26GHz, 2.4GHz, 2.53GHz and upwards

Chipset

- VIA Apollo P4X400 chipset (VT8754 & VT8235)
 - Supports Intel® Pentium® 4 processors with 400MHz (100MHz QDR) and 533MHz (133MHz QDR) CPU Front Side Bus (FSB)
 - AGP v2.0 / v3.0 compliant with 4x / 8x (1.5V) transfer mode
 - High Bandwidth V-Link 533 MB/s 8-bit Client controller
 - Integrated Hardware Sound Blaster/Direct Sound AC'97 audio
 - Ultra DMA 66 / 100 / 133 master mode PCI EIDE controller
 - ACPI 1.0B and APM 1.2 compliant

Main Memory

- 3 x 184-pin DDR DIMM sockets
- Supports up to 3GB of 2.5V DDR333 / 400 (limited) SDRAM (PC3200 / PC2700 / PC2100 / PC1600) with ECC

Slots

- 1 x AGP (Accelerated Graphics Port) 4x / 8x (1.5V) slot
- 6 x PCI 2.2 32-bit PCI bus slots (supports 3.3v / 5v PCI bus interface)
- 1 x CNR (Communication Network Riser) slot

Onboard IDE

- Integrated IDE controller provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 66 / 100 / 133 operation modes
- Can connect up to two channels for four IDE devices

- Integrated Promise PDC20276 RAID IDE controller, allowing up to 4 extra IDE hard disk drives connection.

Onboard Peripherals

- 1 floppy port supports 2 x FDD
- 2 x serial ports (COM 1 + COM 2)
- 1 x SPP/EPP/ECP mode compliant parallel port
- 2 x USB 2.0 / 1.1 ports (plus 4 pin-headers for up to 8 USB 2.0 additional connections)
- 1 x CIR connector
- 1 x IrDA connector for SIR/ASKIR/HPSIR
- 1 x MIDI/Game port
- 2 x RAID connectors
- 1 x Smart Card Reader connector
- 1 x Secure digital connector
- 1 x Memory Stick connector
- 1 x RJ45 NIC port

Audio

- C-Media CMI8738 6-channel controller
- 1 x SPDIF header connector for additional SPDIF bracket

BIOS

- Award Plug & Play BIOS
- Desktop Management Interface (DMI) function which records your mainboard specifications

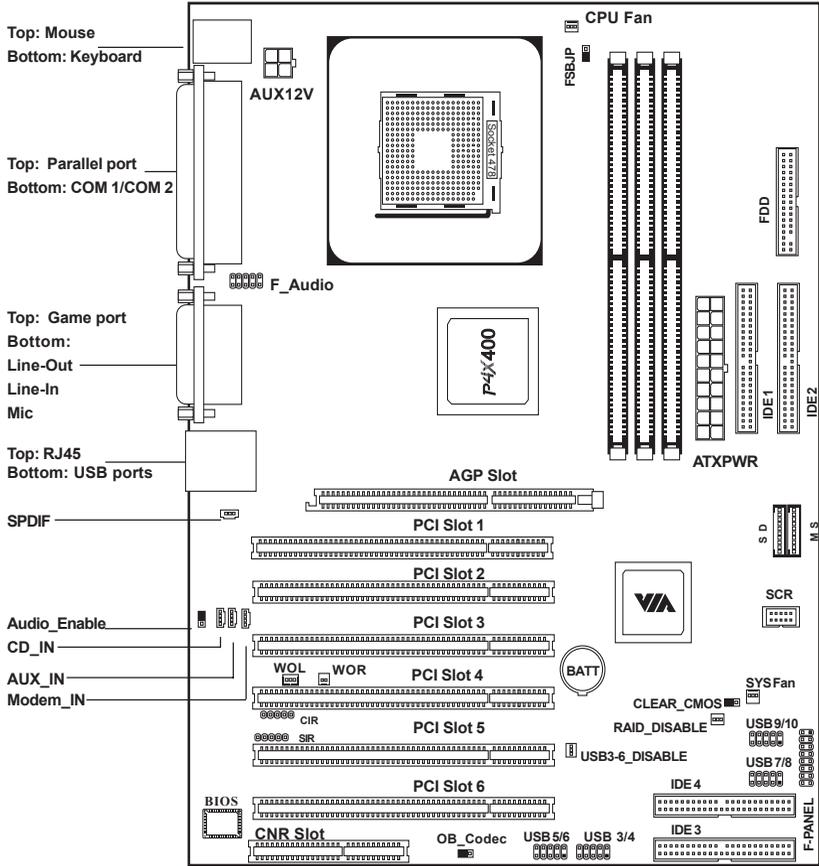
Dimension

- ATX Form Factor
- 30.5cm x 24.5cm

Mounting

- 9 mounting holes

Mainboard Layout



VIA P4PB ULTRA Mainboard

Connectors Guide

Connectors	Function	Reference
ATXPWR	ATX 20-pin power connector	See p. 2-7
AUX12V	ATX 12V power connector	See p. 2-7
JMS1	Mouse connector	See p. 2-8
JKB1	Keyboard connector	See p. 2-8
USB Port Connectors	Connecting to USB devices	See p. 2-9
LPT1	Parallel port connector	See p. 2-9
COM 1 & COM 2	Serial port connectors	See p. 2-10
MIDI/Game Connector	Connecting to joystick or game pad	See p. 2-10
Audio Port Connectors	Line-Out/Line-In/Mic-In	See p. 2-10
RJ45 NIC Port	Port for connecting to LAN port	See p. 2-10
FDD	Floppy disk drive connector	See p. 2-11
IR & CIR	IrDA Infrared Module connector	See p. 2-11
IDE 1 & IDE 2	Hard disk connectors	See p. 2-12
IDE 3 & IDE 4	Promise RAID IDE connectors	See p. 2-13
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AUX IN	AUX Line-In connector	See p. 2-14
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CPUFAN/SYSFAN	Fan Power connectors	See p. 2-15
F_PANEL	Case connectors	See p. 2-15
SPDIF	SPDIF bracket connectors	See p. 2-17
USB 3~10	USB pin-header connectors	See p. 2-18
WOL	Wake-On LAN connector	See p. 2-18
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CNR Slot	Connecting to CNR card	See p. 2-24

2

Installation

This chapter provides you with information about hardware setup procedures. While installing the mainboard, carefully hold the components and closely follow the installation procedures. Some components may be damaged if they are installed incorrectly.

It is recommended to use a grounded wrist strap before handling computer components. Static electricity can damage some components.

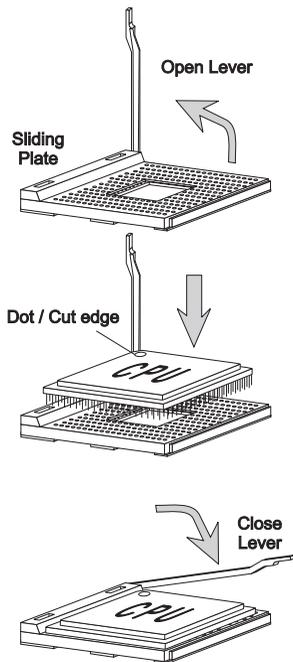
This chapter contains the following sections:

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Memory Installation	2-5
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Back Panel	2-8
Connectors	2-11
Jumpers	2-21
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CPU Installation

The mainboard supports the Intel® Pentium® 4 Willamette/Northwood and Celeron® processors in the 478 pin package (PGA478). When installing the CPU, **ensure the CPU has a large-size heatsink and a cooling fan attached on the top to prevent overheating.** If the heatsink and cooling fan are not included with the CPU, contact your dealer to purchase and install them before turning on the computer.

CPU Installation



1. Pull the lever sideways away from the socket. Then raise the lever up to a 90-degree angle.
2. Look for the dot/cut edge. The dot/cut edge should point towards the lever pivot. The CPU will only fit in the correct orientation.
3. Hold the CPU down firmly, then close the lever shut to complete the installation.

 **WARNING!** Overheating will cause serious damage to the CPU and system. Ensure the cooling fan and heatsink work properly to protect the CPU from overheating.

CPU Core Speed

$$\begin{aligned} \text{If CPU Clock} &= 100\text{MHz} \\ \text{Core/Bus ratio} &= 18 \\ \text{then CPU core speed} &= \text{CPU Clock} \times \text{Core/Bus ratio} \\ &= 100\text{MHz} \times 18 \\ &= 1.8\text{GHz} \end{aligned}$$



WARNING!

Overclocking

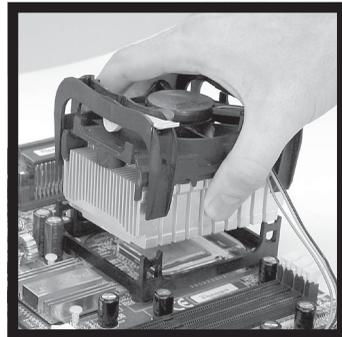
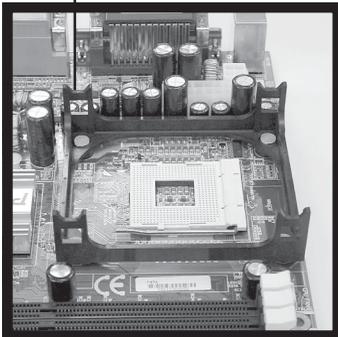
This mainboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal settings, before overclocking. Any attempt to operate beyond product specifications is not recommended. We do not guarantee the damages or risks caused by inadequate operation or operation beyond product specifications.

CPU Fan Installation

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you **MUST** attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

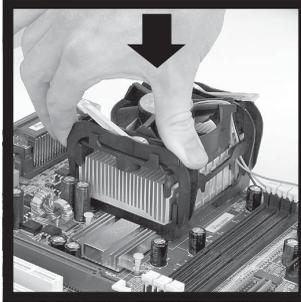
1. Locate the CPU and its retention mechanism on the mainboard.
2. Position the heatsink and fan onto the retention mechanism.

Retention mechanism



Chapter 2

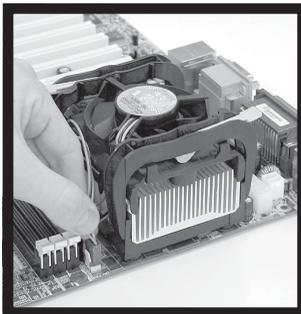
3. Mount the fan on top of the heatsink. Press down the fan firmly until its four clips become wedged in the holes of the retention mechanism.



4. Press the two levers down to secure the fan. Each lever can be pressed down in only ONE direction.



5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the mainboard.

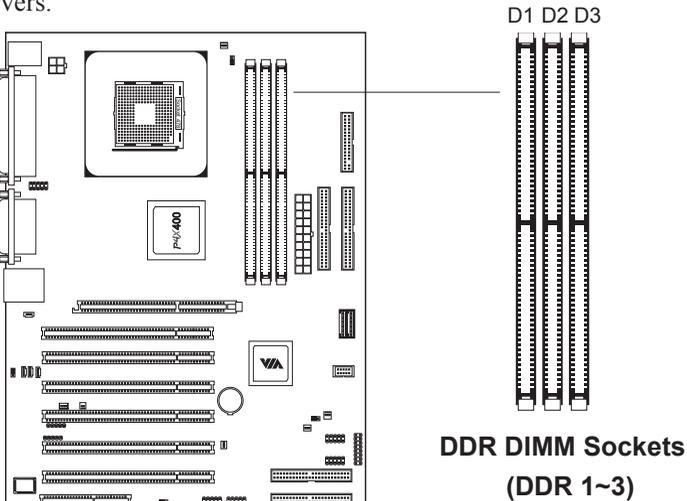


Memory Installation

The mainboard provides 3 sockets for 184-pin, 2.5V DDR DIMM modules with 6 memory banks. To operate properly, at least one DIMM module must be installed.

You can install PC1600/PC2100/PC2700/PC3200 DDR SDRAM modules on the DDR DIMM sockets (DDR 1~3).

