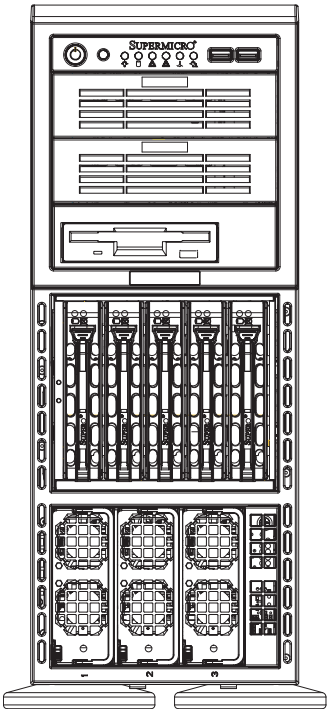
SUPERMICRO®

# SUPERSERVER 8044T-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 8044T-8R. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 8044T-8R is a high-end server based on the SC748TS-R1200P chassis and the X6QT8, a high-end serverboard that supports four Dual-Core Intel® Xeon® 7100 Series processors at a Front Side (System) Bus speed of 800/667 MHz and up to 64 GB of registered ECC DDR2-400 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 X6QT8 serverboard and the SC748TS-R1200P chassis, which comprise the SuperServer 8044T-8R.

### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 8044T-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 8044T-8R.

### Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X6QT8 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 SC748TS-R1200P server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI/SATA 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 Error Beep Codes

### Appendix B: BIOS POST Checkpoint Codes

### Appendix C: System Specifications

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# Notes

# Chapter 1

# Introduction

## 1-1 Overview

The SuperServer 8044T-8R is a high-end server that is comprised of two main subsystems: the SC748TS-R1200P 4U/tower server chassis and the X6QT8 quad Intel Xeon processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 8044T-8R (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the SuperServer 8044T-8R, as listed below:

- Three (3) 8-cm hot-swap exhaust fans (FAN-0081)
- Three (3) 9-cm hot-swap chassis fans (FAN-0090)
- One (1) air shroud (CSE-PT0125)
- Four (4) CPU passive heatsinks (SNK-P0029P)
- One (1) slim floppy drive (FPD-PNSC-W1.44MB)
- One (1) floppy cable (CBL-0051L)
- One (1) I/O shield (CSE-PT55L)
- SCSI Accessories
  One (1) SCSI backplane (CSE-SCA-016)
  One (1) SCSI cable (CBL-0063L)
  One (1) 5-drive mobile rack (CSE-M35S)
  Three (3) dummy drives w/ rails (CSE-PT36)
- Rackmount hardware kit (MCP-290-00001-00)
- One (1) SuperServer 8044T-8R User's Manual

Note: a "B" following a part number (8044T-8RB) indicates black.

## 1-2 Serverboard Features

At the heart of the SuperServer 8044T-8R lies the X6QT8, a quad processor serverboard based on the Intel E8501 chipset. Below are the main features of the X6QT8. (See Figure 1-1 for a block diagram of the E8501 chipset).

### Processors

The X6QT8 supports four 604-pin Intel Xeon 7100 Series processors at a FSB speed of 800/667 MHz. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

### Memory

The X6QT8 has sixteen 240-pin DIMM slots that can support up to 64 GB of ECC DDR2-400 SDRAM. The memory operates in an interleaved configuration and requires requires modules of the same size and speed to be installed two at a time. See Chapter 5 Section 5 for details.

### Onboard SCSI

An onboard Adaptec AIC-7902W dual-channel SCSI controller in integrated into the X6QT8, which supports eight 80-pin SCA Ultra320 SCSI hard drives. RAID 0, 1, 10 and JBOD are supported. 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:** HostRAID supports only four drives.

### Serial ATA

A SATA controller is integrated into the South Bridge of the E8501 chipset to provide a two-port SATA subsystem, which is RAID 0, 1 and JBOD supported. The SATA drives are hot-swappable units.

### PCI Expansion Slots

The X6QT8 has six PCI expansion slots, which includes one PCI-Express x8 slot, one PCI-Express x4 slot, three 64-bit 133 MHz PCI-X slots and one 64-bit 100 MHz PCI-X slot. (The 100 MHz PCI-X 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, two USB 2.0 ports, PS/2 mouse and keyboard ports and two Gb Ethernet ports.

### ATI Graphics Controller

The X6QT8 features an integrated ATI video controller based on the 16 MB ES1000 graphics chip. The ES1000 was designed specifically for servers, featuring low power consumption, high reliability and superior longevity.

### IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

### 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 SC748TS-R1200P server chassis.

### System Power

The SC748TS-R1200P features a redundant (two separate power modules) 1200W 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 SC748TS-R1200P chassis was designed to support five dual-channel, hot-swappable SCSI hard drives. The SCSI backplane provides SAF-TE functions for the SCSI drives.

### Front Control Panel

The control panel on the SuperServer 8044T-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 have been incorporated into the front of the chassis for convenient access.

