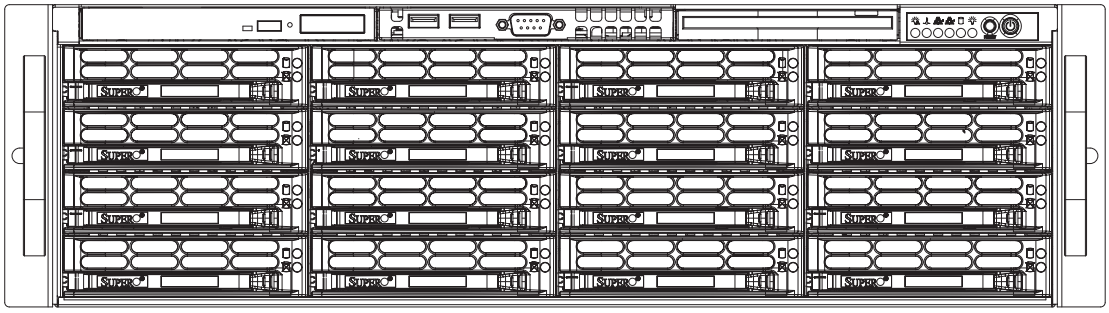
SUPERMICRO®

# SUPERSERVER 6035B-8R+



# USER'S MANUAL

1.0

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Manual Revision 1.0

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# Preface

## About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6035B-8R+. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 6035B-8R+ is a high-end server based on the SC836S2-R800 3U rackmount chassis and the X7DB8+, a dual processor serverboard that supports dual Intel® Xeon™ LGA 771 processors at a Front Side (System) Bus speed of 1333 MHz and up to 64 GB of registered FBD ECC DDR2-667/533 SDRAM.

## Manual Organization

### Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X7DB8+ serverboard and the SC836S2-R800 chassis, which comprise the SuperServer 6035B-8R+.

### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6035B-8R+ into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

### Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

### Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6035B-8R+.

### Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X7DB8+ serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

### Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC836S2-R800 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI or peripheral drives and when replacing system power supply units and cooling fans.

### Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

### Appendix A: BIOS POST Codes

### Appendix B: BIOS POST Messages

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# Chapter 1

# Introduction

## 1-1 Overview

The SuperServer 6035B-8R+ is a high-end server that is comprised of two main subsystems: the SC836S2-R800 3U server chassis and the X7DB8+ dual Intel Xeon processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 6035B-8R+ (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the SuperServer 6035B-8R+, as listed below:

- Three (3) 8-cm hot-swap chassis fans (FAN-0070L)
- One (1) air shroud (MCP-310-00004-00)
- Two (2) CPU passive heatsinks (SNK-P0018)
- One (1) DVD-ROM drive (DVM-PNSC-824)
- One (1) ATA66 cable for DVD drive (CBL-0139L)
- One (1) floppy cable (CBL-0078)
- One (1) rail set (MCP-290-00001-00)
- SCSI Accessories
  One (1) dual-channel SCSI backplane (BPN-SCA-836S2)
  One (1) Ultra320 SCSI ribbon cable (CBL-0043L)
  One (1) Ultra320 SCSI round cable (CBL-0063L)
  Sixteen (16) hot-swap SCSI drive carriers [MCP-220-00001-01(03)]

Note: The 6035B-8R+ is available in silver and black; for the server, a "V" (6035B-8R+V) indicates silver and a "B" (6035B-8R+B) indicates black. A "03" following a part number indicates silver and "01" indicates black.

## 1-2 Serverboard Features

At the heart of the SuperServer 6035B-8R+ lies the X7DB8+, a dual processor serverboard based on the Intel 5000P chipset and designed to provide maximum performance. Below are the main features of the X7DB8+. (See Figure 1-1 for a block diagram of the 5000P chipset).

### Processors

The X7DB8+ supports single or dual LGA 771 type Intel Xeon processors at a FSB speed of 1333 MHz. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

### Memory

The X7DB8+ has sixteen 240-pin DIMM slots that can support up to 64 GB of FBD (Fully Buffered DIMM) ECC DDR2-667/533 SDRAM. The memory operates in a 4-way interleaved configurations and requires requires modules of the same size and speed to be installed four at a time. See Chapter 5 Section 5 for details.

### Onboard SCSI

An onboard Adaptec AIC-7902 dual-channel SCSI controller in integrated into the X7DB8+, which supports eight 80-pin SCA Ultra320 SCSI hard drives. The SCSI drives are connected to an SCA backplane that provides power, bus termination and configuration settings. The SCSI drives are hot-swappable units.

**Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SCSI drives.

### Serial ATA

A SATA controller is integrated into the South Bridge of the 5000P chipset to provide a six-port Serial ATA subsystem, which is RAID 0, 1, 10 and 5 supported. The Serial ATA drives are hot-swappable units.

**Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives.

### PCI Expansion Slots

The X7DB8+ has six PCI expansion slots, which includes two PCI-Express x8 slots, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots and one 64-bit 100 MHz PCI-X slot. (On the X7DB8+, one 100 MHz PCI slot supports Zero Channel RAID.)

### Onboard Controllers/Ports

One floppy drive controller and two onboard ATA/100 controllers are provided to support up to four IDE hard drives or ATAPI devices. The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, a parallel port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports.

### ATI Graphics Controller

The X7DB8+ features an integrated ATI video controller based on the ES1000 graphics chip. The ES1000 was designed specifically for servers, featuring low power consumption, high reliability and superior longevity.

### Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

## 1-3 Server Chassis Features

The following is a general outline of the main features of the SC836S2-R800 server chassis.

### System Power

The SC836S2-R800 features a redundant (two separate power modules) 800W high-efficiency power supply with $I^2C$. This power redundancy feature allows you to replace a failed power supply without shutting down the system.

### SCSI Subsystem

The SC836S2-R800 chassis was designed to support sixteen dual-channel SCSI hard drives, which are hot-swappable units.
**Note:** The operating system you use must have RAID support to enable the hot-swap capability of the SCSI drives.

### Front Control Panel

The control panel on the SuperServer 6035B-8R+ provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, system overheat and power supply failure. A main power button and a system reset button are also included. In addition, two USB ports and a COM port have been incorporated into the front of the chassis for convenient access.

### I/O Backplane

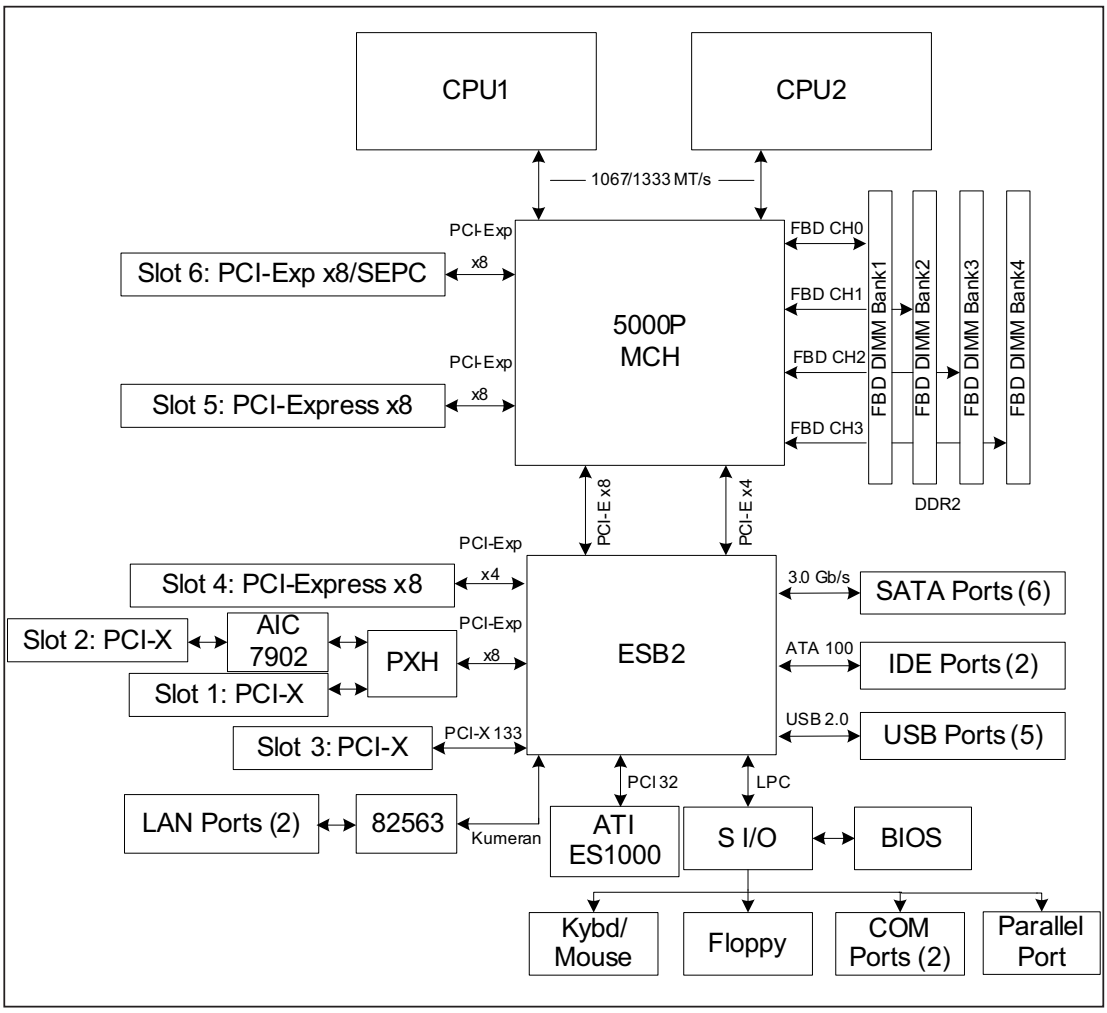
The SC836S2-R800 is an ATX form factor chassis designed to be used in a 3U rackmount configuration. The I/O backplane provides seven PCI expansion slots, one COM port, a parallel port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports.

### Cooling System

The SC836S2-R800 chassis includes three 8-cm hot-plug system cooling fans located in the middle section of the chassis. An air shroud channels the airflow from the system fans to efficiently cool the processors and memory. Two additional 8-cm fans are located at the back of the chassis to expel hot air from the system. Each power supply modules also include a cooling fan.

**Figure 1-1. Intel 5000P/ESB2 Chipset: System Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.



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# Chapter 2

# Server Installation

## 2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6035B-8R+ up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

## 2-2 Unpacking the System

You should inspect the box the SuperServer 6035B-8R+ was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 6035B-8R+. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

## 2-3 Preparing for Setup

The box the SuperServer 6035B-8R+ was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

## Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets, etc.).

## Warnings and Precautions!

## Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

## Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SCSI drives and power supply units to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

## Rack Mounting Considerations

### Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

### Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

### Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

### Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

## 2-4 Installing the System into a Rack

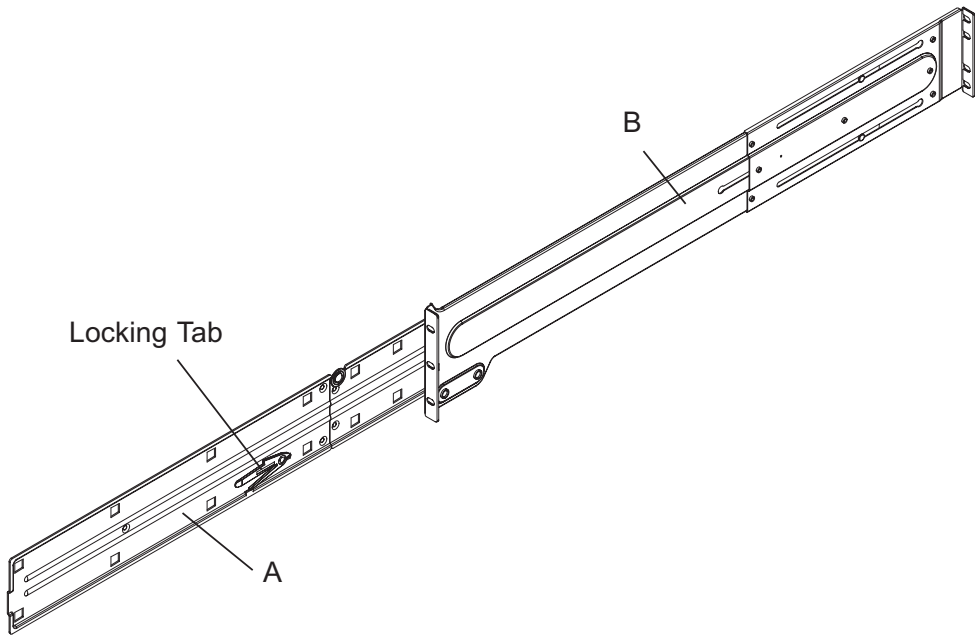
This section provides information on installing the SuperServer 6035B-8R+ into a rack unit. If the 6035B-8R+ has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 6035B-8R+ into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

### Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies with the SuperServer 6035B-8R+. Each of these assemblies consist of two sections: an inner chassis rail that secures to the chassis (A) and an outer rack rail that secures directly to the rack itself (B). All screws and hardware mentioned in the installation steps should be included in the hardware kit.

To remove the chassis rail (A), pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Then depress the locking tab to pull the inner rail completely out. Do this for both the left and right side rack rail assemblies.

**Figure 2-1. Identifying the Sections of the Rack Rails**

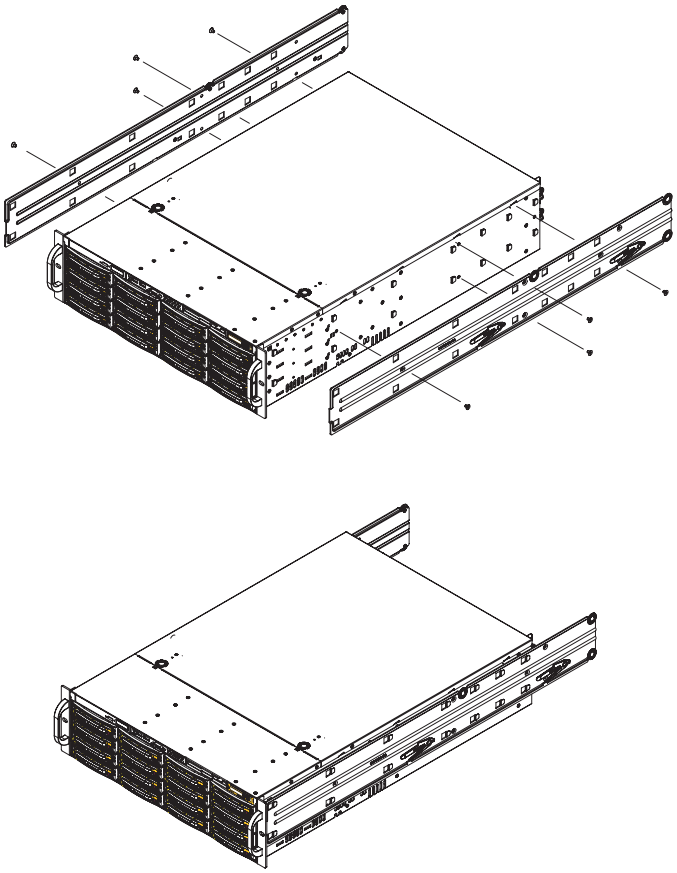


## Installing the Chassis Rails

Position one of the chassis rail sections you just removed along the side of the 6035B-8R+. Note that the two chassis rails are left/right specific. Locate the numerous rail tabs on each side of the chassis and the corresponding holes on each of the chassis rails. Note that the holes are elongated with one end of the hole larger than the other. Align the larger end of each hole with its corresponding tab. With all holes and tabs aligned, position the rail onto the side of the chassis (see Figure 2-2). Once a rail is positioned on the chassis, pull it forward until the rail tabs lock in the small ends of the corresponding holes. Then secure the rail to the chassis with the screws included in the harware kit. Repeat the above steps to install the other rail on the chassis.

**Locking Tabs:** As mentioned, both chassis rails have locking tabs, which serve to lock the server into place when installed and pushed fully into the rack (its normal position).

**Figure 2-2. Installing Chassis Rails**



## Installing the Server into the Rack

Locate the front and rear brackets that on both ends of the outer chassis rail. These brackets sit perpendicular to the rail and are used to attached the rail to the rack. Secure the front bracket to the rack with two screws and the rear bracket to the rack with four screws using the appropriate screws and washers included in the hardware kit (see Figure 2-3). You may need to adjust the rail to match the depth of the rack. Repeat the same steps to install the other outer rail to the rack.

You are now ready to install the server into the rack. Slide the chassis into the rack as shown in Figure 2-4. The chassis may not slide into the rack smoothly or easily when installed the first time. Some adjustment to the slide assemblies might be needed for easier installation.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". You'll need to release the safety taps on both sides of the chassis in order to completely remove the chassis out of the rack.

