HDAMA
User's Guide

RIOWORKS™

The Reliable Building Block

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AccelerTech ServerBoard Manual

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ATTENTION: READ FIRST!

¡INSTALLATION WARNING!

Use Caution When Installing the ServerBoard into the System Chassis

The components underneath the PS/2 Mouse/Keyboard connectors around the mounting hole are very FRAGILE and can be knocked off of their soldered positions, resulting in IRREPARABLE DAMAGE during installation when sliding the board into a system chassis.

Gently install the ServerBoard into the chassis, and use a Mylar Sheet to cover and protect the underside of the ServerBoard during installation. Take care NOT to scrape the bottom of the ServerBoard on the chassis stand-offs and mounting holes.

These components are necessary for many different operations, including the Mouse and the Keyboard. If you damage any of these chips, one of the symptoms is that the ServerBoard will NOT respond to key strokes through the PS/2 port and the ServerBoard will have to be replaced. Other symptoms include the loss of response or functionality in any of the rear I/O ports. Contact your authorized dealer for more information.

The Damage noted here in this WARNING may require the ServerBoard to be replaced. Due to the Nature of the Damage, this may be considered **Out-of-Warranty Damage**. Make certain that ALL documented procedures are followed correctly.

Screw-Hole

Serverboard Manual
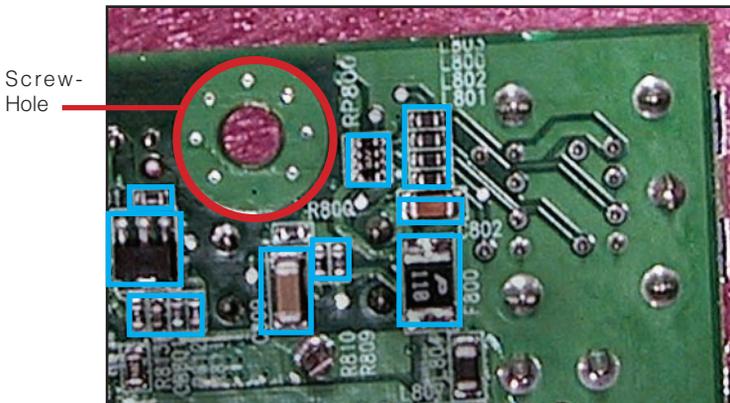
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Overview

Thank you for choosing this high performance Server motherboard. The dual AMD® Opteron micro-Socket 940 motherboard (M/B) based on the SSI form factor and is configured with the AMD® HyperTransport I/O Hub 8111 and PCI-X Tunnel 8131 chipsets. The board features a Hyper Transport speed of 1600 MTs (MegaTransfers per second).

For memory options, there are eight sockets in a four + four configuration to support up to 16 GB of memory using Registered PC3200/PC2700/2100 ECC DDR memory modules.

Flexibility and expandability are provided by two 64-bit/133MHz PCI-X slots, two PCI 64-bit/66MHz PCI slots, and two 32-bit/33Mhz PCI slots. 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 onboard Silicon Image Serial ATA RAID interfaces, dual Broadcom Gigabit Ethernet controllers, and an onboard ATI® RageXL video controller with 8MB memory to provide high system capabilities that meet a wide range of demanding Sever applications.

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

This Section is divided as follows:

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.

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.

IMPORTANT	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.
WARNING	This icon alerts you to potential dangers during the setup of your system. These warnings should **not** 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 serverboard by always working with proper grounding straps and making sure that your system is turned off and unplugged whenever you are working on it,
NOTE	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.
TIP	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 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 and we will try to answer your questions within 24 hours. Before you email your symptoms to sales@Rioworks.com, fill in the *symptom report* to inform and aid our engineers in solving your problem quickly.

Overview

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SERVERBOARD SPECIFICATIONS

Processor	AMD Dual Opteron Socket 940 CPUs with HyperTransport at 1600 MT/s * Built-In Memory Controller Hub (MCH)
Chipset	* AMD 8111 (HyperTransport I/O Hub) * AMD 8131 (PCI-X Tunnel)
Memory	* 4+4 sockets for Registered PC3200/PC2700/PC2100 ECC DDR DIMMs * Supports total system memory size of 16 GB
Internal I/O connectors	* Floppy Connector (Floppy Controller supports 1.44 MB, 2.88 MB, Japanese Floppy 3 Mode and LS-120 floppy disk drives) * Thin-Type Floppy Connector for Slim Floppy Drives * 2x IDE 40-pin connectors (BIOS supports IDE CD-ROM boot up) * 2x USB 1.1 Headers for 4 extendable USB ports * UART 16550 serial port header (for COM2) * AMC Connector for BMC (Baseboard Management Controller) module
On-Board VGA	ATI RageXL with 8MB Memory
On-Board Dual LAN	2x Broadcom BCM5702 Gigabit Ethernet controllers * Fail-Over Support
Expansion Slots	* 2x PCI-X 64 bit / 133/100 MHz * 2x PCI 64 bit / 66/33 MHz * 2x PCI 32 bit / 33 MHz
Rear Panel I/O	1x UART 16550 serial port (COM1) 2x onboard USB 1.1 connectors VGA port for on-board ATI RageXL chip 2x GigaBit Ethernet LAN RJ-45 ports PS/2 mouse and keyboard connectors with Wake-Up function
System Management	AMC connector for Baseboard Management Controller Hardware Monitor ADM1026 (CPU Thermal, Fan, Voltage, Intrusion) Super I/O NS87360 IPMI 1.5 (optional with Remote Management Card) SmartWatch for hardware problem alerts Fault-Tolerance, Fail-Over Support and Timing, Alert on LAN ready
System BIOS	4Mb Flash EEPROM with Phoenix BIOS I2C support. SMBIOS 2.3 and DMI 2.0 compliant Secure Boot, Multiple Boot
Form Factor	Extended ATX form factor (12" x 13") EPS 12V power connectors (24 pin + 8 pin)
Miscellaneous	Integrated VRM support (spec 9.1)
Serial ATA (Option)	Four (4) integrated Silicon Image 3114 Serial ATA ports Supports RAID 0,1,10

Only AMD Opteron 246 or higher supports DDR 400 memory.

SERVERBOARD LAYOUT

Overview

GigE LAN

ATI Rage XL

Broadcom

LAN1
LAN2

VGA

COM1

USB

Mouse
Keyboard

COM2

AMC Connector

PCI 32-bit

PCI 64-bit

PCI-X

AMD 8111

AMD 8131

Power

IDES,P

Floppy

Slim Floppy

S-ATA Port 1,2,3,4
(Option)

CPU1 (H1)

H1 Memory DIMM 2,3,0,1

H0 Memory DIMM 1,0,3,2

Power

CPU0 (H0)

Silicon Image S-ATA
(Option)
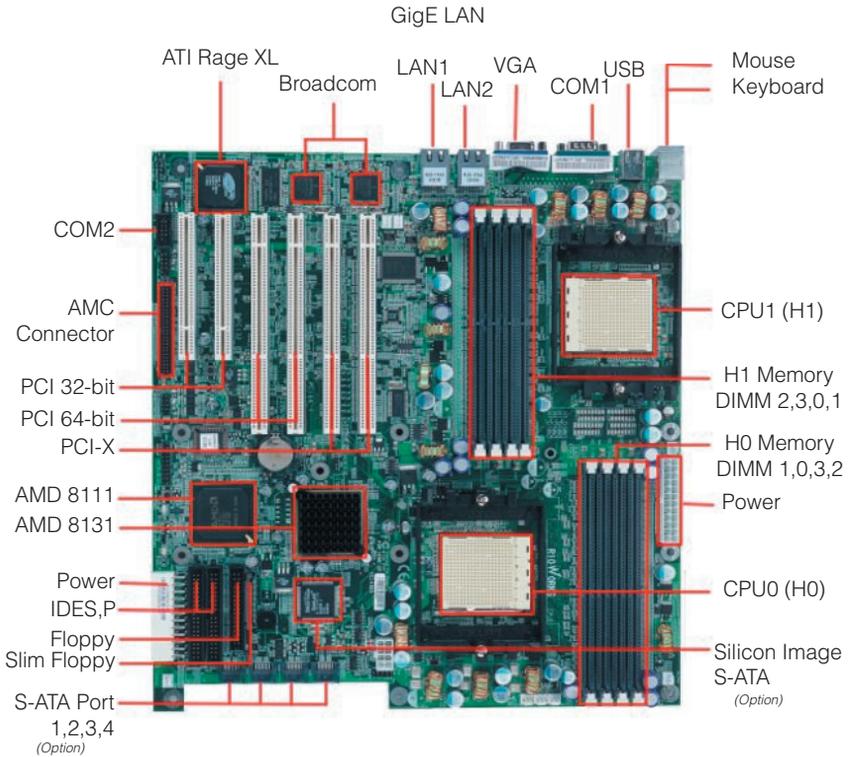
SERVERBOARD MAP

I/O Port Array

Sys Fan 0,1

COM 2
USB Header 0
AMC Connector

32-bit/33 MHz PCI x2
64-bit/66 MHz PCI x2
64-bit/133 MHz PCI-X x2

DDR Memory x4

AMD Opteron Socket 940 (H1)

H1 Fan 1

USB Header 1
Front Panel Switches
Thin-type Floppy connector
Floppy
IDE S,P

H1 Fan 0

24-Pin Power

DDR Memory x4

AMD Opteron Socket 940 (H0)

Silicon Image S-ATA RAID *(Option)*

Aux. Power Connector

System Fan

H0 Fan 0

Serial-ATA Connectors *(Option)*

8-pin Power

LED Board

Fr. Fan 1
Fr. Fan 0

H0 Fan 1

I/O PORT ARRAY

PS/2 Mouse | USB | COM1 | VGA | LAN2 | LAN1
PS/2 KBD | Ports

Overview

Hardware Installation

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

This section is divided as follows:

Hardware Install

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.