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate of transfer by transferring data twice per cycle. This is achieved by transferring data on both the rising and falling edges of the clock. Conventional SDRAM only uses the rising edge of the clock to transfer data. Therefore, conventional SDRAM is called SDR (Single Data Rate) SDRAM. DDR SDRAM uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. DDR SDRAM is also known as SDRAM-II, DDR DRAM and DSDRAM (Double-Speed DRAM). Three types of DDR are available currently: PC1600, PC2100 & PC2700. PC1600 DDR SDRAM running at 100MHz will produce about 1.6GB/s memory bandwidth. PC2100 running at 133MHz will produce 2.1GB/s memory bandwidth. PC2700 running at 166MHz will produce 2.66GB/s memory bandwidth. PC3200 running at 200MHz will produce 3.13GB/s memory bandwidth. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.



DDR Module Installation

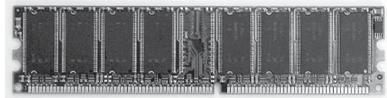
You can install either single sided or double sided 184-pin DDR DIMM modules into the DDR DIMM sockets, depending on your requirements. Differing from SDR DIMM, DDR DIMM modules have only one notch on the center of the module. The number of pins on either side of the breaks are also different. The memory modules will only fit if placed in the correct orientation. Module with ECC function is supported by P4PB ULTRA mainboard.

You can install DDR SDRAM modules in any of the following combinations:

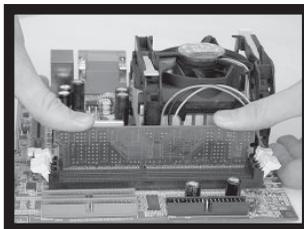
Socket	Memory Module	Total Memory
Socket 1 (Bank 0 & Bank 1)	64 M B , 1 2 8 M B , 2 5 6 M B , 5 1 2 M B , 1 G B	6 4 M B ~ 1 G B
Socket 2 (Bank 2 & Bank 3)	64 M B , 1 2 8 M B , 2 5 6 M B , 5 1 2 M B , 1 G B	6 4 M B ~ 1 G B
Socket 3 (Bank 4 & Bank 5)	64 M B , 1 2 8 M B , 2 5 6 M B , 5 1 2 M B , 1 G B	6 4 M B ~ 1 G B
Maximum System Memory Supported		6 4 M B ~ 3 G B

Note: DDR400 is strongly recommended to install in socket 3 or 2. For more information, please visit VPSD website - <http://www.viavpsd.com/> .

1. The DDR DIMM module has only one notch on the center.



2. Insert the DDR module vertically into the DDR DIMM socket. Make sure the notch is correctly aligned.



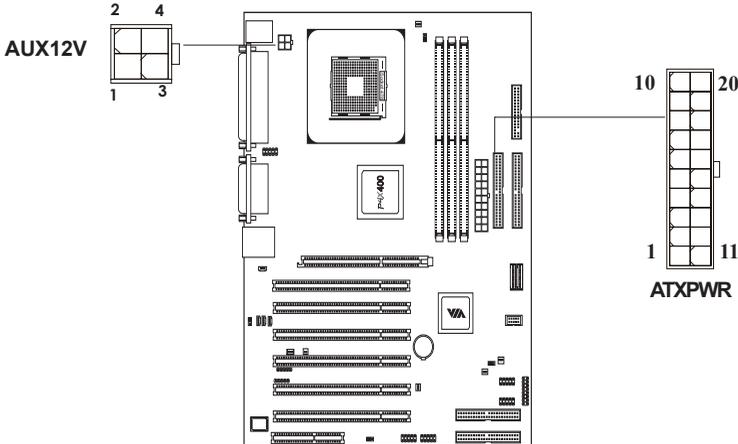
3. The plastic clips at sides of the DIMM socket will automatically close shut.

Power Supply

The mainboard requires an ATX power supply for powering the system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: ATXPWR

This connector is for the ATX power supply. To connect to the ATX power supply, make sure the plugs of the power supply are inserted in the correct orientation and the pins are properly aligned. Then, push down the plugs firmly into the connector.



ATX 12V Power Connector: AUX12V

This 12V power connector is used to provide power to the CPU.

ATXPWR Pin Definition

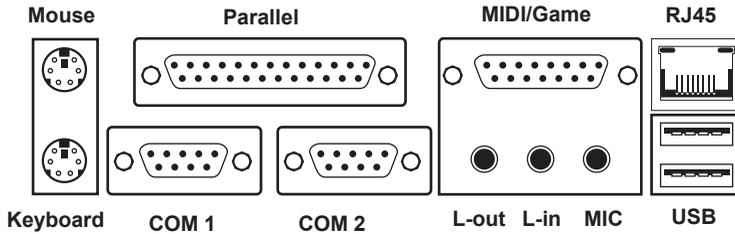
PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

AUX12V Pin

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

Back Panel

The Back Panel provides the following connectors:

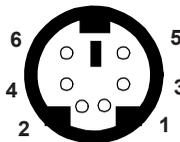


Mouse Connector: JMS1

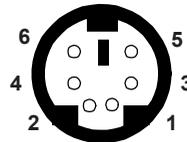
The mainboard provides a standard PS/2 mouse connector for attaching a PS/2 mouse. You can plug a PS/2 mouse directly into this connector. The connector location and pin assignments are as follows:

Keyboard Connector: JKB1

The mainboard provides a standard PS/2 keyboard connector for attaching a PS/2 keyboard. You can plug a PS/2 keyboard directly into this connector.



PS/2 Mouse (6-pin Female)



PS/2 Keyboard (6-pin Female)

Pin Definition

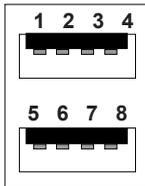
PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	MouseDATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5.	Mouse Clock	Mouse clock
6.	NC	No connection

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5.	Keyboard Clock	Keyboard clock
6.	NC	No connection

USB Port Connectors

The mainboard provides 2 USB 2.0 ports (plus 4 pin-headers for up to 8 additional USB 2.0 connections; see 2-18). USB-compatible devices can be plugged directly into these ports. (Please note that if you want to connect any USB 2.0 devices, you need to do so with the supplied additional connection ports to make full use of USB 2.0. Also, if you want to use USB keyboard or mouse, please connect each to these ports instead of the additional USB-port bracket.)

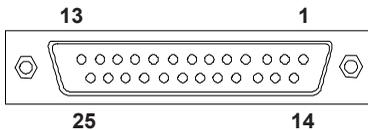


Pin Definition

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data 0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

Parallel Port Connector: LPT1

The mainboard provides a 25-pin female connector for LPT (parallel port). A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) modes.

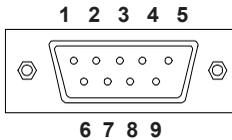


Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Serial Port Connectors: COM 1 & COM 2

The mainboard offers two 9-pin male Serial Port connectors (COM 1 and COM 2) . You can attach a serial mouse or other serial devices directly to these ports.



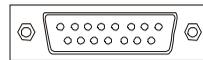
9-Pin Male DIN Connectors

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

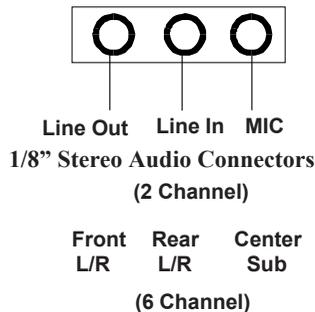
MIDI/Game Connector

You can connect a joystick or game pad to this connector.



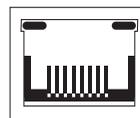
Audio Port Connectors

Line-Out is a connector for speakers or headphones. The **Line-In** connector can be used for an external CD player, tape player, or other audio devices. The **Mic-In** connector is for connecting microphones. Please note when 6-channel applications are used, all three connectors become output connectors. **Line-Out** becomes Front L/R; **Line-In** becomes Rear L/R; **Mic-In** becomes Center/Sub. The 6-CH mode needs proper setting on O/S and application. Win98 supports 4-CH only



RJ45 NIC Port

The mainboard provides one standard RJ45 port for connection to the Local Area Network (LAN). You can connect a network cable to the LAN port.

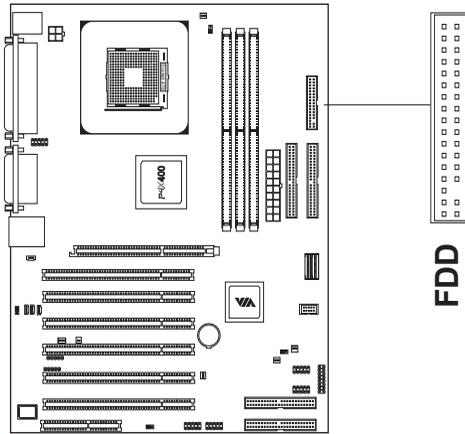


Connectors

The mainboard provides pin-header connectors for FDD, IDE HDD, case, modem, LAN, USB Ports, IR module and the CPU/System FAN.

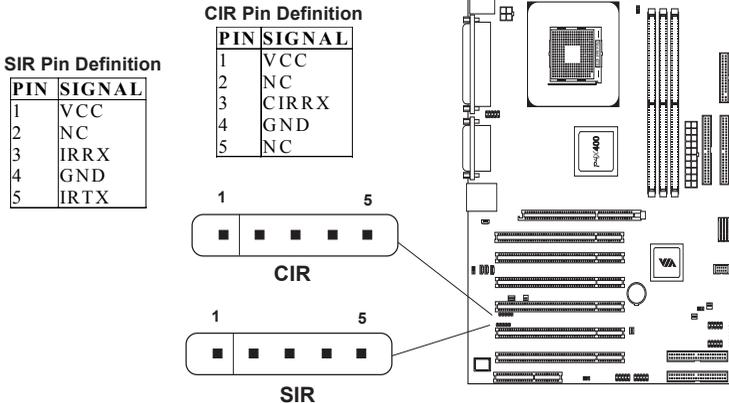
Floppy Disk Drive Connector: FDD

The standard floppy disk drive connector supports 360K, 720K, 1.2M, 1.44M, and 2.88M floppy disk types.



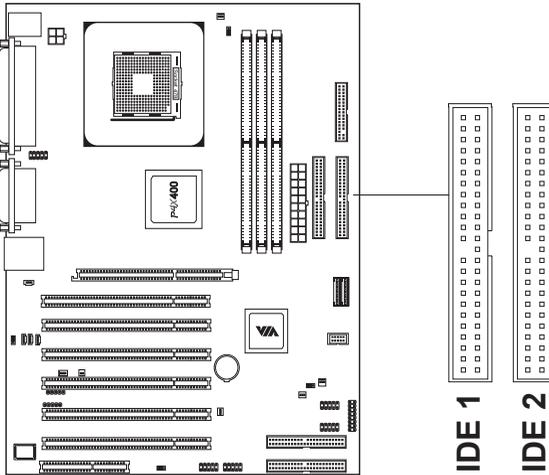
IrDA Infrared Module Connector: SIR & CIR

These connectors allow you to connect IrDA Infrared module(s). You must configure the setting through the BIOS setup to activate the SIR/CIR functions.



Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100/133 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100/133 functions. You can connect up to four hard disk drive, CD-ROM, LS-120 and other devices. These connectors utilize the provided IDE hard disk cable.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure the second hard drive to Slave mode by setting the jumper accordingly.