### I/O Backplane

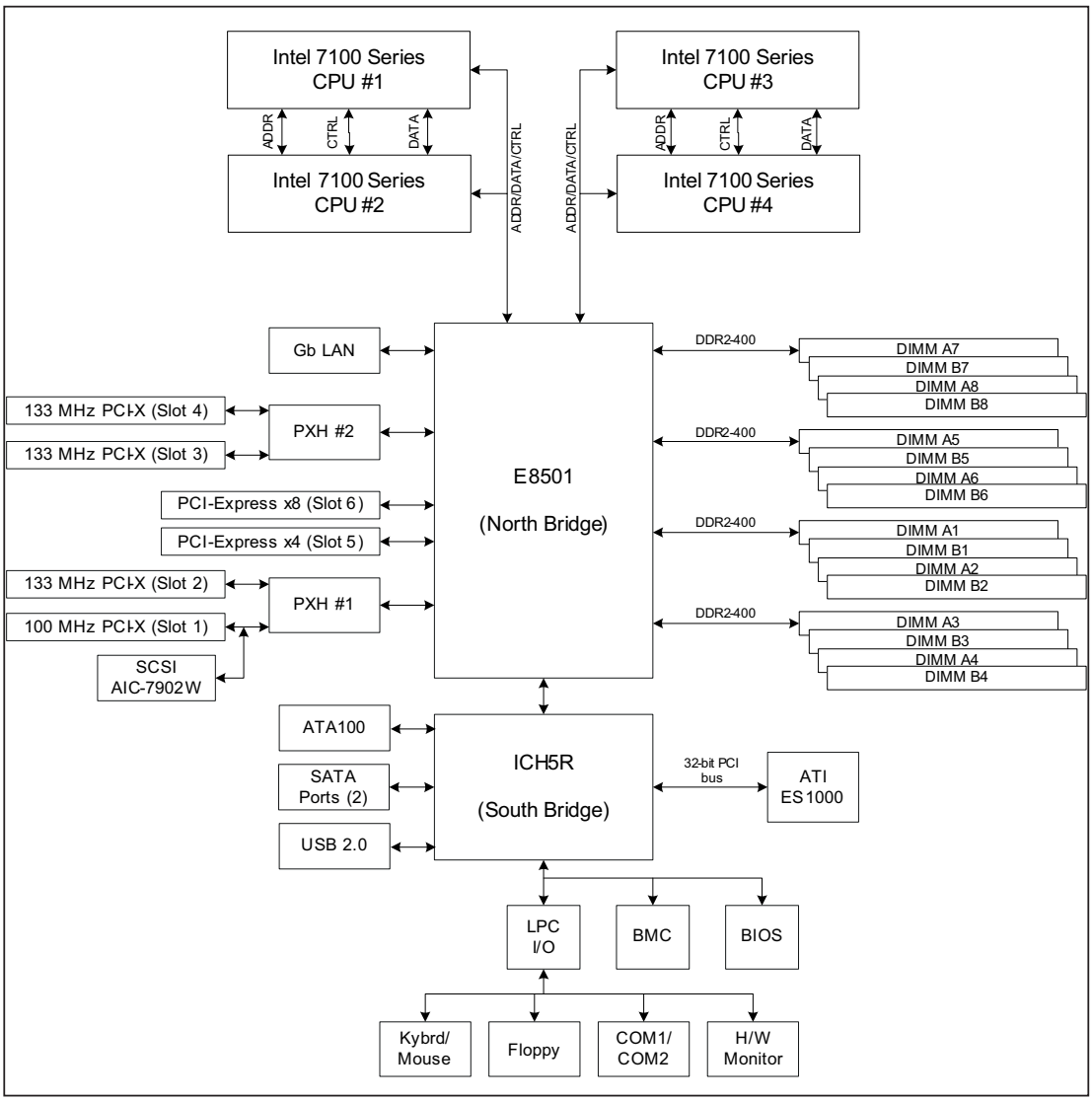
The SC748TS-R1200P is an tower chassis that can also be used in a 4U rackmount configuration. The I/O backplane provides seven PCI expansion slots, one COM port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two Gb Ethernet ports.

### Cooling System

Three 9-cm hot-swap system cooling fans located in the middle section of the chassis and three 8-cm hot-swap exhaust fans are used to cool the system. An air shroud channels the airflow from the system fans to efficiently cool the processors and DIMMs. Each power supply module also include a cooling fan.

**Figure 1-1. Intel E8501 Chipset: System Block Diagram**

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



## 1-4 Contacting Supermicro

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Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139

# Chapter 2

# Server Installation

## 2-1 Overview

This chapter provides a quick setup checklist to get your 8044T-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. The 8044T-8R may be employed either as a tower or mounted in a rack as a 4U rackmount chassis. If using it as a tower unit, please read the Server Precautions in the next section and then skip ahead to Section 2-5.

## 2-2 Unpacking the System

You should inspect the box the system 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 8044T-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. Be sure to read the Rack and Server Precautions in the next section.

## 2-3 Preparing for Setup

The box the system was shipped in may include two sets of rail assemblies, two rail mounting brackets and mounting screws needed for installing the system into a rack (optional kit). 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 system to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the system 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 and the like).

## 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 server panels and covers 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

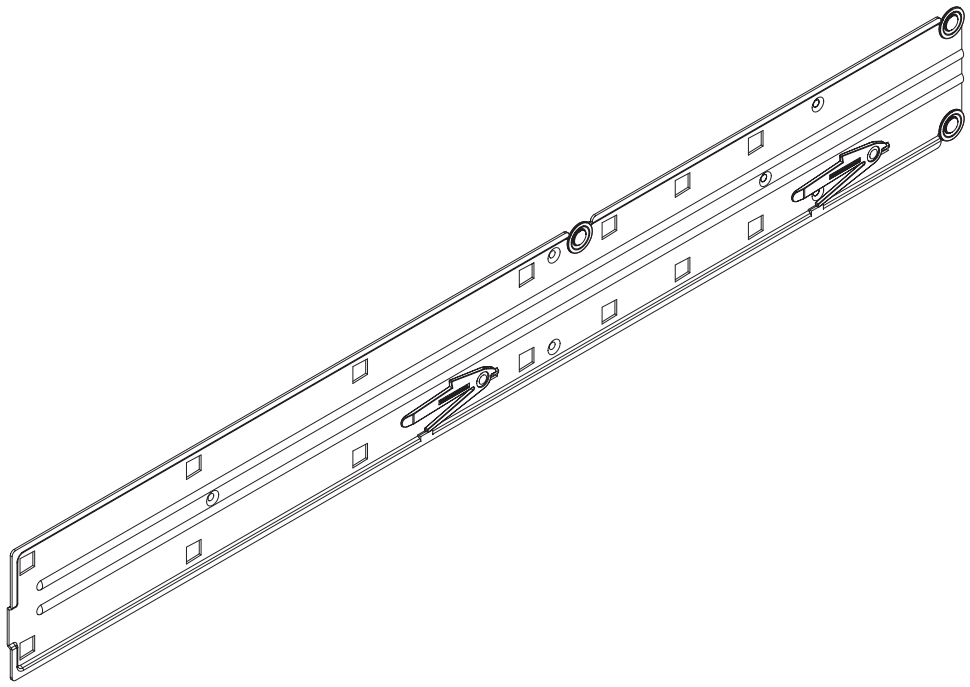
This section provides information on installing the system into a rack unit. Rack installation requires the use of the optional rackmount kit If the system has already been mounted into a rack or if you are using it as a tower, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the server into a rack with the rack rails provided in the rackmount kit. You should also refer to the installation instructions that came with the rack unit you are using.

### Identifying the Sections of the Rack Rails

The optional rackmount kit (MCP-290-00001-00) includes two rack rail assemblies. Each of these assemblies consist of two sections: an inner fixed chassis rail that secures to the chassis and an outer rack rail that secures directly to the rack itself. The inner and outer rails must be detached from each other before installing.

To remove the inner chassis rail, 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. Depress the locking tab to pull the inner rail completely out. Do this for both assemblies (one for each side).

