

# **IWILL P4R533/P4R533-N Motherboard**

## **User's Manual**



### **Federal Communications Commission (FCC) 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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interconnect cables and shielded AC power cable must be employed with this equipment to insure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

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This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and

This device must accept any interference received, including interference that may cause undesired operation.

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**What's In This Chapter:**

Introduction  
Manual Structure  
Manual Features  
Critical Topics  
Packing List  
Pre-Use Checklist

**1: Introduction**

This is the User's Manual is for the P4R533 motherboard. Please read this chapter before you use your motherboard and identify which parts of the manual you will need to refer to, if any. Please pay particular attention to the Critical Topics section.

**Manual Structure**

This manual has seven chapters covering the following topics:

**Chapter 1: Introduction**

Explains the manual structure and conventions and indicates the most important topics in the manual. In addition, there is a list of what you should find in the motherboard package and some pointers on things to do before you configure or install the board.

**Chapter 2: Key Features & Components**

Details the motherboard's hardware features and important components and indicates their locations. Describes the support software that comes with the board on the Power Installer support CD-ROM disc.

**Chapter 3: Motherboard Configuration**

Lists the motherboard's default configuration and configuration options.

**Chapter 4: Installing The Motherboard**

Has information on how to prepare and install the motherboard. Includes installing a CPU and system memory and housing installation considerations.

### Chapter 5: System Configuration

Covers connecting system peripherals to the motherboard, initial BIOS configuration using the CMOS Setup utility, OS options and software installation.

### Chapter 6: Using The Motherboard

Explains system operation features that derive from the motherboard. Has information on performance optimization and troubleshooting.

### Chapter 7: Technical Information

Lists the motherboard's technical specifications.

## Manual Features

This User's Manual is intended to be useful and informative while also making it easy to quickly find specific information or specifications. The manual has icons and notes in the sidebar to note important topics, indicate warnings or further explain and illustrate points. We suggest that most users review the manual to become familiar with the motherboard. Expert users may want to review topics selectively, as needed.

### If The Motherboard Is Already Installed

You may receive the motherboard installed in a working system. If this is the case, you should still probably review the sections on configuring and using the board, especially if an Operating System is not installed yet.

### If You Need To Install This Motherboard

We recommend that only experienced users and technicians install this motherboard. Otherwise, we suggest having a qualified computer technician install and configure the system. This service is usually provided at a nominal fee by better computer stores and service companies.

### Critical Topics

Many users do not read through the entire User's Manual. While this may not be necessary for experienced users or if the motherboard is already installed, there are some topics which are particularly important and deserve your specific attention. These topics cover information critical to the proper installation and use of the motherboard.

For this motherboard, please review the sections on the following topics:

- Jumper Configuration  
Please see Chapter 3.
- CPU installation  
Please see Chapter 4.
- System memory installation  
Please see Chapter 4.
- AGP card installation  
Please see Chapter 5.
- Required BIOS configuration  
Please see Chapter 5.
- Support software installation  
Please see Chapter 5.

## Packing List

The P4R533 motherboard package includes the following items:

- P4R533 or P4R533-N motherboard
- ATA-66/100 IDE connector cable  
Connects IDE devices to one of the onboard IDE connectors.
- Floppy Disk Drive connector cable  
Connects floppy disk drives to the onboard floppy disk connector.
- Rear I/O Panel Shield  
For use in ATX system housings.
- 2 CRIMM modules  
Continuity RIMM modules for unused system memory RIMM sockets.
- 3 Jumper Caps  
Extra caps in case original caps are lost.
- Power Installer support CD-ROM disc  
Includes support software, drivers and bundled software utilities.
- User's Manual
- Quick Installation Guide

## Pre-Use Checklist

Before you install and use the motherboard, please do the following:

- Check Package Contents  
Please compare the package contents to the Packing List on the previous page and confirm that all items are present and undamaged.
- Missing or Damaged Accessories  
If anything is missing, please contact your vendor.

- **Motherboard Damage**  
If the motherboard has been visibly damaged, return the complete package to your vendor with proof of purchase.
- **Prepare Minimum System Components**  
If you are installing the board in a new system, you'll need at least the following internal components;
  - Intel Pentium 4 processor
  - At least two Rambus RIMM memory module
  - 1.5V AGP video display card
  - Desired storage devices (hard disk, CD-ROM, etc.)

You will also need whatever external system peripherals you intend to use, which will normally include at least a keyboard, a pointing device and a video display monitor.



**Chapter Topics:**

Hardware Features

Motherboard Layout

Key Features &amp; Components

Software Features

Driver Software

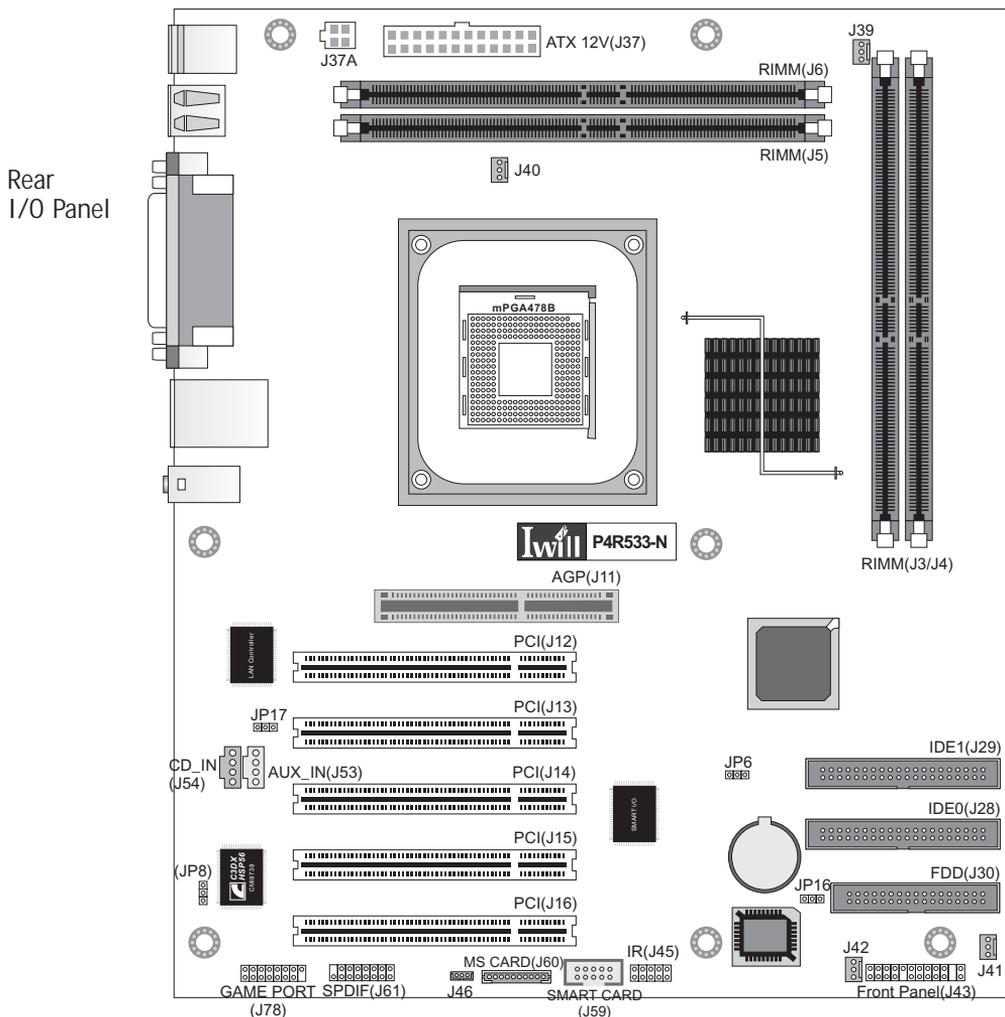
Utility Software

**2: Key Features & Components**

This chapter explains the location and function of this motherboard's key features and components. In addition, it details the software that comes on the Power Installer support CD-ROM disc. Please review this chapter if you are installing the motherboard. It is also useful for reference regarding feature functions after the board is installed in a working system.

### Motherboard Layout

The diagram and key on these two pages shows the location of key components on the motherboard.



## Motherboard Layout Key

<b>Component</b>	<b>Function</b>
CPU	mPGA478 CPU socket
J37, J37A	Power connectors for ATX power supply
J3, J4, J5, J6	RIMM memory sockets for Rambus RIMM modules
J11	AGP connector for 1.5V AGP 4X display card
J12-16	32-bit PCI 2.2 expansion slots
Connectors	
J28, J29	IDE0 & IDE1 ATA drive connectors
J30	Floppy disk drive connector
J40	CPU cooling fan connector
J39, J41, J42	Housing cooling fan connectors
J43	Housing front panel feature connector
J45	IR port module connector
J46	WOL – Wake-On-LAN connector
J53	AUX – auxiliary audio-in connector
J54	CD-In CD-ROM drive audio-in connector
J59	Smart Card Reader connector
J60	Memory Stick Reader connector
J61	Optional 6-channel audio port bracket connector
J78	Game port connector
Jumpers	
JP6	Clear CMOS jumper
JP8	Audio subsystem jumper
JP16	BIOS Flash Protection jumper
JP17	LAN subsystem jumper (P4R533-N only)
Rear panel I/O ports	See figure on next page

**Rear I/O Panel Ports:**

This figure show the ports on the rear I/O panel. The ports include, from top to bottom:

- PS/2 ports
- 2 USB ports
- Parallel & Serial ports
- 2 USB ports (& LAN port)
- Audio ports

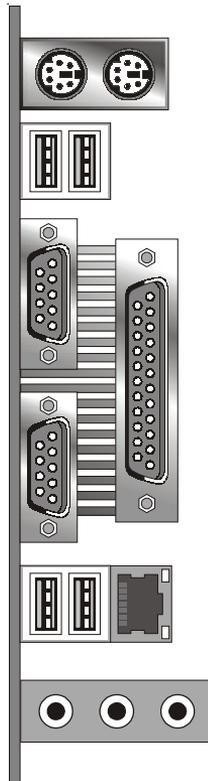
The ports have standard color-coding as follows:

- PS/2 Keyboard: Purple
- PS/2 Mouse: Green
- USB Ports: Black
- LAN jack: None
- Serial Ports: Teal
- Parallel Port: Burgundy
- Line Out jack: Lime
- Line-In jack: Light Blue
- Microphone jack: Pink
- Game/MIDI: Gold\*

**Note:**

This figure illustrates the P4R533-N ports. The standard P4R533 does not have the onboard LAN feature or jack.

\*The Game port connector is on the motherboard and connects to the optional 6CHG 6-channel audio port bracket that mounts in an expansion slot opening. The colored port is on the port bracket.



PS/2 Keyboard, PS/2 Mouse

USB2, USB1

Serial 1 (COM1)

Parallel

Serial 2 (COM2)

USB4, USB3, LAN RJ-45

Line Out, Line In, Mic

**Key Features & Components**

This section explains the function and use of key features and components on the motherboard. It also indicates where to look in the manual for additional information on configuring and using them.

This motherboard uses an ATX form factor PCB in a design that integrates many features onto the board including several external ports.

*Intel 850E Chipset*

This motherboard uses the Intel 850E Chipset. It is a multi-function chipset for higher-end performance and main-stream systems. The components of the Intel 850E Chipset include the following devices mounted on the board:

- 82850E Memory Controller Hub (MCH)
- 82801BA I/O Controller Hub (ICH2)

The chipset provides host bus, memory, AGP, and I/O interfaces and supports both 400MHz and 533MHz Frontside Bus speeds.

## CPU Socket

**Function:** The system CPU installs in this socket.

**Description:** The mPGA478B CPU socket supports all 478-pin Intel Pentium 4 CPUs that use this socket. The motherboard comes with a mounting frame mounted on the board to attach the heatsink and cooling fan assembly required by the Pentium 4 CPU.

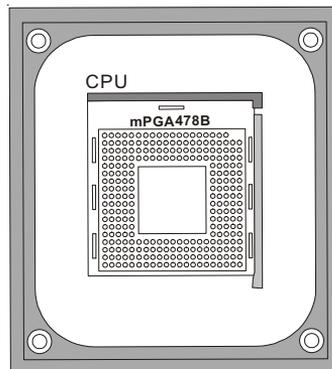
**More Information:** See the section in Chapter 4 on “Installing CPUs” for information supported CPUs and their installation procedure. Technical specifications are listed in Chapter 7.

 **Note:**

This motherboard supports Pentium 4 CPUs that use a quad-pumped 400MHz or 533MHz Frontside Bus. the CPU settings are automatically detected by the system BIOS.

**mPGA478B Socket:**

This socket is for 478-pin Pentium 4 CPUs only.



Heatsink/fan assembly mounting frame

**⚠ Note:**

The default memory specifications are:

400MHz FSB use PC800

533MHz FSB use PC800

If you switch to PC1066 for the 533MHz FSB, you have to manually set the RDRAM Bus Frequency configuration to X4 in the iWILL Smart Setting section of the Award BIOS CMOS Setup Utility.

**RIMM Sockets:**

System memory sockets for PC800 or PC1066 RIMM modules.

See Chapter 4 for important installation information.

**⚠ Note:**

The four RIMM sockets must be used in pairs:

J3 & J5

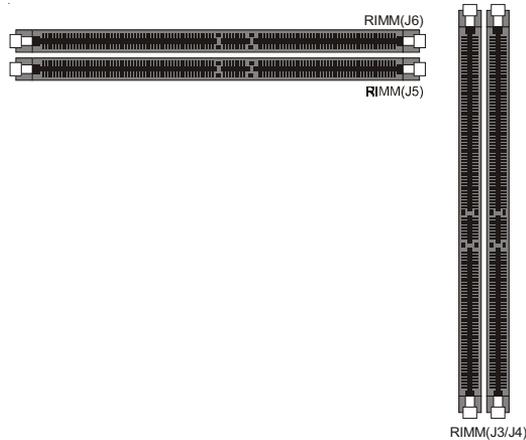
J4 & J6

## System Memory Sockets

**Function:** The RIMM system memory sockets are for installing DRDRAM system memory modules.

**Description:** There are four RIMM memory module sockets on the motherboard. These sockets are for PC800 or PC1066 ECC DRDRAM memory modules (RIMMs). The sockets function independently, allowing a variety of memory configurations up to a total of 2GB.

**More Information:** See the section on Installing System Memory in Chapter 4 for configuration specifications and installation instructions. Technical specifications are listed in Chapter 7.



### The AGP Slot

**Function:** The AGP slot is for installing an AGP interface video display card.

**Description:** The AGP slot is a high-speed slot exclusively designed for an AGP video display card. The AGP slot supports the following type of AGP card:

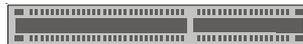
- AGP 4X – 266MHz data transfer, maximum 1064MB/second data throughput

The slot only supports 1.5V devices. Do not use a 3.3V AGP card with this motherboard.

**More Information:** See the section “Connecting & Installing Internal Peripherals” in Chapter 4. Technical specifications are listed in Chapter 7. Also, see the Advanced Chipset Features section of “Configuring the CMOS Setup Utility” in Chapter 5 for information on setting the AGP memory aperture size.

#### AGP Slot:

For AGP 4X 1.5V cards only. Do not use 3.3V cards.



AGP slot is for a AGP 4X card

### PCI Expansion Slots

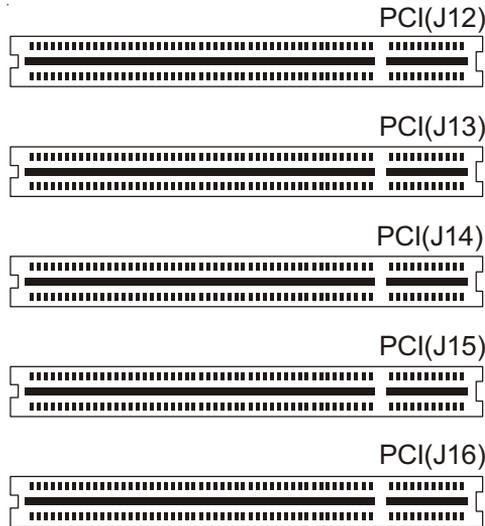
**Function:** The PCI expansion slots are for installing system expansion or “add-on” cards to add additional system hardware.

**Description:** This motherboard has five Bus Master capable PCI expansion slots. The slots are 32-bit, 33MHz slots and are PCI 2.2-compliant. The slots provide a fast high-bandwidth pathway between the motherboard and expansion cards.

**More Information:** See the section “Connecting & Installing Internal Peripherals” in Chapter 4. Technical specifications are listed in Chapter 7.

### PCI Expansion Slots

All slots are Bus Master capable and PCI 2.2 compliant



### Drive Connectors

There are three drive connectors on the motherboard for connecting IDE and floppy disk drives.

#### *IDE Drive Connectors*

**Function:** The two IDE connectors, marked ‘Primary’ and ‘Secondary’, are for connecting IDE drives to the motherboard.

