



**LV310
USER MANUAL**

**Arima Computer Corp.
Building Your Competitive Advantage**



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Super I/O is the registered trademark of National Semiconductor Corporation.

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Technical Support

If a problem arises with your system during installation or operation and is unable to be resolved from the user manual, consult the following list of resources for help:

- Contact the place of purchase for help. This is the recommended solution as they can provide the quickest assistance.
- Visit Arima Computer Corp. website for up to the minute FAQ, guides and updates. The website can be found at: <http://www.arima.com.tw/server/>
- Or contact our support staff at: server@arima.com.tw

About this User Guide

This manual contains some special icons that accompany special sections that are meant to help you along in the installation process. The special sections contain useful and/or critical information that you should know. Watch for these icons as you read through the manual.

Type of icons	Description
NOTE 	This icon indicates useful and timely information that will aid you in the setup.
WARNING 	This icon indicates information on dangerous and/or costly behavior to avoid.

Safety Instruction

- Keep this manual for future reference.
- Keep the equipments in a safe, cool, dry place.
- Perform the installation on a dry, flat surface.
- Ground yourself by touching a plugged-in power supply, which displaces static electricity.
- Adjust the power source to the proper voltage before connecting the equipment to the power outlet.
- Place the power cord in such a manner as to ensure that no one can step on it or trip over it.
- Always unplug the power cord when performing installation.
- Do not have liquid nearby as electrical shock can occur if liquid spills onto the equipment.
- Pay attention to the warnings in the installation instructions when appropriate.
- In the following cases, do not try to fix the problem yourself, contact a party in Technical Support
 - The power cord or plug is damaged.
 - Liquid has been spilled onto the equipment.
 - Obvious sign of damage can be detected on the equipment.



Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Chapter 1. Getting Started

1.1 Congratulations

You have in possession one of the most powerful and versatile Dual Intel Xeon processor solutions, the LV310. Powered by cutting edge Intel E7320 Lindenhurst (MCH) chipset, LV310 efficiently utilizes the combined strength of 800MHz front side bus with an option of integrated U320 SCSI controller, to name just a few. Besides, LV310 supports independent buses for the SATA controller as well as providing the most efficient bus management to date. It provides versatility, performance, value and dependability for today's computing environment. In just a couple of pages, a detailed specification will provide you with a comprehensive view of the capabilities of LV310. Thank you for purchasing Arima Computer Corp.'s family of products.

1.2 Unpacking

Arima Computer Corp. provides a number of accessories for your convenience. Check out the following items that come with your motherboard:

- Quick Installation Guide (Paper)
- Driver and User Guide CD
- 1 x Floppy cable
- 1 x SCSI cable (LV310-F)
- 1 x IDE cable
- 1 x I/O shield
- 2 x CPU retention module
- 1 bag of jumper (3 pcs)

1.3 Feature Highlight

CPU:

- Supports high productivity Dual and Single Intel Xeon processors configuration

Chipset:

- Runs state of the art Intel E7320 Chipset

System Memory:

- Four 184-pin DDR 266/333 memory slots for up to 8GB of RAM.

Expansion Slots:

- Supports 64 -bit PCI-X slots and PCI-Express Expansion slots

Storage:

- Supports LSI 53C1020A U320 SCSI Controller, 1 Internal with LSI ZCR support

Integrated LAN Controller:

- Dual Gigabit Ethernet Ports

Onboard VGA Chip:

- Integrated 8MB ATI RAGE XL PCI graphics

System Management:

- Arima SmartWatch

1.4 Motherboard Specification

Processors:

- Dual mPG604 ZIF socket
- Dual onboard 4-phase VRD (VRM 10.1 Spec.)
- Supports up to two Intel Xeon processors with 1MB of integrated L2 cache (Nocona)
- Supports 800MHz Front Side Bus

Chipsets:

- Intel E7320 Lindenhurst –VS MCH chipset
- MCH + 6300ESB (Hance Rapids)
- National Semiconductor Super I/O PC87366 chip

Memory:

- Four 184-pin 2.5-Volt DDR DIMM sockets
- Dual channel memory bus
- Two-way interleaved memory banks (pair of DIMMs required)
- Supports DDR-266/333 memory
- Supports Registered ECC type memory modules only
- Supports up to 8GB
- Supports Mirroring, Sparing and Chipkill

Expansion Slots:

- Two PCI-Express X4 slots (support x1)
- Two 64-bit 66MHz (3.3V) PCI-X slots
- One 32-bit 33MHz PCI slot
- Total of five usable slots

Integrated U320 SCSI Controller (LH310-F):

- LSI 53C 1020A Single-Channel Ultra320 SCSI Controller
- One 68-pin SCSI connectors (1 x internal connector)
- Zero Channel RAID (ZCR) solution (LSI Logic MegaRAID SCSI 320-0 ZCR) – card not included
- Double transition clocking for 320 MBps throughput on each channel

Integrated LAN Controller:

- 2 x Intel 82541PI Tabor III single port Gigabit Ethernet Controller
- Two RJ-45 connectors with LEDs
- Two 4-pin headers for front panel LED output

Integrated Graphics Controller:

- ATI RAGE XL PCI graphics controller
- 8MB Frame Buffer of video memory

Hance Rapids Integrated SATA:

- Independent DMA operation on 2 ports
- DMA Transfers up to 1.5Gb/s
- Supports RAID 0,1

Hance Rapids Integrated ATA:

- Provides two PCI bus master channels for up to four enhanced IDE devices
- Supports UDMA 100/66/33 IDE drives and ATAPI compliant devices

Super I/O:

- National Semiconductor Super I/O PC87366 chip
- One floppy connector supports two drives
- PS/2 mouse and PS/2 keyboard rear panel connectors
- Two 9-pin serial ports (one rear panel connector and one header)

Rear Panel I/O:

- One DB15 Video connector
- Stacked PS/2 mouse and PS/2 keyboard rear panel connectors
- Stacked two USB-2.0 connectors
- Two RJ-45 connectors with LEDs
- One 9-pin serial connector

BIOS:

- 4Mb Phoenix BIOS
- Legacy USB support
- MP 1.1 & 1.4 compliant
- SMBIOS 2.3.3 and DMI 2.1 compliant
- Soft Power-down
- Multiple boot support (with BIOS Boot Specification v3.1 (BBS) support)

Form Factor:

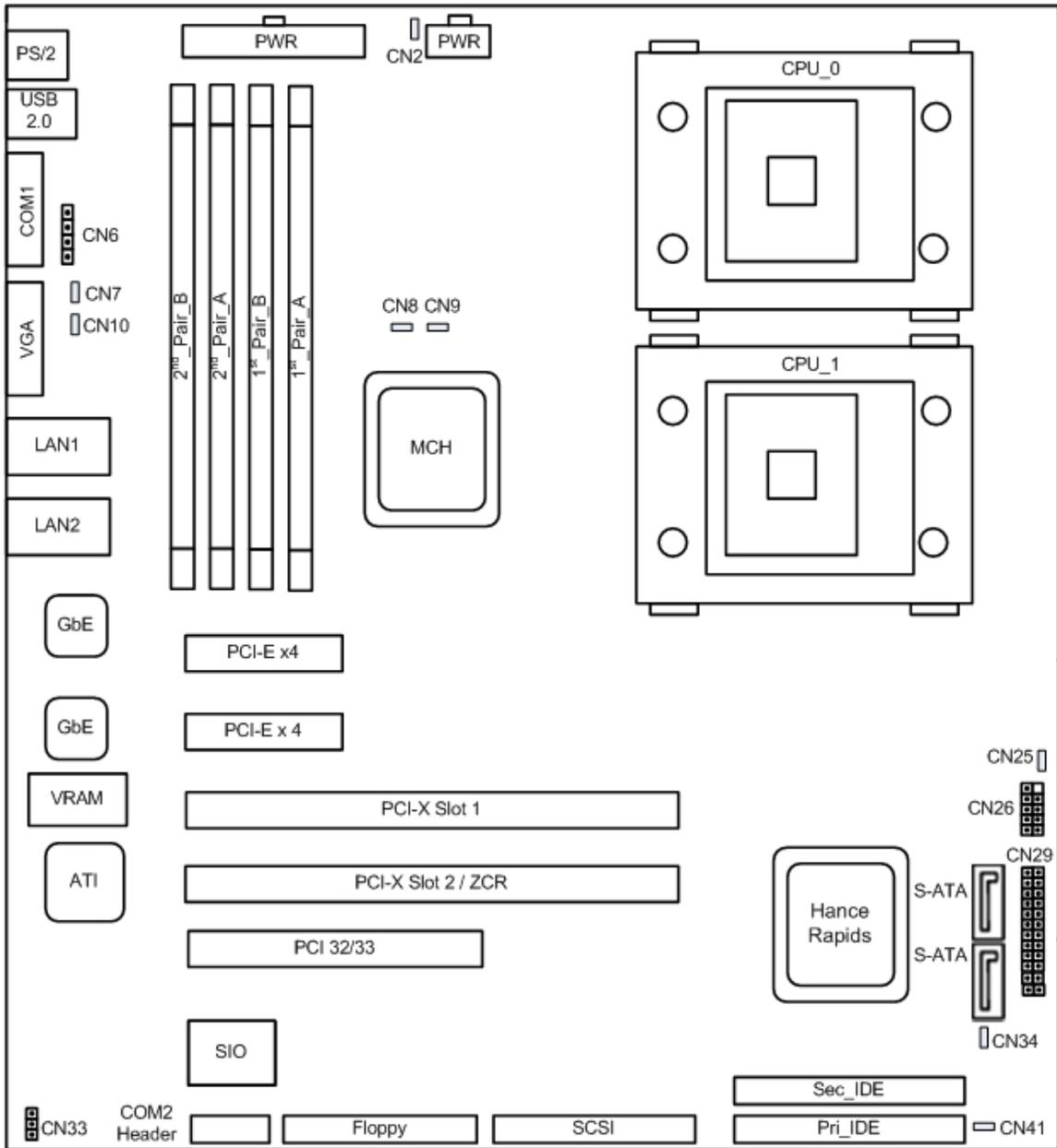
- ATX form factor with size: 12" X 9.6" (8 layers)
- EPS 12V power connectors (24pin + 8pin)

System Management:

- Arima SmartWatch

1.5 Motherboard Layout (Major Components)

The following diagram indicates all the major components of the motherboard.



PCI-X Slot 2 can be used for riser card and Adaptec ZCR (zero channel RAID) card.

1.6 Hardware Monitor

A Super I/O chip PC87366 provides hardware monitoring of voltages (+12V, VCC, VCC3, VBAT, VCC25, CPU0 and CPU1's Vcore), CPU1 and CPU2's temperatures, CPU1 and CPU2's Fan Speed, and SYS Fan Speed.

Chapter 2. Hardware Installation

2.1 Mounting the motherboard

!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.

2.2 Installing the processor

LV310 operates best when dual Intel Xeon processors are in use. When using only one processor, install it in CPU_0 socket.