**Figure 2-3. Assembling the Rack Rails**

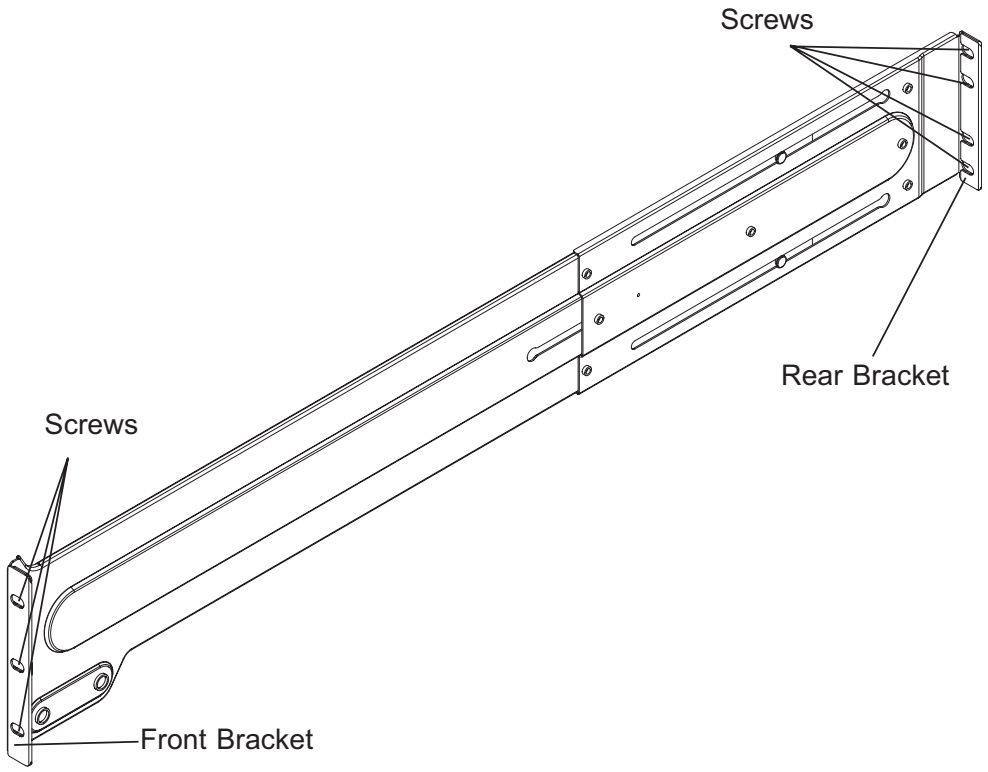
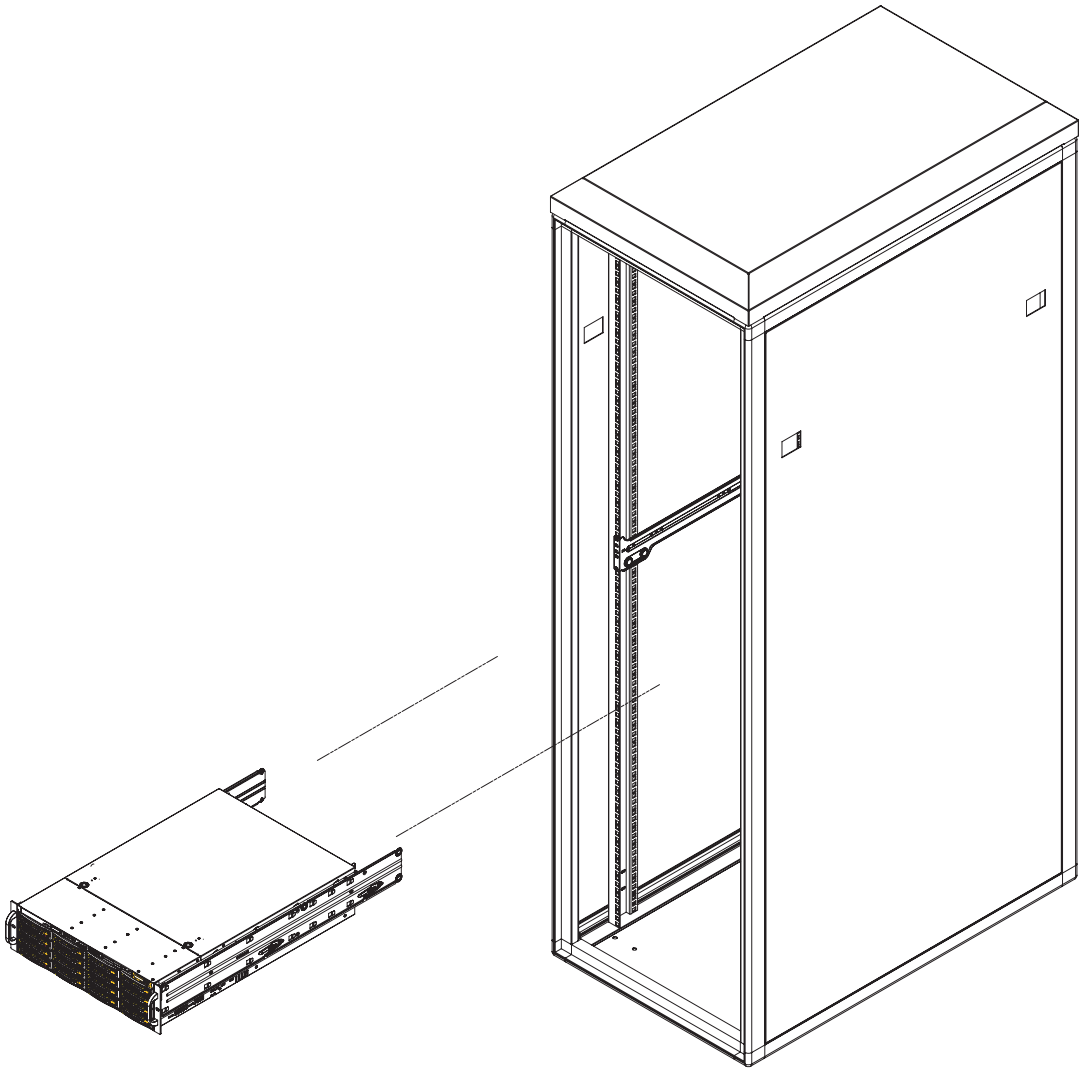


**Figure 2-4. Installing the Server into a Rack**



## 2-5 Checking the Serverboard Setup

After you install the 6035B-8R+ in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

**1. Accessing the inside of the System (see Figure 2-5)**

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis and push the cover toward the rear of the chassis to release it. You can then lift the cover from the chassis to gain full access to the inside of the server.

**2. Check the CPUs (processors)**

You may have one or two processors already installed into the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

**3. Check the system memory**

Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

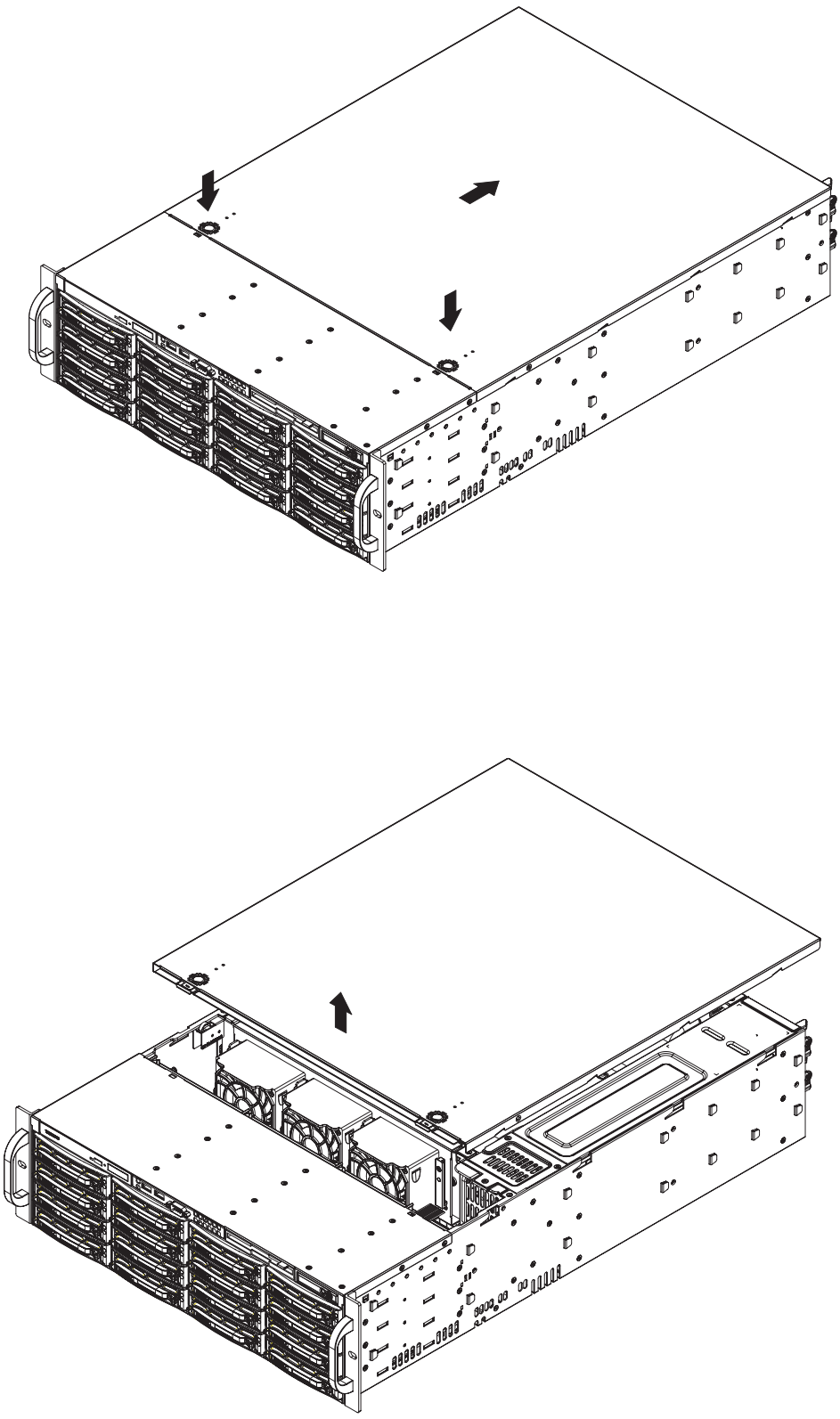
**4. Installing add-on cards**

If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

**5. Check all cable connections and airflow**

Make sure all power and data cables are properly connected and not blocking the chassis airflow. Also make sure that no cables are positioned in front of the fans. See Chapter 5 for details on cable connections.

**Figure 2-5. Accessing the Inside of the System**



## 2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SCSI drives and SCSI backplane have been properly installed and all connections have been made.

**1. Accessing the drive bays**

All drives are accessable from the front of the server. For servicing the DVD-ROM and floppy drives, you will need to remove the top chassis cover. The SCSI disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

**2. DVD-ROM and floppy disk drives**

A slim DVD-ROM and a floppy drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a DVD-ROM and/or floppy disk drive to the system.

**3. Check the SCSI disk drives**

Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SCSI drives, please refer to Chapter 6.

**4. Check the airflow**

Airflow is provided by three 8-cm chassis cooling fans and two 8-cm rear chassis exhaust fans. An air shroud is also included in the system to maximize airflow. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

**5. Supplying power to the system**

The last thing you must do is to provide input power to the system. Plug the power cord(s) from the power supply unit(s) into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

# Chapter 3

# System Interface

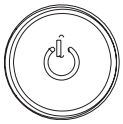
## 3-1 Overview

There are several LEDs on the control panel as well as others on the SCSI drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel.

## 3-2 Control Panel Buttons

The two push-buttons located on the front of the chassis are (in order from left to right) a reset button and a power on/off button.


- **RESET:** Use the reset button to reboot the system.



- **POWER:** This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

## 3-3 Control Panel LEDs

The control panel located on the front of the chassis has several LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- **Power Fail:** Indicates a power supply module has failed. The second power supply module will take the load and keep the system running but the failed module will need to be replaced. Refer to Chapter 6 for details on replacing the power supply. This LED should be off when the system is operating normally.

- **Overheat/Fan Fail:** When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.


- **NIC1:** Indicates network activity on the JLAN1 port when flashing.


- **NIC2:** Indicates network activity on the JLAN2 port when flashing.

- **HDD:** Indicates IDE channel activity. On the SuperServer 6035B-8R+, this LED indicates SCSI and/or DVD-ROM drive activity when flashing.

- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

## 3-4 SCSI Drive Carrier LEDs

Each SCSI drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** The SAF-TE compliant backplane activates the red LED to indicate a drive failure. If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

# Notes

# Chapter 4

# System Safety

## 4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6035B-8R+ from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives. When disconnecting power, you should first power down the system with the operating system and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

## 4-2 General Safety Precautions


Follow these rules to ensure general safety:

- Keep the area around the SuperServer 6035B-8R+ clean and free of clutter.

- The SuperServer 6035B-8R+ weighs approximately 78 lbs (35.5 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs. Don't use the handles (if installed) to lift the chassis; the handles should only be used to pull the server out of the rack.

- 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 clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- 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.

## 4-3 ESD Precautions

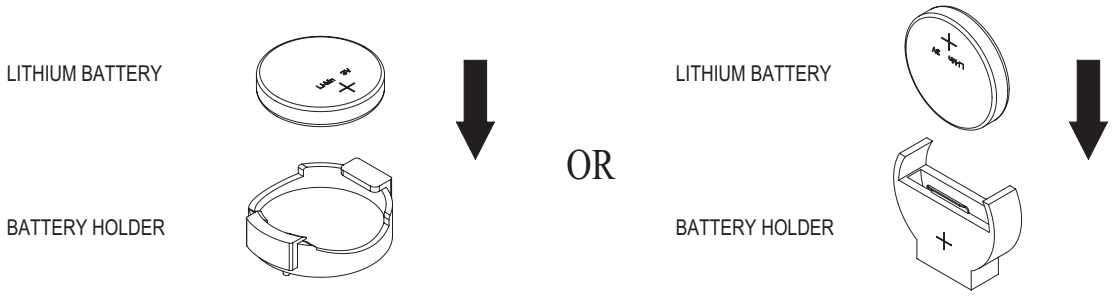
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient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

## 4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 6035B-8R+ is operating to assure proper cooling. Out of warranty damage to the 6035B-8R+ system can occur if this practice is not strictly followed.

**Figure 4-1. Installing the Onboard Battery**



# Chapter 5

# Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the X7DB8+ serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

## 5-1 Handling the Serverboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

### Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

## 5-2 Processor and Heatsink Installation

When handling the processor, avoid placing direct pressure on the label area of the fan. Also, do not place the serverboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

**IMPORTANT:** Always connect the power cord last and remove it first before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket *before* you install the heatsink and fan. The X7DB8+ can support either one or two Xeon LGA 771 processors. If installing one processor only, install it into CPU socket #1.

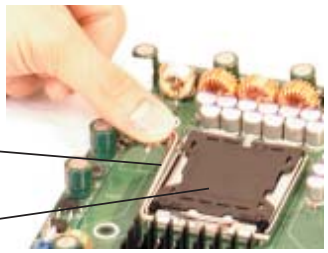
**Notes:**

1. Intel's boxed Xeon CPU package contains a CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel-certified multi-directional heatsinks and fans.

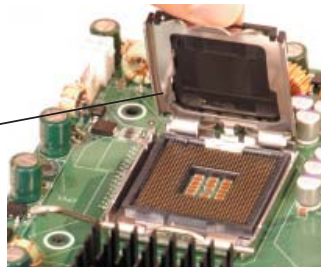
2. When purchasing an LGA 771 CPU or when receiving a serverboard with an LGA 771 CPU pre-installed, make sure that the CPU plastic cap is in place and none of the CPU pins are bent; otherwise, contact the retailer immediately.

### Installing the LGA 771 Processor

1. A black PnP cap is attached to the load plate to protect the CPU socket. Press the load lever down and away from the retention clasp to release the load plate from its locked position.



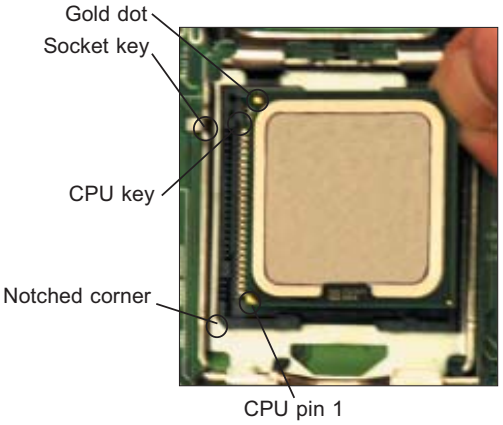

2. Gently lift the load lever to open the load plate.



3. Use your thumb and your index finger to hold the CPU at opposite sides.

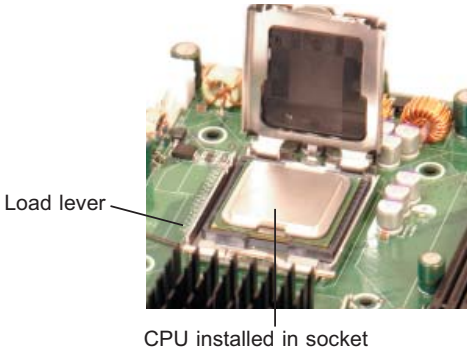
4. Align pin1 of the CPU (the corner marked with a triangle) with the notched corner of the CPU socket.

5. Find the corner of the CPU that has a semi-circle cutout below a gold dot (CPU key). This corner should be aligned with the cutout on the socket (socket key).