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

On-Board
VGA Select

PCI 64 Bit
Jumper

1
2
3

Clear CMOS

PCI-X
Jumper

3
2
1
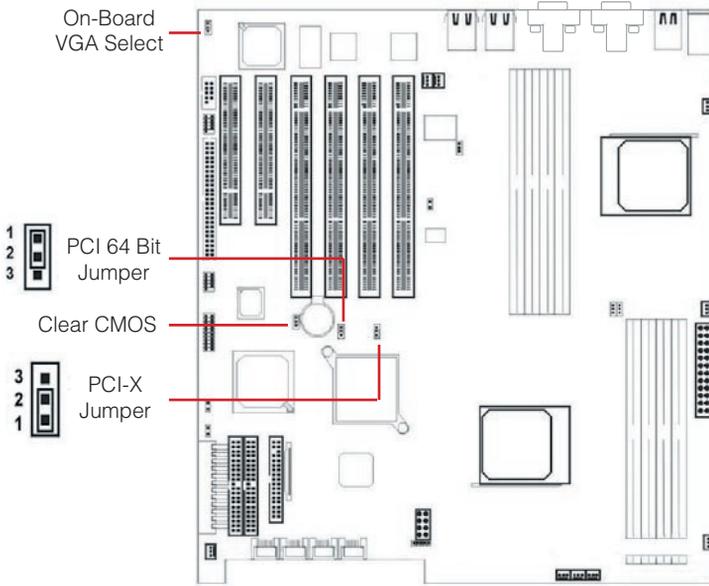
Caution

Only PCI-X Jumper sequence is

3
2
1

On-Board VGA Select, PCI 64 Bit Jumper, Clear CMOS sequence are

1
2
3

JUMPER SETTINGS

On-Board VGA Select Jumper

If you are going to use the onboard VGA feature, you need to set the jumper to enable the VGA header.

1-2	2-3
VGA Enabled (*default*)	VGA Disabled

PCI-X Slot Speed Select Jumper

This header lets you determine the bus speed of the PCI-X slots. The speed can be set to either 133 MHz (default) or 100 MHz.

1-2	2-3
133 MHz Enabled (*default*)	100 MHz Enabled

PCI 64 Bit Slot Speed Select Jumper

This header lets you determine the bus speed of the PCI-X 64-bit slots. The speed can be set to either 64 MHz (default) or 33 MHz

1-2	2-3
66 MHz Enabled (*default*)	33 MHz Enabled

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.

1-2	2-3
Normal (*default*)	Clear CMOS

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

1. Turn off the computer and Remove the Power Cord
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.

✳ IMPORTANT

If you do not remove the power cord, then the CMOS may NOT be cleared.

INSTALLING MEMORY

This ServerBoard 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 PC2100/PC2700/PC3200 (DDR266/DDR333/DDR400) 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 16GB.

The Design of the processor is such that the Memory Controller Hub (MCH) is built-in to the processor. Therefore, if there is no processor present, the respective DIMM Bank is NOT recognized. This is important to note when there is only one (1) processor present (CPU0). Only the H0 DIMM bank will be active, allowing only 4 DIMMs for a max memory of 8 GB.

✴ IMPORTANT

*   The ServerBoard has strict memory and timing requirements. Before buying DDR (Double Data Rate) DIMMs for use with the ServerBoard, it is recommended that you consult your local reseller for the best and most compatible memory to use.
*   The Memory Controller Hub is built-in to the Processor. If NO processor is present, the respective DIMM Bank is NOT recognized.
*   This ServerBoard only supports Registered PC2100/PC2700/PC3200 (DDR266/DDR333/DDR400) compliant modules.

Memory Installation Procedures

This section outlines how to install Registered PC2100/PC2700/PC3200 DDR DIMMs into the ServerBoard.

H1 Memory Bank: 0-3

H0 Memory Bank: 0-3

2 3 0 1

1 0 3 2
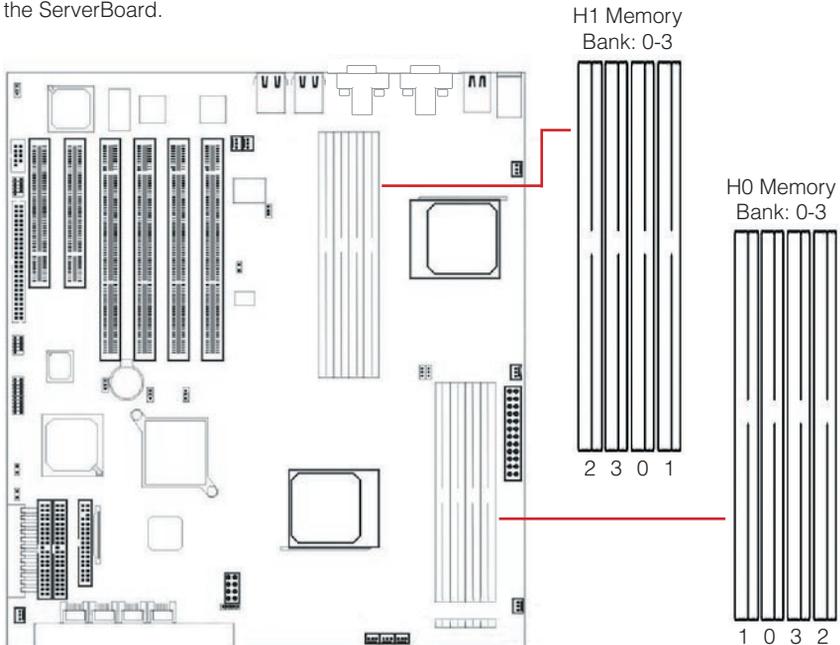
1.   Locate the Memory Banks on the ServerBoard, where you will be installing the DIMMs.

Hardware Install

C-11

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.

80 pins   104 pins
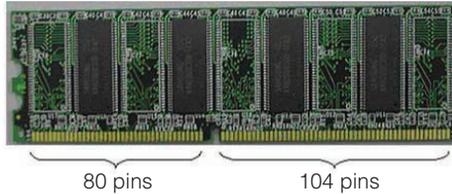
3. Insert the module into the DIMM socket and press down evenly on both ends firmly until the DIMM module is securely in place. (The tabs of the DIMM socket will close-up to hold the DIMM in place when the DIMM is properly installed on the socket's bottom.)

Notch →

Notch ←

Release Tab

The notch hole should line up with the notch on the slot

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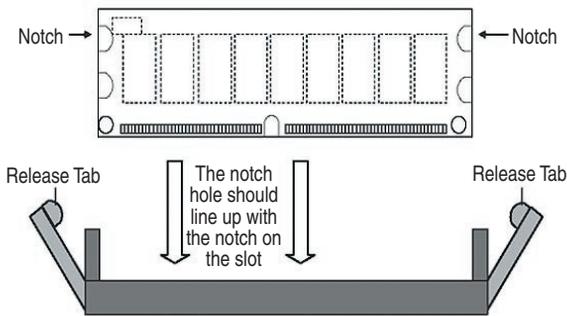
4. Repeat step 1 to step 3 for all additional DIMM modules.

DIMM Slot 1
DIMM Slot 0

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 0 and 1 are paired, and slots 2 and 3 are paired. If you are only installing two DIMMS into a Memory Bank, it is recommended that you install them in slots 0 and 1 to get the full bandwidth. (This is True for the H1 DIMM bank as well.)
*   Remember to populate the H0 DIMM bank with at least 2 DIMMs (for CPU0) before inserting memory modules in the H1 DIMM bank (for CPU1).

RECOMMENDED MEMORY CONFIGURATIONS

The AMD Opteron processors have very specific memory module requirements, and due to the design of the serverboard, 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 serverboard is designed to pair up DIMM slots 0/1 and slots 2/3 for the 128-bit pathway.

The Opteron is designed with the Memory Controller Hub (MCH) built-in to the processor. The DIMM Banks are thus controlled by the processor. If a processor is NOT present, then the respective DIMM Bank is NOT recognized. When only one (1) processor is installed in CPU0, only the H0 DIMM bank is active. DIMMs in the H1 DIMM Bank will NOT be recognized.