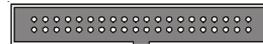
**Description:** The IDE controller on the motherboard supports IDE devices running in all modes up through ATA-100. There are two IDE drive connectors. Each connector supports two drives, a ‘Master’ and a ‘Slave’ which connect to the motherboard with a ribbon cable. The supplied cable supports transfer modes through ATA-100.

**More Information:** See the section on “Connecting Internal Peripherals” in Chapter 5 for instructions on connecting IDE drives. Technical specifications are listed in Chapter 7.

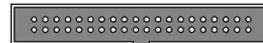
#### IDE Drive Connectors

The channels are labeled on the board.

Secondary IDE1



Primary IDE0



#### *Floppy Disk Drive Connector*

**Function:** The floppy disk drive connector, marked ‘Floppy’, is for connecting one floppy disk drive to the motherboard.

**Description:** The floppy disk drive connector supports connecting one floppy disk drive to the motherboard. The ‘Floppy’ drive connector uses a standard FDD ribbon cable. The floppy disk drive connected to the end of the cable will function as Drive A:. A second drive can be added as Drive B: if required.

**More Information:** See the section on “Connecting Internal Peripherals” in Chapter 4 for instructions on connecting a floppy disk drive. Technical specifications are listed in Chapter 7.

#### Floppy Drive Connector



Other Internal Connectors

There are several other connectors on the motherboard.

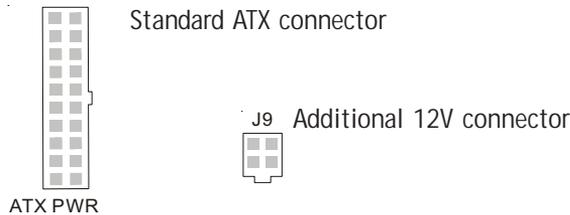
*ATX Power Connectors*

**Function:** Connectors for leads from a system ATX power supply.

**Description:** There are two power connectors on the motherboard for leads from an ATX power supply. The power supply leads plug into the connectors. The connector design prevents incorrect orientation. There are two connectors, the standard 20-pin ATX connector and the additional 4-pin connector that supplies 12-volt current.

**More Information:** Please refer to Chapter 4, “Installing the Board in a System Housing”. Chapter 7 lists technical specifications.

**ATX Power Connectors:**  
An ATX power supply with two power leads is required for this board.



*CPU & System Cooling Fan Connectors J39, 40, 41, 42*

**Function:** Power connectors for CPU and system housing cooling fans.

**Description:** There are three system housing cooling fan connectors and one CPU cooling fan connector (J40) on the motherboard. All the connectors are 3-pin headers. The system housing fan connectors support fan tachometer monitoring. The processor heat sink fan is not speed controlled.

The system fans use the motherboard fan speed control, which consists of three states: Off, Normal speed, and High speed. In Normal speed mode, the system fans run at normal speed until the thermal sensor senses the temperature exceeds the High speed fan threshold temperature. The system fans then run at High speed when the temperature threshold is exceeded.

**More Information:** Please see the PC Health Status section of “Configuring the CMOS Setup Utility” in Chapter 5 for information.

#### Cooling Fan Connectors:

The cooling fan power connectors all use the same 3-pin connector. The System Fan connectors are speed controlled, the CPU Fan connector is not.



Fan power connectors  
(orientation varies)



#### WOL: Wake On LAN Connector J46

**Function:** A connector for the lead from a Network Interface Card that supports the Wake On LAN feature.

**Description:** This feature enables the system to “wake up” from Suspend mode when it receives a signal over a LAN it is connected to. It works with the optional onboard LAN port and will also work with an additional PCI NIC that supports this feature by connecting the card to the WOL connector on the motherboard.

**More Information:** Please see the Power Management Setup section of “Configuring the CMOS Setup Utility” in Chapter 5 for information.

#### Wake On LAN Connector:

This connector is for an additional NIC. The optional onboard LAN port supports WOL without using this connector.



Wake On LAN connector

*CD-In & AUX Audio Connectors J54 & J53*

**Function:** Connectors for audio-in cables from internal peripherals.

**Description:** The two audio-in connectors on the motherboard are for audio cables from optical drives such as a CD-ROM or DVD-ROM drive or a modem/telephony device. The connectors provide an audio input connection between a device and the integrated audio subsystem.

**More Information:** Please see the “Connecting Internal Peripherals” section in Chapter 5.

**Audio-In Connectors:**

The J54 CD-In connector is for CD-ROM or other optical drives. Use the J53 AUX connector for an additional drive or a modem/telephony device.

J54 CD-In  
audio-in connector



J53 AUX  
audio-in connector

*IR Connector J45*

**Function:** Connector for an Infrared (IR) port module.

**Description:** The IR connector supports both IrDA and ASKIR infrared port modules. Follow the module’s instructions to install it.

**More Information:** Please see the Integrated Peripherals section of “Configuring the CMOS Setup Utility” in Chapter 5 for information.

**IR Connector J45:**

The IR connector is for both IrDA and ASKIR port modules. You must use the Integrated Peripherals section of the CMOS Setup Utility to configure the motherboard to use the IR feature.

 IR connector J45

### 6-Channel Audio Option Connectors J61 & J78

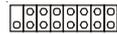
**Function:** Connector for the optional 6-channel audio port bracket. J78 is a Game port connector for the Game port cable from the 6CHG bracket.

**Description:** The 6-channel audio connector supports any of the three optional 6-channel audio port brackets, 6CH, 6CHG and SuperAudio. The port bracket provides additional audio connections for a 5.1 speaker system.

**More Information:** Please see “Connecting Internal Peripherals” section in Chapter 5 and the “System Features” section in Chapter 6.

### 6-Channel Audio:

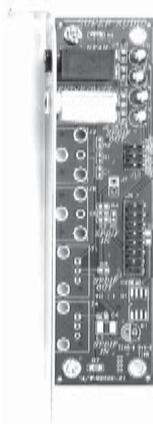
This combined connector is for either of the optional audio port brackets which provide additional audio connections for a 5.1 speaker system. The 6CHG also has a Game port on it with a separate connector cable. The cable plugs onto J78.



J61 Audio port bracket connector

6CH Audio Port Bracket

Rear Speaker  
Center/Bass



SuperAudio Port Bracket

Rear Speaker  
Center/Bass  
RCA Out  
RCA In  
SP/DIF Out  
SP/DIF In



6CHG Audio Port Bracket

Rear Speaker  
Center/Bass

Game Port



J78 Game port connector

*Smartcard Reader Connector J59*

**Function:** Connector for a Smartcard reader module.

**Description:** A housing mounted Smartcard reader module plugs into to this connector.

**More Information:** See the “Connecting Internal Peripherals” and “Configuring the CMOS Setup Utility” sections in Chapter 5.

**Smartcard Reader:**

The connector cable from a Smartcard Reader module plugs into J59.



J59 Smartcard Reader connector

*Memory Stick Reader Connector J60*

**Function:** Connector for a Memory Stick™ or Secure Digital™ memory card reader module.

**Description:** A housing-mounted reader module plugs into to this connector.

**More Information:** See the “Connecting Internal Peripherals” and “Configuring the CMOS Setup Utility” sections in Chapter 5.

**Memory Stick Reader:**

The connector cable from a Memory Stick Reader module plugs into J60.



J60 Memory Stick Reader connector

### Front Panel Connectors

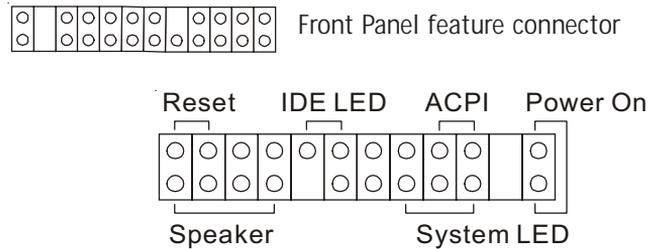
**Function:** Multifunction pin header connector for system housing front panel features.

**Description:** This connector supports the following front panel features:

- Reset Switch
- IDE device activity LED
- System ACPI Suspend switch
- System Power LED
- Housing-mounted speaker

**More Information:** See Chapter 4 “Installing the Board In A System Housing” and Chapter 6, “System Features”.

**Front Panel Connector:**  
Leads from the front panel features connect to this header.



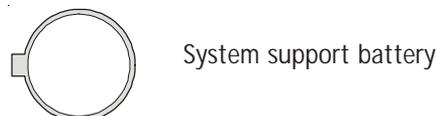
### Battery Housing

**Function:** Housing for system support battery.

**Description:** An external lithium coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the standby current from the power supply extends the life of the battery.

**More Information:** See the Standard CMOS Features section of “Configuring the CMOS Setup Utility” in Chapter 5 to adjust the real-time clock settings.

**Battery & Housing:**  
The battery is a CR2032 Lithium coin cell.



### External I/O Ports

There are several external Input/Output ports on the rear edge of the motherboard and connectors for more on the board. Please refer to the Rear I/O Panel Ports illustration for the port locations. The ports are color-coded for easy identification.

#### PS/2 Ports

**Function:** Connecting PS/2 devices to the system.

**Description:** The PS/2 ports are for a system keyboard and mouse or other pointing device. Do not connect or disconnect PS/2 devices when the system is turned on.

**More Information:** See the Advanced Boot Options section of “Configuring the CMOS Setup Utility” in Chapter 5 for information on adjusting related settings.

#### PS/2 Ports:

Do not plug or unplug devices when the system is turned on.



PS/2 Mouse

PS/2 Keyboard

#### USB Ports

**Function:** Connecting USB 1.1 devices to the system.

**Description:** These four ports are for USB 1.1 devices. The ports are for “Type A” USB cable connectors. You can connect or disconnect USB cables when the system is turned on.

**More Information:** See the Integrated Peripherals section of “Configuring the CMOS Setup Utility” in Chapter 5 for information on adjusting port settings.

#### USB Ports:

There are four USB ports on the rear panel. Ports 3/4 have a separate root hub and have the LAN port mounted in the same housing on the P4R533-N model.



USB ports 1/2



USB ports 3/4 (with P4R533-N LAN)

*LAN Port (P4R533-N Only)*

**Function:** Connecting a CAT 5 LAN cable to the system.

**Description:** This is an RJ-45 connector for standard Cat 5 LAN cabling with RJ-45 jacks. The connector is for the optional onboard LAN controller. You can connect or disconnect a LAN cable when the system is turned on.

**More Information:** See the System Features section of Chapter 6 for more information on LED modes.

**LAN RJ-45 Jack:**

Upper LED = Activity

Lower LED = Link



RJ-45 LAN jack  
(on top of USB3/4 ports)

*Parallel Port*

**Function:** Connecting a device with a parallel interface to the system.

**Description:** The parallel port is generally used to connect a printer to the system. The port supports common parallel port modes and allows bidirectional communication. Use an IEEE 1284 compliant cable with the default ECP mode configuration.

**More Information:** See the Integrated Peripherals section of “Configuring the CMOS Setup Utility” in Chapter 5 for information on adjusting port settings.

**Parallel port:**

The default mode is ECP, configured as EPP 1.9, DMA 3. 1284 compliant.



Parallel port

### Serial (COM) Ports

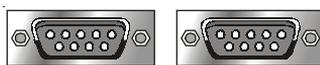
Function: Connecting Serial devices.

The two serial ports have 9-pin connectors. They can operate at speeds up to 115,200bps. You can configure the port speed in the computer's Operating System. Do not connect or disconnect a serial cable when the system is turned on.

**More Information:** See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on adjusting port settings.

### Serial Ports:

The default configuration is Serial 1 = COM1 and Serial 2 = COM2. Installing an IR port requires disabling COM2.



Serials ports 1 & 2

### Audio Jacks & Connectors

Function: Jacks for connecting external audio devices to the onboard audio subsystem.

Description: There are three audio jacks:

- Line Out  
For the two stereo speakers.
- Line In  
Audio input connector for an external audio source.
- Mic  
Microphone connector for a computer microphone.

**More Information:** See the Integrated Peripherals section of "Configuring the CMOS Setup Utility" in Chapter 5 for information on audio settings.

### External Audio Jacks:

The onboard audio supports stereo speakers, audio input and a microphone.



- Mic (Pink)
- Line In (Light Blue)
- Line Out (Lime)

### Jumpers

There are four jumper switches on this motherboard. Jumpers function like switches to establish a hardware configuration setting.

**JP6 Clear CMOS:**  
Default – Normal



#### *JP6 Clear CMOS*

**Function:** Clears the CMOS Setup Utility configuration record stored in the real-time clock's CMOS memory.

**Description:** A 3-pin jumper.

**More Information:** See Chapter 3 for configuration information and the Troubleshooting section in Chapter 6.

**JP8 Audio Chip:**  
Default – Enabled



#### *JP8 Audio Chip*

**Function:** Enables or Disables the onboard audio chip.

**Description:** A 3-pin jumper.

**More Information:** See Chapter 3 for configuration information and “System Features” in Chapter 6.

**JP16 Flash Protect:**  
Default – BIOS control



#### *JP16 Flash Protect*

**Function:** Sets protection method to prevent accidental overwriting of installed system BIOS.

**Description:** A 3-pin jumper.

**More Information:** See Chapter 3 for configuration information and the “Performance Optimization” section in Chapter 6.

**JP17 Onboard LAN:**  
Default:  
P4R533-N – Enabled



#### *JP17 LAN Chip (P4R533-N only)*

**Function:** Enables or Disables the onboard LAN feature.

**Description:** A 3-pin jumper.

**More Information:** See Chapter 3 for configuration information and “System Features” in Chapter 6.

### Software Features

This motherboard comes with driver software and bundled utility software on the supplied Power Installer CD-ROM disc. The Installing OS & Support Software section in Chapter 5 explains how to install the software required to support this motherboard and profiles the bundled utilities.

### Using the Power Installer Disc

You can run the Power Installer CD-ROM install interface under Microsoft Windows 9X, NT 4.0, 2000 or XP. The disc's install interface should load automatically and you then click on the model name of this motherboard.

Power Installer:  
P4R533/P4R533-N  
Main installation screen



### Driver Software

This motherboard requires that you install driver software to support the onboard hardware. You will need to install the following:

- Intel 850E chipset support software  
Driver that supports the chipset and the Intel Application Accelerator that enhances system performance.
- LAN driver software (for use with P4R533-N only)  
Driver software for the P4R533-N onboard LAN
- Audio driver software  
Audio driver and utilities for the onboard CMedia audio chip.
- Onboard LAN Driver Install Guide  
An Adobe Acrobat file that explains where to look for instructions on installing the appropriate LAN driver for your Operating System.
- Smart I/O Device Driver  
Driver for Smart Card, Memory Stick and Secure Digital Card readers.

Please see “Installing OS & Support Software” in Chapter 5 for more information.

**Power Installer:**  
P4R533/P4R533-N  
Driver Installation screen



## Utility Software

The Power Installer disc also has several Windows utility programs on it.

- Acrobat Reader

Acrobat Reader allows you to read documents in the Adobe PDF format, including online documents on the Power Installer disc and a wide range of other content. The reader is free and can be upgraded at the Adobe web site – [www.adobe.com](http://www.adobe.com) – when new versions become available.

- McAfee Anti-Virus

This is anti-virus software from one of the leading vendors.

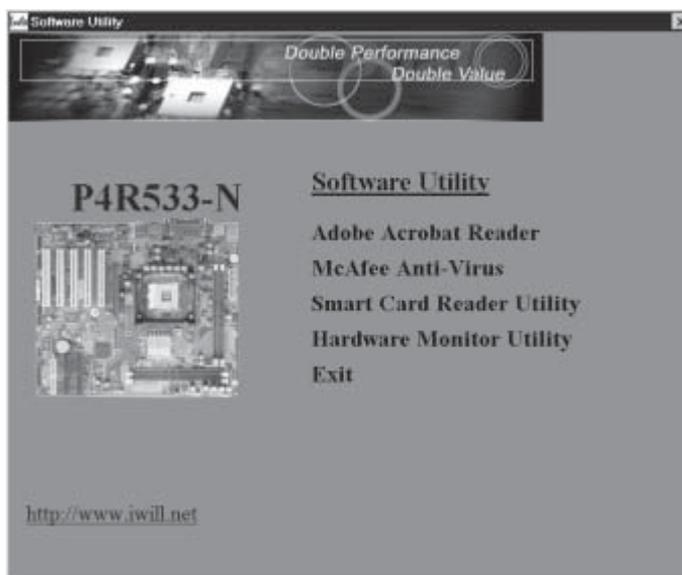
- Smart Card Reader Utility

Software utility for accessing smart cards inserted in a smart card reader connected to the motherboard.

- Hardware Monitor Utility

Hardware Doctor is a Winbond utility that allows you monitor the system hardware and obtain information about voltage levels, internal housing and CPU temperatures and CPU and system memory specifications.

