

**Vig535b  
Motherboard  
Manual**

**viglen**

**Great  
Minds  
Think**

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# Viglen, EMC and the 'CE' mark

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## CE Marking

European standards are being harmonised across borders. If products comply with the same standards in all European countries, product exporting and importing is made simple - paving our way to a common market. If you buy a product with a 'CE' mark on it (shown below), on the box, in the manual, or on the guarantee - it complies with the currently enforced directive(s).



## Introduction to EMC

EMC (Electromagnetic Compatibility) is the term used to describe certain issues with RF (Radio Frequency) energy. Electrical items should be designed so they do not interfere with each other through RF emissions. E.g. If you turn on your microwave, your television shouldn't display interference if both items are CE marked to the EMC directive.

If emitted RF energy is not kept low, it can interfere with other electrical circuitry - E.g. Cars Automatic Braking Systems have been known to activate by themselves while in a strong RF field. As this has obvious repercussions ALL electrical products likely to cause RF related problems have to be 'CE' marked from 1st January 1996 onwards.

If a product conforms to the EMC directive, not only should its RF emissions be very low, but its immunity to RF energy (and other types) should be high. The apparatus has to resist many 'real world' phenomena such as static shocks and mains voltage transients.

## Viglen's Environment laboratory

To gain a 'CE' mark, the Viglen computer range has had to undergo many difficult tests to ensure it is Electromagnetically Compatible. These are carried out in the in-house 'Environment lab' at Viglen Headquarters. We have made every effort to guarantee that each computer leaving our factory complies fully with the correct standards. To ensure the computer system maintains compliance throughout its functional life, it is essential you follow these guidelines.

- Install the system according to Viglen's instructions
- If you open up your Viglen:
  - Keep internal cabling in place as supplied.
  - Ensure the lid is tightly secured afterwards
  - Do not remove drive bay shields unless installing a 'CE' marked peripheral in its place
  - The clips or 'bumps' around the lips of the case increase conductivity - do not remove or damage.
  - Do not remove the ferrite ring from the L.E.D cables.
  - Only use your Viglen computer with 'CE' marked peripherals

This system has been tested in accordance with European standards for use in residential and light industrial areas-this specifies a 10 meter testing radius for emissions and immunity. If you do experience any adverse affects which you think might be related to your computer, try moving it at least 10 meters away from the affected item. If you still experience problems, contact Viglen's Technical Support department who will put you straight through to an EMC engineer - s/he will do everything possible to help. If modifications are made to your Viglen computer system, it might breach EMC regulations. Viglen take no responsibility (with regards to EMC characteristics) of equipment which has been tampered with or modified.

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# Chapter 1: Motherboard Overview

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## Introduction

This manual describes the Viglen VIG535B motherboard inside your computer. The motherboard is the most important part of your computer. It contains all of the CPU, memory and graphics circuitry that make the computer work.

The motherboard contains the very latest CPU design that supports the Intel® Pentium® 4 family including Hyper-Threading enabled CPU's and the very latest Extreme Edition CPU's. All of the supported CPU's include Intel's® **MMX Technology**. MMX technology adds a total of 57 new instructions to the CPU, all of which are designed to vastly improve both multimedia and communications on your PC. The combination of the Intel® processor, MMX technology and Viglen expertise make this a formidable computer.

This manual contains technical information about the Viglen VIG535B motherboard and other hardware components inside your computer. If you are new to computers we recommend that you read the user guide first. If you are an experienced computer user this manual should provide all the information you will need to perform simple upgrades and maintenance.

We hope that this manual is both readable and informative. If you have any comments for suggestions about how we could improve the format then please fill out the form at the back of the manual and send it to us.

Above all we hope that you enjoy using your Viglen computer.

## Feature Summary

The Vig535b motherboard supports Intel® Pentium® 4 and Celeron® processors with up to 1MB of second-level cache integrated in a micro PGA 478 Socket package operating at speeds up to 3.4GHz.

The motherboard features:

### **Form factor:**

- Micro ATX Form Factor: 243mm by 230mm

### **Processor:**

- Single Pentium 4 CPU
- 400/533/800MHz Quad-pumped bus
- Integrated 128, 256, 512 and 1000KB second-level cache
- Socket 478 connector.

### **Main memory:**

- Four 184-pin DDR DIMM sockets.
- Support for up to 2GB of DDR DIMM memory.

### **Chipset**

- SiS 661FX
  - 800Hz Front Side Bus (FSB)
  - AGP 8x
  - Support for 266/333/400MHz DDR RAM
  - Advanced System Power Management features
  - Integrated Super I/O Controller
  - DirectSound AC97 Audio
  - Dual bus master IDE Ultra DMA33/66/100/133

### **Audio**

Audio Codec '97 (AC '97) compatible audio subsystem

### **LAN**

Realtek 10/100 Mbit/sec Platform LAN Connect (PLC) device

### **Peripheral Interfaces**

- Support for two Universal Serial Bus (USB) ports
- One serial port
- One parallel port
- Two IDE interfaces with Ultra DMA 33, ATA66/100/133 support.
- One diskette drive interface
- PS/2 keyboard and mouse ports

### **Expansion Capabilities**

- Three PCI bus add-in card connectors
- One AGP Pro connector

### **Instantly Available PC**

- Support for PCI Local Bus Specification Revision 2.2
- Suspend to RAM support
- Wake on PS/2 keyboard and USB ports

### **Wake on LAN Technology Connector**

- Support for system wake up using an add-in network interface card with remote wake up capability

## **Microprocessor**

The motherboard supports a single Pentium 4 processor with HT technology. The processor's VID pins automatically program the voltage regulator on the motherboard to the required processor voltage. In addition, the front side bus speed is automatically selected. The motherboard currently supports processors that run internally up to 3.4GHz and have a 128KB, 512KB or 1MB second-level cache running at full CPU Speed.

The processor implements MMX™ technology and maintains full backward compatibility with the 8086, 80286, Intel386™, Intel486™, Pentium, Pentium Pro, Pentium II & Pentium III processors. The processor's numeric coprocessor significantly increases the speed of floating-point operations and complies with ANSI/IEEE standard 754-1985.

### **Microprocessor Packaging**

The Pentium 4 processor comes in a FC-PGA package that connects to the motherboard through a socket 478 connector. The package consists of:

- Processor card including the processor core and the second-level cache, burst pipelined synchronous static RAM (BSRAM) and tag RAM.
- Thermal plate.



- Back cover.

## **Second Level Cache**

The second-level cache is located on the die of the CPU itself. The cache includes burst pipelined synchronous static RAM (BSRAM) and tag RAM. All supported onboard memory can be cached.

## **Processor Upgrades**

The motherboard can be upgraded with a Pentium 4 processor that runs at higher speeds.

## **Memory**

### **Main Memory**

The motherboard has two DDR DIMM sockets. Minimum memory size is 128MB; maximum memory size is 2GB. The BIOS automatically detects memory type, size, and speed.

The motherboard supports the following memory features:

- 184-pin DIMMs.
- 266/333/400Mhz
- Un-Buffered Non-ECC DIMM.

## **RDRAM**

Synchronous DRAM (SDRAM) improves memory performance through memory access that is synchronous with the memory clock. This simplifies the timing design and increases memory speed because all timing is dependent on the number of memory clock cycles.

## **Chipset**

The SiS 661FX chipset is the latest generation of desktop PCI set, it includes new features such as –

- 8x AGP Support
- ATA-133 IDE Hard drive support
- 800MHz Front Side Bus support
- ACPI & On-Now

## **Accelerated Graphics Port (AGP)**

The Vig535b features both integrated graphics and an AGP port. When using the integrated graphics then a dynamic portion of the main system memory is used as video memory. There is an optional GPA (Graphics Performance Accelerator) modules which has a dedicated 4MB of video memory. You can also use any AGP video card, with 4x/8x AGP performance.

The Accelerated Graphics Port (AGP) is a high-performance interconnect for graphic-intensive applications, such as 3D applications. AGP is independent of the PCI bus and is intended for exclusive use with graphical-display devices. AGP overcomes certain limitations of the PCI bus related to handling a large amount of graphics data with the following performance features:

- Pipelined-memory read and write operations that hide memory access latency.
- Demultiplexing of address and data on the bus for near 100 percent bus efficiency.
- AC timing for 133 MHz data transfer rates, allowing data throughput of 500 MB/sec.

## **Realtek 8100C Platform LAN Connect Device**

The Realtek 8100C component provides an interface to the back panel RJ-45 connector with integrated LEDs. This physical interface may alternately be provided via the CNR connector.

The Realtek 8100C provides the following functions:

- Basic 10/100 Ethernet LAN Connectivity
- Supports RJ-45 connector with status indicator LEDs
- Full driver compatibility
- Advanced Power Management support
- Programmable transit threshold
- Configuration EEPROM that contains the MAC address

### RJ-45 LAN Connector LEDs

Two LEDs are built into the RJ-45 LAN connector. The following table describes the LED states when the board is powered up and the LAN subsystem is operating.

**Table 1: LAN LED Status**

LED Colour	LED State	Condition
Green	Off	10 Mbit/sec data rate is selected.
Green	On	100 Mbit/sec data rate is selected.
Yellow	Off	LAN link is not established.
Yellow	On (steady state)	LAN link is established.
Yellow	On (brighter and pulsing)	The computer is communicating with another computer on the LAN.

### Universal Serial Bus (USB)

The motherboard has four USB ports; one USB peripheral can be connected to each port. For more than four USB devices, an external hub can be connected to either port. The motherboard fully supports the universal host controller interface (UHCI) and uses UHCI-compatible software drivers.

USB features include:

- Self-identifying peripherals that can be plugged in while the computer is running.
- Automatic mapping of function to driver and configuration.
- Supports isochronous and asynchronous transfer types over the same set of wires.
- Supports up to **127** physical devices.
- Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other applications.
- Error-handling and fault-recovery mechanisms built into the protocol.

#### Note:

*Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device or a low-speed (sub-channel) USB device is attached to the cable. Use shielded cable that meets the requirements for high-speed (fully rated) devices.*

### IDE Support

The motherboard has two independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), Ultra DMA/33, Ultra DMA/66, Ultra DMA/100 & Ultra DMA/133 synchronous-DMA mode

transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

### **LS-120 Support**

LS-120 MB Diskette technology enables you to store 120MB of data on a single, 3.5" removable diskette. LS-120 technology is backward (both read and write) compatible with 1.44MB and 720KB DOS-formatted diskette and is supported by Windows 95 and Windows NT operating system.

The Vig535b board allows connection of an LS-120 compatible drive and a standard 3½" floppy drive. The LS-120 drive can be configured as a boot device before a floppy drive, if selected in the BIOS setup utility.

#### **Note:**

*If you connect an LS-120 drive to an IDE connector and configure it as the "A" drive and configure a standard 3.5" floppy as "B" drive, the standard floppy must be connected to the floppy drive cable's "A" connector (the connector at the end of the cable).*

The BIOS setup utility can be configured to boot firstly from either the LS120 or standard 3½ " floppy drive.

### **Real-Time Clock, CMOS SRAM, and Battery**

The real-time clock is compatible with DS1287 and MC146818 components. The clock provides a time-of-day clock and a multicentury calendar with alarm features and century rollover. The real-time clock supports 256 bytes of battery-backed CMOS SRAM in two banks that are reserved for BIOS use.

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program. An external coin-cell (CR 2032) 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 3.3-V standby current from the power supply extends the life of the battery. The clock is accurate to ± 13 minutes/year at 25 °C with 3.3 V applied.

## I/O Interface Controller

The motherboard uses the SMC FDC37C777 I/O controller which features:

- Serial ports:
  - Internal send/receive 16-byte FIFO buffer.
  - Four internal 8-bit DMA options for the UART with SIR support (USI).
- Multimode bidirectional parallel port:
  - Standard mode, IBM and Centronics compatible.
  - Enhanced parallel port (EPP) mode with BIOS and driver support.
  - High-speed extended capabilities port (ECP) mode.
- Floppy disk controller:
  - N82077 compatible.
  - Single diskette drive interface.
  - 16-byte FIFO.
  - High-performance digital data separator (DDS).
  - PC-AT and PS/2 drive-mode support.
- Keyboard and mouse controller:
  - Industry standard 8042A compatible.
  - General-purpose microcontroller.
  - 8-bit internal data bus.
- ISA Plug-and-Play compatible register set.
- PCI PME interface.
- Intelligent auto power management:
  - Shadowed write-only registers for ACPI compliance.
  - Programmable wake up event interface.