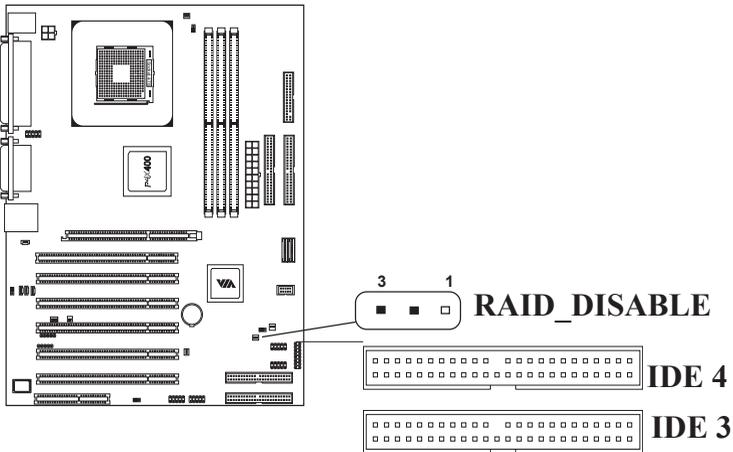
IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

 **TIP:** If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

IDE RAID Connectors: IDE3 & IDE4

The mainboard provides two extra IDE connectors (IDE3 & IDE4). This in turn allows up to four extra IDE HDD connections. You can use these two connectors for setting up RAID 0 or 1 array. If you want to connect two hard disk drives to the RAID IDE connectors, you must always connect each hard disk drive to two separate IDE ribbon cables and you must set both hard disk drives to master mode. For more information on setting RAID 0 or 1 array, please refer to Appendix A of this manual. The RAID function can be disabled. Please short pin 2 and 3 of RAID_DISABLE.



CD-In Connector: CD_IN

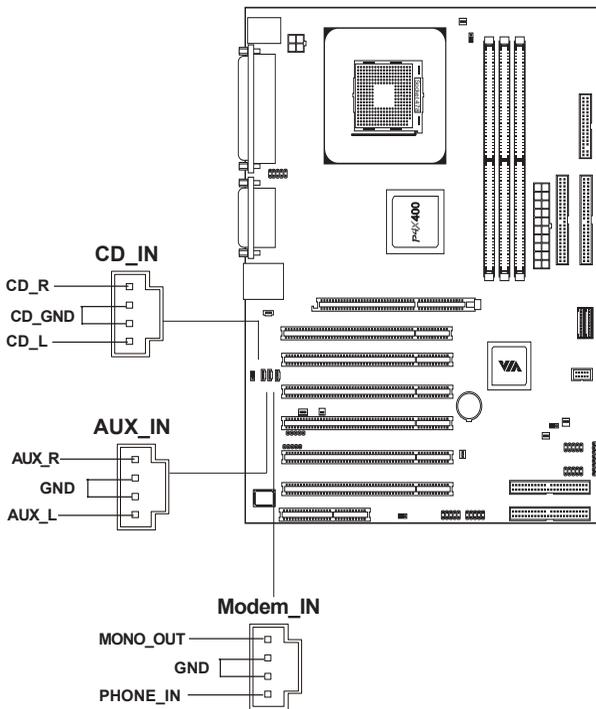
This connector is for the CD-ROM audio connector.

Aux Line-In Connector: AUX_IN

This connector is for a DVD add-on card with Line-in connector.

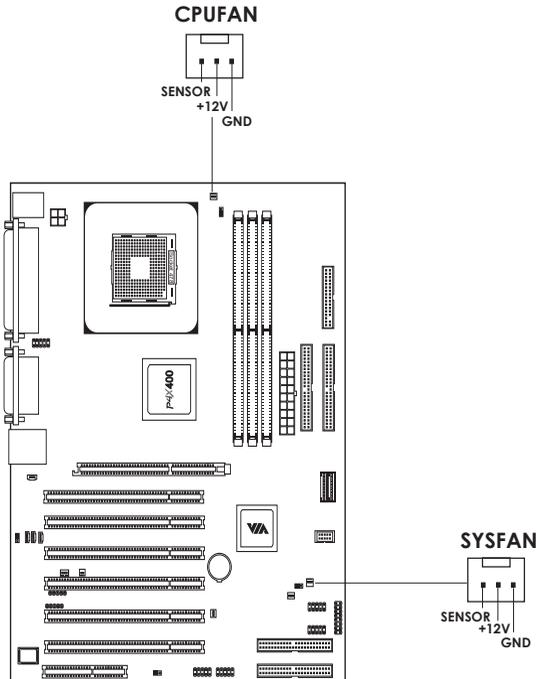
Modem-In Connector: Modem_IN

This connector is for a modem with internal audio connector.



Fan Power Connectors: CPU/SYS FAN

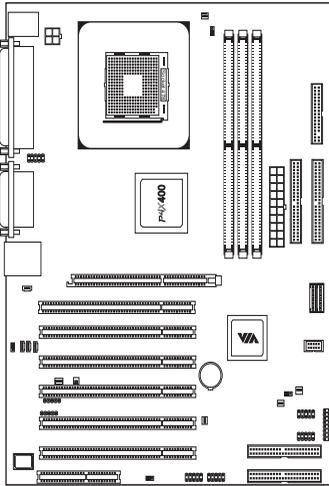
The CPUFAN (CPU fan) and SYSFAN (system fan) run on +12V and maintain system cooling. When connecting the wire to the connectors, always be aware that the red wire is the **Positive** and should be connected to the +12V. The black wire is **Ground** and should be connected to GND. Both CPU and System fan connectors have sensors to detect fan speed.



Note: Always consult the vendor for proper CPU cooling fan.

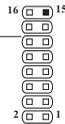
Case Connectors: F_PANEL

The case connector block F_PANEL allow you to connect to the Power Switch, Reset Switch, Power LED, HDD LED and SLED on the case.



Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	PWR_LED+	2	HD_LED+
3	PWR_LED+	4	HD_LED-
5	PWR_LED-	6	PW+
7	SPEAKER+	8	PW-
9	NC	10	RESET+
11	NC	12	RESET-
13	SPEAKER-	14	SLED+
15	NC	16	SLED-



Power Switch

Connect to a 2-pin push button switch. Pressing this button will turn the system power on or off.

Reset Switch

The Reset Switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting while the HDD is working. You can connect the Reset Switch from the system case to this pin.

Power LED

The LED is lit when the system is power on. If the system is in S1 (POS - Power On Suspend) or S3 (STR - Suspend To RAM) state, the LED will blink.

HDD LED

HDD LED shows the activity of a hard disk drive. Avoid turning the power off while HDD LED is lit. Connect the HDD LED from the system case to this pin.

SLED

The SLED is lit when the system is in the S1 (POS - Power On Suspend) state.

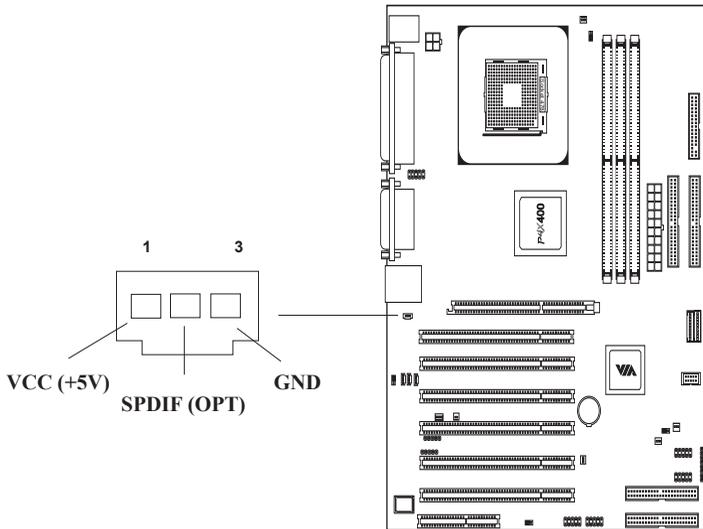
Speaker

The speaker from the system case is connected to this pin.

SPDIF Connector: SPDIF

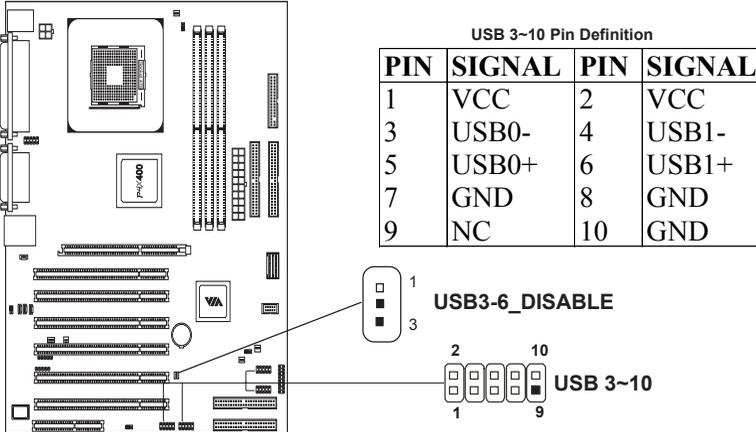
This connector is for connecting the SPDIF bracket that comes with this mainboard. The SPDIF bracket consists of two SPDIF connectors (one for optical and the other RCA).

The SPDIF output provides digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder. The feature is available only with stereo system which has digital output function.



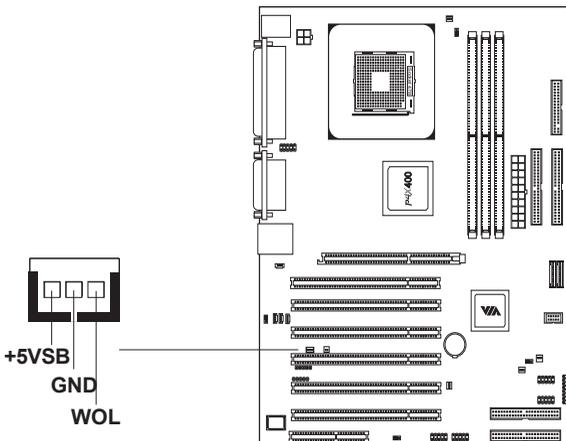
USB pin-header: USB3~10

The mainboard provides 4 front USB pin-header connectors, allowing up to 8 additional USB 2.0 ports. Please plug the USB 4-port module onto these pin-headers. The USB3-6_DISABLE can work by shorting pin 2 and 3.



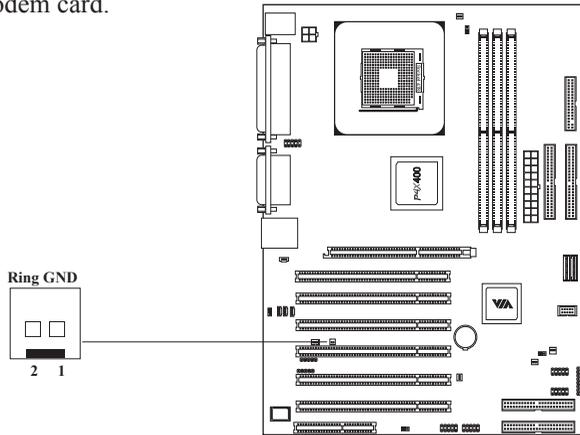
Wake-On LAN Connector: WOL

This connector allows you to connect a network card with the Wake-On LAN function. The connector will power up the system when a signal is received through the network card.



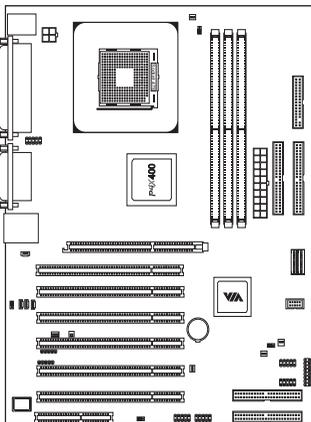
Wake-On Ring Connector: WOR

This connector allows you to connect a modem card with the Wake-On Ring function. The connector will power up the system when a signal is received through the modem card.



Secure Digital and Memory Stick Connectors: SD/MS

These connectors support non-volatile memory devices called Secure Digital (SD) memory card and Memory Stick (MS). A SD/MS reader needs to be connected for these devices to work.