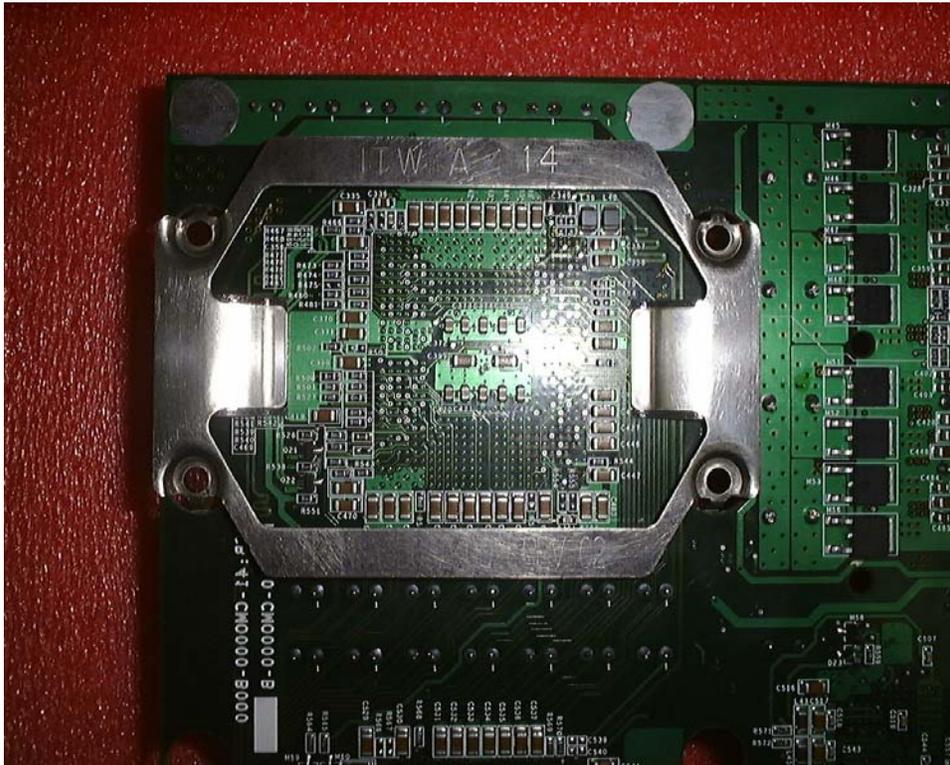


We discourage you from installing in the CPU_1 socket if you have only one processor to install. The result may be unpredictable.

Procedure:

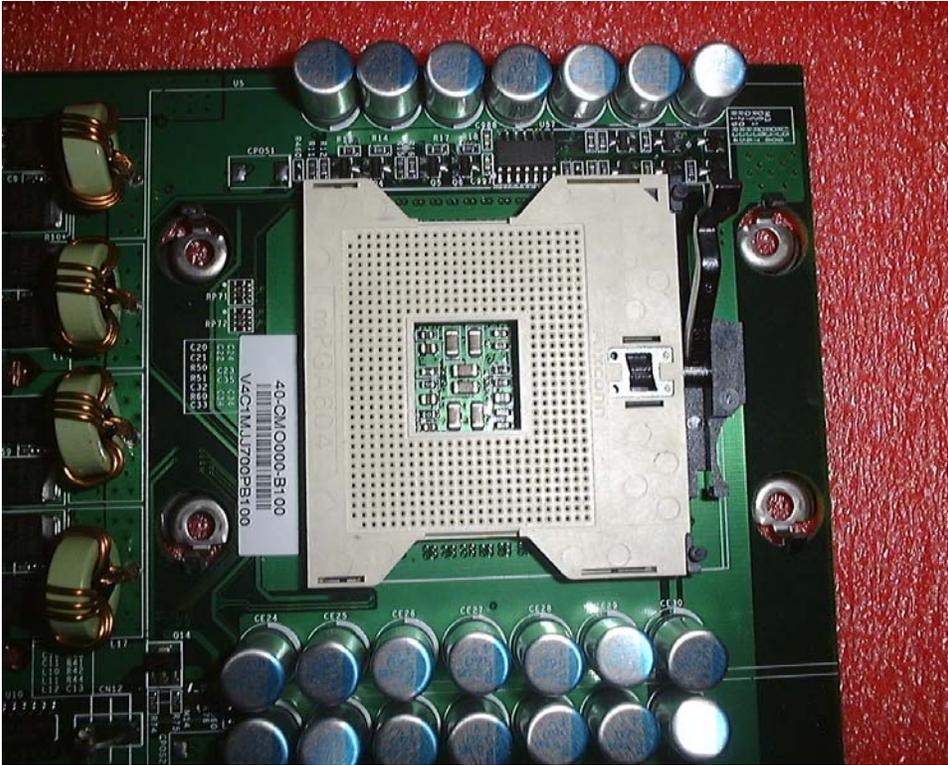
First read the instructions that come with the CPU. Then consult the following instructions specific to the installation for 1U system.

1. Flip over the motherboard and install the backplate. There are four holes around each CPU socket; align the backplate with the four holes around the CPU socket and insert the backplate from the back of the motherboard through the four holes. The backplate should now clamp onto the motherboard.

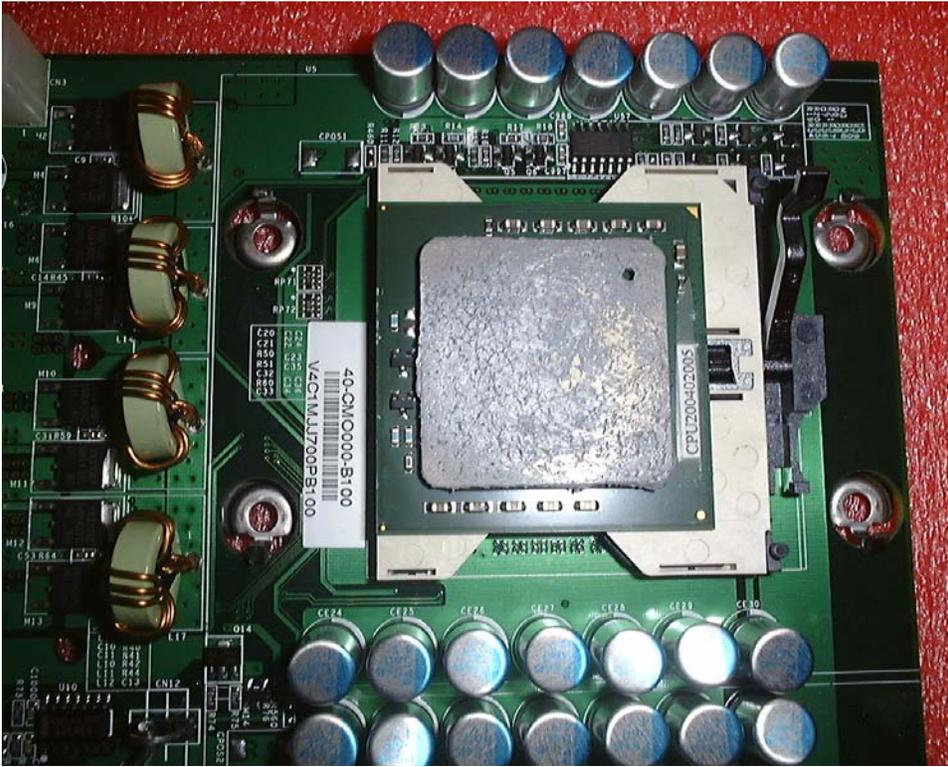


A good quality backplate should have tape over some parts of it that prevents electrical damage. Whenever possible, use high quality backplates to prolong the life of your motherboard.

2. Lift up the lever and locate the triangle marking on the CPU and CPU socket. Refer to the following picture.



3. Place the CPU with the correct orientation (B) as shown in the following pictures. The lever is still up and the two triangles are in the same corner.



The CPU will not fit if the orientation is wrong. Do not try to force the CPU into the socket; it could result in irreparable damage to the CPU.

4. Lower the socket lever to lock in place.



5. Now, rest the motherboard into the chassis, align the four holes of the backplate with the four bolts of the chassis.

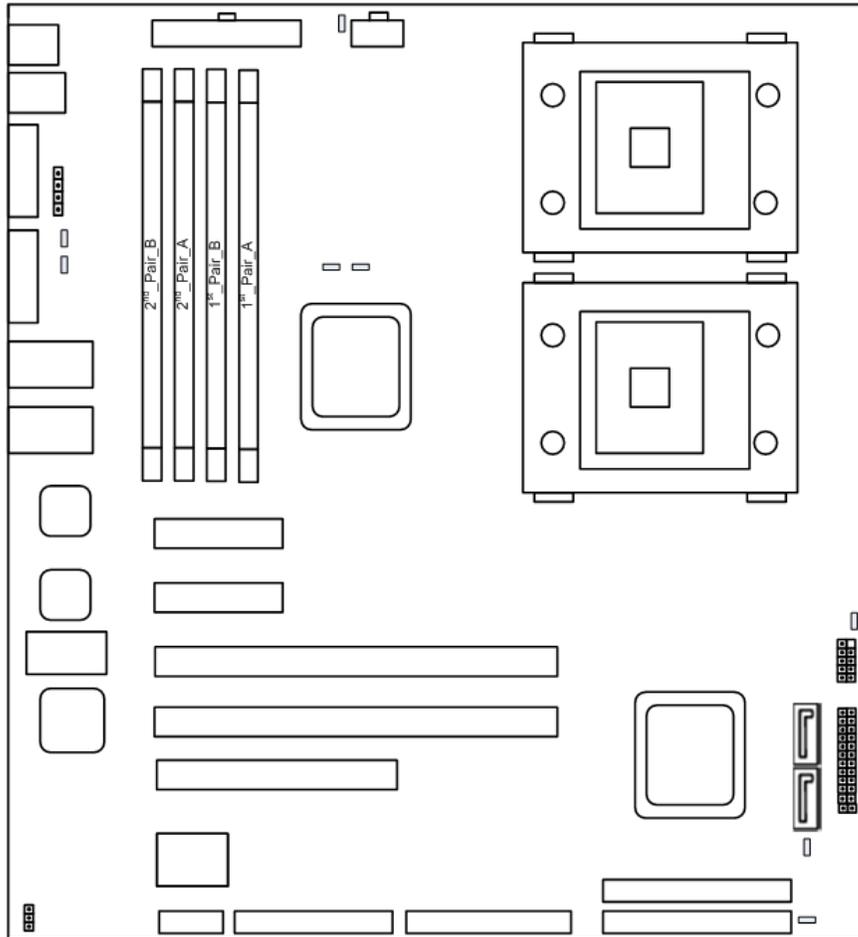


We do not recommend you to apply thermal grease at this point of the installation. The heatsink provided already has thermal grease on the bottom for your convenience. Do not apply more thermal grease if it is already present. Too much thermal grease will spill onto the CPU circuit and damage the CPU.

2.3 Installing the memory

2.3.1 DIMM combination

The following diagram indicates the locations of memory sockets, captioned 1st_Pair_A through 2nd_Pair_B.



Types of memory supported:

Four sockets of 184-pin 2.5Volt DDR DIMM supporting DDR-266/333

As indicated on the diagram, they are running on dual channel memory bus and two-way interleaved memory banks. Therefore, the memory must be INSTALLED IN PAIRS. The first pair must be installed in the “1st_Pair_A” and “1st_Pair_B” locations as indicated in the diagram. The second pair must be installed in the “2nd_Pair_A” and “2nd_Pair_B” locations. Be sure that every memory pair is of the same speed, size and rank.