**Figure 2-1. Inner Fixed Chassis Rail**



## Installing the Chassis Rails

You will need to remove the top bezel cover and the feet to add rack rails to the chassis. First, remove the top and right covers (top and left covers when standing as a tower chassis) by depressing the latch on the rear lip of the top (side if tower) cover to release it - then push the cover off. Finally, unscrew the four feet and remove them from the chassis (see Figure 2-2).

You can now attach rack rails to the top and bottom (now the sides) of the chassis. First add the rack handles. Then position the inner chassis rail sections you just removed along the side of the chassis making sure the screw holes line up. Note that these two rails are left/right specific. Screw the rail securely to the side of the chassis (see Figure 2-3). Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installing into a telco rack.

**Locking Tabs:** The chassis rails have locking tabs that serve to lock the server into place when installed and pushed fully into the rack, which is its normal position.

**Figure 2-2. Preparing to Install the Chassis Rails**

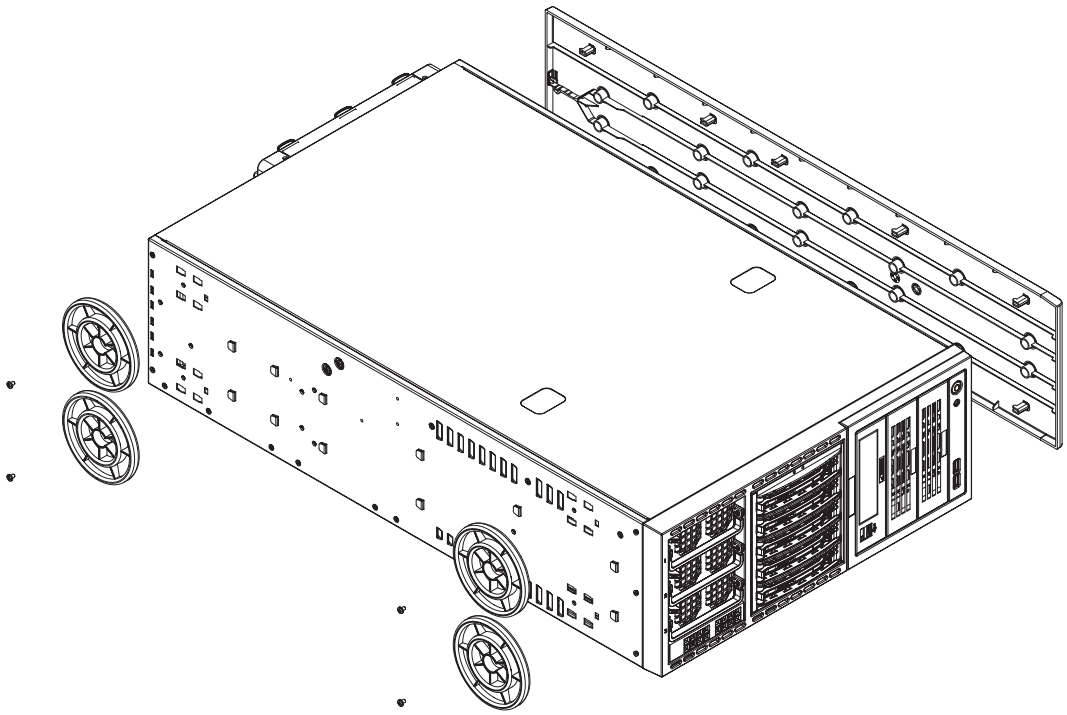
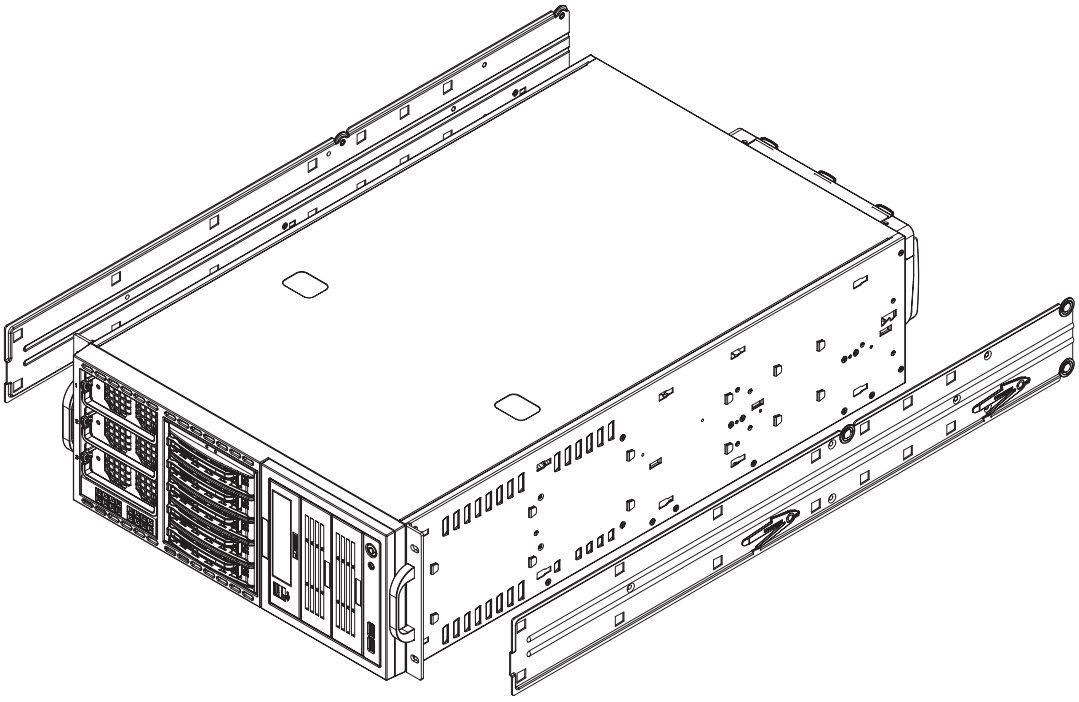