By default, the I/O controller interfaces are automatically configured during boot up. The I/O controller can also be manually configured in the Setup program.

### Serial Ports

Two 9-pin D-Sub serial port connector are located on the back panel and is compatible with NS16C550 UARTs.

### Parallel Port

The connector for the multimode bidirectional parallel port is a 25-pin D-Sub connector located on the back panel. In the Setup program, the parallel port can be configured for the following:

- Compatible (standard mode).
- Bidirectional (PS/2 compatible).
- Extended Parallel Port (EPP).
- Enhanced Capabilities Port (ECP).

## Floppy Controller

The I/O controller is software compatible with the N82077 floppy drive controllers and supports both PC-AT and PS/2 modes. In the Setup program, the floppy interface can be configured for the following floppy drive capacities and sizes:

- 1.25/1.44 MB, 3.5-inch

## PS/2 Keyboard and Mouse Interface

PS/2 keyboard and mouse connectors are located on the back panel. The +5 V lines to these connectors are protected with a PolySwitch circuit that, like a self-healing fuse, re-establishes the connection after an over-current condition is removed.

The keyboard controller supports the hot-key sequence <Ctrl><Alt><Del> for a software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power-On Self Test (POST).

## Audio Subsystem

The Vig535b board has multiple AC '97 V 1.03 compliant audio features including an Analog Devices ALC 655 codec.

The audio subsystem includes these features:

- Split digital/analog architecture for improved S/N (signal-to-noise) ratio:  $\geq 85\text{dB}$  – measured at line out, from any analog input, including line in, CD-ROM, and auxiliary line in.
- 3-D stereo enhancement
- Power management support for APM 1.2 and ACPI 1.0 (driver dependant)
- Audio inputs:
  - Four analog line-level stereo inputs for connection from line in, CD, video source line in and aux
  - Two analog line-level inputs for speakerphone input and PC beep
  - One mono microphone input
- Audio outputs:
  - Stereo line-level output
  - Mono output for speakerphone

## **Management Extension Component**

### **System BIOS**

The system BIOS, from Phoenix Technology, provides ISA and PCI compatibility. The BIOS is contained in a flash memory device on the system board. The BIOS provides the power-on self test (POST), the system Set-up program, a PCI and IDE auto-configuration utility, and BIOS recovery code.

### **PCI Auto Configuration**

The PCI auto-configuration utility works in conjunction with the Set-up program to support using PCI add-in boards in the system. When you turn on the system power after installing a PCI board, the BIOS automatically configures interrupts, DMA channels, I/O space, and so on. Since PCI add-in boards use the same interrupt resources as ISA add-in boards, you must specify the interrupts used by ISA boards in the set-up program. The PCI auto-configuration program complies with version 2.1 of the PCI BIOS specification.

### **IDE Auto Configuration**

If you install an IDE drive in the system, the IDE auto-configuration utility automatically detects and configures the drive for operation in the system. This utility eliminates the need to enter the Set-up program after you install an IDE drive.

### **Expansion Slots**

The system has five PCI bus add-in card connectors and One AGP universal connector.

# System Board Components

Figure 1: Motherboard Layout & Components

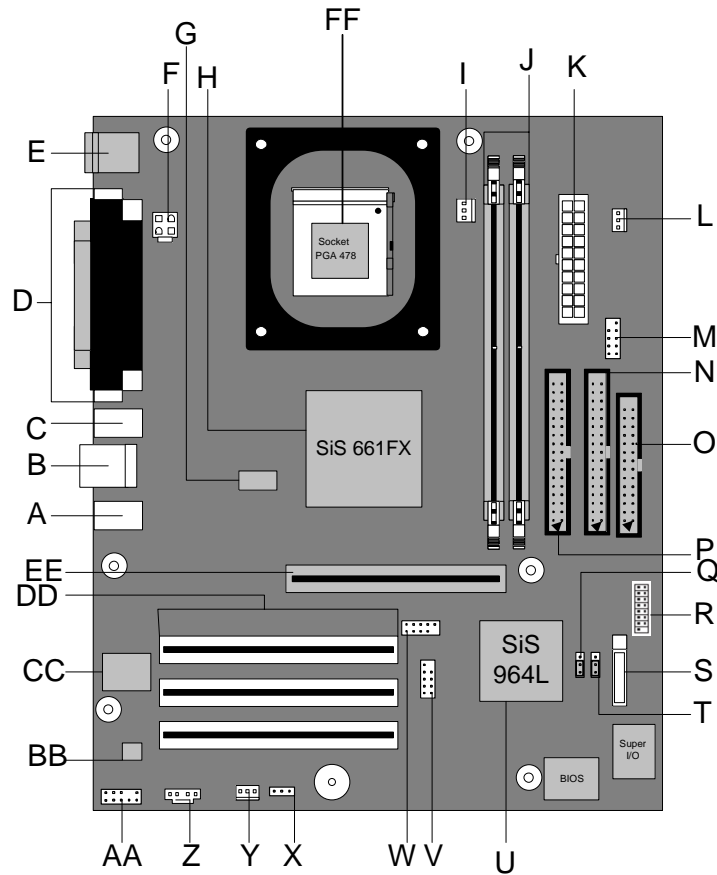


Table 2: Motherboard Connection

A: Audio	Q: Jumper 1
B: USB and LAN	R: Panel 1
C: USB	S: Battery
D: VGA, LPT and COM1	T: Jumper 3
E: PS/2	U: South bridge SiS 964L
F: ATX 4 pin	V: Front Panel USB connector
G: Clock Generator	W: Front Panel USB connector
H: North Bridge SiS 661FX	X: Speaker
I: CPU Fan	Y: Case Fan 1
J: DIMM socket 1 and 2	Z: Auxiliary line audio input connector
K: ATX 20 pin	AA: Front Panel Audio
L: Case Fan 2	BB: Audio Codec ALC 655
M: COM2	CC: LAN controller
N: IDE1	DD: PCI slot's
O: Floppy Drive 1	EE: AGP slot
P: IDE2	FF: 478 pin CPU socket



## **Overview of System Board Components**

### **A - External Audio Socket**

Situated at the rear of the motherboard, this has three 3.5mm jack sockets. The blue socket is the line in, the green socket is line out and the pink is the mic.

### **B – USB and LAN**

This provides 2 USB ports as well as a 10/100 Ethernet port.

### **C – USB**

This provides 2 addition USB ports.

### **D – LPT, Serial and a VGA ports**

This allows a printer to be connected. The serial port allows a serial device to be attached such as external modem. The VGA port allows a monitor to be attached using the on board graphics hardware.

### **E – PS/2 keyboard and mouse**

Allows a PS/2 mouse and keyboard to be attached.

### **F – 4-pin ATX power connector**

Provides additional power to the AGP Slot

### **G – Clock generator**

Keeps the system in sync

### **H – North Bridge**

The SIS ® 611FX provides the processor interface with 800/533/400 MHz frequency, support for Intel ® Hyper-Threading Technology, system memory interface at 266MHz operation, and 1.5V AGP interface that supports AGP 2.0 specification including 8x Fast Write protocol.

### **I – CPU fan connector**

Allows a CPU fan to be connected.

## **J – 2x DDR DIMM slots**

This allows up to 2GB of DDR RAM to be installed. Up to 1GB of RAM in each slot.

## **K – 20-pin ATX power connector**

This is the main power connector.

## **L – Power Fan Connector**

This allows the power unit fan to be connected to the motherboard. (Case dependent)

## **M – Comm 2**

Allows an additional serial port to be added. (Additional hardware required)

## **N – Primary IDE port**

This allows up to 2 devices, such as CD/DVD drives and hard drives to be added to the IDE channel. The port is slotted to ensure correct installation.

## **O – Floppy drive connector**

This allows a floppy drive to be added to the motherboard. The port is slotted to ensure correct installation.

## **P – Secondary IDE port**

This allows and additional 2 IDE device to be added to the motherboard. The port is slotted to ensure correct installation.

## **Q – Jumper 1 (Red)**

This allows the CMOS to be cleared. Read the section regarding the BIOS and CMOS. The default position of the jumper is covering pin 1 and 2. (see figure 3)

## **R – Panel 1**

This is the panel to which the case cables are connected, such as the power switch, Power LED etc..

## **S – Battery**

The battery keeps the CMOS memory when the system isn't turned on.

## **T – Jumper 3**

This allows the BIOS to be rewritable. Read the section regarding the BIOS the default position of the jumper is covering pin 1 and 2. (see figure 3)

## **U – South bridge**

The SIS ® 964L integrated peripheral controller supports various I/O functions including 2-channel ATA/133 bus master IDE controller, up to six USB 2.0 ports, LPC Super I/O interface, AC'97 interface and PCI 2.2 interface.

## **V – Internal USB3 header**

This allows an additional 2 USB ports to be added with the use of a cable.

## **W – Internal USB4 header**

This allows an additional 2 USB ports to be added with the use of a cable.

## **X – Internal Speaker header**

Allows a case speaker to be added to the motherboard.

## **Z – Internal Audio header**

Allows the audio from the CD ROM to be run through the internal audio via an analogue cable.

## **AA – Front Panel Audio**

Allows a front facing audio panel to be fitted.

## **BB – Audio Codec**

Decodes different audio formats.

## **CC – LAN controller**

On board NIC

## **DD – PCI slot**

Allows a PCI device to be fitted such as a fire wire card or wireless card.

**EE – AGP slot**

Allows an AGP device to be fitted such as a graphics card.

**FF - 478 Intel CPU socket**

This the socket in which the CPU is installed into.

## Back Panel Connectors

The motherboard external IO connectors are attached to a metallic I/O shield. This shield serves several purposes:

- It protects the sensitive motherboard from any external EMC interference.
- It stops the computer from interfering with other electrical devices.
- It allows the motherboard to be easily upgraded in the future without having to resort to buying a whole new case. Simply change the I/O shield to match the motherboard.

The I/O shield provides external access to PS/2 keyboard and mouse connectors as well as one serial port, one parallel port, four USB ports, one LAN Port and the audio connectors.

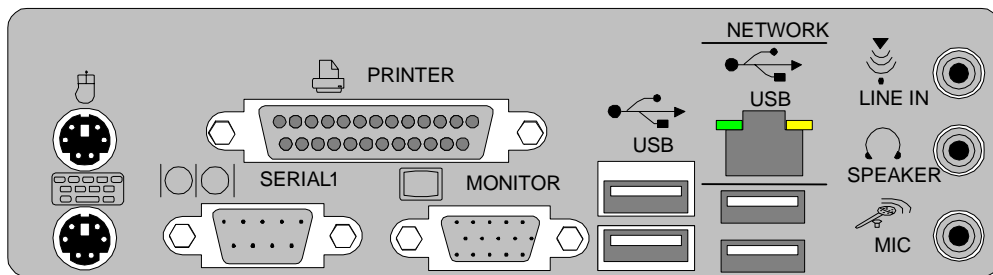


Figure 2: Rear I/O Shield

**Note:** Power to the computer should be turned off before a keyboard or mouse is connected or disconnected.

### PS/2 Keyboard/Mouse Ports

The purple connector is for a PS/2 keyboard and the green connector is for a PS/2 mouse connector.

### USB 2.0 Ports

These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

### Serial Port

This 9-pin COM1 port is for a pointing device or other serial devices.

### Parallel Port

This 25-pin port allows connection of a parallel device e.g. Printer, scanner etc

## Video Graphics Adapter Port

This 15-pin port is for a VGA monitor or other VGA-compatible devices.

## RJ-45 Port

This port allows connection to a Local Area Network (LAN) through a network hub.

## Line-In Jack

This Line In (light blue) jack connects a tape player or other audio sources. In 6-channel mode, the function of this jack becomes Bass/Center.

## Line-Out Jack

This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.

## Microphone Jack

This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Rear Speaker Out.