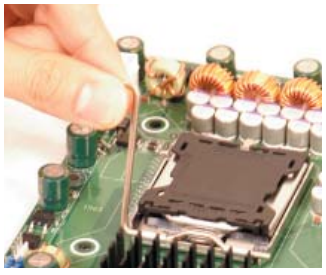

6. Once aligned, carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket, do not move the CPU horizontally or vertically and do not rub the CPU against any surface or any of the contacts, which may damage the CPU and/or contacts.

7. With the CPU in the socket, inspect the four corners of the CPU to make sure that it is properly installed.

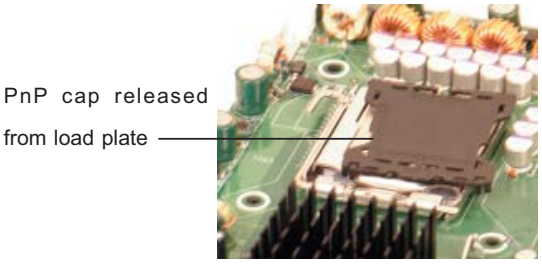



8. Use your thumb to gently push the load lever down until it snaps into the retention clasp.

9. If the CPU is properly installed into the socket, the PnP cap will be automatically released from the load plate when the lever locks. Remove the cap. Repeat steps to install a second CPU if desired.



**Warning!** Keep the plastic PnP cap. The serverboard must be shipped with the PnP cap properly installed to protect the CPU socket. Shipment without the PnP cap properly installed will void the warranty.



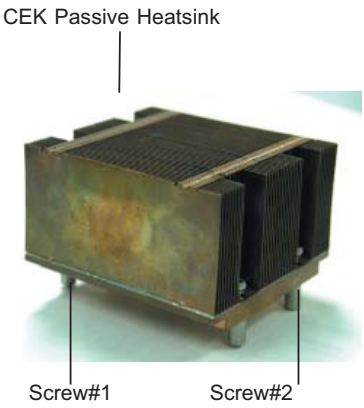
## Installing the Heatsink

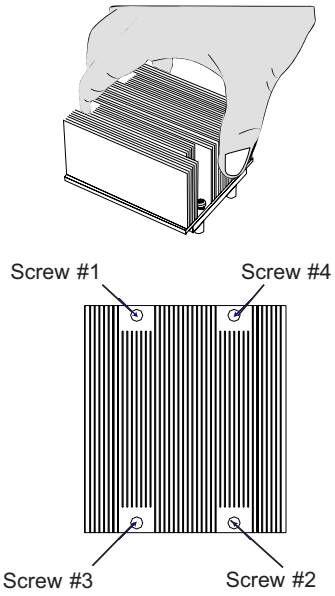
1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the (preinstalled) heatsink retention mechanism.

3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug. Do not fully tighten the screws or you may damage the CPU.)

4. Add the two remaining screws then finish the installation by fully tightening all four screws.




## Removing the Heatsink

**Warning!** *We do not recommend removal of the heatsink. However, if you do need to uninstall the heatsink, please follow the instructions below to prevent damage to the CPU or the CPU socket.*

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as shown in the third diagram above.

2. Hold the heatsink as show in the second diagram above and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the heatsink is loose, remove it from the CPU.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the heatsink.

## 5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

### Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to reroute them as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables. The following data cables (with their serverboard connector locations noted) should be connected. See the serverboard layout diagram in this chapter for connector locations.

- DVD-ROM drive cable (IDE#1)
- SCSI cables (JA1, JA2)
- Control Panel cable (JF1, see next page)

### Connecting Power Cables

The X7DB8+ has a 24-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to the "ATX Power" connector to supply power to the serverboard. See the Connector Definitions section in this chapter for power connector pin definitions.

In addition, your power supply must be connected to the 4-pin Secondary ATX Power connection at JPW2 and the 8-pin processor power connector at JPW3.

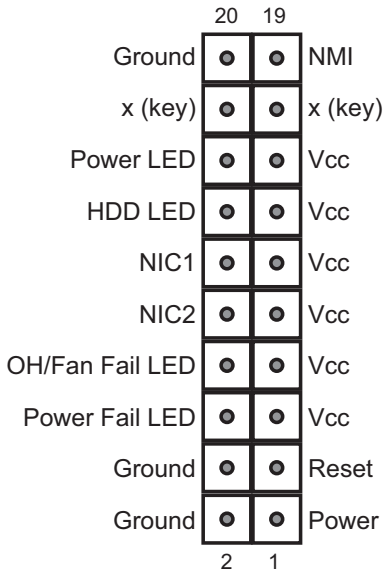
## Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-3 for the pin locations of the various front control panel buttons and LED indicators. Please note that even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single keyed ribbon cable to simplify their connection. The red wire in the ribbon cable plugs into pin 1 of JF1. Connect the other end of the cable to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

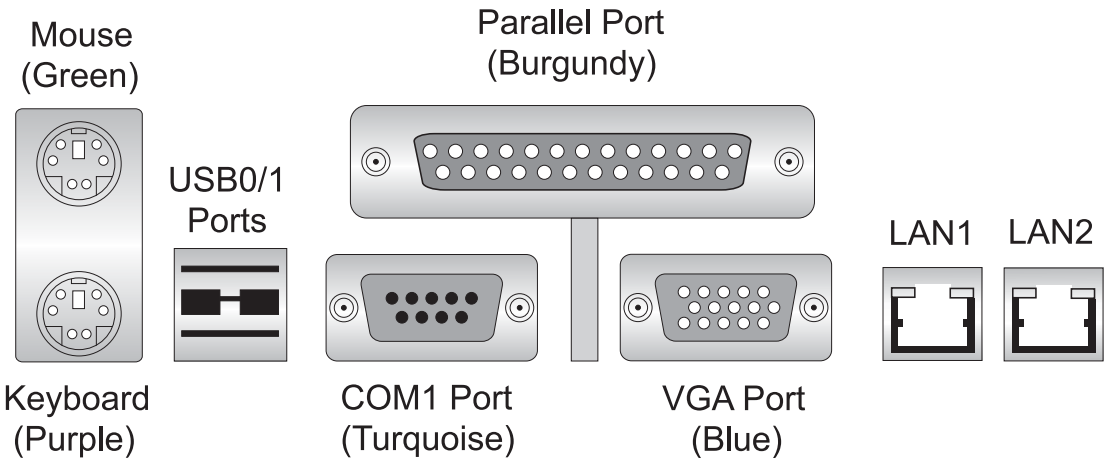
**Figure 5-3. Front Control Panel Header Pins (JF1)**



## 5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-4 below for the colors and locations of the various I/O ports.

**Figure 5-4. Rear Panel I/O Ports**




## 5-5 Installing Memory

**Note:** Check the Supermicro web site for recommended memory modules.

***CAUTION!***

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

### DIMM Installation (See Figure 5-5)

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM 1A. The memory scheme is interleaved so you must install four modules at a time, beginning with DIMM 1A, DIMM 2A, DIMM 3A and DIMM 4A and so on. (See the Memory Installation Table below.) Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.

2. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

### Memory Support

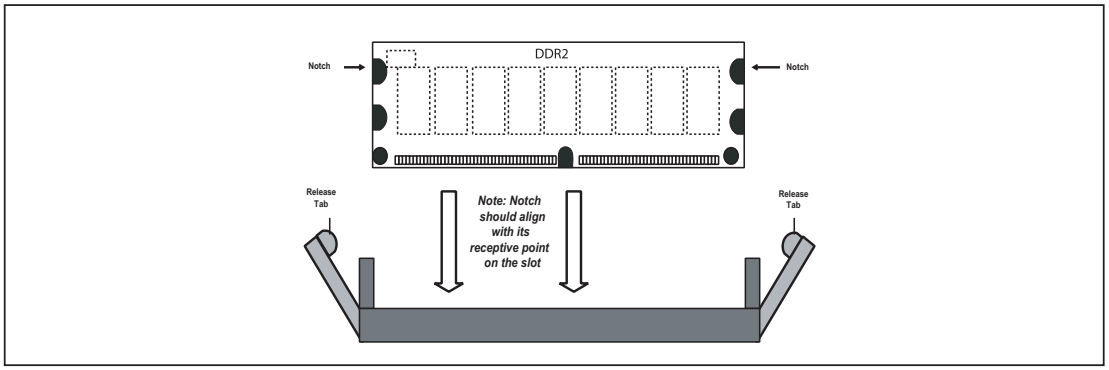
The X7DB8+ supports up to 64 GB of FBD (Fully Buffered DIMMs) ECC DDR2-667/533. Populating with pairs of memory modules that are of the same size and same type will result in interleaved memory.

**Note:** Due to OS limitations, some operating systems may not show more than 4 GB of memory. To optimize memory support, follow the table below when installing memory.

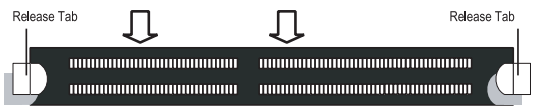
| Optimized DIMM Configurations | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Branch 0 | | | | | | | | Branch 1 | | | | | | | |
| Number of DIMMs | Bank 1 (Channel 0) | | | | Bank 2 (Channel 1) | | | | Bank 3 (Channel 2) | | | | Bank 4 (Channel 3) | | | |
| 4 DIMMs | 1A | --- | --- | --- | 2A | --- | --- | --- | 3A | --- | --- | --- | 4A | --- | --- | --- |
| 8 DIMMs | 1A | 1B | --- | --- | 2A | 2B | --- | --- | 3A | 3B | --- | --- | 4A | 4B | --- | --- |
| 12 DIMMs | 1A | 1B | 1C | --- | 2A | 2B | 2C | --- | 3A | 3B | 3C | --- | 4A | 4B | 4C | --- |
| 16 DIMMs | 1A | 1B | 1C | 1D | 2A | 2B | 2C | 2D | 3A | 3B | 3C | 3D | 4A | 4B | 4C | 4D |

**Notes: i.** "---" indicates an unpopulated DIMM slot. **ii.** All memory modules must be of the same speed and type. **iii.** Interleaved memory is supported when pairs of DIMMs are installed in *both Branch 0 and Branch 1*. Interleaved memory is *not* available if only 2 DIMMs are installed.

**Figure 5-5. Installing DIMM into Slot**




Top View of DDR2 Slot




**To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches.**

**To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.**

## 5-6 Adding PCI Cards

**1. PCI slots**

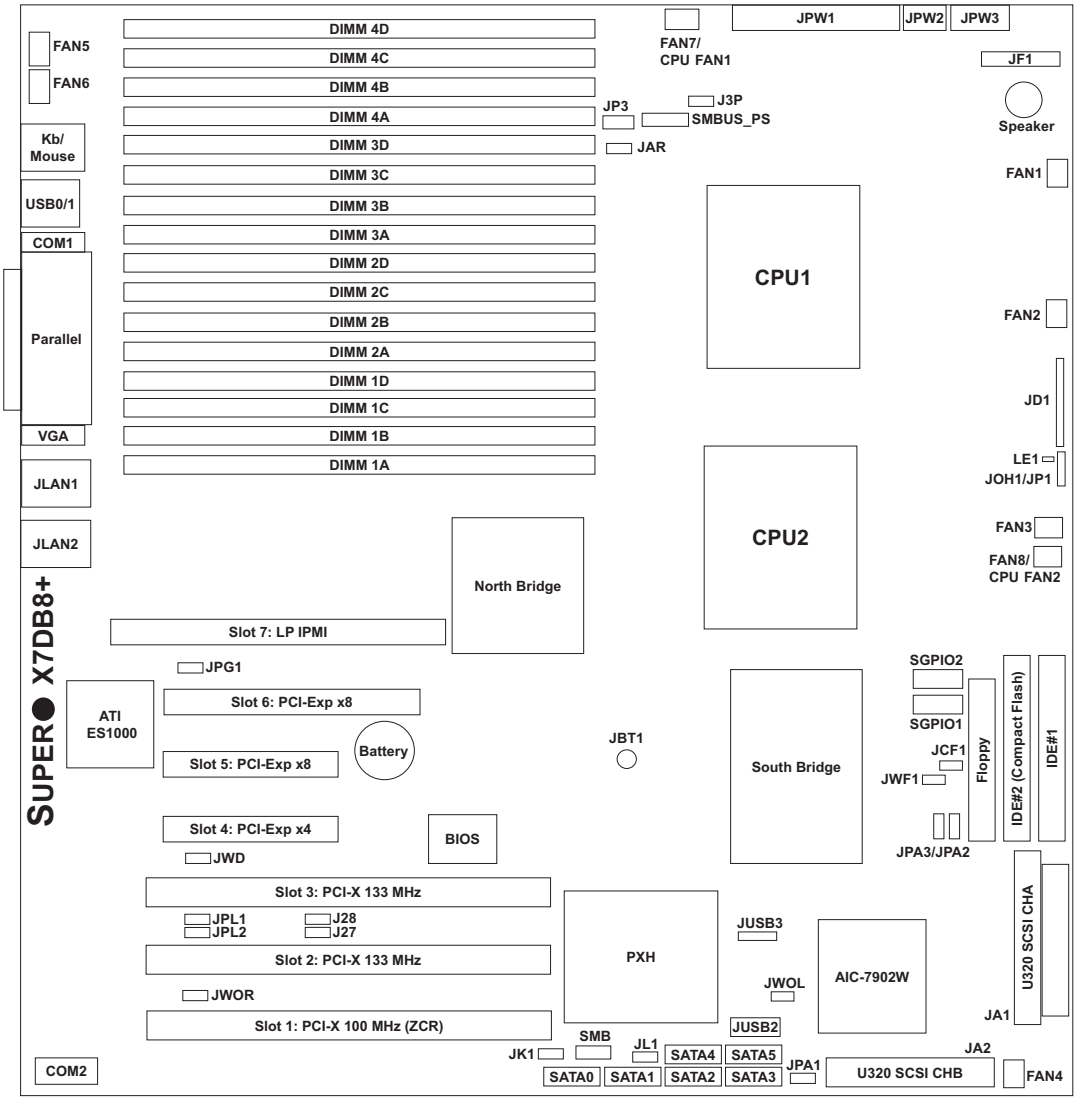
The X7DB8+ has six PCI expansion slots, which includes two PCI-Express x8 slots, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots and one 64-bit 100 MHz PCI-X slot. On the X7DB8+, the 100 MHz PCI-X slot supports Zero Channel RAID (ZCR).

**2. PCI card installation**

The SC836S2-R800 chassis can accommodate standard size PCI expansion cards installed in all six slots on the serverboard. Before installing a PCI add-on card, make sure you install it into a slot that supports the speed of the card (see step 1, above). After gaining access to the inside of the server, determine which slot you wish to populate, then press down on the curved section at the top of the tab for that slot. While pressing down, lift the tab to unlock the shield. Insert the expansion card into the correct slot on the serverboard, pushing down with your thumbs evenly on both sides of the card. Lock the card into place by pressing down on the tab. Follow this procedure when adding a card to other slots.

# 5-7 Serverboard Details

**Figure 5-6. SUPER X7DB8+ Layout**
(not drawn to scale)




**Notes:**

**Jumpers not noted are for test purposes only.**

**IDE#2 is for Compact Flash card use only. To use, close (enable) jumper JCF1 and connect the compact flash power to JWF1.**

# X7DB8+ Quick Reference

| Jumper | Description | Default Setting |
|---|---|---|
| J27/J28 | SMBUS to PCI Enable/Disable | Closed (Enabled) |
| J3P | 3rd Power Fail Detect | Open (Disabled) |
| JAR | Alarm Reset | Open (Disabled) |
| JBT1 | CMOS Clear | (See Section 5-9) |
| JCF1 | Compact Flash Master/Slave Select | Closed (Master) |
| JPA1 | SCSI Controller Enable/Disable | Pins 1-2 (Enabled) |
| JPA2/JPA3 | SCSI ChA/ChB Termination En/Dis | Open (Enabled) |
| JPG1 | VGA Enable/Disable | Pins 1-2 (Enabled) |
| JPL1/ JPL2 | JLAN1/JLAN2 Enable/Disable | Pins 1-2 (Enabled) |
| JWD | Watch Dog | Pins 1-2 (Reset) |

| Connector | Description |
|---|---|
| COM1/COM2 | COM1/COM2 Serial Port Connector/Header |
| FAN 1-8 | Fans 1-8 (Fans 1-4 = 3-pin, Fans 5-8 = 4-pin) |
| Floppy | Floppy Disk Drive Connector |
| IDE#1/IDE#2 | IDE Hard Drive/Compact Flash Card Connectors |
| JA1/JA2 | SCSI Channel A & B Connectors |
| JD1 | Power LED (pins1-3)/Speaker Header (pins 4-7) |
| JF1 | Front Control Panel Connector |
| JK1 | Keylock Header |
| JL1 | Chassis Intrusion Header |
| JLAN1/2 | G-bit Ethernet Ports |
| JOH1 | Overheat LED |
| JP3 | Power Fail Header |
| JPW1 | Primary 24-Pin ATX Power Connector |
| JPW2 | Secondary Power Connector |
| JPW3 | Processor Power Connector |
| JWF1 | Compact Flash Card Power Connector |
| JWOL | Wake-on-LAN Header |
| JWOR | Wake-on-Ring Header |
| LE1 | PWR LED Indicator |
| LP IPMI (Slot 7) | Low Profile IPMI Connector |
| Parallel | Parallel (Printer) Port |
| SATA0-SATA5 | Intel Serial ATA Connectors |
| SGPIO1/SGPIO2 | SGPIO Headers |
| SMB | System Management Bus Header |
| SMBUS_PS | Power System Management ($I^2C$) Header |
| USB0/1, JUSB2, JUSB4 | Back Panel USB0/1, Front Panel USB2/3, USB4 |

# 5-8 Connector Definitions

## ATX Power Connector

The Primary ATX power supply connector (JPW1) meets the SSI (Superset ATX) 24-pin specification. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

**Primary ATX Power Connector Pin Definitions (JPW1)**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 13 | +3.3V | 1 | +3.3V |
| 14 | -12V | 2 | +3.3V |
| 15 | COM | 3 | COM |
| 16 | PS_ON | 4 | +5V |
| 17 | COM | 5 | COM |
| 18 | COM | 6 | +5V |
| 19 | COM | 7 | COM |
| 20 | Res (NC) | 8 | PWR_OK |
| 21 | +5V | 9 | 5VSB |
| 22 | +5V | 10 | +12V |
| 23 | +5V | 11 | +12V |
| 24 | COM | 12 | +3.3V |

## Secondary Power Connector

In addition to the Primary ATX power connector (above), the Secondary 12v 8-pin connector (JPW2) must also be connected to your power supply. See the table on the right for pin definitions.