Power Installer :  
P4R533/P4R533-N  
Utility installation screen



**In This Chapter:**

The Default Configuration

Hardware Configuration: Jumper Settings

Firmware Configuration: The BIOS CMOS Setup Utility

Reconfiguring the Motherboard

Hardware Reconfiguration

Firmware Reconfiguration

**3: Motherboard Configuration**

This chapter details the motherboard's default configuration and configuration options. Please review the contents of this chapter to find out information on the default configuration or alternative configuration options to change the default configuration.

The motherboard will operate properly in the default configuration. Please make certain that any configuration changes you make will not adversely affect system operation.

**The Default Configuration**

The default configuration is set at the time of manufacture. The configuration is comprised of the hardware configuration settings and the default firmware settings in the BIOS CMOS Setup Utility.

**Hardware Configuration: Jumper Settings**

This motherboard is mainly configured in firmware, which simplifies configuration. There are also a few hardware settings. The hardware settings are configured using standard jumper switches. The motherboard has five jumper switches. The first section is about the two BIOS-related jumpers and the second about the three hardware configuration jumpers.

### BIOS-Related Jumpers

#### *Jumper JP6: Clear CMOS Memory*

JP6 is a jumper switch, but it does not set a hardware configuration setting. The BIOS CMOS Setup Utility creates a system configuration record that is stored in CMOS memory in the real-time clock chip. If the configuration record data becomes corrupted or is destroyed, or if the CMOS Setup Utility settings are changed to an unusable configuration, the motherboard may not run properly or at all. JP6 provides a means to delete the configuration data stored in CMOS memory and reset the configuration to the CMOS Setup Utility's Optimized Defaults.

Follow this procedure to clear CMOS memory. The jumper is beside the coin battery. If necessary, refer to the board diagram and key in Chapter 2 for the location of the JP6 jumper.

1. Turn off and unplug the system. Remove the system housing cover (see documentation if necessary).
2. Set JP6 to the Clear CMOS position by placing the jumper cap over pins 2 and 3 for one minute.
3. Return the jumper cap to the Normal position.
4. Replace the system housing cover, plug in the system and turn it on.
5. Run the CMOS Setup utility and load the Optimized Defaults. You can then enter any custom settings you require.
6. Save the settings as you exit the program and restart the computer.

The system should now operate normally.

#### JP6: Clear CMOS Memory

Setting	Function
Short 1-2 	Normal operation [Default]
Short 2-3 	Clear CMOS memory – see instructions

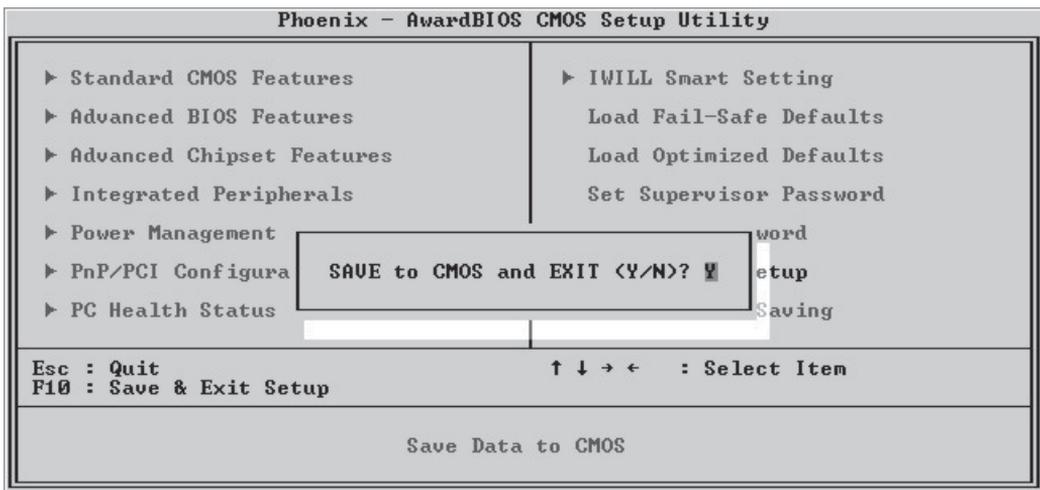
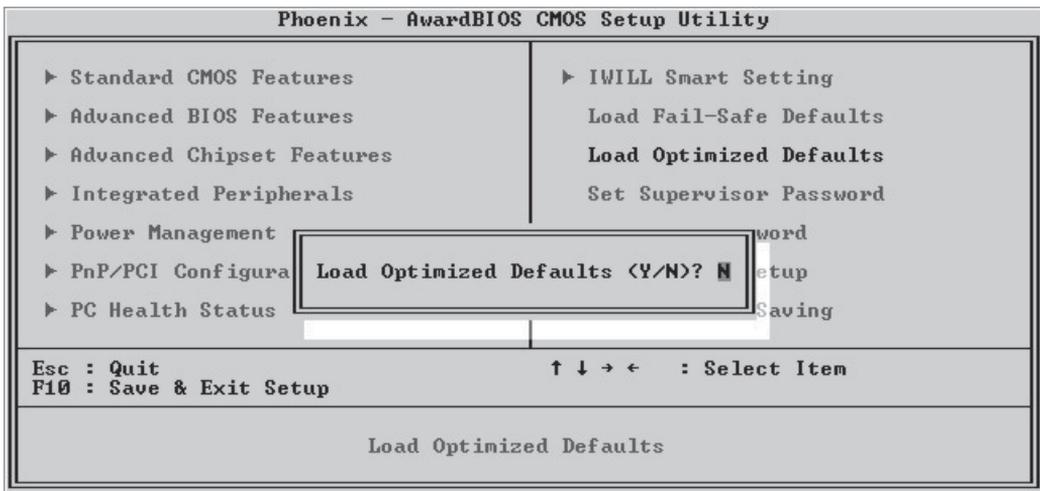
#### BIOS CMOS Setup Utility – Main Screen

The main screen of the CMOS Setup Utility has a Load Optimized Defaults item that loads the default operation settings. After you perform the Clear CMOS procedure, load the defaults as follows:

1. Select Load Optimized Defaults and press the Enter key.
2. A message will appear asking you to confirm.
3. Type a Y to confirm and press the Enter key again.
4. Make other settings you require.
5. Select Save & Exit Setup and press the Enter key.

The system will restart and use the new settings.

See the section on “Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.



### *Jumper JP16: BIOS Flash Protect*

The system BIOS and CMOS Setup Utility are stored in Flash memory on the motherboard, which provides permanent storage, but is rewritable, allowing for BIOS updates. Jumper JP16 controls the protection scheme that prevents accidental damage to or rewriting of the data stored in Flash memory.

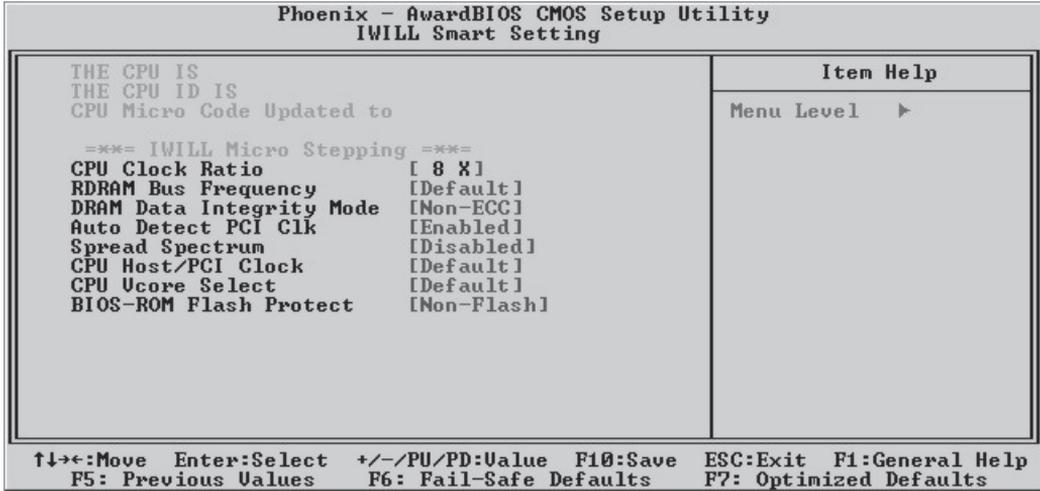
JP16 has three setting options which allow the BIOS to be protected either by a firmware setting in the “IWILL Smart Setting” section of the CMOS Setup Utility or by the jumper’s hardware setting. The firmware setting option is more convenient, so it is the default setting for this jumper. The setting options are listed in the table below.

#### **JP16: BIOS Flash Protect**

Setting	Function
Short 1-2 	Flash protection mode enabled
Short 2-3 	Protection mode selected in BIOS CMOS Setup Utility [Default]
Open [Remove Cap]	No BIOS Flash Protection

#### BIOS CMOS Setup Utility – IWILL Smart Setting

The IWILL Smart Setting section of the CMOS Setup Utility has a BIOS-ROM Flash Protect item that controls BIOS flash protection. The default setting is “Non-Flash”. The optional setting is “Flashable”. See the section on “Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.



Hardware Configuration Jumpers

*Jumper JP8: Audio Chip*

This jumper controls the onboard CMedia audio chip. If this is disabled, the onboard audio will not work and its system resources are released for other use.

**JP8: Audio Chip**

Setting	Function
Short 1-2 	Enabled [Default] - Onboard audio chip is enabled
Short 2-3 	Disabled - Onboard audio chip is disabled

*Jumper JP17: LAN Chip (P4R533-N only)*

This jumper controls the onboard LAN feature on the P4R533-N. If this is disabled, the onboard LAN will not work and its system resources are released for other use.

**JP17: LAN Chip**

Setting	Function
Short 1-2 	Enabled [Default]
Short 2-3 	Disabled

**Note:**

Both models can also use PCI Network Interface Cards. This jumper has no effect on them.

### Firmware Configuration: The CMOS Setup Utility

The BIOS CMOS Setup Utility a configuration record of system settings. This record is based on the “Optimized Defaults that are stored with the utility in Flash memory and can be reloaded at any time.

Many of these settings are either recommended or required for the motherboard to operate properly. Other settings are customizable and can be changed to suit your specific system configuration and operation requirements.

A number of the variable settings, such as CPU and IDE device settings are set to be automatically detected in the default configuration. While these settings can also be established manually, automatic detection is more convenient, safe and reliable. We strongly recommend that you leave all auto-detection settings undisturbed unless you have a specific reason not to and you are certain of what you are doing. Incorrect configuration of the CMOS Setup Utility can result in unreliable operation or a failure of the motherboard to work at all.

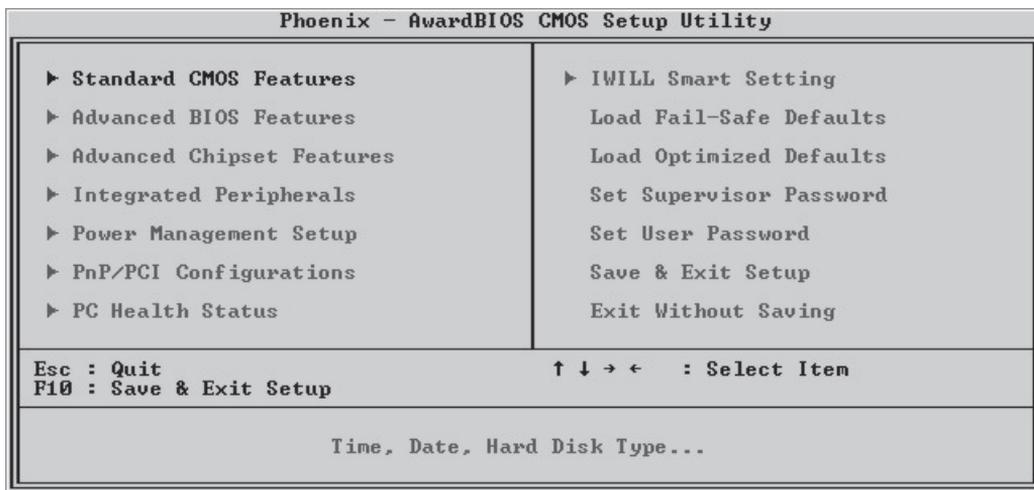
#### *Using the CMOS Setup Utility*

Please refer to the “Configuring the CMOS Setup Utility” section in Chapter 5 for information on using the utility and some settings you might want to customize. The utility does not run under an Operating System. You must load it during the Power On Self Test (POST) while the computer is starting up by press the Delete key or the Del key on the system keyboard’s numeric keypad.

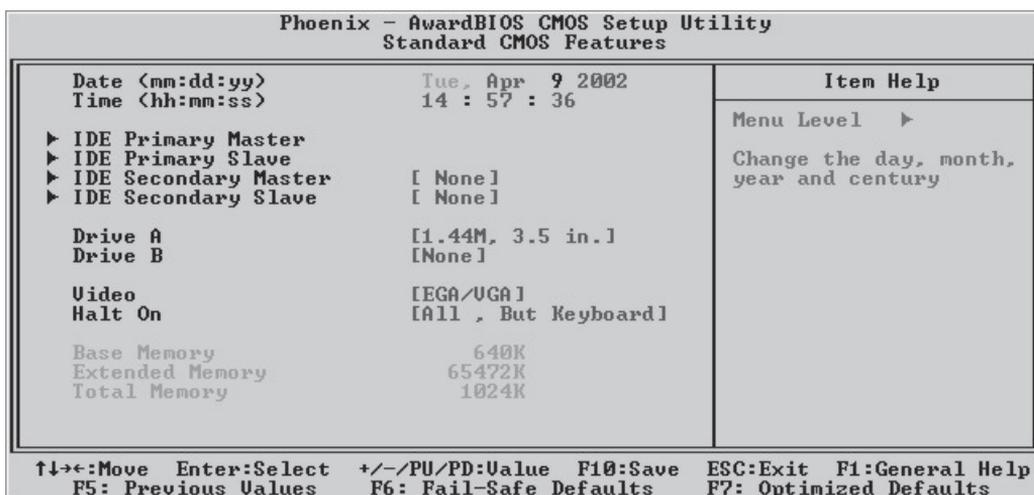
### BIOS CMOS Setup Utility – Main Screen

Load the CMOS Setup Utility during the POST by pressing the Delete or Del key. The utility interface commands are explained at the bottom of each screen and “General Help” is available by pressing the F1 key. See the section on “Configuring the CMOS Setup Utility in Chapter 5 for information on how to use this program.

The main screen has a basic list command instructions at the bottom of the screen and displays a function description of the highlighted item.



Sections marked by an arrow on the main screen have a list of command instructions at the bottom of each screen.



### Reconfiguring the Motherboard

You can change the default configuration (as shipped) of this motherboard as needed. However, since this motherboard has only a few hard configuration options and the CMOS Setup Utility is configuration is mostly either required, recommended or automatic, there will probably be little reason to do so.

#### Hardware Reconfiguration

We recommend leaving the jumper settings at the default settings unless you need to perform the Clear CMOS procedure. It is much more convenient to control the BIOS Flash Protection feature using the CMOS Setup Utility.

If you want to use a sound card instead of the onboard audio, you should Disable the onboard audio.

You can also Disable the onboard LAN on the P4D-N if the need arises, though you don't need to do this to add another LAN card to the system.

#### Firmware Reconfiguration

You can initially specify or customize the CMOS Setup Utility settings when you first configure the system (as covered in Chapter 5) to meet your requirements. Other than doing this, there should be no need to reconfigure the CMOS Setup Utility unless the system configuration changes or the configuration record stored in CMOS memory becomes corrupted and unusable, which is not common. If you need to completely recreate the system configuration record, follow the Clear CMOS procedure described in this chapter.



**In This Chapter:**

Pre-Installation Preparation

Installing CPUs

Installing System Memory

Installing the Motherboard in a System Housing

Motherboard Installation Procedure

Completing System Configuration

**4: Installing the Motherboard**

This chapter covers preparing the motherboard for installation, installing the board in a system housing or “chassis” and installing or connecting other internal system components.

There are a number of important topics in this chapter and we strongly urge that you review it before attempting to install the motherboard.

**Pre-installation Preparation**

Before you install the motherboard you will need to do the following:

- Install a 478-pin Intel Pentium 4 CPU
- Install Rambus RIMM system memory modules

Both of these require specific procedures that you must follow precisely to insure that the components are successfully installed and work properly. Please review the instructions in this section in detail and follow them carefully. The procedures are not complex.

### Installing A CPU

This motherboard uses the 478-pin Intel Pentium 4 processor. To install an Intel Pentium 4 CPU on the motherboard it is very important to precisely and entirely follow the procedure for installing both the CPU and its cooling assembly. Failure to do so can result in either improper operation or damage to the CPU and possibly the motherboard.