The memory nodes are also shared over the entire bus. It is possible to operate a system with two CPUs and only a pair of DIMMs in the H0 DIMM 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 0 or DIMM slot 2 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/PC3200/DDR266/DDR333/DDR400 DIMMs and that they appear on the List of Recommended Memory Modules):

IMPORTANT

* If you only have one (1) processor, install ALL DIMMs into the H0 DIMM Bank.
* 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.

If you have...	You should install them in...
One (1) CPU (Installed in Socket CPU0)	
1 DIMM	H0 Bank: Slot 0 or Slot 2 (*This only provides 64-bit memory access*)
2 DIMMs	H0 Bank: Slots 0/1 OR Slots 2/3
4 DIMMs	H0 Bank: Slots 0,1,2,3 (*Memory installed in H1 will NOT be recognized*)
Two (2) CPUs	
1 DIMM	H0 Bank: Slot 0 or Slot 2 (*This only provides 64-bit memory access*)
2 DIMMs	H0 Bank: Slots 0/1 OR Slots 2/3
4 DIMMs	H0 Bank: Slots 0/1 H1 Bank: Slots 0/1
6 DIMMs	H0 Bank: Slots 0,1,2,3 H1 Bank: Slots 0/1 OR Slots 2/3
8 DIMMs	H0 Bank: Slots 0,1,2,3 H1 Bank: Slots 0,1,2,3

INSTALLING THE PROCESSOR AND HEATSINK

The ServerBoard accommodates AMD® Opteron micro-PGA Socket 940 processors at 1600 MTs (MegaTransfers per second). You must first insert a CPU into CPU socket 0 (CPU0) before installing one in CPU socket 1 (CPU1).

Processor (CPU) Installation

This section outlines how to install a CPU into the ServerBoard
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.

Pin1

Pin 1 of CPU is lined up with Pin1 of Socket.
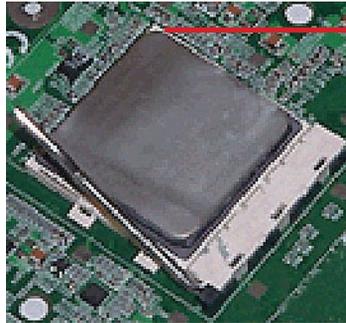
3. Apply Thermal Compound (Thermal grease) to the top of the CPU.
4. Mount the Heatsink on top of the installed CPU by attaching it to the motherboard with the included screws (first on one side, then the other).
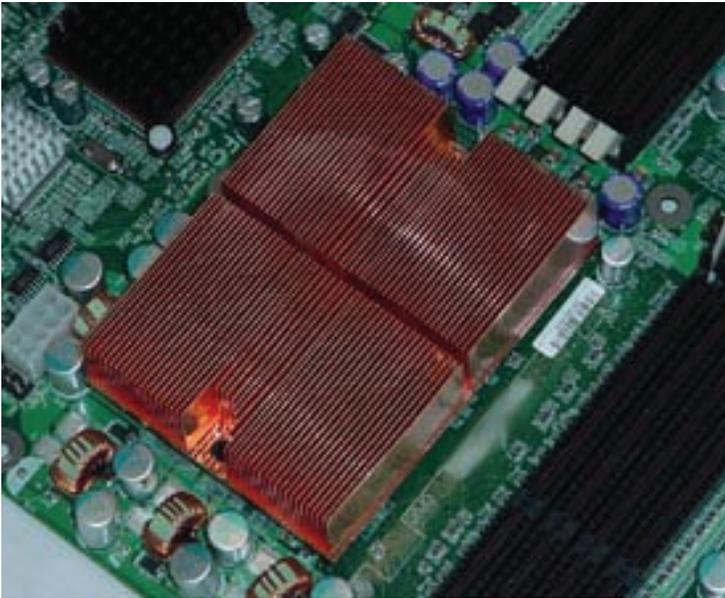
<div style="writing-mode: vertical">Hardware Install</div>

Installing the Processor and Heatsink continued...

5.   Connect the 3-wire fan cable to the H0_FAN1 connector on the motherboard.
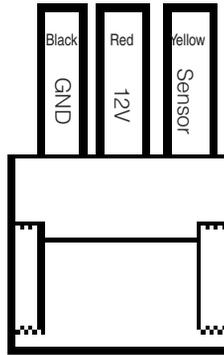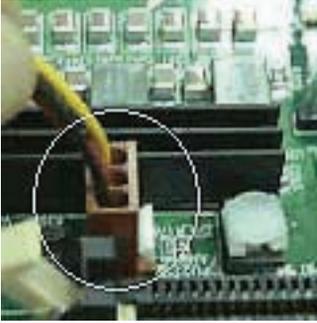
6.   Repeat steps 1 thru 5 to install a second CPU (CPU1)

Hardware
Install

The following map of the ServerBoard illustrates the location of all the connectors on the ServerBoard. Use this map to aide you in connecting devices to your ServerBoard.
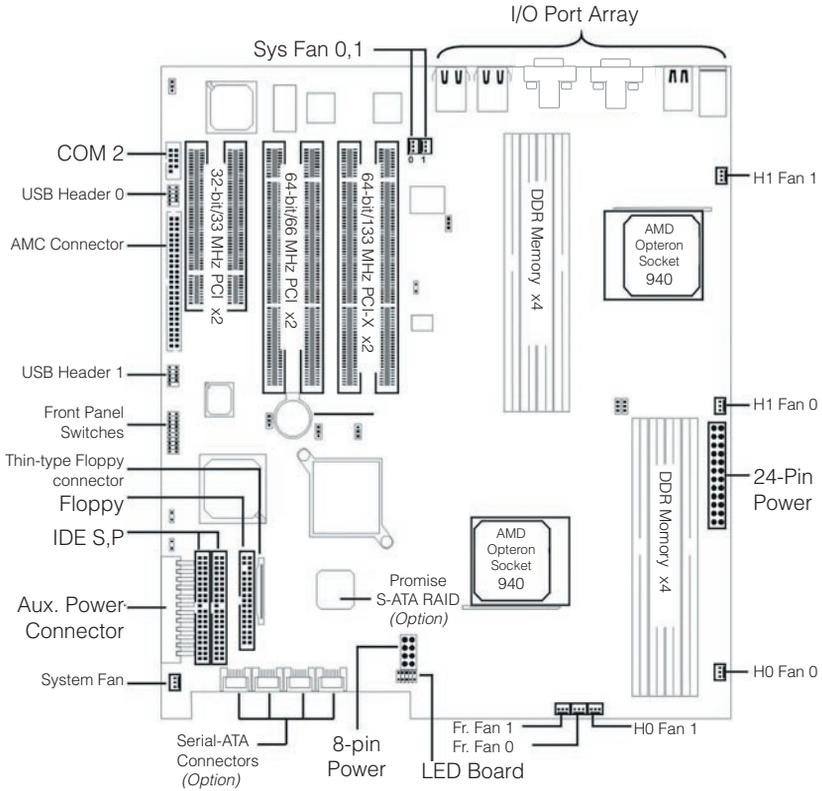
Hardware Install

ATX POWER CONNECTORS

ATX 24-pin connectors connect the ServerBoard 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.

24-pin Power Supply
Connector

+3.3V		+3.3V
-12V		+3.3V
COM		COM
PS_ON		+5v
COM		COM
COM		+5V
COM		COM
Reserved		PWR_OK
+5V		5VSB
+5V		+12V
+5V		+12V
COM		3.3V

Hardware Install

8-pin Power Supply
Connector (+12V)

+12V		GND
+12V		GND
+12V		GND
+12V		GND
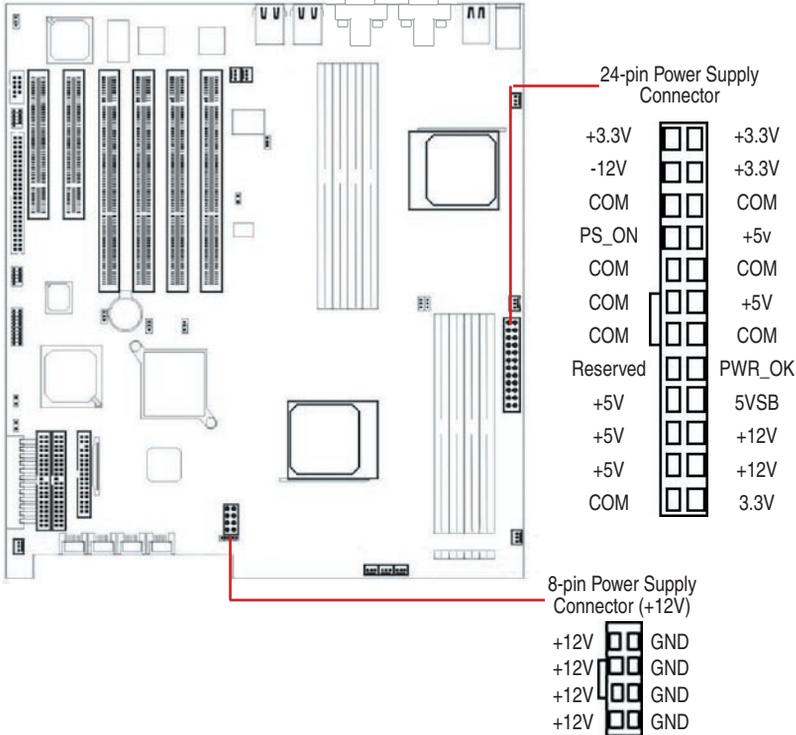
✳ IMPORTANT
It is recommended that you use an ATX Power Supply that complies with the Intel ATX 2.03 specification.