**Secondary Power Pin Definitions (JPW2)**

| Pins | Definition |
|---|---|
| 1 & 2 | Ground |
| 3 & 4 | +12V |

## Processor Power Connector

The JPW3 header must also be connected to the power supply to provide power for the processor(s). See the table on the right for pin definitions.

**Processor Power Pin Definitions (JPW3)**

| Pins | Definition |
|---|---|
| 1 through 4 | Ground |
| 5 through 8 | +12V |

## NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

**NMI Button Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 19 | Control |
| 20 | Ground |

## Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

**Power LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 15 | Vcc |
| 16 | Control |

### HDD LED

The HDD (IDE Hard Disk Drive) LED connection is located on pins 13 and 14 of JF1. Attach the IDE hard drive LED cable to display disk activity. Refer to the table on the right for pin definitions.

| HDD LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 13 | Vcc |
| 14 | HD Active |

### NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF1. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

| NIC1 LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 11 | Vcc |
| 12 | Ground |

### NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF1. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

| NIC2 LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 9 | Vcc |
| 10 | Ground |

### Overheat/Fan Fail LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

| OH/Fan Fail LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 7 | Vcc |
| 8 | Ground |

### Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

| Power Fail LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 5 | Vcc |
| 6 | Ground |

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

**Reset Button Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 3 | Reset |
| 4 | Ground |

### Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

**Power Button Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 1 | PW_ON |
| 2 | Ground |

### Universal Serial Bus Ports (USB0/1)

Two Universal Serial Bus ports are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

**Universal Serial Bus Ports Pin Definitions (USB0/1)**

| USB0 | | USB1 | |
|---|---|---|---|
| Pin # | Definition | Pin # | Definition |
| 1 | +5V | 1 | +5V |
| 2 | PO- | 2 | PO- |
| 3 | PO+ | 3 | PO+ |
| 4 | Ground | 4 | Ground |
| 5 | N/A | 5 | Key |

### Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

**Chassis Intrusion Pin Definitions (JL1)**

| Pin# | Definition |
|---|---|
| 1 | Intrusion Input |
| 2 | Ground |

## Serial Ports

The COM1 serial port is located beside the mouse port. COM2 is a header on the serverboard (see serverboard layout for location). See the table on the right for pin definitions.

**Serial Port Pin Definitions (COM1/COM2)**

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

**Note:** Pin 10 is included on the header but not on the port. NC indicates no connection.

## Power Fail Header

Connect a cable from your power supply to the Power Fail header to provide you with warning of a power supply failure. The warning signal is passed through the PWR_LED pin to indicate a power failure. See the table on the right for pin definitions.

**Power Fail Header Pin Definitions (JP3)**

| Pin# | Definition |
|---|---|
| 1 | P/S 1 Fail Signal |
| 2 | P/S 2 Fail Signal |
| 3 | P/S 3 Fail Signal |
| 4 | Reset Signal |

**Note:** This feature is only available when using redundant Supermicro power supplies.

## Fan Headers

The X7DB8+ has eight fan headers, designated Fan1 through Fan8. Fan speed is controlled via Thermal Management with a BIOS setting. See the table on the right for pin definitions.

**Note:** Fan1-4 are 3-pin fans and Fan5-8 are 4-pin fans. Pins 1-3 of the 4-pin fan headers are backward compatible with traditional 3-pin fans. When using a Thermal Management setting, use all 3-pin fans or all 4-pin fans on the serverboard. Do not use 3-pin fans and 4-pin fans together.

**Fan Header Pin Definitions (Fan1-8)**

| Pin# | Definition |
|---|---|
| 1 | Ground (Black) |
| 2 | +12V (Red) |
| 3 | Tachometer |
| 4 | PWM Control |

## Universal Serial Bus Headers

Three USB headers are located near the WOL header on the serverboard. JUSB2 includes USB2/3 and JUSB3 is for USB4. These are included for connection to the ports on the front of the chassis. A USB cable (not included) is needed for the connection. See the table on the right for pin definitions.

**Universal Serial Bus Headers Pin Definitions (JUSB2/3)**

| USB2 | | USB3 | |
|---|---|---|---|
| Pin # | Definition | Pin # | Definition |
| 1 | +5V | 1 | +5V |
| 2 | PO- | 2 | PO- |
| 3 | PO+ | 3 | PO+ |
| 4 | Ground | 4 | Ground |
| 5 | N/A | 5 | N/A |

## Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED, pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

**Speaker Connector Pin Definitions (JD1)**

| Pin # | Function | Definition |
|---|---|---|
| 4 | + | Speaker data (red wire) |
| 5 | Key | No connection |
| 6 | | Key |
| 7 | | Speaker data |

## ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are located on the I/O back plane. See the table on the right for pin definitions.

**PS/2 Keyboard and Mouse Port Pin Definitions (Kb, Mouse)**

| Pin# | Definition |
|---|---|
| 1 | Data |
| 2 | NC |
| 3 | Ground |
| 4 | VCC |
| 5 | Clock |
| 6 | NC |

## Overheat LED

Connect an LED to the JOH header to provide warning of a chassis overheating condition. See the table on the right for pin definitions.

**Overheat LED Pin Definitions (JOH)**

| Pin# | Definition |
|---|---|
| 1 | +5V |
| 2 | OH Active |

## Wake-On-LAN

The Wake-On-LAN header is designated WOL. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

**Wake-On-LAN Pin Definitions (JWOL)**

| Pin# | Definition |
|---|---|
| 1 | +5V Standby |
| 2 | Ground |
| 3 | Wake-up |

## Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a WOR card and cable to use this feature.

**Wake-On-Ring Pin Definitions (JWOR)**

| Pin# | Definition |
|---|---|
| 1 | Ground (Black) |
| 2 | Wake-up |

## SMB

The System Management Bus header (for the PCI bus) designated SMB is located near the SATA ports. Connect the appropriate cable here to utilize SMB on your system. See the table on the right for pin definitions.

**SMB Header Pin Definitions (SMB)**

| Pin# | Definition |
|---|---|
| 1 | Data |
| 2 | Ground |
| 3 | Clock |
| 4 | No Connection |

## SMBUS_PS

The SMBUS_PS header is for $I^2C$, which may be used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

**SMB Power ($I^2C$) Pin Definitions (SMBUS_PS)**

| Pin# | Definition |
|---|---|
| 1 | Clock |
| 2 | Data |
| 3 | Power Fail |
| 4 | Ground |
| 5 | +3.3V |

### SGPIO

The two headers labeled SGPIO1 and SGPIO2 are for SGPIO (Serial General Purpose Input/Output). SGPIO provides a bus between the SATA controller and the SATA drive backplane to provide SATA enclosure management functions.

**SGPIO Header Pin Definitions (SGPIO1, SGPIO2)**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | NC | 2 | NC |
| 3 | Ground | 4 | Data |
| 5 | Load | 6 | Ground |
| 7 | NC | 8 | NC |

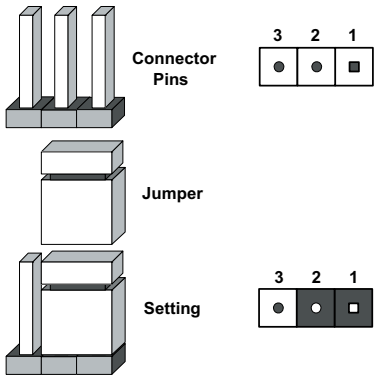
**Note:** NC indicates no connection.

## 5-9 Jumper Settings

### Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the serverboard layout page for jumper locations.

**Note:** On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.




### CMOS Clear

JBT1 is used to clear CMOS and will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1) First power down the system and unplug the power cord(s)
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver
3) Remove the screwdriver (or shorting device)
4) Reconnect the power cord(s) and power on the system.

**Note:** *Do not use the PW_ON connector to clear CMOS*.

### JLAN Enable/Disable

Change the setting of jumper JPL1 and JPL2 to enable or disable the on-board LAN ports JLAN1 and JLAN2, respectively. See the table on the right for jumper settings. The default setting is enabled

| JLAN Enable/Disable Jumper Settings (JPL1/JPL2) | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | Enabled |
| Pins 2-3 | Disabled |

### Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Pins 1-2 will cause WD to reset the system if an application hangs. Pins 2-3 will generate a non-maskable interrupt signal for the application that is hung up. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

**Note:** When enabled, the user needs to write their own application software to disable the Watch Dog Timer.

| Watch Dog Jumper Settings (JWD) | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | Reset |
| Pins 2-3 | NMI |
| Open | Disabled |

### 3rd Power Supply Fail Detect Enable/Disable

The system can notify you in the event of a power supply failure. This feature assumes that three power supply units are installed in the chassis with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with J3P to prevent false alarms. See the table on the right for jumper settings.

| 3rd Power Supply Fail Detect Enable/Disable Jumper Settings (J3P) | |
|---|---|
| Jumper Setting | Definition |
| Open | Disabled |
| Closed | Enabled |

### Alarm Reset (JAR)

The system will notify you in the event of a power supply failure. This feature assumes that Supermicro redundant power supply units are installed in the chassis. If you only have a single power supply installed, you should not connect anything to this jumper to prevent false alarms. See the table on the right for jumper settings.

| Alarm Reset Jumper Settings (JAR) | |
|---|---|
| Pin# | Definition |
| 2 | +5V |
| 1 | Ground |

### SCSI Controller Enable/ Disable

Jumper JPA1 is used to enable or disable the onboard SCSI controller. The default setting is on pins 1-2 to enable SCSI. See the table on the right for jumper settings.

| SCSI Enable/Disable Jumper Settings (JPA1) | |
|---|---|
| Both Jumpers | Definition |
| Pins 1-2 | Enabled |
| Pins 2-3 | Disabled |

### SCSI Termination Enable/ Disable

Jumpers JPA2/JPA3 are used to enable or disable termination for the SCSI Channel A (JPA2) and Channel B (JPA3) connectors. The default setting is open to enable termination. See the table on the right for jumper settings.

**Note:** In order for the SCSI drives to function properly, please do not change the default setting (enabled) set by the manufacturer.

| SCSI Term. Enable/Disable Jumper Settings (JPA2/JPA3) | |
|---|---|
| Jumper Setting | Definition |
| Open | Enabled |
| Closed | Disabled |

## Compact Flash Master/Slave Select

A Compact Flash Master (Primary)/Slave (Secondary) Select jumper is located at JCF1. Close this jumper to enable the use of a compact flash card. For the compact flash card and JCF1 to work properly, you will first need to connect the compact flash card's power cable to JWF1. See the table on the right for jumper settings.

**Compact Flash Card Master/ Slave Select (JCF1)**

| Jumper | Definition |
|---|---|
| Open | Slave (Secondary) |
| Closed | Master (Primary) |

## SMBUS to PCI Enable/ Disable

The J27 and J28 pair of jumpers allows you to connect the System Management Bus to the PCI expansion slots. The default setting is closed (on) for both jumpers to enable the connection. Both connectors must be set the same (J27 is for data and J28 is for the clock). See the table on right for jumper settings.

**SMBUS to PCI Enable/Disable (J27/J28)**

| Jumper Setting | Definition |
|---|---|
| Closed | Enabled |
| Open | Disabled |

## VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

**VGA Enable/Disable Jumper Settings (JPG1)**

| Jumper Setting | Definition |
|---|---|
| Pins 1-2 | Enabled |
| Pins 2-3 | Disabled |

# 5-10 Onboard Indicators

## JLAN1/JLAN2 LEDs

Each Ethernet port has two LEDs. One LED indicates activity when blinking while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

| JLAN LED (Connection Speed Indicator) | |
|---|---|
| LED Color | Definition |
| Off | 10 MHz |
| Green | 100 MHz |
| Amber | 1 GHz |

## SCSI Activity LED Indicators

There are two SCSI Activity LED indicators on the X7DB8+. DA1 indicates the activity status of SCSI Channel A and DA2 indicates the activity status of SCSI Channel B.

## Onboard Power LED

LE1 is a power LED located beside JP1. When this LED is lit, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components.

## 5-11 Parallel Port, Floppy and Hard Drive Connections

Note the following when connecting the floppy and hard disk drive cables:

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

### Parallel Port Connector

See the table below for pin definitions of the parallel (printer) port.

**Parallel (Printer) Port Connector Pin Definitions**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | Strobe- | 2 | Auto Feed- |
| 3 | Data Bit 0 | 4 | Error- |
| 5 | Data Bit 1 | 6 | Init- |
| 7 | Data Bit 2 | 8 | SLCT IN- |
| 9 | Data Bit 3 | 10 | GND |
| 11 | Data Bit 4 | 12 | GND |
| 13 | Data Bit 5 | 14 | GND |
| 15 | Data Bit 6 | 16 | GND |
| 17 | Data Bit 7 | 18 | GND |
| 19 | ACK | 20 | GND |
| 21 | BUSY | 22 | Write Data |
| 23 | PE | 24 | Write Gate |
| 25 | SLCT | 26 | NC |

## Floppy Connector

The floppy connector is located near the IDE connectors. See the table below for pin definitions.

**Floppy Drive Connector Pin Definitions (Floppy)**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | Ground | 2 | FDHDIN |
| 3 | Ground | 4 | Reserved |
| 5 | Key | 6 | FDEDIN |
| 7 | Ground | 8 | Index |
| 9 | Ground | 10 | Motor Enable |
| 11 | Ground | 12 | Drive Select B |
| 13 | Ground | 14 | Drive Select B |
| 15 | Ground | 16 | Motor Enable |
| 17 | Ground | 18 | DIR |
| 19 | Ground | 20 | STEP |
| 21 | Ground | 22 | Write Data |
| 23 | Ground | 24 | Write Gate |
| 25 | Ground | 26 | Track 00 |
| 27 | Ground | 28 | Write Protect |
| 29 | Ground | 30 | Read Data |
| 31 | Ground | 32 | Side 1 Select |
| 33 | Ground | 34 | Diskette |

## SATA Ports

There are no jumpers to configure the onboard SATA ports. See the table on the right for pin definitions.

**SATA Port Pin Definitions (SATA0 - SATA5)**

| Pin # | Definition |
|---|---|
| 1 | Ground |
| 2 | TXP |
| 3 | TXN |
| 4 | Ground |
| 5 | RXN |
| 6 | RXP |
| 7 | Ground |

## IDE Connectors

There are two IDE connectors: IDE#1 (blue) and IDE#2 (white). IDE#1 is designated as the primary IDE drive. IDE#2 is designated as the secondary IDE drive and is reserved for Compact Flash card use only. See the table below for pin definitions.

**Note:** IDE#2 is reserved for Compact Flash card use only. Do not use it for other devices. If IDE#2 is populated with a Compact Flash card, IDE#1 will only support one device. For the Compact Flash card to work properly, you will first need to connect a power cable to JWF1.

**IDE Drive Connectors**
**Pin Definitions (IDE#1)**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | Reset IDE | 2 | Ground |
| 3 | Host Data 7 | 4 | Host Data 8 |
| 5 | Host Data 6 | 6 | Host Data 9 |
| 7 | Host Data 5 | 8 | Host Data 10 |
| 9 | Host Data 4 | 10 | Host Data 11 |
| 11 | Host Data 3 | 12 | Host Data 12 |
| 13 | Host Data 2 | 14 | Host Data 13 |
| 15 | Host Data 1 | 16 | Host Data 14 |
| 17 | Host Data 0 | 18 | Host Data 15 |
| 19 | Ground | 20 | Key |
| 21 | DRQ3 | 22 | Ground |
| 23 | I/O Write | 24 | Ground |
| 25 | I/O Read | 26 | Ground |
| 27 | IOCHRDY | 28 | BALE |
| 29 | DACK3 | 30 | Ground |
| 31 | IRQ14 | 32 | IOCS16 |
| 33 | Addr1 | 34 | Ground |
| 35 | Addr0 | 36 | Addr2 |
| 37 | Chip Select 0 | 38 | Chip Select 1 |
| 39 | Activity | 40 | Ground |

## Ultra320 SCSI Connectors

There are two SCSI connectors on the serverboard. SCSI Channel A is located at JA1 and SCSI Channel B is located at JA2. Refer to the table at right for the pin definitions.

