

# HDAMB User's Guide



Version: 0.70  
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**Overview**

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Install**

**BIOS  
Setup**

**Appendix**

# AccelerTech ServerBoard Manual

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## Overview

Thank you for choosing this high performance motherboard. This is a dual AMD® Opteron micro-Socket 940 motherboard (M/B) based on the ATX form factor and features both the AMD® HyperTransport I/O Hub (8111) and the AMD® AGP Tunnel (8151)chipset. The board features a Hyper Transport bandwidth of 6.4 GB/s.

For memory options, there are four (4) sockets to support up to 8 GB of memory using 184-pin Registered PC2700/2100 ECC DDR memory modules.

Flexibility and expandability are provided by five (5) 32-bit/33Mhz PCI slots and an 8x AGP slot. This selection of PCI slots permits the use of numerous add-on cards and Peer PCI transaction support provides increased system performance.

Other features include an onboard Promise Serial ATA interfaces, a Broadcom Gigabit Ethernet controller, an onboard RealTek ALC-650 audio chip, IEEE 1394 and USB 2.0 to provide high system capabilities that meet a wide range of demanding applications.

Before we begin the manual, we would like to go over some precautions to insure the safety of both the MainBoard and the technician/operator. Please read the **General Safety**, **ESD**, and **Operating Precautions** in their entirety before beginning.

This Section is divided as follows:

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## GENERAL SAFETY PRECAUTIONS

- \* Keep the area around the Server clean and free of clutter.
- \* Servers weigh a lot. They can average about 50 lbs. (~22.68 kg)  
When lifting the system, two people should lift slowly from opposite ends with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- \* Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- \* While working on the system, do **not** wear loose items such as neckties and unbuttoned shirt sleeves. They can come into contact with electrical circuits or get pulled into a cooling fan.
- \* Remove any jewelry or metal objects from your body, which are excellent metal conductors and can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

## !System Safety!

### ESD PRECAUTIONS

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- \* Use a grounded wrist strap designed to prevent static discharge.
- \* Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- \* Touch a grounded metal object before removing the board from the antistatic bag.
- \* Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- \* Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- \* When handling chips or modules, avoid touching their pins.
- \* Put the motherboard and peripherals back into their antistatic bags when not in use.
- \* For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- \* After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

### OPERATING PRECAUTIONS

Care must be taken to insure that the chassis cover is in place when the server is operating to assure proper cooling. **Out of warranty** damage to the server can occur if this practice is not strictly followed.

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## ABOUT THIS USER'S MANUAL

This manual explains how to build your system in detail. Please follow the procedures in this User Manual carefully and pay special attention to these icons.

 <b>IMPORTANT</b>	This icon informs you on particularly important details regarding the setup or maintenance of your system. While we point out the most vital paragraphs in a chapter, you should always read the entire section carefully.
 <b>WARNING</b>	This icon alerts you to potential dangers during the setup of your system. These warnings should <b>not</b> be considered as the whole of your safety precautions. Never forget that computers are electronic devices and are capable of delivering and receiving shocks. Prevent damage to yourself and your MainBoard by always working with proper grounding straps and making sure that your system is turned off and unplugged whenever you are working on it.
 <b>NOTE</b>	This icon brings certain notes to your attention during the setup process. It provides you with useful information especially for setting up a new system.
 <b>TIP</b>	This icon gives you tips on how to configure your system in simple and easy ways. This icon provides useful descriptions in helping you configure your system.

## GETTING HELP

If a problem arises with yours system during Installation or Operation, you should first ask your dealer for help as they have most likely configured your system. They generally have the best grasp of your issues and the fastest response for your symptoms. If your dealer is near your location, it is recommended that you first bring your system to them to have it serviced instead of attempting to solve the problem yourself.

If those options don't work for you, RioWorks also provides some helpful resources to help you.

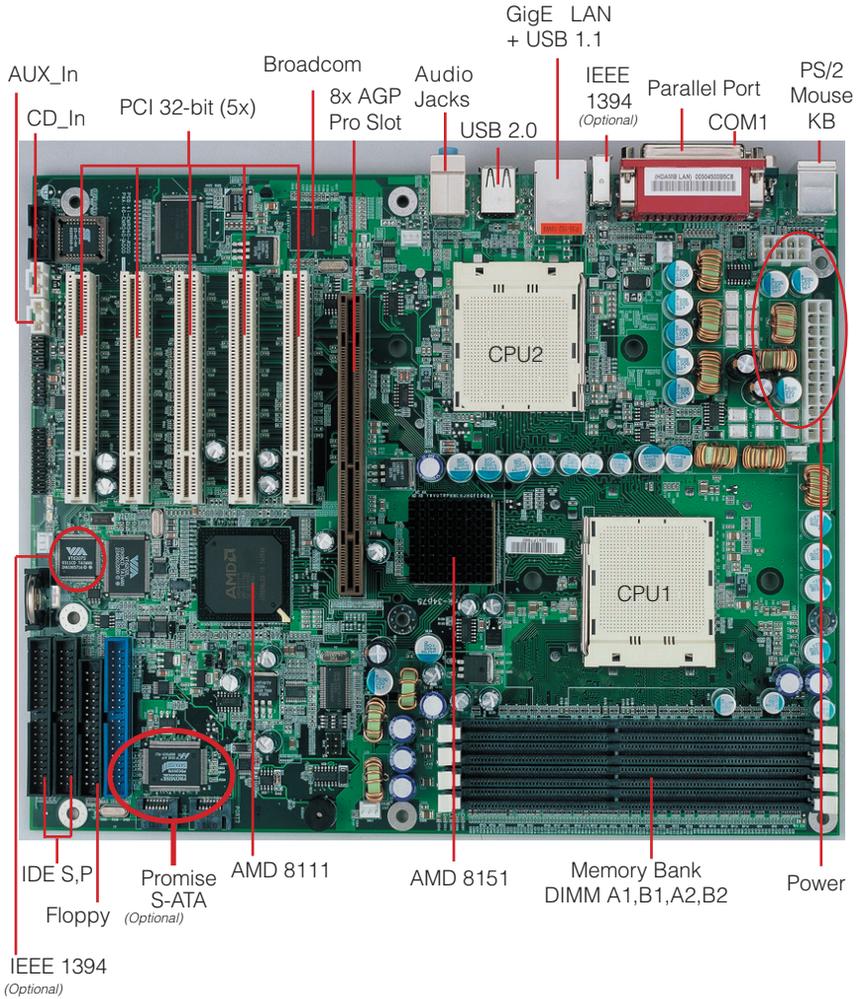
1. Visit RioWorks™ website at [www.RioWorks.com](http://www.RioWorks.com) and navigate to this product's page which contain links to product updates such as Jumper settings or BIOS updates.
2. The FAQ (*Frequently Asked Questions*) sections in the RioWorks™ website are often helpful since other users often have the same questions.
3. Email us at: [sales@RioWorks.com](mailto:sales@RioWorks.com) and we will try to answer your questions within 24 hours. Before you email your symptoms to [sales@RioWorks.com](mailto:sales@RioWorks.com), fill in the *symptom report* to inform and aid our engineers in solving your problem quickly.

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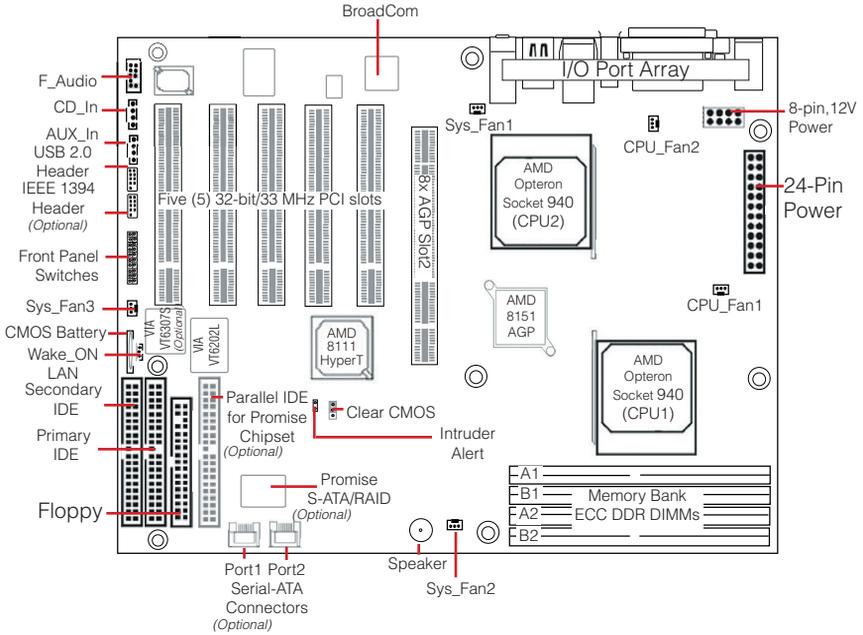
## WORKSTATIONBOARD SPECIFICATIONS

Processor	AMD Dual Opteron Socket 940 CPUs * Supports 1.8 GHz and faster * HyperTransport of 6.4 GB/s bandwidth * Built-In Memory Controller Hub (MCH)
Chipset	* AMD 8111 (HyperTransport I/O Hub) * AMD 8151 (AGP Tunnel)
Memory	* 4 + 0 socket for 184-pin DDR DIMM sockets * Uses Registered PC2700/PC2100 ECC DDR memory * Supports total system memory size of up to 8 GB
Internal I/O connectors	* 34-pin Floppy Connector * 4-pin CD-In and Aux-In audio input connectors
Accelerated Graphics Port	8x AGP Pro slot
IDE Bus	* 2x 40-pin IDE connectors, supports up to four (4) Enhanced IDE devices * Dual Channel Master Mode * Ultra DMA 133/100/66/33
On-Board LAN	Integrated single Broadcom 5702 Gigabit Ethernet Controller
Audio	Integrated Realtek ALC-650, Professional 6-channel Audio * AC '97 CODEC
USB	Integrated VIA VT6202L with four (4) USB 2.0 ports (2x onboard, 1x header)
Expansion Slots	5x PCI 32 bit / 33 MHz
Rear Panel I/O	PS/2 mouse and keyboard connectors with Wake-Up function 1x UART 16550 serial port (COM1) 1x 25-pin parallel port with ECP/EPP support 2x onboard USB 1.1 connectors 1x GigaBit Ethernet LAN RJ-45 port Audio Phone Jacks - Speaker Out, Mic In, Line-In.
System Management	Hardware Monitor (CPU Thermal, Fan, Voltage, Intrusion) Super I/O NS87366
System BIOS	4Mb Flash EEPROM with Phoenix BIOS I2C support. SMBIOS 2.3 and DMI 2.0 compliant Soft Power-Down Secure Boot, Multiple Boot support
Form Factor	Extended ATX form factor (12" x 9.6") EPS 12V power connectors (24 pin + 8 pin)
Serial ATA (Optional)	Promise PDC 20378 chipset * 2 Serial ATA ports and 1 Parallel ATA with RAID 0, 1, and 10
IEEE 1394 (Optional)	Integrated VIA VT6307S for IEEE 1394 port (1x onboard, 1x header)

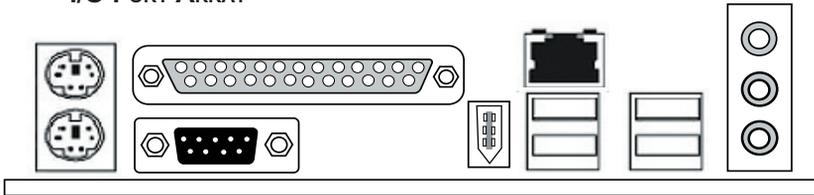
# MAINBOARD LAYOUT



## MAINBOARD MAP



## I/O PORT ARRAY



PS/2 Mouse  
PS/2 KBD

Parallel Port  
COM1

GigE LAN  
IEEE 1394 (Optional)  
USB 1.1  
Ports (2)

Audio Jacks:  
Line-In  
Spk-Out  
Mic-In

# Hardware Installation

In this section, we detail the procedures for how to install processors and other hardware components in your MainBoard. Go to the specific sections to read more about section you are interested

This section is divided as follows:

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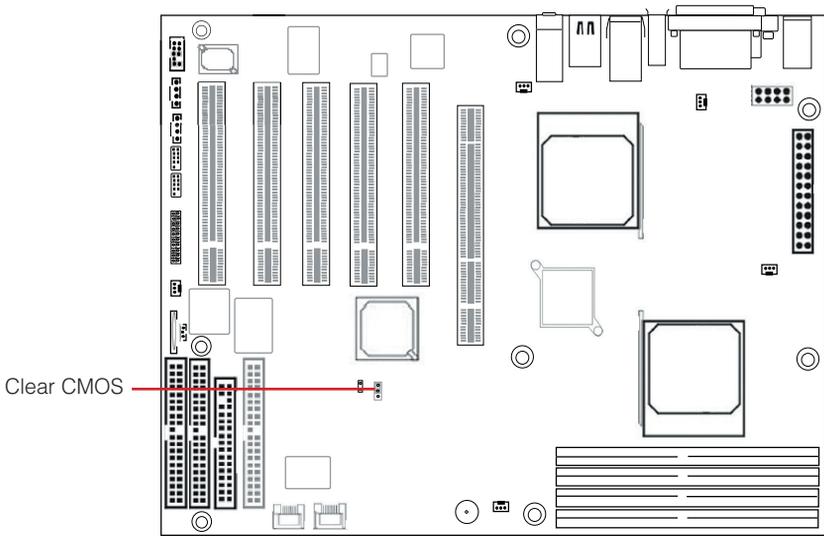


## WARNING

This motherboard contains sensitive electronic components that can be easily damaged by static electricity. Follow the instructions carefully to ensure correct Installation and to avoid static damage.

## MAP OF JUMPERS

Refer to the following illustration to find the location of the MainBoard's jumpers

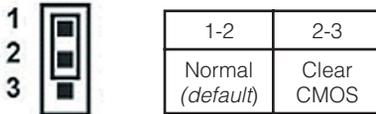


**Hardware  
Install**

## JUMPER SETTINGS

### Clear CMOS Header

The onboard button cell battery powers the CMOS RAM. It contains all the BIOS setup information. Keep the jumper connected to pins 1-2 (Default) to retain the RTC data as shown below.



Under certain circumstances, you will need to reset system settings. Follow these instructions to clear the CMOS RTC data:

1. Turn off the computer.
2. Short pins 2 and 3 with a jumper for a few seconds.
3. Replace the jumper to pins 1 and 2.
4. Turn on your computer by pressing the power-on button.
5. Hold down <F2> during boot and select either <Load Optimal Defaults> or <Load Failsafe Defaults> in the "Exit" section. Then go through the BIOS setup to re-enter user preferences. Refer to Chapter 2 BIOS SETUP for more information.

## INSTALLING MEMORY

This MainBoard uses Dual Inline Memory Modules (DIMM). Two 4-DIMM socket memory banks are available, one memory bank for each CPU socket. The DIMM sockets accommodate 184-pin PC2100/PC2700 (DDR266/DDR333) and Double Data Rate (DDR) memory modules in 128MB, 256MB, 512MB, 1GB and 2GB size combinations. Total installed memory size is between a minimum of 128MB to a maximum of 8GB.