Hardware Install

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FLOPPY DISK DRIVE CONNECTOR

This 34-pin connector supports the standard floppy disk drive ribbon cable. Connect the single connector end to the ServerBoard. 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 ServerBoard and the floppy drive. The Thin-Type Ribbon connector is specifically designed for use with Slim Floppy drives that connect directly to the serverboard.

PRIMARY IDE CONNECTORS

The two 40-pin IDE connectors (primary and secondary channels) support 40-wire IDE ribbon cables. Connect the single connector end to the ServerBoard. 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. The ServerBoard BIOS now supports IDE HDD or IDE CD-ROM bootup. (Pin 20 is removed to prevent the connector from being insertied in the wrong orientation when using ribbon cables with pin 20 plugged in). The BIOS supports Ultra DMA 33/66/100/133.

34-pin Floppy Connector

Pin1

40-pin IDE Connectors

Pin1

Slim-Type Floppy Connector

IDE_S IDE_P
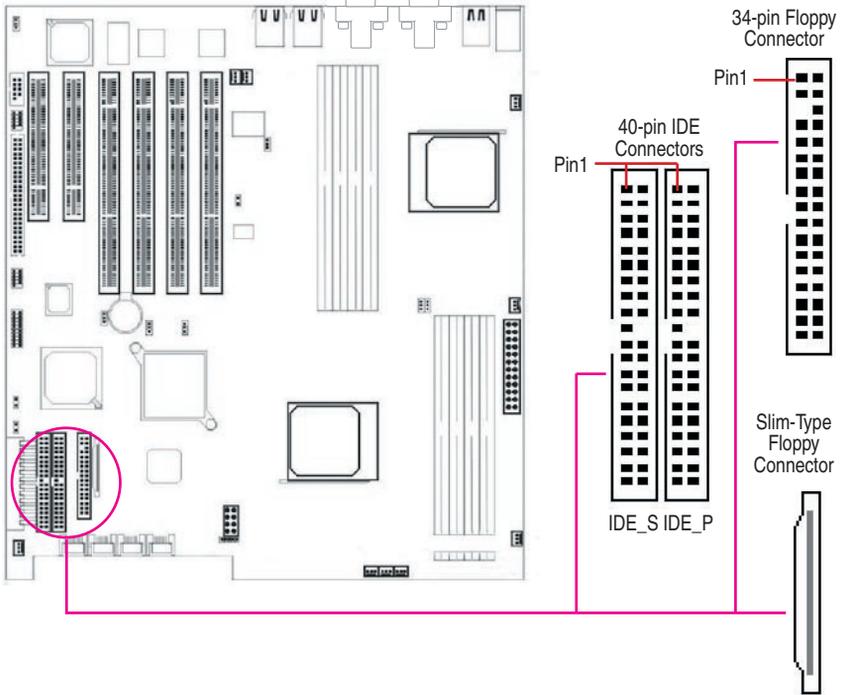
IMPORTANT

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 ServerBoard.

Front Panel Switch Headers

Reset
Speaker
Power Switch
HDD_LED
Power LED
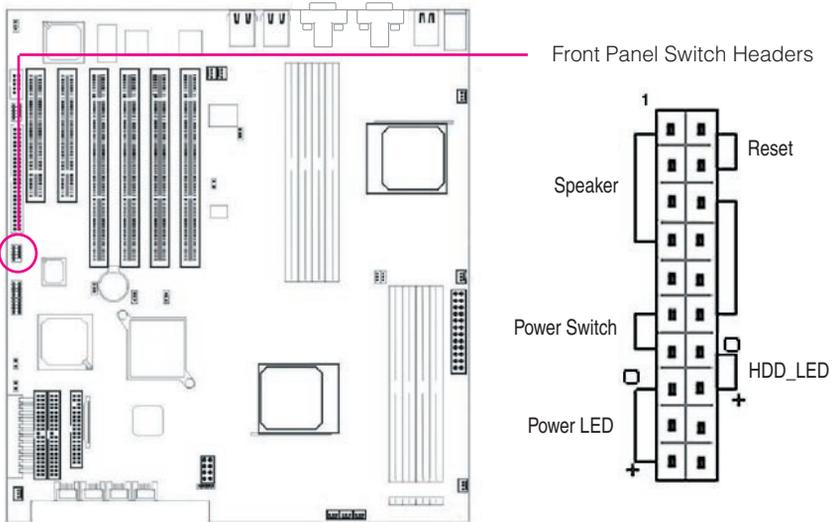
Reset Switch (2-pin RST)
This 2-pin connector connects to the chassis-mounted reset switch for rebooting your computer without turning your power switch off and on. This is a preferred method of rebooting your system to prolong the life of your system's power supply.

SCSI Hard Disk Card Activity LED (4-pin SCSI_HD)
The 4-pin connector can be connected to the 4-pin activity LED connector of SCSI cards Read and Write activities by devices connected to the SCSI card will cause the front panel LED to light up.

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 ServerBoard 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 serverboard 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.

Sys_Fan0, Sys_Fan1
H1_Fan1
H1_Fan0
H0_Fan0
Front_Fan0, Front_Fan1, H0_Fan1
Sys_Fan
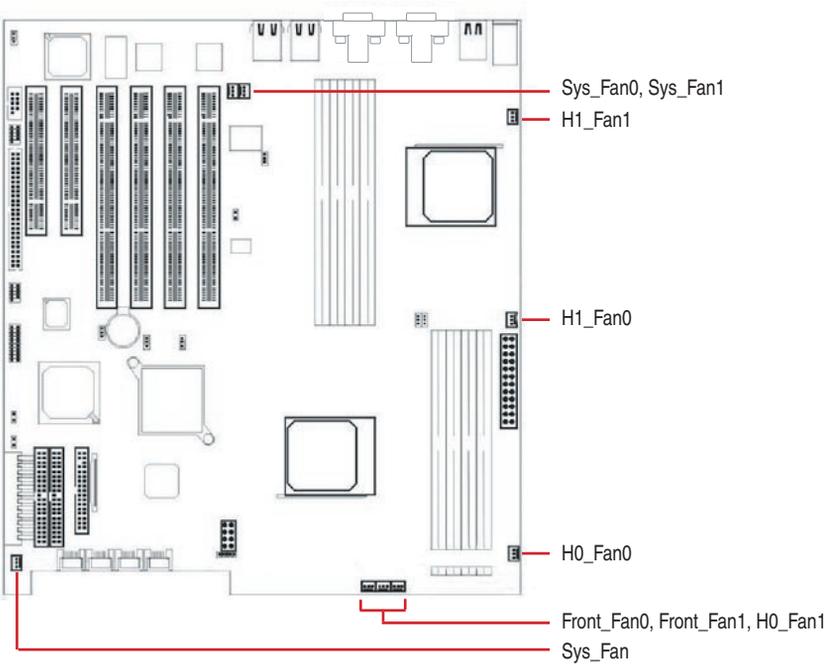
NOTE

*   The "Rotation" signal can only be used with fans specially designed for the rotation signal.
*   Only fans connected to FRONT_FAN1, FRONT_FAN0, H0_FAN1, H0_FAN1, H1_FAN0 and H1_FAN1 are monitored by the BIOS

REAR PANEL I/O PORTS

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

PS/2 Mouse   USB   COM1   VGA   LAN2   LAN1
PS/2 KBD   Ports
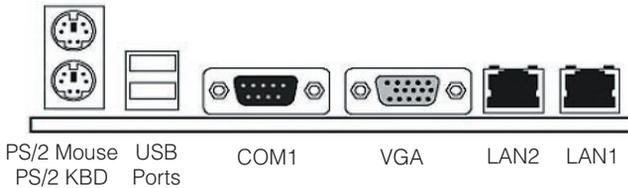
PS/2 Mouse Connector (6-pin Female)
The system will direct IRQ12 to the PS/2 mouse if one is detected. If no mouse is detected, IRQ12 will be free for expansion cards to use.

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 I & 2 (Two 4-pin Female)
Two onboard external USB 1.1 ports are available for connecting USB devices.

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.