**Ultra320 SCSI Drive Connector Pin Definitions (JA1/JA2)**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | +DB (12) | 35 | -DB (12) |
| 2 | +DB (13) | 36 | -DB (13) |
| 3 | +DB (14) | 37 | -DB (14) |
| 4 | +DB (15) | 38 | -DB (15) |
| 5 | +DB (P1) | 39 | -DB (P1) |
| 6 | +DB (0) | 40 | -DB (0) |
| 7 | +DB (1) | 41 | -DB (1) |
| 8 | +DB (2) | 42 | -DB (2) |
| 9 | +DB (3) | 43 | -DB (3) |
| 10 | +DB (4) | 44 | -DB (4) |
| 11 | +DB (5) | 45 | -DB (5) |
| 12 | +DB (6) | 46 | -DB (6) |
| 13 | +DB (7) | 47 | -DB (7) |
| 14 | +DB (P) | 48 | -DB (P) |
| 15 | Ground | 49 | Ground |
| 16 | DIFFSENS | 50 | Ground |
| 17 | TERMPWR | 51 | TERMPWR |
| 18 | TERMPWR | 52 | TERMPWR |
| 19 | Reserved | 53 | Reserved |
| 20 | Ground | 54 | Ground |
| 21 | +ATN | 55 | -ATN |
| 22 | Ground | 56 | Ground |
| 23 | +BSY | 57 | -BSY |
| 24 | +ACK | 58 | -ACK |
| 25 | +RST | 59 | -RST |
| 26 | +MSG | 60 | -MSG |
| 27 | +SEL | 61 | -SEL |
| 28 | +C/D | 62 | -C/D |
| 29 | +REQ | 63 | -REQ |
| 30 | +I/O | 64 | -I/O |
| 31 | +DB (8) | 65 | -DB (8) |
| 32 | +DB (9) | 66 | -DB (9) |
| 33 | +DB (10) | 67 | -DB (10) |
| 34 | +DB (11) | 68 | -DB (11) |

## 5-12 Installing Software

After all the hardware has been installed, you must first install the operating system and software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your serverboard.

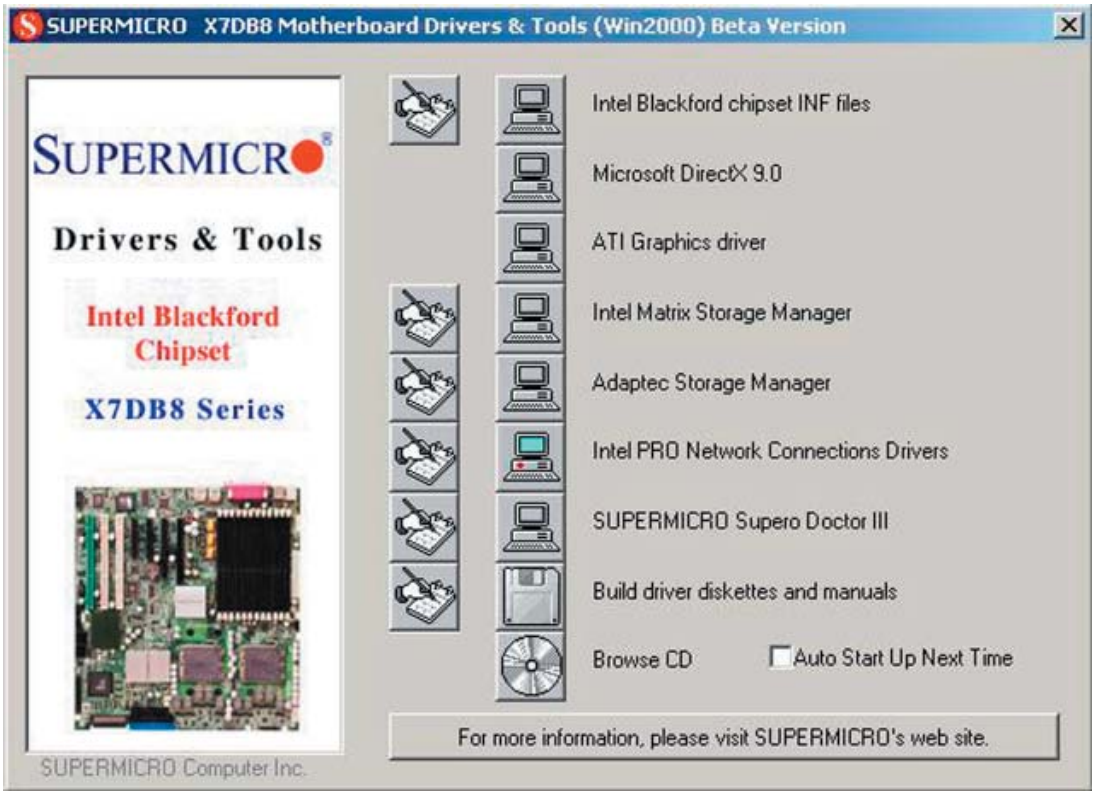



**Figure 5-7. Driver/Tool Installation Display Screen**

**Note:** Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, which is optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

# Notes

# Chapter 6

# Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC836S2-R800 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

### Tools Required

The only tool you will need to install components and perform maintenance is a Philips screwdriver.

## 6-1 Static-Sensitive Devices

Electricstatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

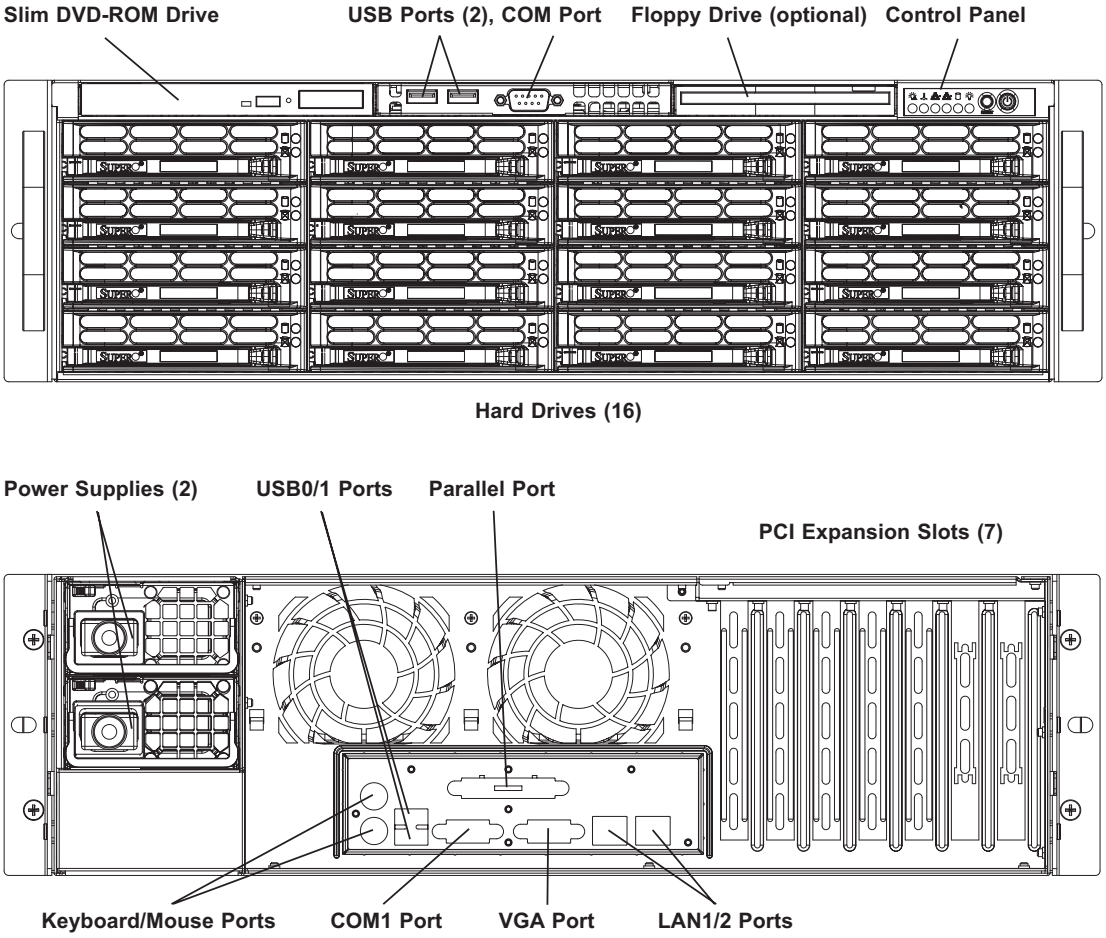
### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards 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 serverboard.

### Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

**Figure 6-1. Front and Rear Chassis Views**




## 6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

# 6-3 System Fans

Three 8-cm hot-swap chassis fans and two 8-cm exhaust fans provide the cooling for the SuperServer 6035B-8R+. It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

## System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the fans has failed.

## Replacing System Fans

**1. Removing a fan**

Remove the chassis cover. Depress the tab on the side of the fan to unlock and remove the fan along with its housing. The fan's power connections will automatically detach. System power does not need to be shut down since the fans are hot-pluggable.

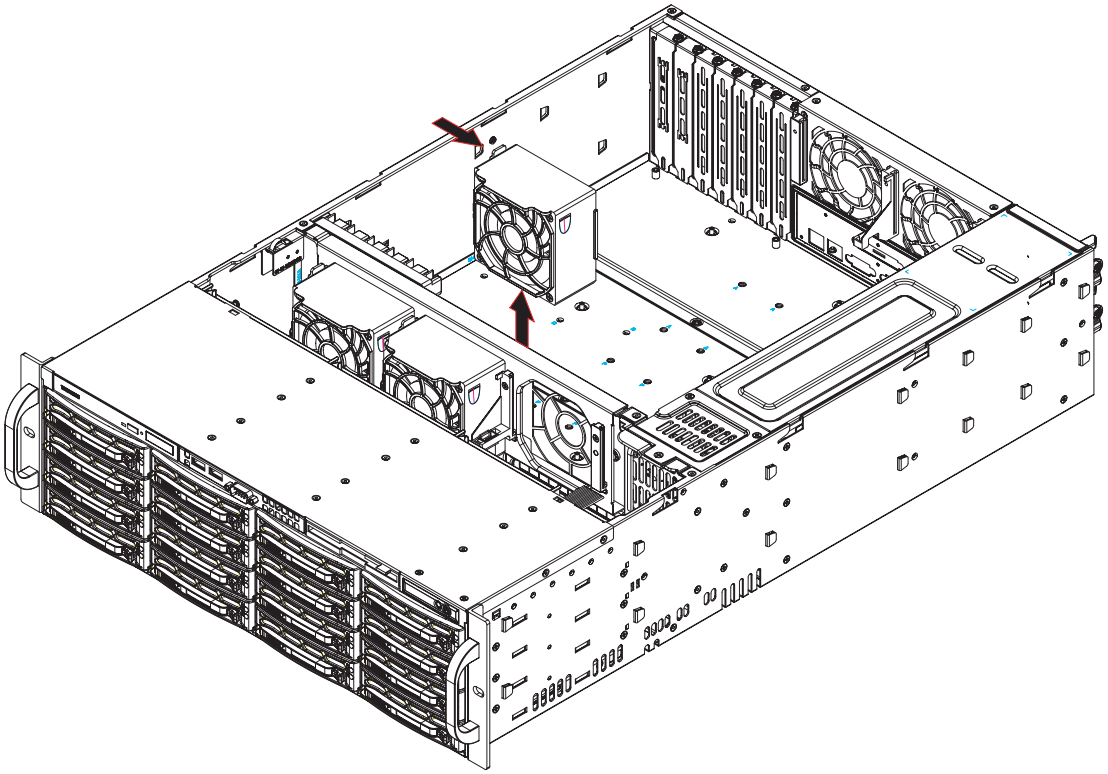
**2. Installing a new fan**

Replace the failed fan with an identical 8-cm, 12 volt fan (available from Supermicro, p/n FAN-0070L). Position the new fan into the space vacated by the failed fan previously removed. A "click" can be heard when the fan is fully installed in place and the power connections are made. If the system power is on, the hot-plug feature will cause the fan to start immediately upon being connected to its header on the serverboard.

## Rear Exhaust Fans

The two rear exhaust fans are also hot-swappable. To remove, depress the tab on the side of the fan to unlock it, then pull it staight up and out of the chassis.

**Figure 6-2. Removing System Cooling Fans**



## 6-4 Drive Bay Installation/Removal

### Accessing the Drive Bays

SCSI Drives: You do not need to access the inside of the chassis or remove power to replace or swap SCSI drives. Proceed to the next step for instructions.

**Note:** You must use standard 1" high, SCSI drives in the SuperServer 6035B-8R+.

DVD-ROM/Floppy Disk Drive: For installing/removing the DVD-ROM or floppy disk drive, you will need to gain access to the inside of the server by removing the top cover of the chassis. Proceed to the "DVD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

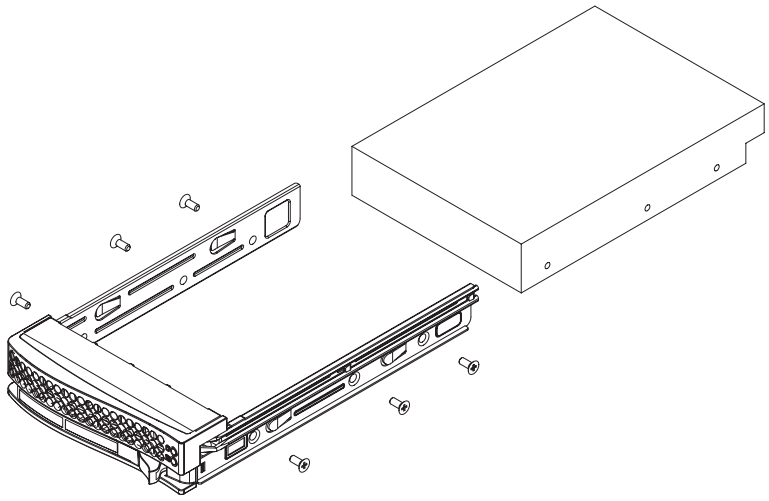
5.25" Drive Bay: For installing/removing a component in the 5.25" drive bay, proceed to the "5.25" Drive Bay Installation" section later in this chapter for instructions.

## SCSI Drive Installation

**1. Mounting a SCSI drive in a drive carrier**

The SCSI drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drives. For this reason, even empty carriers without SCSI drives installed must remain in the chassis. To add a new SCSI drive, install a drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

**Figure 6-3. Mounting a SCSI Drive in a Carrier**



**Use caution when working around the SCSI backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.**

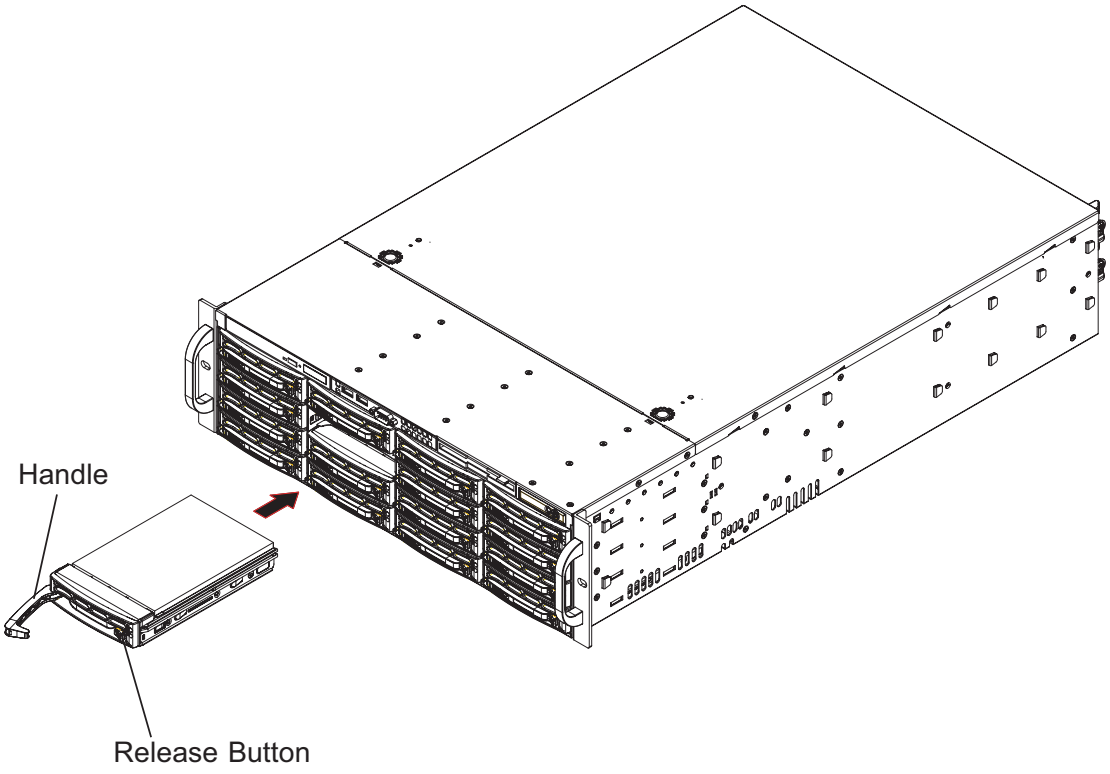
**<u>Important:</u> Regardless of how many SCSI hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.**

**2. Installing/removing hot-swap SCSI drives**

The SCSI drive carriers are all easily accessible at the front of the chassis. These hard drives are hot-pluggable, meaning they can be removed and installed without powering down the system. To remove a carrier, push the release button located beside the drive LEDs. Then swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-4).