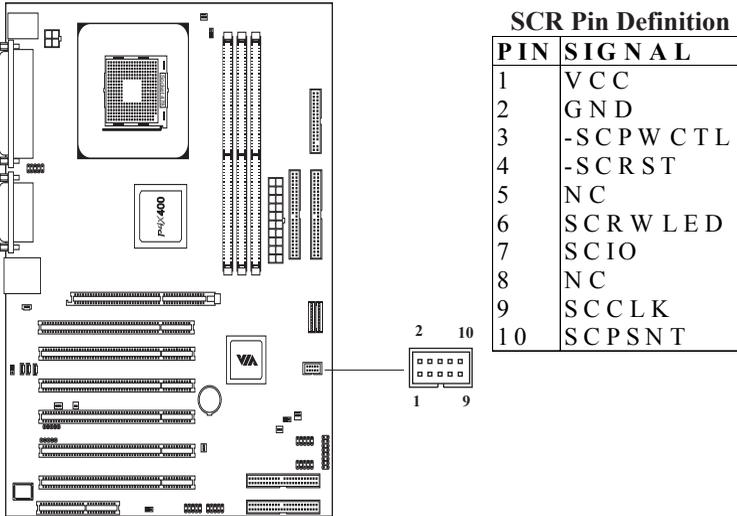


SD and MS Pin Definition

PIN	SD SIGNAL	MS SIGNAL
1	GND	GND
2	SD 1	MS 1
3	+3.3 V	+3.3 V
4	SD 2	MS 2
5	SD 3	MS 3
6	SD 4	MS 4
7	SD 5	MS 5
8	SDCLK	MSCLK
9	-SDPWR	-MSPWCTL
10	SDLED	MSRWLED

PC Smart Card Reader: SCR

This connector accommodates a Smart Card Reader that allows you to conveniently make transactions such as financial, health care, telephony, or traveling services through a Smart Card user interface software.

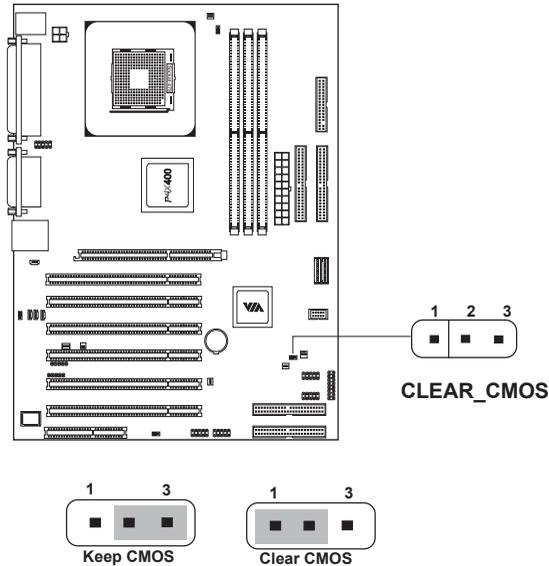


Jumpers

The mainboard provides jumpers for setting the mainboard's functions. This section will explain how to change settings for your mainboard's functions through the use of the jumpers.

Clear CMOS Jumper: CLEAR_CMOS

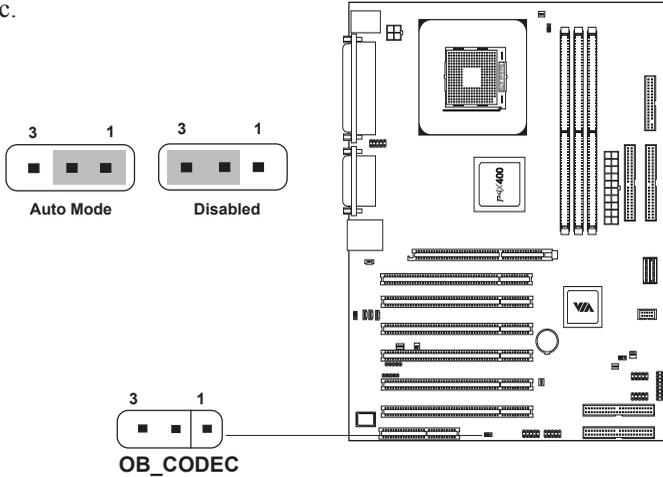
The onboard CMOS RAM stores system configuration data and has an onboard battery power supply. The long-life battery has a lifetime of at least 5 years. If you want to clear the system configuration data from the CMOS RAM, use the CLEAR_CMOS (Clear CMOS jumper). Follow the instructions below to clear the data:



WARNING!  You can clear the CMOS by shorting 1-2 pin while the system is off. Then return it to the 2-3 pin position. Avoid clearing the CMOS while the system is on; this will damage the mainboard.

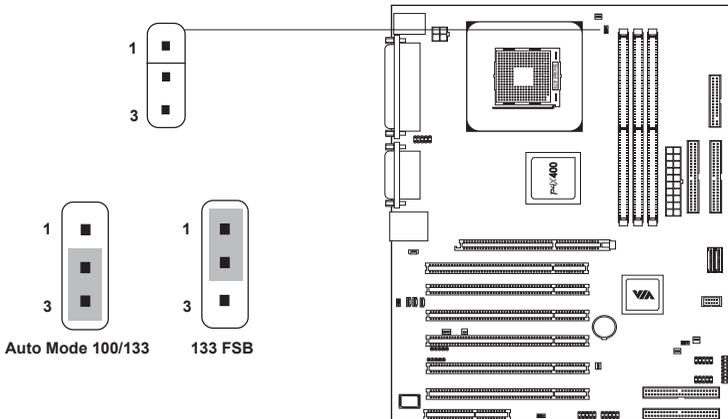
Audio Codec Auto Detect Jumper: OB_CODEC

This jumper enables or disables the audio codec auto detect function. If a CNR card based audio codec is found, then the auto detect function will automatically disable the onboard audio codec to avoid conflict. If the auto detect function is disabled, then the mainboard will always disable the onboard audio codec.



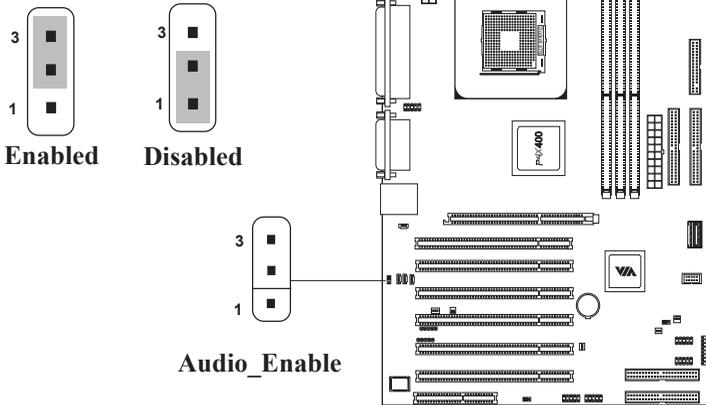
CPU FSB Setting Jumper: FSBJP

This jumper allows you to set up CPU FSB frequency.



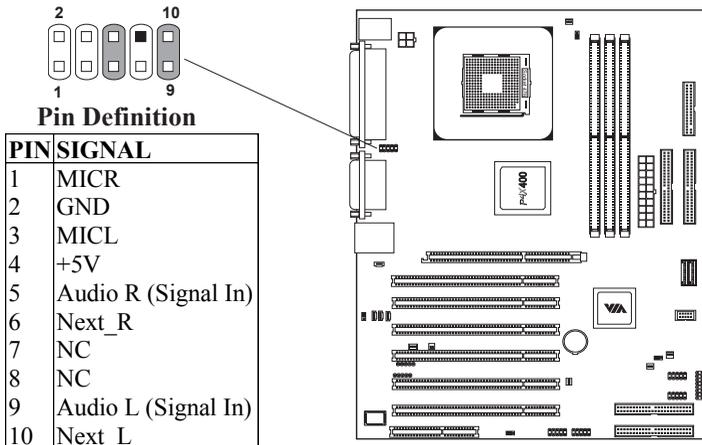
Onboard Audio Jumper: Audio_Enable

This jumper enables or disables the onboard audio chip. Setting jumper to enabled mode enables the onboard audio chip, while disabled mode disables the onboard audio chip.



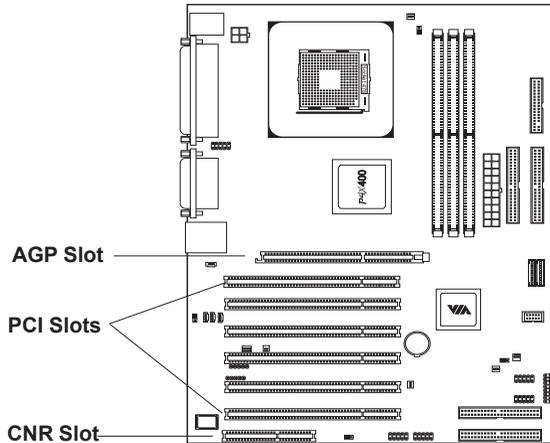
Onboard Front Audio Jumper: F_Audio

This jumper allows you to connect audio jacks on front panel for convenient connection and control of audio devices. The line-out default setting is to short pin 5, 6, 9, and 10.



Slots

The mainboard provides six 32-bit Master PCI bus slots, one AGP4X/8X (1.5V) slot and one CNR slot.



AGP (Accelerated Graphics Port) Slot

The AGP4X/8X (1.5V) slot allows you to insert an AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory and provides two levels of throughputs: 4x (1.07GB/s) and 8x (2.14GB/s).

PCI Slots

The six PCI slots allow you to insert expansion cards to meet your needs. When adding or removing PCI expansion cards, ensure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

CNR (Communication Network Riser) Slot

The CNR slot allows you to insert a CNR expansion card. CNR is a specially designed network, audio, or modem riser card for ATX family mainboards. Its main processing is done through software and is controlled by the mainboard's chipset.

PCI Interrupt Request Routing

IRQ allows devices to send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#
PCI Slot 4	INT D#	INT A#	INT B#	INT C#
PCI Slot 5	INT A#	INT B#	INT C#	INT D#
PCI Slot 6	INT B#	INT C#	INT D#	INT A#

3

BIOS Setup

This chapter gives you detailed explanation of each BIOS setup functions. It consists of the following topics:

Entering Setup	3-2
Control Keys	3-2
Getting Help	3-3
The Main Menu	3-4
Standard CMOS Features	3-6
Advanced BIOS Features	3-8
Advanced Chipset Features	3-11
Integrated Peripherals	3-13
Power Management Setup	3-17
PNP/PCI Configurations	3-22
PC Health Status	3-24
Frequency/Voltage Control	3-25
Load Fail-Safe Defaults	3-28
Load Optimized Defaults	3-29
Set Supervisor/User Password	3-30
Save & Exit Setup	3-32
Exit Without Saving	3-33

Entering Setup

Power on the computer and press DEL straight away to enter the BIOS setup menu. If you missed the BIOS setup entry point, you may restart the system and try again.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
<F7>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

Getting Help

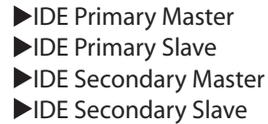
After entering the BIOS setup menu, the Main Menu appears.

Main Menu

The main menu displays all BIOS setup categories. Use the control keys (↓↑) to select any item/sub-menu. Description of the selected/highlighted category is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears on the left of certain fields, this means a sub-menu is available. The sub-menu contains additional options. You can use control keys (↓↑) to highlight the field and press <Enter> to enter the sub-menu. To return from the sub-menu press <Esc >.



- ▶IDE Primary Master
- ▶IDE Primary Slave
- ▶IDE Secondary Master
- ▶IDE Secondary Slave

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu/sub-menu by pressing <F1>. The help screen displays the keys for use and navigate the BIOS setup. Press <Esc> to exit the help screen.

The Main Menu

The Main Menu contains twelve setup functions and two exit choices. Use arrow keys to select the items and press <Enter> to accept or enter the sub-menu.



Standard CMOS Features

Use this menu to set basic system configurations.

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to set chipset specific features and optimize system performance.

Integrated Peripherals

Use this menu to set onboard peripherals features.