VGA Connector (15-pin Female)
The VGA port connects to a display device. See BIOS for more information VGA setup.

Onboard LAN Ports 2 & 1 (RJ-45)
This ServerBoard uses the Broadcom BCM5702 Gigabit Ethernet Controller. There are two RJ-45 ports available for connecting to networks. 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.

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

Serial Port Header (COM2)

USB Header 0

USB Header 1
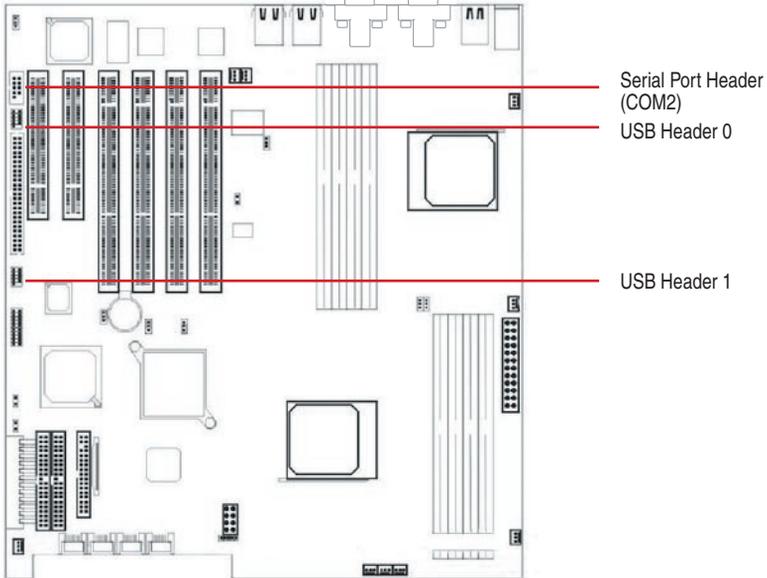
Serial Port (COM2) Header (9-pin)
This is for connecting an additional serial port to the ServerBoard. This is generally used adding a 25-pin female serial connector. See BIOS for setup information.

9-pin Serial
Port Header

COM2 Pin Assignments			
Pin	Desc.	Pin	Desc.
1	DCD	2	DSR
3	Serial In	4	RTS
5	Serial Out	6	CTS
7	DTR	8	RI
9	GND		

On-Board USB 0 & 1 Header (5-pin)
This header is for connecting up to 4 additional USB ports to the ServerBoard. See BIOS for setup information.

5-pin Onboard
USB Header

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

INSTALLING EXPANSION CARDS

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

The ServerBoard features 2 PCI-X (64-bit, 133Mhz) slots, 2 PCI-64 (64-bit, 66MHz) slots, and 2 PCI-32 (32-bit, 33MHz) slots to accomodate 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 serverboard, 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 serverboard and expansion cards.

ASSIGNED IRQS AND EXPANSION CARDS

An IRQ number is automatically assigned to PCI expansion cards. In the PCI bus design, the BIOS automatically assigns an IRQ to a PCI slot that contains a card requiring an IRQ.The system will automatically assign an INTA # to the IRQ routing table, but you can manually configure IRQ routing in the PCI Configuration submenu in the BIOS setup.

If necessary to install a PCI card, you should set the jumpers on your PCI cards to INTA.

The following details the IRQ priorities by PCI device:

PCI Device	IDSEL	IRQ
PCI-32 Slot 4	AD20	INT A, B, C, D
PCI-32 Slot 5	AD21	INT B, C, D, A
VGA Rage XL	AD22	INT C
PCI-64 Slot 2	Go_A_AD17	Go_A_INT B, C, D, A
PCI-64 Slot 3	Go_A_AD18	Go_A_INT C, D,, A, B
BCM5702_1	Go_A_AD19	Go_A_INT D
BCM5702_2	Go_A_AD20	Go_A_INT D
PCI-X Slot 0	Go_B_AD17	Go_B_INT B, C, D, A
PCI-X Slot 1	Go_B_AD18	Go_B_ INT C, D, A, B

POWERING ON YOUR SYSTEM

Follow these instructions to power on the computer after you have installed the ServerBoard 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.

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.

BIOS

This chapter discusses the PhoenixBIOS Setup program built into the ROM BIOS. The Setup program allows users modifying the basic system configurations according to their requirements.

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:

BIOS Setup

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 item
Right Arrow Key	Move to the next item
<Esc> key or <Alt-X>	In the Submenu: to Exit the submenu. In the BIOS main menu: Quit Without Saving Changes.
<Enter> Key	Select the highlighted item. When available, a pop-up list will display for you to select the item value.
<PgUp> Key	Increase the numeric value or make change
<PgDn> Key	Decrease the numeric value or make change
+ Key	Increase the numeric value or make change
– Key	Decrease the numeric value or make 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	Load Previous values for this page
<F6> Key	Load Failsafe Defaults for this page
<F7> Key	Load Optimal Defaults this page
<F10> key	Save configuration and exit the BIOS Setup Utility
<Tab> or <Shift-Tab>	Cycle cursor up and down.
<Home> or <End>	Move cursor to top or bottom of window.
<PgUp> or <PgDn>	Move cursor to next or previous page.
<Alt-R>	Refresh screen.

BIOS Setup

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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

BIOS Setup Main Menu

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

```
                      PhoenixBIOS Setup Utility
    Main   Advanced  Security   Power    Boot   Server   Exit
                                             Item Specific Help
     System Time:           [16:19:20]
     System Date:           [03/02/2003]    <Tab>, <Shift-
                                            Tab>, or <Enter>
     Legacy Diskette A:     [1.44/1.25 MB 3½"]  selects field
     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  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.
System Date	MM/DD/YYYY	Set the system date.
Diskette A Diskette B	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" Not installed Disabled	Select the type of floppy-disk drive installed in your system. 1.25 MB is a Japanese media format that requires a 3½" Mode 3 Diskette drive.
HDD Post Write Buffer	Enabled Disabled	Enables and disables the HDD post write buffer. Enable this item for better performance.
Large Disk Access Mode	DOS Other	Select "DOS" if you have DOS. Select "Other" if you have another operating system such as UNIX. * 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	Enabled Disabled	Disable this item to NOT display the System Configuration on Boot and speed up the boot process.
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.

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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.

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, usually 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 usually 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]              │ Select the drive
                CHS Format                    │ type of the fixed
   Cylinders:             [13328]             │ disk installed
   Heads:                 [  15]              │ in your system.
   Sectors:               [  63]              │ If type User
   Maximum Capacity:       6449 MB            │ is selected,
                LBA Format                    │ Cylinders, Heads,
   Total Sectors:         [0]                 │ and Sectors
   Maximum Capacity:      [0MB]               │ can be edited
   Multi Sector Transfer: [16 Sectors]        │ directly.
   LBA Mode Control:      [Enabled]           │ Auto attempts
   32-bit I/O:            [Enabled]           │ to automatically
   Transfer Mode:         [Fast PIO 4]        │ detect the
   Ultra DMA Mode:        [Enabled]           │ drive type for
                                              │ drives that
                                              │ comply with ANSI
                                              │ specifications.

    F1  Help  Select Item  -/+ Change Valuesn F9 Setup Defaults
    ESC Exit  Select Menu Enter Select » Submenu F10 Save and Exit
```

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		
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	Total disk capacity
LBA Format		
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	Total disk capacity
Multi-Sector Transfers	Disabled Standard 2 sectors 4 sectors 8 sectors 16 sectors	Any selection except Disabled determines the number of sectors transferred per block. "Standard" is 1 sector per block.
LBA Mode Control	Enabled Disabled	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads, & Sectors.
32-Bit I/O	Enabled Disabled	Enables 32-bit communication between CPU and IDE card. Requires PCI or local bus.
Transfer Mode	Standard Fast PIO 1 ~ 4	Selects the method for transferring the data between the hard disk and system memory. The Setup menu only lists those options supported by the drive and platform.
Ultra DMA Mode	Disabled Mode 0 ~ 6	If you install a device that supports UltraDMA, change the appropriate item on this list to the value listed in the device's documentation. You may have to install the UltraDMA driver supplied with this serverboard to use an UltraDMA device.

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.