**Note:** Your operating system must have RAID support to enable the hot-plug capability of the SCSI drives.

**Figure 6-4. Removing a SCSI Drive Carrier**




**Important:** **All of the SCSI drive carriers must remain in the drive bays to maintain proper cooling airflow.**

### Hard Drive Backplane

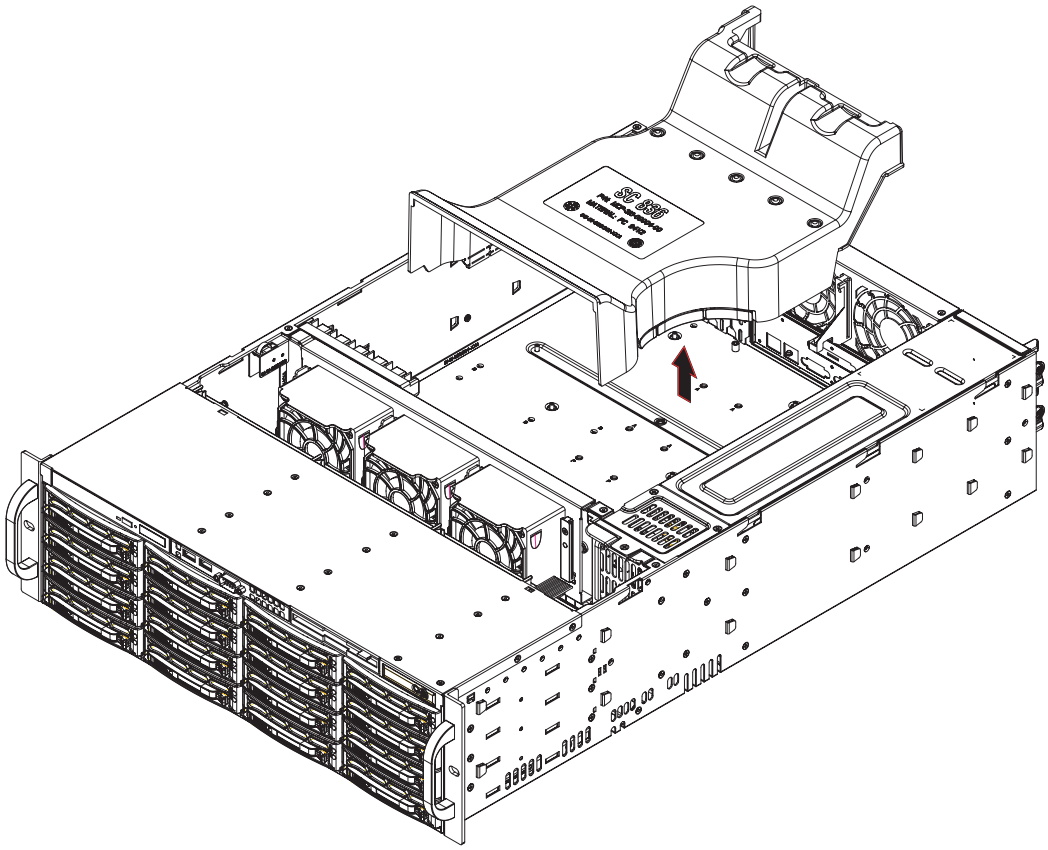
The SCSI drives plug into a backplane that provides power, drive ID and bus termination. A RAID controller can be used with the backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the Serial ATA drives. The backplane is already preconfigured, so there are no jumpers or switches present on it.

### Removing the Air Shroud

Under most circumstances you will not need to remove the air shroud to perform any service on the system. However, if you wish to temporarily remove it (the air shroud sould always be in place when the system is operating), please follow this procedure.

The air shroud is secured into place with the rear exhaust fans. Remove both of these fans by depressing their tabs and lifting them out of the chassis. You can then lift the air shroud out (see Figure 6-5). To reinstall, simply position the air shroud in its proper place and push both fans back in until you hear them click into place.

**Figure 6-5. Removing the Air Shroud**



## DVD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD-ROM and floppy drive bays. The 6035B-8R+ accomodates only slim type DVD-ROM drives. Side mounting brakets are typically needed to mount a slim DVD-ROM drive in the 6035B-8R+ server.

First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. You must power down the system before installing or removing floppy or IDE components.

Drives mount on rails and should "click" into place to be correctly and fully installed in their bays.

- The floppy disk drive cable has seven twisted wires.
- A color mark on a cable typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

# 6-5 Power Supply

The SuperServer 6035B-8R+ has an 800 watt redundant power supply consisting of two power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

## Power Supply Failure

If either of the two power supply modules fail, the other will take the full load and allow the system to continue operation without interruption. The PWR Fail LED will illuminate and remain on until the failed module has been replaced. Replacements can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

## Removing/Replacing the Power Supply

You do not need to shut down the system to replace a power supply module. The backup power supply module will keep the system up and running while you replace the failed hot-swap module. Replace with the same model (see part number in the Appendix), which can be ordered directly from Supermicro.

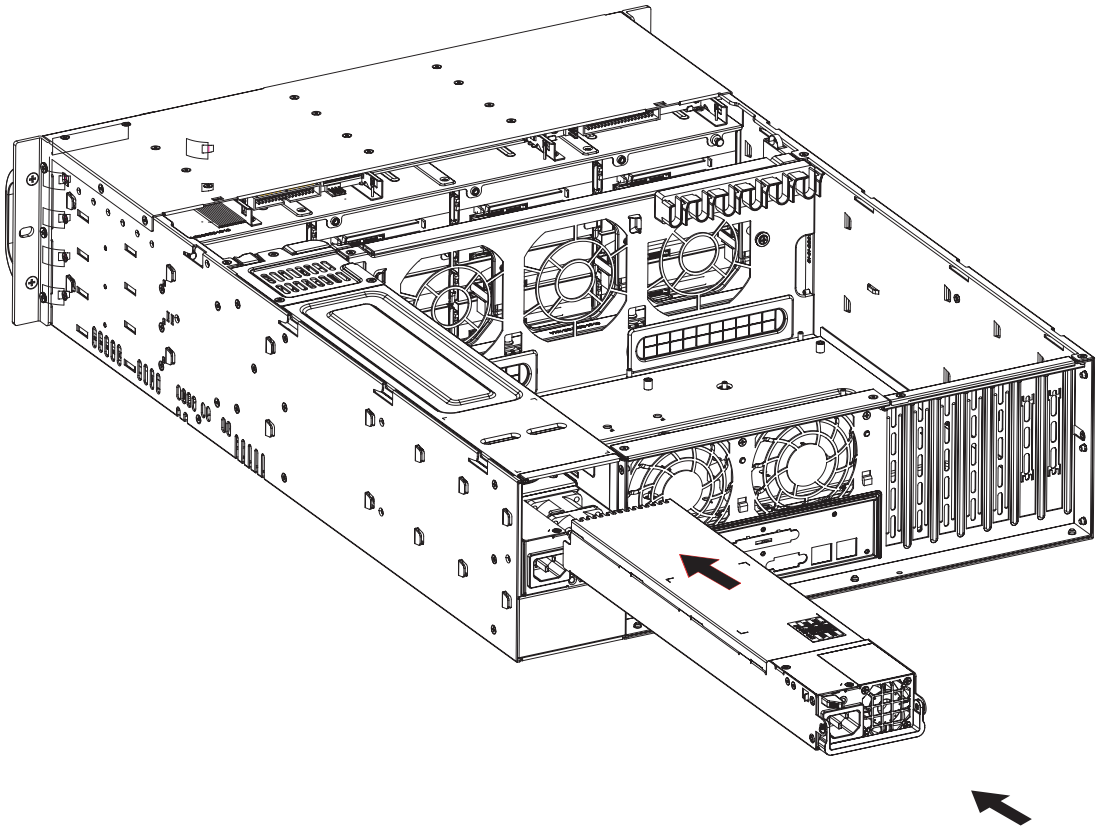
**1. Removing the power supply**

First unplug the power cord from the failed power supply module. Then depress the locking tab on the power supply module and use the handle to pull it straight out of the chassis.

**2. Installing a new power supply**

Replace the failed module with another by simply pushing the new power supply module into the power bay until you hear a click. Secure the locking tab on the unit and finish by plugging the AC power cord back into the module. See Figure 6-6.

**Figure 6-6. Replacing a Power Supply Module**



# Chapter 7

# BIOS

## 7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X7DB8+. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

**Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to the BIOS that may not be reflected in this manual.

### System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS flash chip stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup 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.

### How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. (See below.)

### Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 7-3, detailed descriptions are given for each parameter setting in the Setup utility.

**Warning!** To prevent possible boot failure, do not shut down or reset the system while updating the BIOS.

## 7-2 Running Setup

***Default settings are in bold text unless otherwise noted.***

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

**Press the <Delete> key to enter Setup**

## 7-3 Main BIOS Setup

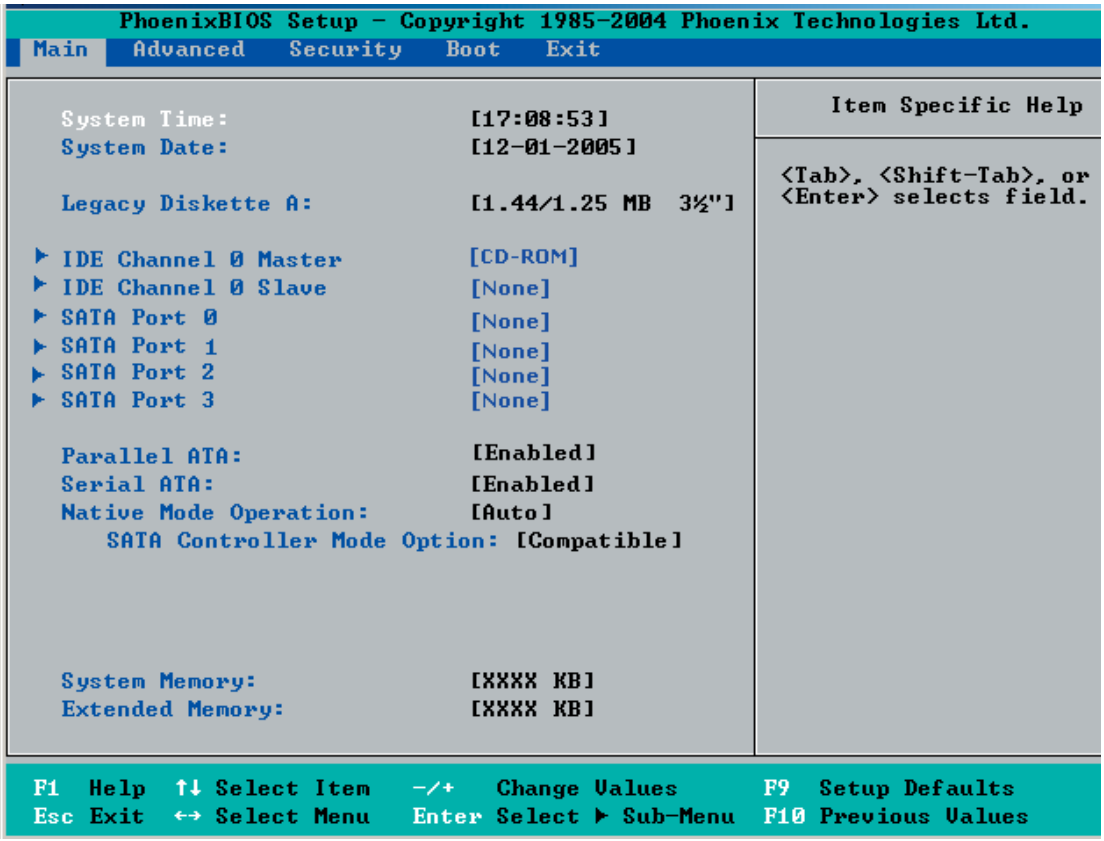
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

## Main BIOS Setup Menu




### Main Setup Features

#### System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

#### System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

#### BIOS Date

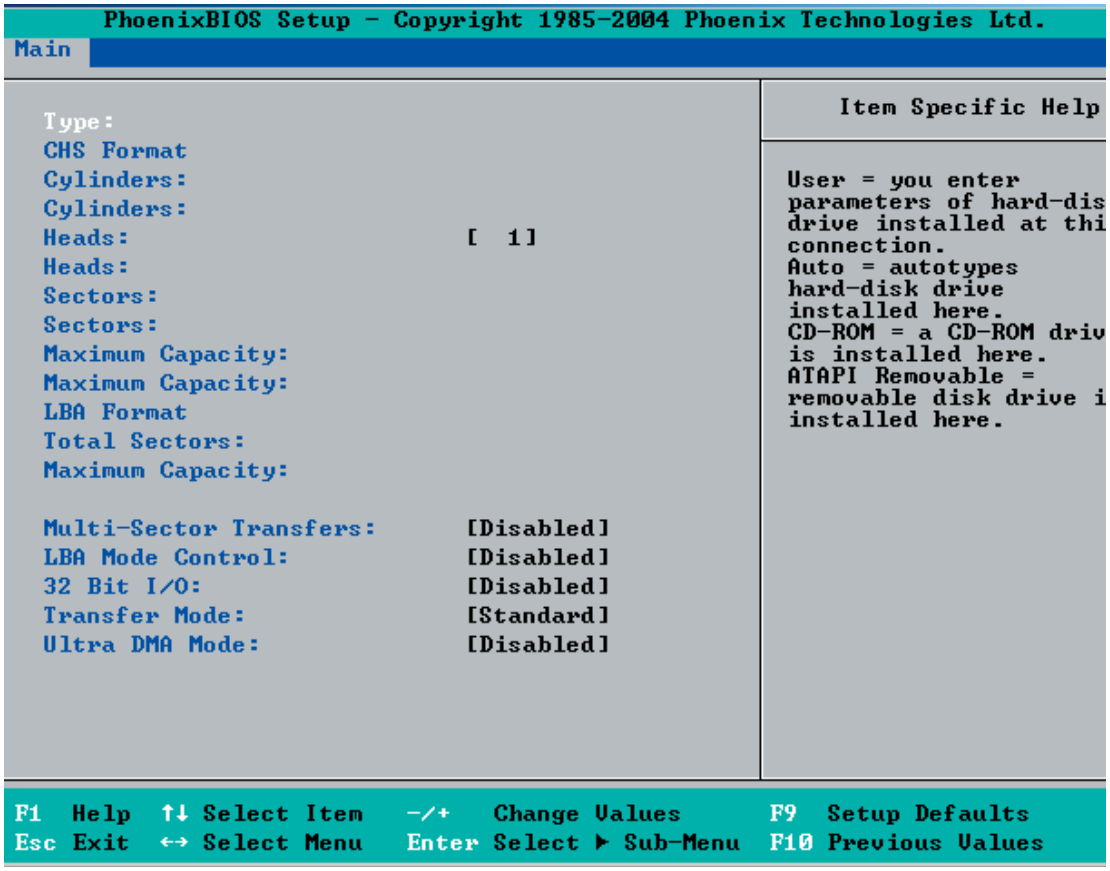
This field displays the date when this version of BIOS was built.

#### Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

### ▶IDE Channel 0 Master/Slave, SATA Port0, SATA Port1, SATA Port2 and SATA Port3

These settings allow the user to set the parameters of IDE Channel 0 Master/ Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:




#### Type

Selects the type of IDE hard drive. The options are **Auto**, (which allows the BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CDROM and ATAPI Removable. The option "User" will allow the user to enter the parameters of the HDD installed at this connection. The option "Auto" will allow the BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option 1-39 to select a predetermined HDD type. Select CDROM if a CDROM drive is installed. Select ATAPI if a removable disk drive is installed.

**CHS Format**

The following items will be displayed by the BIOS:

**Type:** This item displays the type of CPU.

**Cylinders:** This item indicates the status of cylinders.

**Headers:** This item indicates the number of headers.

**Sectors:** This item displays the number of sectors.

**Maximum Capacity:** This item displays the maximum storage capacity of the system.

**LBA Format**

The following items will be displayed by the BIOS:

**Total Sectors:** This item displays the number of total sectors available in the LBA Format.

**Maximum Capacity:** This item displays the maximum capacity in the LBA Format.

### Multi-Sector Transfer

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors, and **16 Sectors**.

### LBA Mode Control

This item determines whether the Phoenix BIOS will access the IDE Channel 0 Master Device via the LBA mode. The options are **Enabled** and Disabled.

### 32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

### Transfer Mode

This option allows the user to set the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

### Ultra DMA Mode

This option allows the user to select Ultra DMA Mode. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

### Parallel ATA

This setting allows the user to enable or disable the function of Parallel ATA. The options are Disabled, Channel 0, Channel 1, and **Both.**

### Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

### Native Mode Operation

Select the native mode for ATA. The options are: Parallel ATA, Serial ATA, Both, and **Auto**.

### SATA Controller Mode

Select **Compatible** to allow the SATA and PATA drives to be automatically-detected and be placed in the Legacy Mode by the BIOS. Select Enhanced to allow the SATA and PATA drives to be to be automatically-detected and be placed in the Native IDE Mode.