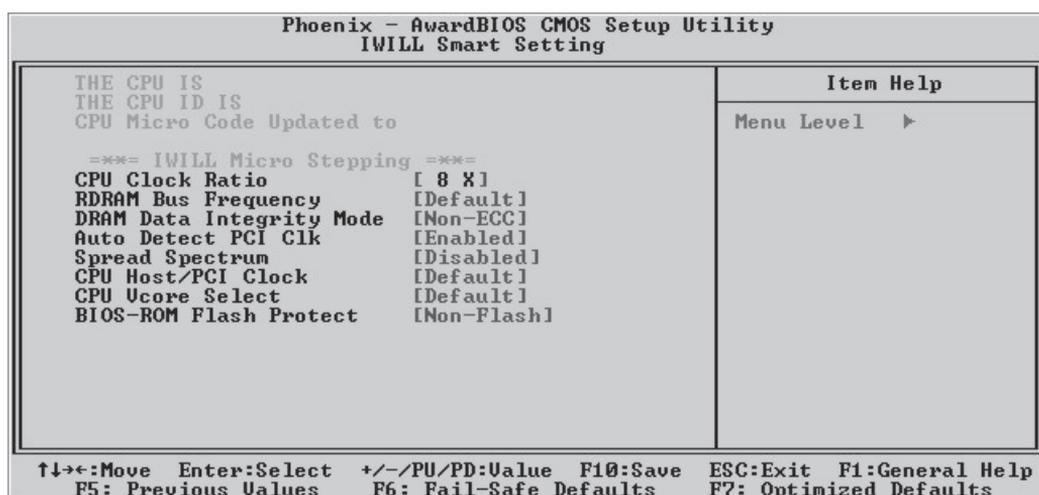
To install an Intel Pentium 4 processor on this motherboard you will need to do the following:

- Install a Pentium 4 processor in the mPGA478 socket
- Install the Heatsink/Retention Mechanism

Please follow the procedure detailed below to install the Pentium 4 processor on the board. Intel boxed Pentium 4 processors come with full installation instructions. If you have these, please also read and follow those instructions carefully.

### Processor Selection

This motherboard supports all 478-pin Pentium 4 processors and the BIOS automatically detects the required settings and configures the CMOS Setup Utility accordingly. The settings in the IWILL Smart Setting section control this feature.



### Installing The Processor

Installing a Pentium 4 processor in the mPGA478 Socket is the simplest part of the procedure. It is very important, however, to carefully handle the processor by the side edges and always fully observe precautions against electrostatic discharge. We assume here that you are installing an Intel Pentium 4 boxed processor that comes with a heatsink and Thermal Interface Material applicator. The illustrations show these. If you are installing a non-boxed processor, the procedure is the same, but the accessory items may have a different appearance.

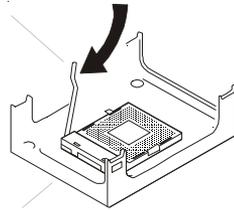
Please follow the installation procedure as illustrated on the next two pages. The illustrations are generic and do not specifically represent this motherboard.

The processor installation procedure is as follows:

1. Raise the locking lever of the processor locking mechanism to a perpendicular position.

#### Step 1:

Raise the retaining lever

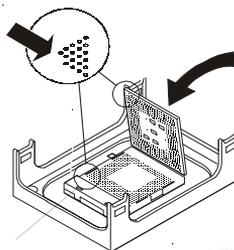


Raise the socket lever to the vertical position

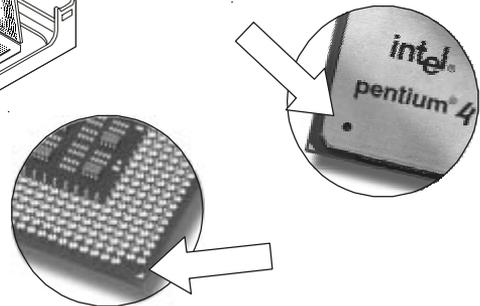
2. Align the processor to the socket by matching the Pin 1 corner of the socket to the Pin 1 corner on the socket, which is located at the corner where the locking arm attaches to the socket.

#### Step 2:

Align the Pin 1 corners

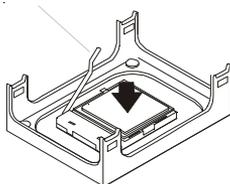


Match the Pin 1 positions on the socket and the processor



- Carefully insert the Pentium 4 processor in the socket receptacles, taking care not to bend any pins.

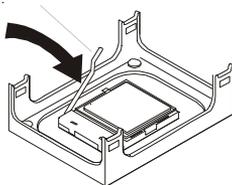
**Step 3:**  
Insert the processor



Gently press the processor into the socket.

- Lower the locking mechanism's retaining lever and secure it in place to secure the processor in the socket. Grasp the processor by the edges and gently pull upwards to insure it is properly inserted. The processor shouldn't move.

**Step 4:**  
Secure the retaining lever



Press the retaining lever back down into the horizontal position and make sure it latches in place.

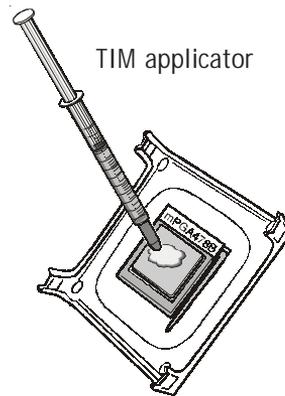
### *Installing the Heatsink*

Once you have installed the CPU, you must install a Fan/Heatsink. The Fan/Heatsink clips into to the Retention Mechanism attached to the board via its integrated retaining clip assembly.

#### Apply Thermal Interface Material

Before you install the Fan/Heatsink you must apply the Thermal Interface Material (TIM) that is supplied in an applicator with boxed Intel Pentium 4 processors (or an exact equivalent) to the top of the installed CPU. If the Fan/Heatsink already has a patch of TIM on its underside, you don't need to apply any additional TIM to the CPU. We assume here that you have TIM in an Intel-supplied applicator. To apply TIM to the CPU do as follows:

1. Apply all of the TIM in the applicator to the center of the CPU's top plate.

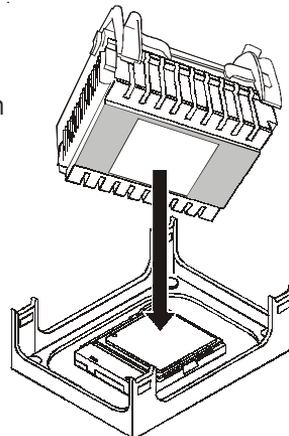


#### Step 1:

Apply TIM if needed.

2. Do not spread the TIM around. When you place the Heatsink on top of the CPU the material will disperse evenly.

Align and place on top of the CPU



Next, install the processor Fan/Heatsink assembly as detailed below.

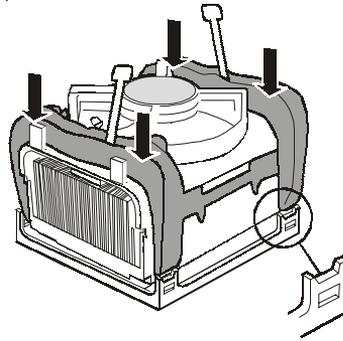
Install the Fan/Heatsink

To install the processor Fan/Heatsink assembly do as follows:

1. Place the Fan/Heatsink on top of the Pentium 4 CPU so that it's retaining clip frame snaps into the recesses in the Retaining Mechanism. The Fan/Heatsink will only fit into the mechanism frame in the correct orientation.

**Step 1:**

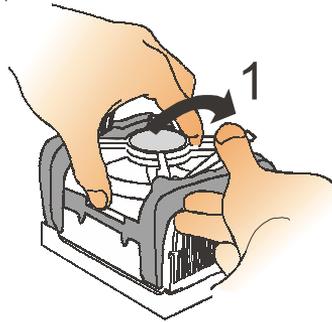
Clip Fan/Heatsink assembly into the Retention Mechanism



2. Hold the Fan/Heatsink steady and press one of the clip assembly's locking levers down into the locked position.

**Step 2:**

Hold the assembly steady and press one of the retaining clip locking arms into the locked position



3. Repeat the process for the second clip. Keep holding the Fan/Heatsink steady so that you don't damage the TIM. The locking levers should now hold the heatsink securely in the Retention Mechanism.

**Step 3:**

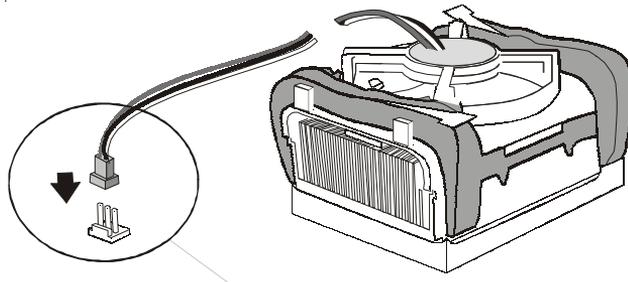
Hold the assembly steady and press the other retaining clip's locking arm into the locked position

**Connect Fan/Heatsink Power Lead**

Plug the fan power lead onto the CPU Fan power connector near the CPU socket. When you do this the CPU installation is complete.

**Step 4:**

Plug the Fan power lead onto the CPU fan power connector



## Installing System Memory

This section details the procedure for installing system memory on the motherboard. Correct memory configuration is critical for proper system operation. Please review this section carefully and follow the configuration guidelines precisely.

### *Memory Specifications*

The motherboard has four RIMM module sockets. The sockets operate in pairs or “banks”. This motherboard uses Rambus DRDRAM RIMM modules for system memory. The system memory specification are:

- Rambus DRDRAM RIMM modules
- PC800 or PC1066 memory
- Maximum 2GB total system memory

### *Memory Configuration Options*

This motherboard has specific memory configuration requirements. These include:

- All sockets must have either RIMM or CRIMM modules installed in them.
- Any capacity RIMM may be used in any socket as long as total memory does not exceed 2GB.
- Modules must be the same speed (PC800 or PC1066).

### *Module Types*

There are two modules types:

- RIMM

Rambus Inline Memory Module – a Rambus DRDRAM memory module.

- CRIMM

Continuity Rambus Inline Memory Module – not a memory module. Used to occupy empty sockets

CRIMMs must be installed in all sockets that do not have RIMMs installed in them. No sockets can remain empty.

### *Module Configurations*

The figures on the next page illustrate the allowed module configurations. Do not install modules in any other configuration. Please note the configurations indicate module positioning, not capacity. You can install any mixture of module capacities that does not exceed 2GB.

## Memory Configuration Layouts:

The configuration layout shown here are the only ones allowed. Do not use any other layout of RIMM and CRIMM modules. All sockets **MUST** have some kind of module installed.

Modules install in pairs. both modules in a pair must be the same size, for example, 256MB + 256MB.

 RIMM module

 CRIMM module

### Note:

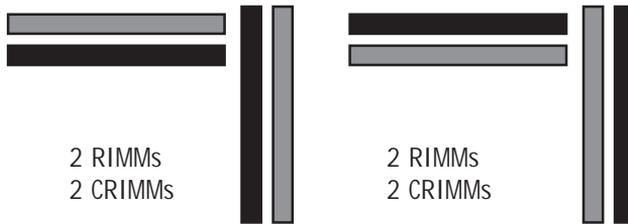
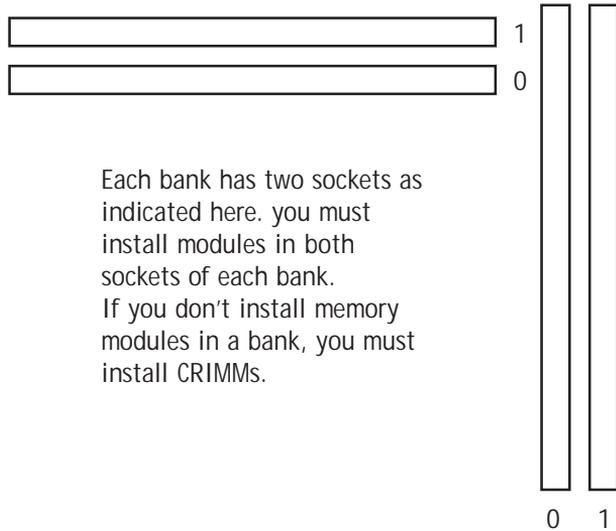
The default memory configuration both 400MHz FSB and 533MHz FSB CPUs is for PC800 memory.

If you use PC1066 RIMMs with a Pentium 4 CPU that has a 400MHz FSB, the modules will not perform at their rated speed.

If you use PC1066 RIMMs with a Pentium 4 CPU that has a 533MHz FSB, you have to manually set the RDRAM Bus Frequency to X4 in the iWILL Smart Setting section of the Award BIOS CMOS Setup Utility.

### Warning:

Do not install a mix of PC800 and PC1066 RIMMs.



The minimum configuration is two RIMMs, the maximum is four RIMMs. Bank order does not matter. Maximum memory 2GB.

### *Installing Memory Modules*

Installing RIMM or CRIMM modules is simple. The modules insert in the sockets and are held in place by the socket retaining arms. The edge connectors on the modules are of different widths and there are key notches in the center of each module. These ensure that you can not insert a module incorrectly.

Before you install any modules, you should review the configuration requirements and choose a configuration. You should then prepare the required number of RIMM and CRIMM modules.

To install either type of module follow this procedure:

1. Align the module to the socket so that the edge connectors on the module match the socket sections.
2. Hold the module perpendicular to the motherboard and press the edge connector into the socket.
3. Press the module fully into the socket so that the socket retaining arms swing up and engage the retention notches at each end of the module.

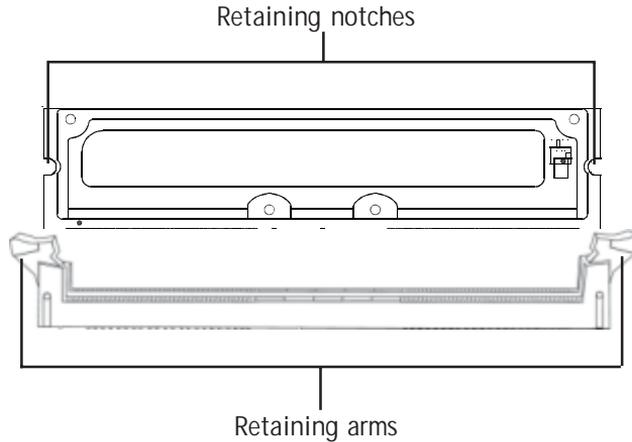
Following the configuration pattern you have chosen, repeat this procedure until all modules are installed. Re-check the configuration pattern guide and confirm that you have installed module in the correct configuration.

Once all modules are installed, system memory installation is complete.

### Module Installation:

All modules insert in the RIMM sockets in the same way. The socket retaining arms should engage the retaining notches on the module securely.

Make sure the module is correctly oriented before inserting it in the socket



### Important Note:

You must set the RDRAM Bus Frequency manually for PC1066 memory.

#### *PC1066 Memory Configuration*

You must manually set the RDRAM Bus Frequency setting to the X4 setting in the IWILL Smart Setting section of the CMOS Setup Utility. This sets the memory clock to operate at 533MHz with a 533MHz FSB Pentium 4 CPU. PC800 memory is automatically configured to work with a 400MHz FSB Pentium 4 CPU.

#### *System Memory Recognition*

The BIOS will automatically recognize the installed memory configuration and configure the CMOS Setup Utility. No other action is required to complete system memory installation.

### Installing the Motherboard in a System Housing

This section explains the basic requirements for installing this motherboard in a system housing or “chassis”. Since housing designs vary widely, you will need to consult the housing documentation for specific information.

This motherboard can be installed in any housing that supports the ATX form factor.

To install the motherboard in a system housing you will need to do the following:

- Install a rear I/O panel shield
- Attach the board to the housing
- Connect leads from the housing’s front panel

You can then connect other internal system components as described later in this chapter.

#### *Motherboard Installation Procedure*

This section assumes you are installing the board in a suitable ATX housing. We also assume you have prepared the board for installation as previously described in this manual. If the housing you are using normally stands vertically, place the open housing on it’s side before you start.

Please follow this procedure to install this motherboard:

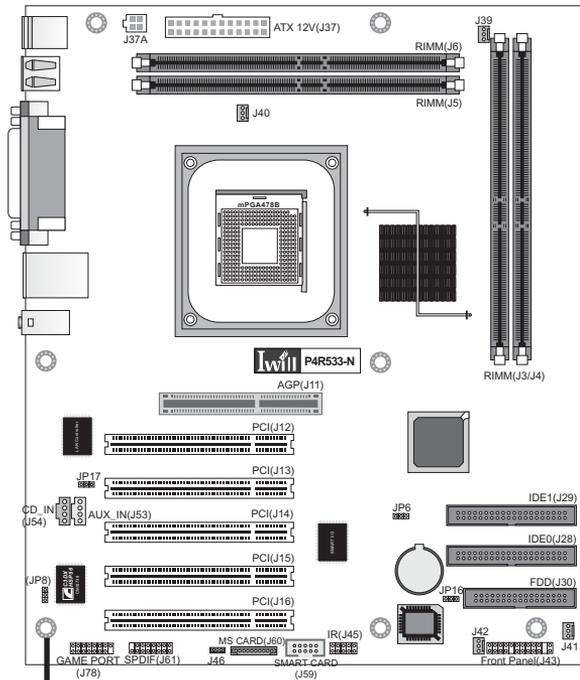
1. Review any instructions that came with the system housing and prepare the necessary mounting hardware that came with it.
2. Identify the mounting holes on the board and confirm that the housing has standoffs that match them.
3. Install the rear I/O panel shield that came with the motherboard in the housing’s I/O panel opening. This should fit in the housing .
4. Insert the board in the housing and align the mounting holes to the standoffs on the housing’s motherboard mounting plate. Make sure all of the rear I/O ports are properly aligned with the openings in the I/O panel shield.
5. Attach the board to the housing by inserting mounting screws in all the holes and tightening them snugly.