**Figure 2-3. Installing the Rails to the Chassis**



## Installing the Rack Rails

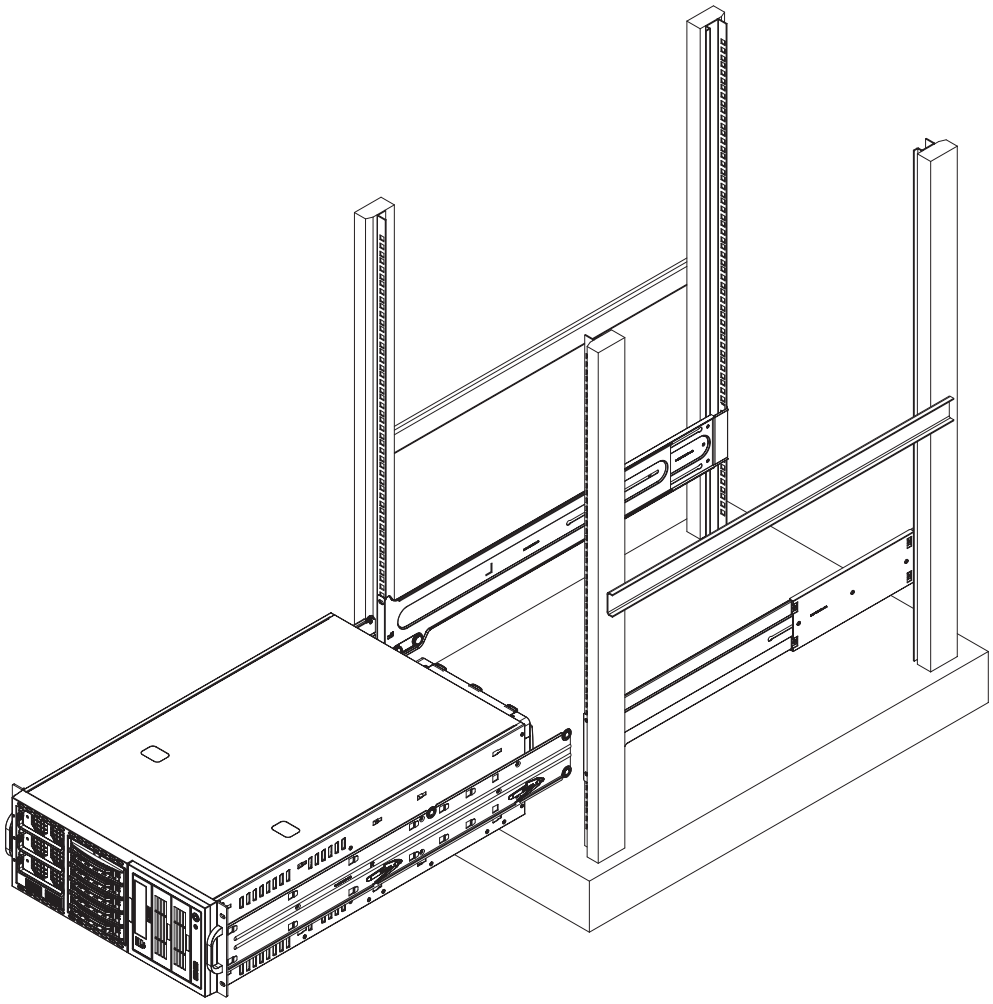
Determine where you want to place the 8044T-8R in the rack. (See Rack and Server Precautions in Section 2-3.) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward.

## Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. You should have two brackets in the rack mount kit. Install these first keeping in mind that they are left/right specific (marked with "L" and "R"). Then, line up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting).

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack (see Figure 2-4).

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



## 2-5 Checking the Serverboard Setup

After setting up the the system, 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)**
   (If rack mounted, 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").) There are two screws that secure the cover to the chassis - remove these first. Using the indentations on the side cover (see Figure 2-5), push the cover to slide it off the chassis. 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 four processors already installed into the serverboard. Each processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

3. **Check the system memory**
   Your server 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. See Chapter 5 for details on cable connections.

## 2-6 Checking the Drive Bay Setup

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

1. **Accessing the drive bays**
   All drives can be accessed from the front of the server. For servicing the CD-ROM, IDE hard drives and floppy drives, you will need to remove the top/left chassis cover. The SCSI disk drives can be installed and removed from the front of the chassis without removing any chassis covers.

2. **Installing components into the 5.25" drive bays**
   To install components into the 5.25" drive bays, you must first remove the top/left chassis cover as described in the previous section. Refer to Chapter 6 for details.

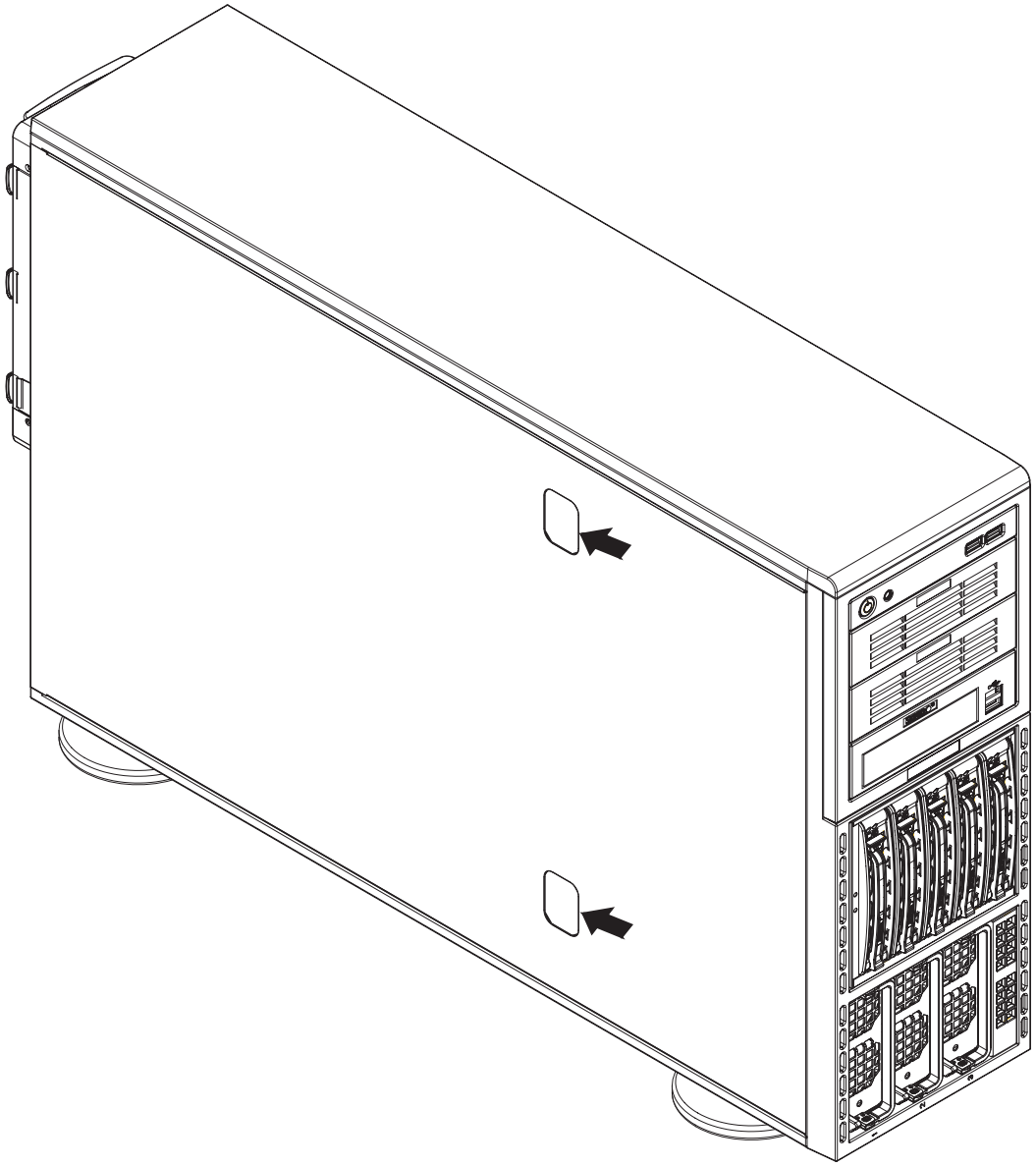
3. **Installing CD-ROM and floppy disk drives**
   Refer to Chapter 6 if you need to install a CD-ROM and/or floppy disk drive to the system.