Power Management Setup

Use this menu to set onboard power management functions.

PnP/PCI Configurations

Use this menu to set the PnP and PCI configurations.

PC Health Status

This menu shows the PC health status.

Frequency/Voltage Control

Use this menu to set the system frequency and voltage control.

Load Fail-Safe Defaults

Use this menu to load the BIOS default settings for minimal and stable system operations.

Load Optimized Defaults

Use this menu to load BIOS default settings for optimal and high performance system operations.

Set Supervisor Password

Use this menu to set supervisor password.

Save & Exit Setup

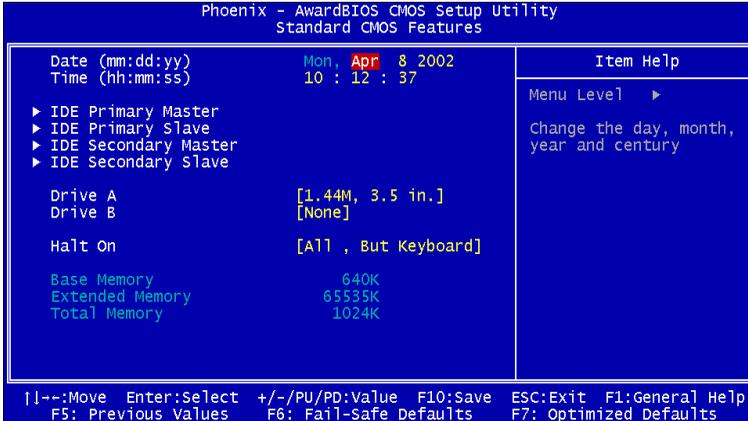
Save BIOS setting changes and exit setup.

Exit Without Saving

Abandon all BIOS setting changes and exit setup.

Standard CMOS Features

Use the arrow keys to highlight the item and use the <PgUp> or <PgDn> keys to select the value you desire for each item.



Date

The date format is <Day><Month><Date><Year>.

Day - day of the week, for example Friday. Read-only.

Month - the month from Jan to Dec.

Date - the date from 1 to 31.

Year - the year, range from 1999 to 2098.

Time

The time format is <Hour><Minute><Second>.

Drive A/B

Set the type of floppy drive installed. Available options are *None*, *360K*, *5.25 in.*, *1.2M*, *5.25 in.*, *720K*, *3.5 in.*, *1.44M*, *3.5 in.*, *2.88M*, *3.5 in.*

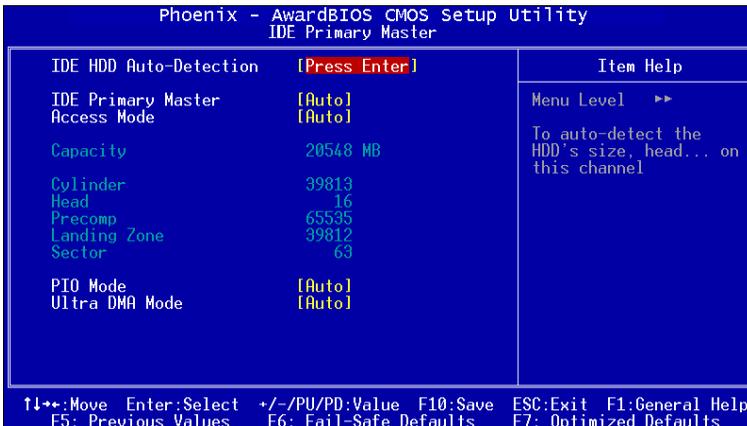
Halt On

Determine the system behaviour if an error is detected at boot. Settings are:

<i>All Errors</i>	System halts when any error is detected.
<i>No Errors</i>	System does not halt for any error.
<i>All, But Keyboard</i>	System halts for all error (except keyboard error).
<i>All, But Diskette</i>	System halts for all error (except diskette error).
<i>All, But Disk/Key</i>	System halts for all error (except disk/keyboard error)

IDE Primary Master/Slave and Secondary Master/Slave

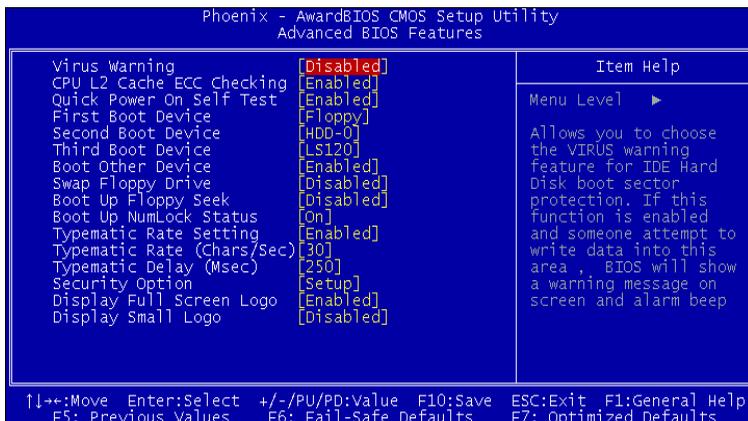
Press <Enter> to enter the sub-menu and the following screen appears:



The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. Select Auto whenever possible. If you select Manual, make sure the information provided is from your hard disk vendor or system manufacturer.

IDE Primary Slave	The settings are None, Auto, Manual.
Access Mode	The settings are CHS, LBA, Large, Auto.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation.
Landing Zone	Cylinder location of the landing zone.
Sector	Number of sectors.
PIO Mode	The settings are Mode 0/1/2/3/4, Auto.
UltraDMA Mode	The settings are Disabled and Auto.

Advanced BIOS Features



Virus Warning

Set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled, any attempt to write data into this area will cause a beep and warning message display on screen. Settings: *Disabled* and *Enabled*.

CPU L2 Cache ECC Checking

Set the ECC (Error-Correcting Code) feature for Level 2 cache. Facilitates error detection/correction when data passes through Level 2 cache. Settings: *Enabled* and *Disabled*.

Quick Power On Self Test

Shorten Power On Self Test (POST) cycle and enable shorter bootup time. Allow BIOS to skip some check items during POST. Settings: *Enabled* and *Disabled*.

First/Second/Third Boot Device

Set the boot device sequence as BIOS attempts to load the disk operating system. The settings are:

<i>Floppy</i>	The system will boot from floppy drive.
<i>LS120</i>	The system will boot from LS-120 drive.
<i>HDD-0</i>	The system will boot from first HDD.

<i>SCSI</i>	The system will boot from SCSI.
<i>CD-ROM</i>	The system will boot from CD-ROM.
<i>HDD-1</i>	The system will boot from second HDD.
<i>HDD-2</i>	The system will boot from third HDD.
<i>HDD-3</i>	The system will boot from fourth HDD.
<i>ZIP100</i>	The system will boot from ATAPI ZIP drive.
<i>LAN</i>	The system will boot from network drive.
<i>Disabled</i>	Disable this sequence.

Boot Other Device

Enable the system to boot from other devices if the system fails to boot from the First/Second/Third boot device. Settings: *Enabled* and *Disabled*.

Boot Up Floppy Seek

Set floppy seek during POST, BIOS will determine whether the floppy is 40 or 80 tracks. Settings: *Enabled* and *Disabled*.

Boot Up NumLock Status

Set the NumLock status when the system is powered on. “On” will turn key pad into number keys, and “Off” will turn key pad into arrow keys. Settings: *On* and *Off*.

Typematic Rate Setting

Set the typematic rate and delay. Settings: *Enabled* and *Disabled*.

Typematic Rate (Chars/Sec)

When Typematic Rate Setting is enabled. This item allows you to set the rate (characters/second) at which the keys are accelerated. Settings: *6, 8, 10, 12, 15, 20, 24* and *30*.

Typematic Delay (Msec)

When Typematic Rate Setting is enabled. This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250, 500, 750* and *1000*.

Security Option

Specifies the type of BIOS password protection that is implemented. Settings are described below:

Option	Description
<i>Setup</i>	The password prompt appears only when end users try to run Setup.
<i>System</i>	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

Display Full Screen Logo

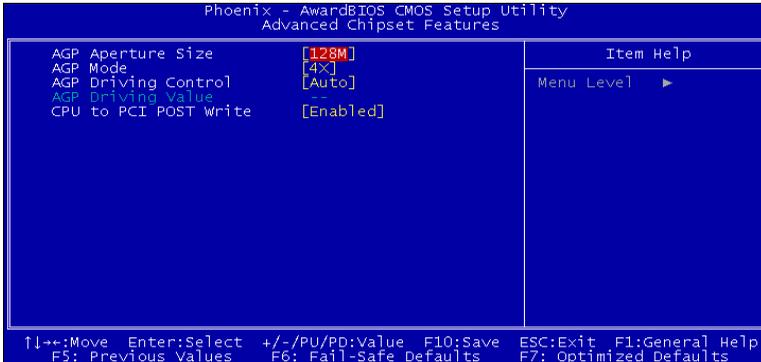
Show full screen logo during BIOS bootup process. Settings: *Enabled* and *Disabled*.

Display Small Logo

Show small energy star logo during BIOS bootup process. Settings: *Enabled* and *Disabled*.

Advanced Chipset Features

The Advanced Chipset Features menu is used for optimizing the chipset functions.



Note: Change these settings only if you are familiar with the chipset.

AGP Aperture Size

This setting controls just how much memory space can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. Settings: *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256MB.*

AGP Mode

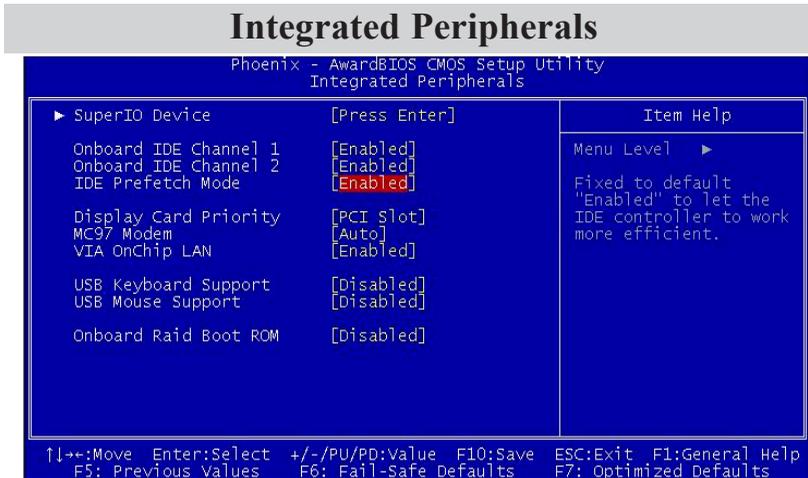
This mainboard supports the AGP 4x interface. When the AGP 4x video card is used, it can transfer video data at 1066MB/s. AGP 4x is backward-compatible, leave the default 4x mode on if unsure. When set to 1x mode, the maximum transfer rate it at 266MB/s, and 2x mode transfers data at 533MB/s. AGP8x mode can be detected automatically once you plug in the AGP8x card. Settings: *4X, 2X and 1X.*

AGP Driving Control

The setting is used to adjust AGP driving force. Selecting *Manual* allows you to type a AGP driving force in AGP Driving Value. It is strongly suggested to select *Auto* to avoid causing any system error. Settings: *Auto and Manual.*

CPU to PCI POST Write

When *Enabled*, CPU can write up to four words of data to the PCI write buffer before CPU must wait for PCI bus cycle to finish. If *Disabled*, CPU must wait after each write cycle until PCI bus signals that it is ready to receive more data. Settings: *Enabled* and *Disabled*.



Onboard IDE Channel 1/2

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately. Settings: *Disabled*, *Enabled*.

IDE Prefetch Mode

This allows your hard disk controller to use the fast block mode to transfer data to and from the hard disk drive. Block mode is also called block transfer, multiple commands or multiple sector read/write. *Enabled* enables IDE controller to use block mode; *Disabled* allows the controller to use standard mode.