#### **Required Tool:**

- Philips-head screw driver (Crosshead)

## Mounting Holes

There are 7 mounting holes on the motherboard that should correspond to mounting standoffs on the system housing's motherboard mounting plate.



Mounting holes

### Connecting Front Panel Components

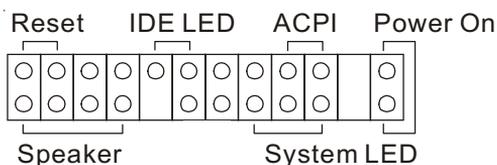
After the motherboard is installed in the system housing, you should connect whatever front panel components the housing has to the Front Panel feature connector on the motherboard.

The figure below indicates the pin assignments of the connector for your reference.

#### Front Panel Connector:

Leads from the front panel features connect to this header.

Front Panel feature connector



### Completing System Configuration

Once the motherboard is installed in the system housing, you can proceed to connect or install whatever internal devices you will use to complete the system. These will at least include an AGP display card and disk drives and connecting the housing power supply leads.

After that, having replaced the system housing cover, you can connect external peripherals to complete the process of preparing the system for use. These will include at least a video display and a keyboard and probably a pointing device. Please see the next chapter for information on completing these final hardware installation steps and installing Operating System and support software.

**In This Chapter:**

Installing or Connecting Internal Peripherals

    Installing an AGP Card

    Connecting Internal Devices

Connecting External System Peripherals

Configuring the CMOS Setup Utility

Installing an OS & Support Software

## 5: System Configuration

This chapter explains what you need to do to assemble a complete system after you have installed the motherboard in a system housing. This will include installing or connecting internal devices, connecting external system components. Once the system is assembled, you'll need to check and possibly configure the motherboard's CMOS Setup Utility, install an Operating System and install the support software supplied on the Power Installer support CD-ROM disc.

### Installing or Connecting Internal Peripherals

To complete the assembly of a working system you will need to at least install an AGP video display card and connect whatever disk drives you will use in the system. This section covers what you need to know on the motherboard side to do this. You will also need to consult the documentation that comes with your internal system peripherals for additional installation instructions and information. This section covers the minimum components you will need to connect to the motherboard to create a functioning system. You may plan to add other devices as well.

### Installing an AGP Card

The AGP connector on the board supports AGP 4X 1.5-volt display cards. Follow the instructions that come with the display card for installing the card hardware in the AGP slot.

### AGP Configuration

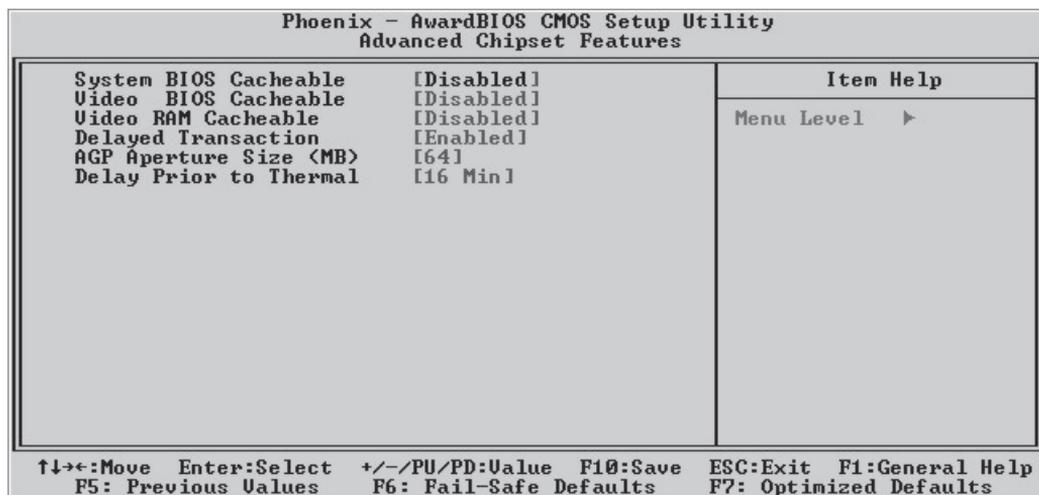
You can configure the amount of system memory the AGP card will use as auxiliary memory by adjusting the AGP Aperture Size setting in the Advanced Chipset Features section of the CMOS Setup Utility. The default aperture setting is 64MB the maximum is 256MB.

### Display Drivers

You should install the display card's display driver software according to the instructions that come with the card after you have completed system assembly and have installed an OS and the support software for this motherboard.

### AGP Aperture Setting

You can set the AGP aperture size in the Advanced Chipset Features section of the CMOS Setup Utility



### Connecting Internal Devices

To assemble a complete system capable of completing the installation of this motherboard you will need to install and connect the following internal devices:

- Hard Disk Drive
- CD-ROM or other optical drive
- Floppy disk drive

The floppy disk drive is not strictly necessary, but is a standard system component and is needed if you will create driver floppy disks from the Power Installer 2.

We assume here, in the absence of an alternative drive controller that any hard disk or optical drives will be IDE devices connected to the motherboard's IDE channels.

#### *Connecting IDE Devices*

This motherboard supports two IDE channels, Primary and Secondary. It has two IDE device connectors onboard which support IDE devices running in any data transfer mode up to ATA-100. Each IDE connector supports two drives, a Master and a Slave. The drives connect to the motherboard with an IDE ribbon cable. IDE cables have three connectors on them, one that plugs into a drive connector on the board and the other two that connect to IDE devices. The connector at the end of the cable is for the Master drive. The connector in the middle of the cable is for the Slave drive.

There are three types of IDE ribbon cable, supporting transfer modes up through ATA-33, ATA-66 or ATA-100. You must use a cable that supports the transfer mode of the fastest device connected to it. For example, if both an ATA-66 mode and an ATA-100 mode device are connected to the same cable, the cable must support ATA-100 mode to achieve maximum performance.

To install an IDE drive, connect the drive to one of the drive connectors on a suitable ribbon cable. Plug the board end of the cable into one of the IDE connectors on the motherboard.

### IDE Drive Positioning

Normally the system's primary hard disk drive should be in the Primary Master position. If you will use only the supplied ribbon cable, connect a CD-ROM drive to the Primary Slave position.

If you obtain an additional IDE ribbon cable, you can install a second hard disk drive in the Primary Slave position and install the CD-ROM as the Secondary Master. This is a good idea if the CD-ROM drive uses a slower data transfer mode than the hard disk drive.

Follow any instructions that come with the drives to configure and install them. IDE devices generally can be set to one of three operation modes:

- Master
- Slave
- Cable Select

Many drives come set to the Master setting. If you will use the drive in a Slave position, you must reconfigure it as either Slave or use the Cable Select setting to allow the drives position on the cable to define the mode.

### *Connecting a Floppy Disk Drive*

This motherboard has one Floppy Drive connector for connecting one or two floppy disk drives. Most computer systems use one 3.5-inch 1.44MB floppy disk drive. The drive connector is for a standard floppy drive ribbon cable.

To install a floppy disk drive, connect the drive to the end of the cable, which is the Drive A: position. Plug the other end of the cable into the floppy disk drive connector on the motherboard.

### *Connecting a Smartcard or Memory Stick® Reader*

This motherboard has connectors for a Smartcard reader (J59) and a Memory Stick® memory card reader (J60).

To connect any of these devices, follow the instructions that come with them. You will need to connect a module cable to the appropriate connector and enable the feature in the "Integrated Peripherals" section of the CMOS Setup Utility. The default port settings listed should work.

## Onboard IDE Connectors

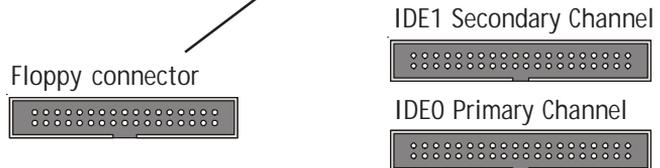
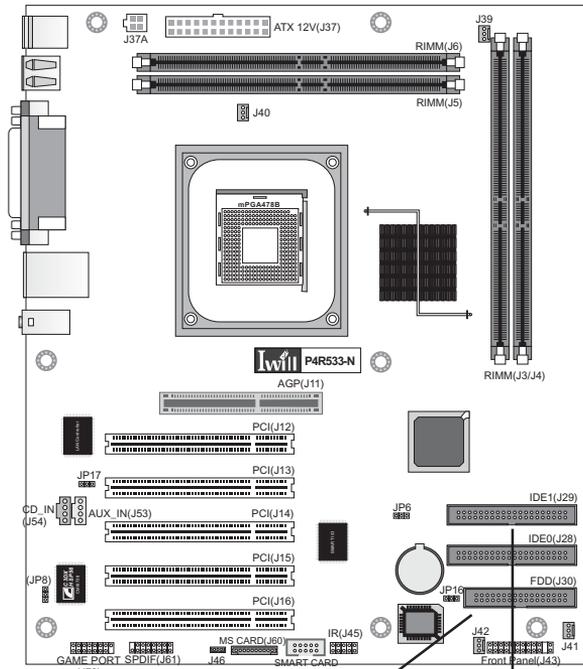
Each channel connector supports one IDE channel with two drives, a Master and a Slave. The Master drive connects to the connector on the end of the ribbon cable. The Slave drive connects to the connector in the middle of the ribbon cable.

### Note:

The ribbon cable used must support the transfer mode of the fastest device connected to it to avoid degraded performance.

## Floppy Drive Connector

The floppy drive connector supports two floppy disk drives. The first drive, Drive A:, connects to the connector on the end of the floppy drive connector cable. A second drive, Drive B:, would connect to the middle connector on the cable although systems now commonly only have one floppy disk drive.



## Connecting External System Peripherals

To complete the assembly of functioning system you will need at minimum to connect the following external system components to the system housing:

- Video Display Monitor
- Keyboard
- Mouse or other Pointing Device

### Connecting a Display Monitor

You can connect any display monitor supported by the AGP display card you installed in the system. This may include either a CRT or LCD monitor, depending on the card's specifications.

Connect the display monitor cable to the appropriate display connector on the AGP card according to the instructions that come with the card and monitor.

### Connecting a Keyboard & Mouse

You can use either PS/2 or USB input devices with this motherboard.

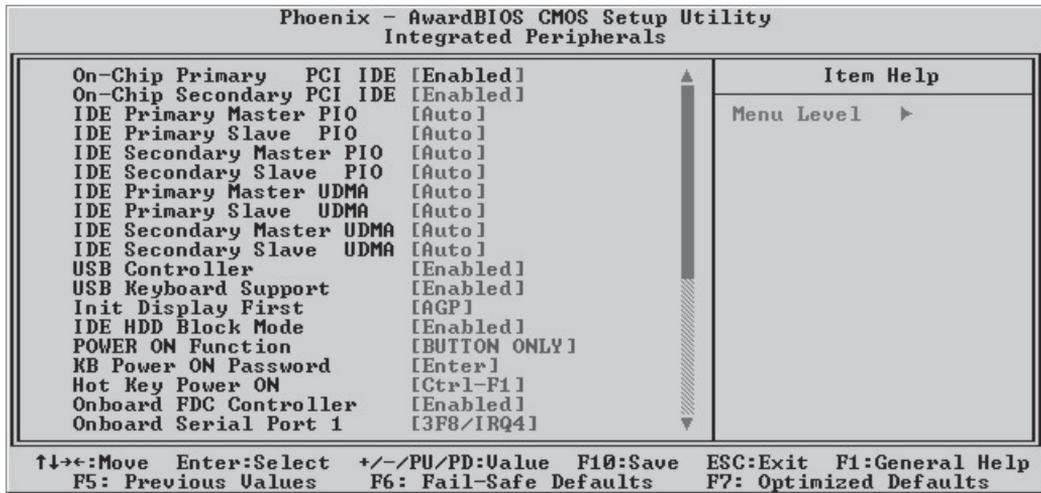
#### Connecting PS/2 Devices

Connect a PS/2 keyboard and mouse to the Keyboard and Mouse PS/2 ports on the rear I/O port panel. Don't connect or disconnect a device while the system is turned on. Doing so can damage the board.

#### Connecting USB Devices

You can use a USB keyboard and mouse with this motherboard. They plug into two of the USB ports. The Operating System you use must support USB to use any USB devices. You can plug and unplug USB devices when the system is turned on.

## CMOS Setup Utility – Integrated Peripherals



The “USB Keyboard Support” default is Enabled. This allows you to use a USB keyboard before the operating system loads. Your OS must also support USB to use a USB keyboard with it.

## Configuring the CMOS Setup Utility

The motherboard Award BIOS includes the CMOS Setup Utility that creates a system configuration record that is stored in CMOS memory on the board and is required by the system to operate properly.

Most of the configuration settings are either predefined by the BIOS Optimized Default settings which are stored with the BIOS or are automatically detected and configured without requiring User action. There are a few settings that you may need to change depending on your system configuration.

This section gives a brief profiles of the several sections of the CMOS Setup Utility and indicates settings you might need to change and those which you should not.

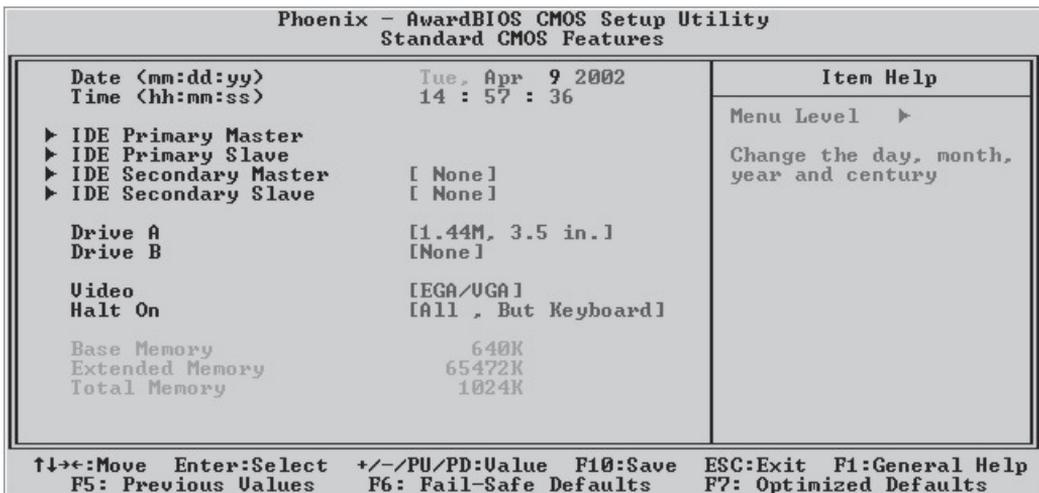
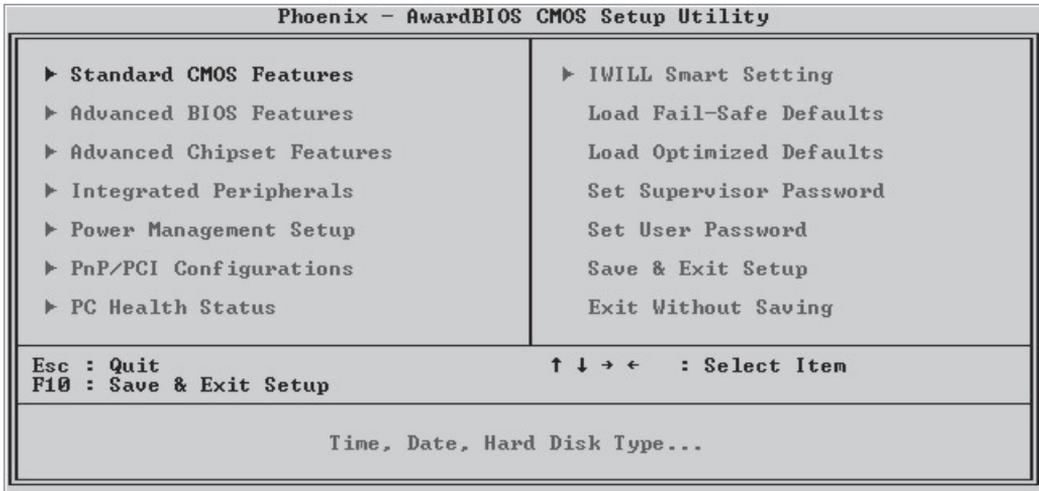
### The CMOS Setup Utility User Interface

The CMOS Setup Utility user interface is simple and largely self evident. The utility can only be operated from the keyboard and all commands are keyboard commands. The utility does not support mouse use. The commands are straightforward and those available for the program section you are in are listed at the bottom of the screen. The main screen has few commands, other sections have more. General Help, which lists the commands and their functions is available at any time by pressing the F1 key.