4. **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.

5. **Check the airflow**
   Airflow is provided by three 9-cm hot-swap chassis fans working in conjunction with three 8-cm exhaust fans, which are located at the rear of the chassis. The system component layout was carefully designed to promote sufficient airflow through the chassis. Also 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. Keep this in mind when you reroute them after working on the system.

6. **Supplying power to the system**
   The last thing you must do is to provide input power to the system. Plug the power cords from the power supply modules 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). Finally, depress the power on button on the front of the chassis.

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



# Chapter 3

# System Interface

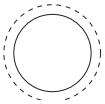
## 3-1 Overview

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. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

## 3-2 Control Panel Buttons

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

RESET



- **Reset:** Use the reset switch to reboot the system.

- **Power:** The main power switch is used to apply or remove power from the power supply to the server system. 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 SC748TS-R1200P chassis has five 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. This should be accompanied by an audible alarm. A backup 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 failed power supply modules. 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 (on and not flashing) 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 overheat condition exists.


- **NIC2:** Indicates network activity on LAN2 when flashing .


- **NIC1:** Indicates network activity on LAN1 when flashing.

- **HDD:** Indicates IDE channel activity. On the 8044T-8R, this light indicates SCSI and/or CD-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 Drive Carrier LEDs

### SCSI Drives

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 8044T-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 CD-ROM and floppy drives (not necessary for SCSI drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords from all the power supply modules 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 8044T-8R clean and free of clutter.

- The 8044T-8R weighs approximately 65.5 lbs (29.8 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.

- 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

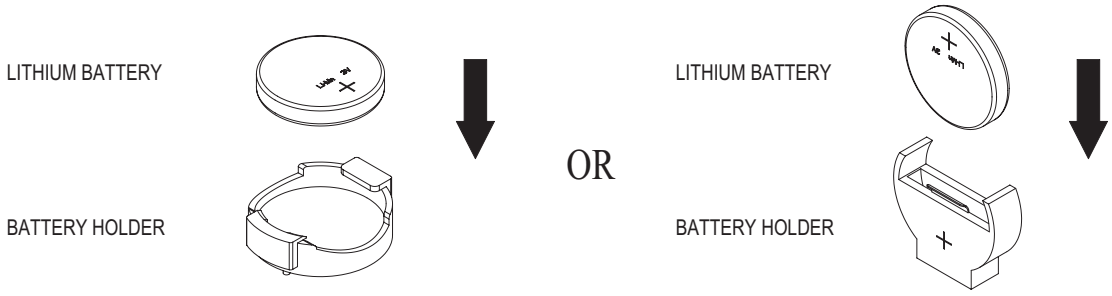
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient 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 any board from its 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 8044T-8R is operating to ensure proper cooling. Out of warranty damage to the 8044T-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 X6QT8 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 each processor into its CPU socket *before* you install the heatsink and fan. The X6QT8 can support either two or four Xeon 7100 type processors. If installing two processors only, install them into CPU sockets #1 and #2.

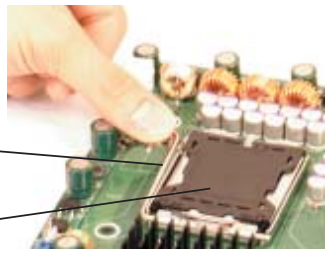
**Notes:**

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.

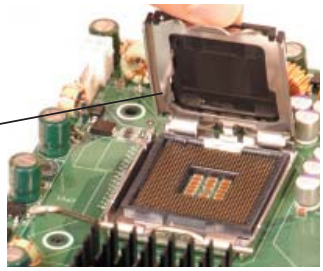
2. When purchasing a Xeon 7100 CPU or when receiving a serverboard with a CPU pre-installed, make sure that the CPU plastic cap is in place and none of the CPU pins are bent; otherwise, contact the retailer immediately.

### Installing the 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.



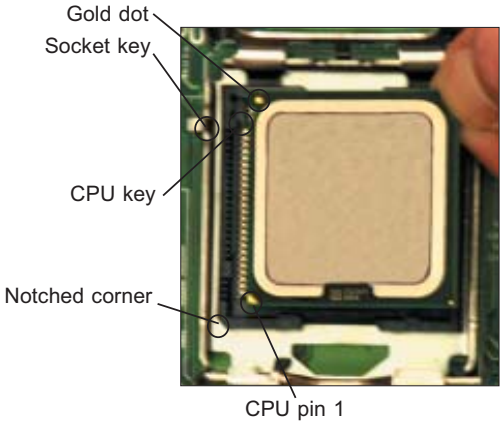

2. Gently lift the load lever to open the load plate.



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

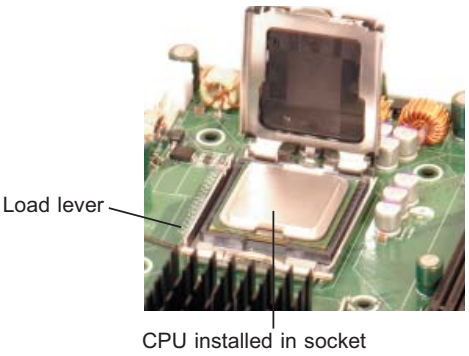
4. Align pin1 of the CPU (the corner marked with a triangle) with the notched corner of the CPU socket.