DDR memory types are determined by two factors: speed and rank. LV310 supports DDR 266/333 speed in both single/dual ranks. The rank of your memory could impact the effectiveness of the motherboard. Table 1 indicates the setup that LV310 has been tested on.



The number of memory chips and how they are stacked on a memory module do not indicate the rank of that memory module. The only way to determine the rank of a memory module is to contact the memory manufacturer for its specification.

The first row reads: if you use 1 pair of DDR of type single rank, install in 1st_Pair slots.

Table 1.

Memory Configuration	2nd_Pair	1st_Pair
1 pair of single rank		single rank
1 pair of dual rank		dual rank
2 pairs of single rank	single rank	single rank
1 pair of single rank 1 pair of dual rank	dual rank	single rank
2 pairs of dual rank	dual rank	dual rank

*These configurations using DDR 333 are not recommended by Intel®.



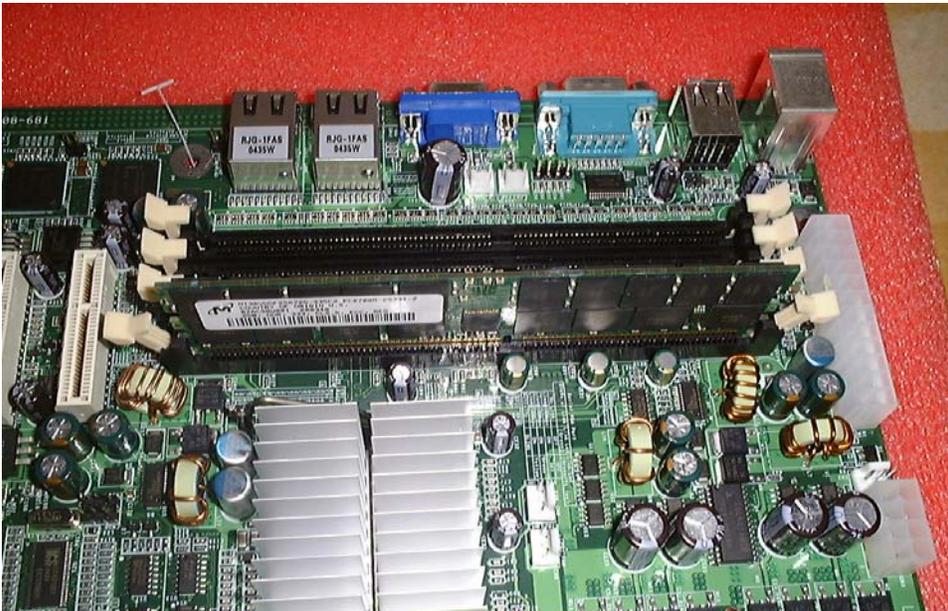
Any configuration other than the recommended is not guaranteed to work. Please refrain from using those configurations as we cannot provide technical support on them.

2.3.2 Installing DIMM modules

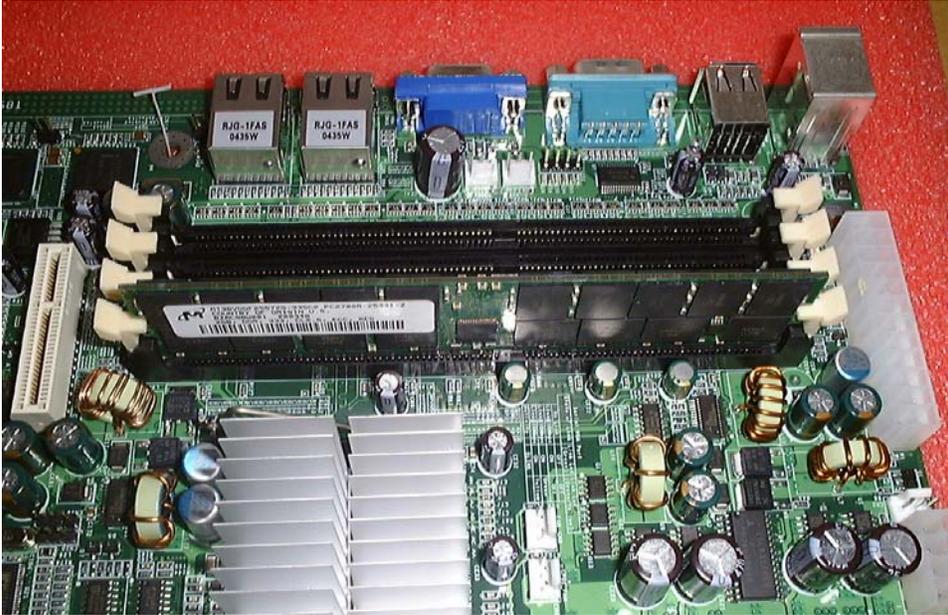
1. Open up the brackets:



2. Line up the memory with socket. Make sure the gap fits into the socket.



3. Push in the memory stick until bracket can be closed securely onto the stick. Make sure the brackets hold onto the memory module.



These pictures only show one memory stick but remember to install them in pairs.

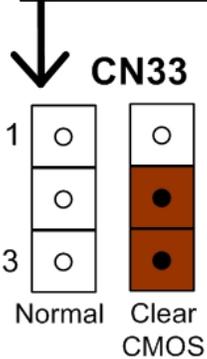
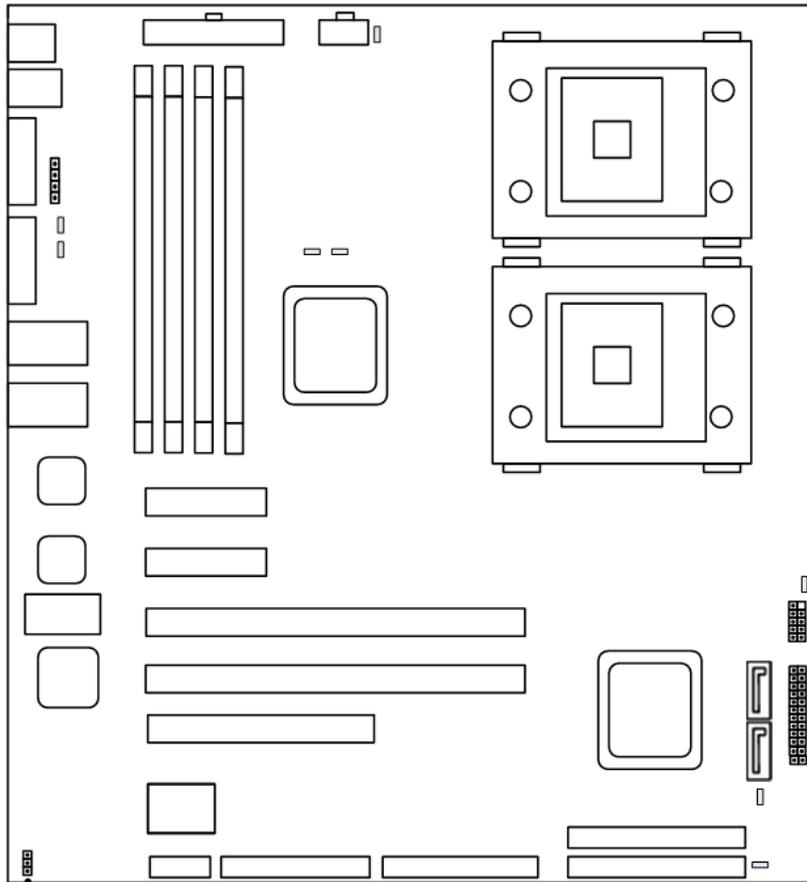
2.4 Jumper Configuration

2.4.1 Clear CMOS header

Header CN33 controls CMOS setting. Position your motherboard as it appears in the following diagram.

To clear CMOS:

1. Turn off the system.
2. Short pin 2 and pin 3 using a jumper for a few seconds.
3. Take out the jumper.
4. Turn on the system and reconfigure the BIOS.



2.5 Power Supply

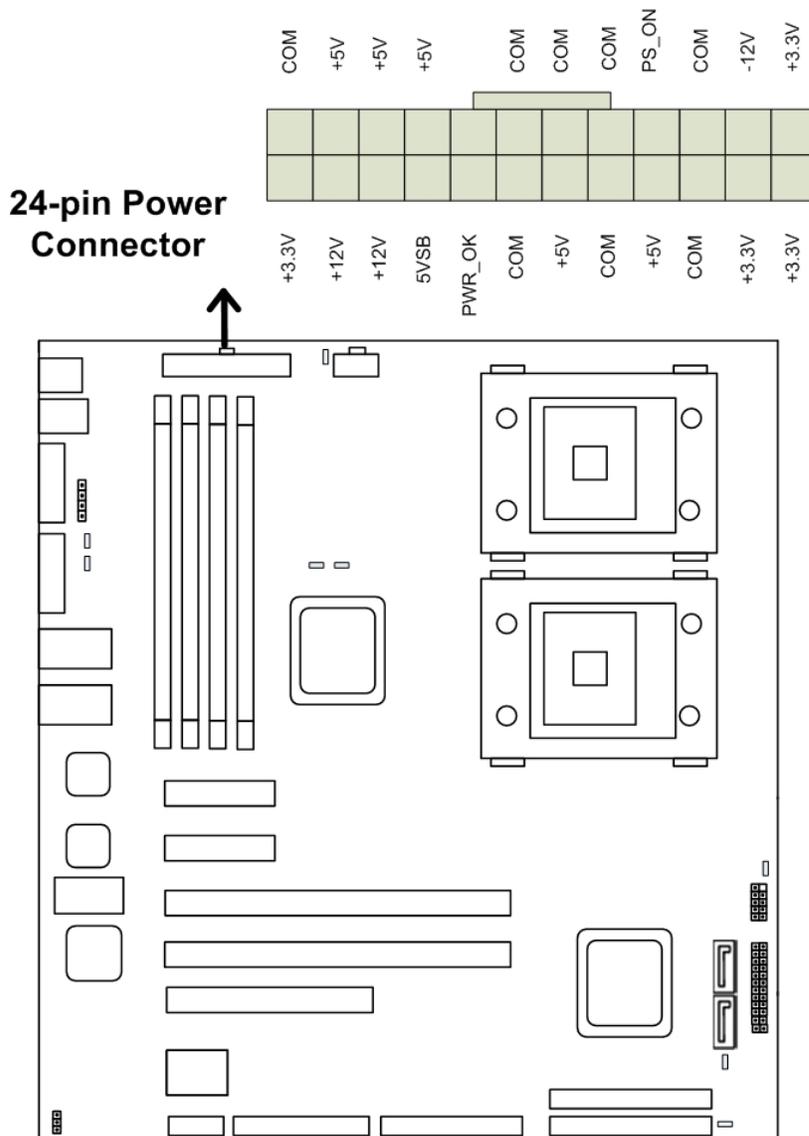
2.5.1 ATX 24-pin power connector

There is a 24-pin power connector on the motherboard. The 24-pin connector provides power to the motherboard and the 8-pin connector provides power to the CPU. So both must be connected for the system to run properly.

Be sure to plug the power supply connector in the right direction. Failure to do so could cause damage to the motherboard.