**Note:** *The functions of the Line Out, Line In, and Microphone jacks change when you select the 6-channel audio configuration.*

**Table 3:** Audio 2, 4 or 6-channel configuration

	<b>Headphone/2-Speaker</b>	<b>4-Speaker</b>	<b>6-Speaker</b>
<b>Light Blue</b>	Line In	Rear Speaker Out	Rear Speaker Out
<b>Lime</b>	Line Out	Front Speaker Out	Front Speaker Out
<b>Pink</b>	Mic In	Mic In	Bass/Center

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## Chapter 2: System Board Options

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The VIG535B motherboard is capable of accepting Pentium® 4 CPU's. RAM can be upgraded to a maximum of 2GB using DDR266, DDR333, DDR400 SDRAM DIMMs Non ECC Unbuffered memory.

### **WARNING!**

***Unplug the system before carrying out the procedures described in this chapter. Failure to disconnect power before you open the system can result in personal injury or equipment damage. Hazardous voltage, current, and energy levels are present in this product. Power switch terminals can have hazardous Voltages present even when the power switch is off.***

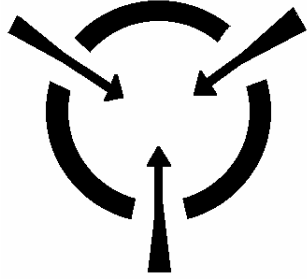
***The procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment. Do not operate the system with the cover removed. Always replace the cover before turning on the system.***

As the colours of the wires in the mains lead of this computer may not correspond with the coloured markings identifying the terminals in your plug precede as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter **E** or by the safety Earth symbol  $\perp$  or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter **N** or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter **L** or coloured red.



**CAUTION!**

*The Viglen Vig535b motherboard and associated components are sensitive electronic devices. A small static shock from your body can cause expensive damage to your equipment.*

Make sure you are earthed and free of static charge before you open the computer case. If you are unsure about upgrading your computer, return it to Viglen so a qualified engineer can perform the upgrade.

**STEPS TO TAKE TO PREVENT STATIC DISCHARGE:**

1. The best way to prevent static discharge is to buy an anti-static strap from your local electrical shop. While you are wearing the strap and it is earthed, static charge will be harmlessly bled to ground.
2. Do not remove the component from its anti-static protective packaging until you are about to install it.
3. Hold boards by the edges - try not to touch components / interface strips etc.

**Note:** *We recommend that you return your computer to the service department for upgrading. Any work carried out is fully guaranteed. Upgrades should only be carried out by persons who are familiar with handling IC's, as incorrect installation will invalidate the guarantee.*



## Overview of Jumper Settings

The Vig535b motherboard contains the latest technology to offer an almost jumper less configuration. All Pentium® 4 CPUs are automatically detected and the Speed is automatically set from the information provided by the CPU.

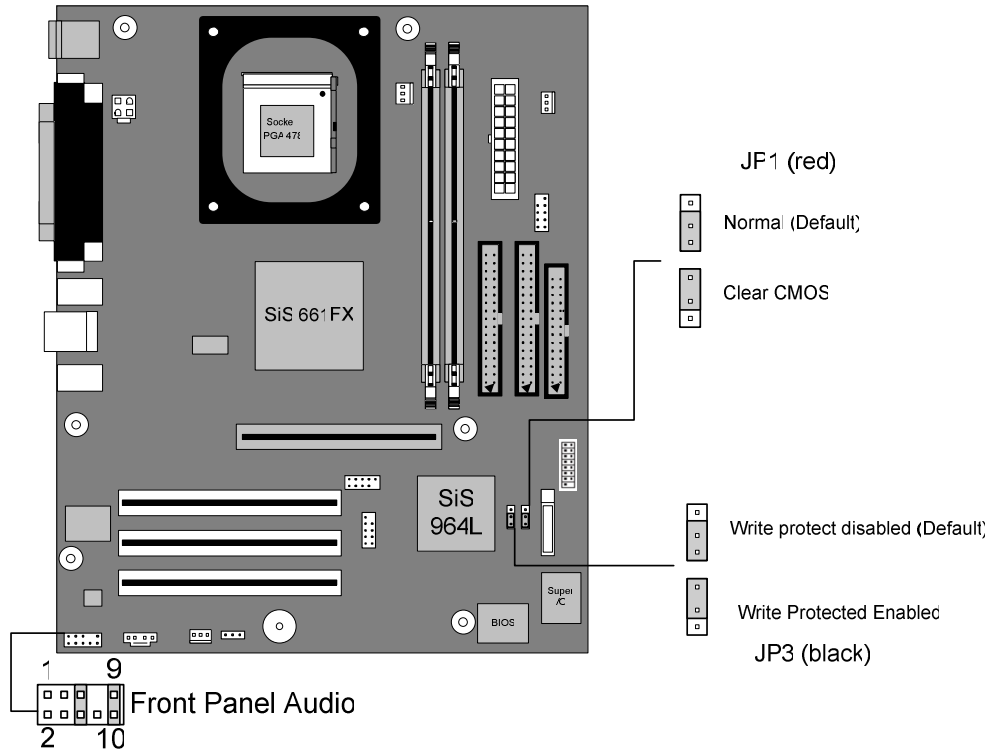
The only jumper present on the motherboard is for clearing all the CMOS settings. In the unlikely event of the CMOS becoming corrupted then jumper JP1 can be set to clear the contents of the CMOS.

### **CAUTION!**

*Never remove jumpers using large pliers as this can damage the pins. The best way to remove a jumper is to use a small pair of tweezers or fine needle-nosed pliers.*

*Never remove a jumper when the computer is switch on. Always switch the computer off first.*

# System Board Jumper Settings



**Figure 3:** System Board Jumper Settings

**Table 4:** Clear CMOS Jumper Settings

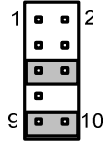
Function	Jumper (JP1)	Configuration
Default	1-2	The BIOS uses current configuration information and passwords for booting.
Clear	2-3	Turn off the system and unplug the power cord. Move the jumper from pins 1-2 (default) to pins 2-3 for about 5~10 seconds. Then move the jumper back to pins 1-2.

**Note:** Except when clearing the rtc ram, never remove the jumper on JP1 default position. Removing the jumper will cause system boot failures.

**Table 5:** Bios Write Protection

Function	Jumper (JP3)	Configuration
Write Protect Enabled (default)	2-3	Protects the BIOS from being written to.
Write Protect Disabled	1-2	Turn off the system and unplug the power cord. Move the jumper from pins 1-2 (default) to ins 2-3. Reboot the system.

**Table 6:** Front Panel Audio Jumper Settings

Function	Jumper	Configuration
Normal 	5 – 6 and 9- 10	The audio line signals are routed back to the line connector.

**Table 6a:** Front panel Audio Connector

Pin	Signal name	Pin	Signal name
1	Audio Mic	2	Ground
3	Audio Mic Bias	4	VCC
5	Speaker Out Right Channel	6	Speaker Out Right Channel Return
7	X	8	Key
9	Speaker Out Left Channel	10	Speaker Out Left Channel Return

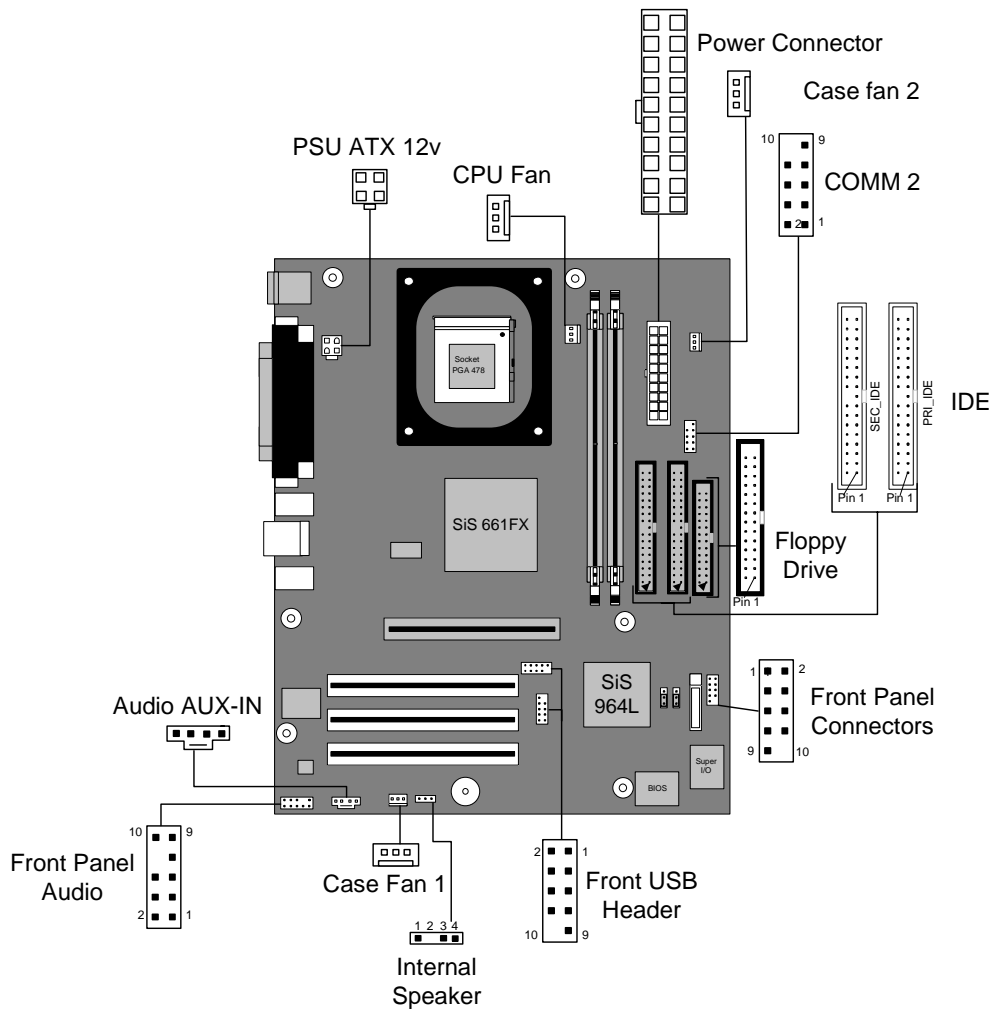
**CAUTION!**

*Do not move the jumper with the power on. Always turn off the power and unplug the power cord from the computer before changing the jumper.*

**Note:** *There is no jumper setting for configuring the processor speed or bus frequency.*

# Motherboard Connectors

There are connectors on the motherboard for FAN, IDE, Power supply, CD audio, Floppy, IDE, & Front Panel Connectors. The location and/or details of these connections are shown below.



**Figure 4:** Motherboard Connectors

## Front Panel Connectors

The following are all connectors situated along the front edge of the motherboard. They are often connected to buttons and LED's situated on the front panel.

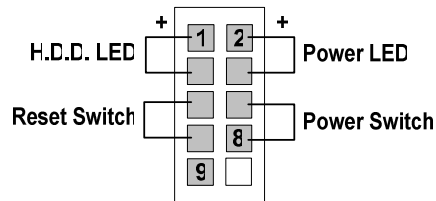


Figure 5: Front panel connectors

### Hard Disk L.E.D. Connector

This goes to the Hard Disk L.E.D. on the front panel, which lights up when the IDE Hard Disk is in use.

### Reset switch connector

When these pins are shorted, it will cause the computer to perform a cold reboot.

### Power L.E.D.

This attaches to the power L.E.D on the front panel, to display if the computer is active or not.

### Power On/Off

When these pins are shorted it turns the computer on and off.