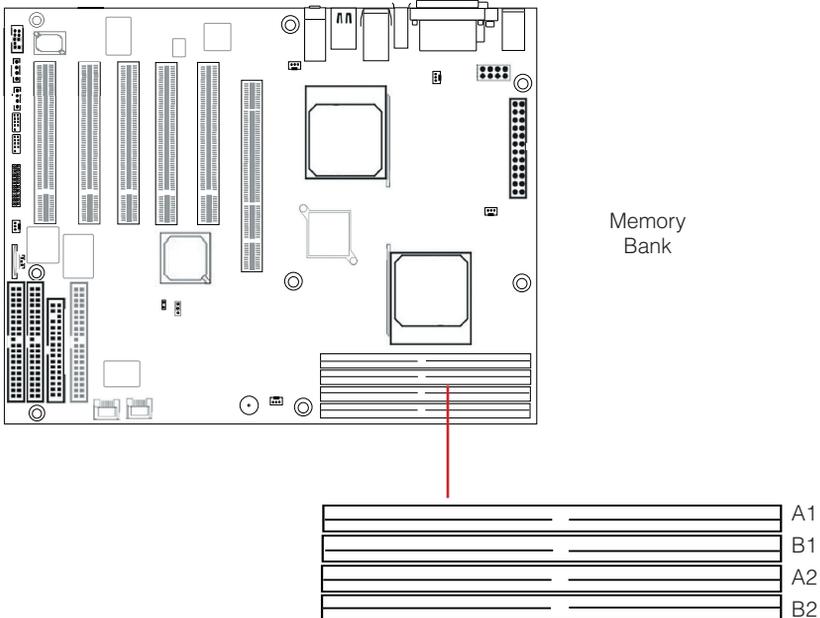


### IMPORTANT

- \* The MainBoard has strict memory and timing requirements. Before buying DDR (Double Data Rate) DIMMs for use with the MainBoard, it is recommended that you consult your local reseller for the best and most compatible memory to use.
- \* This MainBoard only supports Registered PC2100/PC2700 (DDR266/DDR333) compliant modules.

### Memory Installation Procedures

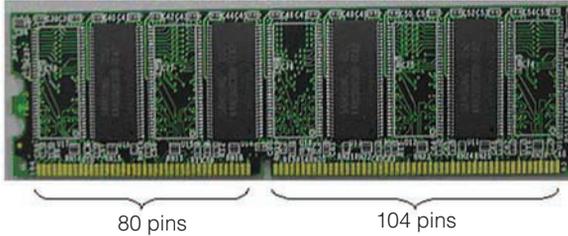
This section outlines how to install Registered PC2100/PC2700 DDR DIMMs into the MainBoard.



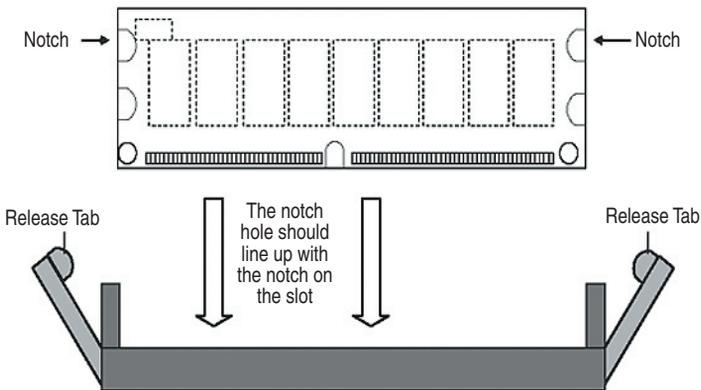
1. Locate the Memory Bank on the MainBoard, where you will be installing the DIMMs.

*Installing Memory continued...*

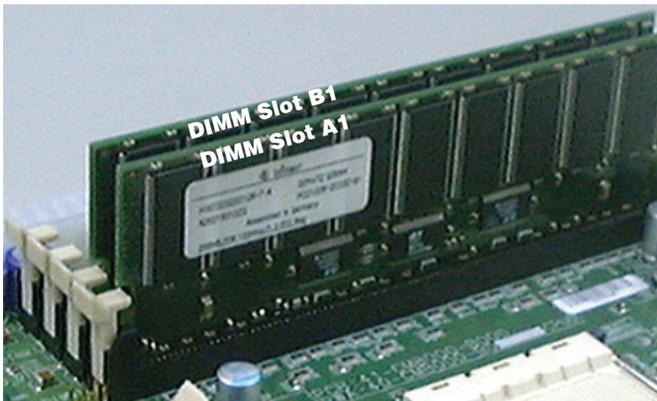
2. Make sure the DIMM's pins are facing down, and check that the pin arrangement on the memory module resembles the one pictured below.



3. Insert the module into the DIMM socket and press down evenly on both ends firmly until the DIMM module is securely in place. (The tabs of the DIMM socket will close-up to hold the DIMM in place when the DIMM is properly installed on the socket's bottom.)



4. Repeat step 1 to step 3 for all additional DIMM modules.





## IMPORTANT

- \* The Opteron features a 128-bit wide DDR memory interface. To take advantage of the 128-bit interface, you must install DIMMs in pairs of two (2). DIMM slots A1 and B1 are paired, and slots A2 and B2 are paired. If you are only installing two DIMMS into a Memory Bank, it is recommended that you install them in slots A1 and B1 to get the full bandwidth.
- \* To ensure compatibility, only use DIMM pairs of the same exact type and size and made by the same company. Refer to "Appendix A: Recommended Memory Modules" for a list of supported DIMMS.

## RECOMMENDED MEMORY CONFIGURATIONS

The AMD Opteron processors have very specific memory module requirements, and due to the design of the MainBoard, there are certain configurations of memory that work best to make the most effective use of the memory bandwidth.

The AMD Opteron features 128-bit DDR memory channels. DDR Memory Modules are only 64-bit. In order to benefit from the full bandwidth, you should always install the DIMMS in pairs. The MainBoard is designed to pair up DIMM slots A1/B1 and slots A2/B2 for the 128-bit pathway.

The DIMM memory banks are shared over the dual CPU sockets. It is possible to operate a system with two CPUs and only a pair of DIMMs in the memory bank.

The Opteron does support 64-bit only operation, but due to the design of the DIMM banks, the single DIMM must be inserted in either DIMM slot A1 or DIMM slot A2 to function. The system will NOT boot otherwise.

The following is our recommended DIMM installation path based on the number of DIMMS being installed (Remember to check that the DIMMS are 2.5V Registered ECC DDR PC2100/PC2700/DDR266/DDR333 DIMMS and that they appear on in **Appendix A: Recommended Memory Modules**):

If you have...	You should install them in...
1 DIMM	Slot A1 or slot A2 <i>(Note: this configuration only provides 64-bit memory access)</i>
2 DIMMs	Slots A1/B1 OR Slots A2/B2
4 DIMMs	Slots A1,B1,A2,B2

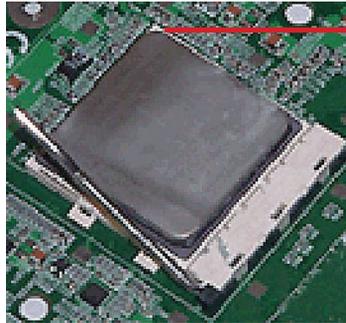
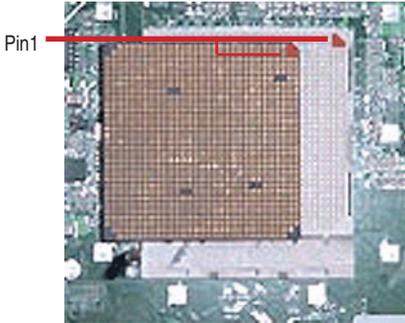
## INSTALLING THE PROCESSOR AND HEATSINK

The MainBoard accommodates AMD® Opteron micro-PGA Socket 940 processors and a HyperTransport bandwidth of 6.4 GB/s. You must first insert a CPU into CPU socket 1 (CPU1) before installing one in CPU socket 2 (CPU2).

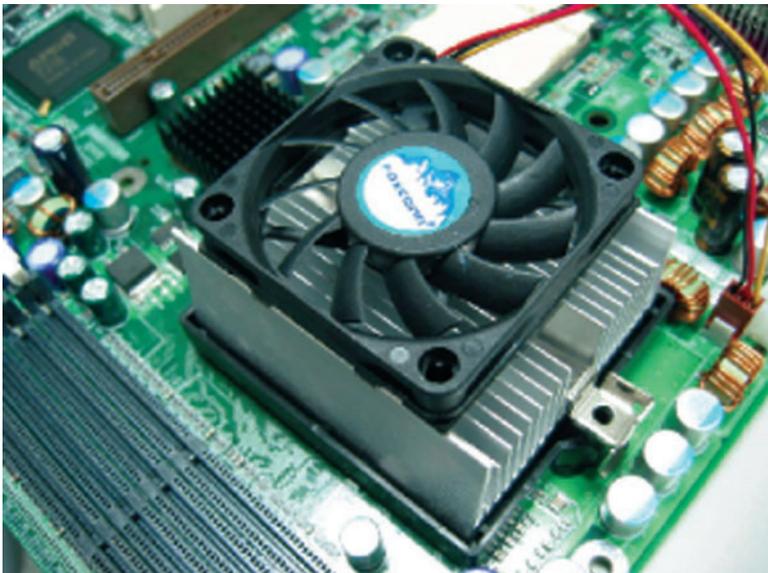
### *Processor (CPU) Installation*

This section outlines how to install a CPU into the MainBoard

1. Locate Pin 1 on the CPU socket and Pin 1 on the CPU itself.
2. Lift up the lever on the CPU Socket 940. Then line up Pin 1 on the CPU with the Pin 1 marking on the socket before inserting the CPU into the Socket 940. Check that the CPU is flush in the socket, and lower the lever to lock the CPU in place.

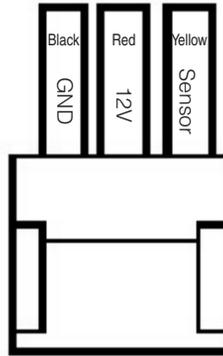
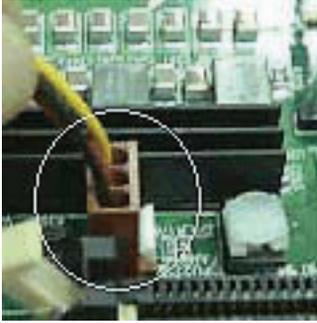


3. Apply Thermal Compound (Thermal grease) to the top of the CPU.
4. Mount the Heatsink on top of the installed CPU by attaching it to the motherboard with the included screws (first on one side, then the other).



*Installing the Processor and Heatsink continued...*

5. Connect the 3-wire fan cable to the CPU\_Fan1 connector on the motherboard.

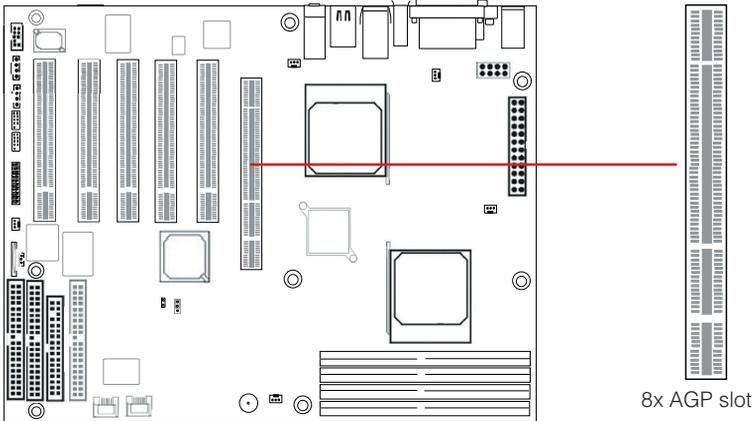


6. Repeat steps 1 thru 5 to install a second CPU (CPU2)

## THE AGP PRO SLOT

The MainBoard does not feature an integrated video solution. Therefore, you will need to install a video card to use the MainBoard. The Accelerated Graphics Port Pro (AGP Pro) slot is specifically designed to support a new generation of AGP graphics cards with ultra-high memory bandwidths (up to 8x).

This mainboard supports 4x/8x (1.5V) and 3.3V AGP video cards. The MainBoard will automatically supply extra voltages as necessary to adapt to the installed AGP card.



**Hardware  
Install**



AGP 2x Notch    AGP 4x/8x Notch

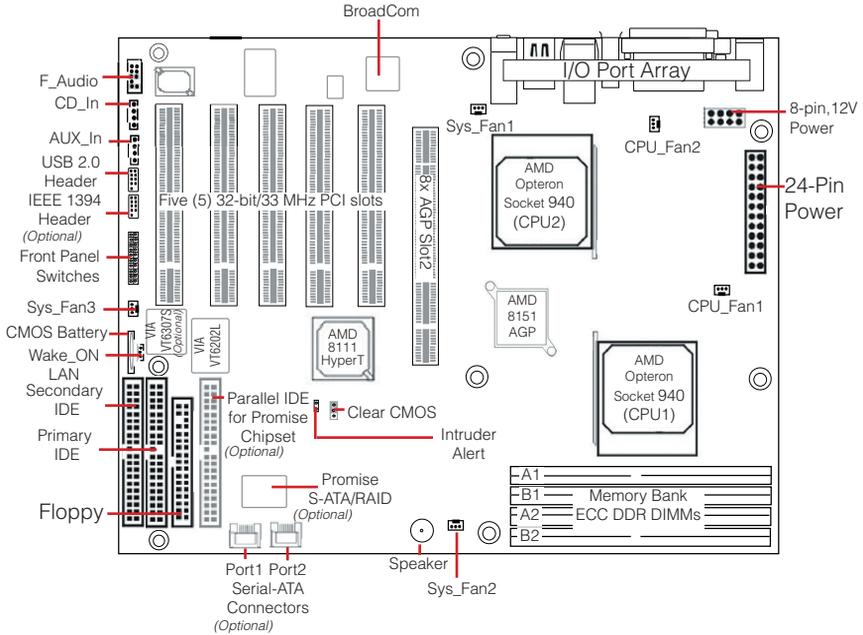


### IMPORTANT

- \* Both 1.5V and 3.3V AGP cards are supported by this 8x AGP Pro slot. Refer to the documentation that came with your AGP card for more information on Card Settings..

## MAP OF MAINBOARD CABLE CONNECTORS

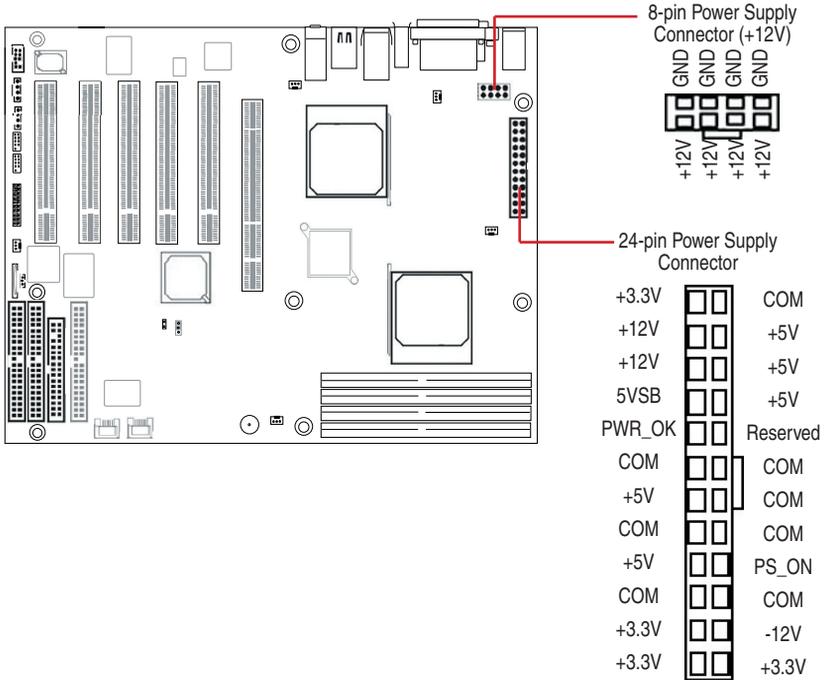
The following map of the MainBoard illustrates the location of all the connectors on the MainBoard. Use this map to aid you in connecting devices to your MainBoard.