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).



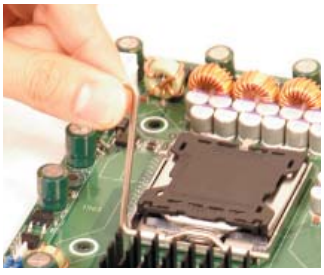

6. Once aligned, carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket, do not move the CPU horizontally or vertically and do not rub the CPU against any surface or any of the contacts, which may damage the CPU and/or contacts.

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

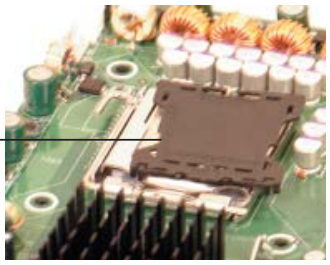



8. Use your thumb to gently push the load lever down until it snaps into the retention clasp.

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.



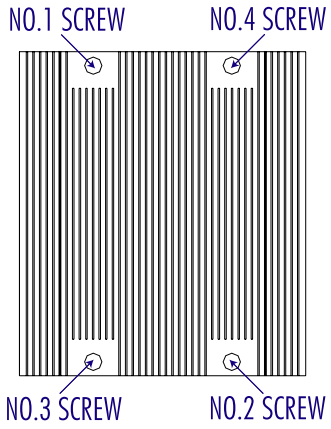
## Installing the Heatsink

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 that the CPU or the heatsink be removed. 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 serverboard in the sequence as show in the picture above.

2. Hold the heatsink 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 (JIDE#1)
- Control Panel cable (JF1, see next page)
- SCSI cable (JA1)

### Connecting Power Cables

The X6QT8 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 JPW1 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 8-pin Processor Power connections at JPW2 and JPW3.

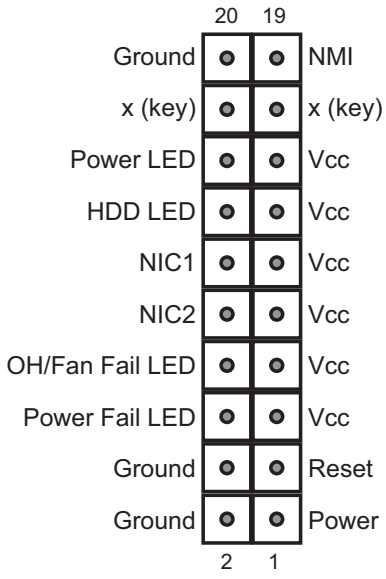
## Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 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.

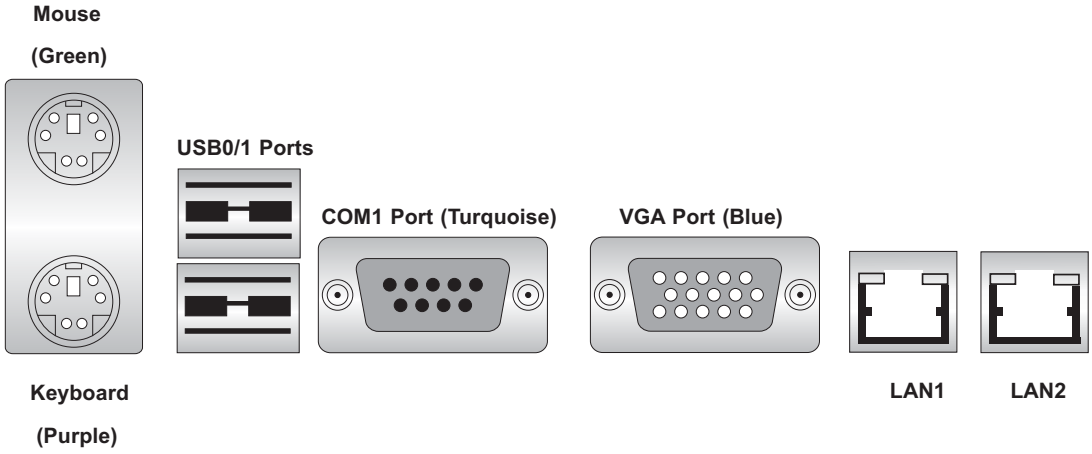
**Figure 5-1. Front Control Panel Header Pins (JF1)**



## 5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

**Figure 5-2. 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 the first slot of the first bank. Each memory controller chip (UXMB) works independently from the others. For best memory performance, a minimum of eight DIMMs are required (two for each UXMB chip). See the Memory Table on the following page.

2. To optimize memory performance, install DIMMs in the following order: slots A1& B1, slots A3 & B3, slots A5 & B5, and slots A7 & B7.

3. 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.

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

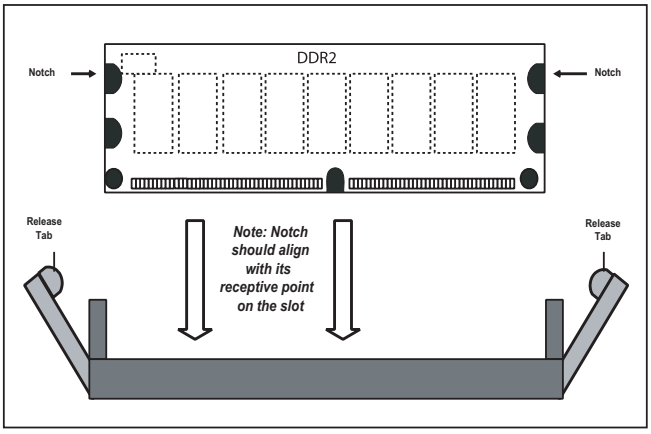
**Memory Support**

The X6QT8 supports up to 64 GB of ECC FBD (Fully Buffered DIMM) DDR2-400 SDRAM. The memory is an interleaved configuration, which requires modules of the same size and speed to be installed in pairs. You should not mix DIMMs of different sizes and speeds. See Figure 5-3 for installing and removing memory modules.