Display Card Priority

This setting specifies which VGA card is your primary graphics adapter. Settings: *PCI Slot* and *AGP*.

MC97Modem

Auto allows the mainboard to detect whether a modem is used. If a modem is used, the onboard VIA MC'97 (Modem Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect to a modem. Settings: *Auto* and *Disabled*.

VIA OnChip LAN

This setting allows you to enhance VIA OnChip LAN. Settings: *Enabled* and *Disabled*.

Chapter 3

USB Keyboard Support

Enable USB Keyboard Support for DOS and Windows 95. Settings: *Enabled* and *Disabled*.

USB Mouse Support

Enable USB Mouse Support for DOS and Windows 95. Settings: *Enabled* and *Disabled*.

Onboard Raid Boot ROM

Enable system to boot up with the onboard Raid system. Settings: *Enabled* and *Disabled*.

SuperIO Device

Press <Enter> to enter the sub-menu and the following screen appears:



Onboard FDC Controller

Enable the onboard floppy controller. Select “Enabled” when you have installed a floppy disk drive. Settings: *Enabled* and *Disabled*.

Onboard Serial Port 1/2

Set the base I/O port address and IRQ for the onboard serial port A/serial port B. Selecting *Auto* allows BIOS to automatically determine the correct base I/O port address. Settings: *Disabled*, *3F8/IRQ4*, *2F8/IRQ3*, *3E8/IRQ4*, *2E8/IRQ3* and *Auto*.

UART Mode Select

The field specifies the operation mode for serial port “COM B”. If the mode selected is not “Serial Port” then “COM B” will be disabled in order for other device to take effect. Settings are:

<i>Serial Port:</i>	RS-232C Serial Port
<i>IrDA(Infrared):</i>	IrDA-compliant Serial Infrared Port
<i>ASKIR(Infrared):</i>	Amplitude Shift Keyed Infrared Port
<i>SmartCard Reader:</i>	SmartCard Reader

RxD, TxD Active

Set the receiving and transmission as active high or active low. Settings: “Hi Hi”, “Hi Lo”, “Lo Hi” and “Lo Lo”.

IR Transmission Delay

Set the delay mode of IR transmission/reception. Settings: *Enabled* and *Disabled*.

UR2 Duplex Mode

Set the operating mode of IR transmission/reception. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed. Settings: *Full* and *Half*.

Onboard Parallel Port

This specifies the I/O port address and IRQ of the onboard parallel port. Settings: *378/IRQ7*, *278/IRQ5*, *3BC/IRQ7* and *Disabled*.

Parallel Port Mode

Set the parallel port mode. To operate the onboard parallel port as Standard Parallel Port, choose “SPP.” To operate the onboard parallel port in the EPP mode, choose “EPP.” By choosing “ECP”, the onboard parallel port will operate in ECP mode. Choosing “ECP + EPP” will allow the onboard parallel port to support both the ECP and EPP modes simultaneously. Settings are:

<i>SPP</i> :	Standard Parallel Port
<i>EPP</i> :	Enhanced Parallel Port
<i>ECP</i> :	Extended Capability Port
<i>ECP+EPP</i> :	Extended Capability Port + Enhanced Parallel Port

EPP Mode Select

Select the Enhance Parallel Port Mode. Settings: *EPPI.9* and *EPPI.7*.

ECP Mode Use DMA

ECP utilizes a DMA channel. This field is only available if Parallel Port Mode is set to “ECP”. Select DMA channel for ECP use. Settings: *1* and *3*.

Game Port Address

Set I/O port address for onboard game port. Settings: *Disabled*, *201* and *209*.

Midi Port Address

Set I/O port address for onboard midi port. Settings: *Disabled*, *330* and *300*.

Midi Port IRQ

Set an IRQ for the onboard midi port. This field is only available if midi port is not “Disabled”. Settings: *5* and *10*.

SC Port Address

Enable or disable Smart Card reader. Settings: *Enabled* and *Disabled*.

SC Port IRQ

Display the current Smart Card Reader IRQ.

MS/SD Port Address

Enable or disable Memory Stick/Secure Digital reader. Settings: *Enabled* and *Disabled*.

MS/SD Port Mode

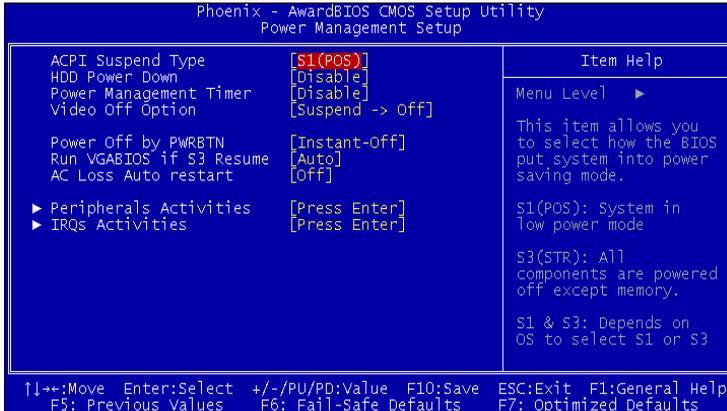
Select to use Memory Stick/Secure Digital reader. Only one can function at the same time. Settings: *MS Socket* and *SD Socket*.

MS/SD Port IRQ

Display the current Memory Stick/Secure Digital IRQ.

Power Management Setup

The Power Management Setup menu configures the system to most effectively save energy while operating in a manner consistent with your own style of computer use.



ACPI Suspend Type

Set the power saving mode for ACPI function. Settings are:

S1/POS - S1/Power On Suspend (POS) is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system context.

S3/STR - S3/Suspend To RAM (STR) is a power-down state. In this state, power is supplied only to essential components such as main memory and wakeup-capable devices. The system context is saved to main memory, and context is restored from the memory when a “wake-up” event occurs.

S1 & S3 - Depends on OS to select S1 or S3.

HDD Power Down

Set the time to power down HDD after hard disk inactivity. Settings: *Disable* and *1~15 Min*.

Power Management Timer

Set the idle time before system enters power saving mode. ACPI OS such as Windows XP will override this option. Settings: *Disable* and *1/2/4/6/8/10/20/30/40 min* and *1 hr*.

Video Off Option

Select whether or not to turn off the screen when system enters power saving mode, ACPI OS such as Windows XP will override this option.

Settings are:

Always On - The screen is always on even when system enters power saving mode.

Suspend -> Off - The screen is turned off when system enters power saving mode.

Power Off by PWRBTN

This field configures the power button function. Settings are:

Instant-Off - The power button functions as a normal power-on/-off button.

Delay 4 Sec - The system is turned off if power button is pressed for more than four seconds.

Run VGABIOS if S3 Resume

Select whether to run VGA BIOS if resumed from S3 state. This is only necessary for older VGA drivers, select Auto if in doubt. Settings: *Auto, Yes* and *No*.

AC Loss Auto restart

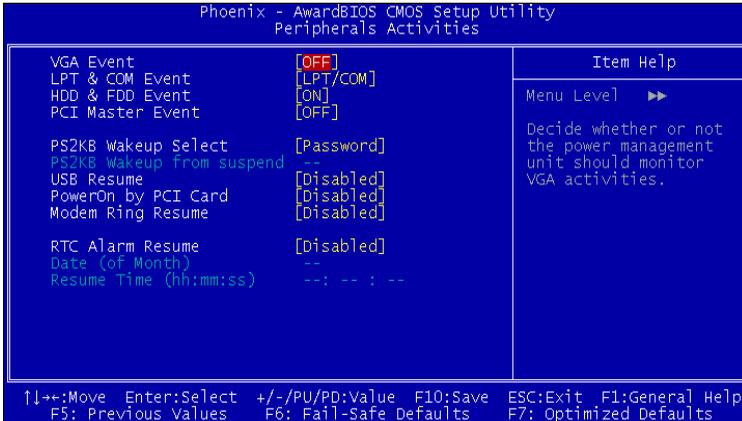
The field defines how the system will act after an AC power loss during system operation. Choose the system power state when the AC power is back. Settings are:

Off Keep the system in off state until power button is pressed.

On The system automatically restarts when AC power is back.

Peripheral Activities

Press <Enter> to enter the sub-menu and the following screen appears:



VGAEvent

Decide whether or not the power management unit should monitor VGA activities. Settings: *Off* and *ON*.

LPT & COMEvent

Decide whether or not the power management unit should monitor parallel port (LPT) and serial port (COM) activities. Settings: *None*, *LPT*, *COM* and *LPT/COM*.

HDD & FDDEvent

Decide whether or not the power management unit should monitor hard disks and floppy drives activities. Settings: *Off* and *On*.

PCIMasterEvent

Decide whether or not the power management unit should monitor PCI master activities. Settings: *Off* and *On*.

PS2KB Wakeup Select

When select Password, please press ENTER key to change Password, 8 characters maximum. Settings: *Password* and *Hot key*.

PS2KB Wakeup from suspend

Select which Hot-Key to wake-up the system from power saving mode. Settings: *Disabled*, *Ctrl+F1*, *Ctrl+F2*, *Ctrl+F3*, *Ctrl+F4*, *Ctrl+F5*, *Ctrl+F6*, *Ctrl+F7*, *Ctrl+F8*, *Ctrl+F9*, *Ctrl+F10*, *Ctrl+F11*, *Ctrl+F12*, *Power*, *Wake* and *Any Key*.

USB Resume

Decide whether or not the USB devices can wake the system from suspend state. Settings: *Disabled* and *Enabled*.

PowerOn by PCI Card

Decide whether or not any PCI card can power up the system or resume from suspend state. Such PCI cards include LAN, onboard USB ports, etc. Settings: *Disabled* and *Enabled*.

Modem Ring Resume

Decide whether or not any Ring-In signals from Modem can wake up the system from suspend state. Settings: *Disabled* and *Enabled*.

RTC Alarm Resume

The field is used to enable or disable the feature of booting up the system on a scheduled time/date. Settings: *Disabled* and *Enabled*.

Date(of Month)

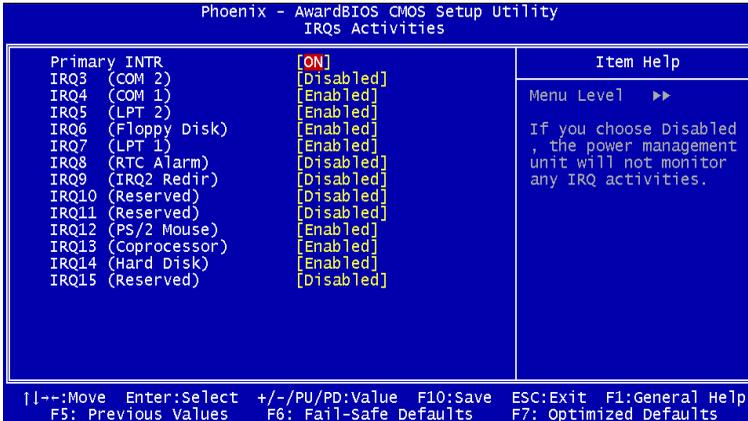
The field specifies the date for *RTC Alarm Resume*. Settings: 0~31.

Resume Time (hh:mm:ss)

The field specifies the time for *RTC Alarm Resume*. Format is <hour> <minute><second>.

IRQs Activities

Press <Enter> to enter the sub-menu and the following screen appears:



Primary INTR

Selecting *ON* will cause the system to wake up from power saving modes if activity is detected from any enabled IRQ channels.