**Note:** The Enhanced mode is supported by the Windows 2000 OS or a later version.

When the SATA Controller Mode is set to "Enhanced", the following items will display:

#### Serial ATA (SATA) RAID Enable

Select Enable to enable Serial ATA RAID Functions. (*For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: "ICH RAID Code Base" will be available for you to select Intel or Adaptec Host RAID Controller. If this item is set to **Disabled**, the item: SATA AHCI Enable will be available. ) The options are Enabled and **Disabled**.

#### SATA AHCI

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Exercise caution when using this function. This feature is for advanced programmers only.) The options are Enabled and **Disabled**.

#### ICH RAID Code Base

Select Intel to enable Intel's ICH HostRAID Controller. Select Adaptec to use Adaptec's HostRAID Driver. The options are **Intel** and Adaptec**.**

### System Memory

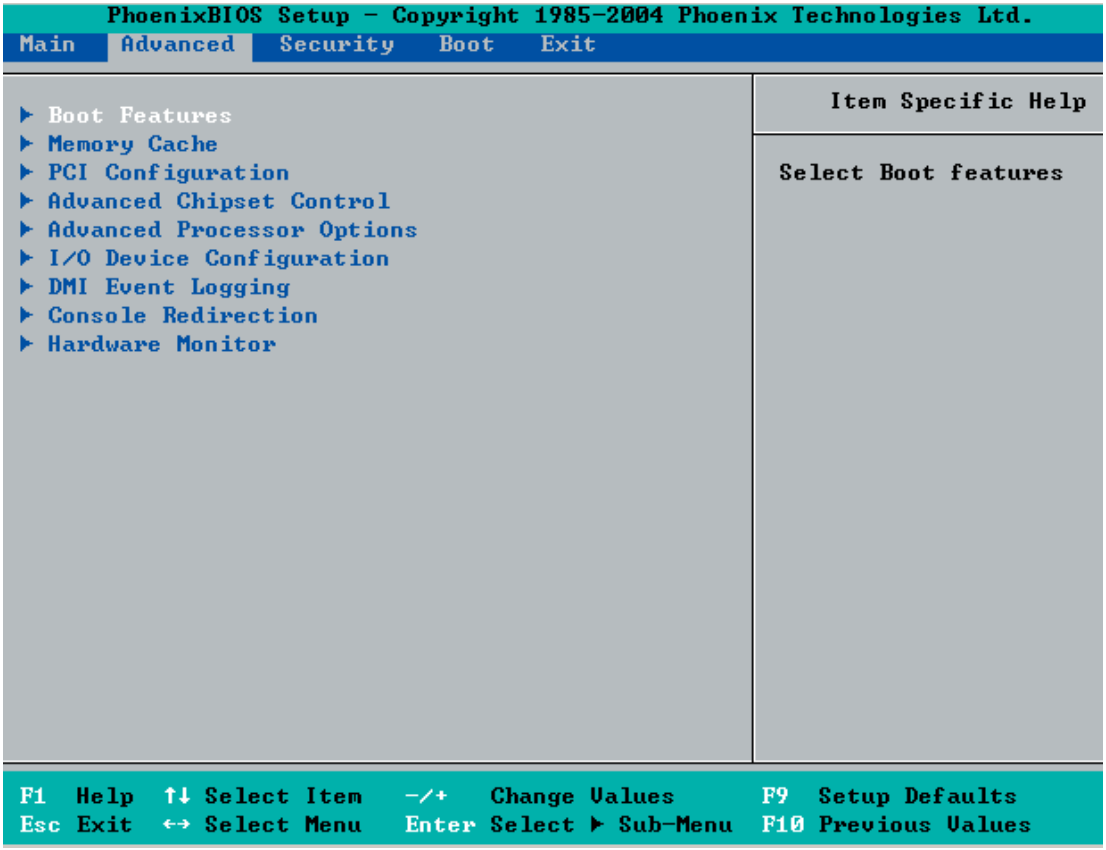
This display informs you how much system memory is recognized as being present in the system.

### Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

## 7-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.



## ▶Boot Features

Access the submenu to make changes to the following settings.

### Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

### Quiet Boot

This setting allows you to Enable or **Disable** the diagnostic screen during boot-up.

### ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

### Power Button Behavior

If set to **Instant-Off**, the system will power off immediately as soon as the user hits the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are instant-off and 4-sec override.

### Resume On Modem Ring

Select On to "wake your system up" when an incoming call is received by your modem. The options are On and **Off**.

### Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On, and **Last State**.

### Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

### Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

## ▶Memory Cache

### Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable this function, and this area will be reserved for BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

### Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable the function and this area will be reserved for Video BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

### Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or to be written into the CPU's L1 and L2 cache to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into system memory at the same time. Select "Write Protect" to prevent data from being written into Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

### Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into the CPU's L1, L2, and L3 cache to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

### Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations.

Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

### Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write-combining configuration with 4GB or more memory. The options are Enabled and **Disabled**.

## ▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

### Onboard GLAN1/Onboard GLAN2 (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN. The options are Disabled and **Enabled**.

### Onboard SCSI OPROM Configure

Enabling this option provides the capitally to boot from SCSI HDD. The options are Disabled and **Enabled**.

### Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and **No**.

### Frequency for PCI-X#1, PCI-X#2, PCI-X#3

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

### Frequency for PCI-X#1 On Riser, Frequency for PCI-X#2-#3 On Riser

(Available when an Active Riser Card is present.)

This option allows the user to change the bus frequency of the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

### ▶Slot#1 PCI 100 MHz ZCR, Slot#2 PCI-X 133MHz, Slot#3 PCI-X 133MHz, Slot#4 PCI-Exp x8, Slot#5 PCI-Exp x8, and Slot#6 PCI-Exp x4

Access the submenu for each of the settings above to make changes to the following:

#### Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

#### Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

#### Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

### Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

### ▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

**Warning!** Exercise caution when changing the Advanced settings. Incorrect values entered may cause system malfunction. Also, a very high DRAM frequency or incorrect DRAM timing may cause system instability. When this occurs, revert to the default settings.

### SERR Signal Condition

This setting specifies the ECC Error conditions that an SERR# is to be asserted. The options are None, **Single Bit**, Multiple Bit, and Both.

### 4GB PCI Hole Granularity

This feature allows you to select the granularity of PCI hole for PCI slots. If MTRRs are not enough, this option may be used to reduce MTRR occupation. The options are: **256 MB**, 512 MB, 1GB and 2GB.

### Memory Branch Mode

This option allows the BIOS to enumerate Host Mode for Device 16, Function 1, Reg. 40h bit 16 and Reg. 58h [14]. The options are **Interleave**, Sequential, Mirroring, and **Single Channel 0**.

### Branch 0 Rank Sparing

Select **enable** to enable the sparing feature for Branch 0 Rank. The options are Enabled and **Disabled**.

### Branch 1 Rank Sparing

Select **enable** to enable the sparing feature for Branch 0 Rank. The options are Enabled and **Disabled**.

### Enhanced x8 Detection

Select **Enabled** to enable Enhanced x8 DRAM UC Error Detection . The options are Disabled and **Enabled**.

### Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are Disabled, PCI and **LPC**.

### Clock Spectrum Feature

If Enabled, the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

### Enabling Multi-Media Timer

Select Yes to activate a set of timers that are alternative to the traditional 8254 timers for the OS use. The options are Yes and **No**.

### USB Function

Select Enabled to enable the function of USB devices specified. The settings are **Enabled** and Disabled.

### USB Device 29 F3 Only

Select Enabled to enable the function of USB device as specified. The settings are **Enabled** and Disabled.

### Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

## ▶Advanced Processor Options

Access the submenu to make changes to the following settings.

### CPU Speed

This is a display that indicates the speed of the installed processor.

**Hyper-threading** (Available when supported by the CPU.)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

**Machine Checking** (Available when supported by the CPU.)

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are Disabled and **Enabled**.

**Thermal Management 2** (Available when supported by the CPU.)

Set to Enabled to use Thermal Management 2 (TM2) which will lower CPU voltage and frequency when the CPU temperature reaches a predefined overheat threshold. Set to **Disabled** to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

**C1 Enhanced Mode** (Available when supported by the CPU.)

Set to Enabled to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are Enabled and **Disabled**. (**P**lease refer to Intel's web site for detailed information.)

**No Execute Mode Memory Protection** (Available when supported by the CPU and the OS.)

Set to Enabled to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack.

**Note:** this feature is available when your OS and your CPU support the function of Execute Disable Bit.) The options are **Disabled** and Enabled. (Note: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.

**Adjacent Cache Line Prefetch** (Available when supported by the CPU.)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and **Enabled**.

### Set Maximum Extended CPUID=3

Select Enabled to set the Maximum Extended CPUID value to 3. The options are Enabled and **Disabled**.

### Intel <R> Virtualization Technology

Select Enabled to use the feature of Virtualization Technology. The options are Enabled and **Disabled**.

### ▶I/O Device Configuration

Access the submenu to make changes to the following settings.

### KBC Clock Input

This setting allows you to select clock frequency for KBC. The options are 6MHz, 8MHz, **12MHz,** and 16MHz.

### Serial Port A

This setting allows you to assign control of serial port A. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

#### Base I/O Address

This setting allows you to select the base I/O address for serial port A. The options are **3F8**, 2F8, 3E8, and 2E8.

#### Interrupt

This setting allows you to select the IRQ (interrupt request) for serial port A. The options are IRQ3 and **IRQ4**.

### Serial Port B

This setting allows you to assign control of serial port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

#### Mode

This setting allows you to set the type of device that will be connected to serial port B. The options are **Normal** and IR (for an infrared device).

#### Base I/O Address

This setting allows you to select the base I/O address for serial port B. The options are 3F8, **2F8**, 3E8 and 2E8.

#### Interrupt

This setting allows you to select the IRQ (interrupt request) for serial port B. The options are **IRQ3** and IRQ4.

### Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS-or OS- controlled).

#### Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

#### Interrupt

This setting allows you to select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

#### Mode

This feature allows you to specify the parallel port mode. The options are Output only, Bi-Directional, EPP and **ECP**.

#### DMA Channel

This item allows you to specify the DMA channel for the parallel port. The options are DMA1 and **DMA3**.

### Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS and OS controlled).

#### Base I/O Address

This setting allows you to select the base I/O address for the Floppy port. The options are **Primary** and Secondary.

### ▶DMI Event Logging

Access the submenu to make changes to the following settings.

#### Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

#### Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

#### View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

#### Event Logging

This setting allows you to **Enable** or Disable event logging.

#### ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

#### Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

#### Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

## ▶Console Redirection

Access the submenu to make changes to the following settings.

### COM Port Address

This item allows you to specify to redirect the console to Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

### BAUD Rate

This item allows you to select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

### Console Type

This item allows you to choose from the available options to select the console type for console redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, and VT-UTF8.

### Flow Control

This item allows you to choose from the available options to select the flow control for console redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

### Console Connection

This item allows you to choose select the console connection: either **Direct** or Via Modem.

### Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and **Off**.

## ▶Hardware Monitor Logic

### CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 70°C, 75°C, **80°C** and 85°C.

Highlight this and hit <Enter> to see monitor data for the following items:

**CPU1 Temperature**: This item displays CPU1 Temperature.

**CPU2 Temperature**: This item displays CPU2 Temperature.

**LM93 Temperature**: This item displays LM93 Temperature.

**Fan 1-FAN8**: If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of the fans indicated in this item.

#### Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vise versa. If the option is set to "3-pin fan", the fan speed is controlled by voltage. If the option is set to "4-pin", the fan speed will be controlled by Pulse Width Modulation (PWM). Select "3-pin" if your chassis came with 3-pin fan headers. Select "4-pin" if your chassis came with 4-pin fan headers. Select "Workstation" if your system is used as a Workstation. Select "Server" if your system is used as a Server. Select "Disable" to disable the fan speed control function to allow the onboard fans to run at the full speed (12V) at all the time. The Options are: **1. Disable**, 2. 3-pin (Server), 3. 3-pin (Workstation), 4. 4-pin (Server) and 5. 4-pin (Workstation).

### Voltage Monitoring

The following items will be monitored and displayed:

**P12V_VR0**

**P12V_VR1**

**FSB VTT**

**PXH Vcore**

**ES2B Vcore**

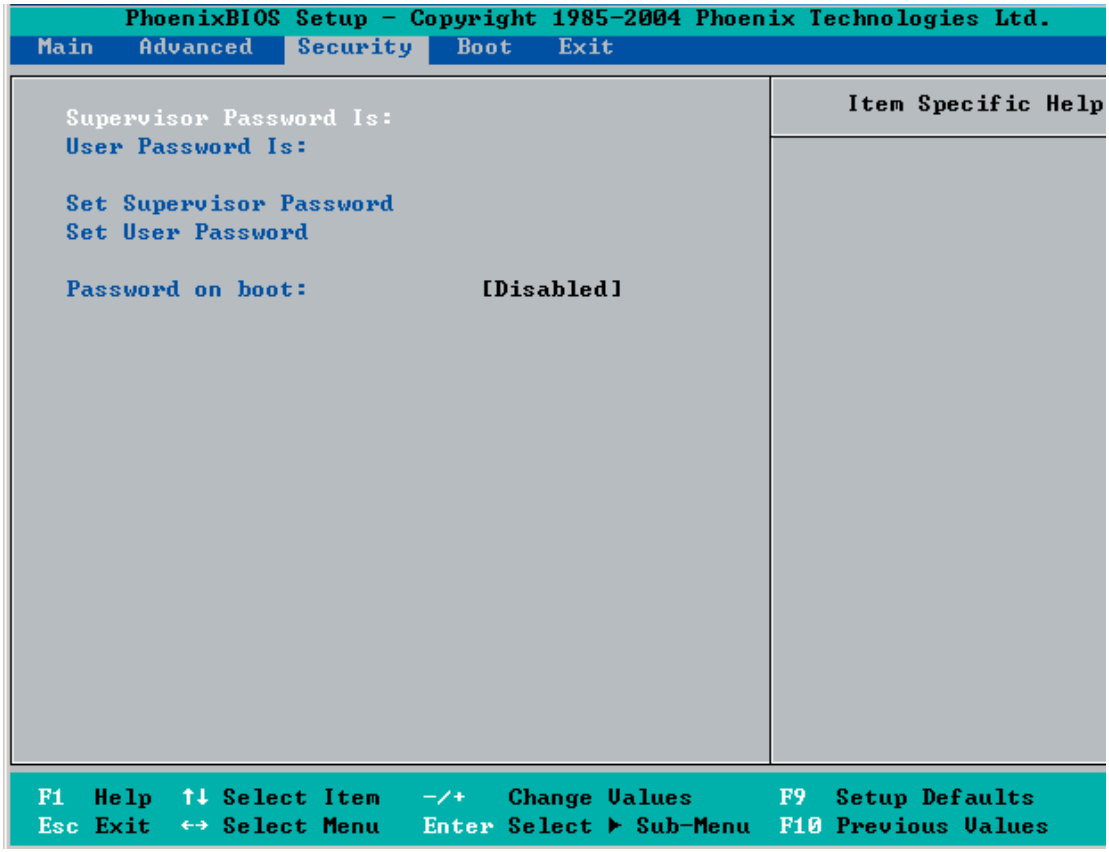
**CPU1Vcore**

**CPU2Vcore**

**P3V3**

## 7-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.




### Supervisor Password Is:

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

### User Password Is:

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

### Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

### Set User Password

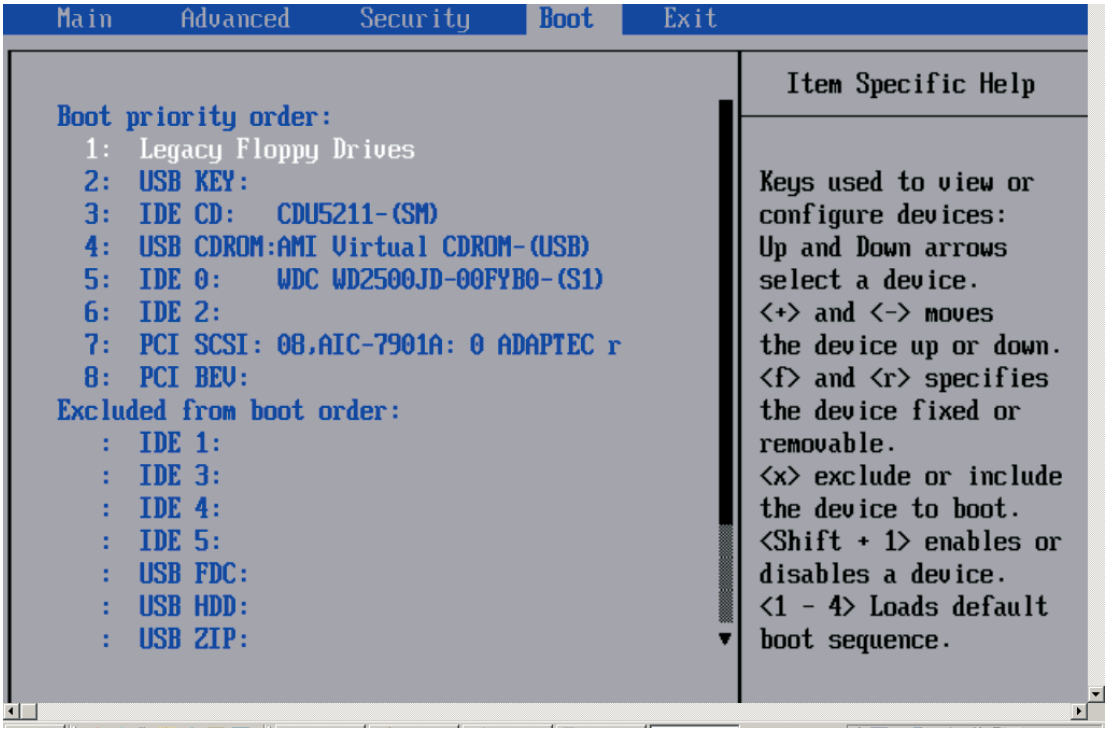
When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