Make sure your power supply can support at least 2 amps standby power for the Advanced Configuration and Power Interface (ACPI) functions.

Refer to the following diagram for the connector locations and orientations.

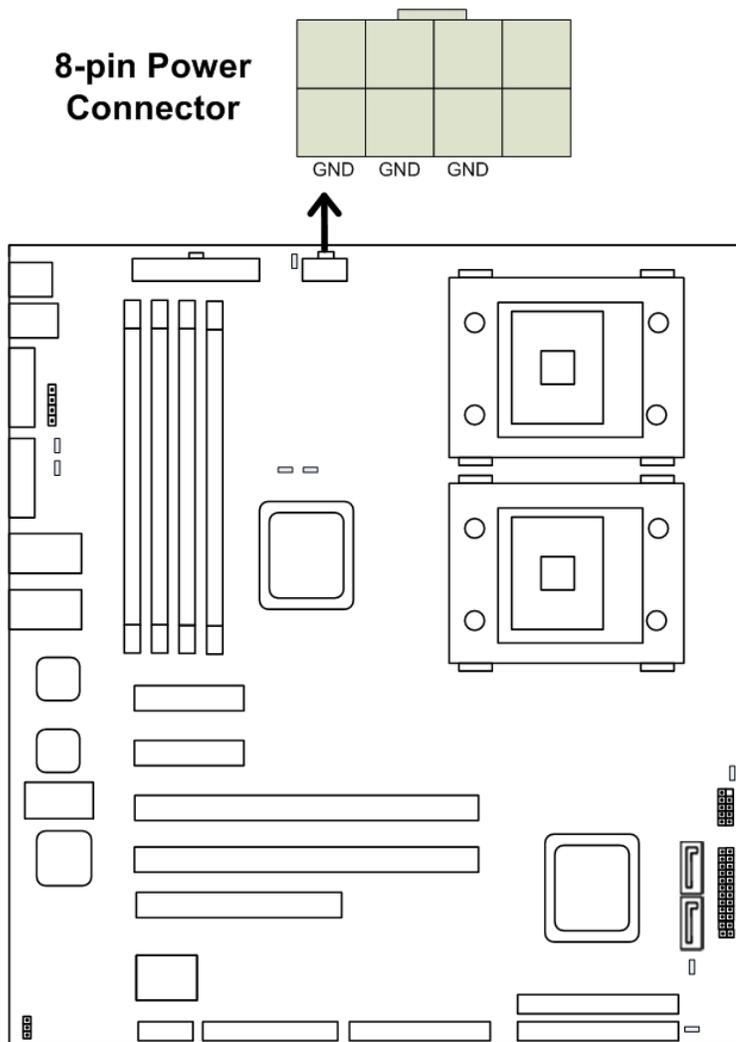




Make sure the AC adapter is not plugged into the wall outlet during installation. The electric current could damage the motherboard.

2.5.2 ATX 8-pin power connector

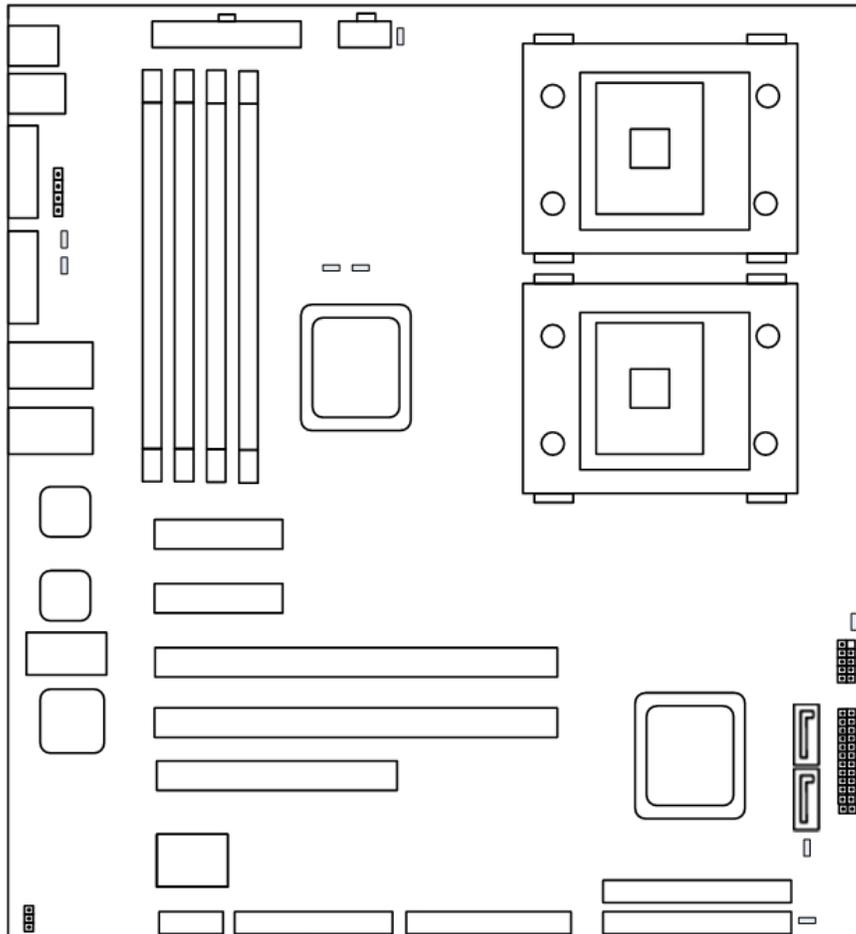
The 8-pin connector provides dedicated power to the CPU. Refer to the following diagram for its location and configuration.



2.6 Cables & Connectors

2.6.1 Floppy disk drive connector

The following diagram indicates the location of the floppy drive connector:



**Floppy Disk Drive
Connector**

To install the floppy drive, first refer to the instructions that come with the floppy drive. Then consult the instructions [here](#).

Attaching a floppy drive can be done in a similar manner to an IDE drive. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there will be a key pin on the cable, which will force proper connection of the cable.

The motherboard supports only one floppy connector, but the connector can support up to two floppy drives. Below are some symptoms of incorrectly installed floppy drives. Wrong installation should not

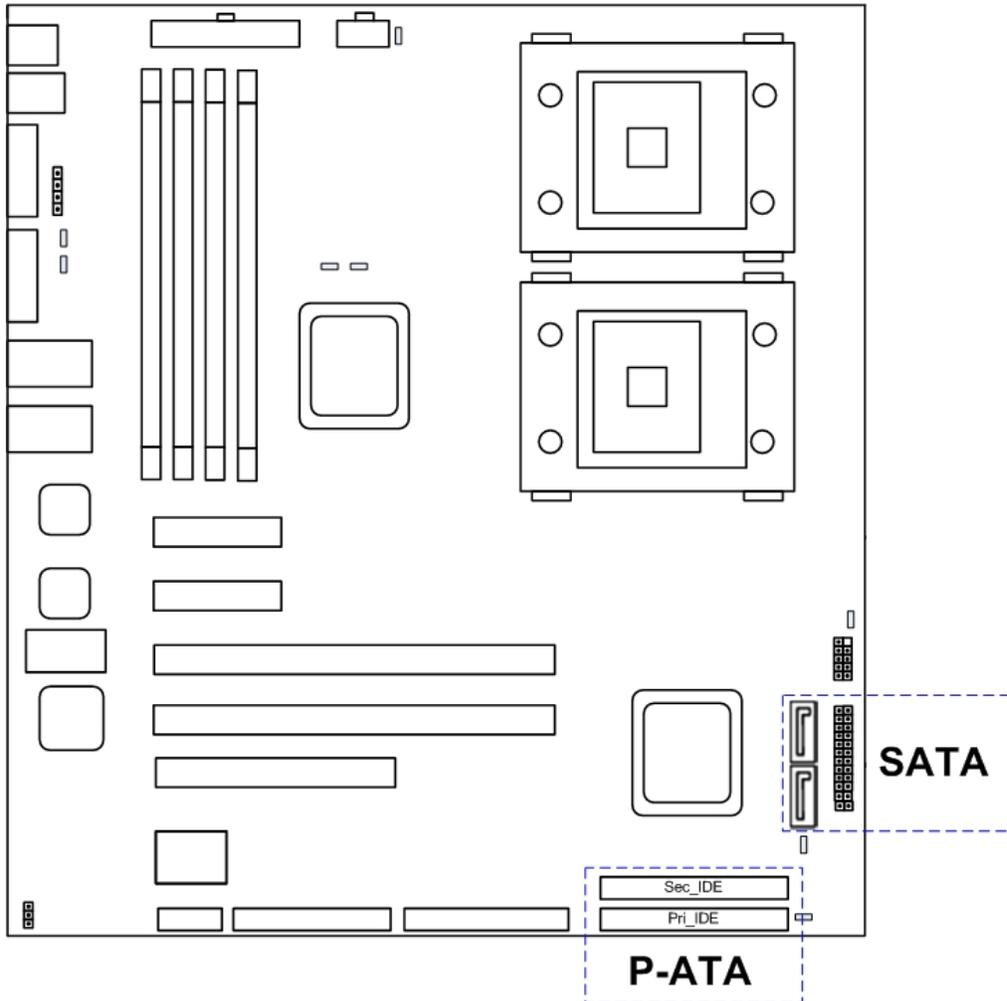
cause severe damage but it may cause your system to freeze or crash when trying to read and/or write to the floppy diskette.

Diagnosing an incorrectly installed floppy drive

Drive is not automatically detected.	Usually caused by faulty cables, cables put in backwards or a bad floppy drive or motherboard. Try another floppy drive to verify the problem if the cable is properly installed or try replacing the actual cable. Also check to see if the onboard floppy controller is enabled in the BIOS setup.
Drive Fail message at boot-up.	The cable, floppy drive or motherboard may be faulty. Try another drive or cable to verify.
Drive does not power on.	Check power cable and cabling. Maybe a bad power supply or drive cable problem.
Drive activity light is constantly on.	Usually signifies that the cable on the drive is on backwards, which is a common issue. Reverse the cable on the floppy drive end and try again.

2.6.2 IDE connectors

The following diagram indicates the location of the IDE connectors:



As always, read the instructions that come with the IDE drive and then consult the instructions here.