**Hardware Install**

## ATX Power Connectors

ATX 24-pin connectors connect the MainBoard to the ATX power supply. Find the proper orientation of the connectors and push down firmly to make sure that the pins are aligned (the connector will only insert properly when properly aligned). The 8-pin connector is a dedicated power connector to supply power for the CPUs. For Wake on LAN support, the 5-volt Stand-by lead (+5VSB) from the ATX power supply must supply at least 2A.



### IMPORTANT

It is recommended that you use an ATX Power Supply that complies with the Intel ATX 2.03 specification.

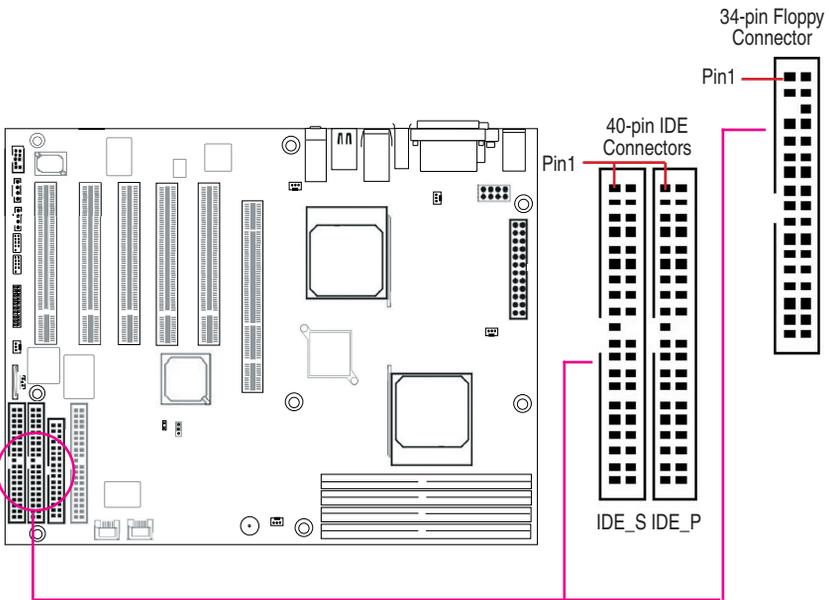
## FLOPPY DISK DRIVE CONNECTOR

This 34-pin connector supports the standard floppy disk drive ribbon cable. Connect the single connector end to the MainBoard. Then, plug the other end of the ribbon into the floppy drive. Make sure you align the Pin 1 on the connector with the Pin 1 alignments on the MainBoard and the floppy drive.

## PRIMARY IDE CONNECTORS

The two 40-pin IDE connectors (primary and secondary channels) support 80-conductor IDE ribbon cables. Connect the single connector end to the MainBoard. Then, connect the two connectors at the other end to your IDE device(s). If you connect two hard disks to the same cable, you must set the second drive as a **Slave** through its jumpers settings. Refer to the IDE device's documentation for the specific jumper settings. (Pin 20 is removed to prevent the connector from being inserted in the wrong orientation when using ribbon cables with pin 20 plugged in). The BIOS supports Ultra DMA 33/66/100/133.

Hardware  
Install

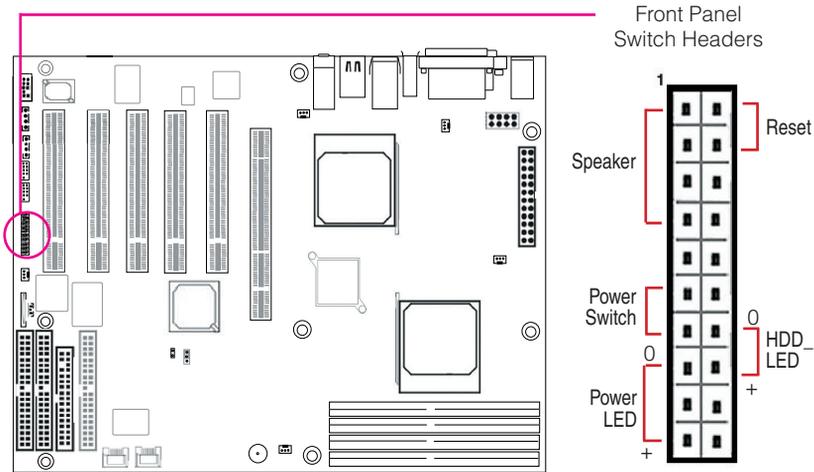


### IMPORTANT

Ribbon cables should always be connected with the red stripe on the Pin 1 side of the connector. IDE ribbon cables must be less than 46 cm (18 inches) long, with the second drive connector no more than 15 cm (6 inches) away from the first connector.

## FRONT PANEL SWITCHES

The front panel switches header connects the front control panel buttons and LEDs to the MainBoard.



### *Reset Switch (2-pin RST)*

This 2-pin connector connects to the chassis-mounted reset switch for rebooting your computer without turning your power switch off and on. This is a preferred method of rebooting your system to prolong the life of your system's power supply.

### *Hard Disk Activity LED (2-pin HDD\_LED)*

This connector supplies power to the chassis's HDD/IDE activity LED. Read and Write activity by devices connected to the Primary or Secondary IDE connectors will cause the front panel LED to light up.

### *Speaker Connector (4-pin SPEAKER)*

There is one jumper over pin1 and pin2 (*default setting*) for the internal buzzer. If you want to use the external case-mounted speaker instead of the internal buzzer, remove the jumper and connect the speaker wire to the 4-pin connector.

### *ATX Power Switch / Soft Power Switch (2-pin PWR\_SW)*

A momentary switch connected to this 2-pin connector controls the system power. Pressing the button once will switch the system between ON and SLEEP mode. The system power LED shows the status of the system's power.

### *System Power LED (3-pin PWR\_LED)*

This 3-pin connector connects to the chassis-mounted system power LED, which lights up when the system is powered on.

**Hardware  
Install**

## FRONT/BACK/CPU/AUX FAN CONNECTORS

There are nine 3-pin fan connectors in the MainBoard motherboard. Two fans are used for CPU0 and CPU1; seven are for auxiliary power. These connectors support cooling fans of 500mA (6W) or less. Depending on the fan manufacturer, the wiring and plug may be different. Connect the fan's plug to the MainBoard with respect to the polarity of the fan connector.

3-pin Fan Connector



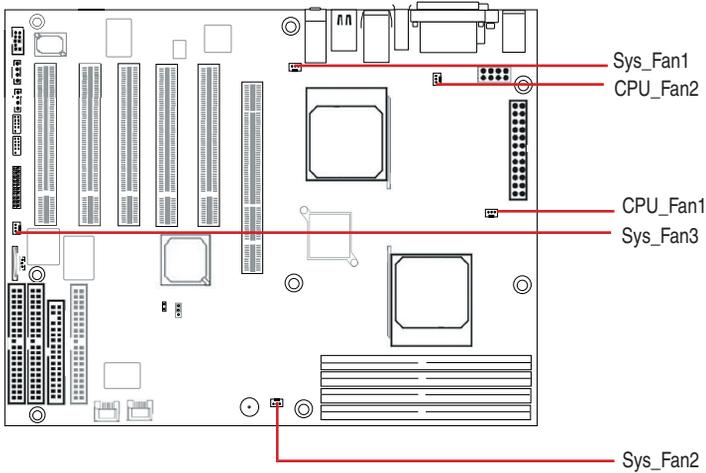
Sensor +12V GND



### WARNING

The CPU and/or motherboard will overheat if there is not enough airflow across the CPU and onboard heatsink. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. These are NOT jumpers, do NOT place jumper caps over these pins.

Hardware  
Install

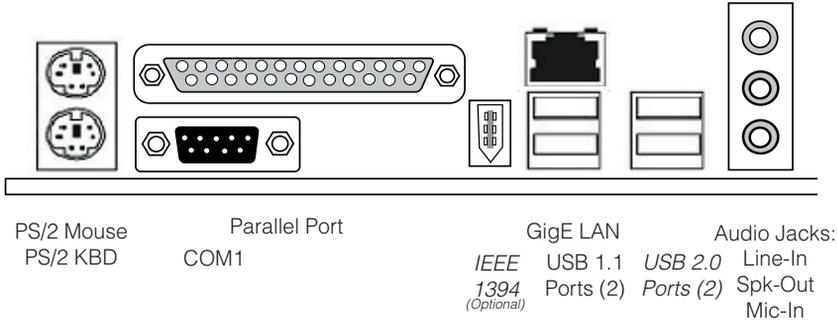


### NOTE

- \* The "Rotation" signal can only be used with fans specially designed for the rotation signal.
- \* Only fans connected to CPU\_Fan1 and CPU\_Fan2 are monitored by the BIOS.

## REAR PANEL I/O PORTS

This is an illustration of the MainBoard rear I/O port array



### *PS/2 Mouse Connector (6-pin Female)*

The system will direct IRQ12 to the PS/2 mouse if one is detected. If no mouse is detected, IRQ12 will be free for expansion cards to use.

### *PS/2 Keyboard Connector (6-pin Female)*

This connection is for standard keyboards using a PS/2 (mini DIN) plug. This connector will not accept standard AT size (large DIN) keyboard plugs. You may need a DIN to mini DIN adapter for standard AT keyboards.

### *Universal Serial Bus Ports (4-pin Female)*

Two (2) onboard external USB 1.1 ports are available for connecting USB devices. Depending on your MainBoard model, you may have two (2) onboard USB 2.0 ports available. Refer to **USB 2.0 Ports & Header** for more information.

### *IEEE 1394 / FireWire Connector (6-pin Male) (Optional)*

Depending on your MainBoard model, you may have one (1) onboard IEEE 1394 connector port for connecting FireWire devices. Refer to **IEEE 1394 Ports & Header** for more information.

### *Serial Port (COM1) Connector (9-pin Male)*

The COM1 serial port can be used for pointing devices or other serial devices. See BIOS for more on serial port setup.

### *Parallel Printer Connector (25-pin Female)*

You can enable the parallel port and choose an IRQ through the BIOS. You can choose between ECP and EPP support through the BIOS setup.

### *Onboard LAN Port (RJ-45)*

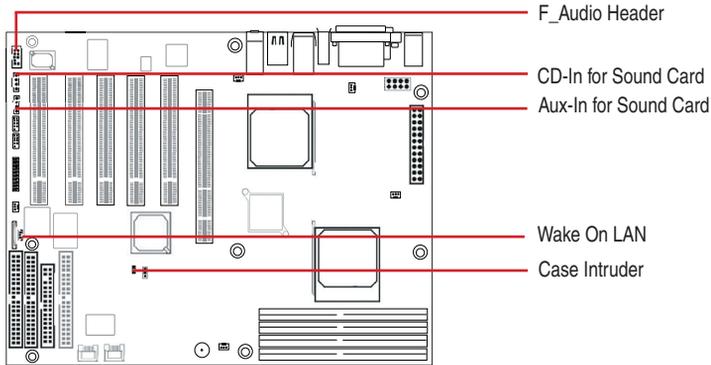
This MainBoard uses the Broadcom BCM5702 Gigabit Ethernet Controller. The controller consists of both the Media Access Controller (MAC) and Mbps Physical Layer (PHY) interface. Refer to the "Onboard LAN User Guide" for further information.

### *Audio Jacks (Phone Jacks)*

The interface with the onboard RealTek ALC-650. It has 3 phone jacks for Speaker-Out, Microphone In, and Line-In.

## ADDITIONAL I/O CONNECTORS

The MainBoard also contains connectors for adding additional ports and devices to the MainBoard.



### Front Audio Jumpers and Headers (F\_Audio)

In order to use the front audio connector, you need to have a chassis that has a front-audio connector. Make sure that the pin assignment of the cables are the same as the pin assignment on the MainBoard

\* If you want use the rear audio connectors, keep the jumpers installed. (*Default setting*)

\* If you want use front audio connectors, remove the jumpers and connect the Front Audio Connector Cable.



F_Audio Pin Assignments			
Pin	Desc.	Pin	Desc.
1	Mic1	2	GND
3	Mic2	4	Power
5	Front Audio R	6	Rear Audio R
7	Reserved		
9	Front Audio L	10	Rear Audio L

### CD\_In & Aux\_In Audio Inputs (4-pin)

There are both CD-In and Aux-In 4-pin connectors to connect your internal sound devices to the Sound Card. See Audio for setup information.

4-pin Onboard  
Audio Header



Audio Pin Assignments	
Pin	Description
1	Audio- L
2	Ground
3	Ground
4	Audio - R

### Case Intruder (2-pin)

This connector enables the Case Open / Intruder Alert item in the Hardware Monitor. Connect this header to the appropriate cable in the system chassis to enable.



*Additional I/O Connectors continued...*

### *Wake On LAN (3-pin)*

This connector enables an expansion LAN card to boot up and control the system. The connector powers on the system when a WakeUp packet or signal is received through the LAN card. Use the Wake\_ON\_LAN cable to connect the MainBoard to the expansion card.



WOL Pin Assignments	
Pin	Description
1	PME
2	Ground
3	+5 V StandBy

## INSTALLING EXPANSION CARDS

This outlines the procedure for adding expansion cards to your MainBoard. Remember to read the documentation for your expansion cards and make the necessary hardware and software setting changes (i.e. jumper settings).

The MainBoard features five (5) PCI-32 (32-bit, 33MHz) slots to accommodate PCI expansion cards.

1. Remove the bracket plate on the slot you intend to use. Keep the bracket for possible future use.
2. Insert the PCI card into the correct slot on the MainBoard, pushing down with your thumbs evenly on both sides of the card.
3. Secure the card on the slot with the screw you removed above.



### **WARNING**

Completely power OFF your power supply when adding or removing any expansion cards or other system components. Failure to do so may cause severe damage to both your MainBoard and expansion cards.

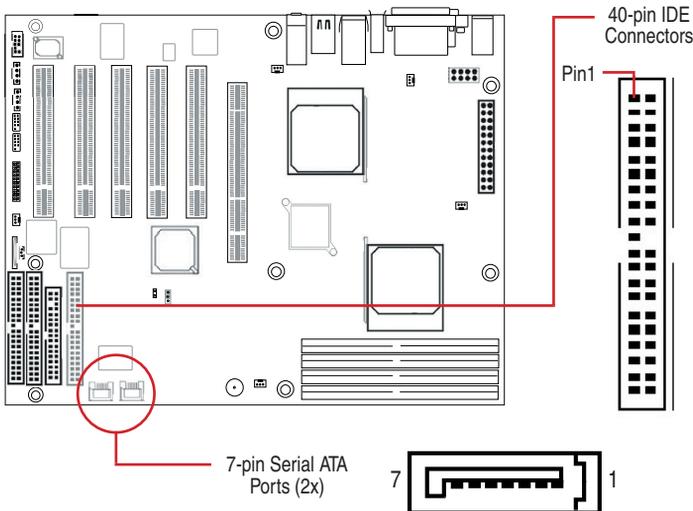
## PROMISE CHIPSET AND SERIAL ATA (OPTIONAL)

The Serial version of this MainBoard is equipped with an integrated Promise PDC20378 Serial ATA chipset. This chipset supports up to 4 IDE devices at transfer rates of up to 150MB/s.