BIOS Setup

ADVANCED MENU

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

```
                        PhoenixBIOS Setup Utility
     Main    Advanced  Security   Power    Boot    Server   Exit
                                                     Item Specific Help

     Installed O/S:               [Other]            Select the
     Reset Configuration Data:    [No]               operating system
                                                     installed on you
     USB Host Controller:         [Enabled]          system that you
     USB BIOS Legacy Support:     [Enabled]          use most often.
     CPU0, CPU1 Link Tx Speed     [800Mhz]
     CPU0, GOLEM0 Link Tx Speed   [600Mhz]           Note: An
                                                     incorrect
     4GB Memory Hole Adjust:      [Auto]             setting can
     4GB Memory Hole Size:        [64 MB]            cause unexpected
     IOMMU                        [Disabled]         behavior in
     Size                         [32 MB]            some operating
     Multiprocessor Specification:         [1.4]     systems.
     Use PCI Interrupt Entries in MP Table:  [Yes]

  » Chipset Configuration
  » Keyboard Configuration
  » I/O Device Configuration
     QuickBoot Mode:              [Enabled]
     Boot Diagnostic Screen:      [Enabled]
  » PCI Configuration
  » Console Redirection
```

BIOS
Setup

Use this chart to help you configure your Advanced Menu:

Feature	Options	Description
Installed Operating System	Other Win95 Win98 Win2000 WinMe	Select the operating system you installed on the system. In the case of multiple-boot systems, select the one you use most often.
Reset Configuration Data	Yes No	Yes erases all configuration data in a section of memory reserved for ESCD (Extended System Configuration Data) which stores the configuration settings for non-PnP plug-in devices. Select Yes when required to restore the manufacturer's defaults.
USB Host Controller	Enabled Disabled	Enables and disables the onboard USB host controller. When enabled, the following item becomes available.
USB BIOS Legacy Support	Enabled Disabled	Enables support for the legacy USB bus and its devices.
CPU0, CPU1 Link Tx Speed	800Mhz 1GMhz	CPU0 to CPU1 Tx Speed select
CPU0, GOLEM0 Link Tx Speed	600Mhz 800Mhz	CPU0 to GOLEM0 Tx Speed select
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	
IOMMU	Enabled Disabled	IOMMU Enable/Disable
Size	32MB 64 MB 128 MB 256 MB 512 MB 1 GB 2 GB	
Multiprocessor Specification	1.4 1.1	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	Enabled Disabled	When enabled, the POST (Power-On Self Test) is disabled, speeding up the system boot up.
Boot Diagnostic Screen	Enabled Disabled	Enable this item if you are having trouble with the system and you want to diagnose the problem. Disable this item to turn off this feature, but this is only recommended when all memory banks are of the same size/type.

BIOS Setup

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

                    Setup Warning                Controls system
      Setting items on this menu to incorrect    memory parity
    values may cause your system to malfunction. through the
                                                 chipset.
    DRAM Bank Interleave:    [Disabled]
    Note Memory Interleave:  [Disabled]
    ECC:                     [Enabled]
    Dram ECC:                [Enabled]
    ECC Scrub Redirection:   [Disabled]
    Chip-Kill:               [Enabled]

    DCACHE ECC Scrub CTL:    [Disabled]
    L2 ECC Scrub CTL:        [Disabled]
    DRAM ECC Scrub CTL:      [Enabled]

   F1  Help  Select Item   -/+ Change Values F9  Setup Defaults
   ESC Exit  Select Menu Enter Select » Submenu F10 Save and Exit
```

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.

BIOS Setup

Use this table in configuring the system chipset features:

Feature	Options	Description
Dram Bank Interleave	Disabled AUTO	Enable this item to increase memory speed. It interleaves memory blocks across DRAM chip selects. When enabled, separate memory banks are set for odd and even addresses and the next byte of memory can be accessed while the current byte is being refreshed. 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	Enabled Disabled	ECC Check/Correct Mode This is a Global enable function for all blocks within the CPU core and North Bridge. This option will display the "Dram ECC", "DCACHE ECC Scrub CTL", "L2 ECC Scrub CTL", and "DRAM ECC Scrub CTL" options in this menu when enabled. Enable only if the DIMMs are Registered ECC and support parity/ECC checking.
Dram ECC	Enabled Disabled	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. *This option only appears if the ECC option is enabled.*
ECC Scrub Redirection	Enabled Disabled	Enable ECC Scrubber to correect errors detected in DRAM during normal CPU requests (Foreground Scrubbing)
Chip-Kill	Enabled Disabled	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. *This option only appears if the ECC option is enabled.*
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 L2 CACHE Lines. *This option only appears if the ECC option is enabled.*
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 can NOT be enabled without first enabling Dram ECC. *This option only appears if the ECC option is enabled.*

BIOS Setup

KEYBOARD CONFIGURATION SUBMENU

This screen is displayed when you select the "Keyboard Coniifiguration" 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]              Selects Power-on
   Keyboard auto-repeat rate:       [30/sec]       state for NumLock
   Keyboard auto-repeat delay:      [1/2 second]




 F1  Help  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	2/sec 6/sec 10/sec 13.3/sec 21.8/sec 26.7/sec 30/sec	Sets the number of times a second to repeat a keystroke when the key is held down.
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.

BIOS Setup

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

                                                'Disabled'
     Serial Port A:          [Enabled]          prevents any
       Base I/O address:     [3F8]              installed PS/
       Interrupt:            [IRQ4]             2 mouse from
                                                functioning, but
     Serial Port B:          [Enabled]          frees up
       Base I/O address:     [2F8]              IRQ 12. 'Enabled'
       Interrupt:            [IRQ3]             forces the PS/
                                                2 mouse port
     Parallel Port:          [Enable]           to be enabled
       Mode:                 [ECP]              regardless if a
       Base I/O address:     [378]              mouse is present.
       Interrupt:            [IRQ5]             'Auto Detect'
       DMA channel:          [DMA 1]            will enable the
                                                PS/2 mouse only
     Floppy disk controller: [Enabled]          if present. 'OS
                                                Controlled' only
     PS/2 Mouse:             [Enabled]          displayed if the
                                                OS controls the
                                                mouse.

     F1  Help   Select Item  -/+ Change Values F9  Setup Defaults
     ESC Exit   Select Menu Enter Select » Submenu F10 Save and Exit
```

BIOS
Setup

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

Feature	Options	Description
Serial port A: Serial port B:	Disabled Enabled Auto	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. OS Controlled lets the PnP Operating System (such as Windows 95) configure the port after POST.
Base I/O Address	3F8 2F8 3EB 2EB	Select the Base I/O address for the Serial Ports.
Interrupt	IRQ 3 IRQ 4	Set the Interrupt for the Serial Port.
Parallel Port:	Disabled Enabled Auto	Disabled turns off the port. Enabled requires you to enter the base Input/Output address and the Interrupt number below. Auto makes the BIOS auto configure the port during POST. OS Controlled lets the PnP Operating System (such as Windows 95) configure the port after POST.
Mode	Bi-Directional EPP ECP EPP+ECP	Bi-directional modes are a two-way protocol. You can select one of two types: Extended Parallel Port (EPP) or Extended Capabilities Port (ECP).
Base I/O Address	378 278 3BC	If you select Enabled for the Parallel Port, choose one of these I/O addresses.
Interrupts	IRQ5 IRQ7	If you select Enabled for the Parallel Port, choose one of these interrupt options.
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	Enables the on-board legacy diskette controller. Disabled turns off all legacy diskette drives.
PS/2 Mouse	Disabled Enabled	Enables and disables support for a PS/2 mouse.

BIOS Setup

WARNING

If you choose the same I/O address or Interrupt for more than one port, the menu displays an asterisk (*) at the conflicting settings. It also displays this message at the bottom of the menu:

`* Indicates a DMA, Interrupt, I/O, or memory resource conflict with another`
`device. Resolve the conflict by selecting another settings for the devices.`