### *Running the CMOS Setup Utility*

The CMOS Setup Utility does not require an operating system to run. You run the utility by typing the Del or Delete key when the computer is starting to boot up. The utility's main screen will then appear.

## CMOS Setup Utility – Interface commands



### CMOS Setup Utility Program Sections

The CMOS Setup Utility is divided into several subsections and some top level commands including the following sections:

- Standard CMOS Features
- Advanced BIOS Features
- Advanced Chipset features
- Integrated Peripherals
- Power Management Setup
- PnP/PCI Configurations
- PC Health Status
- IWILL Smart Setting

The main screen also has these command options:

- Load Fail-Safe Defaults
- Load Optimized Defaults
- Set Supervisor Password
- Set User Password
- Save & Exit Setup
- Exit Without Saving

Please see the following sections for a brief profile of what each section does, information on settings you might want to change and things to leave alone.

To open one of the program sections, highlight the item you want and press the Enter key. To change a setting, highlight an item and use the “Value” keys indicated to change the setting. Alternatively, press the Enter key and all options for that item will display and you can choose from those listed.



*Standard CMOS Features*

Main Section Functions

This section has the real time clock settings, the IDE and floppy device settings.

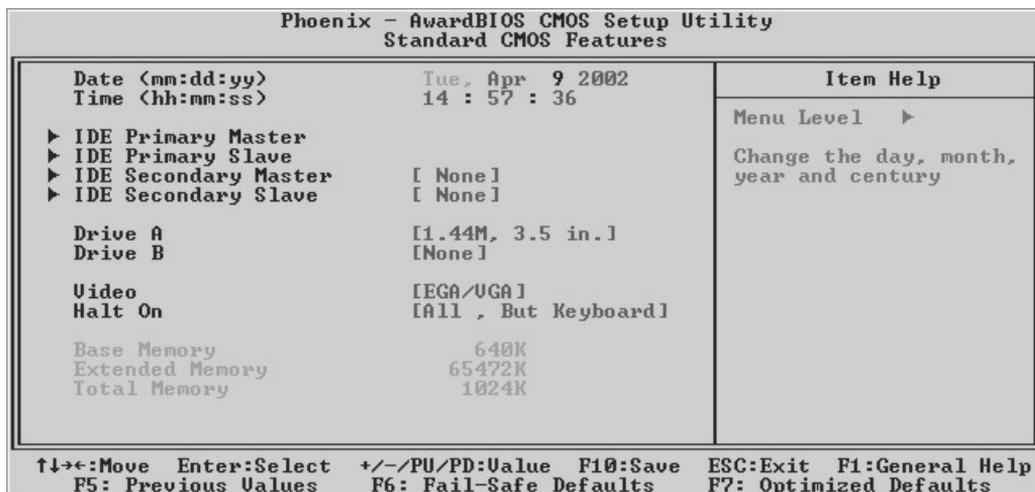
Default & Autodetected Settings

The IDE device settings are autodetected. You shouldn't need to change this. The floppy and other settings are standard defaults.

Setting Options & Constraints

You can reset the time and date settings if they are not correct for your location.

CMOS Setup Utility – Standard CMOS Features



In operation, the screen will display the detected IDE devices

### Advanced BIOS Features

#### Main Section Functions

This section mainly configures boot options including boot devices and their boot order and some power functions. There are also some miscellaneous boot configuration settings.

#### Default & Autodetected Settings

The screen illustration shows the default settings. These do not need to be changed. You can customize the settings to suit your purposes if necessary and you know what you're doing.

#### Setting Options & Constraints

You can change the boot device assignments and order, the boot options and the power on settings as you like. You can select which security option applies, Setup or System. You must set a password for it at the main level or it will have not effect.

### CMOS Setup Utility – Advanced BIOS Features

Phoenix – AwardBIOS CMOS Setup Utility		Item Help
Advanced BIOS Features		
Virus Warning	[Disabled]	Menu Level ▶  Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area , BIOS will show a warning message on screen and alarm beep
CPU L1 & L2 Cache	[Enabled]	
Quick Power On Self Test	[Enabled]	
RAID & SCSI Boot Order	[RAID,SCSI]	
First Boot Device	[Floppy]	
Second Boot Device	[HDD-0]	
Third Boot Device	[LS120]	
Boot Other Device	[Enabled]	
Swap Floppy Drive	[Disabled]	
Boot Up Floppy Seek	[Enabled]	
Boot Up NumLock Status	[On]	
Gate A20 Option	[Fast]	
Typeomatic Rate Setting	[Disabled]	
x Typeomatic Rate <Chars/Sec>	6	
x Typeomatic Delay <Msec>	250	
Security Option	[Setup]	
OS Select For DRAM > 64MB	[Non-OS2]	
Report No FDD For WIN 95	[No]	
↑↓←→:Move Enter:Select +/-/PU/PD=Value F10:Save ESC:Exit F1:General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

### Advanced Chipset Features

#### Main Section Functions

Configures the chipset, BIOS caching and the AGP Aperture size.

#### Default & Autodetected Settings

Everything on this screen is an optimized default or is autodetected.

#### Setting Options & Constraints

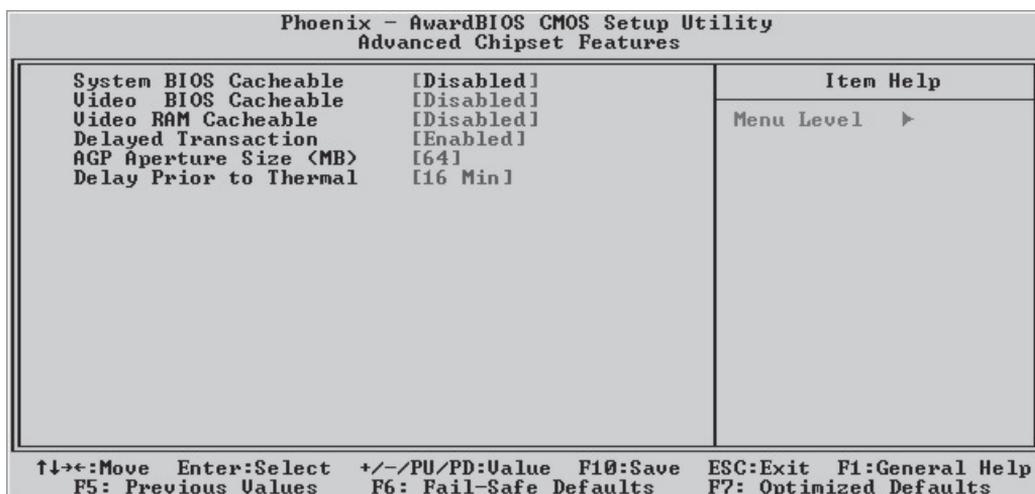
Don't change the Delayed Transaction default.

You can adjust Cacheable defaults, the AGP Aperture and the Delay Prior to Thermal setting. The default settings will work.

You can set the three Cacheable settings to Enabled to enhance system performance. If you experience system operation problems set the Video BIOS and RAM settings back to Disabled.

Delay Prior to Thermal sets a time-out after which, when the CPU temperature reaches a warning threshold, the BIOS will start reducing the CPU clock in steps to reduce the CPU temperature.

### CMOS Setup Utility – Advanced Chipset Features



### Integrated Peripherals

#### Main Section Functions

Configures the peripheral features integrated onto the motherboard.

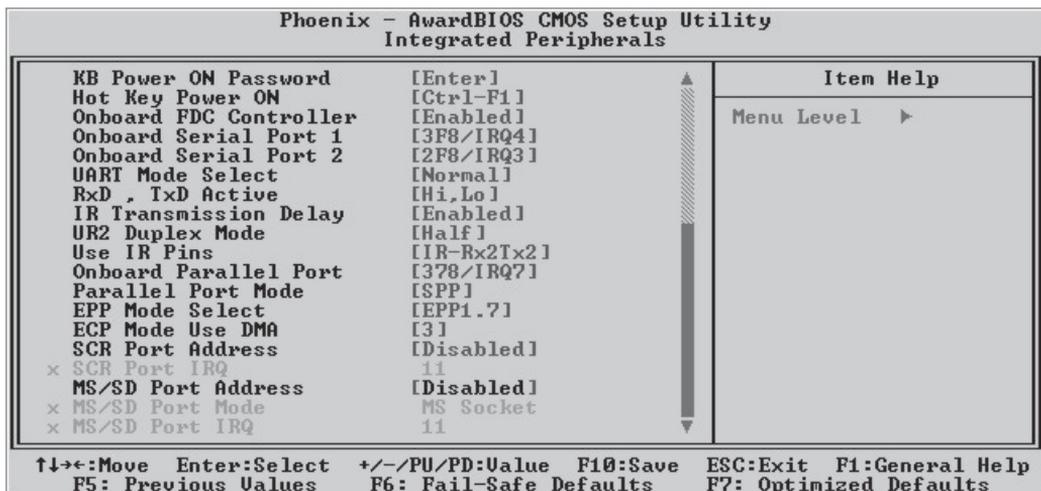
#### Default & Autodetected Settings

Everything on this screen is an optimized default. The IDE transfer mode settings are autodetected. The system will work with these defaults. The port settings are standard PC settings.

#### Setting Options & Constraints

You can disable onboard devices and change port settings. If you install an IR port module, you have to set the “COM2 Mode Select” line to the appropriate IR setting. The last two items when you scroll to the bottom of the list are “SCR Port Address” and “MS/SD Port Address”. These enable and configure a Smartcard reader and a Memory Stick™ or Secure Digital™ memory card reader respectively. These devices must have different port addresses. If you will install either device, choose either the 3E0 or 2E0 address. The other two options are already in use by the serial ports and shouldn’t be used unless you disable the serial port that is using the address you want to use.

### CMOS Setup Utility – Integrated Peripherals



### Power Management Setup

#### Main Section Functions

Configures power management settings. These are overridden by ACPI power management in Windows when ACPI Function is set to the default, Enabled.

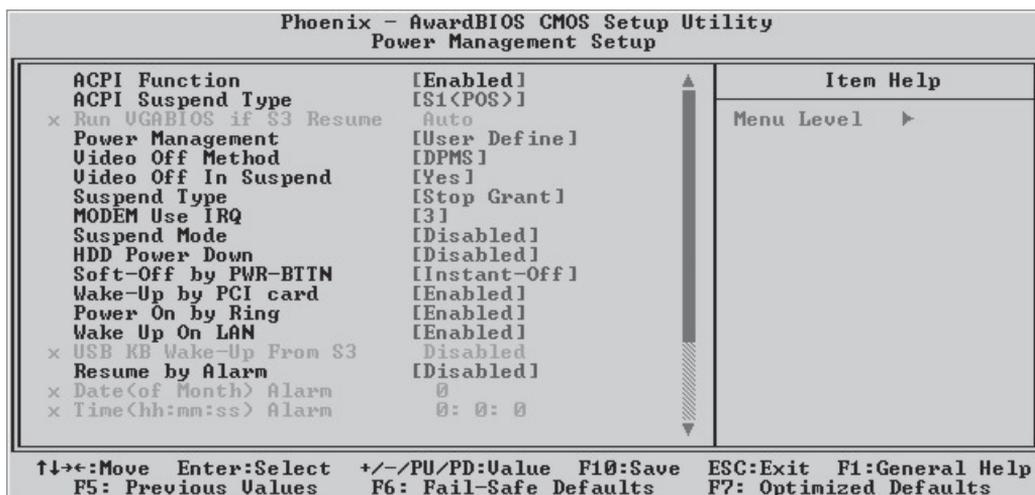
#### Default & Autodetected Settings

Everything on this screen is an optimized default.

#### Setting Options & Constraints

You can select the Minimum or Maximum configurations rather than the User Defined defaults. You can customize all settings in User Defined mode. If your OS supports power management, configure it there. You can also set a date and time for the system to turn on or wake up and other wake up features.

### CMOS Setup Utility – Power Management Setup



### *PnP/PCI Configurations*

Section Function

Configures Plug and Play and other PCI bus settings.

Default & Autodetected Settings

The default is for the BIOS to control these functions.

Setting Options & Constraints

Don't change the resource settings, they're set to be handled automatically by the BIOS. If you have a problem after you install an expansion card, set "Reset Configuration Data" to Enabled to rewrite the ESCD.

### CMOS Setup Utility – PnP/PCI Configurations

Phoenix – AwardBIOS CMOS Setup Utility		
PnP/PCI Configurations		
Item	Value	Item Help
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Auto<ESCD>]	Menu Level ▶
× IRQ Resources	Press Enter	
× Memory Resources	Press Enter	
PCI/UGA Palette Snoop	[Disabled]	
Assign IRQ For UGA	[Enabled]	
Assign IRQ For USB	[Enabled]	
INT Pin 1 Assignment	[Auto]	
INT Pin 2 Assignment	[Auto]	
INT Pin 3 Assignment	[Auto]	
INT Pin 4 Assignment	[Auto]	
INT Pin 5 Assignment	[Auto]	
INT Pin 6 Assignment	[Auto]	
INT Pin 7 Assignment	[Auto]	
INT Pin 8 Assignment	[Auto]	
Default is 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 OS cannot boot		
↑↓←→: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults		

*PC Health Status*

Section Function

Configures the Shutdown Temperature and displays detected system information.

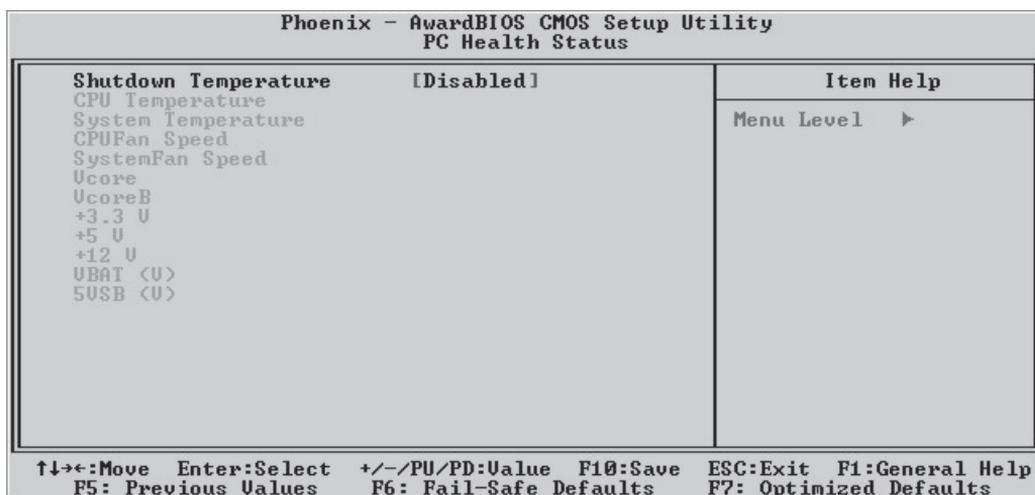
Default & Autodetected Settings

The Shutdown Temperature settings is an optimized default. The list of system information is autodetected and displayed.

Setting Options & Constraints

You can select a the Shutdown Temperature setting. If the detected CPU temperature reaches that point, the system will automatically shut down to protect the CPU.

CMOS Setup Utility – PC Health Status



### *IWILL Smart Setting*

Section Function

Configures CPU settings.

Default & Autodetected Settings

The default is to autodetect CPU and DRAM settings. Don't change the "Spread Spectrum" setting.

Setting Options & Constraints

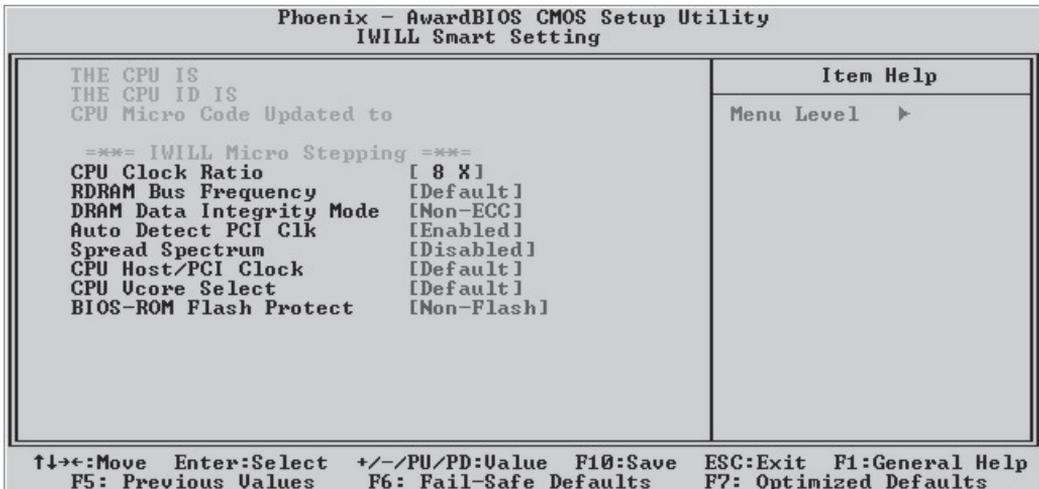
Don't change the auto-detected settings unless you really know what you are doing. You can use the IWILL Micro Stepping section to configure the CPU settings yourself, but we do not recommend this. Configuring CPU settings at variance with Intel's specifications may damage the CPU and void the warranty.