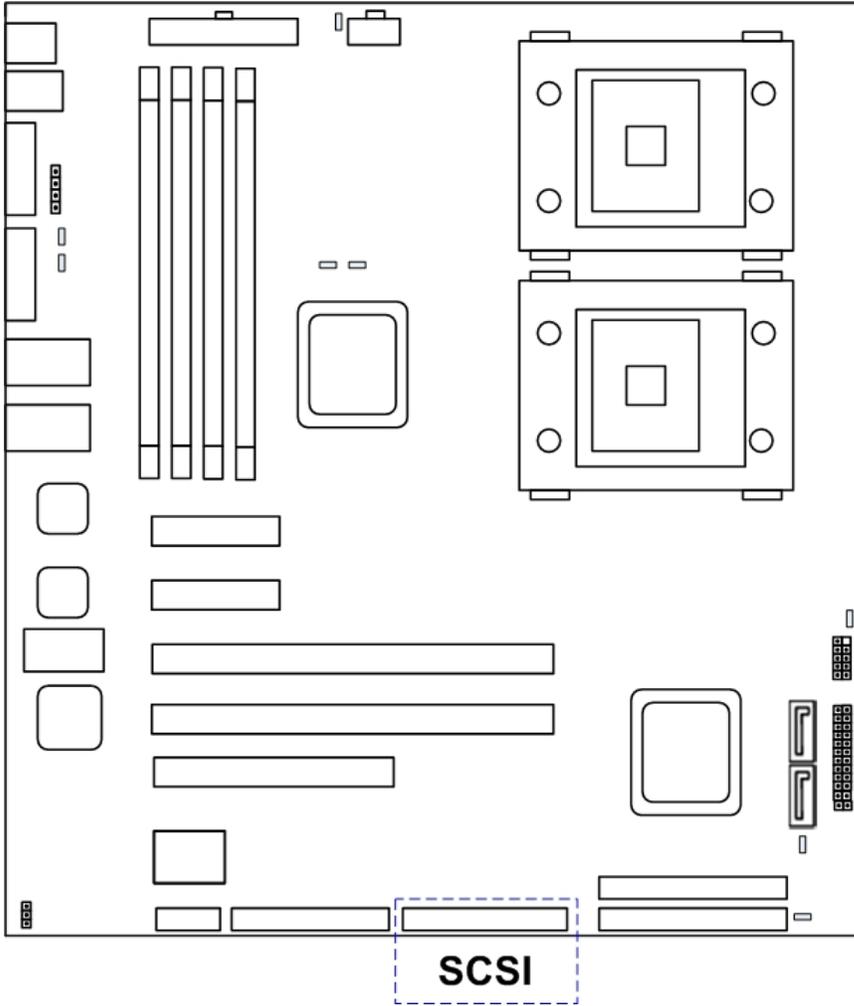
For Parallel ATA, installing IDE drives has become simpler over the years. The cables are now “keyed” to guide the user to the correct installation configuration. Each IDE connector can support two IDE drives. For the first IDE drive you want to use the Pri_IDE connector (setting the drive to Master). For the second IDE drive you can either use the connector (in which case, the second IDE drive should be set to Slave) or you use the Sec_IDE connector (in this case, set the second IDE drive to Master).



Remember to set BIOS to match the configuration that you implement here. Go to Advanced Menu section of BIOS for detail.

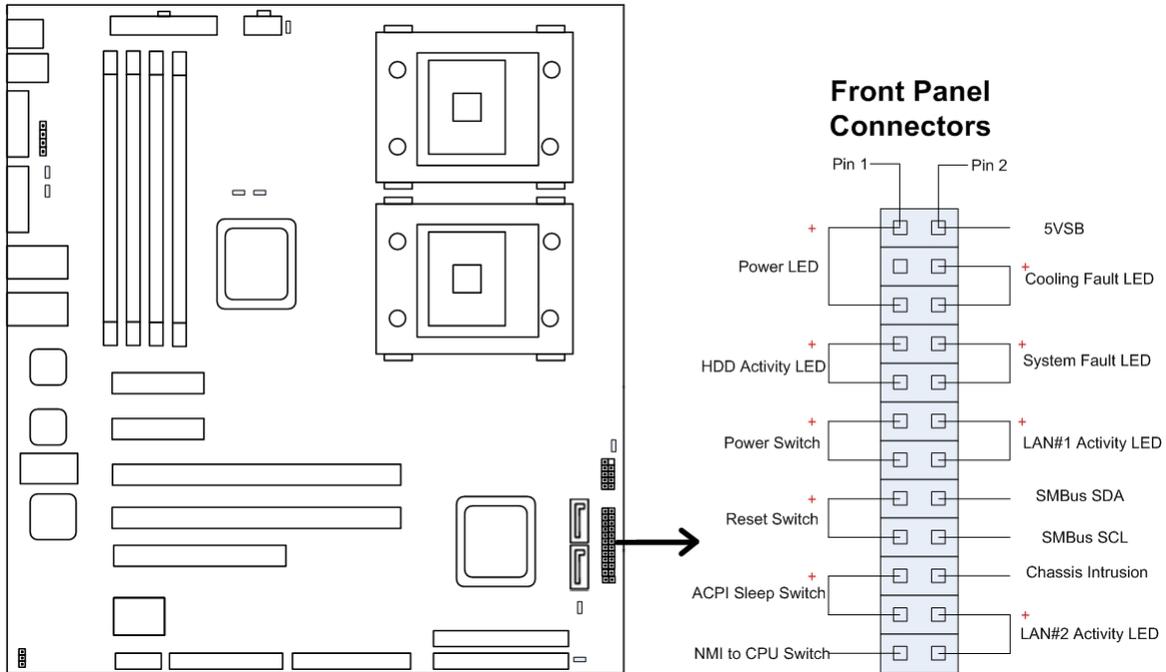
2.6.3 SCSI Connector

LV310 deploys LSI 53C1020A Single-Channel Ultra320 SCSI Controller for SCSI hard drive.



2.6.4 Front Panel Connectors

You can find the pin number on the corner of the pin block. Pin 2 is located closer to the outer edge of the motherboard than pin 1. The red + indicates the anode, or the +5V. The opposite pin, then, indicates the cathode or the ground.

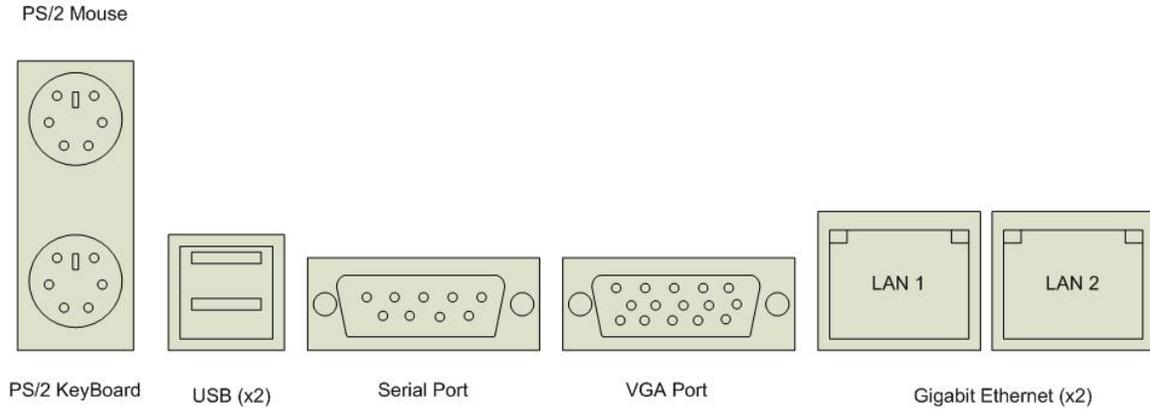


- Power LED:** This 3-pin connector attaches to the power LED.
- HDD Activity LED:** This 2-pin connector attaches to the LED of the hard disk. The LED lights up when HDD is active.
- Power Switch:** This 2-pin connector attaches to the power button of the system.
- Reset Switch:** This 2-pin connector attaches to the case-mounted reset switch for rebooting your computer without turning on/off your power switch.
- ACPI Sleep Switch:** This 2-pin connector connects to the switch that can take the system into standby mode when pressed.
- NMI to CPU Switch:** This 1-pin connector connects to the switch that send Non-Maskable Interrupt to the CPU. User can customize the button to perform a particular function.
- 5 VSB:** This connector provides the user with power to any extra devices that uses 5 volt power.

Cooling Fault LED:	This connector connects to the LED that lights up when a problem arises with cooling system.
System Fault LED:	This connector connects to the LED that lights up when a problem arises with the system.
LAN#1 Activity LED:	This connector connects to the LED that lights up when there is activity on the LAN 1 port.
SMBus SDA:	A private bus to BMC chip for serial data, for use with BMC only.
SMBus SCL:	A private bus to BMC chip for serial clock, for use with BMC only.
Chassis Intrusion:	This connects to the mechanical switch that indicates whether the chassis had been opened. User can activate it if desired.
LAN#2 Activity LED:	This connector connects to the LED that lights up when there is activity on the LAN 2 port.

2.6.5 Rear Panel I/O ports

The following illustration displays the motherboard I/O port array.

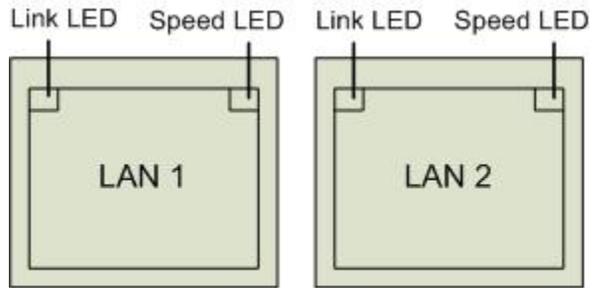


Type of Port	Function
PS/2 Mouse connector	The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, IRQ12 can be used for expansion slot.
PS/2 Keyboard connector	This connection is for a standard keyboard using a PS/2 plug (mini DIN). This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.
USB Port 1 & 2	Two external USB 2.0 ports that allow simultaneous connections of 2 USB devices.
Serial Port connector (9-pin male)	This serial port can be used for pointing devices or other serial devices. See BIOS setup.
VGA connector (15-pin female)	The VGA port connects display devices such as a monitor. See the BIOS setup.
Gigabit Ethernet Port 1 & 2	These ports are RJ-45. The motherboard uses Intel 82541PI dual channel Gigabit Ethernet Controller, depending on the manufacturing option.

2.6.6 Back Panel LAN LED

It allows the user to monitor LAN activities from the back of the system.

State of Link	Link LED (green)	Speed LED (green/yellow)
No link	OFF	OFF
Link @ 10Mbps	ON	OFF
Link @ 100Mbps	ON	Green
Link @ 1000Mbps	ON	Yellow
activity	BLINK	



Gigabit Ethernet (x2)

2.6.7 Front Panel LAN LED Connector

Header CN6 controls the front panel LAN LED activation.