**Note:** Due to OS limitations, some operating systems may not support more than 4GB of memory.

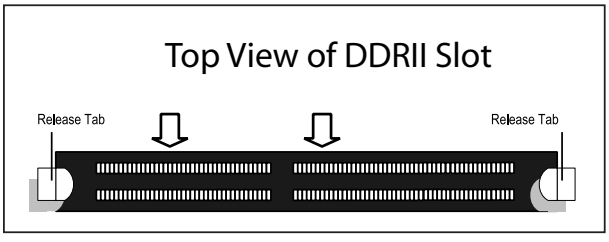
| Controller | DIMM Slot | | | |
|---|---|---|---|---|
| | Bank 1 | | Bank 2 | |
| **UXMB1** | A1 | B1 | A2 | B2 |
| **UXMB2** | A3 | B3 | A4 | B4 |
| **UXMB3** | A5 | B5 | A6 | B6 |
| **UXMB4** | A7 | B7 | A8 | B8 |

**Figure 5-3a. Installing DIMM into Slot**




**To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.**
**To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.**

**Figure 5-3b. Top View of DDR2 Slot**



## 5-6 Adding PCI Cards

### 1. PCI Expansion Slots

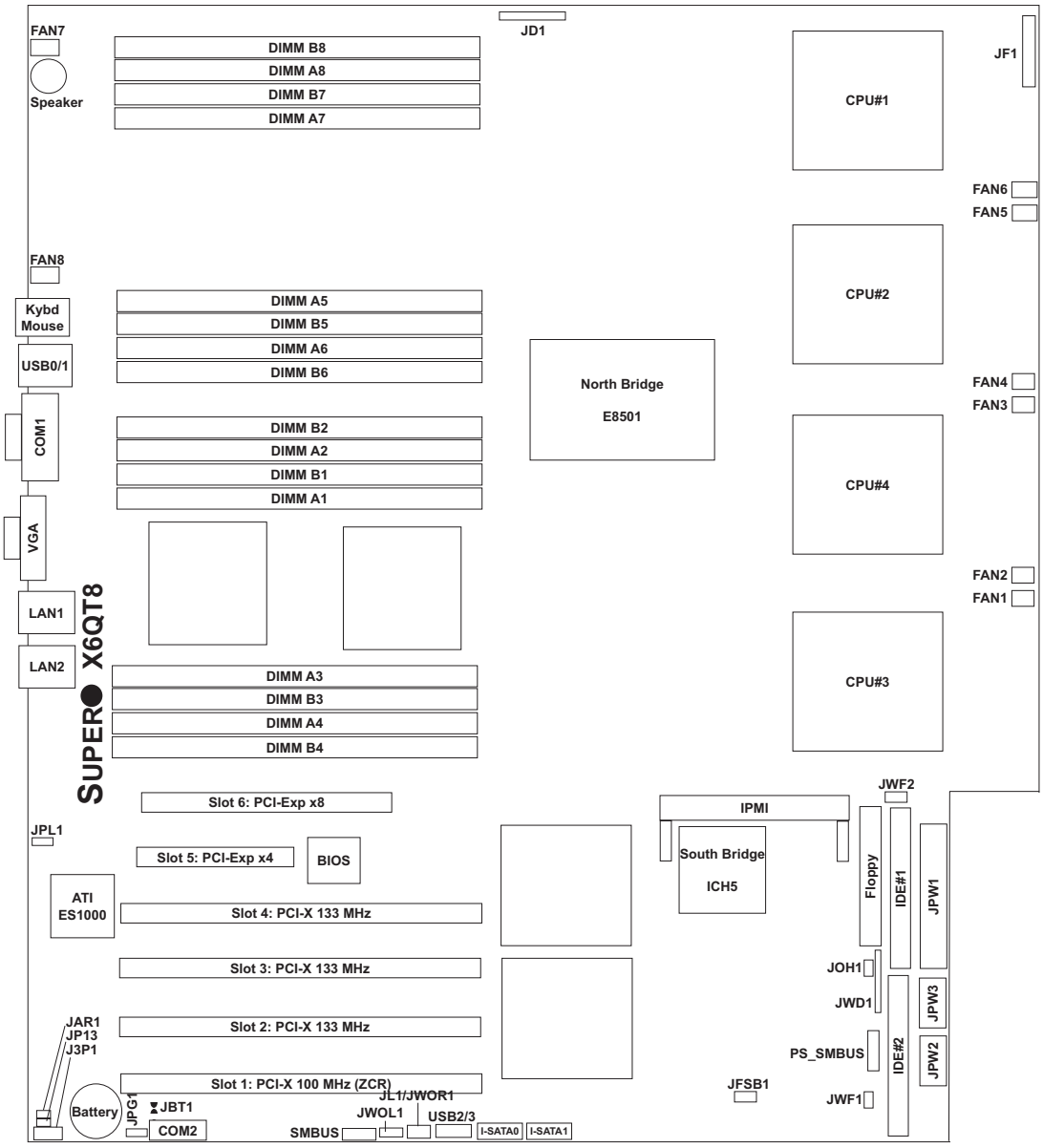
The X6QT8 has six PCI expansion slots, which includes one PCI-Express x8 slot, one PCI-Express x4 slot, three 64-bit 133 MHz PCI-X slots and one 64-bit 100 MHz PCI-X slot. (The 100 MHz PCI-X slot supports Zero Channel RAID.) All six slots may be populated in the SC748TS-R1200P chassis.

### 2. PCI card installation

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 blue 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 5-4. SUPER X6QT8 Layout**
(not drawn to scale)




**Notes:**

Jumpers not noted are for test purposes only.

# X6QT8 Quick Reference

| Jumper | Description | Default Setting |
|---|---|---|
| JBT1 | CMOS Clear | (See Section 5-9) |
| JFSB1 | Front Side Bus Speed Select | Open (Auto) |
| JP13 | 3rd Power Fail Detect | Open (Disabled) |
| JPG1 | VGA Enable/Disable | Pins 1-2 (Enabled) |
| JPL1 | LAN1/LAN2 Enable/Disable | Pins 1-2 (Enabled) |
| JWD1 | Watch Dog | Pins 1-2 (Reset) |

| Connector | Description |
|---|---|
| COM1/COM2 | COM1/COM2 Serial Port Connector/Header |
| FAN 1-8 | Fan Headers 1-8 |
| Floppy | Floppy Disk Drive Connector |
| IDE#1 | IDE Hard Drive Connector |
| IDE#2 | Compact Flash Card Connector |
| IPMI Socket | Intelligent Platform Management Interface Connector |
| I-SATA0~SATA1 | Intel (ICH5) SATA Ports |
| JAR1 | Alarm Reset |
| JD1 | Power LED (pins1-3)/Speaker Header (pins 4-7) |
| JF1 | Front Control Panel Connector |
| JL1 | Chassis Intrusion Header |
| JOH1 | Overheat LED |
| JPW1 | Primary 24-Pin ATX Power Connector |
| JPW2 | Processor Power Connector |
| JPW3 | Processor Power Connector |
| JWF1 | Compact Flash Power (Master) |
| JWF2 | Compact Flash Power (Slave) |
| JWOL1 | Wake-on-LAN Header |
| JWOR1 | Wake-on-Ring Header |
| LAN1/2 | Gigabit Ethernet Ports |
| SMBUS | System Management Bus Header |
| PS_SMBUS | System Management Power ($I^2C$) Header |
| USB0/1 | USB Ports |
| USB2/USB3 | USB Headers (USB2 and USB3) |

# 5-8 Connector Definitions

## ATX Power Connector

The primary ATX power supply connector 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.