## Upgrading the CPU

### **CAUTION!**

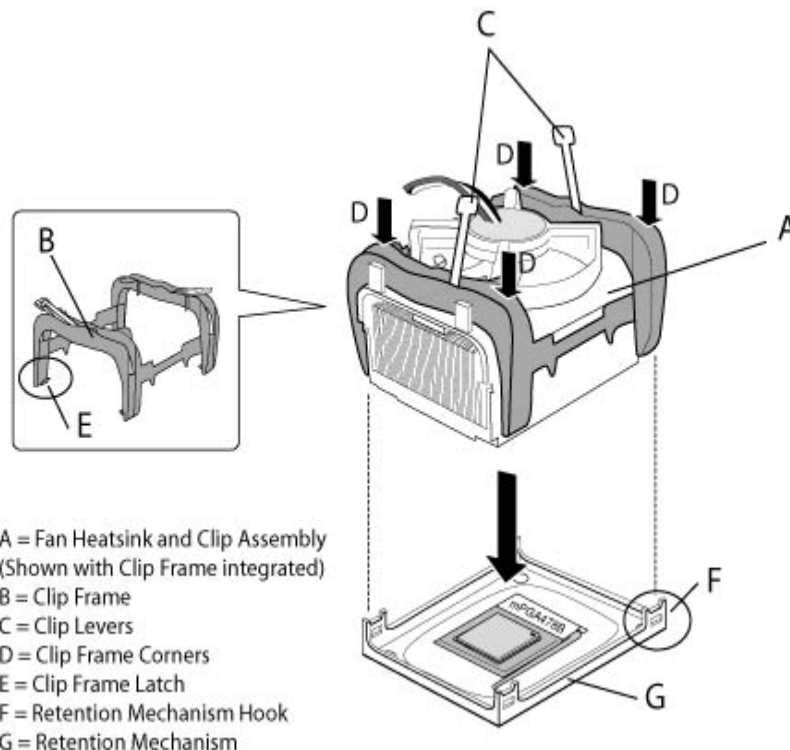
*Allow time for the processor and heat sink to cool before touching either of them.*

The Pentium® 4 processor together with Level 2 cache chips are housed in a protective package.

The design of the Vig535b computer makes it a simple job to replace or upgrade the processor. To do so please refer to figure 6 and follow the instructions below:

1. Read the warnings at the start of this chapter and ensure a static free environment
2. Remove the lid from the computer by removing the four screws at the rear of the case
3. Locate the CPU module by referring to Figure 1 if necessary
4. Locate the heat sink clips, and remove heat sink (and unplug FAN cable)
5. Lift arm on Socket to release the CPU
6. Lift the CPU Vertically upwards until it is clear of the socket

You can now fit the replacement CPU and heat sink into the socket.



**Figure 6:** Installing the CPU heatsink (note heatsink type may vary from one shown above)

# Installing & Removing Memory Modules

## Installing Memory

You can install from 64MB to 2GB of memory in the motherboard DIMM sockets. The motherboard has two DIMM sockets. The motherboard supports the following memory features:

- 184-pin DIMMs with gold-plated contacts.
- Non-ECC (64-bit) memory.
- 64MB, 128MB, 256MB, 512MB and 1GB modules.

**Note:** *DDR SDRAM must meet the Version 1.0 June 2000 JEDEC Solid State Technology Association specifications for DDR266 SDRAM.*

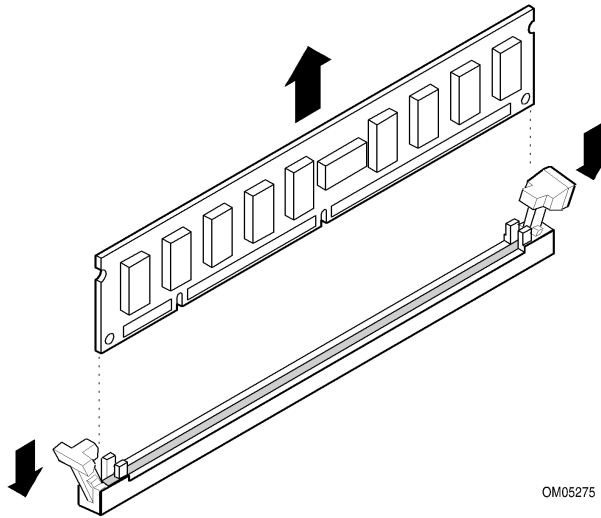
To install DIMMs, follow these steps:

1. Observe the precautions in "Before You Begin". Turn off the computer and all Peripheral devices.
2. Remove the computer cover and locate the DIMM sockets.
3. Holding the DIMM by the edges, remove it from its antistatic package.
4. Make sure the clips at either end of the socket are pushed away from the socket.
5. Position the DIMM above the socket. Align the two small notches in the bottom edge of the DIMM with the keys in the socket. Insert the bottom edge of the DIMM into the socket.
6. When the DIMM is seated, push down on the top edge of the DIMM until the retaining clips at the ends of the socket snap into place. Make sure the clips are firmly in place.
7. Replace the computer cover.

## Removing Memory

To remove a DIMM, follow these steps:

1. Observe the precautions in "Before You Begin".
2. Turn off all peripheral devices connected to the computer. Turn off the computer.
3. Remove the computer cover.
4. Gently spread the retaining clips at each end of the socket. The DIMM pops out of the socket. Hold the DIMM by the edges, lift it away from the socket, and store it in an antistatic package.
5. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.



OM05275

**Figure 7:** Removing Memory Modules

## Expansion Slots

The motherboard has three PCI slots and one Accelerated Graphics Port (AGP) slot. To install and configure an expansion card:

1. Install an expansion card following the instructions that came with the chassis.
2. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4, System BIOS.
3. Assign an IRQ to the card. Refer to the tables below.
4. Install the drivers and/or software applications for the expansion card according to the card documentation.

**Table 7:** Standard IRQ Assignment

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
4*	12	Communication Port (COM1)
5*	13	IRQ Holder for PCI steering
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	IRQ Holder for PCI steering
10*	5	Advanced AC'97 CODEC
11*	6	Standard PCI Graphics Adapter (VGA)
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

\* These IRQs are usually available for ISA or PCI devices



**Table 8:** IRQ Assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI Slot 1	-	used	-	-	-	-	-	-
PCI Slot 2	-	-	used	-	-	-	-	-
PCI Slot 3	-	-	-	used	-	-	-	-
AGP Slot	used	-	-	-	-	-	-	-
Onboard USB Controller HC0	-	-	-	-	shared	-	-	-
Onboard USB Controller HC1	-	-	-	-	shared	-	-	-
Onboard USB Controller HC3	-	-	-	-	shared	-	-	-
EHCI	-	-	-	-	shared	-	-	-
Onboard LAN	-	-	used	-	-	-	-	-
Onboard Audio	-	-	-	-	-	-	used	-

## PCI Slots

There are three 32-bit PCI slots on this motherboard. The slots support PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

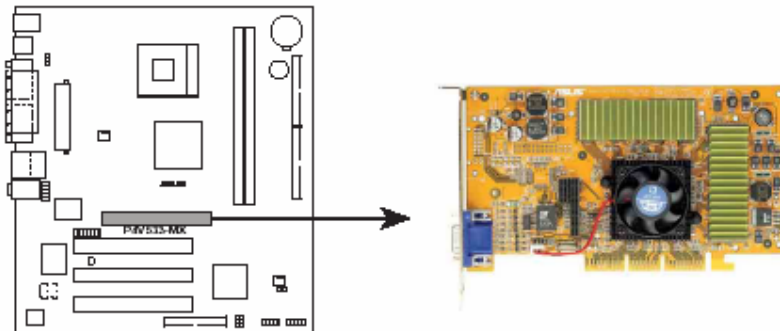


**Figure 8:** Installing a PCI card

## AGP Slot

This motherboard has an Accelerated Graphics Port (AGP) slot that supports AGP 8X (3.3V/1.5V) cards.

**Note:** The notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.



**Figure 9:** Install an AGP card

## Replacing the Clock/CMOS RAM Battery

A lithium battery is installed in a socket on the system board.

The battery has an estimated life expectancy of seven years. When the battery starts to weaken, it loses voltage; when the voltage drops below a certain level, the system settings stored in CMOS RAM (for example, the date and time) may be wrong.

If the battery fails, you will need to replace it with a **CR2032** battery or an equivalent. As long as local ordinance permits, you may dispose of individual batteries as normal rubbish. Do not expose batteries to excessive heat or any naked flame. Keep all batteries away from children.

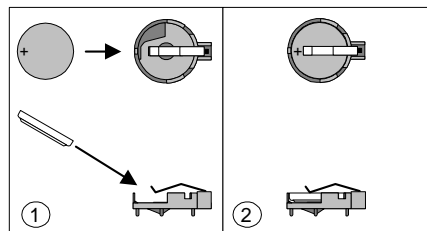
### **CAUTION!**

*Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by Viglen. Discard used batteries according to manufacturer's instructions.*

The battery is listed as board component 'E' on the diagram on Figure 1.

To replace the battery, carry out the following:

1. Observe the precautions in "Before You Begin."
2. Turn off all peripheral devices connected to the system.
3. Turn off the system.
4. Remove any components that are blocking access to the battery.
5. Figure 1 shows the battery location. Gently pry the battery free from its socket, taking care to note the "+" and "-" orientation of the battery (Figure 10).
6. Install the new battery in the socket.



**Figure 10:** Removing the Battery

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# Chapter 3: Solving Problems

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The first part of this chapter helps you identify and solve problems that might occur when the system is in use. The second part lists error code messages that might be displayed.

Please remember that if you cannot solve the problem by yourself then you should contact your suppliers Technical Support for further assistance.

Viglen Technical Support can be reached in the following ways:

Telephone: 020 8758 7000  
Fax: 020 8758 7080  
Email: techsupport@viglen.co.uk

You can also look for support information on our web site:

<http://www.viglen.co.uk>

Device drivers and various useful utilities can be downloaded from our ftp site:

<ftp://ftp.viglen.co.uk>

## Resetting the System

Before checking your system for hardware problems, it is always a good idea to try resetting your computer and see if a re-boot can solve the problem. Most software related problems can be solved simply by re-booting your PC.

**Table 9:** Resetting the System

To do the following	Press
Soft boot: Clear the system memory and reload the operating system (also called warm reset).	<Ctrl + Alt + Del>
Cold boot: Clear the system memory, halt power to all peripherals, restart POST, and reload the operating system.	Power off/on or reset button (at front of the system)

## Troubleshooting Procedures

This section provides a step-by-step troubleshooting procedure to identify a problem and locate its source.

### **CAUTION!**

1. Turn off the system and any peripheral devices before you disconnect any peripheral cables from the system. Otherwise, you can permanently damage the system or the peripheral devices.
2. Make sure the system is plugged into a properly grounded power outlet.
3. Make sure your keyboard and video display are correctly connected to the system. Turn on the video display, and turn up its brightness and contrast controls to at least two-thirds of the maximum (refer to the documentation supplied with the video display).
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in the diskette drive. If the operating system normally loads from a diskette, insert the operating system diskette into the drive.
5. Turn on the system. If the power indicator does not light, but the system seems to be operating normally, the indicator is probably defective. Monitor the power-on self test (POST) execution. Each time you turn on the system, the POST checks the system board, memory, keyboard, and certain peripheral devices.

**Note:** If the POST does not detect any errors, the system beeps once and boots up.

Errors that do not prevent the boot process (non-fatal errors) display a message that looks similar to the following:

```
Error Message Line 1
Error Message Line 2
Press <F2> for Set-up, <F1> to Boot
You can note the error and press <F1> to resume the boot- up process, or
<F2> to enter Set-up.
```

Errors that prevent the boot process from continuing (fatal errors), are communicated by a series of audible beeps. If this type of error occurs, refer to the error codes and messages listed at the end of this chapter.

6. Confirm that the operating system has loaded.

## Problems Operating Add-in Boards

Problems related to add-in boards are usually related to improper board installation or interrupt and address conflicts. Go through the checklist below to see if you can correct the problem. If the problem persists after you have checked and corrected all of these items, contact the board vendor's customer service representative.

Did you install the add-in board according to the manufacturer's instructions?  
Check the documentation that came with the board. Are all cables installed properly?

The following items are suggestions for troubleshooting problems related to PCI/ISA legacy (non-Plug and Play) add-in boards.

- If the PCI/ISA board uses an interrupt, run Set-up and set the interrupt that is being used by the PCI/ISA board to Used by PCI/ISA Card. Please refer to the BIOS manual for details of how to do this.
- If the PCI/ISA legacy board uses memory space between 80000H - 9FFFFH, run Set-up and set conventional memory to 256 K.
- If the PCI/ISA legacy board uses shared memory between C8000H - DFFFFH, run Set-up and enable shared memory for the appropriate memory space.