Set the RDRAM Bus Frequency to X4 if you have a 533MHz FSB Pentium 4 CPU installed and will use PC1066 memory.

Set the DRAM Data Integrity Mode to ECC if you will use ECC memory.

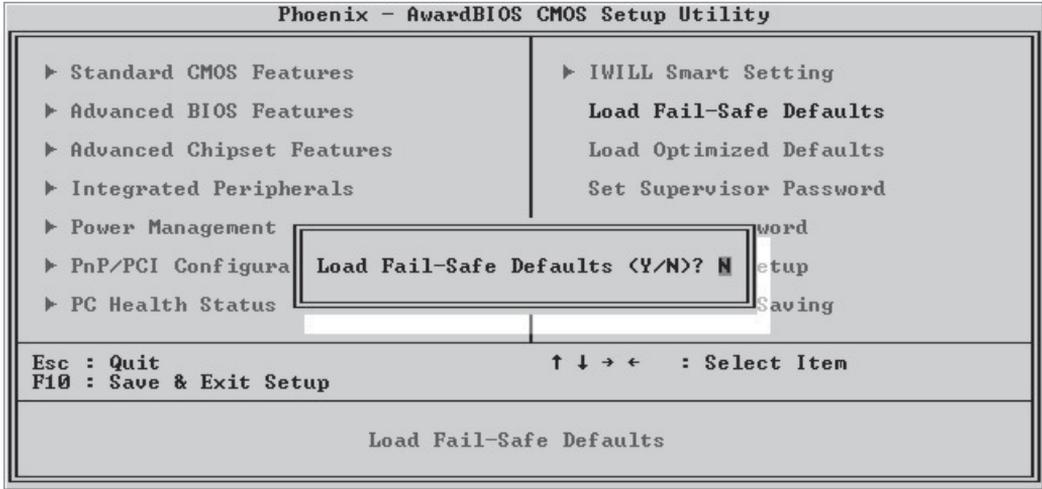
Change the "BIOS-ROM Flash Protect" line to Flashable setting if you need to update the BIOS.

### CMOS Setup Utility – CPU Smart Setting



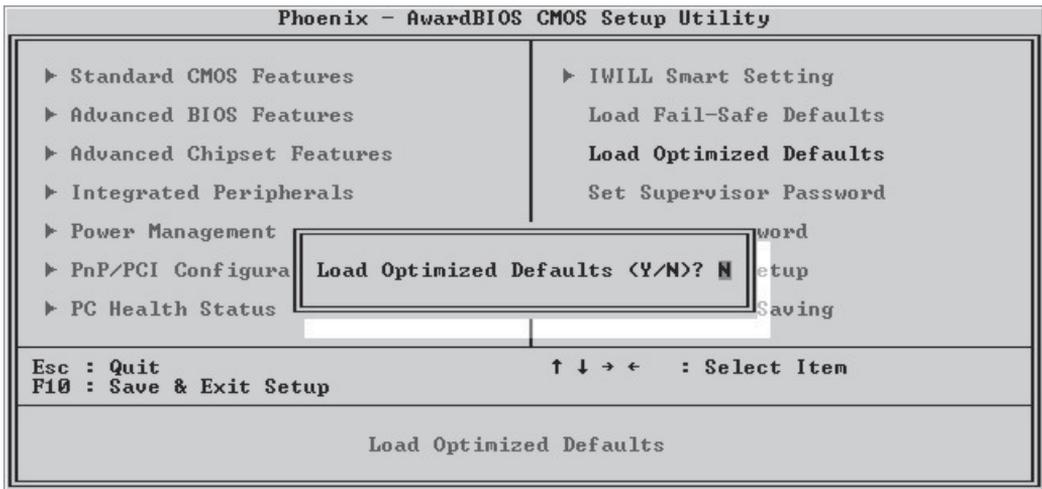
*Load Fail-Safe Defaults*

This loads a set of minimum configuration defaults. It is used to allow the system to start and then troubleshoot hardware problems. You shouldn't need to use this, it's mainly for technicians.



*Load Optimized Defaults*

This loads the Optimized Defaults. Do this if the configuration record has been corrupted or mistakenly configured or after the Clear CMOS procedure has been performed. See Chapter 3 for more information on this procedure. To load the defaults, select this item, press the Enter key, type a Y and press Enter again.



### *Set Supervisor/User Password*

These two items set passwords for system access.

#### *Setting a Password*

You can install a Supervisor or User Password. The password prevents access to the CMOS Setup Utility (Supervisor) or the entire system (User).

To install a password, follow these steps:

1. Highlight either Set Password item in the main menu and press Enter.
2. The password dialog box will appear.
3. If you are entering a new password, carefully type in the password. You cannot use more than eight characters or numbers. Passwords are case-sensitive. Press Enter after you have typed in the password. If you are deleting a password that is already installed just press Enter when the password dialog box appears.
4. The system will ask you to confirm the new password by asking you to type it in a second time. Carefully type the password again and press Enter, or just press Enter if you are deleting a password that is already installed.
5. If you have used the correct format, the password will be installed.

If you decide not to set a password after bringing up the password entry window, press the Enter key, not Esc to exit the password entry window.

### *Save & Exit Setup*

This saves the current utility configuration as a new configuration record, exits the utility and restarts the system using the saved configuration record.

### *Exit Without Saving*

Exits the utility and restarts the system without changing the saved configuration record.

In general, it should not be necessary to use the CMOS Setup Utility once you have fully configured it. In the event you do need to change or re-establish the settings, always make sure to save the settings when you exit the utility or the new settings will not be stored.



### Installing an OS & Support Software

This section covers installing Operating System software and the support software on the Power Installer support CD-ROM disc. Once you have configured the CMOS Setup Utility, you should install an OS. If you install a supported Microsoft OS, you should also install the driver software on the Power Installer disc.

#### Installing an Operating System

This motherboard is intended to use the following Operating Systems:

- Microsoft Windows 9X
- Microsoft Windows NT
- Microsoft Windows 2000
- Microsoft Windows XP
- Linux
- Novell Netware
- Unix

Prepare the hard disk drive and install an OS according to the instructions that come with the OS you will use.

#### Installing the Support Software

The Power Installer CD-ROM disc comes with required hardware drivers for Microsoft Windows and some additional utility software, as noted in Chapter 2. If you have installed a supported Microsoft OS, you must install the required drivers. If you have installed Linux, you can create Linux support disks.

*Installing Windows Drivers*

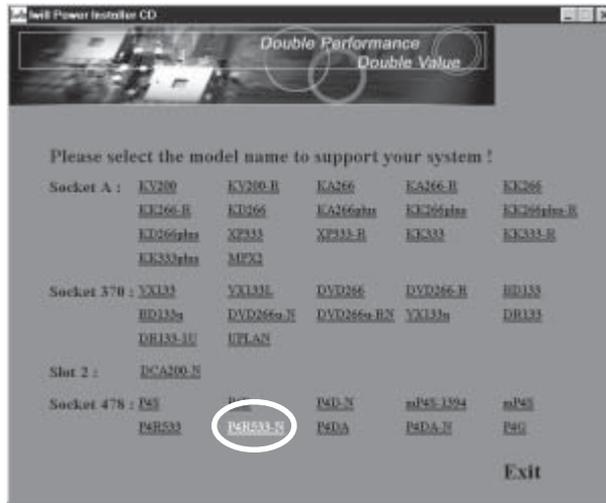
This section assumes you have installed one of the supported Microsoft Operating Systems on the system hard disk drive.

To install Windows drivers, insert the Power Installer support CD-ROM disc in the system's CD-ROM (or other optical drive) and wait for the Power Installer interface to automatically load. If it doesn't start, run the Power Installer interface directly from the disc by running Setup.

The Power Installer main screen will appear. Click on this motherboard's model number to open the section for this board.

**Power Installer:  
Main Screen**

Click on the model name for this board in the Socket 478 section.



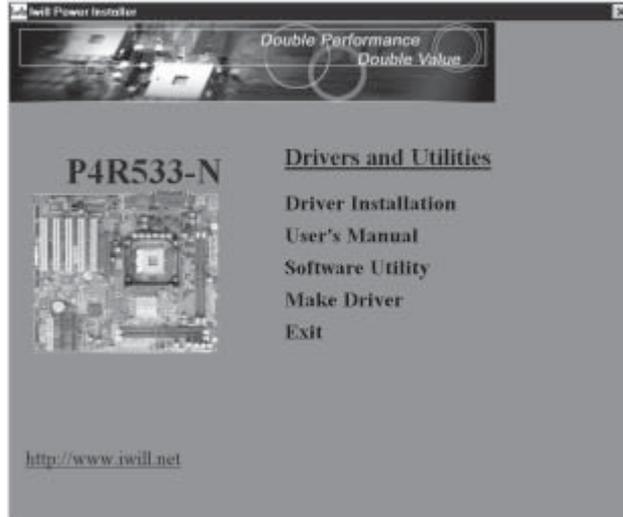
**Power Installer:  
P4R533-N Main Screen**

You can automatically install the required Intel chipset support by choosing "Auto Installation" or you can do all installations manually by choosing Manual Installation. Either way, you must install the Intel chipset support before you install anything else.



The “Driver and Utilities” screen will appear when you click on Manual Installation. Click on “Driver Installation” and the Driver Installation screen will appear.

**Power Installer:  
Drivers and Utilities**  
Click on Driver Installation  
to access the driver instal-  
lation list.



Install the first two items for the Intel Chipset in sequence by clicking on them and following the install program instructions.

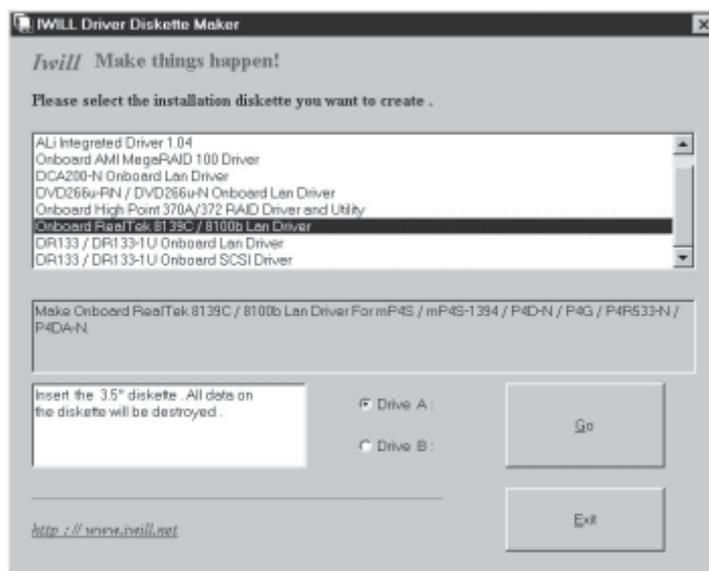
Next install the “Onboard Audio Driver” in the same way. If you have the P4R533-N, review the “Onboard Lan Driver Install Guide” by clicking on that item for information on how to install the appropriate LAN driver for the OS you are using.

The Adobe Acrobat reader install program will run when you try to view the Lan Driver Installation Guide if you have not already installed it. Install the program and then repeat the procedure to read the guide information.

If you have installed either a Smart Card Reader or a Memory Stick/Secure Digital card reader, install the Smart I/O Device Driver.

### *The Make Driver Utility*

The “Make Driver” utility makes driver floppy disks. There aren’t any disks you need for this board in the program list, so you don’t need to use this program.



### *Making & Installing Linux Drivers*

You can boot the system from the Power Installer disc. The system will boot from the Linux kernel on the disc and you can use the disk creator that loads to create Linux support disks. You can then use these to install any necessary modules according to your Linux distribution's instructions for module installation.

### Installing the Utility Software

To install the utility software bundled on the Power Installer disc, click on "Software Utility" in the Drivers and Utilities screen to open the Software Utility window.

To install the the supplied utility software packages, click on the item you want to install and follow the install program's instructions.

**Power Installer:  
Software Utility Section**  
and follow the install program instructions.





**In This Chapter:**

Using System Features

Front Panel Controls &amp; Indicators

Additional System Features

Installing &amp; Configuring An IR Port

Performance Optimization

Troubleshooting

**6: Using the Motherboard**

This chapter covers several topics related to using this motherboard once it is installed in a working system. These include external system features that connect to the motherboard, things you can do to optimize the performance of a system based on this board and some troubleshooting tips you can review in the event any problems arise.

**Using System Features**

This section explains the system controls and indicators that connect to the motherboard. It also explains how the other system level features on the board work.

**Front Panel System Controls & Indicators**

The front panel of the system housing will have some or all of the front panel features that connect to the motherboard. These enable the User to determine some information on the systems operational status and provide some system controls.

*System Controls*

The front panel connector on the motherboard supports several system controls that mount on the front panel of the system housing.

#### Power Button

Function: Turns the system On and Off.

Use: This button is configured by the CMOS Setup Utility by the “Soft-Off by PWR-BTTN” line in the Power Management section. Depending on the setting, the power button will function in one of two modes, instant on/off or instant on/4 second delay off. In the delay mode, when you push the power button for less than 4 seconds when the system is turned, the system goes into the Suspend power conservation mode. In this mode, you have to push the button for more than 4 seconds to turn the system power off.

#### Reset Switch

Function: Restarts the system to cold boot.

Use: Press the button to restart the system. This forces a restart under all conditions. Don't use the Reset button if you can shut the system down from within the Operating System.

#### Note On Reset & Rebooting:

You should always restart or shut down the system by using the OS command for this. This procedure allows the OS to shut down properly, minimizing the possibility of hard disk drive problems or data loss. If the system crashes or “hangs”, you may have to restart the system at the hardware level. There are two hardware reboot options, a keyboard command and the Reset button.

You can effect a “warm” reboot with a key command if the OS supports it. For example, all versions of Microsoft Windows support restarting the computer with the Ctrl-Alt-Del (Delete) command. You can try this command first if it is supported. Otherwise, you will need to use the Reset button.

#### Suspend Button

Function: Toggles system in and out of Suspend mode.

Use: Press the button to cause the system to enter or resume from Suspend mode.

Note: The front panel feature connector supports a system Suspend button (the ACPI connector) but not all system housings have this button. The same function can be performed at the Operating System level if the OS supports the feature.

### Indicator LEDs

The motherboard front panel features connector supports three system status indicator LEDs:

- Power Status LED Indicator  
Lights when the system is turned on.
- Hard Disk Drive Activity LED Indicator  
Flashes during hard disk drive access.
- Power Conservation Mode LED Indicator  
Lights to indicate the system is in a Suspend state power conservation mode.

Most system housings will have all of these LEDs mounted in the housing's front panel.

### LAN Features

There are two additional system features, LAN LED indicators on the P4R533-N and Wake On LAN.

#### *P4R533-N LAN Indicator LEDs*

The RJ-45 LAN jack on the rear I/O panel has two indicator LEDs mounted above it.

- Activity LED (on left)  
Flashes when the LAN connection is active.
- Link LED (on right)  
Lights to indicate the LAN is connected.

#### *Wake-on LAN (WOL)*

**Function:** The system wakes up in response to a signal arriving over a LAN that it is connected to.

**Use:** The P4R533-N's onboard LAN interface supports the WOL feature. In addition, the onboard WOL connector supports connection to an additional PCI Network Interface Card. The WOL cable from the card connects to the WOL connector on the board.

The feature is enabled by default in the Power Management section of the CMOS Setup Utility.

## Installing & Configuring An IR Port

There is a pin header connector for an Infrared communications port module on the motherboard. An IR port enable wireless communication between the system and another device with IR capability. Common examples of such devices are a PDA or notebook computer. Installing an IR port module requires disabling the COM2 serial port on the rear I/O panel and reconfiguring it for IR use in the CMOS Setup Utility.