The Promise Chipset also supports RAID configurations. RAID stands for "Redundant Array of Independent Devices" and provides different levels of safety, redundancy and performance. This chipset supports RAID 0, 1, and 10, which are defined as follows:

RAID Type	Description
RAID 0	Striping: high performance, designed ot connect multiple drives to act as one
RAID 1	Mirroring: writes data to two drives at once in case one drive fails, the other one will be a complete replica and can continue on. Full fail-over
RAID 10	a combination of RAID 0 and 1: over 4 drives, The drives are split in half and striped together, and the 2 new striped drives are then mirrored.

The Serial version of this MainBoard features two (2) Serial ATA ports and a Blue 40-pin connector for 2 parallel IDE devices. Refer to the documentation that came with the drives for more information about settings and installation.



Serial ATA Pin Assignments	
Pin	Description
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

## INTEGRATED AUDIO

This MainBoard features an integrated RealTek ALC-650 audio chip. It is a professional 6-channel processor using the AC '97 CODEC. Due to that, there are a few extra connectors dedicated to the audio capabilities of this chip.

There is a Front Audio Connector with Jumpers. There is a bar of phone jacks in the back for audio output that can be used as normal (Speaker Out, Mic In, Line In) or you can modify the Windows XP configuration to get 6 speaker sound using the same 3 phone jacks.

## USB 2.0 PORTS AND HEADER

The Serial Version of this MainBoard features the VIA VT6202L chip integrated into the board. This chip supports four (4) USB 2.0 ports. USB 2.0 supports transfer rates of up to 480MB/s. Two show up on the on-board I/O array, and a header completes the last two (2) for external installation.

5-pin Onboard  
USB Header



USB Pin Assignments	
Pin	Description
1	VCC
2	Data -
3	Data +
4	Ground
5	NC / Key

## IEEE 1394 (FireWire) PORTS AND HEADER (OPTIONAL)

The Serial Version of this MainBoard features an integrated VIA VT6307S chip which supports two (2) IEEE 1394 (Firewire) ports. IEEE 1394 (FireWire) supports transfer rates of up to 400MB/s. One port is installed on the on-board I/O array, and a header completes the last port for external installation.

9-pin Onboard  
IEEE 1394 Header



IEEE 1394 Pin Assignments			
Pin	Desc.	Pin	Desc.
1	TPB+	2	TPB-
3	GND	4	GND
5	TPA+	6	TPA-
7	VCC	8	VCC
9	N/C		

## POWERING ON YOUR SYSTEM

Follow these instructions to power on the computer after you have installed the MainBoard and all system devices.

1. Be sure that all switches are off (in some systems, Off is marked by "O").
2. After double-checking all jumper settings and connections, close the system chassis cover.
3. Connect the power cord to the power cord connector located on the power supply at the back of your system chassis and plug the power cord into a power outlet that is equipped with a surge protector.
4. Turn on your devices in the following order:
  - Monitor
  - External SCSI devices (starting with the last device on the chain)
  - System power

For ATX power supplies, you need to switch On the power supply, then press the ATX power switch on the front of the chassis the first time you start up the system.

5. The power LED on the front panel of the system case will light up. For ATX power supplies, the system LED will light up when the ATX power switch is pressed. The monitor LED may light up after the system's LED if it complies with "Green" standards or if it has a power standby feature. The system will first run its "power-on" tests. While the tests are running, additional messages will appear on the screen. If you do not see anything on the screen within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Re-check your jumper settings and connections. Contact your retailer/dealer for assistance if everything else fail.
6. During power-on, hold down <F2> to enter BIOS setup. Follow the instructions in BIOS for further setup information.

**Hardware  
Install**



### NOTE

To Power OFF your system, You have to first exit or shut down your operating system before switching OFF the power switch. In most operating systems with ATX power supplies, the Advanced Power Management Interface (APMI) features will turn the computer off automatically. In some ATX power supplies, you need to press the ATX power switch after exiting or shutting down your operating system to turn off your system.

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# BIOS

This chapter discusses the PhoenixBIOS Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration.

The BIOS is the Basic Input / Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The PhoenixBIOS flash chip stores the system parameters, such as type of disk drives, video displays, etc. in the CMOS. When the computer is turned off, a back-up battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the computer is powered-on the computer is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot-up.

The PhoenixBIOS installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

This section is divided up as follows:

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Using the BIOS Setup Utility	C-30
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## STARTING THE BIOS SETUP

The PhoenixBIOS is immediately activated every time you power on the system. The BIOS reads the system information contained in the CMOS and begins the process of checking the system and configuring it. After configuring the system, the BIOS will follow the Boot Order to seek out an operating system. The BIOS then turns control of the system over to the operating system.

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility.

1. Power on the System.

*Note: Normally, the only visible POST (Power On Self Test) routine is the memory test.*

2. As the memory is being tested, you can access the BIOS Setup Utility by pressing the <F2> key when "Press F2 to enter SETUP" appears briefly at the bottom of the screen.

From the main menu of the BIOS Setup Utility, you can access the other setup screens, such as the Security and Power menus.

## USING THE BIOS SETUP UTILITY

Navigating through the BIOS Setup Utility is straight forward. Use the arrow keys to highlight items, press <Enter> to select items in menus, and press <Esc> to quit. The following table provides more details about how to navigate in the Setup program using the keyboard.

Up ArrowKey	Move to the previous item
Down Arrow Key	Move to the next item
Left Arrow Key	Move to the previous menu
Right Arrow Key	Move to the next menu
<Esc> key or <Alt-X>	In the Submenu: Exit the submenu. In the BIOS main menu: Jump to the Exit Menu
<Enter> Key	Select the highlighted item. When available, a pop-up list will display for you to select the item value or select a submenu
<PgUp> Key	Previous page on Scrollable menus or Jump to the first interactive item listed
<PgDn> Key	Next page on Scrollable menus or Jump to the last interactive item listed
+ Key	Increase the numeric value or make a change
- Key	Decrease the numeric value or make a change
<F1> Key or <Alt-H>	General Help on Setup navigation keys. Press <F1> key to view a small help window that describes the appropriate keys to use and the possible options for the highlighted item. To exit the Help Window, press <ESC> key or press the <F1> key again.
<F5> Key	Select next lower value for field
<F6> Key or <Space>	Select next higher value for field
<F7> Key	Load Optimal Defaults this page
<F9> Key	Load Configuration
<F10> Key	Save Configuration and exit the BIOS Setup Utility
<Tab> or <Shift-Tab>	Select Next / Previous Field in the menu
<Home> or <End>	Move cursor to top or bottom of window.
<PgUp> or <PgDn>	Move cursor to next / previous page in scrollable menus.
<Alt-R>	Refresh screen.

### *Navigating the Menus*

Use the arrow keys to move between the options. The scroll bar on the right of any window indicates that there is more than one page of information in the window. Use <PgUp> and <PgDn> to navigate between the pages. Pressing <Home> and <End> displays the first and last page. Press <Esc> to exit the current window.

### *The Field Help Window*

The help panel/window on the right side of each menu displays the help text for the currently selected field. It updates as you move through each field.

### *Activating SubMenus*

Use the arrow keys to move the cursor over the desired submenu option. Press <Enter> and the submenu will be accessed. A » symbol designates all submenus.

### *Saving Values*

To Save the values you have just set, move the cursor to the Exit Menu. The Save Values option saves all values currently displayed in the menus.



## **IMPORTANT**

The BIOS does NOT automatically save values that you have modified. If you do not save your values before you exit the BIOS Setup Utility, all your changes will be lost.

If after making and saving system changes with the BIOS Setup Utility, you discover that your computer is no longer able to boot, the PhoenixBIOS supports an override, which will reset your system to the Failsafe defaults. If that fails, it is possible to manually clear the present CMOS information through the "Clear CMOS Header" on the motherboard (Refer to Jumper Settings for more information).

The best advice is to ONLY alter settings which you thoroughly understand. The default settings have been carefully chosen by PhoenixBIOS to provide the maximum system performance and reliability. Even a slight change to the chipset setup may cause potential and unpredictable failure to the system.

## BIOS SETUP MAIN MENU

This is the first screen that is displayed when you enter the BIOS Setup Utility.

PhoenixBIOS Setup Utility		Server	Exit
Main	Advanced	Security	Power Boot
System Time: [16:19:20]			Item Specific Help  <Tab>, <Shift-Tab>, or <Enter> selects field
System Date: [03/02/2003]			
Legacy Diskette A: [1.44/1.25 MB 3½"]			
Legacy Diskette B: [Disabled]			
» Primary Master 6449 MB			
» Primary Slave None			
» Secondary Master CD-ROM			
» Secondary Slave None			
HDD Post Write Buffer: [Disabled]			
Large Disk Access Mode: [DOS]			
Boot Summary Screen: [Disabled]			
Extended Memory Testing: [Just zero it]			
System Memory: 640 KB			
Extended Memory: 31744 KB			
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults			
ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit			

You can make these modifications on the Main Menu itself. Select the Submenus to modify those settings.

Feature	Options	Description
System Time	HH:MM:SS	Set the system time. <Tab>, <Shift-Tab> or <Enter> selects field
System Date	MM/DD/YYYY	Set the system date. <Tab>, <Shift-Tab> or <Enter> selects field
Diskette A Diskette B	Disabled 360 KB, 5 ¼" 1.2 MB, 5 ¼" 720 KB, 3 ½" 1.44/1.25 MB, 3 ½" 2.88 MB, 3 ½"	Selects floppy-disk type installed in your system. Note that 1.25 MB 3½" references a 1024 byte/sector Japanese media format. The 1.25 MB 3½" diskette requires a Mode 3 floppy disk drive.
HDD Post Write Buffer	Disabled Enabled	Enable/disable HDD post write buffer support. Enable this item for better performance.
Large Disk Access Mode	Other DOS	Unix, Novell Netware or other operating systems, select "Other".  * A large disk is one that has: - more than 1024 cylinders, - more than 16 heads, or - more than 63 tracks per sector
Boot Summary Screen	Disabled Enabled	Display system configuration on Boot.
Extended Memory Testing	Enabled Just zero it Disabled	Determines which type of tests will be performed on the Extended memory (above 1M)
System Memory	N/A	Displays amount of conventional memory detected during boot up.
Extended Memory	N/A	Displays the amount of extended memory detected during boot up.

## MASTER AND SLAVE SUBMENUS

The Master and Slave submenus accessed from the Main Menu controls Hard-Disk Drives, Removable-Disk Drives (such as Zip Drives) and CD-ROM Drives.

The PhoenixBIOS 4.0 supports up to two IDE disk controllers. They are referred to as primary and secondary controllers. Each controller supports one master drive and one slave drive. When designing your system, it is recommended that you install your IDE devices on the two controllers as follows (refer to your IDE device's documentation on how to set them as Master or Slave) :

- \* If you have 1 drive: 1 Primary Master
- \* If you have 2 drives: 1 Primary Master, 1 Primary Slave OR  
1 Primary Master, 1 Secondary Master
- \* If you have 3 drives: 2 Masters, 1 Slave
- \* If you have 4 drives: 2 Masters, 2 Slaves

There is one IDE connector for each controller on your machine, normally labeled "Primary IDE" and "Secondary IDE." There are usually two connectors on each IDE ribbon cable. When the ribbon cable is attached to the system's IDE connector and connected to two drives, the device on the end of the cable is the Master. If you set your drive to "Cable Select", then the drive may show up as either a master or a slave depending on which connector it is attached and what other device is connected to the same ribbon cable.

In the Main Menu, it displays the results of Autotyping—information each drive provides about its own parameters (e.g., cylinders, heads, and sectors)—and the drives appear how they are arranged in the system as Primary or Secondary and Masters or Slaves.

Select one of the Master or Slave drive submenus if you need to change your drive settings. Pressing <Enter> on the selected drive displays the following submenu:

PhoenixBIOS Setup Utility			
Main	Primary Master	Item Specific Help	
Type:	[Auto]	<b>User</b> = You enter parameters of hard-disk Drive installed at this connection. <b>Auto</b> = Auto-Types hard-disk drive installed here. <b>1-39</b> = You select pre-determined type of hard-disk drive installed here. <b>CD-ROM</b> = a CD-ROM drive is installed here <b>ATAPI Removable</b> = removable disk drive is installed here	
<b>CHS Format</b>			
Cylinders:	[13328]		
Heads:	[ 15]		
Sectors:	[ 63]		
Maximum Capacity:	6449 MB		
<b>LBA Format</b>			
Total Sectors:	[0]		
Maximum Capacity:	[0MB]		
Multi Sector Transfer:	[16 Sectors]		
LBA Mode Control:	[Enabled]		
32-bit I/O:	[Enabled]		
Transfer Mode:	[Fast PIO 4]		
Ultra DMA Mode:	[Enabled]		
F1 Help	^v Select Item		-/+ Change Values
ESC Exit	<> Select Menu		Enter Select » Submenu F10 Save and Exit

**BIOS Setup**

Master/Slave SubMenu continued...

Use the following chart to configure your Master/Slave devices:

Feature	Options	Description
Type	None 1 to 39 User Auto IDE Removable CD-ROM ATAPI Removable	None = Either that Autotyping is not able to supply the drive type OR the end user has selected "None", disabling any drive that may be installed. User = The end-user supplies the hard-disk/device information. Auto = Autotyping, the drive itself supplies the drive information. IDE Removable = Removable read-and-write media drive (e.g., IDE Zip drive). CD-ROM = Readable CD-ROM drive. ATAPI Removable = Drive that Reads-and-writes to a media (e.g., LS120, USB Floppy, USB Zip).
CHS Format		* <i>Selectable ONLY when Type = [User]</i>
Cylinders	1 to 65,536	Number of cylinders.
Heads	1 to 16	Number of read/write heads.
Sectors	1 to 63	Number of sectors per track.
Max. Capacity	0 ~ current limit	Displays total disk capacity. <i>Not Selectable</i>
LBA Format		* <i>Selectable ONLY when Type = [User]</i>
Total Sectors	1 to 63	Number of sectors per track. (You do NOT need to set Landing Zone and Write Precomp for IDE drives)
Max. Capacity	0 ~ current limit	Displays total disk capacity. <i>Not Selectable</i>
Multi-Sector Transfers	Disabled 2 sectors 4 sectors 8 sectors 16 sectors	Specify the number of sectors per block for multiple sector transfers. "MAX" refers to the size the disk returns when queried.
LBA Mode Control	Disabled Enabled	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads, & Sectors.
32-Bit I/O	Disabled Enabled	This setting Enables/Disables 32-bit IDE Data Transfers
Transfer Mode	Standard Fast PIO 1 ~ 4 FPIO 3 / DMA 1 FPIO 4 / DMA 2	Select the method for moving data to / from the drive. Auto-Type the drive to select the optimum transfer mode.
Ultra DMA Mode	Disabled Mode 0 ~ 6	Selects the Ultra DMA mode used for moving data to / from the drive. Auto-Type the drive to select the optimum transfer mode.