## Problems & Suggestions

**Table 10:** Problems and Suggestions

What happens	What to do
Application software problems	<p>Try resetting the system.</p> <p>Make sure all cables are installed correctly.</p> <p>Verify that the system board jumpers are set properly.</p> <p>Verify that your system hardware configuration is set correctly. In Setup, check the values against the system settings you recorded previously. If an error is evident (wrong type of drive specified, for example), make the change in Setup and reboot the system. Record your change.</p> <p>Make sure the software is properly configured for the system. Refer to the software documentation for information.</p> <p>Try a different copy of the software to see if the problem is with the copy you are using.</p> <p>If other software runs correctly on the system, contact the vendor of the software that fails.</p> <p>If you check all of the above with no success, try clearing CMOS RAM and reconfiguring the system. Make sure you have your list of system settings available to re-enter, because clearing CMOS RAM sets the options to their default values.</p>
Characters on-screen are distorted or incorrect	<p>Make sure the brightness and contrast controls are properly adjusted on the monitor.</p> <p>Make sure the video signal cable and power cables are properly installed.</p> <p>Make sure your monitor is compatible with the video mode you have selected.</p>
Characters do not appear on screen	<p>Make sure the video display is plugged in and turned on.</p> <p>Check that the brightness and contrast controls are properly adjusted.</p> <p>Check that the video signal cable is properly installed.</p> <p>Make sure a video board is installed, enabled, and the jumpers are positioned correctly.</p> <p>Reboot the system.</p>
CMOS RAM settings are wrong	<p>If system settings stored in CMOS RAM change for no apparent reason (for example, the time of day develops an error), the backup battery may no longer have enough power to maintain the settings. Replace the battery (Chapter 2).</p>
Diskette drive light does not go on when drive is in use or is tested by POST	<p>Make sure the power and signal cables for the drive are properly installed.</p> <p>Check that the drive is properly configured and enabled in Setup.</p>

**Table 10: Problems and Suggestions (Continued)**

<b>What happens</b>	<b>What to do</b>
Hard drive light does not go on when drive is in use or is tested by POST	<p>Make sure the power and signal cables for the drive are properly installed.</p> <p>Make sure the front panel connector is securely attached to the system board headers.</p> <p>Check that the drive is properly configured and enabled in Setup.</p> <p>Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.</p>
Power-on light does not go on	<p>If the system is operating normally, check the connector between the system board and the front panel. If OK, the light may be defective.</p>
Prompt doesn't appear after system boots	<p>It's probably switched off.</p> <p>A serious fault may have occurred consult your dealer service department / Technical Support.</p>
Setup, can't enter	<p>If you can't enter Setup to make changes, check the switch that disables entry into Setup (Chapter 2). If the switch is set to allow entry into Setup, you might need to clear CMOS RAM to the default values and reconfigure the system in Setup.</p>
System halts before completing POST	<p>This indicates a fatal system error that requires immediate service attention. Note the screen display and write down any beep code emitted. Provide this information to your dealer service department / Technical Support.</p>

---

# Chapter 4: System BIOS

---

## What is the BIOS?

The BIOS (Basic Input Output System) is an important piece of software which is stored in a ROM (Read Only Memory) chip inside the computer. It consists of the basic instructions for controlling the disk drives, hard disk, keyboard and serial/parallel ports. The BIOS also keeps a list of the specifications of the computer in battery-backed RAM (also known as the CMOS RAM) and provides a special Setup program to change this information.

The BIOS in your Viglen computer is guaranteed to be fully compatible with the IBM BIOS. It has been written by American MegaTrends Inc. (AMI), an industrial leader in the field of BIOS software.

## The Power-On sequence

When the computer is first switched on, certain instructions in the BIOS are executed to test various parts of the machine. This is known as the POST (Power-On Self Test) routine. When you switch the computer on (or when you press the Reset button or press <Ctrl> + <Alt>+ <Delete> keys, which has the same effect), you can see on the monitor that it counts through the memory, testing it. The floppy disk drives are then accessed and tested, and the various interfaces are checked. If there are any errors, a message is displayed on the screen.

Having passed all the tests, and if you have activated the password facility, the BIOS then asks you to enter the boot password to continue. The following section describes how to do this. The BIOS then loads the operating system, either - MS DOS, Windows 98SE, OS/2 or NetWare, etc. - from the hard disk (or floppy disk if one is inserted in Drive A:). The computer is then ready for use.



# Phoenix BIOS

## Introduction

The motherboard uses an Phoenix BIOS, which is stored in flash memory and can be upgraded using a disk-based program. In addition to the BIOS, the flash memory contains the Setup program, Power-On Self Test (POST), Advanced Power Management (APM), the PCI auto-configuration utility, and is Windows 95-ready Plug and Play. This motherboard supports system BIOS shadowing, allowing the BIOS to execute from 64-bit onboard write-protected DRAM.

The BIOS displays a message during POST identifying the type of BIOS and the revision code.

## BIOS Upgrades

A new version of the BIOS can be upgraded from a diskette using the AFUDOS.EXE utility that is available from the Viglen FTP site. This utility does BIOS upgrades as follows:

- Updates the flash BIOS from a file on a disk.
- Updates the language section of the BIOS.
- Makes sure that the upgrade BIOS matches the target system to prevent accidentally installing a BIOS for a different type of system.

BIOS upgrades and the AWDFLASH.EXE utility may be available online at [www.viglen.co.uk](http://www.viglen.co.uk) or by request.

**Note:** *Please review the instructions distributed with the upgrade utility before attempting a BIOS upgrade.*

## Using AWDFLASH to update the BIOS

The BIOS can be updated using the AWDFLASH.EXE utility in DOS environment.



# Configuring the Motherboard using BIOS Setup

## Before You Begin

### **CAUTION!**

- *Always follow the steps in each procedure in the correct order.*
- *Set up a log to record information about your computer, such as model, serial numbers, installed options, and configuration information.*
- *Use an anti-static wrist strap and a conductive foam pad when working on the motherboard.*

### **WARNINGS**

*The procedures in this chapter assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.*

*Disconnect the computer from its power source and from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems before you open the computer or perform any procedures can result in personal injury or equipment damage. Some circuitry on the motherboard may continue to operate even though the front panel power button is off.*

### **CAUTION!**

*Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to a metal part of the computer chassis.*

## BIOS Setup Program

This motherboard supports a programmable firmware hub (FWH) that you can update using the provided utility described in section “2.1 Managing and updating your BIOS.”

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup”. This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognise these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On Self Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. It is a menu driven program, which means you can scroll through the various sub-menus and make your selections from the available options using the navigation keys.

**Note:** *If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system stability. Select the Load Default Settings item under the Exit Menu.*

## BIOS Menu Screen

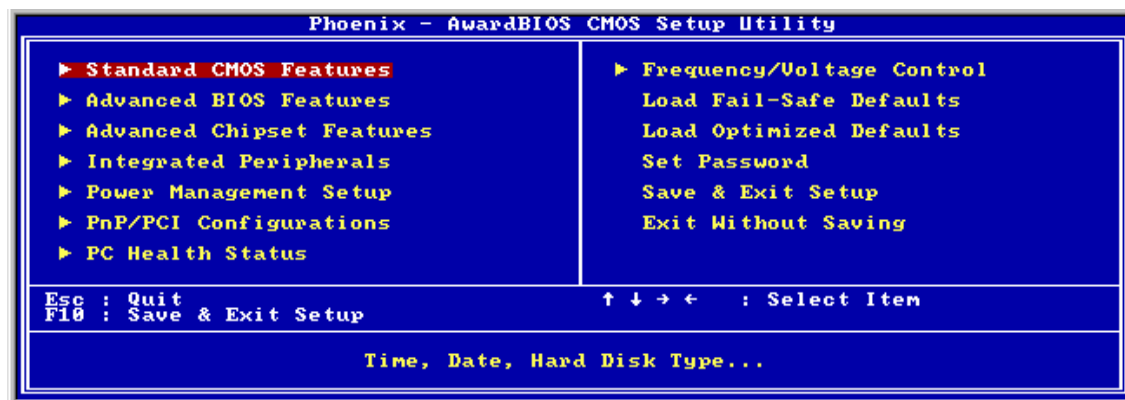


Figure 11: BIOS Menu Screen

## Menu Bar

The menu bar on top of the screen has the following main items:

Table 11: Options

<b>Standard CMOS features</b>	For changing the basic system configuration
<b>Advanced BIOS features</b>	For changing the advanced system settings
<b>Advanced Chipset Features</b>	For changing Advanced chipset settings
<b>Integrated Peripherals</b>	For changing PCI, AGP and USB settings
<b>Power Management Setup</b>	For changing the advanced power management (APM) configuration
<b>PnP/PCI Configurations</b>	For changing IRQ settings
<b>PC Health Status</b>	Displays information regarding CPU temp and fan speed
<b>Frequency/Voltage Control</b>	For changing the CPU frequency and displaying current frequency information

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

## Navigation Keys

At the **bottom right corner** of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

## Main Menu Items

The Main menu is the first screen you are presented with on entering the BIOS setup.

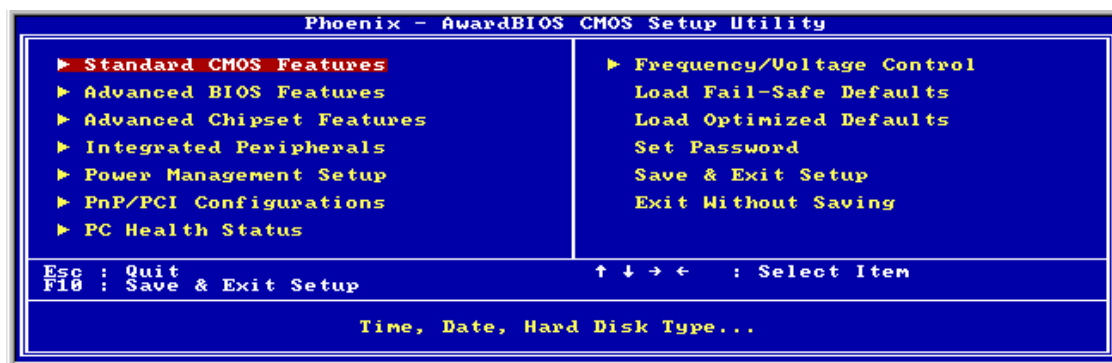


Figure 12: Main Menu

## Sub Menu Items

An item with a sub-menu on any menu screen is distinguished by a solid triangle before the item. To display the sub-menu, select the item and press Enter.

## Configuration Fields

These fields show the values for the menu items. If an item is user-configurable, you may change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press Enter to display a list of options.

## Pop Up Window

Select a menu item then press Enter to display a pop-up window with the configuration options for that item.

## Scroll Bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press **Up/Down arrow keys** or **PageUp/PageDown keys** to display the other items on the screen.

## General Help

To view general help press F1. This displays help information on the particular option you are in.

## Standard CMOS Features

When you enter the BIOS Setup program, the Main menu screen appears giving you an overview of the basic system information.

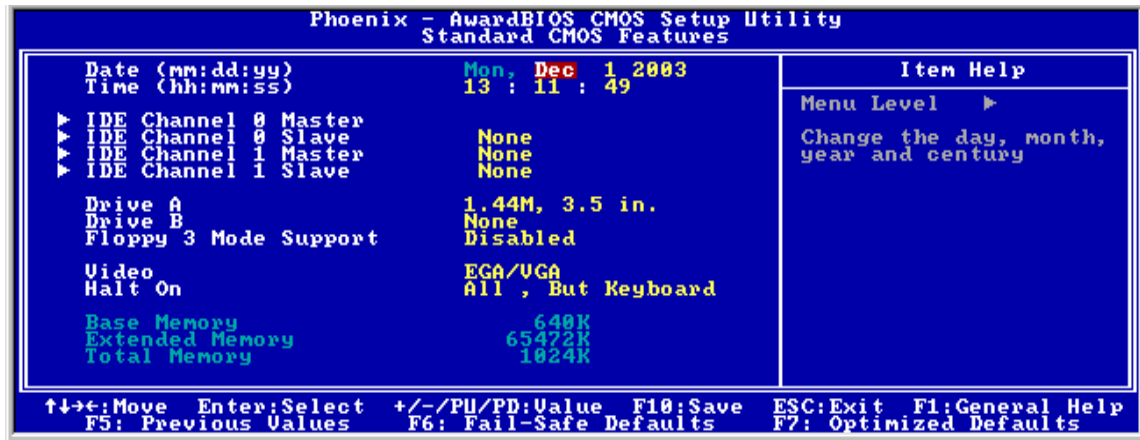


Figure 13: Standard CMOS features

### System Date

This item allows you to set the system date [xx:xx:xx].