CONSOLE REDIRECTION SUBMENU

This submenu controls the configuration to remotely control the system.

```
                    PhoenixBIOS Setup Utility
         Advanced
             Console Redirection                Item Specific Help

  COM Port Address:              [Disabled]     If enabled, it
                                                will use a port
  Console Connection:            [Direct]       on the motherboard
  Baud Rate:                     [19.2K]
  Flow Control :                 [CTS/RTS]
  Console Type:                  [ANSI]
  Continue C.R. after POST       [On]




  F1  Help  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 Onboard COM A Onboard COM B	If Enabled, it will use a port on the serverboard.
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	Specifies a console type.
Contiune C.R. after POST	Off On	If enable, it will use a port on the motherboard.

BIOS
Setup

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

 » PCI Device Slot #1:                     Setup items
 » PCI Device Slot #2:                     for configuring
 » PCI Device Slot #3:                     the specific PCI
 » PCI Device Slot #4:                     device
 » PCI Device Slot #5:
 » PCI Device Slot #6:

 » Onboard Device Control

 » PCI/PNP IRQ Exclusion
 » PCI/PNP UMB Exclusion

  F1  Help  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.

BIOS
Setup

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:

PCI Device Slots 1-n		
Feature	**Options**	**Description**
Option ROM Scan	Disabled Enabled	Initialize device expansion ROM.
Enable Master	Disabled Enabled	Enables selected device as a PCI bus master. Not every device can function as a master. Check your device documentation.

Onboard Device Control		
Feature	**Options**	**Description**
Onboard LAN1/2	Disabled Enabled	Enables the onboard LAN function and LAN ports one and two.
Option ROM Scan	Disabled Enabled	Initialize device expansion ROM.
Onboard SATA	Disabled Enabled	Enables the onboard Serial ATA RAID function.

PCI/PNP IRQ Exclusion		
Feature	**Options**	**Description**
IRQ 3/4/5/7/10/11	Available Reserved	Enables you to reserve these IRQs for devices.
Items marked with an asterisk (*) indicate a DMA, IRQ, I/O, or memory resource conflict.		

PCI/PNP UMB Exclusion		
Feature	**Options**	**Description**
C800 – CBFF ~ DC00 - DFFF	Available Reserved	Enables you to reserve these upper memory blocks for devices.
Items marked with an asterisk indicate a DMA, IRQ, I/O, or memory resource conflict.		

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  Security  Power    Boot   Server   Exit
                                              Item Specific Help

     Supervisor Password is: Clear           Supervisor
     User Password is:       Clear           Password controls
                                             access to the
  Set Supervisor Password:[Enter]            setup utility.
  Set User Password:      [Enter]

  Password on boot:       [Disabled]
  Fixed disk boot sector: [Normal]
  Diskette access:        [Supervisor]




  F1  Help  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.

BIOS Setup

🖎 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 seven alphanumeric characters. Symbols and other keys are ignored. 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.

Serverboard Manual

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    Power    Boot    Server   Exit
                                                Item Specific Help

     ACPI Enabled:                 [Yes]      Select Power
     ACPI SRAT Table:              [Disabled] Management Mode.
     Spread Spectrum Modulation    [No]       Choosing modes
     Suppress Unused PCI Slot Clocks [Yes]    changes system
                                              power management
     WakeUp On LAN/PME:            [Enabled]  settings. Maximum
                                              Power Savings
     Power Savings:                [Customize] conserves the
                                              greatest amount
     Standby Timeout:              [15 sec]   of system power
       Auto Suspend Timeout:       [15 sec]   while Maximum
                                              Performance
     Resume On Time:               [Off]      conserves power
     Resume Time:                  [00:00:00] but allows
     Resume Date:                  [00/00/0000] greatest system
                                              performance.
     After Power Failure:          [Last State] To alter these
                                              settings, choose
                                              Customize. To
                                              turn off power
                                              management,
                                              choose Disable.

     F1  Help   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.

BIOS Setup

Power Menu continued...
Use this chart to help configure the system's power settings:

Feature	Options	Description
ACPI Enabled	Yes No	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 SRAT (Static Resource Affinity Table).
Spread Spectrum Modulation	No 0.10% 0.40% 0.70% 1.0% 1.3% 1.6% 2.0%	If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.
Suppress Unused PCI Slot Clocks	Yes No	When this item is enabled, BIOS will disable the clock signal of free PCI slots, which frees resources.
WakeUp On LAN/PME	Disabled Enabled	Enables WakeUp on LAN/PME support.
Power Savings	Disabled Customize Maximum Power Savings Maximum Performance	Maximum options: pre-defined values. Select Customize to make your own selections from the following fields. Disabled turns off all power management.
Standby Timeout	Off 1 min 2 min 4 min 6 min 8 min 12 min 16 min	Inactivity period required to put system in Standby (partial power shutdown).
Auto Suspend Timeout	Disabled 5 min 10 min 15 min 20 min 30 min 40 min 60 min	Inactivity period required after Standby to Suspend (maximum power shutdown).
Resume On Time	Off On	Wakes up system at predetermined time.
Resume Time	HH/MM/SS	Enter the time that you want the system to wake up.
Resume Date	MM/DD/YYYY	Enter the date that you want the system to wake up.
After Power Failure	Last State Stay Off Power On	Enables you to set the system's behavior after a power failure.

BIOS Setup

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    Boot    Server   Exit
                                                Item Specific Help

                                               Use these keys
    -Removable Devices                         to set the boot
        Legacy Floppy Drives                   order in which
    -Hard Drive                                the BIOS attempts
        Primary Master                         to boot the OS:
        Bootable Add-in Cards                  <+> or <-> moves
    CD-ROM Drive                               device up or
    Network Boot                               down.
    MBA v7.0.3 Slot 0218                       <Enter> expands
    MBA v7.0.3 Slot 0220                       or collapses
                                               devices marked
                                               with + or -.

                                               <Ctrl+Enter>
                                               expands all
                                               <Shift+1> enables
                                               or disables a
                                               device.

   F1  Help   Select Item  -/+ Change Values F9  Setup Defaults
   ESC Exit  Select Menu Enter Select » Submenu F10 Save and Exit
```

BIOS Setup

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

Feature	Options	Description
Removable Devices	Legacy Floppy Drive	The computer attempts to boot from the floppy disk drive.
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)
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 on-board LAN connection.
MBA v7.0.3 Slot 0218 MBA v7.0.3 Slot 0220		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    Server   Exit
                                              Item Specific Help

                                           Control the POST
    Display without KB ERR MSG:   [No]     Error Message
                                           Display or not
                                           when without KB

  » Hardware Monitor




   F1  Help  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.

BIOS Setup

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 Fan 0 Speed =      5203 RPM              All items on this
   CPU 0 Fan 1 Speed =      No Function           menu can NOT be
   CPU 1 Fan 0 Speed =      5118 RPM              modified in User
   CPU 1 Fan 1 Speed =      No Function           mode. If any items
   Front Fan 0 Speed =      3037 RPM              require changes,
   Front Fan 0 Speed =      3043 RPM              please consult your
   CPU 0 TemHerature =      56 °C                 System Supervisor.
   CPU 1 Temperature =      58 °C
   Vbat :                   3.320 V
   Vcc(5V) :                5.048 V
   -12V :                   - 11.7343
   +12V :                   +12.625 V
   CPU 0 Vcore :            1.5958 V
   CPU 1 Vcore :            1.6095 V
   CPU 0 Vtt(1.25V) :       1.2288 V
   CPU 1 Vtt(1.25V) :       1.2725 V
   CPU 0 Vcc(2.5V) :        2.4745 V
   CPU 1 Vcc(2.5V) :        2.3990 V
   Vsb(3.3V) :              3.2830 V
   Vcc3(3.3V) :             3.2830 V
   VLDT(1.2V) :             1.2544 V


 F1  Help   ^v Select Item  -/+ Change Values  F9 Setup Defaults
 ESC Exit   <> Select Menu Enter Select » Submenu F10 Save and Exit
```

BIOS Setup

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    Exit
                                                 Item Specific Help

                                                 Exit System Setup
    Exit Saving Changes                          and save your
    Exit Discarding Changes                      changes to CMOS.
    Load Setup Defaults
    Discard Changes
    Save Changes



   F1  Help  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.

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 updates all the selections 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.

BIOS
Setup

Phoenix Boot Utilities

This ServerBoard 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.

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Serverboard Manual

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.   Network Boot
<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 Setup

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."

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:
```
  A:\> phlash16 HDAMA182.ROM /MODE=3 /BBL /C
```
Syntax:
```
 phlash16           Phlash command name
 HDAMA177.ROM       Filename of new BIOS ROM supplied by dealer
 /BBL               Flash the Boot Block
 /C                 Clean CMOS
```

BIOS
Setup

Troubleshooting

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