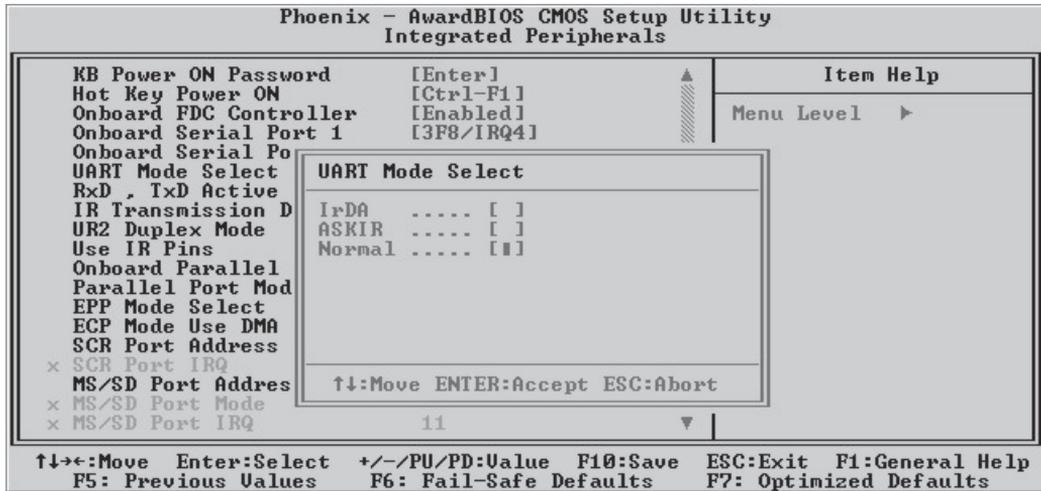
Installing an IR port module requires an expansion slot opening unless the system housing has a built-in IR port with a cable to connect to the motherboard.

Follow the instructions that come that come with the port module you want to install. The basic installation procedure is as follows if the module installs in an expansion slot opening:

1. Turn off and unplug the system if necessary.
2. Remove the system housing cover.
3. Locate the J45 IR pin header connector on the motherboard. It is below the FDD connector.
4. Remove the expansion slot cover in the system housing that corresponds to an open PCI slot. There may be a slot cover retaining screw to remove and put aside for later use.
5. Insert the port module in the open expansion slot cover and align the module's mounting bracket with the screw hole for the retaining screw (if there is one). Insert the screw and tighten it to secure the port module in place.
6. Plug the module's connector cable on to the IR connector on the motherboard.
7. Replace the system housing cover.
8. Plug in and turn on the computer.
9. Run the CMOS Setup Utility and pen the Integrated Peripherals section. Set the "UART Mode Select" to the required mode, IrDA or ASKIR, and configure the port settings below it if necessary. Save the settings and reboot.

## CMOS Setup Utility – Integrated Peripherals

## UART Mode Select – IR mode selection for COM2



The supported Microsoft Operating Systems should automatically detect and configure the port module after you restart the system. Consult the OS documentation or online Help for more information if necessary. You may also need to install support software that came with the IR port module in order to use it. Consult the installation instructions that came with the module for additional instructions.

**⚠ Note:**

The default memory configuration both 400MHz FSB and 533MHz FSB CPUs is for PC800 memory.

If you use PC1066 RIMMs with a Pentium 4 CPU that has a 400MHz FSB, the modules will not perform at their rated speed.

If you use PC1066 RIMMs with a Pentium 4 CPU that has a 533MHz FSB, you have to manually set the RDRAM Bus Frequency to X4 in the IWILL Smart Setting section of the Award BIOS CMOS Setup Utility.

**Warning:**

Do not install a mix of PC800 and PC1066 RIMMs.

## Performance Optimization

This section covers things you can do to increase the performance of a system based on this motherboard. The topics covered include system memory, disk subsystems and processor upgrades or adjustments.

### System Memory

Adding system memory will increase system performance and capability under any of the supported Operating System. This motherboard supports a total of 2GB of system memory. If you have not installed the maximum, you can consider increasing the amount of installed system memory. Additional system memory speeds up system operation and in some cases produces additional stability in the Operating System.

### Disk Subsystems

This motherboard supports IDE drives using data transfer modes up through ATA-100. If you use IDE drives as the primary disk subsystem, selecting drives that support ATA-100 and have a high rotation speed (at least 7,200rpm) will maximize performance.

If you need even better performance from a disk subsystem, you can consider adding a SCSI controller card and SCSI disk drive. A SCSI disk controller with high-speed SCSI hard disk drives will provide a substantial performance enhancement.

### Processor Upgrades & Adjustments

Processor speed has a significant effect on overall system performance. To increase system performance, you can consider using or upgrading to a faster processor.

The Intel Pentium 4 processor used by this motherboard comes in a variety of clock speeds. To maximize performance, select a processor with the fastest clock speed the system budget or specification allows.

The CMOS Setup Utility's IWILL Smart Setting feature will automatically detect and configure whatever processors are installed. Manual configuration using the "IWILL Micro Stepping" settings is also available, but setting the Intel Pentium 4 processor to operating parameters outside those specified can damage the CPU and void the warranty.

## Troubleshooting

This section details some things you can do to evaluate problems that could possibly occur in the course of using this motherboard. The topics covered include possible hardware problems and problems with the CMOS Setup Utility's system configuration record.

### Hardware Problems

A hardware problem may occur either after you install additional hardware or because some existing hardware has failed or has a disconnected or loose connection. This section has some pointers on things you can check before seeking assistance.

#### General Hardware Troubleshooting

If the motherboard does not operate properly when you first try to use it in the system, it is likely that it is either configured incorrectly, there are problems with external connections. It is also possible the board or some other system component is defective. Always check the most obvious possibilities first.

First check the external components:

- Make sure the system, the monitor and any other external peripherals are plugged in and turned on. Confirm that the system and the power LEDs on any external peripherals are on.
- Check that the monitor, keyboard and mouse are properly connected.

Next check the CMOS Setup Utility:

- Run the CMOS Setup Utility and load the Optimized Defaults. Reset any other custom settings. Remember to "Save & Exit Setup" to restart the computer.

If there is still a problem, check the internal components. Turn off and unplug the system before you remove the system housing cover.

- Press all installed RIMMs into the module sockets to make sure they're fully inserted.
- Make sure you used the correct cables to connect the internal peripherals and that the peripherals are properly connected to the motherboard. Check the Master/Slave positions on all IDE cables. If you installed a device that uses ATA-100 mode, make sure it is connected to the motherboard with an ATA-100 cable to ensure maximum performance.
- Check that all expansion cards are correctly installed and fully inserted in the expansion slots. Pay particular attention to the AGP display card.
- Make sure the processor and its cooling assembly are properly installed.
- Check all the hardware settings on the motherboard and make sure they are correct.

When you're done, reassemble the system and try again. If the problem persists after you have checked all of the above, there may be a hardware conflict or bug. See the next section for additional information.

### Hardware Configuration Problems

It is possible for system hardware components to conflict with each other. While all the components and subsystems on the motherboard are designed and tested to work together, expansion cards and peripheral devices can be a problem.

Assuming you have gone through the general troubleshooting procedures and the system still will not start, if you have just added new hardware to your system, there may be a hardware conflict or bug or a problem with a device driver. Try removing the new hardware and see if the system will start. If it does, consult with the device manufacturer for information on solving the problem. In some cases, a firmware or driver upgrade may resolve the problem.

### *Plug and Play Problems*

This motherboard supports the automatic recognition and configuration of expansion cards that support the Plug and Play (PnP) specification. Most currently available expansion cards support PnP. PnP simplifies card installation by allowing the system to handle system resource allocation. If you install an expansion card that is not PnP compliant, you may still need to configure the card manually. Consult the card's documentation for instructions or other information.

### Replacing the System Configuration Record

As noted previously, the CMOS Setup Utility creates a system configuration record and stores it in CMOS memory on the motherboard. This record must be correct and uncorrupted for the system to operate properly. It is possible for the system configuration record can become corrupted or lost. If this occurs, the system will not operate properly or at all. This is not a serious problem. You can restore a working configuration using the CMOS Setup Utility to create a new configuration record by loading the Optimized Defaults and reentering any other settings you had made.

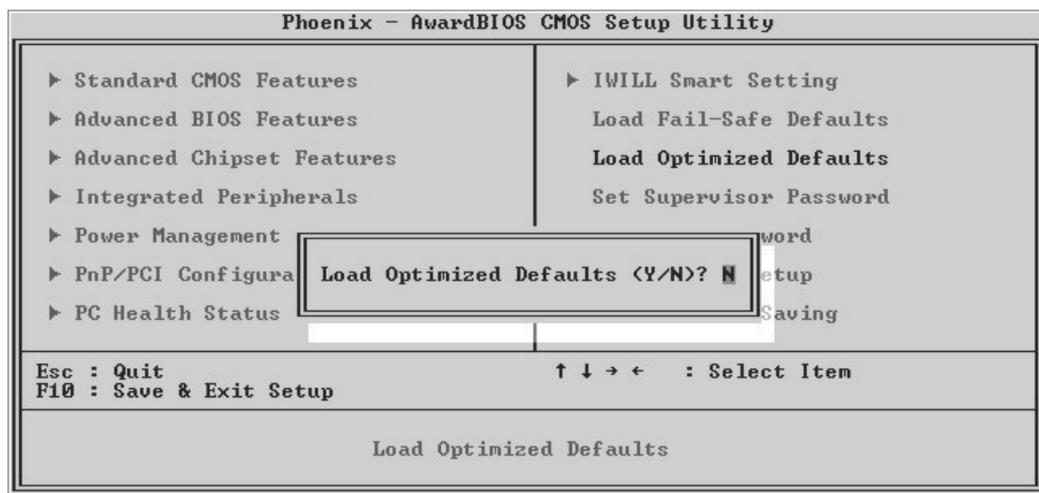
### Loading Optimized Defaults

The CMOS Setup Utility does not require an operating system to run. You run the utility by typing the Del or Delete key while the system is starting up to brings up the utility's main screen.

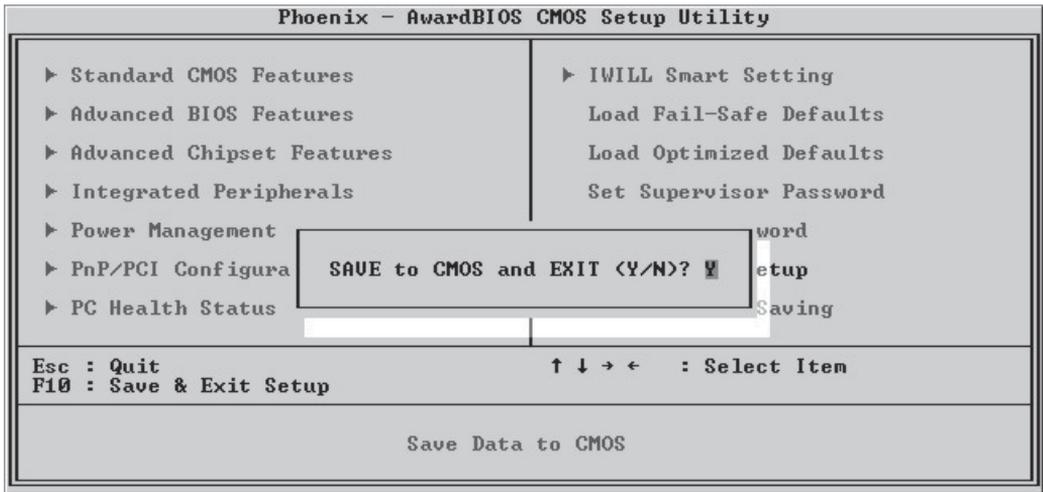
There are two sets of defaults listed, Optimized and Fail-Safe. The Fail-Safe Defaults are a minimum configuration set for use by technicians when troubleshooting system problems. The Optimized Defaults are what the system normally operates on. If a corrupted system configuration record caused the problem you experienced, once you load the Optimized Defaults and reboot, the system should function normally. The instructions on the next page illustrate this procedure.

You can easily restore a working system configuration record from the main screen of the CMOS Setup Utility. To do so, do as follows:

1. Select the “Load Optimized Defaults” item.
2. Press the Enter Key. A confirmation message will appear on the screen. Type a “Y” to accept loading the Optimized Default settings. Now make any other settings you need to.



3. Select “Save & Exit Setup” and press the Enter key. A confirmation message will appear. Press the Enter key again to confirm.



The CMOS Setup Utility will close and the system will reboot. The system should then start properly and run normally.



**In This Chapter:**  
Technical Specifications

### **7: Technical Specifications**

This chapter lists some technical information about this motherboard.

## Processor I/F (Socket 478)

Supports 1 478-pin Pentium 4 processor

Supports 400MHz and 533MHzFSB (Frontside Bus)

Supports Intel Pentium 4 CPU from 1.5 to 2.2 GHz and up

## CPU Frequency/Voltage Select

Supports Vcore selection by BIOS

Supports CPU Multiplier selection by BIOS (from 8X to 50X in 0.5 increments)

Supports CPU External Frequency selection by BIOS (up to 156MHz)

## ChipSet (Marking, Packing)

Intel 850E

ICH2

## Memory

Supports PC800 & PC1066 devices

Supports ECC memory (Single bit error Correction, Multiple bit error Detection)

Supports 128MB/256MB/512MB RIMMs

Supports up to 2GB using four 512MB modules

## Graphics

Supports AGP 4X 1.5V Only

## General I/O

PCI 2.1/2.2 compliance

Supports 32-bit/33MHz PCI interface

Supports LPC interface

Supports ATA33/ATA66/ATA100 IDE interface

Supports Floppy interface

Supports 16550A UART interface

Supports ECP/EPP interface

Supports PS/2 interface

Supports SIR/FIR/CIR interface

Supports USB interface

## Discrete IDE

Supports two independent ATA channels

Supports ATA66/ATA100 and PIO mode

Supports Win9X/WinNT/Win2K/WinXP/Linux/NetWare/Solaris/UnixWare/OpenServer/SCO ODT

**LAN Support (P4R533-N only)**

Supports HomePNA interface

Supports 10/100M BaseT (IEEE 802.3u Auto-Negotiation) Ethernet interface

Supports Full-Duplex Flow Control (IEEE 802.3x)

Supports Remote Power-up using Wake-on-LAN technology (card only)

Supports Wake-Up on Magic packet through PME#

Supports Wake-Up on LinkChg through PME#

Supports Wake-Up on Microsoft wake-up frame through PME#

Supports Wake-Up on "Interesting" packet through PME#

Supports WFM

Supports Alert-on-LAN

Supports Win9X/WinNT/Win2K/WinXP//Linux/NetWare/Solaris/UnixWare/OpenServer/SCO ODT

**Audio Support**

CMedia audio controller on board

Supports Creative SB-Link protocol

Supports Game/MIDI interface

Supports Audio interface

Supports Win9X/WinNT/Win2K/WinXP/Linux/NetWare/Solaris/UnixWare/OpenServer/SCO ODT

**Management**

Supports voltage monitoring (+12V/+5V/Vcore/Vcore2/VIO/Vbat/Vsb)

Supports fan control signal (CPU/SYS)

Supports temperature sensor (CPU/AUX/SYS)

Supports Chassis Intrusion

Supports Power on by LAN/Ext. Modem/Int. Modem/PS2 Keyboard/PS2 Mouse/RTC/PME

Supports Resume by LAN/Ext. Modem/Int. Modem/PS2 Keyboard/PS2 Mouse/RTC/PME

Supports AOL

Supports Intel LDCM/LDSM

Supports AMI ADCM

Supports ACPI

Supports APM

Supports DMI

Supports SMBUS

Supports PnP

Supports BIOS ROM Flash Control

Supports "AC-Loss Recovery"

Supports Suspend to RAM (DRAM should not have power during S1/S5 state)

Supports Manually Assigned PCI IRQ

Supports Auto-reboot function through TCO Timer when system hangs

Supports ICH Safe-Mode function through jumper

Supports PS/2 mouse and PS/2 keyboard auto swapping

## Power Requirements

Onboard DC/DC switching voltage regulator supports Vcore up to 60A current  
Supports adjustable Vcore (By BIOS CMOS Setup Utility)  
Supports 150A/us Icc slew rate  
Expansion Slot, Sockets and Connectors  
One mPGA478 CPU socket  
Four RIMM sockets  
One AGP 1.5V AGP slot  
Five 32bit/33MHz Bus Master PCI slots  
Two IDE ATA-33/66/100 connectors  
One FDC connector  
Two External Serial Port connectors  
One External Parallel Port connector  
One External PS/2 Mouse connector  
One External PS/2 Keyboard connector  
One Internal Game/MIDI connector  
One Internal CD-In audio-in connector  
One Internal AUX audio-in connector  
Two External USBx2 ports, one with stacked RJ45 connector (RJ-45 on P4R533-N only)  
One Internal IR connector  
One Internal WOL connector  
One CPU temperature sensor  
One System temperature sensor  
One CPU fan connector with PWM control  
Three System fan connectors with fan control  
One Smart Card reader connector  
One Memory Stick® reader connector  
One Internal SMBus connector  
One ATX 20-pin power connector  
One ATX 12V 4-pin power connector (ATX 12V for Vcore)

## Driver & Utility Support

Power Installer CD-ROM Disc  
850E Chipset Support  
Audio Driver Supporting Win98/ME/NT/2K/XP  
LAN Driver Supporting Win98/ME/NT/2K/XP  
Software Utilities

## Form Factor

ATX, 305mm x 260mm  
4 Layer design