### Password on Boot

This setting allows you to require a password to be entered when the system boots up. The options are Enabled (password required) and Disabled (password

## 7-6 Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

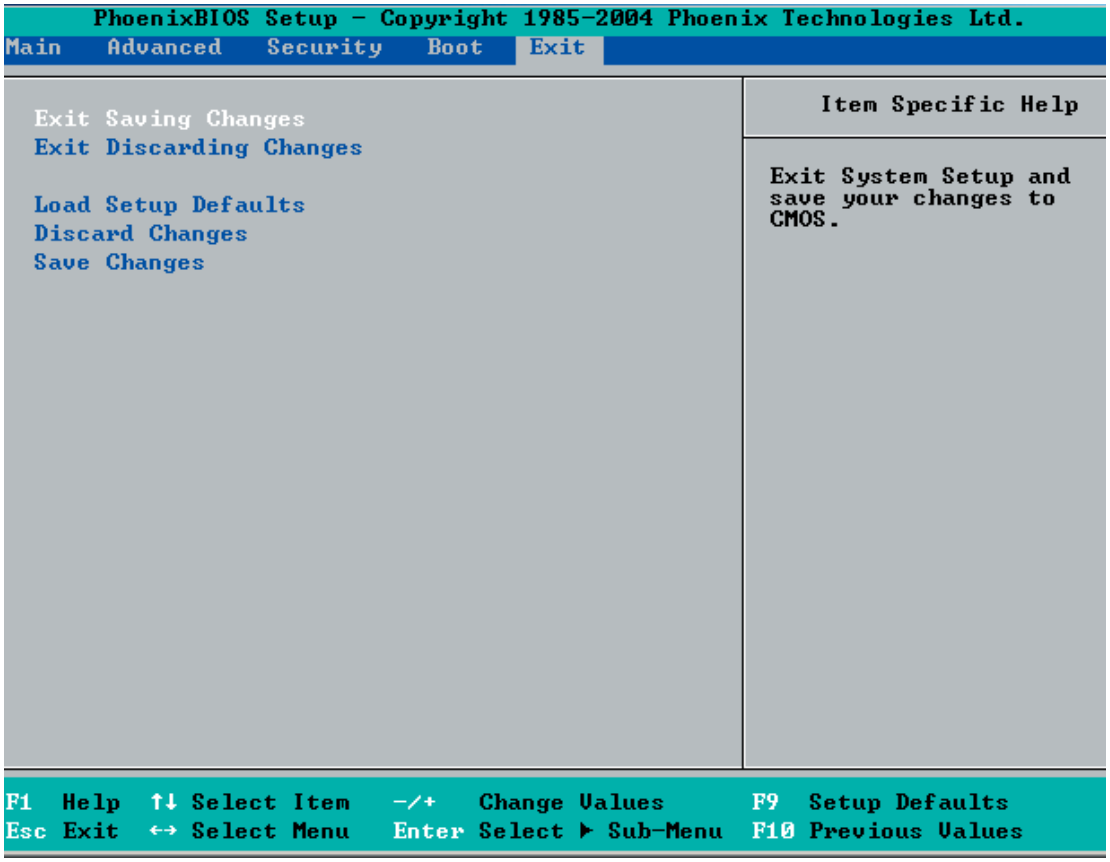


### Boot Priority Order/Excluded from Boot Order.

Use the Up and Down Arrow Keys to select a device. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the devices. You can also use the keys indicated above to specify the priority of boot order of a device or to move items from the category of "Excluded from Boot Order" to the category of "Boot Priority Order" and vise versa. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

## 7-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.



### Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

### Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

### Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

### Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

### Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

# Appendix A

# BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

**Failure Fixed Disk**
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

**Stuck key**
Stuck key on keyboard.

**Keyboard error**
Keyboard not working.

**Keyboard Controller Failed**
Keyboard controller failed test. May require replacing keyboard controller.

**Keyboard locked - Unlock key switch**
Unlock the system to proceed.

**Monitor type does not match CMOS - Run SETUP**
Monitor type not correctly identified in Setup

**Shadow Ram Failed at offset: nnnn**
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

**System RAM Failed at offset: nnnn**
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

**Extended RAM Failed at offset: nnnn** Extended memory not working or not configured properly at offset **nnnn.**

**System battery is dead - Replace and run SETUP**
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

**System CMOS checksum bad - Default configuration used**

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

**System timer error**

The timer test failed. Requires repair of system board.

**Real time clock error**

Real-Time Clock fails BIOS hardware test. May require board repair.

**Check date and time settings**

BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

**Previous boot incomplete - Default configuration used**

Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

**Memory Size found by POST differed from CMOS**

Memory size found by POST differed from CMOS.

**Diskette drive A error**

**Diskette drive B error**

Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

**Incorrect Drive A type - run SETUP**

Type of floppy drive A: not correctly identified in Setup.

**Incorrect Drive B type - run SETUP**

Type of floppy drive B: not correctly identified in Setup.

**System cache error - Cache disabled**
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

**CPU ID:**
CPU socket number for Multi-Processor error.

**EISA CMOS not writeable**
ServerBIOS2 test error: Cannot write to EISA CMOS.

**DMA Test Failed**
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

**Software NMI Failed**
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

**Fail-Safe Timer NMI Failed**
ServerBIOS2 test error: Fail-Safe Timer takes too long.

**device Address Conflict**
Address conflict for specified **device.**

**Allocation Error for: device**
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

**CD ROM Drive**
CD ROM Drive identified.

**Entering SETUP ...**
Starting Setup program

**Failing Bits: nnnn**
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

**Fixed Disk n**
Fixed disk **n** (0-3) identified.

**Invalid System Configuration Data**
Problem with NVRAM (CMOS) data.

**I/O device IRQ conflict**
I/O device IRQ conflict error.

**PS/2 Mouse Boot Summary Screen:**
PS/2 Mouse installed.

**nnnn kB Extended RAM Passed**
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

**nnnn Cache SRAM Passed**
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

**nnnn kB Shadow RAM Passed**
Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

**nnnn kB System RAM Passed**
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

**One or more I2O Block Storage Devices were excluded from the Setup Boot Menu**
There was not enough room in the IPL table to display all installed I2O block-storage devices.

**Operating system not found**
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

**Parity Check 1 nnnn**
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.** Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

**Parity Check 2 nnnn**

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

**Press <F1> to resume, <F2> to Setup, <F3> for previous**

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

**Press <F2> to enter Setup**

Optional message displayed during POST. Can be turned off in Setup.

**PS/2 Mouse:**

PS/2 mouse identified.

**Run the I2O Configuration Utility**

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

**System BIOS shadowed**

System BIOS copied to shadow RAM.

**UMB upper limit segment address: *nnnn***

Displays the address ***nnnn*** of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

**Video BIOS shadowed**

Video BIOS successfully copied to shadow RAM.

# Notes

# Appendix B

# BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

## Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error

1 repetitive long beep - no memory detected

## Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen.

The following is a list of codes that may be written to port 80h.

| POST Code | Description |
|---|---|
| 02h | Verify Real Mode |
| 03h | Disable Non-Maskable Interrupt (NMI) |
| 04h | Get CPU type |
| 06h | Initialize system hardware |
| 07h | Disable shadow and execute code from the ROM. |
| 08h | Initialize chipset with initial POST values |
| 09h | Set IN POST flag |
| 0Ah | Initialize CPU registers |
| 0Bh | Enable CPU cache |
| 0Ch | Initialize caches to initial POST values |
| 0Eh | Initialize I/O component |
| 0Fh | Initialize the local bus IDE |
| 10h | Initialize Power Management |
| 11h | Load alternate registers with initial POST values |
| 12h | Restore CPU control word during warm boot |
| 13h | Initialize PCI Bus Mastering devices |
| 14h | Initialize keyboard controller |

| POST Code | Description |
|---|---|
| 16h | 1-2-2-3 BIOS ROM checksum |
| 17h | Initialize cache before memory Auto size |
| 18h | 8254 timer initialization |
| 1Ah | 8237 DMA controller initialization |
| 1Ch | Reset Programmable Interrupt Controller |
| 20h | 1-3-1-1 Test DRAM refresh |
| 22h | 1-3-1-3 Test 8742 Keyboard Controller |
| 24h | Set ES segment register to 4 GB |
| 28h | Auto size DRAM |
| 29h | Initialize POST Memory Manager |
| 2Ah | Clear 512 kB base RAM |
| 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 |
| 2Fh | Enable cache before system BIOS shadow |
| 32h | Test CPU bus-clock frequency |
| 33h | Initialize Phoenix Dispatch Manager |
| 36h | Warm start shut down |
| 38h | Shadow system BIOS ROM |
| 3Ah | Auto size cache |
| 3Ch | Advanced configuration of chipset registers |
| 3Dh | Load alternate registers with CMOS values |
| 41h | Initialize extended memory for RomPilot |
| 42h | Initialize interrupt vectors |
| 45h | POST device initialization |
| 46h | 2-1-2-3 Check ROM copyright notice |
| 47h | Initialize I20 support |
| 48h | Check video configuration against CMOS |
| 49h | Initialize PCI bus and devices |
| 4Ah | Initialize all video adapters in system |
| 4Bh | QuietBoot start (optional) |
| 4Ch | Shadow video BIOS ROM |
| 4Eh | Display BIOS copyright notice |
| 4Fh | Initialize MultiBoot |
| 50h | Display CPU type and speed |
| 51h | Initialize EISA board |
| 52h | Test keyboard |
| 54h | Set key click if enabled |
| 55h | Enable USB devices |
| 58h | 2-2-3-1 Test for unexpected interrupts |
| 59h | Initialize POST display service |
| 5Ah | Display prompt "Press F2 to enter SETUP" |

| POST Code | Description |
|---|---|
| 5Bh | Disable CPU cache |
| 5Ch | Test RAM between 512 and 640 kB |
| 60h | Test extended memory |
| 62h | Test extended memory address lines |
| 64h | Jump to UserPatch1 |
| 66h | Configure advanced cache registers |
| 67h | Initialize Multi Processor APIC |
| 68h | Enable external and CPU caches |
| 69h | Setup System Management Mode (SMM) area |
| 6Ah | Display external L2 cache size |
| 6Bh | Load custom defaults (optional) |
| 6Ch | Display shadow-area message |
| 6Eh | Display possible high address for UMB recovery |
| 70h | Display error messages |
| 72h | Check for configuration errors |
| 76h | Check for keyboard errors |
| 7Ch | Set up hardware interrupt vectors |
| 7Dh | Initialize Intelligent System Monitoring |
| 7Eh | Initialize coprocessor if present |
| 80h | Disable onboard Super I/O ports and IRQs |
| 81h | Late POST device initialization |
| 82h | Detect and install external RS232 ports |
| 83h | Configure non-MCD IDE controllers |
| 84h | Detect and install external parallel ports |
| 85h | Initialize PC-compatible PnP ISA devices |
| 86h | Re-initialize onboard I/O ports. |
| 87h | Configure Motherboard Configurable Devices (optional) |
| 88h | Initialize BIOS Data Area |
| 89h | Enable Non-Maskable Interrupts (NMIs) |
| 8Ah | Initialize Extended BIOS Data Area |
| 8Bh | Test and initialize PS/2 mouse |
| 8Ch | Initialize floppy controller |
| 8Fh | Determine number of ATA drives (optional) |
| 90h | Initialize hard-disk controllers |
| 91h | Initialize local-bus hard-disk controllers |
| 92h | Jump to UserPatch2 |
| 93h | Build MPTABLE for multi-processor boards |
| 95h | Install CD ROM for boot |
| 96h | Clear huge ES segment register |
| 97h | Fix up Multi Processor table |
| 98h | 1-2 Search for option ROMs. One long, two short beeps on checksum failure |

| POST Code | Description |
|---|---|
| 99h | Check for SMART Drive (optional) |
| 9Ah | Shadow option ROMs |
| 9Ch | Set up Power Management |
| 9Dh | Initialize security engine (optional) |
| 9Eh | Enable hardware interrupts |
| 9Fh | Determine number of ATA and SCSI drives |
| A0h | Set time of day |
| A2h | Check key lock |
| A4h | Initialize typematic rate |
| A8h | Erase F2 prompt |
| AAh | Scan for F2 key stroke |
| ACh | Enter SETUP |
| AEh | Clear Boot flag |
| B0h | Check for errors |
| B1h | Inform RomPilot about the end of POST. |
| B2h | POST done - prepare to boot operating system |
| B4h | 1 One short beep before boot |
| B5h | Terminate QuietBoot (optional) |
| B6h | Check password (optional) |
| B7h | Initialize ACPI BIOS |
| B9h | Prepare Boot |
| BAh | Initialize SMBIOS |
| BBh | Initialize PnP Option ROMs |
| BCh | Clear parity checkers |
| BDh | Display MultiBoot menu |
| BEh | Clear screen (optional) |
| BFh | Check virus and backup reminders |
| C0h | Try to boot with INT 19 |
| C1h | Initialize POST Error Manager (PEM) |
| C2h | Initialize error logging |
| C3h | Initialize error display function |
| C4h | Initialize system error handler |
| C5h | PnPnd dual CMOS (optional) |
| C6h | Initialize note dock (optional) |
| C7h | Initialize note dock late |
| C8h | Force check (optional) |
| C9h | Extended checksum (optional) |
| CAh | Redirect Int 15h to enable remote keyboard |
| CBh | Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk |
| CCh | Redirect Int 10h to enable remote serial video |

| POST Code | Description |
|---|---|
| CDh | Re-map I/O and memory for PCMCIA |
| CEh | Initialize digitizer and display message |
| D2h | Unknown interrupt |

**The following are for the boot block in Flash ROM**

| POST Code | Description |
|---|---|
| E0h | Initialize the chipset |
| E1h | Initialize the bridge |
| E2h | Initialize the CPU |
| E3h | Initialize system timer |
| E4h | Initialize system I/O |
| E5h | Check force recovery boot |
| E6h | Checksum BIOS ROM |
| E7h | Go to BIOS |
| E8h | Set Huge Segment |
| E9h | Initialize Multi Processor |
| EAh | Initialize OEM special code |
| EBh | Initialize PIC and DMA |
| ECh | Initialize Memory type |
| EDh | Initialize Memory size |
| EEh | Shadow Boot Block |
| EFh | System memory test |
| F0h | Initialize interrupt vectors |
| F1h | Initialize Run Time Clock |
| F2h | Initialize video |
| F3h | Initialize System Management Manager |
| F4h | Output one beep |
| F5h | Clear Huge Segment |
| F6h | Boot to Mini DOS |
| F7h | Boot to Full DOS |

If the BIOS detects error 2C, 2E, or 30 (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-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

# Notes

# Appendix C

# System Specifications

### Processors

Single or dual Intel® Xeon™ LGA 771 type processors at a front side (system) bus speed of 1333 MHz.

**Note: Please refer to our web site for a complete listing of supported processors.**

### Chipset

Intel 5000P/ESB2 chipset

### BIOS

8 Mb Phoenix® Flash ROM

### Memory Capacity

Sixteen 240-pin DIMM sockets supporting up to 64 GB of FBD ECC DDR2-667/533 SDRAM

**Note: 4-way interleaved memory - requires memory to be installed four modules at a time. See the memory section in Chapter 5 for details.**

### Dual-Channel SCSI Controller

Adaptec AIC-7902W dual-channel controller for U320 SCSI (RAID 0, 1 5 and 10 supported)

### SATA Controller

Intel on-chip (ESB2) controller for 6-port SATA 3 Gb/s (RAID 0, 1 supported)

### SCSI Drive Bays

Sixteen (16) hot-swap drive bays to house sixteen (16) standard SCSI drives

### Peripheral Drive Bays

One (1) slim DVD-ROM drive
One (1) slim floppy drive (optional)

### Expansion Slots
Two PCI-Express x8 slots, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots and one 64-bit 100 MHz PCI-X slot (supports ZCR)

### Serverboard
X7DB8+ (Extended ATX form factor)
Dimensions: 13.5 x 13.05 in (343 x 332 mm)

### Chassis
SC836S2-R800, 3U rackmount
Dimensions: (WxHxD) 17.2 x 5.2 x 25.5 in. (437 x 132 x 648 mm)

### Weight
Gross (Bare Bone): 78 lbs. (35.5 kg.)

### System Cooling
Three (3) 8-cm system fans
Two (2) 8-cm exhaust fans
One (1) air shroud

### System Input Requirements
AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 12A - 4A
Rated Input Frequency: 50 to 60 Hz

### Power Supply
Rated Output Power: 800W (Part# PWS-801-1R)
Rated Output Voltages: +12V (66A), +5Vsb (4A)

### BTU Rating
3921 BTUs/hr (for rated output power of 800W)

### Operating Environment
Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

## Regulatory Compliance

Electromagnetic Emissions:
FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)

# Notes