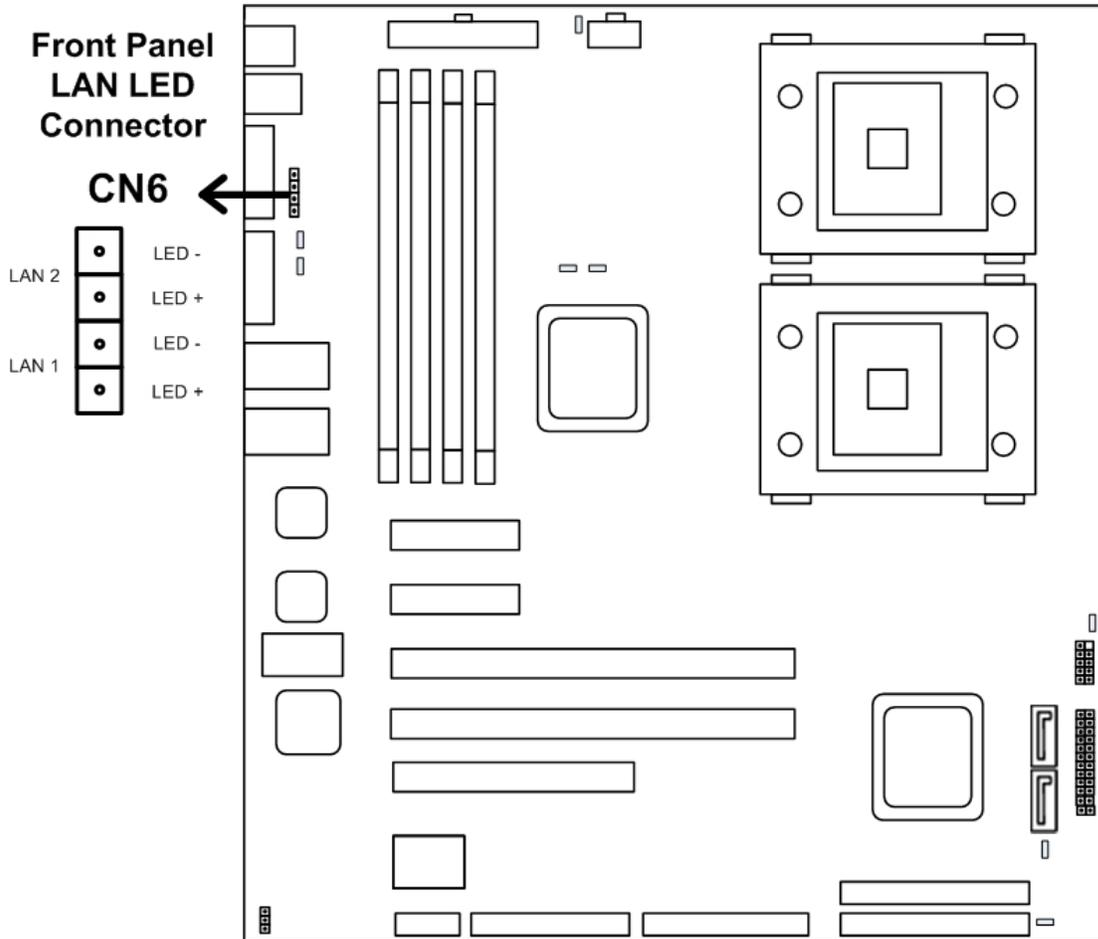
Front panel LAN LED are meant to show link and activity. When link is established, the LED stays on.

When LAN transfer is in progress, the LED flashes.

To activate the front panel LAN LED, connect the LED wires to CN6.

Each front panel LAN LED requires 2 pins; CN6 has 4 pins, therefore supports two LAN LED connections.

Refer to the following diagram for the location and orientation of header CN6.

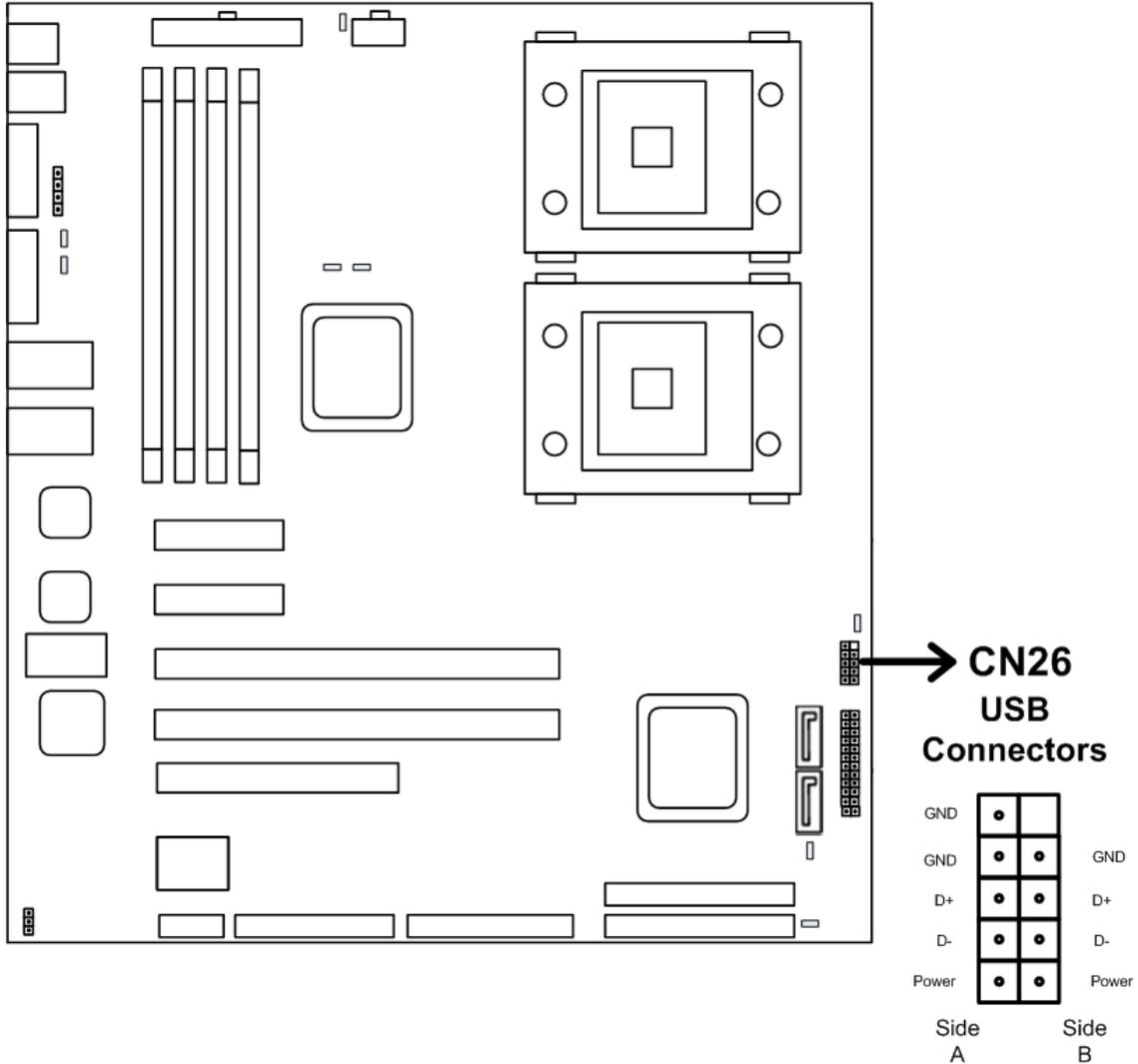


2.6.8 USB Connectors

Header CN26 controls the two USB connections.

To activate the front USB, connect the two USB wire to CN26. Each USB wire requires 4 pins; CN26 has 9 pins, therefore supports two USB connections. The one extra pin is for chassis ground use.

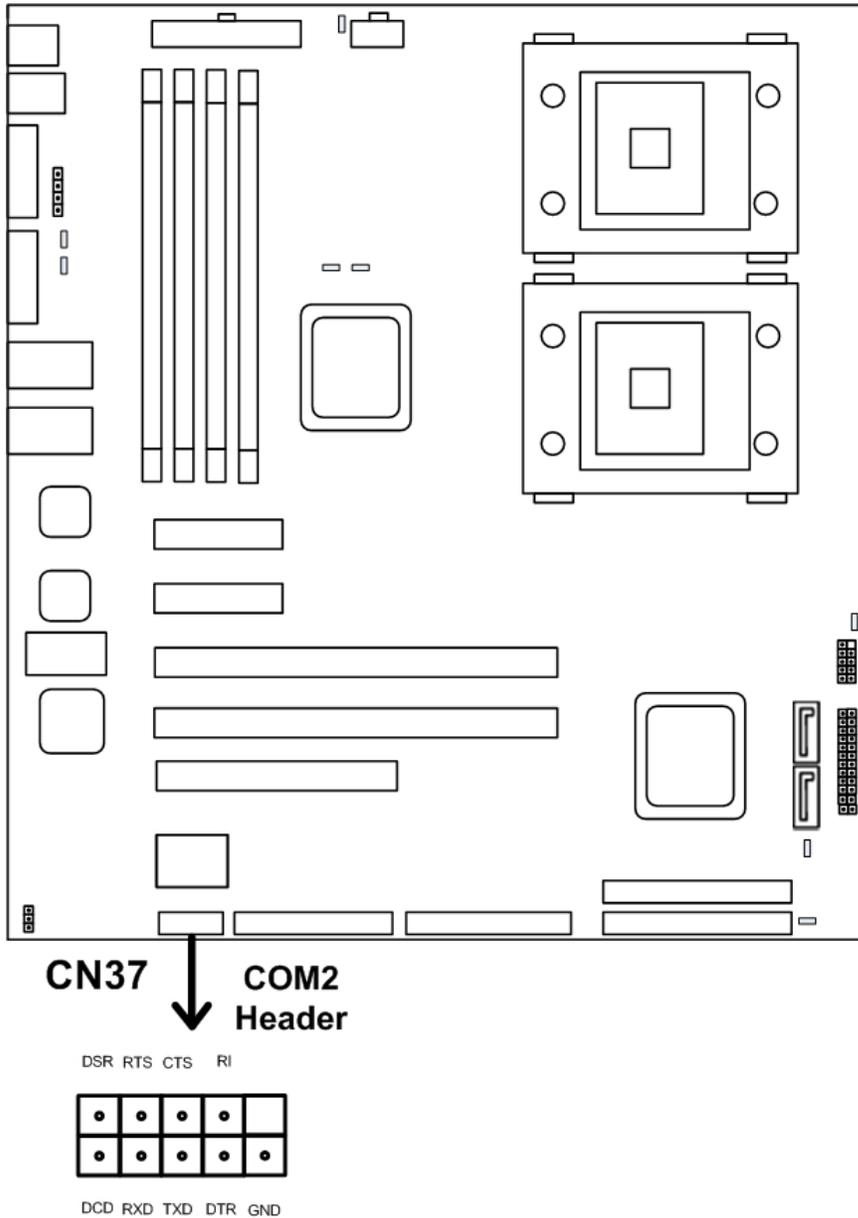
Refer to the following diagram for the location of CN26.



Side A shares the same bus as USB A, therefore two USB devices cannot use side A and USB A together. Only one device will work at a time. The same goes for Side B and USB B.

2.6.9 Front Panel Serial Port Connector

Header CN37 controls the activation of front panel serial port.
In the specification, front panel serial port is COM2, the back panel is COM1.
Refer to the following diagram for location and orientation of CN37.



Chapter 3. BIOS Setup

This chapter discusses the PhoenixBIOS setup program built into the ROM BIOS. BIOS is the basic input/output system, the firmware on the motherboard that enables the hardware to interface with the software. The setup program allows the users to modify the basic system configurations according to their needs. The configuration is then stored in battery-backed NVRAM so that it retains the configuration when the power is turned off. The PhoenixBIOS installed in the motherboard's ROM is a custom version of an industry standard BIOS.

The rest of the chapter will list all the menus and sub-menus in the BIOS. Along with them, you can also find the list of possible values for any configurable item in the BIOS.

3.1 Entering BIOS Setup

The PhoenixBIOS is activated when the system is powered on. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. After finishing configuring the whole system, BIOS will seek an OS on disk and turn over control of the system to the OS found.

While BIOS is in control, the Setup menu can be accessed by pressing the <F2> key when the following message appears briefly at the bottom of the screen during Power On Self Test: "Press <F2> to enter SETUP."