### System Time

This item allows you to set the system time [xx:xx:xx]

### IDE Channel X Master/Slave

This shows what devices are running of which IDE channel.

### Drive A, B [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options:

[Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

### Floppy 3 Mode Support

This feature is not supported.

**Video**

This item selects the type of video adapter used for the primary system monitor.

**Halt On**

This item determines whether the system stops if an error is detected during system boot-up.

**Base Memory**

This displays the amount of base memory installed on the system, typically 640K.

**Extended Memory**

This displays the amount of extended memory detected during system boot-up.

**Total Memory**

This displays the total amount of memory available in the system.



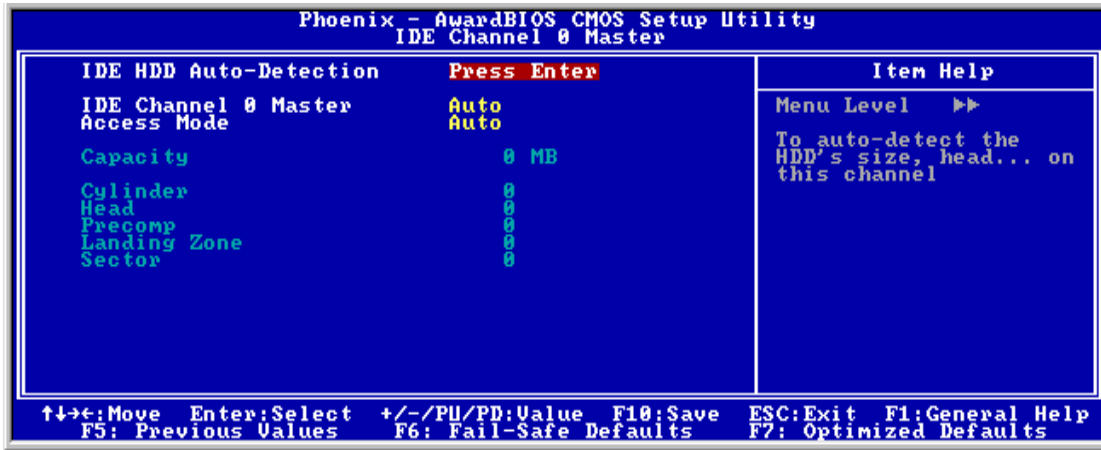


Figure 14: IDE Device Sub-Menu

### IDE HDD Auto-Detection

This item allows you to detect the parameters of IDE devices by pressing <Enter>. The parameters are shown automatically on the screen.

### IDE Channel 0 Master/Slave IDE Channel 1 Master/Slave

When set to [Auto], the BIOS will automatically check what kind of IDE device you are using. If you want to define your own drive, set it to [Manual] and make sure you fully understand the meaning of the parameters. Refer to the manual supplied with the device to get the correct settings.

### Access Mode

This item selects the mode to access your IDE device. Leave this to its default [Auto] setting to detect the access mode of your HDD automatically.

### Capacity

The approximate size of the disk drive. The size is normally slightly greater than the formatted disk given in the disk-checking program.

### Cylinder

This item configures the number of cylinders

### Head

This item configures the number of read/write heads.

### Precomp

This item displays the number of cylinders at which to change the write timing.

## Landing zone

This item displays the number of cylinders specified as the landing zone for the read/write heads.

## Advanced BIOS features

The Advanced menu items allow you to change the settings for the CPU and other system devices.

### **CAUTION!**

*Take caution when changing the settings of the Advanced menu items. Incorrect field values may cause the system to malfunction.*

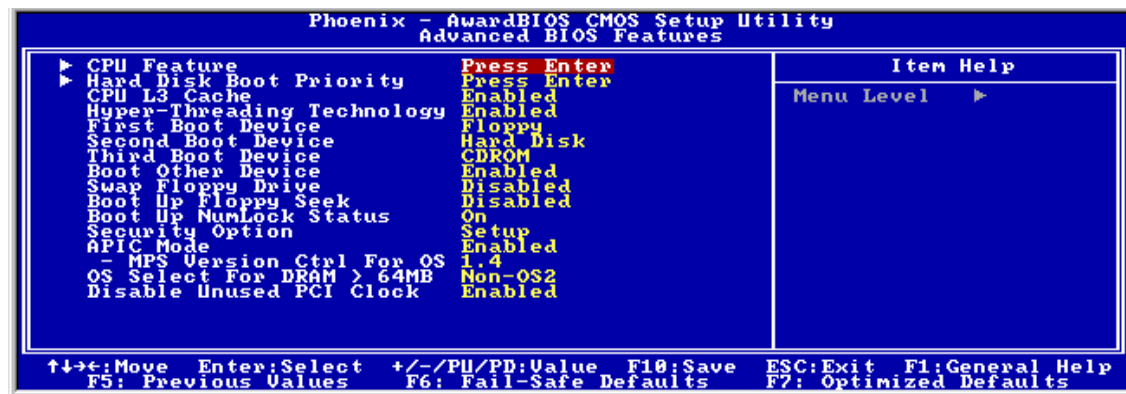


Figure 15: Advanced BIOS features Sub-Menu

## CPU Feature

This item is used to manage the thermal state for certain CPU.

## Hard Disk Boot Priority

Use this option to select the hard disk boot priority

## CPU L3 Cache

This item is used to enable the L3 cache (default setting) and appears only for certain CPU (Intel Pentium 4 processor with HT technology Extreme Edition) that possesses L3 cache.

## Hyper-Threading Technology

This item is used to enable the functionality of the processor with Hyper-Threading Technology and will appear only when using such processor.

## First Boot / Second Boot Device / Third Boot Device / Boot Other Device

Select the drive to boot first, second and third in the [First Boot Device], [Second Boot Device] and [Third Boot Device] items respectively. The BIOS will boot the operating system according to the sequence of the drives selected. Set [Boot Other Device] to [Enabled] if you wish to boot from another device other than these three items.

## Swap Floppy Drive

When set to [Enabled], and the system is booting from the floppy drive, the system will boot from drive B instead of the regular drive A. There must be two floppy drives connected in the system to use this function.

## Boot Up Floppy Seek

When set to [Enabled], the BIOS will check whether the floppy disk drive is installed or not.

## Boot Up NumLock Status

This item determines the default state of the numeric keypad at system boot up.

**[On]** The numeric keypad functions as number keys.

**[Off]** The numeric keypad functions as arrow keys.

## Security Option

This item determines when the system will prompt for password - every time the system boots or only when enters the BIOS setup.

**[Setup]:** The password is required only when accessing the BIOS Setup.

**[System]:** The password is required each time the computer boots up.

**NOTE:** Don't forget your password. If you forget the password, you will have to open the computer case and clear all information in the CMOS before you can start up the system. But by doing this, you will have to reset all previously set options.

## MPS Version Ctrl For OS:

This item specifies which version of MPS (Multi-Processor Specification) this motherboard will use. Leave this item to its default setting.

## OS Select For DRAM >64MB

This item allows access to memory greater than 64MB when using OS/2. Leave this item to its default setting when using any other operating system.

## Disable Unused PCI Clock

This option disables the clock of a PCI slot that is not in use.

**[Yes]:** The system automatically detects the unused DIMM and PCI slot and stops sending the clock signal to them.

**[No]:** The clock signal is sent to all PCI slots.

## Advanced Chipset Features

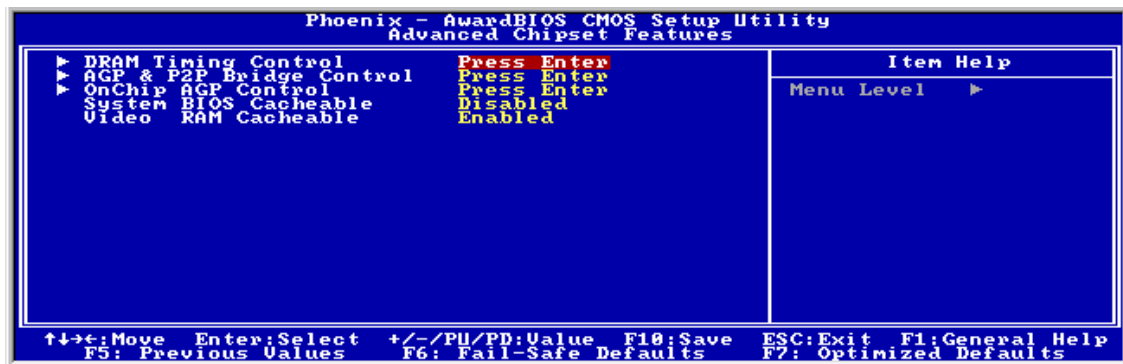


Figure 16: Advanced Chipset Features

## DRAM Timing Control



Figure 17: DRAM Timing Control

## Memory Timing

Allows the used to select the CAS latency time in HCLKs of 2, 2.5 or 3. The value is set a the factory depending on the DRAM installed. DO NOT change the values in this field unless you have changed the DRAM or CPU.

## AGP & P2P Bridge Control

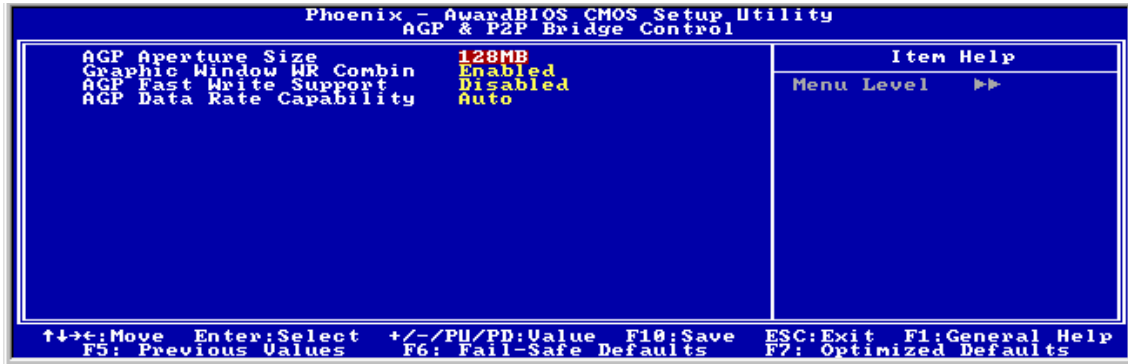


Figure 18: AGP & P2P Bridge Control

### AGP Aperture Size

This controls how much system RAM is allocated to the AGP for video purposes.

### Graphic Window WR Combin

This determines whether the graphic window base address is valid or not.

### AGP Fast Write Support

Enables and disables AGP fast write support.

### AGP Data Rate Capability

This allow the user to control the AGP card data transfer rate.

## OnChip AGP Control



Figure 19: OnChip AGP Control

## VGA Share Memory Size

This shows the amount of memory borrowed from the main memory for use with the VGA. In the case above the memory being used for the VGA is 32MB, this also means that 32MB will be lost from the main memory.

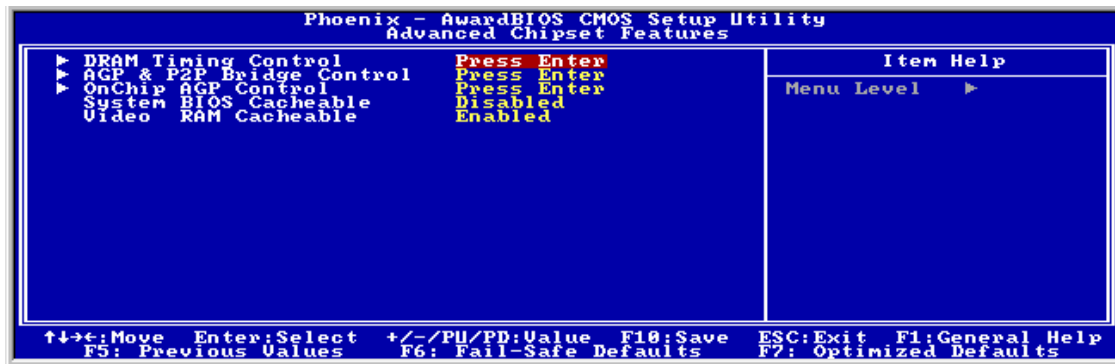


Figure 20: Advanced Chipset Features

## System BIOS Cacheable

This allows the BIOS to be cached in the memory for faster execution. Enable for better performance.