```
                    ┌─────────────┐
                    │ Unexpected  │
                    │  Symptom    │
                    └─────────────┘
```

Turn OFF the system power and unplug the AC power cord.
Remove all add-on cards and peripherals including VGA,
Floppy, IDE and ATAPI devices.

Check that all jumper settings are correct.

Check that the CPU, memory modules, mouse, and keyboard
are properly installed on the mainboard and that the 115/230V
switch on the power is properly set.
Then, connect onboard VGA port to a monitor.

Plug the power cord into the onboard power connector(s) and
turn ON the power supply.
Make sure the system is still in a soft-OFF state.

Clear the CMOS using the Clear CMOS Header
on the Mainboard

Power-On the system and check that
the power supply is working and that the
fans connected to the mainboard are ON

NO

YES

Contact your
authorized
dealer to
check your
system.

NO

Check to see that the
POST screen appears on
the monitor.

VGA card or
monitor may
be defective

YES

Continue to
Next Page of
Flowchart

Appendix

Troubleshooting Flowchart continued...

↓

Press <Ctrl>+<Alt>+<Del> key simultaneously
to reboot the system

Check that the system can be re-booted. ——NO——→ Keyboard may be defective

YES

During system boot, press the <F2> key to enter BIOS Setup.
Select <Load Optimal Defaults> in the
<Exit> Menu of BIOS Setup

Power OFF the system and re-connect the floppy and IDE
cables to the onboard FDD and IDE connectors.

Power ON the system and check to see that
the system can boot successfully. ——NO——→ IDE cable or Hard Disk may be defective

YES

If the system boots up successfully, but the Operating System
still does NOT start up, then you will need to re-install the
operating system you intend to use on this system
(i.e. Win98,Win NT, Win2000, etc.)

END

Appendix

WARNING
Before inserting or installing any add-on cards or hardware components in the ServerBoard,
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 mainetnance of systems.

Symptom	Check point
No Power (FAN is not spinning)	* Make sure that no short circuit exists between the mainboard and chassis * Check that all jumpers are set to their default positions. * Check that the 115V/230V switch on the power supply is properly set. * Check that the CPU is properly inserted in the CPU socket. * Check that the power connector of the CPU fan is plugged in the correct position. * Turn the power switch ON and OFF to test the system. * Check the power of the battery on the mainboard. (In general, the battery voltage is around 3VDC)
Able to power ON the system (FAN is spinning), but NO screen display.	* Disconnect and remove all components from the mainboard except for the CPU, memory modules, and the CPU fans. * 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. * Check that all jumpers are set to their default positions. * Clear the CMOS through the Clear CMOS header. * Check that the onboard VGA port and the monitor are properly connected. * Check that you are using a 400 FSB CPU and PC2100/PC2700 (DDR266/DDR333) Memory modules in the ServerBoard. If not, change the CPU to 400 FSB or memory to PC2100/PC2700 (DDR266/DDR333) and try to power ON the system again. * Use the onboard speaker to aide in determining the problem.
Memory Error(s)	* Check that the memory DIMM modules are inserted properly into the DIMM sockets. * Check to see if different speed memory modules are mixed in and used in the ServerBoard 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. * Make sure all your memory modules in the ServerBoard 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.

Appendix

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.

Appendix

Addendum A: Recommended Memory Modules

All modules in the following tables have been validated by the manufacturer

As of 1-Mar-2003

ATP				
256MB	266MHz	SAMSUNG K4H280838D-TCB0	AB32L72A8S4B0S	
256MB	266MHz	SAMSUNG K4H560838D-TCB0	AB32L72Q8SQB0S	
256MB	333MHz	Infineon HYB25D256800BT-6	AB32L72Q8SQB3C	
256MB	333MHz	SAMSUNG K4H560838D-TCB3	AB32L72Q8SQB3S	
256MB	400MHz	SAMSUNG K4H560838E-TCCC	AB32L72Q8SQC4S	
512MB	266MHz	SAMSUNG K4H560838D-TCB0	AB64L72Q8S8B0S	
512MB	333MHz	Infineon HYB25D256800BT-6	AB64L72Q8S8B3C	
512MB	333MHz	SAMSUNG K4H560838D-TCB3	AB64L72Q8S8B3S	
512MB	400MHz	SAMSUNG K4H560838E-TCCC	AB64L72Q8S8C4S	
1GB	266MHz	SAMSUNG K4H560438D-TCB0	AB28L72P4SQB0S AB28L72P4SMB0S	
1GB	333MHz	Infineon HYB25D256400BT-6	AB28L72P4SMB3C	
1GB	333MHz	SAMSUNG K4H560438D-TCB3	AB28L72P4SMB3S AB28L72P4SQB3S	
1GB	333MHz	SAMSUNG K4H560438E-TCB3	AB28L72P4SNB3S	
1GB	400MHz	SAMSUNG K4H560438E-GCCC	AB28L72Y4BFC4S	
2G	266MHZ	SAMSUNG K4H510438M-TCB0	AB56L72P4SMB0S	
2G	333MHz	SAMSUNG K4H510438B-TCB3	AB56L72P4SMB3S	

Micron				
256MB	266MHZ	MT 46V32MB-75C	MT9VDDT3272G-265C3	
512MB	266MHZ	MT 46V64M4-75C	MT18VDDT6472G-265C3	
512MB	333MHZ	MT 3JCII D9BNQ	MT18VDDF6472G-335C1	
1GB	266MHZ	MT 17327-02	MT36VDDT12872G-265C2	
1GB	333MHz	MT 3LCII D9BJR	MT36VDDF12872G-335C3	

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Kingston			
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
512MB	400MHz	SAMSUNG K4H560838E-TCCC	KVR400X72RC3A/512
1GB	266MHz	SAMSUNG K4H560438C-TCB0	KVR266X72RC25L/1G
1GB	266MHz	Infineon HYB25D256400BT-7	KVR266X72RC25/1024
2GB	266MHz	MIT 17319-00	KVR266X72RC25/2G
2GB	333MHZ	ELPIDA 17301-02	KVR333X72RC25/2G

Corsair			
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
1GB	333 MHz	SAMSUNG K4H560438E-TCB3	CM74SD1024RLP-2700/S
1GB	333 MHz	MT 46V64M8-6TC	CM72SD1024RLP-2700/M
1GB	400MHz	MT46V64M8-5BC	CM72SD1024RLP-3200/M
2GB	266MHz	SAMSUNG K4H510438M-TCA2	CM74SD2048R-2100/S

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Smart			
512MB	266MHZ	SAMSUNG K4H560438D-TCB0	SM6472RDDR3H1LP
512MB	266MHz	MT 46V64M4-75C	SM6472RDDR3H1LP-M
512MB	266MHz	NANYA NT5DS64M4AT-7K	SM6472RDDR301LP2-N
512MB	333MHz	SAMSUNG K4H560438D-TCB3	SM6472RDDR6H1LP-S
512MB	333MHz	SAMSUNG K4H560838D-TCB3	SM6472RDDR6H2BLP-S
512MB	333MHZ	MT 46V32M8-6T	SM6472RDDR6H2BLP-M
512MB	333MHZ	Infineon HYB25D256400BC-6	SM6472RDDR6H1BGBI
1GB	266MHz	SAMSUNG K4H510638D-TCB0	SM12872RDDR3H1LP
1GB	333MHz	SAMSUNG K4H560438D-TCB3	SM12872RDDR6H1BL-S
1GB	333MHz	Infineon HYB250256400BC-6	SM12872RDDR6H2BGAI
2GB	266MHz	SAMSUNG K4H1G0638M-TCB0	SM25672RDDR3H1LP
2GB	266MHz	Infineon 17314-03	SM25672RDDR301LP-I

Viking			
512MB	266MHz	SAMSUNG K4H560438D-TCB0	VI4CR647224DTH
512MB	266MHz	SAMSUNG K4H560838D-TCB0	VI4CR647228DTH
512MB	333MHz	MT 46V64M4-6TC	VI4CR647224DTK
1GB	266MHZ	SAMSUNG K4H560438D-TCB0	VI4CR287224DYH
1GB	333MHz	SAMSUNG K4H560438D-TCB3	VI4CR287224DYK

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

Infineon			
256MB	266MHz	Infineon HYB25D12800AT-7	HYS72D32001GR-7-A
512MB	400MHz	Infineon HYB25D256400BC-5	HYS72D64300GBR-5-B

Transcend			
512MB	333MHz	V58C2256804SA75	TS64MDR72V3F
512MB	333MHz	SAMSUNG K4H560838E-TCCC	TS64MDR72V4F3
1G	333MHz	SAMSUNG K4H560438D-TCB3	TS128MDR72V3E

KINGBEE			
1GB	333MHz	SAMSUNG K4H560438D-TCB3	KBRM-1GB-F1

Virtium			
512MB	333MHz	SAMSUNG K4H560838D-TCB3	VM383L6423E-B3S
512MB	333MHz	SAMSUNG K4H560438E-TCB3	VM383L6420E-B3S
1GB	333MHz	SAMSUNG K4H560438E-TCB3	VM383L2820-B3S
1GB	333MHz	SAMSUNG K4H560438E-TCB3	VM383L2826E-B3S

Ventura			
512MB	333MHz	SAMSUNG K4H560838E-TCB3	D52YVK25SV

BUFFALO			
256MB	400MHz	SAMSUNG K4H560838E-TCCC	PC3200 - 30330-Z
512MB	400MHz	SAMSUNG K4H560838D-TCCC	PC3200R - 30330 -Z

AVANT			
1GB	333MHz	MT 46V128M4	AVM7228R53C5333K0-A

PMI			
512MB	333MHz	SAMSUNG K4H560838E-TCB3	MD3412RSA-T286A

Appendix

Addendum B: Symptom Report Form

Mother Board			Serial Number			
			Bios Version			
CPU 0			Speed (MHz)			
CPU 1			Speed (MHz)			
H0 Bank	pair 1 (slot 0, 2)	Vendor		Part Number		
		Size x2		Chip		
	pair 2 (slot 1,3)	Vendor		Part Number		
		Size x2		Chip		
H1 DIMM	pair 1 (slot 0,2)	Vendor		Part Number		
		Size x2		Chip		
	pair 2 (slot 1,3)	Vendor		Part Number		
		Size x2		Chip		
Floppy		Drive A:		Drive B:		
OnBoard IDE	Pri. IDE	Master		Slave		
	Sec. IDE	Master		Slave		
Onboard SCSI		Chan. 0				
		Chan. 1				
OnBoard Serial ATA		Port 0		Port 2		
		Port 1		Port 3		
PCI Slots		PCI-X -1		PCI-64 -2		
		PCI-X -2		PCI-32 -1		
		PCI-64 -1		PCI-32 -2		
Operating System				Power Supply		
Symptoms						
Contact Information	Name			Phone		
	Company			Email		

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