3.2 Using Setup

The following table provides details about how to navigate the Setup program using keyboard.

Key	Function
Up Arrow ↑	Move to the previous item.
Down Arrow ↓	Move to the next item.
Left Arrow ←	Move to the previous menu.
Right Arrow →	Move to the next menu.
Esc	In the submenu: Exit the submenu. In the main menu: Exit without saving.
Enter	Select the item. A pop-up window will appear to allow setting of the item's value. If the item has a 4in front of it, it means that the item leads to a sub-menu. Pressing <Enter> will take you to the sub-menu.
PgUp	Increase the numeric value or goes to the previous setting value.
PgDn	Decrease the numeric value or goes to the next setting value.
+	Increase the numeric value or goes to the previous setting value.
-	Decrease the numeric value or goes to the next setting value.
F1	General help on setup navigation keys. Press <F1> key to pop up a small help window that describe the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <ESC> key or <F1> key again.
F9	Setup Defaults.
F10	Save and Exit.

3.3 Troubleshooting

In case the system cannot be booted after some changes in BIOS, use the clear CMOS jumper setting to reset the BIOS to default. To avoid such problem, configure only the items that you thoroughly understand and refrain from modifying the default chipset settings.

3.4 Main Menu

Main	Advanced	PhoenixBIOS Setup Utility Security	Power	Boot	Server	Exit	
							Item Specific Help
System Time: [12:59:59] System Date: [11/30/2004] BIOS Version V0.06 Legacy Diskette A: [1.44/1.25 MB 3½] Extended Memory Testing [Just zero it] System Memory: 624 KB Extended Memory: 1047040 KB							<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit							

The following table shows the items that you can customize on the Main menu page:

Item	Options	Description
System Time	No options.	Shows the time of the day in the format of Hour/Min/Sec.
System Date	No options.	Shows the date in the format of MM/DD/YYYY.
BIOS Version	No options	Shows the version of the BIOS
Legacy Diskette A	Disabled 720 Kb 1.44/1.25 MB 2.88 MB	Selects floppy type. Note that 1.25 MB 3½" references a 1024 byte/sector Japanese media format. The 1.25 MB, 3½" diskette requires a 3-Mode floppy-disk drive.
Extended Memory Testing	Normal Just zero it None	Determines which type of tests will be performed on extended memory (above 1M).
System Memory	No options.	This item is not configurable to user.
Extended Memory	No options.	This item is not configurable to user.

3.5 Advanced Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Server	Exit
						Item Specific Help
<ul style="list-style-type: none"> ▶ Memory Cache ▶ PnP/PCI Configurations ▶ Disk Configurations ▶ Diskette Configuration ▶ Integrated Peripherals ▶ Console Redirection 						Enable 2 nd Logical Processor.
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults			
ESC Exit	←→ Select Menu	Enter Select ▶ Sub-Menu	F10 Save and Exit			

3.5.1 Memory Cache Sub Menu

PhoenixBIOS Setup Utility		
Advanced		
Memory Cache		Item Specific Help
Cache System BIOS area: [Write Protect] Cache Video BIOS area [Write Protect] Cache Base 0-512k: [Write Back] Cache Base 512k-640k: [Write Back] Cache Extended Memory Area: [Write Back] Cache A000 – AFFF: [Disabled] Cache B000 – BFFF: [Disabled] Cache C800 – CBFF: [Disabled] Cache CC00 – CFFF: [Disabled] Cache D000 – D3FF: [Disabled] Cache D400 – D7FF: [Disabled] Cache D800 – DBFF: [Disabled] Cache DC00 – DFFF: [Disabled] Cache E000 – E3FF: [Disabled] Cache E400 – E7FF: [Disabled] Cache E800 – EBFF: [Disabled] Cache EC00 – EFFF: [Disabled]		Controls caching of system BIOS area..
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit		

The following table shows the items that you can customize on the Memory Cache sub menu page:

Item	Options	Description
Cache System BIOS area	Uncached Write Protect	Controls caching of system BIOS area.
Cache Video BIOS area	Uncached Write Protect	Controls caching of video BIOS area.
Cache Base 0-512k, 512k-640k	Uncached Write Through Write Protect Write Back	Controls caching of 512k base memory, 512k 640k base memory respectively.
Cache Extended Memory Area	Uncached Write Through Write Protect Write Back	Controls caching of system memory above one megabyte.

Cache A000-AFFF, B000-BFFF	Disabled USWC Caching Write Through Write Protect Write Back	Disabled – This block is not cached. USWC Caching – Uncached Speculative Write Combined. Write Through – Writes are cached and sent to main memory at once. Write Protect – Writes are ignored. Write Back – Writes are cached, but not sent to main memory until necessary.
Cache C800-CBFF, ..., EC00-EFFF	Disabled Write Through Write Protect Write Back	Disabled – This block is not cached. Write Through – Writes are cached and sent to main memory at once. Write Protect – Writes are ignored. Write Back – Writes are cached, but not sent to main memory until necessary.

3.5.2 PnP/PCI Configurations

PhoenixBIOS Setup Utility							
Main	Advanced	Security	Power	Boot	Server	Exit	
							Item Specific Help
Install O/S: [Win2000] Reset Configuration Data: [No]							
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit							

The following table shows the items that you can customize on the PnP/PCI Configurations menu page:

Item	Options	Description
Installed O/S	Other Win2000	Select the operating system installed on your system which you will use most commonly.
Reset Configuration Data	No Yes	Select 'Yes' if you want to clear the Extended system Configuration Data (ESCD) area.

3.5.3 Disk Configurations Sub Menu

PhoenixBIOS Setup Utility	
Advanced	
Disk Configurations	Item Specific Help
Large Disk Access Mode: [DOS] Parallel ATA: [Both] Serial ATA: [Enabled] SATA RAID Enable [Disabled] Onboard SCSI (LSI53C1020A) [Enabled] SCSI Oprom Scan: [Enabled] ► IDE Channel 0 Master [None] ► IDE Channel 0 Slave [None] ► IDE Channel 1 Master [None] ► IDE Channel 1 Slave [None] ► SATA Port 0 Master [None] ► SATA Port 1 Master [None]	
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit	

The following table shows the items that you can customize on the Disk Configurations sub menu page:

Item	Options	Description
Large Disk Access Mode	Other DOS	Unix, Novell Netware, or other operating systems, select 'Other'. If you are installing new software and the drive fails, change this selection and try again. Different operating systems require different representations of drive geometries.
Parallel ATA	Disabled Channel 0 Channel 1 Both	Enable the PATA
Serial ATA	Disabled Enabled	Enable the SATA
SATA RAID Enable	Disabled Enabled	Enable SATA RAID functionality
Onboard SCSI (LSI53C1020A)	Disabled Enabled	Enabled/Disabled Onboard SCSI device
SCSI Oprom Scan	Disabled Enabled	Enabled/Disabled Onboard SCSI (LSI53C1020A) OPROM Scan

3.5.3.1 IDE Channel Sub Menu

When there is a drive installed on an IDE or SATA, the sub menu will look like the following:

PhoenixBIOS Setup Utility			
Advanced			
IDE Pri./PATA Master [200GB]		Item Specific Help	
Type:	[Auto] LBA Format	User = you enter parameters of hard disk drive installed at this connection. Auto = autotypes hard disk drive install here. 1-39 = you select pre-determined type of hard-disk drive installed here. CD-ROM = a CD-ROM drive is installed here. ATAPI Removable = removable disk drive is installed here.	
Total Sectors:	390721968		
Maximum Capacity:	200GB		
Multi-Sector Transfers:	[16 Sectors]		
LBA Mode Control:	[Enabled]		
32 Bit I/O:	[Disabled]		
Transfer Mode:	[FPIO 4 / DMA 2]		
Ultra DMA Mode:	[Disabled]		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit

The following table shows the items that you can customize on the IDE/SATA sub menu page:

Item	Options	Description
Type	Auto None ATAPI Removable CD-ROM IDE Removable Other ATAPI User	User = you enter parameters of hard disk drive installed at this connection. Auto = autotypes hard disk drive installed here. 1-39 = you select pre-determined type of hard-disk drive installed here. CD-ROM = a CD-ROM drive is installed here. ATAPI Removable = removable disk drive is installed here.
Multi-Sector Transfers	Disabled 2 sectors 4 sectors 8 sectors 16 sectors	Specify the number of sectors per block for multiple sector transfers. 'Max' refers to the size the disk returns when queried.
LBA Mode Control	Disabled Enabled	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads & Sectors.
32 Bit I/O	Disabled Enabled	This setting enables or disables 32 bit IDE data transfers.

Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3/ DMA 1 FPIO 4/ DMA 2	Select the method for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.
Ultra DMA Mode	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Selects the Ultra DMA mode used for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.



All the IDE Channel sub-menus and SATA sub menus have the same sub menu layout as the one shown above.

3.5.4 Diskette Configuration Sub Menu

PhoenixBIOS Setup Utility			
Advanced			
Diskette Configuration		Item Specific Help	
Floppy Disk Controller:	[Enabled]	Configure using these options: [Disabled] No configuration [Enabled] User configuration [Auto] BIOS or OS chooses configuration	
Floppy check:	[Disabled]		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit

The following table shows the items that you can customize on the Diskette Configuration sub menu page:

Item	Options	Description
Floppy Disk Controller	Disabled Enabled Auto	Configure using these options: [Disabled] No configuration [Enabled] User configuration [Auto] BIOS or OS chooses configuration
Floppy check	Disabled Enabled	Enable verifies floppy type on boot; disabled speeds boot.

3.5.5 Integrated Peripherals Sub Menu

The Integrated Peripherals sub menu looks like the following:

PhoenixBIOS Setup Utility		
Advanced		
Integrated Peripherals		Item Specific Help
<p>► KBC Features</p> <p>Legacy USB Support: [Enabled]</p> <p>Serial port A: [Enabled] Base I/O Address: [3F8] Interrupt: [IRQ 4]</p> <p>Serial port B: [Enabled] Base I/O Address: [2F8] Interrupt: [IRQ 3]</p> <p>Floppy disk controller [Enabled]</p> <p>PS/2 Mouse [Auto Detect]</p> <p>Spectrum Mode [Enabled]</p> <p>Onboard LAN1 [Enabled] Onboard GLAN1 Oprom Scan: [Enabled]</p> <p>Onboard LAN2 [Enabled] Onboard GLAN2 Oprom Scan: [Enabled]</p>		Select keyboard options
<p>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit</p>		

The following table shows the items that you can customize on the Integrated Peripherals sub menu page:

Item	Options	Description
Legacy USB Support	Disabled Enabled	Enable support for Legacy Universal Serial Bus
Serial port A or Serial port B	Disabled Enabled Auto	Configure serial port using options: [Disabled]: No configuration. [Enabled]: User configuration. [Auto]: BIOS or OS chooses configuration. (OS controlled): Displays when controlled by OS.
Serial Port Base I/O Address	3F8 2F8 3E8 2E8	Set the base I/O address for serial port.
Serial Port Interrupt	IRQ 3 IRQ 4	Set the interrupt for serial port.
Floppy disk controller	Disabled Enabled Auto	