Some older drives, do not use Autotyping and require that the end-user select a pre-defined fixed-disk-type value or specifying the drive parameters separately with the "User" type option selected. You can find the correct parameters for hard-disk drives in the device's manual or written on the casing of the drive itself.



**NOTE**

Once you have established correct parameters for your drive, write them down and store them in a safe place in case these values are lost in the CMOS or if autotyping fails. If these parameters are not correctly entered in CMOS, you will NOT be able to access the data on your drive.



**WARNING**

Incorrect settings can cause your system to malfunction. To correct mistakes, return to the Setup and first restore the Setup Defaults with <F9>. Then, enter the correct drive info.

## ADVANCED MENU

The Advanced menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility		
Main	<b>Advanced</b>	Security Power Boot Server Exit
		Item Specific Help
Installed O/S:	[Other]	Select the operating system installed on your system which you will use most commonly.  Note: An incorrect setting can cause some operating systems to display unexpected behavior.
Reset Configuration Data:	[No]	
» HyperTransport Configuration		
» 8x AGP Control Options		
USB Host Controller:	[Enable]	
USB BIOS Legacy Support:	[Enable]	
4GB Memory Hole Adjust:	[Auto]	
4GB Memory Hole Size:	[64 MB]	
Multiprocessor Specification:	[1.4]	
Use PCI Interrupt Entries in MP Table:	[Yes]	
» Chipset Configuration		
» Keyboard Configuration		
» I/O Device Configuration		
QuickBoot Mode:	[Enable]	
Boot Diagnostic Screen:	[Disable]	
» PCI Configuration		
» Console Redirection		
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit		

Use this chart to help you configure your Advanced Menu:

Feature	Options	Description
Installed Operating System	Other Win95 Win98 WinMe Win2000	Select the operating system installed on your system which you will use most commonly.
Reset Configuration Data	No Yes	Select "Yes" if you want to clear the Extended System Configuration Data (ESCD) area.
USB Host Controller	Disable Enable	Enables or Disables the USB hardware. (Disabled resources will be freed up for other uses)
USB BIOS Legacy Support	Disable Enable	Enables or Disables support for USB Keyboards and Mice. (Enable for use with a non-USB aware Operating System such as DOS or UNIX)
4GB Memory Hole Adjust	Manual Auto	Auto = Adjust the memory hole size automatically according to the memory space used by PCI devices. Manual = memory hole size is determined manually.
4GB Memory Hole Size	64 MB 128 MB 256 MB 512 MB 1 GB 2 GB	4GB Memory Hole Size
Multiprocessor Specification	1.1 1.4	Configures the MultiProcessor Specification revision level. Some Operating Systems will require 1.1 for compatibility reasons
Use PCI Interrupt Entries in MP Table	Yes No	Configures the MP Table with PCI Interrupt entries.
QuickBoot Mode	Disable Enable	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Boot Diagnostic Screen	Disable Enable	Display the diagnostic screen during Boot.

## HYPERTRANSPORT CONFIGURATION SUBMENU

This screen is displayed when you select the "HyperTransport Configuration" SubMenu from the Advanced Menu.

PhoenixBIOS Setup Utility	
Advanced	
HyperTransport Configuration	Item Specific Help
» Lokar Side A » Lokay Side B	HyperTransport Link Configuration and Compensation Control.
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit	

### Lokar Side A SubMenu

This screen is displayed when you select the "Lokar Side A" SubMenu from the HyperTransport SubMenu.

PhoenixBIOS Setup Utility	
Advanced	
Lokar Side A	Item Specific Help
Lokar Side A Width: [8-bit] Lokar Side A Speed: [200 MHz]	Transmitting port's width. The width of receiving port on the other side of the link is also controlled by this value
Lokar Side A Pos Edge Comp: [CALCOMP]	
Lokar Side A Neg Edge Comp: [CALCOMP]	
Lokar Side A Impedence Comp: [CALCOMP]	
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit	

Use this chart to help you configure your Lokar Side A SubMenu:

Feature	Options	Description
Lokar Side A Width	8-bit 16-bit 2-bit 4-bit	Transmitting port's width. The width of receiving port on the other side of the link is also controlled by this value
Lokar Side A Speed	200 MHz 400 MHz 600 MHz 800 MHz	The port's transmission frequency.
Lokar Side A Pos Edge Comp	CALCOMP DATA CALCOMP + DATA CALCOMP - DATA	Transmitter rising edge (P) drive strength compensation mode. Either apply CALCOMP directly, apply DATA directly, add DATA to CALCOMP or subtract DATA from CALCOMP CALCOMP = a calculated value from the auto-compensation circuitry Result clamped between 1 and 19.
DATA	0~31	Select the value to be used with the Auto-Compensation logic, Type in value, or use the <+> and <-> keys
Lokar Side A Neg Edge Comp	CALCOMP DATA CALCOMP + DATA CALCOMP - DATA	Transmitter falling edge (N) drive strength compensation mode. Result clamped between 1 and 19
Lokar Side A Impedence Comp	CALCOMP DATA CALCOMP + DATA CALCOMP - DATA	Receiver impedance compensation Result clamped between 0 and 31

*HyperTransport Configuration SubMenu continued...*

*Lokar Side B SubMenu*

This screen is displayed when you select the "Lokar Side B" SubMenu from the HyperTransport SubMenu.

PhoenixBIOS Setup Utility		
Advanced		Item Specific Help
Lokar Side B		
Lokar Side B Pos Edge Comp:	[CALCOMP]	Transmitter rising edge (P) drive strength compensation mode.
Lokar Side B Neg Edge Comp:	[CALCOMP]	
Lokar Side B Impedence Comp:	[CALCOMP]	
Lokar Side B Width:	[8-bit]	Result clamped between 1 and 19
Lokar Side B Speed:	[200 MHz]	
Thor0 Port0 Tx Pos Mode:	[CALCOMP]	
Thor0 Port0 Tx Neg Mode:	[CALCOMP]	
Thor0 Port0 Rx Imp Mode:	[CALCOMP]	
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit		

Use this chart to help you configure your Lokar Side B SubMenu:

Feature	Options	Description
Lokar Side B Pos Edge Comp	CALCOMP	Transmitter rising edge (P) drive strength compensation mode.
	DATA CALCOMP + DATA CALCOMP - DATA	Either apply CALCOMP directly, apply DATA directly, add DATA to CALCOMP or subtract DATA from CALCOMP. CALCOMP = a calculated value from the auto-compensation circuitry  Result clamped between 1 and 19.
DATA	0-31	Select the value to be used with the Auto-Compensation logic, Type in value, or use the <+> and <-> keys
Lokar Side B Neg Edge Comp	CALCOMP	Transmitter falling edge (N) drive strength compensation mode.
	DATA CALCOMP + DATA CALCOMP - DATA	Result clamped between 1 and 19
Lokar Side B Impedence Comp		Receiver impedance compensation  Result clamped between 0 and 31
Lokar Side B Width	8-bit	Transmitting port's width.
	2-bit	The width of receiving port on the other side of the link is also controlled by this value
	4-bit	
Lokar Side B Speed	200 MHz 400 MHz	The port's transmission frequency.
Thor0 Port0 Tx Pos Mode	CALCOMP	Transmitter rising edge (P) drive strength compensation mode.
	DATA CALCOMP + DATA CALCOMP - DATA	Result clamped between 1 and 19.
Thor0 Port0 Tx Neg Mode		Transmitter falling edge (N) drive strength compensation mode.
		Result clamped between 1 and 19.
Thor0 Port0 Rx Imp Mode		Receiver impedance compensation.
		Result clamped between 0 and 31.

**BIOS Setup**

## 8x AGP CONTROL OPTIONS SUBMENU

This screen is displayed when you select the "8x AGP Control Options" SubMenu from the Advanced Menu.

PhoenixBIOS Setup Utility			
<b>Advanced</b>			
8x AGP Control Options		Item Specific Help	
AGP Operations:	[Enabled]	Advanced Features for the Accelerated Graphics Port (AGP).	
Graphics Aperture:	[64 MB]		
AGP 8x Mode:	[Enabled]		
Fast Writes:	[Disabled]		
Side Band Signals:	[Disabled]		
Calibration Cycle Time:	[64 Milliseconds]		
AGP Comp Data Neg Edge Mode:	[CALCOMP]		
AGP Comp Data Pos Edge Mode:	[CALCOMP]		
AGP Comp Strobe Neg Edge Mode:	[CALCOMP]		
AGP Comp Strobe Pos Edge Mode:	[CALCOMP]		
AGP Comp Data Skew Value:	[0]		
AGP Comp Strobe Skew Value:	[0]		
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults			
ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit			

8x AGP Control Options SubMenu continued...

Use this chart to help you configure your 8x AGP Control Option SubMenu:

Feature	Options	Description
AGP Operations	Disabled Enabled	Choose to Allow / Disallow advanced AGP operations (DevA: 0xAB bit 8)
Graphics Aperture	32 MB 64 MB 128 MB 256 MB 512 MB 1 GB 2 GB None	Selects the size of the Graphics Aperture for the AGP Video Device.
AGP 8x Mode	Enabled Disabled	Enables special AGP 3.0 version Signaling and Data Transfers. If your card does NOT specify 8x support, then Disable 8x mode.
Fast Writes	Enabled Disabled	Performance Option: Some AGP cards support the faster signal timing. If you experience problems, try Disabling the Fast Writes.
Side Band Signals	Disabled Enabled	Some cards need side-band signals to increase their performance.
Calibration Cycle Time	4 milliseconds 16 milliseconds 64 milliseconds 256 milliseconds	Period between cycles: 000b = 4 ms, 001b = 16 ms 010b = 64 ms, 011b = 256 ms
AGP Comp Data Neg Edge Mode	CALCOMP DATA CALCOMP + DATA CALCOMP - DATA	Compensation modes for the AGP Bus. AGP Output signal edge drive strength compensation mode.  Either apply CALCOMP directly, apply DATA directly, add DATA to CALCOMP or subtract DATA from CALCOMP.  CALCOMP = a calculated value from the auto-compensation circuitry
AGP Comp Data Pos Edge Mode		
AGP Comp Strobe Neg Edge Mode		
AGP Comp Strobe Pos Edge Mode		
DATA	0~255	Select the value to be used with the Auto-Compensation logic. Type in value, or use the <+> and <-> keys
AGP Data Skew Value	0~15	Select the value to be used with the Auto-Compensation logic. Type in value, or use the <+> and <-> keys
AGP Strobe Skew Value	0~15	Select the value to be used with the Auto-Compensation logic. Type in value, or use the <+> and <-> keys

## CHIPSET CONFIGURATION SUBMENU

This screen is displayed when you select the "Chip Configuration" SubMenu. In a system with no PCI, select "Advanced Chipset Control" from the Advanced menu to display this screen.

PhoenixBIOS Setup Utility	
Advanced	
Chipset Configuration	Item Specific Help
<p style="text-align: center;">Setup Warning</p> <p style="text-align: center;">Setting items on this menu to incorrect values may cause your system to malfunction.</p> <p>DRAM Bank Interleave: [Disabled]            Node Memory Interleave: [Disabled]            ECC: [Enabled]            Dram ECC: [Enabled]            ECC Scrub Redirection: [Disabled]            Chip-Kill: [Enabled]</p> <p>DCACHE ECC Scrub CTL: [Disabled]            L2 ECC Scrub CTL: [Disabled]            Dram ECC Scrub CTL: [Enabled]</p>	<p>Select Options for Advanced Chipset Features.</p>
<p>F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults            ESC Exit &lt;&gt; Select Menu Enter Select » Submenu F10 Save and Exit</p>	

The chipset consists of one or more integrated circuits that act as an interface between the CPU and much of the system's hardware. You can use this menu to change the values in the chipset registers and optimize your system's performance



### NOTE

The contents of this menu depend on the chipset installed on your motherboard. Incorrect settings can cause your system to malfunction.

Chipset Configuration SubMenu continued...

Use this table in configuring the system chipset features:

Feature	Options	Description
Dram Bank Interleave	Disabled AUTO	Enable this item to increase memory speed. Interleave memory blocks across Dram chip selects.  BIOS will AUTO detect compatibility on each node.
Node Memory Interleave	Disabled AUTO	Interleave memory blocks across Processor Nodes. BIOS will AUTO detect compatibility of /memory System
ECC	Disabled Enabled	ECC Check/Correct Mode This is a Global enable function for all blocks within the CPU core and North Bridge.  Note; After loading setup defaults, restart and enter setup to access Dram ECC setup options.
Dram ECC	Disabled Enabled	If all memory in the system supports ECC (x72), enabling this will Initial scrub Dram and enable system requests to Dram to be checked and/or corrected. <i>This option only appears if the ECC option is enabled.</i>
ECC Scrub Redirection	Disabled Enabled	Enable ECC Scrubber to correct errors detected in DRAM during normal CPU requests (Foreground Scrubbing)
Chip-Kill	Disabled Enabled	Enable Chip-Kill ECC on Nodes with all x4 ECC capable DIMMs
DCACHE ECC Scrub CTL	Disabled 40 ns 80 ns 160 ns 320 ns 640 ns 1.28 us 2.56 us	Sets the rate of Background Scrubbing for DCACHE lines.  <i>This option only appears if the ECC option is enabled.</i>
L2 ECC Scrub CTL	Disabled 40 ns 80 ns 160 ns 320 ns 640 ns 1.28 us 2.56 us	Sets the rate of Background Scrubbing for CACHE lines.  <i>This option only appears if the ECC option is enabled.</i>
Dram ECC Scrub CTL	Disabled 1.31 ms 2.62 ms 5.24 ms 10.49 ms 20.97 ms 42.0 ms 84.0 ms	Sets the rate of BACKGROUND Scrubbing for DRAM (in addition to normal ECC Scrubbing from system requests).  Note: BACKGROUND agent works independently of CPU requests and bus masters, but it CANNOT be enabled without first enabling Dram ECC.  <i>This option only appears if the ECC option is enabled.</i>

## KEYBOARD CONFIGURATION SUBMENU

This screen is displayed when you select the "Keyboard Configuration" SubMenu. If the system has a PCI chipset, select "Advanced Chipset Control" from the Advanced menu to display this screen.

This menu enables you to configure your keyboard behavior at system boot time .

PhoenixBIOS Setup Utility	
Advanced	
Keyboard Configuration	Item Specific Help
NumLock: [Auto] Keyboard auto-repeat rate: [30/sec] Keyboard auto-repeat delay: [1/2 second]	Keyboard Feature Configuration Menu
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit	

use this chart to help configure your keyboard.

Feature	Options	Description
Numlock	Auto On Off	On or Off sets the keyboard NumLock status (either ON or OFF) on boot up. "Auto" sets the NumLock ON if it finds a numeric key pad.
Keyboard auto-repeat rate	30/sec 26.7/sec 21.8/sec 18.5/sec 13.3/sec 10/sec 6/sec 2/sec	Sets the number of times a second to repeat a keystroke when the key is held down.  Selects Key Repeat Rate.
Keyboard auto-repeat delay	¼ sec ½ sec ¾ sec 1 sec	Sets the delay time after the key is held down before it begins to repeat the keystroke.  Selects Delay before the Key Repeats

## I/O DEVICE CONFIGURATION SUBMENU

The CPU communicates with external devices such as printers through devices called Input/Output (I/O) ports such as serial and parallel ports. These I/O devices require the use of system resources such as I/O addresses and interrupt lines. If these devices are Plug and Play, either the BIOS can allocate the devices during POST, or the operating system can do it. If the I/O devices are not Plug and Play, they may require manually setting them in Setup.