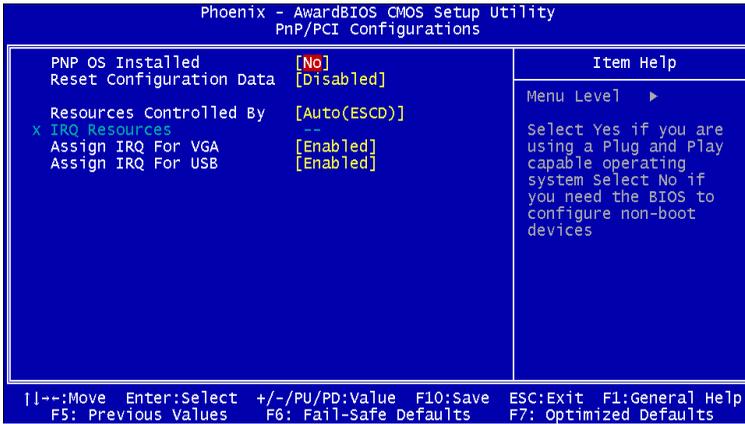
IRQ3-IRQ15

Enables or disables the monitoring of the specified IRQ line. If set to *Enabled*, the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes.

Note: IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the IO device.

PNP/PCI Configurations

This section describes the BIOS configuration of the PCI bus system. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



PNP OS Installed

When set to *Yes*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 95 or 98/98SE. When set to *No*, BIOS will initialize all the PnP cards. Set to *Yes* the operating system is Plug & Play capable. The settings: *No* and *Yes*.

Reset Configuration Data

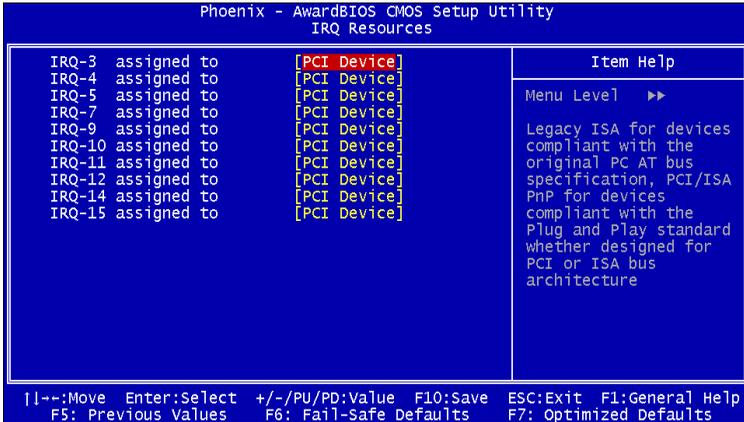
Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The settings: *Enabled* and *Disabled*.

Resource Controlled By

The BIOS can automatically configure all the boot and Plug and Play compatible devices. Choose “Auto(ESCD)” if unsure, the BIOS will automatically assign IRQ, DMA and memory base address fields. The settings: *Auto (ESCD)* and *Manual*.

IRQ Resources

The items are adjustable only when *Resources Controlled By* is set to *Manual*. Press <Enter> and you will enter the sub-menu of the items.



IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings:

PCI Device: For Plug & Play compatible devices designed for PCI bus architecture.

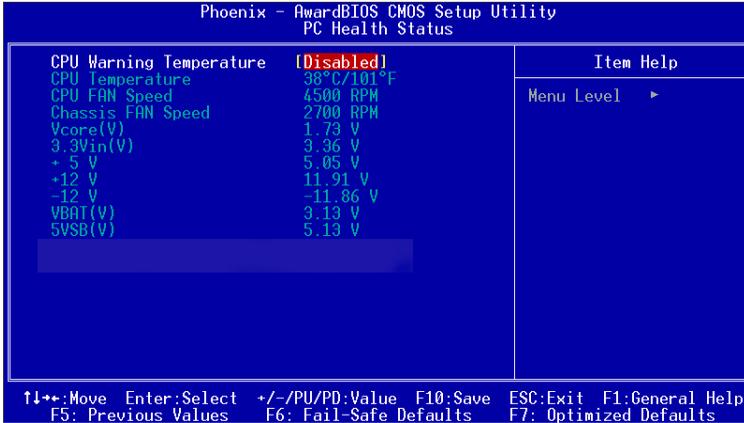
Reserved: The IRQ will be reserved for further request.

Assign IRQ For VGA/USB

Assign IRQ for VGA and USB devices. Settings: *Disabled* and *Enabled*.

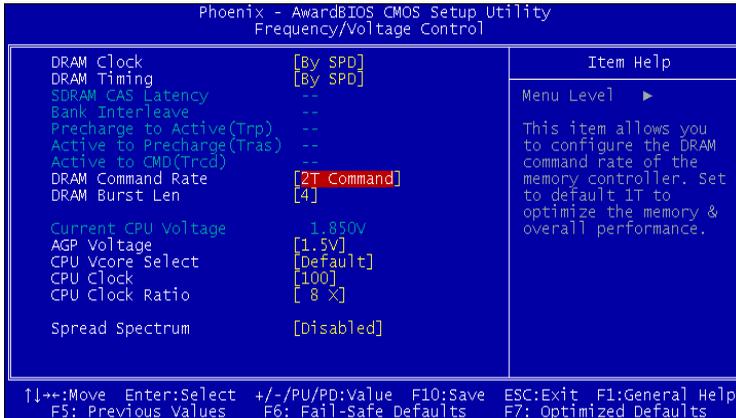
PC Health Status

This section shows the status of your CPU, fan, warning for overall system status.



Vcore, vTT 1.25V, 3.3V, Vcc(+5V), +12V, -12V, -5V, 5VSB, Current CPU Temperature, Current CPU Fan Speed, Current System Fan Speed. These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Frequency/Voltage Control



DRAM Clock

The chipset supports synchronous and asynchronous mode between host clock and DRAM clock frequency. Settings: *By SPD*, *100MHz*, *133MHz*, *166MHz* and *200MHz*.

DRAM Timing

This setting determines whether DRAM timing is configured by reading the contents of the SPD (Serial Presence Detect) EPROM on the DRAM module. Selecting Yes makes SDRAM Cycle Length and Bank Interleave automatically determined by BIOS according to the configurations on the SPD. Settings: *Manual* and *By SPD*.

SDRAM CAS Latency

Set the time between SDRAM read command and when the data actually becomes available. Settings: *1.5*, *2*, *2.5* and *3*.

Bank Interleave

Set the interleave mode of the SDRAM interface. Interleaving allows banks of SDRAM to alternate their refresh and access cycles. One bank will undergo its refresh cycle while another is being accessed. This improves performance of the SDRAM by masking the refresh time of each bank. Settings: *Disabled*, *2 Bank* and *4 Bank*.

Precharge to Active (Trp)

Set the time from DRAM precharge to active state. Settings: *2T* and *3T*.

Active to Precharge (Tras)

Set the time from active back to precharge state. Settings: *5T* and *6T*.

Active to CMD (Trcd)

Set the time from active state to command state. Settings: *2T* and *3T*.

DRAMCommandRate

This setting controls the DRAM command rate. Selecting 1T allows DRAM signal controller to run at 1T (T=clock cycles) rate. Selecting 2T makes DRAM signal controller run at 2T rate. 1T is faster than 2T. Settings: *2T Command* and *1T Command*.

DRAM Burst Len

This setting allows you to set the size for DRAM Burst-Length. The bigger the size, the faster the system addresses memory. Settings: *4* and *8*.

AGP Voltage

This setting allows you to set the appropriate AGP voltage. Settings: *1.5V*, *1.6V*, *1.7V* and *1.8V*.

CPU Vcore Select

This setting allows you to adjust the CPU core voltage. Please note that it may be dangerous to adjust the Vcore over 10% of original CPU specification. Setting options: *Default*, *+0.100V*, *+0.075v*, *+0.050V*, *+0.025V*, *-0.025V*, *-0.050V*, *-0.075V*, and *-0.100V*.

CPU Clock

This setting specifies the clock frequency of CPU host bus (FSB) and provides a method for end-users to overclock the processor accordingly. If the CPU clock is set over the tolerance limit of the CPU, the mainboard will show the following message "IMPROPER OVERCLOCKING SETTING, SYSTEM IS RESETTING CPU CLOCK TO DEFAULT. Please re-enter BIOS Setup and remember to save before quit!". This feature protects the CPU from damage due to overclocking.

CPU Ratio

This setting controls the multiplier that is used to determine the internal clock speed of the processor relative to the external or mainboard clock speed.

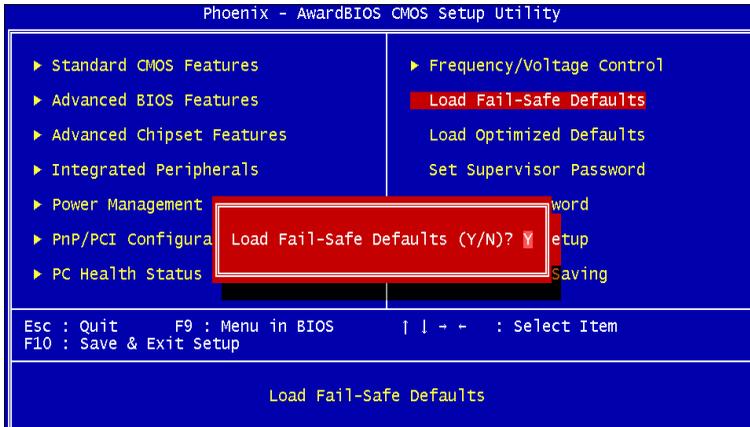
Spread Spectrum

When the mainboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problems, leave the setting at Disabled for optimal system stability and performance. But if you are plagued by EMI, setting to Enabled for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a 0.25% jitter can introduce a temporary boost in clock speed of 25MHz (with a 1GHz CPU) which may just cause your overclocked processor to lock up. Settings: *Disabled*, $\pm 0.25\%$, -0.5% , $\pm 0.5\%$ and $\pm 0.38\%$.

Load Fail-Safe Defaults

This option on the main menu allows users to restore all the BIOS settings to the default Fail Safe values. These values are set by the mainboard manufacturer to provide a minimal and stable system.

When you select Load-Fail Safe Defaults, a message as below appears:

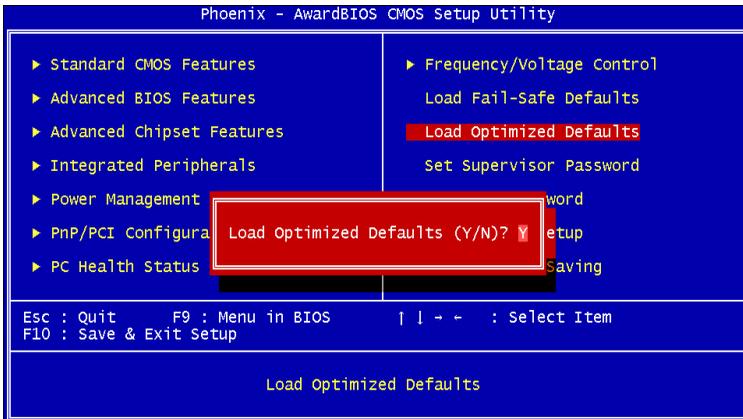


Pressing “Y” loads the default BIOS values that provide a minimal and stable system configuration.

Load Optimized Defaults

This option on the main menu allows users to restore all the BIOS settings to the default Optimized values. The Optimized Defaults are the default values also set by the mainboard manufacturer for both optimized and stable performance of the mainboard.

When you select Load Optimized Defaults, a message as below appears:



Pressing “Y” loads the default values that are factory settings for optimal and stable system performance.

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:



Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously set password from CMOS memory. You will be prompted to confirm the password. Re-type the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the Security Option of the Advanced BIOS Features menu. If the Security Option is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when trying to enter Setup.