PS/2 Mouse	Disabled Enabled Auto	'Disabled' prevents any installed PS/2 mouse from functioning, but frees up IRQ 12. 'Enabled' forces the PS/2 mouse port to be enabled regardless if a mouse is present. 'Auto Detect' will enable the PS/2 mouse only if present. 'OS Controlled' only displayed if the OS controls the mouse.
Spectrum Mode	Disabled Enabled	Enabled/Disabled Spectrum Mode
Onboard LAN1	Disabled Enabled	Enabled/Disabled Onboard LAN1 device
Onboard GLAN1 OPROM Scan	Disabled Enabled	Enabled/Disabled Onboard GLAN1 (Intel 82541PI) OPROM Scan
Onboard LAN2	Disabled Enabled	Enabled/Disabled Onboard LAN2 device
Onboard GLAN2 OPROM Scan	Disabled Enabled	Enabled/Disabled Onboard GLAN2 (Intel 82541PI) OPROM Scan

3.5.6 Console Redirection Sub Menu

The Console Redirection sub menu looks like the following:

PhoenixBIOS Setup Utility		
Advanced		
Console Redirection		Item Specific Help
Com Port Address	[Disabled]	If enabled, it will use a port on the motherboard.
Baud Rate	[19.2K]	
Console Type	[PC ANSI]	
Flow Control	[CTS/RTS]	
Console connection	[Direct]	
Continue C.R. after POST	[Off]	
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit		

The following table shows the items that you can customize on the Console Redirection sub menu page:

Item	Options	Description
Com Port Address	Disabled On-board COM A On-board COM B	If enabled, it will use a port on the motherboard.
Baud Rate	300 1200 2400 9600 19.2K 38.4K 57.6K	Enables the specified baud rate.
Console Type	VT100 VT100, 8bit PC-ANSI, 7bit PC-ANSI VT100+ VT-UTF8	Enables the specified console type.
Flow Control	None XON/XOFF CTS/RTS	Enables flow control
Console connection	Direct Via modem	Indicate whether the console is connected directly to the system or a modem is used to connect.
Continue C.R. after POST	Off On	Enables Console Redirection after OS has loaded.

3.6 Security Menu

PhoenixBIOS Setup Utility			
Main	Advanced	Security Power Boot Server Exit	
		Item Specific Help	
Supervisor Password Is:	Clear	Supervisor Password controls access to the setup utility.	
User Password Is:	Clear		
Set Supervisor Password:	[Enter]		
Set User Password:	[Enter]		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit

The following table shows the items that you can customize on the Security menu page:

Item	Options	Description
Supervisor Password Is	Clear Set	Displays the password if there is one.
User Password Is	Clear Set	Displays the password if there is one.
Set Supervisor Password	Enter	Supervisor Password controls access to the setup utility.
Set User Password	Enter	*Note: to use this feature, you must first set supervisor password.

3.7 Power Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Server	Exit
						Item Specific Help
Enable ACPI [Yes] Wake On Lan [Enabled] Power Savings [Disabled] Resume On Time [Off] Resume Time [00:00:00] Power Button Behaviour [On/Off] Instant Off [Disabled] Suspend Mode [Suspend] After Power Failure: [Last State]						Enable/Disable support for Wake On Lan
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Exit ←→ Select Menu Enter Select ► Sub-Menu F10 Save and Exit						

The following table shows the items that you can customize on the Power menu page:

Item	Options	Description
Enable ACPI	No Yes	Enable/Disable ACPI BIOS (Advance Configuration and Power Interface) Debug only, remove this option for production.
Wake On Lan	Disabled Enabled	Enable/Disable support for Wake On Lan
Power Savings	Disabled Maximum Power Savings Maximum Performance	Maximum Power Savings conserves the greatest amount of system power. Maximum Performance conserves power but allows greatest system performance. To alter these settings, choose Customized. To turn off power management, choose Disabled.
Resume On Time	Off On	Enable wakes the system up at a specific time.
Resume Time		Specify the time when the system is to wake up. <Tab>, <Shift-Tab>, or <Enter> selects field.
Power Button Behaviour	On/Off Wake/Sleep	Select the desired system power state after press power button. On/Off: System power off Wake/Sleep: System enter sleep mode

Instant Off	Disabled Enabled	Enable support for Power Button Instant Off Function to support wake up by PME and Alarm on Time work normally. Disable this Item, System will execute 4 second override shutdown, that will cause wake up by PME and Alarm on Time no function!
Suspend Mode	Suspend Save to Disk	Select the type of Suspend Mode. If you choose SAVE TO DISK the system will save its state to disk and power off. If you choose SUSPEND the system will save its state but remain in a low power mode. If you choose SUSPEND then you also have the option of choosing Save To Disk
After Power Failure	Stay Off Last State Power On	Sets the mode of operation IF an AC/Power Loss occurs. The two modes are: ‘Stay Off’ keeps the power off until power button is pressed; ‘Last State’ restores previous power state before loss occurred; ‘Power On’ turns on the system when AC power becomes available.

3.8 Boot Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Server	Exit
						Item Specific Help
QuickBoot Mode: [Enabled] Boot-time Diagnostic Screen [Enabled] Summary Screen [Disabled] ► Boot Priority						Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults			
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit			

3.8.1 Boot Priority Sub Menu

All the possible devices that you can boot from are automatically detected and listed on the page. The items with a '+' in front of it indicates that the item is a category with more devices nested under it. You can use <Enter> to display the nested devices. The first device listed is the first boot device. In the example shown below, the CD-ROM is the first boot device, followed by the ST380023AS-(P0) in the category of hard drive.

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Exit	
Boot Priority						Item Specific Help
CD-ROM Drive -Hard Drive ST380023AS-(P0) Bootable Add-in Cards +Removable Devices Network Boot IBA GE Slot 0330 v1216 IBA GE Slot 0331 v1216						Keys used to view or configure devices: <Enter> expands or collapses devices with a + or - <Ctrl-Enter> expands all <Shift-1> enables or disables a device. <+> and <-> moves the device up or down. <n> may move removable device between Hard Disk or Removable Disk. <d> Remove a device that is not installed.
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults			
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu	F10 Save and Exit			

3.9 Hardware Monitor Sub Menu

This section functionally provides the details of hardware monitor as represented below:

Main		Advanced		PhoenixBIOS Setup Utility		Security		Power		Boot		Server		Exit	
															Item Specific Help
V(+12V) = 0. V V(VCC) = 4.83 V V(VCC3) = 3.19 V V(VBAT) = 2.94 V V(VCC25) = 2.90 V V(CPU 0 Vcore) = 1.24 V V(CPU 1 Vcore) = 1.33 V CPU 0 Temperature = 37 C CPU 1 Temperature = 37 C CPU 0 Fan Speed = 5052 RPM CPU 1 Fan Speed = 5052 RPM System Fan Speed = 5052 RPM															All items on this menu cannot be modified in user mode. If any items require changes, please consult your system Supervisor.
F1 Help		↑↓ Select Item		-/+ Change Values		F9 Setup Defaults		ESC Exit		←→ Select Menu		Enter Select ► Sub-Menu		F10 Save and Exit	

3.10 Exit Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Server	Exit
						Item Specific Help
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes						Exit System Setup and save your changes to CMOS.
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults			
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu	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.

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 store the selections displayed in the menus in 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 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 get the Default Values (as described below) or try to change the selections that caused the boot to fail.

Exit Discarding Changes

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

Load Setup Defaults

To display 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 changes data stored in CMOS.

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.

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.

3.11 About the Boot Utilities

The MainBoard comes with the following boot utilities:

Phoenix QuietBoot™: Phoenix QuietBoot displays a graphic illustration rather than the traditional POST messages while keeping you informed of diagnostic problems.

Phoenix MultiBoot™: Phoenix MultiBoot is a boot screen that displays a selection of boot devices from which you can boot your operating system.

3.11.1 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 number 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 <F10> to display the POST screen

Press <F2> to enter Setup

POST issues an error message

The BIOS or an option ROM requests keyboard input

The following explains each of these situations.

When <F10> is pressed	<p>Press <F10> switch to the POST screen and take one of two actions:</p> <ol style="list-style-type: none"> 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: A: Load the operating system from a boot device of your choice. B: Enter Setup. C: Exit the Boot First Menu (with <Esc>) and load the operating system from the boot devices in the order specified in Setup. 2. If MultiBoot is not installed, the boot process continues as usual.
Press <F2> to enter Setup	Press <F2> at any time during POST switch to the POST screen (if not already displayed) and enters Setup.
POST issues an error message	<p>Whenever POST detects a non-fatal error, QuietBoot switches to the POST screen and displays the errors. It then displays this message:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>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.</p> </div>
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 displays prompts for entering the information. POST continues from there with the regular POST screen.

3.11.2 Phoenix MultiBoot

Phoenix MultiBoot expands your boot options by letting you choose your boot device, which could be a hard disk, floppy disk, or CD ROM. You can select 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 Setup Boot Menu. The following describes the Boot First Menu.

The Boot First Menu

Display the Boot First Menu by pressing <F10> 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 previous boot sequence.
- * 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, the first one in the Setup Boot menu is the one represented here.

3.12 BIOS Flash Upgrade Utility

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

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

Update the current BIOS with a new version.

Restore a BIOS when it has become corrupted.

3.12.1 Executing Phoenix Phlash

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

```
C:\PHLASH16 [filename] /BBL /C
```

Phoenix Phlash automatically updates or replaces the current BIOS with the one which your OEM or dealer supplies you.

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

Cannot flash when memory managers are present.

If you see this message after you execute Phlash, you must disable the memory manager on your system.

To do so, follow the instructions in the following sections.

Disabling Memory Managers

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

DOS 5.0 (or later version)

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

1. Boot DOS 5.0 or later version. (In Windows 95, at the boot option screen, choose Option 8, "Boot to a previous version of DOS.")
2. When DOS displays the "Starting MS-DOS" message, press <F5>.

After you press <F5>, DOS bypasses the CONFIG.SYS and AUTOEXEC.BAT files, and therefore does not load any memory managers.

You can now execute Phlash.

Create a Boot Diskette

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

3. Insert a diskette into your A: drive.
4. Enter the following from the command line: Format A: /S
5. Reboot your system from the A: drive.

Your system will now boot without loading the memory managers, and you can then execute Phlash.

Command:

```
A:\> PHLASH16 LH510F.102 /BBL /C
```

Where:

PHLASH16	Phlash command name
LH510F.102	Filename of new BIOS ROM supplied by dealer

/BBL
/C

Flash the Boot Block
Clear CMOS

APPENDIX I: Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DMI: A specification that establishes a standard framework for managing networked computers. DMI covers hardware and software, desktop systems and servers, and defines a model for filtering events and describing interfaces.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which loses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they’re found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip.

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

OPROM: Firmware on adapter cards that control bootable peripherals. The system BIOS interrogates the option ROMs to determine which devices can be booted.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI bridge: allows you to connect multiple PCI devices onto one PCI slot.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SMBIOS: The system management specification addresses how motherboard and system vendors present management information about their products in a standard format by extending the BIOS interface on Intel architecture systems.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

ZCR (Zero Channel RAID): ZCR card provides RAID-5 solution by working with the onboard SCSI/SATA/SATA-II chip through special PCI-X slot with Intel RAIDIOS logic, thus lowering cost of RAID-5 solution