On some systems, the chipset manages the communication devices. Other systems have, instead, a separate I/O chip on the motherboard for configuring and managing these devices.

This submenu allows you to control the configuration settings for the I/O ports. Select "I/O Device Configuration" on the Advanced Menu to display this menu and specify how you want to configure these I/O Devices:

PhoenixBIOS Setup Utility		
Advanced		
I/O Device Configuration		Item Specific Help
Serial Port A:	[Enabled]	Configure Serial Port A using Options: <b>Disabled</b> = No configuration <b>Enabled</b> = User Configuration <b>AUTO</b> = BIOS or OS chooses configuration <b>OS Controlled</b> = Displayed when controlled by OS
Base I/O address:	[3F8]	
Parallel Port:	[Enable]	
Mode:	[ECP]	
Base I/O address:	[378]	
Interrupt:	[IRQ5]	
DMA channel:	[DMA 1]	
Floppy disk controller:	[Enabled]	
Base I/O address:	[Primary]	
PS/2 Mouse:	[Enabled]	
F1 Help	^ Select Item	-/+ Change Values
ESC Exit	<> Select Menu	Enter Select > Submenu F10 Save and Exit
F9	Setup Defaults	

*I/O Device Configuration SubMenu continued...*

Use the following chart to configure the Input/Output settings:

Feature	Options	Description
Serial port A:	Disabled Enabled Auto	Configure Serial Ports using Options: Disabled = No configuration Enabled = User configuration AUTO = BIOS or OS chooses configuration
Base I/O Address	3FB 2FB 3EB 2EB	Select the Base I/O address for the Serial Ports.
Parallel Port	Disabled Enabled Auto	Configure the Parallel Port using Options: Disabled turns off the port. Enabled requires you to enter the base Input/Output address and the Interrupt number on the next line. Auto makes the BIOS configure the port automatically during POST.
Mode	Output Only Bi-Directional EPP ECP	Set the mode for the Parallel Port using options: Output Only = standard one-way protocol for a parallel device (SPP) Bi-directional = two-way protocol EPP = Extended Parallel Port ECP = Extended Capabilities Port
Base I/O Address	378 328	Set the Base I/O address for the Parallel Port.
Interrupt	IRQ 5 IRQ 7	Set the Interrupt for the Parallel Port.
DMA Channel	DMA 1 DMA 3	Select which DMA (Direct Memory Access) channel to be used by the parallel port. if using in ECP mode.
Floppy Disk Controller	Disabled Enabled AUTO	Enables the on-board legacy diskette controller. Disabled turns off all legacy diskette drives. Auto = BIOS or OS chooses the configuration.
Base I/O Address	Primary Secondary	Set the Base I/O address for the Floppy Disk Controller.
PS/2 Mouse	Disabled Enabled	Disabled = prevents any installed PS/2 mouse from functioning, but frees up IRQ 12. Enabled = forces PS/2 mouse port to be enabled regardless if a mouse is present.



**WARNING**

If you choose the same I/O address or Interrupt for more than one port, the menu displays a yellow asterisk (\*) at the conflicting settings.

## CONSOLE REDIRECTION SUBMENU

This submenu controls the configuration to remotely control the system.

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
Console Redirection		Item Specific Help
COM Port Address:	[Disabled]	Additional Setup menus to configure the console.  If enabled, it will use a port on the motherboard
Console Connection:	[Direct]	
Baud Rate:	[19.2K]	
Flow Control :	[CTS/RTS]	
Console Type:	[ANSI]	
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit		

Use the following chart in configuring the Console Redirection submenu:

Feature	Options	Description
COM Port Address	Disabled On-board COM A	If Enabled, it will use a port on the MainBoard.
Console Connection	Direct Via modem	Indicate whether the console is connected directly to the system or a modem is used to connect.
Baud Rate	300 1200 2400 9600 19.2K 38.4K 57.6K 115.2K	Enables the specified baud rate.
Flow Control	None XON/XOF CTS/RTS	Enables Flow Control. XON/XOF is software flow control CTR/RTS is hardware flow control
Console Type	vt100 vt100 8bit ANSI 7bit ANSI vt100 plus UTF8	Enables the specified console type.

## PCI DEVICES SUBMENU

If the system has a PCI bus, selecting "PCI Devices" from the Advanced menu displays the following submenu:

PhoenixBIOS Setup Utility	
Advanced	Exit
PCI Configuration	Item Specific Help
<ul style="list-style-type: none"><li>» Onboard Device Control</li><li>» PCI/PNP IRQ Exclusion</li><li>» PCI/PNP UMB Exclusion</li></ul>	Additional Setup Menus to configure PCI devices
F1 Help   ^v Select Item   -/+ Change Values   F9 Setup Defaults ESC Exit   <> Select Menu   Enter Select   » Submenu   F10 Save and Exit	

PCI Devices are devices equipped for operation with a PCI (Peripheral Component Interconnect) bus, a standardized Plug-and-Play hardware communication system that connects the CPU with other devices.

*PCI Devices SubMenu continued...*

Use this submenu to configure the PCI devices installed on your system by selecting each individual submenu. Use the following chart in configuring the PCI devices submenus:

*OnBoard Device Control SubMenu*

The Onboard Device Control SubMenu is for configuring specific PCI devices.

<b>Onboard Device Control</b>		
<b>Feature</b>	<b>Options</b>	<b>Description</b>
Onboard LAN1/2	Enabled Disabled	Enable / Disable the onboard LAN function and LAN port.
Option ROM Scan	Enabled Disabled	Initialize device expansion ROM.
Onboard SATA	Enabled Disabled	Enables the onboard Serial ATA RAID function.
Onboard 1394	Enabled Disabled	Enable / Disable onboard IEEE 1394 Controller
Onboard AC97	Enabled Disabled	Enable / Disable onboard AC97 Audio Controller

*PCI/PNP IRQ Exclusion SubMenu*

The PCI/PNP IRQ Exclusion SubMenu is for reserving specific IRQs for use by legacy ISA devices.

<b>PCI/PNP IRQ Exclusion</b>		
<b>Feature</b>	<b>Options</b>	<b>Description</b>
IRQ 3/4/5/7/10/11	Available Reserved	Reserves the specified IRQ for use by Legacy ISA Devices.
<i>Items marked with an asterisk (*) indicate a DMA, IRQ, I/O, or memory resource conflict with another device.</i>		

*PCI/PNP UMB Exclusion SubMenu*

The PCI/PNP UMB Exclusion SubMenu is for reserving specific upper memory blocks for use by legacy ISA devices.

<b>PCI/PNP UMB Exclusion</b>		
<b>Feature</b>	<b>Options</b>	<b>Description</b>
C800 – CBFF ~ DC00 - DFFF	Available Reserved	Reserves the specified block of upper memory for use by Legacy ISA Devices.
<i>*Items marked with an asterisk indicate a DMA, IRQ, I/O, or memory resource conflict with another device.</i>		



**NOTE**

The contents of this menu depend on the devices installed on your system. Incorrect settings can cause your system to malfunction. To correct mistakes, return to Setup and restore the System Defaults (F9).

## SECURITY MENU

The Security menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility	
Main	Advanced <b>Security</b> Power Boot Server Exit
Item Specific Help	
Supervisor Password is:	Clear
User Password is:	Clear
Set Supervisor Password:	[Enter]
Set User Password:	[Enter]
Password on boot:	[Disabled]
Fixed disk boot sector:	[Normal]
Diskette access:	[Supervisor]
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit	

Use this menu to specify your security settings. The settings here determine who has access to the BIOS setup utility program and to the system.

### PASSWORDS

The Setup Utility allows you to specify passwords in the Security menu. The passwords control access to the BIOS and certain Security menu options during system startup. The passwords are NOT case sensitive. In other words, a password can be entered using either upper or lower case letters.

The "Supervisor Password" controls access to the BIOS Setup Utility screen and can be used to access the system during boot up. The "User Password" controls the usage of the system. If so enabled, the end-user could be required to enter a password to be able to boot up the system.



#### NOTE

When Passwords are set and Enabled in the BIOS, the system will prompt for passwords in the appropriate situations.

- \* During System Boot and BIOS entry, if three (3) WRONG passwords are entered, the system will be disabled and will require the user to reset the system.

## SETTING AND USING PASSWORDS

The Security Menu allows you to set the Supervisor and User passwords for the system. Select the appropriate options and press <Enter> to start the process.

### *Set Supervisor Password*

This field allows you to set the Supervisor password. To set the Supervisor password, highlight this field and press the [Enter] key. The following dialog box appears:

Set Supervisor Password		
Enter New Password	[	]
Confirm New Password	[	]

Type the password and press the [Enter] key. You can type up to eight alphanumeric characters. Symbols and other keys can NOT be used in the password. To confirm the password, type the password again and press the [Enter] key. The Supervisor password is now set. This password allows full access to the BIOS Setup menus.

### *To Clear the Supervisor Password*

To clear the Supervisor Password, highlight the "Set Supervisor Password" field and press the [Enter] key. The following dialog box appears:

Set Supervisor Password		
Enter Current Password	[	]
Enter New Password	[	]
Confirm New Password	[	]

- \* Enter the current password.
- \* Leave the Enter New Password field blank and press [Enter] twice. The Password is now cleared

### *Set User Password*

This field allows you to set the User password. (The Supervisor password must be set before the User password.) To set the User password, follow the instructions for setting the Supervisor password. The User password allows restricted access to the Setup menus.

Feature	Options	Description
Password on boot	Disabled Enabled	This option requires the Supervisor password to be set to function. When enabled, the system will require either the Supervisor or User password before the system will bootup.
Fixed Disk Boot Sector	Normal Write Protect	This option requires the Supervisor password to be set to function. When set to Normal, the system will allow normal access to the HDD boot sector. When set to Write Protect, the BIOS blocks all access to the boot sector.
Diskette Access	User Supervisor	This option requires the Supervisor or User password be set to function. When set to Supervisor or User, the system will prompt the user for the supervisor or user password before allowing access to the floppy diskette drive.



### NOTE

Write protecting the HDD boot sector will protect the HDD against boot sector viruses. However, this option may interfere with the normal operation of certain operating systems or anti-virus programs which normally need access to the boot sector area.

## POWER MENU

Use this menu to specify your settings for Power Management. Remember that the options available depend upon the hardware installed in your system. Those shown here are from a typical system.

The Power menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility			
Main	Advanced	Security <b>Power</b> Boot Server Exit	
		Item Specific Help	
ACPI Enabled:	[Yes]	Select Power Management Mode. Choosing modes changes system power management settings. Maximum Power Savings conserves the greatest amount of system power while Maximum Performance conserves power but allows greatest system performance. To alter these settings, choose Customize. To turn off power management, choose Disable.	
ACPI SRAT Table:	[Disabled]		
Spread spectrum modulation	[No]		
Suppress Unused PCI Slot Clocks	[Yes]		
WakeUp On LAN/PME:	[Enabled]		
Power Savings:	[Customize]		
Standby Timeout:	[15 sec]		
Auto Suspend Timeout:	[15 sec]		
Resume On Time:	[Off]		
Resume Time:	[00:00:00]		
Resume Date:	[00/00/0000]		
After Power Failure:	[Last State]		
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults			
ESC Exit <> Select Menu Enter Select > Submenu F10 Save and Exit			

A power-management system reduces the amount of energy used after specified periods of inactivity. The Setup menu pictured here supports a Full On state, a Standby state with partial power reduction, and a Suspend state with full power reduction.

Use the Advanced Options on this menu to specify whether or not the activity of interrupts can terminate a Standby or Suspend state and restore Full On. Do NOT change these settings if you do not know which devices use the interrupts.

*Power Menu continued...*

Use this chart to help configure the system's power settings:

Feature	Options	Description
ACPI Enabled	No Yes	This mainboard supports ACPI (Advanced Configuration and Power management Interface). Use this item to enable or disable the ACPI feature. ACPI is a power management specification that makes hardware status information available to the operating system. ACPI enables a PC to turn its peripherals on and off for improved power management especially in portables. It also allows the PC to be turned on and off by external devices, so that the touch of a mouse or the press of a key will "wake up" the machine.
ACPI SRAT Table	Disabled Enabled	Enables and disables the ACPI 2.0 SRAT (Static Resource Affinity Table) for ccNUMA systems
Spread Spectrum Modulation	No 0.10% 0.40% 0.70% 1.00% 1.30% 1.60% 2.00%	If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.  Enables frequency spreading on clock generators to reduce EMI emissions.
Suppress Unused PCI Slot Clocks	Yes No	When enabled, the BIOS will disable the unused clock signals of free PCI slots to reduce EMI and power consumption.
WakeUp On LAN/PME	Disabled Enabled	Enables WakeUp on LAN/PME support.
Power Savings	Disabled Customize Maximum Power-Savings Maximum Performance	Maximum Power-Savings = conserves the greatest amount of system power. Maximum Performance = conserves power but allows greatest system performance. To alter these settings, choose Customize. To turn off power management, choose Disabled.
Standby Timeout	Off 1 min 2 min 4 min 6 min 8 min 12 min 16 min	Amount of time the system needs to be in Idle mode before entering Standby mode. Standby mode turns off various devices in the system, including the screen, until you start using the computer again.
Auto Suspend Timeout	Disabled 5 min 10 min 15 min 20 min 30 min 40 min 60 min	Amount of time the system needs to be in Standby mode before entering the Suspend mode.
Resume On Time	Off On	Enabled, it wakes the system up at a specific time.
Resume Time	HH/MM/SS	Specify the time when the system is to wake up.
Resume Date	MM/DD/YYYY	Specify the date when the system is to wake up.
After Power Failure	Stay Off Last State Power On	Sets the mode of operation if an AC Power Loss occurs. Stay Off = returns the system to an OFF state. Power On = returns the system to a Full ON state. Last State = returns the system to the state when the AC Power Loss occurred.

## BOOT MENU

After you turn on your computer, it will attempt to load an operating system (such as Windows 98) from the first device set in the Boot Menu. If it cannot find an operating system on that device, it will attempt to load it from one or more other devices in the order specified in the Boot Menu. Boot devices can include: hard drives, floppy drives, CD-ROMs, removable devices (e.g., Iomega Zip drives), and network cards.



### NOTE

Specifying any device as a boot device on the Boot Menu requires the availability of an operating system on that device. Most systems come with an operating system already installed on hard-drive C:\.

The Boot menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	<b>Boot</b>	Server	Exit
					Item Specific Help	
CD-ROM Drive -Hard Drive Primary Master Bootable Add-in Cards -Removable Devices Legacy Floppy Drives Network Boot MBA v6.20.0 Slot 0230					Keys used to view or configure devices: <Enter> expands or collapses devices with a + or - <Ctrl+Enter> expands all <Shift+1> enables or disables a device <+> and <-> moves the device up or down <n> may move removable devices between Hard Disk and Removable Devices <d> removes a device that is not installed	
F1	Help	^v	Select Item	-/+	Change Values	F9 Setup Defaults
ESC	Exit	<>	Select Menu	Enter	Select >	Submenu F10 Save and Exit

Use this menu to arrange to specify the priority of the devices from which the BIOS will attempt to boot the Operating System.