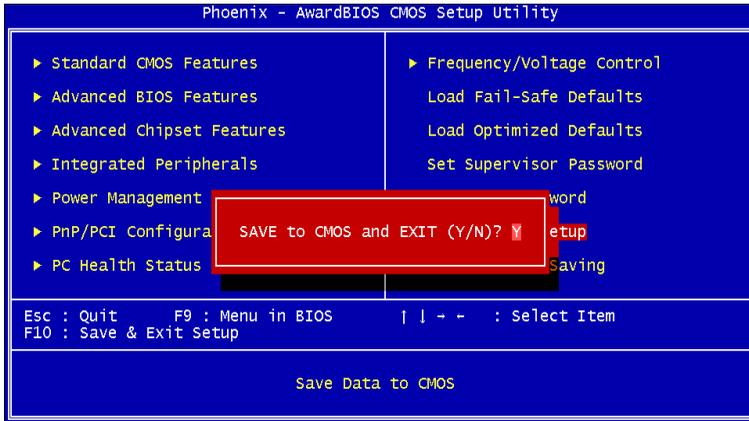
About Supervisor Password & User Password:

Supervisor password : Can enter and change the settings of the setup menus.

User password: Can only enter but do not have the right to change the settings of the setup menus.

Save & Exit Setup

When you want to quit the Setup menu, you can select this option to save the changes and quit. A message as below will appear on the screen:

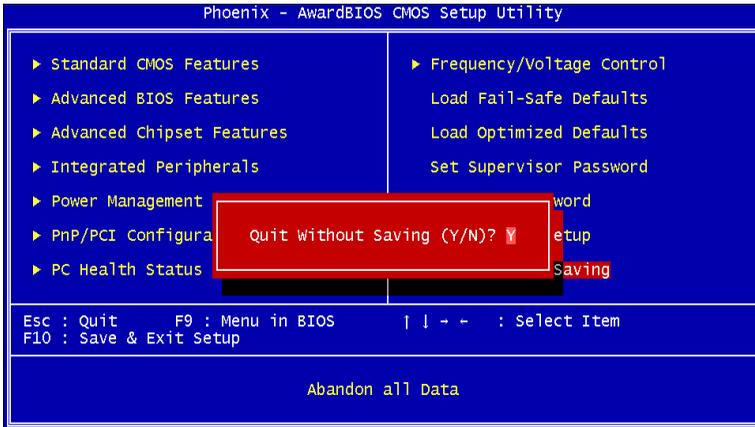


Typing “Y” will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS.

Typing “N” will return to the Setup Utility.

Exit Without Saving

When you want to quit the Setup menu, you can select this option to abandon the changes. A message as below will appear on the screen:



Typing “Y” will allow you to quit the Setup Utility without saving any changes to RTC CMOS.

Typing “N” will return to the Setup Utility.

4

Software Setup

This chapter gives you brief descriptions of each mainboard driver and application. It consists of the following topic:

Driver Utilities CD Content 4-2

Note: You must install VIA chipset drivers first before installing other drivers such as audio or VGA drivers. The applications will only function correctly if the necessary drivers are already installed.

Driver Utilities CD Content

Getting Started

The mainboard includes a Driver Utilities CD which contains driver utilities and software to enhance the performance of the mainboard. Please check that you have this CD in your gift box. If the CD is missing in your gift box, please contact your local dealer for the CD.

Note: The driver utilities and software are updated from time to time. Please visit VPSD website (<http://www.viavpsd.com/>) for the latest updated driver utilities and software of the mainboard.

Running the Driver Utilities CD

To start using the CD, just simply insert the CD into your local CD-ROM or DVD-ROM drive. The CD should run automatically when you close your CD-ROM or DVD-ROM drive. The driver utilities and software menu screen should then appear on your desktop. If the CD does not run automatically, you can run the CD manually by typing “D:\Setup.exe” at Start\Run.

(Please note that D: might not be your CD-ROM/DVD-ROM drive letter. Make sure you type the correct letter of CD-ROM/DVD-ROM drive on your system).

CD Content

Upon running the CD, the following driver utilities and software menu screen appears as follow:

The driver utilities and software in this CD are:

- **VIA 4in1 Drivers:** Contains VIA ATAPI Vendor Support Driver (enables the performance enhancing bus mastering functions on ATA-capable Hard Disk Drives and ensures IDE device compatibility), AGP VxD Driver (provides service routines to your VGA driver and interface directly to hardware, providing fast graphical access), IRQ Routing Miniport Driver (sets the system's PCI IRQ routing sequence) and VIA INF Driver (enables the VIA Power Management function).

- **C-Media Audio Driver and Applications:** Enhance the onboard C-Media audio chip. The application allows you to set your speakers to your desired sound system.

- **VIA USB 2.0 Driver:** Enhance VIA USB 2.0 ports. (Please refer to Readme.htm under Drivers/USB2 directory for further information on installing USB2.0 driver.)

- **Promise RAID Controller Driver:** Enhance the onboard Promise RAID controller.

- **VIA LAN Driver:** Enhance the onboard VIA LAN chip.

- **Winbond Smart@IO Driver:** Enhance Smart Card Memory Stick socket and Secure Digital Card socket.

- **FliteDeck (Optional):** Contains four sub-utilities
 - i) JetStream: enables directly overclocking FSB under Windows OS.
 - ii) MissionControl: lets you monitor local and remote computer systems.
 - iii) SysProbe: allows you to view your computer hardware configuration.
 - iv) FlashPort: allows you to flash BIOS under Windows OS.

Appendix

Introduction to RAID

The basic idea of RAID (Redundant Array of Independent Disks, formally known as *Redundant Array of Inexpensive Disks*) is to store the same data in different places on multiple hard disks. It is primarily a performance option, but it too can be used for data protection against the loss of data due to human carelessness, mechanical failures or natural disasters. It has parity check function such that when one of the hard disk in the array fails, after replacing the disk with a new one, all data is kept intact as nothing has happened.

Raid 0

RAID 0 is also know as “striping”. The minimum of disks require to implement RAID 0 is two. All the disks connected to this array are seen as a single large disk. For example, if you have two identical hard disks which all come with 20GB of capacity, the operating system will see these two hard disks as one 40GB hard disk.

Data blocks are split equally among the disks. For example, if you have 8 blocks of data to be stored in two hard disks, blocks 1, 3, 5 and 7 will be stored in disk 1 while blocks 2, 4, 6 and 8 will be stored in disk 2. Performance is increased as read and write can be carried out in parallel, but with no data redundancy. The disadvantage of RAID 0 array is that when one of the disk fails, the whole arrays fails since the data is spread across the array. RAID 0 is best used where cost/performance is critical, but data integrity is not.

RAID 1

RAID 1 is also known as “mirroring”. Two identical hard disks are seen as only one hard disk, but with only with capacity of just one. For example, if you have two 20GB hard disks connected to this array, instead of showing 40GB, the operating system will only see a single 20GB hard disks.

Data is mirrored between the disks. This means that you have two disks both containing exactly the same data. The advantage of RAID 1 is when one disk fails, the array will keep working as nothing has happened. Read performance is improved since the disks can be read just once, while write performance is more or less identical as writing to a single disk.

Getting Started

This section is designed to get you started for installation of your MBFastTrak 133 Lite.

Installing The Hard Drives

Hard drives must be Ultra ATA 133/100/66/33 to operate with the MBFastTrak 133 Lite. For optimal performance, install all *identical* drives of the same model and capacity. The drives' *matched performance* allows the array to function better as a single drive.

1. We recommend using identical drive as part of MBFastTrak 133 Lite array. If striping for performance, use two new drives. If mirroring for protection, you can use two new drives OR use an existing drive and a new drive (the new drive must be the same size or larger than the existing drive).
2. Configure the jumpers of the jumpers of the hard drive you're preparing to connect to the MBFastTrak 133 Lite using the correct "Master / Slave" or "Cable-Select" settings in the positions described in the table below.

NOTE: *Sometimes the Master drive with no slave attached is called "Single". The master slave setting differentiates two drives chained on the same connector. The Slave hard drive does not have RAID functionality; it will act as a common hard drive*

Jumper Settings		
# of Drives	IDE Channel 1	IDE Channel 2
1	M	----
2	M	M
3	M & S	M
4	M & S	M & S

M = Master, S = Slave

3. Install the hard drives into the hard drive bays of your system, including the power cables.
4. Attach one Ultra ATA cable to each hard disk. Then attach one cable to each of the IDE connectors on the MBFastTrak 133 Lite control. The col-

ored edge of the cables indicates pin 1 and the blue cable connector must be attached to the MBFastTrak 133 Lite connector.

Note: You must use an 80-wire, 40-pin cable when connecting an Ultra ATA/133 hard drive to the MBFastTrak 133 Lite controller.

Creating Your Disk Array

You will now use the FastBuild BIOS utility to create your array using the attached disks. There are three different scenarios in creating this array. You can create an array for performance, you can create a Security array using new hard drives (recommended), or you can create a Security array using an existing hard drive and a new hard disk.

1. Boot your system. If this is the first time you have booted with the MBFastTrak 133 Lite and drives installed, the Promise onboard BIOS will display the following screen.

```
MBFastTrak133 Lite (tm) BIOS Version 2.00.0.XX
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

No array defined . . .

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.
```

2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu.
3. Press “1” to display the Auto Setup Menu below. This is the fastest and easiest method to creating your first array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[Auto Setup Options Menu]

Optimize Array for:           Performance
Typical Application usage:   A/V Editing

[ Auto Setup Configuration ]

Mode .....Stripe
Drives used in Array ..... 2
Array Disk Capacity ..... 16126

[ Keys Available ]

[↑] Up [↓] Down [←, →, Space] Change Option [ESC] Exit [Ctrl-Y] Save
```

Creating an Array for Performance

Note: MBFastTrak 133 Lite allows users to create striped arrays with 1, 2 drives.

To create an array for best performance, follow these steps:

1. Using the Spacebar, choose “Performance” under the Optimize Array for section.
2. Select how you will use your PC most under the Typical Application usage section. The choices are A/V Editing, Server and Desktop (the default)
3. Press <Ctrl-Y> keys to Save and create the array.
4. Reboot your system.
5. Once the array has been created, you will need to FDISK and format the array as if it were a new single hard drive.

Creating a Security Array With New Drives

Note: MBFastTrak 133 Lite permit only two drives to be used for a single Mirrored array in Auto Setup.

To create an array for data protection using new hard drives, follow these steps:

1. Using the Spacebar, choose “Security” under the Optimize Array for section.
2. Press <Ctrl-Y> keys to Save your selection.
3. The window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No) Y - Create and Duplicate N - Create Only

4. Press “N” for the Create Only option.
5. A window will appear almost immediately confirming that your Security array has been created. Press any key to reboot the system.

Array has been created. <Press Any Key to Reboot>
--

6. Proceed with normal FDISK and format procedures as if you had just installed a new hard drive.

Creating a Security Array With An Existing Data Drive

Note: MBFastTrak 133 Lite permits only two drives to be used for a single *Mirrored* array in *Auto Setup*.

You would use this method if you wish to use a drive that already contains data and/or is the bootable system drive in your system. You will need another drive of identical or larger storage capacity.

Follow these steps:

1. Using the Spacebar, choose “Security” under the Optimize Array for section.
2. Press <Ctrl-Y> keys to Save your selection. The window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No) Y - Create and Duplicate N - Create Only

3. Press “Y” for the Create and Duplicate option. The window below will appear asking you to select the Source drive to use. FastBuild will copy all data from the Source drive to the Target drive.

Source Disk		
Channel:ID	Drive Model	Capacity (MB)
Target Disk		
Channel:ID	Drive Model	Capacity (MB)
[Please Select A Source Disk]		
Channel:ID	Drive Model	Capacity (MB)
1 :Master	QUANTUMCR8.4A	8063
2 :Master	QUANTUMCR8.4A	8063
[↑] Up [↓] [ESC] Exit [Ctrl-Y] Save		

4. Use the arrow keys to choose which drive contains the existing data to be copied.
5. Press <Ctrl-Y> keys to Save selection and start duplication. The following progress screen will appear.

6. Select “Y” to continue. If you choose “N”, you will be returned to step 1.

Start to duplicate the image . . .
Do you want to continue? (Yes/No)
Y – Continue N – Abort

7. Once completed, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system.

Array has been created.
<Press Any Key to Reboot>