## Video RAM cacheable

This allows the video BIOS and RAM to be cached in the memory for faster execution. Enable for better performance.

## Integrated Peripherals



Figure 21: Integrated Peripherals

### Init Display First

This specifies whether your graphics card is installed in one of the PCI slots or is integrated on the motherboard.

### OnChip IDE Device



Figure 22: OnChip IDE Device

### Internal PCI/IDE

Used to enable or disable the internal PCI IDE channel.

### IDE Bus Master

Used to enable or disable the IDE bus mastering under DOS.

### IDE Burst Mode

When enabled every write instruction sent by the system, will be sent to the write buffer. Burst able transaction then burst on the PCI bus in one go and non-burst able transactions do not.

## OnChip PCI Device



Figure 23: OnChip PCI Device

### USB Controller

This enable the USB controller. Leave as the default 'Enable' if you wish to add USB device to your computer.

### USB 2.0 Supports

Enables USB 2.0 support on your computer.

### USB Keyboard Support via

This allows a USB keyboard to be used in a DOS environment by selecting [BIOS] or in the OS by selecting [OS].

### USB Mouse Support via

This allows a USB mouse to be used in a DOS environment by selecting [BIOS] or in the OS by selecting [OS].

### Audio Controller

This allows you to control the onboard AC97 audio. Disable this item if you are going to install a PCI audio add-on card.



## Onboard SuperIO Device



Figure 24: Onboard SuperIO device

### Onboard FDD Controller

This enables the onboard floppy disk drive controller.

### Onboard Serial Port 1

This assigns the I/O address and interrupt request (IRQ) for the onboard serial port1 (COM1)

### Onboard Serial Port 2

This assigns the I/O address and interrupt request (IRQ) for the onboard serial port2 (COM2)

### Onboard Parallel Port

This assigns the I/O address and interrupt request (IRQ) for the onboard parallel port.

### Parallel Port Mode

This sets the data transfer protocol for your parallel port. There are four options: SSP (Standard Parallel Port), EPP (Enhanced Parallel Port), ECP (Extended Capabilities Port) and ECP+EPP.

SPP – Output Only.

ECP/EPP – Bi-directional, allows both input and output. Only supported by ECP and EPP award peripherals.

### ECP Mode Use DMA

When the parallel port is set to ECP mode, the port can use either DMA 3 or DMA 1.

## Onboard PCI Device



Figure 25: Onboard PCI Device

### Onboard LAN Device

Enables and disables the onboard LAN

### LAN Boot ROM

Enables and disables booting from the onboard LAN or a network add-in card with a remote boot ROM installed.

## Power Management Setup



Figure 26: Power Management Setup

### ACPI Suspend Type

This selects the type of suspend mode.

[S1(POS)] Enables the Power On Suspend function.

[S3(STR)] Enables the Suspend to RAM function.

### MODEM Use IRQ

This specifies the IRQ that is used by the modem in order to be woken from an incoming call.

### Power Button Override

Under ACPI (Advanced Configuration and Power management Interface) you can create a software power down. A software power down allows the system to resume from Wake Up Alarms. This is controlled by the power button. If set to Instant-Off the system powers off straight away. If set to Delay 4 sec. the power button has to be held for 4 seconds before shutting down.

### Restore On AC Power Loss

Selects the action the system takes after a AC power failure.

[Power Off] When the AC power returns the system remains off. You must press the power button to turn the system on.

[Power On] When the AC power returns the system will be powered on automatically.

[Last State] When the AC power returns the system will return to the state it was in. If it was left on when the power goes then it will be turned on, if it was off it will remain off.

## PM Wakeup Events



Figure 27: PM Wake up events

### Wakeup by Ring

Wakes the system up from a incoming call on a modem.

### Wakeup by PME# of PCI

Wakes the system from power saving mode when a signal is received from a specific hardware peripheral or component.

### USB Resume from S3

Allows a USB device to wake the system from S3.

### PS2KB Wakeup from S3

Allows a PS/2 keyboard to wake the system by either a hot key combination or any key that is pressed. The default is [Any Key].

### PS2MS Wakeup from S3

Allows a PS/2 mouse to wake the system by either just movement or movement and a click. The default is [Move & Click].

### Wakeup by Alarm

Allows the system to be woken from an alarm. Once enabled options for Month Alarm, Day Alarm and time alarm are available to be selected and edited.

## PnP/PCI Configurations



Figure 28: PnP/PCI Configurations

### Forced Update ESCD

When this is Enabled, next time you boot up the ESCD is cleared and the BIOS resets the settings for the plug & play PCI card. The following boot up this will be reset to disable.

**Note: The ESCD (Extended System Configuration Data) contains the IRQ, DMA, I/O port and memory information of the system. This is a specification and feature of the Plug & Play BIOS.**

### IRQ Resources



Figure 29: IRQ Resources

This sets each system interrupt either [PCI Device] or [Reserved].

## PnP/PCI Configurations Setup Menu



Figure 30: PnP/PCI Configurations

### PCI/VGA Palette Snoop

This determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not.

[Enable] MPEG ISA/VESA VGA card work with PCI/VGA.

[Disable] MPEG ISA/VESA VGA card do not work with PCI/VGA.

### PIRQ\_0 Use No. ~ PIRQ\_7 Use IRQ No.

This allows IRQ numbers to be specified manually or automatically for installed PCI devices.

## PC Health Status

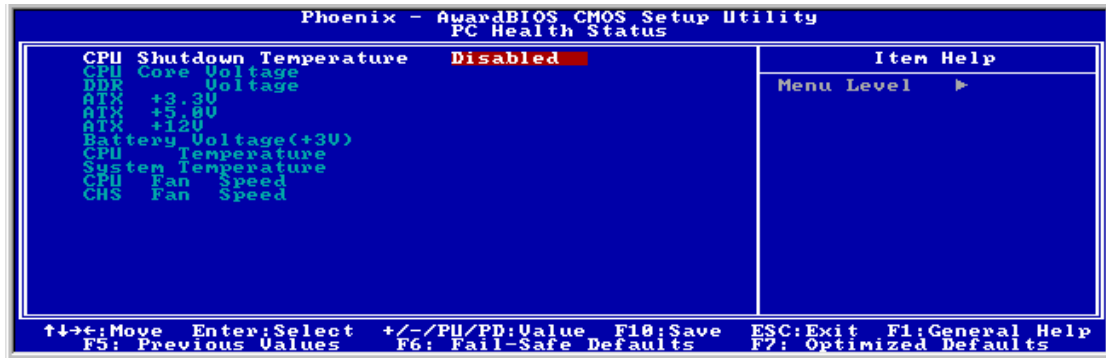


Figure 31: PC health Status

### CPU Shutdown Temperature

This item allows a temperature to be set at which the system will shut down automatically to prevent over heating.

### All Voltages, Fans Speed and Thermal Monitoring

These are unchangeable as they give the current statuses of the CPU, environment temperatures, fan speeds and the system power voltage.

## Frequency/Voltage Control

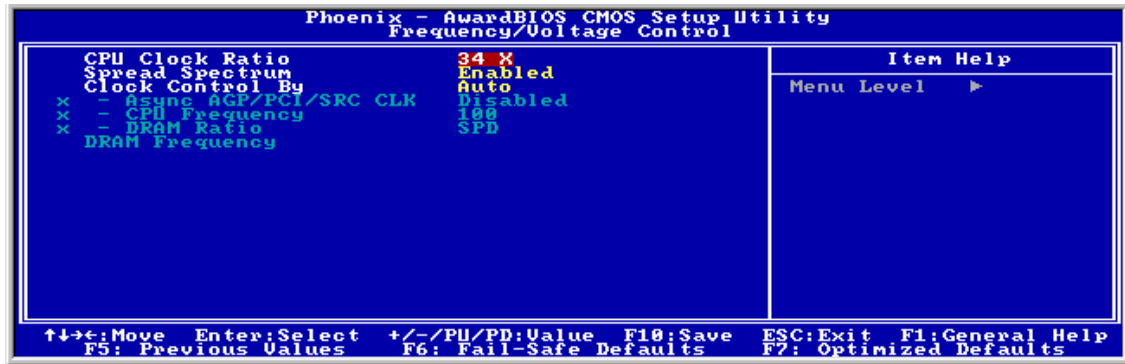


Figure 32: Frequency/Voltage Control

### CPU Clock ratio

Allows the CPU clock ratio to be changed if it isn't locked.

### Spread Spectrum

If enabled, could reduce the EMI (Electro-Magnetic Interference) generated by the system.

### Clock Control By

Allows control over Async, CPU Frequency, DRAM Ratio and DRAM frequency.



## Main Menu Additional Options

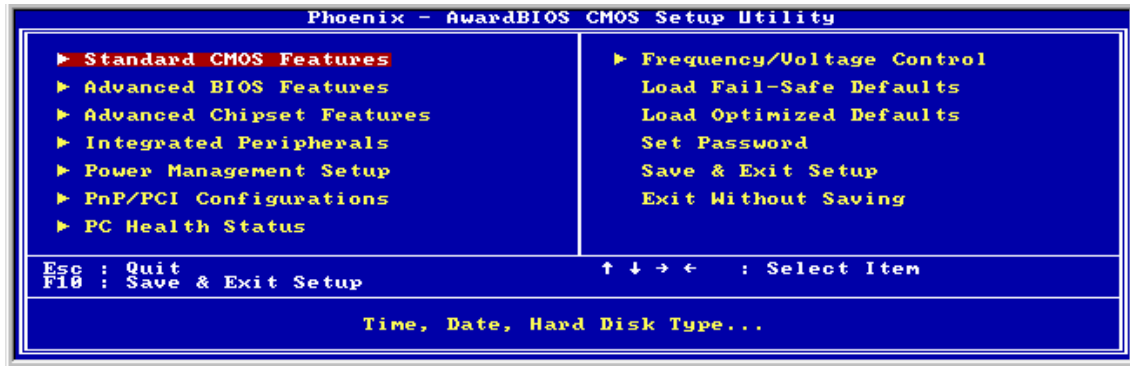


Figure 33: Main Menu

### Load Fail-Safe Defaults

Loads the BIOS defaults that are most stable and implement minimal system operation.

### Load Optimized Defaults

Loads the BIOS defaults that are set by the factory for optimal performance.

### Set Password

Allows a password to be set to restrict access to the BIOS configuration

### Save & Exit Setup

Allows the settings that have been changed to be saved and exits the BIOS setup menu. This also reboots the machine.

### Exit Without Saving

Exits the BIOS setup menu without saving any setting that have been changed. This also reboots the machine.

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# Chapter 5: Technical Information

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**Note:** *This chapter is indented for experienced users only, and only to be used as a reference. Changes to or modify any of the components/ connectors listed herein can and will seriously damage your system, including the motherboard, CPU and/or any other hardware.*

*You do not need to read this chapter to configure your motherboard. If you are not sure about the details listed herein, please skip and disregard them.*

## Enhanced IDE

IDE has been used in computer systems for some time, and has been a cheap solution to data storage. It has now been realised that traditional IDE has its limitations and thus needed to be improved. This was where Enhanced IDE came from. The main developments to the IDE interface are:

- Support hard drives of capacity greater than 528MB. This is achieved through BIOS changes.
- Improved data transfer rates. Transfer rates of 1-3MB/sec were the best to be expected from older IDE drives. With local bus technology this increased to about 6MB/sec. Now with multimedia applications, requiring vast amounts of information, even faster transfers rates were needed. Now drives with Enhanced IDE controllers can deliver up to 13MB/sec which is in the region of SCSI-2 performance.
- Dual-IDE channels have now been added which allows up to four IDE drives to be supported by the system. Each channel supporting two IDE devices.
- Non disk IDE peripherals have been developed (IDE CD-ROMs, IDE tape streamers) which can be simply attached to the one channel requiring no special hardware (requiring the use of an ISA slot) or complicated drivers. This is a standard interface meaning that any IDE CD-ROM or tape streamer can be attached.