In the example above, the BIOS will first attempt to boot from the CD-ROM Drive. Failing that, it will then attempt to boot from the Primary Master Hard Disk, and so on down the list.

Removable Devices, Hard Drive, and Network Boot are the generic types of devices on your system from which you can boot an operating system. You may have more than one device of each type. If so, the generic type is marked with a plus sign. Use the <Enter> key to expand or collapse the devices marked with a <+> or <->. Press <Ctrl+Enter> to expand all such devices

*Boot Menu continued...*

To change a device's priority on the list, first select it with the up-or-down arrows, and move it up or down using the <+> and <-> keys. Pressing <n> moves a device between the Removable Devices and Hard Drive. Pressing <Shift+1> enables or disables a device. Pressing <d> removes a device that is not installed.

Feature	Options	Description
Hard Drive	Primary Master	To attempt to boot the primary master IDE Device
	Bootable Add-in Cards	To attempt to boot from Bootable cards (such as LAN or SCSI cards)
Removable Devices	Legacy Floppy Drive	The computer attempts to boot from the floppy disk drive.
CD-ROM Drive		The computer attempts to boot from the CD-ROM drive.
Network Boot		The computer attempts to boot from the network through the additional LAN card (if installed)
MBA v. 6.20.0 Slot 0230		The computer attempts to boot from the network through the On-Board LAN connection.

**SERVER MENU**

The Server menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility	
Main	Advanced Security Power Boot <b>Server</b> Exit
Item Specific Help	
Display without KB ERR MSG: [No]	Control the POST Error Message Display or not when without KB
» Hardware Monitor	
F1 Help ^v Select Item -/+ Change Values F9 Setup Defaults	
ESC Exit <> Select Menu Enter Select » Submenu F10 Save and Exit	

Many servers are run as "Headless" appliances (no KB, mouse, or monitor connected). Under normal settings, if no keyboard is detected, the POST will display an error message and pause the system boot, as it is a requirement for system boot up. This screen allows the end-user to NOT have that error message displayed, and allows the system to boot up normally even when a keyboard is not detected.

Here are the options for the Server Menu:

Feature	Options	Description
Display without KB ERR MSG	Yes No	Controls the POST Error Message Display. Use the "Yes" option to suppress the POST KB error message and allow the system to boot even if no KB is detected. The "No" option will continue to display the error message and pause the system boot up if no KB is detected.

## HARDWARE MONITOR SUBMENU

Selecting "Hardware Monitor" from the Server menu displays the following submenu:

PhoenixBIOS Setup Utility		Server
Hardware Monitor		Item Specific Help
CPU 0 Vcore =	1.59 V	All items on this menu can NOT be modified in User mode. If any items require changes, please consult your System Supervisor.
CPU 1 Vcore =	1.104 V	
V (bat) =	No Function	
V (vdd) =	5.10 V	
V (Vcc3) =	3.30 V	
CPU 0 Temperature =	56 °C	
CPU 1 Temperature =	58 °C	
VH =	1.2725 V	
VCC25 =	2.5067 V	
CPU Fan 0 Speed =	No Function	
CPU Fan 1 Speed =	No Function	
System Fan Speed =	3037 RPM	
F1 Help    ^v Select Item    -/+ Change Values    F9 Setup Defaults		
ESC Exit    <> Select Menu    Enter Select    » Submenu    F10 Save and Exit		

## EXIT MENU

The Exit menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Server	<b>Exit</b>
						Item Specific Help
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes						Exit System Setup and save your changes to CMOS.
F1 Help	^v Select Item	-/+ Change Values	F9 Setup Defaults			
ESC Exit	<> Select Menu	Enter Select	» Submenu	F10 Save and Exit		

The following sections describe each of the options on this menu. Note that <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

### *Exit Saving Changes*

After making your selections on the Setup menus, select "Exit Saving Changes" or "Save Changes" to see a screen similar to the following:

Setup Confirmation	
Save configuration changes and exit now?	
[Yes]	[No]

- \* Select Yes and press <Enter> to save the changes.

Both procedures will store the selections displayed in the menus into the CMOS (short for "battery-backed CMOS RAM") a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in the CMOS.

During boot up, PhoenixBIOS attempts to load the values saved in CMOS. If those values cause the system boot to fail, reboot and press <F2> to enter Setup. In Setup, you can restore the Default Values <F9> or try to change the selections that caused the boot to fail.

### *Exit Discarding Changes*

Use this option to exit Setup without saving in the CMOS any new selections or changes you may have made. The selections previously in effect remain in effect.

*Exit Menu continued...*

### *Load Setup Defaults*

To load the default values for all the Setup menus, select "Load Setup Defaults" from the Main Menu. The program displays this message:

Setup Confirmation	
Load default configuration now?	
[Yes]	[No]

- \* Select Yes and press <Enter> to load the default configuration.

If, during boot up, the BIOS program detects a problem in the integrity of values stored in CMOS, it displays these messages:

```
System CMOS checksum bad - run SETUP
Press <F1> to resume, <F2> to Setup
```

The CMOS values have been corrupted or modified incorrectly (perhaps by an application program that modifies stored CMOS data.)

Press <F1> to resume the boot or <F2> to run Setup with the ROM default values already loaded into the menus. You can make other changes before saving the values to CMOS.

### *Discard Changes*

If, during a Setup Session, you change your mind about changes you have made and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS.

Selecting "Discard Changes" on the Exit menu will update all the selections with the previous values stored in the CMOS and displays this message:

Setup Confirmation	
Load previous configuration now?	
[Yes]	[No]

- \* Select Yes and press <Enter> to load the previous configuration.

### *Save Changes*

Selecting "Save Changes" saves all the selections without exiting Setup. Selecting this option will display this message:

Setup Confirmation	
Save configuration changes now?	
[Yes]	[No]

- \* Select Yes and press <Enter> to save configuration changes and continue working in BIOS Setup.

You can return to the other menus if you want to review and change your selections.

## PHOENIX BOOT UTILITIES

This MainBoard comes with the following boot utilities:

- \* Phoenix **QuietBoot™**: Phoenix QuietBoot displays a graphic illustration rather than the traditional POST messages while keeping you informed of diagnostic problems.
- \* Phoenix **MultiBoot™**: Phoenix MultiBoot is a boot screen that displays a selection of boot devices from which you can boot your operating system.

### USING PHOENIX QUIETBOOT

Right after you turn on or reset the computer, Phoenix QuietBoot displays the QuietBoot Screen, a graphic illustration created by the computer manufacturer instead of the text-based POST screen, which displays a series of PC diagnostic messages.

To exit the QuietBoot screen and run Setup, display the MultiBoot menu, or simply display the PC diagnostic messages, you can simply press one of the hot keys described below.

The QuietBoot Screen stays up until just before the operating system loads unless one of the following actions occurs:

- \* Press <Esc> to display the diagnostic/POST screen
- \* Press <F2> to enter Setup
- \* POST issues an error message
- \* The BIOS or an option ROM requests keyboard input

Here are the possible QuietBoot scenarios in greater detail:

When Escape is pressed	Pressing <Esc> switches to the POST screen and takes one of two actions: 1. If MultiBoot is installed, the boot process continues with the POST screen until the end of POST, and then displays the Boot First Menu, text-based with these options: * Load the operating system from the boot device of your choice. * Enter the BIOS Setup Utility. * Exit the Boot First Menu (with <Esc>) and load the operating system from the boot devices specified in the BIOS Setup. OR 2. If MultiBoot is not installed, the boot process continues as usual.
Press <F2> to enter Setup	Pressing <F2> at any time during POST switches to the POST screen (if not already displayed) and enters Setup.
POST issues an error message	Whenever POST detects a non-fatal error, QuietBoot switches to the POST screen and displays the errors. It then displays this message: Press <F1> to resume, <F2> to Setup Press <F1> to continue with the boot. Press <F2> if you want to correct the error in Setup.
The BIOS or an option ROM requests keyboard input	If the BIOS or an Option ROM (add-on card) requests keyboard input, QuietBoot switches over to the POST screen and the Option ROM display prompts the user to enter the information. POST then continues from there with the regular POST screen.

## PHOENIX MULTIBOOT

Phoenix MultiBoot expands your boot options by letting you choose your boot device on startup, which could be a hard disk, floppy disk, or a CD-ROM. You can configure your boot device in Setup, or you can choose a different device each time you boot during POST by selecting your boot device in The Boot First Menu.

MultiBoot consists of:

- \* The Setup Boot Menu
- \* The Boot First Menu

Refer to the **Boot Menu** in BIOS Setup for more information on the Setup Boot Menu. The following describes the Boot First Menu.

### *The Boot First Menu*

Display the Boot First Menu by pressing <Esc> during the POST. In response, the BIOS first displays the message, "Entering Boot Menu ..." and then displays the Boot Menu at the end of POST. Use the menu to select any of these options:

- \* Override the existing boot sequence (for this boot only) by selecting another boot device. If the specified device does not load the operating system, the BIOS reverts to the boot sequence stored in Setup.
- \* Enter Setup.
- \* Press <Esc> to continue with the existing boot sequence

Boot Menu
Select boot device or Setup.
Use the Up and Down arrows to select the Boot First device, then press <Enter> or <Esc> to exit.
1. Hard Drive
2. ATAPI CD-ROM
3. Diskette Drive
4. Removable Devices
5. MBA v6.20.0 Slot 0230
<Setup>

If there is more than one bootable hard drive, then the first one in the Setup Boot menu is the one represented here.

## BIOS FLASH UPGRADE UTILITY

Phoenix Phlash gives you the ability to update your BIOS from a floppy disk without having to install a new ROM BIOS chip.

Phoenix Phlash is a utility for “flashing” (copying) a BIOS to the Flash ROM installed on your computer from a floppy disk. A Flash ROM is a Read-Only Memory chip that you can write to using a special method called “flashing.” Use Phoenix Phlash for the following tasks:

- \* Update the current BIOS with a new version.
- \* Restore a BIOS when it has become corrupted.
- \* Installation

Phoenix Phlash is shipped on a floppy disk with your computer as a compressed file called CRISDISK.ZIP that contains the following files:

CRISDISK.BAT	Executable file for creating the Crisis Recovery Diskette.
PHLASH.EXE	Programs the flash ROM.
PHLASH16.EXE	Performs platform-dependent functions.
BIOS.ROM	Actual BIOS image to be programmed into flash ROM.
MINIDOS.SYS	Allows the system to boot in Crisis Recovery Mode.
MAKEBOOT.EXE	Creates the custom boot sector on the Crisis Recovery Diskette.

### *Installing Phoenix Phlash*

To install Phoenix Phlash on your hard disk, follow this simple procedure:

1. Insert the distribution diskette into drive A:
2. Unzip the contents of CRISDISK.ZIP into a local directory, presumably C:\PHLASH16.
3. Store the distribution diskette in a safe place.

### **CREATE A CRISIS RECOVERY DISKETTE**

If the OEM or dealer from whom you purchased your system has not provided you with one, then you should create a Crisis Recovery Diskette before you use the Phlash utility.

If you are unable to boot your system or successfully load the Operating System, the BIOS may have been corrupted, in which case you will have to use the Crisis Recovery Diskette to reboot your system.

There are several methods that you can use to create the Crisis Recovery Diskette. Below is one recommended procedure.

1. Be sure you have successfully installed the Phlash Utility onto your hard disk.
2. Insert a clean diskette into drive A: or B:
3. From the local directory, enter the following: CRISDISK [drive]: where [drive] is the letter of the drive into which you inserted the diskette. For help, type CRISDISK /? or CRISDISK /h.

CRISDISK.BAT formats the diskette, then copies MINIDOS.SYS, VGABIOS.EXE (if available), PHLASH.EXE, PLATFORM.BIN and BIOS.ROM to the diskette, and creates a custom boot sector.

4. Write protect and label the Crisis Recovery Diskette



### **NOTE**

You can only supply a volume label after the Crisis Recovery Diskette has been formatted and the necessary files copied because MINIDOS.SYS must occupy the first directory entry for the diskette to boot properly.

## UPDATING THE CRISIS RECOVERY DISKETTE

If the BIOS image (BIOS.ROM) changes due to an update or bug fix, you can easily update the Crisis Recovery Diskette.

- \* Simply copy the new BIOS.ROM image onto the Crisis Recovery Diskette. No further action is necessary.

## EXECUTING PHOENIX PHLASH

You can run Phoenix Phlash in one of two modes:

- \* Command Line Mode
- \* Crisis Recovery Mode



### WARNING

For your own protection, be sure you have a Crisis Recovery Diskette ready to use before executing Phlash.

#### *Command Line Mode*

Use this mode to update or replace your current BIOS. To execute Phlash in this mode, move to the directory into which you have installed Phoenix Phlash and type "Phlash" at the prompt:

```
C:\Phlash> phlash16 [filename] /BBL /C
```

Phoenix Phlash automatically updates or replaces the current BIOS with the one which your OEM or dealer supplies you (it's a .ROM file).

Command Example:

```
C:\Phlash> phlash16 HDAMB_120.ROM /BBL /C
```

Syntax:

<b>plash16</b>	<b>Phlash command name</b>
<b>HDAMB_120.ROM</b>	<b>Filename of new BIOS ROM supplied by dealer</b>
<b>/BBL</b>	<b>Flash the Boot Block</b>
<b>/C</b>	<b>Clean CMOS</b>

Phlash may fail if your system is using memory managers, in which case the utility displays the following message:

```
Cannot flash when memory managers are present.
```

If you see this message after you execute Phlash, you must disable the memory manager on your system. To do so, follow the instructions in the following sections.

## DISABLING MEMORY MANAGERS

To avoid failure when flashing, you must disable the memory managers that load from CONFIG.SYS and AUTOEXEC.BAT. There are two recommended procedures for disabling the memory managers. One consists of pressing the <F5> key (if you are using DOS 5.0 or above), and the other requires the creation of a boot diskette.

### *Disabling with DOS 5.0 (or later version)*

For DOS 5.0 and later, follow the two steps below to disable any memory managers on your system. If you are not using at least DOS 5.0, then you must create a boot diskette to bypass any memory managers (See Create a Boot Diskette, below).

1. Boot DOS 5.0 or later version. (In Windows 95, at the boot option screen, choose Option 8, "Boot to a previous version of DOS.")
2. When DOS displays the "Starting MS-DOS" message, press <F5>. After you press <F5>, DOS bypasses the CONFIG.SYS and AUTOEXEC.BAT files, and therefore does not load any memory managers.
3. Go to the Phlash directory, and you can now execute Phlash.

### *Create a Boot Diskette*

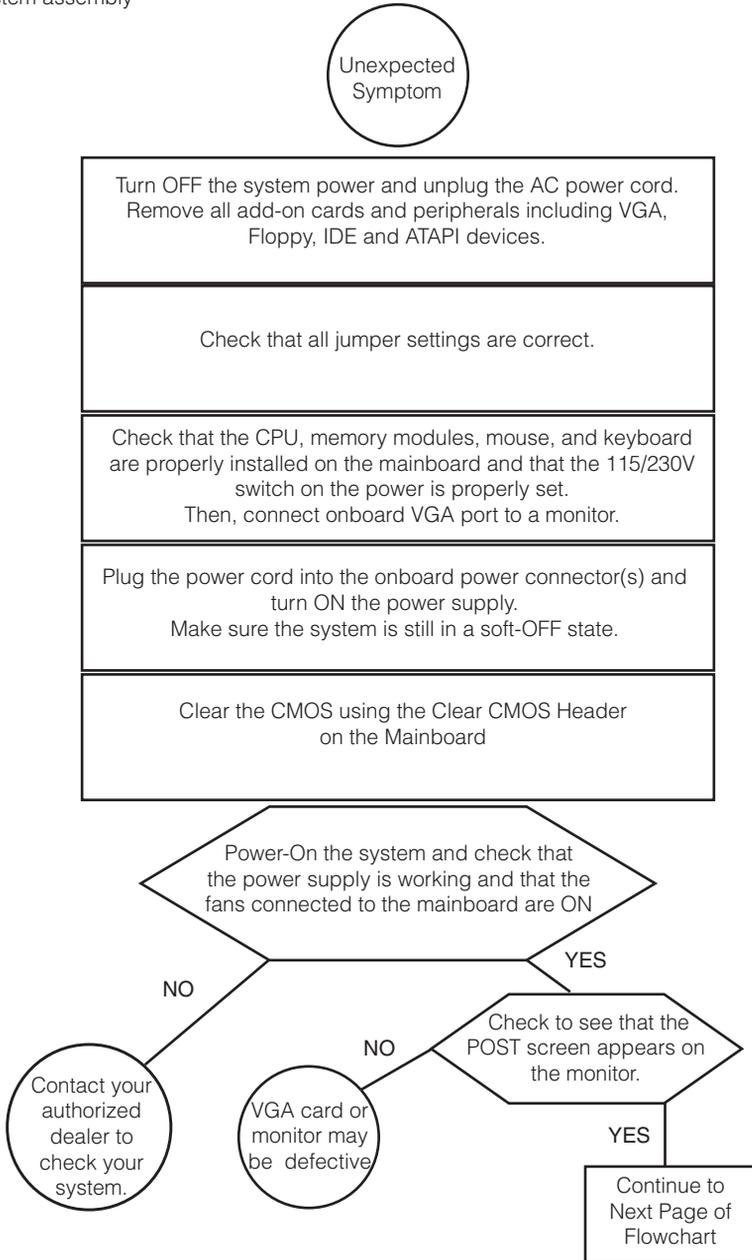
To bypass memory managers in DOS versions previous to 5.0, follow this recommended procedure:

1. Insert a diskette into your A: drive.
2. Enter the following from the command line: Format A: /S
3. Reboot your system from the A: drive. Your system will now boot without loading the memory managers, and you can then execute Phlash.
4. move to the Phlash directory, and you are now free to execute Phlash.

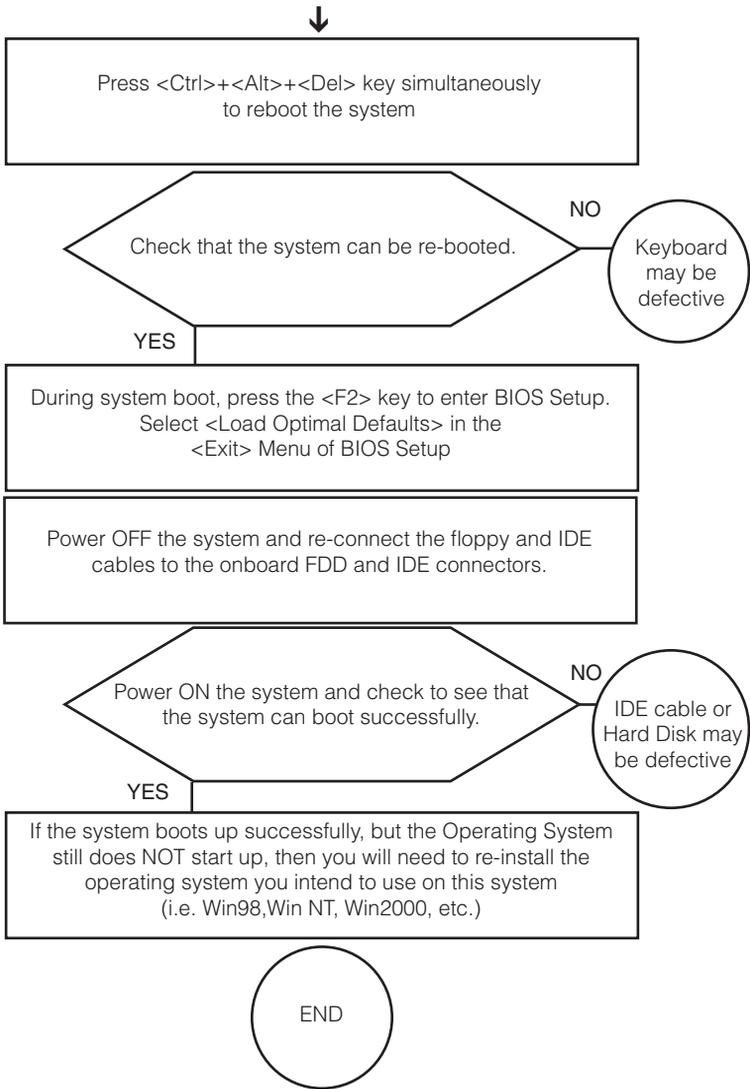
# Troubleshooting

## Troubleshooting Flowchart

Here are some flowcharts to help you check for common problems encountered during system assembly



Troubleshooting Flowchart continued...



**WARNING**

Before inserting or installing any add-on cards or hardware components in the MainBoard, always remember to FIRST disconnect the power cord.

## Symptom Checklist

Use this chart for more detailed information about some common problems that occur during assembly and in the maintenance of systems.

Symptom	Check point
No Power (FAN is not spinning)	<ul style="list-style-type: none"> <li>* Make sure that no short circuit exists between the mainboard and chassis</li> <li>* Check that all jumpers are set to their default positions.</li> <li>* Check that the 115V/230V switch on the power supply is properly set.</li> <li>* Check that the CPU is properly inserted in the CPU socket.</li> <li>* Check that the power connector of the CPU fan is plugged in the correct position.</li> <li>* Turn the power switch ON and OFF to test the system.</li> <li>* Check the power of the battery on the mainboard. (In general, the battery voltage is around 3VDC)</li> </ul>
Able to power ON the system (FAN is spinning), but NO screen display.	<ul style="list-style-type: none"> <li>* Disconnect and remove all components from the mainboard except for the CPU, memory modules, and the CPU fans.</li> <li>* Check that the memory is Registered ECC DIMM. Refer to Appendix A: Recommended Memory Modules or contact your authorized dealer for a list of qualified memory vendors and models.</li> <li>* Check that all jumpers are set to their default positions.</li> <li>* Clear the CMOS through the Clear CMOS header.</li> <li>* Check that the onboard VGA port and the monitor are properly connected.</li> <li>* Check that you are using a 400 FSB CPU and PC2100/PC2700 (DDR266/DDR333) Memory modules in the MainBoard. If not, change the CPU to 400 FSB or memory to PC2100/PC2700 (DDR266/DDR333) and try to power ON the system again.</li> <li>* Use the onboard speaker to aide in determining the problem.</li> </ul>
Memory Error(s)	<ul style="list-style-type: none"> <li>* Check that the memory DIMM modules are inserted properly into the DIMM sockets.</li> <li>* Check to see if different speed memory modules are mixed in and used in the MainBoard memory banks. Verify that the BIOS setup is configured for the fastest speed of RAM used. RioWorks recommends that you always install the same speed DDR RAM in your system.</li> <li>* Make sure all your memory modules in the MainBoard are compliant with the PC2100/PC2700 (DDR266/DDR333) Specifications and that they appear either in Appendix A: Recommended Memory Modules or on your authorized dealer's Qualified Vendor's List of Memory Modules.</li> </ul>

# POST Errors and Beep Codes

## *PhoenixBIOS 4.0 Release 6.0*

When you turn on or reset an IBM-compatible PC, the BIOS first performs a number of tasks, called the Power-On-Self-Test (POST). These tasks test and initialize the hardware and then boot the Operating System from the hard disk.

At the beginning of each POST task, the BIOS outputs the test-point error code to I/O port 80h. Programmers and technicians use this code during troubleshooting to establish at what point the system failed and what routine was being performed. Some motherboards are equipped with a seven segment LED display that displays the current value of port 80h.

For production boards which do not contain the LED display, you can purchase an installable "Port 80h" card that performs the same function. If the BIOS detects a terminal error condition, it issues a terminal-error beep code, attempts to display the error code on the upper left corner of the screen and on the port 80h LED display, and halts POST. It attempts repeatedly to write the error to the screen. This attempt may "hash" some CGA displays.

If the system hangs before the BIOS can process the error, the value displayed at the port 80h is the last test performed. In this case, the screen does not display the error code.

### *Terminal POST Errors*

There are several POST routines that require success to finish POST. If they fail, they issue a **POST Terminal Error** and shut down the system. Before shutting down the system, the error handler issues a beep code signifying the test point error, writes the error to port 80h, attempts to initialize the video, and writes the error in the upper left corner of the screen (using both mono and color adapters).

The routine derives the beep code from the test point error as follows:

1. The 8-bit error code is broken down to four 2-bit groups.
2. Each group is made one-based (1 through 4) by adding 1.
3. Short beeps are generated for the number in each group.

Example:

Testpoint 16h = 00 01 01 10 = 1-2-2-3 beeps

### *POST Task Routines*

The following is a list of Terminal Test Point codes written to port 80h at the start of each routine, the beep codes issued along with the terminal errors, and a description of the POST routine. Unless otherwise noted, these codes are valid for PhoenixBIOS 4.0 Release 6.0.

*POST Errors and Beep Codes continued...*



**NOTE**

The documented routines are sorted by their test point numbers assigned in the BIOS code. Their actual order of execution during the POST can be quite different.

Code	Beep	POST Routine Description
16h	1-2-2-3	BIOS ROM checksum
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
2Ch	1-3-4-1	RAM failure on address line xxxx
2Eh	1-3-4-3	RAM failure on data bits xxxx of low byte of memory bus
30h	1-4-1-1	RAM failure on data bits xxxx of high byte of memory bus
46h	2-1-2-3	Check ROM copyright notice
58h	2-2-3-1	Test for unexpected interrupts
98h	1-2	Search for Option ROMs. One long, Two short beeps on Checksum failure.
B4h	1	One short beep before BOOT
		For Boot Block in Flash ROM
F4h	1	Output one beep before BOOT (for Boot Block in Flash ROM)

If the BIOS detects an error in test codes 2Ch, 2Eh, or 30h (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed.

For Example:

“2C 0002” means address line 1 (bit one set) has failed.

“2E 1020” means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits.

The BIOS also sends the bitmap to the port 80h LED display. It first displays the check point code, followed by a delay, the high-order byte, another delay, and then the low-order byte of the error and a delay. The system will continually repeat this sequence.

## Addendum A: Recommended Memory Modules

\* All modules in the following tables have been validated by the manufacturer \*  
As of 24-Apr-2003

<b>ATP</b>			
256MB	266MHz	SAMSUNG K4H280838D-TCB0	AB32L72A8S4B0S
256MB	266MHz	SAMSUNG K4H560838D-TCB0	AB32L72Q8SQB0S
256MB	333MHz	SAMSUNG K4H560838D-TCB3	AB32L72Q8SQB3S
512MB	266MHz	SAMSUNG K4H560838D-TCB0	AB64L72Q8S8B0S
512MB	333MHz	SAMSUNG K4H560838D-TCB3	AB64L72Q8S8B3S
1GB	266MHz	SAMSUNG K4H560438D-TCB0	AB28L72P4SQB0S
1GB	266MHz	SAMSUNG K4H560438D-TCB0	AB28L72P4SMB0S
1GB	333MHz	SAMSUNG K4H560438D-TCB3	AB28L72P4SMB3S
2G	266MHZ	SAMSUNG K4H510438M-TCB0	AB56L72P4SMB0S

<b>Corsair</b>			
512MB	266MHz	MT 46V32M8-75C	CM72SD512RLP-2100/M
512MB	333MHZ	SAMSUNG K4H560838D-TCB3	CM72SD512RLP-2700/S
1GB	266MHz	SAMSUNG K4H560438D-TCB0	CM78SD1024R-2100/S
1GB	266MHz	NANYA NT5DS64M4AT-7K	CM74SD1024RLP-2100/Y
1GB	333 MHz	MT 46V64M4-6TC	CM74SD1024RLP-2700/M
2GB	266MHz	SAMSUNG K4H510438M-TCA2	CM74SD2048R-2100/S

<b>Infineon</b>			
256MB	266MHz	Infineon HYB25D12800AT-7	HYS72D32001GR-7-A

<b>Pan RAM</b>			
1G	266MHz	NANYA NT5DS64M4AW-7K	184DR1G664,NA,PG20

<b>Kingston</b>			
256MB	266MHz	Infineon HYB25D256800BT-7	KVR266X72RC25L/256
256MB	266MHz	HYNIX HY5DU28822AT-H	KVR266X72RC25L/256
256MB	266MHz	SAMSUNG K4H280838C-TCB0	KVR266X72RC25/256
512MB	266MHz	Infineon HYB25D256400AT-7	KVR266X72RC25/512
1GB	266MHz	SAMSUNG K4H560438C-TCB0	KVR266X72RC25L/1000
1GB	266MHz	Infineon HYB25D256400BT-7	KVR266X72RC25/1024
2GB	266MHz	MIT 17319-00	KVR266X72RC25/2G

<b>Micron</b>			
256MB	266MHZ	MT 46V32MB-75C	MT9VDDT3272G-265C3
512MB	266MHZ	MT 46V64M4-75C	MT18VDDT6472G-265C3
1GB	266MHZ	MT 17327-02	MT36VDDT12872G-265C2

<b>Smart</b>			
512MB	266MHZ	SAMSUNG K4H560438D-TCB0	SM6472RDDR3H1LP
512MB	266MHz	MT 46V64M4-75C	SM6472RDDR3H1LP-M
512MB	266MHz	NANYA NT5DS64M4AT-7K	SM6472RDDR301LP2-N
1GB	266MHz	SAMSUNG K4H510638D-TCB0	SM12872RDDR3H1LP
2GB	266MHz	SAMSUNG K4H1G0638M-TCB0	SM25672RDDR3H1LP

<b>Viking</b>			
512MB	266MHz	SAMSUNG K4H560438D-TCB0	VI647224DTH
512MB	266MHz	SAMSUNG K4H560438D-TCB0	VI647228DTH
1GB	266MHZ	SAMSUNG K4H560438D-TCB0	VI4CR287224DYH

## Addendum B: Symptom Report Form

Mother Board	HDAMB		Serial Number	
			Bios Version	
CPU 0			Speed (MHz)	
CPU 1			Speed (MHz)	
DDR DIMM	pair 1 (slot A1, A2)	Vendor		Part Number
		Size x2		Chip
	pair 2 (slot B1, B2)	Vendor		Part Number
		Size x2		Chip
Floppy		Drive A:	Drive B:	
OnBoard IDE	Pri. IDE	Master		Slave
	Sec. IDE	Master		Slave
OnBoard Serial ATA		Port 0		Parallel Port
		Port 1		
PCI Slots	PCI-32 -1			PCI-32 -4
	PCI-32 -2			PCI-32 -5
	PCI-32 -3			
Operating System			Power Supply	
Symptoms				
Contact Information	Name		Phone	
	Company		Email	

**Appendix**