## Operating Systems and Hard Drives

Standard CHS is the translation that has been used for years. Its use limits IDE capacity to maximum of 528MB regardless of the size of the drive used.

Logical Block mode overcomes the 528MB maximum size limitation imposed by the Standard CHS mode. It should be used only when the drive supports LBA (Logical Block Addressing), and the OS supports LBA, or uses the BIOS to access the disk.

Extended CHS mode also overcomes the 528MB maximum size limitation imposed by Standard CHS mode. It can be used with drives which are larger than 528MB that do not support LBA.

Auto Detected allows the BIOS to examine the drive and determine the optimal mode. The first choice is to utilise Logical Block mode if it is supported by the drive. The second choice is to utilise Extended CHS mode if the drive topology allows. If neither of the above methods is possible, the Standard CHS mode is used.

Different operating systems have different abilities regarding IDE translation mode.

UNIX operating systems (as currently implemented) do not support either LBA or ECHS and must utilise the standard CHS method. UNIX can support drives larger than 528MB, but does so in its own way.

OS/2 2.1 and OS/2 Warp can support LBA, ECHS or standard CHS methods. Note that LBA support may require a switch setting on an OS/2 driver in order to operate in that mode.

OS/2 2.0 & Novel NetWare can support either ECHS or standard CHS methods. In order to use LBA with NetWare a driver that supports current parameters must be used. OS/2 2.0 does not support LBA.

DOS & Windows can use LBA, ECHS or standard CHS methods. The '32-bit Disk Access' driver built into Windows WDCTRL.386 can only be used with the standard CHS method, To use either LBA or ECHS method and '32-bit Disk Access' an alternative .386 driver must be installed, this combination will also provide the best performance. If this driver is not installed and the drive fitted to the system supports Type F DMA on the ISA interface or Mode 3 on the PCI interface then higher performance will be achieved by NOT using '32-bit Disk Access'.

## Power Supply Connector

When used with an ATX-compliant power supply that supports remote power on/off, the motherboard can turn off the system power through software control.

To enable soft-off control in software, advanced power management must be enabled in the Setup program and in the operating system. When the system BIOS receives the correct APM command from the operating system, the BIOS turns off power to the computer.

With soft-off enabled, if power to the computer is interrupted by a power outage or a disconnected power cord, when power resumes, the computer returns to the power state it was in before power was interrupted (on or off).

**Table 12:** Power Supply Connector

Pin	Signal Name
1	+3.3 V
2	+3.3 V
3	Ground
4	+5 V
5	Ground
6	+5 V
7	Ground
8	PWRGD (Power Good)
9	+5 VSB (Standby)
10	+12 V
11	+3.3 V
12	-12 V
13	Ground
14	PS-ON# (power supply remote on/off control)
15	Ground
16	Ground
17	Ground
18	-5 V
19	+5 V
20	+5 V

## Other Useful Connectors

**Table 13:** Front Panel I/O Connectors

Connector	Pin	Signal Name	Connector	Pin	Signal Name
Sleep/Power LED Green	2	+5 V	HDD LED	1	+5V HDD
Sleep/Power LED Yellow	4	0 v	HDD LED	3	OV HDD
Power Switch	6	SWITCH ON	RESET	5	RESET
Power Switch	8	Ground	RESET	7	Ground
No connection	10	None	No connection	9	+5V

**Table 14:** PS/2 Keyboard/Mouse Connectors

Pin	Signal Name
1	Data
2	No connect
3	Ground
4	+5 V (fused)
5	Clock
6	No connect

**Table 15:** Stacked USB Connectors

Pin	Signal Name
1	+5 V (fused)
2	USBP0# [USBP1#]
3	USBP0 [USBP1]
4	Ground

**Table 16:** Serial Port Connectors

Pin	Signal Name
1	DCD
2	Serial In #
3	Serial Out #
4	DTR#
5	Ground
6	DSR
7	RTS
8	CTS
9	RI

**Table 17:** Audio Line Out Connector

Pin	Signal Name
Sleeve	Ground
Tip	Audio Left Out
Ring	Audio Right Out

**Table 18:** Audio Line In Connector

Pin	Signal Name
Sleeve	Ground
Tip	Audio Left In
Ring	Audio Right In

**Table 19:** Audio Mic In Connector

Pin	Signal Name
Sleeve	Ground
Tip	Mono In
Ring	Electret Bias Voltage

**Table 20:** Parallel Port Connector

Pin	Signal Name	Pin	Signal Name
1	Strobe#	14	Auto Feed#
2	Data bit 0	15	Fault#
3	Data bit 1	16	INIT#
4	Data bit 2	17	SLCT IN#
5	Data bit 3	18	Ground
6	Data bit 4	19	Ground
7	Data bit 5	20	Ground
8	Data bit 6	21	Ground
9	Data bit 7	22	Ground
10	ACK#	23	Ground
11	Busy	24	Ground
12	Error	25	Ground
13	Select		

**Table 21:** PCI Bus Connectors

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	Ground (TRST#)*	B1	-12 V	A32	AD16	B32	AD17
A2	+12 V	B2	Ground (TCK)*	A33	+3.3 V	B33	C/BE2#
A3	+5 V (TMS)*	B3	Ground	A34	FRAME#	B34	Ground
A4	+5 V (TDI)*	B4	no connect (TDO)*	A35	Ground	B35	IRDY#
A5	+5 V	B5	+5 V	A36	TRDY#	B36	+3.3 V
A6	INTA#	B6	+5 V	A37	Ground	B37	DEVSEL#
A7	INTC#	B7	INTB#	A38	STOP#	B38	Ground
A8	+5 V	B8	INTD#	A39	+3.3 V	B39	LOCK#
A9	Reserved	B9	no connect (PRSNT1#)*	A40	+5 V (SDONE)*	B40	PERR#
A10	+5 V (I/O)	B10	Reserved	A41	+5 V (SBO#)*	B41	+3.3 V
A11	Reserved	B11	no connect (PRSNT2#)*	A42	Ground	B42	SERR#
A12	Ground	B12	Ground	A43	PAR	B43	+3.3 V
A13	Ground	B13	Ground	A44	AD15	B44	C/BE1#
A14	+3.3 V aux	B14	Reserved	A45	+3.3 V	B45	AD14
A15	RST#	B15	Ground	A46	AD13	B46	Ground
A16	+5 V (I/O)	B16	CLK	A47	AD11	B47	AD12
A17	GNT#	B17	Ground	A48	Ground	B48	AD10
A18	Ground	B18	REQ#	A49	AD09	B49	Ground
A19	PME#	B19	+5 V (I/O)	A50	Key	B50	Key
A20	AD30	B20	AD31	A51	Key	B51	Key
A21	+3.3 V	B21	AD29	A52	C/BE0#	B52	AD08
A22	AD28	B22	Ground	A53	+3.3 V	B53	AD07
A23	AD26	B23	AD27	A54	AD06	B54	+3.3 V
A24	Ground	B24	AD25	A55	AD04	B55	AD05
A25	AD24	B25	+3.3 V	A56	Ground	B56	AD03
A26	IDSEL	B26	C/BE3#	A57	AD02	B57	Ground
A27	+3.3 V	B27	AD23	A58	AD00	B58	AD01
A28	AD22	B28	Ground	A59	+5 V (I/O)	B59	+5 V (I/O)
A29	AD20	B29	AD21	A60	REQ64C#	B60	ACK64C#
A30	Ground	B30	AD19	A61	+5 V	B61	+5 V
A31	AD18	B31	+3.3 V	A62	+5 V	B62	+5 V

\* These signals (in parentheses) are optional in the PCI specification and are not currently implemented.

**Table 22: Front Panel USB**

Pin	Pin Assignment	Pin	Pin Assignment
1	VCC	2	VCC
3	Data0 -	4	Data1 -
5	Data0 +	6	Data1 +
7	Ground	8	Ground
9	NC	10	NC

**Table 23: COM2**

Pin	Pin Assignment	Pin	Pin Assignment
1	DCD	2	RXD
3	TXD	4	DTR
5	Ground	6	DSR
7	RTS	8	CTS
9	RI	10	NC

**Table 24: Internal Speaker**

Pin	Pin Assignment
1	Signal
2	NC
3	Ground
4	+5V

## Other Information

### Reliability

The mean time between failures (MTBF) prediction is calculated using component and subassembly random failure rates. The calculation is based on the Bellcore Reliability Prediction Procedure, TR-NWT-000332, Issue 4, September 1991.

The MTBF prediction is for:

- Redesigning the motherboard for alternate components if failure rates exceed reliability expectations.
- Estimating repair rates and spare parts requirements.

MTBF data is calculated from predicted data @ 55 °C.

The MTBF prediction for the motherboard is 112,977. 7547 hours.

### Temperature

**Table 25:** Temperature

Temperature	Specification
Non-operating	-40°C to +70°C
Operating	0°C to +55°C



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# Chapter 6: Glossary

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**BIOS**

(Basic Input Output System) This is software stored on a chip and consists of the instructions necessary for the computer to function. The System BIOS contains the instructions for the keyboard, disk drives etc., and the VGA BIOS controls the VGA graphics card.

**CPU**

Central Processing Unit. This is the main piece of equipment on the motherboard. The CPU processes data, tells memory what to store and the video card what to display.

**Default**

The configuration of the system when it is switched on or the standard settings before any changes are made.

**DIMM**

Dual In-Line Memory Module, a type of memory module used for the systems main memory.

**Driver**

A piece of software which is used by application software to control some special features. Each graphics board and printer requires its own driver.

**D-Type**

A common type of connector used for connecting printers, serial ports, game port, and many other types of interface.

**DRAM**

Dynamic Ram used for main system memory, providing a moderately fast but cheap storage solution.

**FDC**

Floppy Disk Controller - the interface for connecting floppy disk drives to the computer.

**Hercules**

A monochrome graphics video mode which first appeared in the Hercules graphics card. Provides a resolution of 720 by 348 pixels.

**IDE**

Integrated Drive Electronics - currently the most popular type of interface for hard disk drives. Much of the circuitry previously required on hard disk controller cards is now integrated on the hard disk itself.

**Interface**

The electronics providing a connection between two pieces of equipment. For example, a printer interface connects a computer to a printer.

**Interlace**

The mode the graphics card uses to refresh a monitor screen. When the graphics is in interlace mode, the frequency of the display update is lower than in non-interlace mode. This causes a slight flicker, so generally non-interlaced mode is better if the monitor supports it.

**L.E.D.**

Light Emitting Diode - a light which indicates activity - for example hard disk access.

**PCI**

Peripheral Component Interface. It became apparent to manufacturers that the 8MHz AT ISA BUS on the standard PC was just not fast enough for today's applications, and so PCI was invented. It is a high speed data bus that carries information to and from components - known as 'Local Bus'.

**RAM**

Random Access Memory - the memory used by the computer for running programs and storing data.

**ROM**

Read Only Memory - a memory chip which doesn't lose its data when the system is switched off. It is used to store the System BIOS and VGA BIOS instructions. It is slower than RAM.

**Shadow Memory**

The BIOS is normally stored in ROM. On certain systems it can be copied to RAM on power up to make it go faster. This RAM is known as shadow memory. The System BIOS is responsible for this copying.

**Super VGA**

Additional screen modes and capabilities provided over and above the standard VGA defined by IBM.

**VGA**

Video Graphics Array - the graphics standard defined by IBM and provided on IBM's PS/2 machines.



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# Chapter 7: Suggestions

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Viglen is interested in continuing to improve the quality and information provided in their manuals. Viglen has listed some questions that you may like to answer and return to Viglen. This will help Viglen help to keep and improve the standard of their manuals.

1. Is the information provided in this and other manuals clear enough?

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2. What could be added to the manual to improve it?

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3. Does the manual go into enough detail?

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4. Would you like an on-line version of this manual?

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5. How do you rate the Viglen Technical support and Service Departments?

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6. Are there any technological improvements that could be made to the system?

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7. Other points you would like to mention?

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Please return this slip to:

- Product Development Dept.
- Viglen Ltd.
- Viglen House
- Alperton Lane
- Alperton
- Middlesex
- HA0 1DX