**ATX Power 24-pin 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 |

## Processor Power Connectors

Both JPW2 and JPW3 must be connected to the power supply to provide power for the processors. See the table on the right for pin definitions.

**Processor Power Pin Definitions (JPW2, 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 or fan fail. 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 on the rear I/O panel. USB0 is the bottom port and USB1 is the top port. 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 |

## Universal Serial Bus Headers

Four additional USB headers (at JUSB2 and JUSB3) are included on the serverboard. These may be used for front side access. 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, JUSB3)**

| USB2 | | USB3, USB4 | |
|---|---|---|---|
| Pin # | Definition | Pin # | Definition |
| 1 | +5V | 1 | +5V |
| 2 | PO- | 2 | PO- |
| 3 | PO+ | 3 | PO+ |
| 4 | Ground | 4 | Ground |
| 5 | Key | 5 | NC |

## Serial Ports

The COM1 serial port is located on the rear I/O panel. 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.

## Fan Headers

The X6QT8 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.

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

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

**Note:** Currently only 3-pin control is supported (no PWM).

## 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 |

### Power LED/Speaker

On the JD1 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 beside the USB ports. See the table on the right for pin definitions.

**PS/2 Keyboard and Mouse Ports Pin Definitions**

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

### Overheat LED

Connect an LED to the JOH1 header to provide warning of a chassis overheating condition. See the table on the right for pin definitions.

**Overheat LED Pin Definitions (JOH1)**

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

### Wake-On-LAN

The Wake-On-LAN header is designated JWOL1. 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 (JWOL1)**

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

## Wake-On-Ring

The Wake-On-Ring header is designated JWOR1. 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 (JWOR1)**

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

## SMBUS

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

**SMBUS Pin Definitions (SMBUS)**

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

## PS_SMBUS

This connector is for $I^2C$, which may be used to monitor the status of the power supply. See the table on the right for pin definitions.

**PS_SMBUS ($I^2C$) Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | Clock |
| 2 | SMB Data |
| 3 | N/A |
| 4 | N/A |
| 5 | N/A |

## Alarm Reset (JAR1)

Using the PS_SMBUS can notify you in the event of a power supply failure. This feature assumes that Supermicro redundant power supply units are installed in the chassis. Connect a microswitch to the JAR1 pins to disable the power supply fail alarm.

**Alarm Reset Pin Definitions (JAR1)**

| Pin# | Definition |
|---|---|
| 2 | +5V |
| 1 | Ground |

### LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.

### Compact Flash Card PWR (Master)

A Compact Flash card power connector is located at JWF1. Connect your compact flash card's power cable to JWF1 to utilize the compact flash card as a master device. See also JWF2 (below).

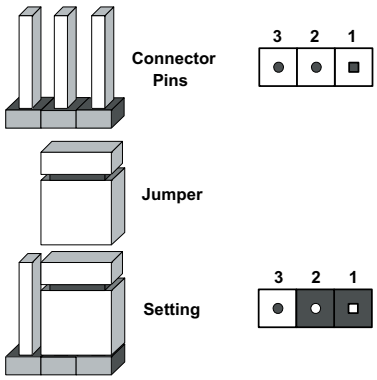
### Compact Flash Card PWR (Slave)

A Compact Flash card power connector is located at JWF2. Connect your compact flash card's power cable to JWF2 to utilize the compact flash card as a slave device. See also JWF1 (above).

# 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.*

## 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 |

### 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 JP13 to prevent false alarms. See the table on the right for jumper settings.

**3rd Power Supply Fail Detect Enable/Disable Jumper Settings (JP13)**

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

### LAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard Ethernet (RJ45) ports LAN1 and LAN2. See the table on the right for jumper settings. The default setting is enabled

**LAN Enable/Disable Jumper Settings (JPL1)**

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

### Watch Dog Enable/Disable

JWD1 controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application is “hung up”. Pins 1-2 will cause Watch Dog to reset the system if an application is hung up. 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 (JWD1)**

| Jumper Setting | Definition |
|---|---|
| Pins 1-2 | Reset |
| Pins 2-3 | NMI |
| Open | Disabled |

### Front Side Bus Speed Select

JFSB1 may be used to change the front side bus speed to 667 MHz. See the table on the right for jumper settings. The default setting is open (auto select).

| Front Side Bus Speed Jumper Settings (JPS1) | |
|---|---|
| Jumper Setting | Definition |
| Open | Auto |
| Closed | 667 MHz |

## 5-10 Onboard Indicators

### LAN1/LAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gigabit LAN port, 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.

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

## 5-11 Floppy, IDE and SATA 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.

### Floppy Connector

The floppy connector located beside the IDE#1 connector. 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 |

## IDE Connectors

There are no jumpers to configure the onboard IDE#1 and IDE#2 connectors. See the table on the right for pin definitions.

**IDE Drive Connectors**
**Pin Definitions (IDE#1, IDE#2)**

| 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 |

## SATA Ports

See the table on the right for pin definitions for the onboard SATA ports.

**SATA Port Pin Definitions**
**(I-SATA0 ~ I-SATA1)**

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

# Notes

# Chapter 6

# Advanced Chassis Setup

This chapter covers the steps required to install components and perform simple maintenance on the SC748TS-R1200P chassis. Following the component installation steps in the order given will eliminate most common problems. If some steps are unnecessary, skip ahead to the step that follows. Refer to Chapter 2 for instructions on installing the system as a 4U rackmount.

### Tools Required

The only tool you will need is a Philips screwdriver.

## 6-1 Static-Sensitive Devices

Static electrical discharge 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 static discharge.

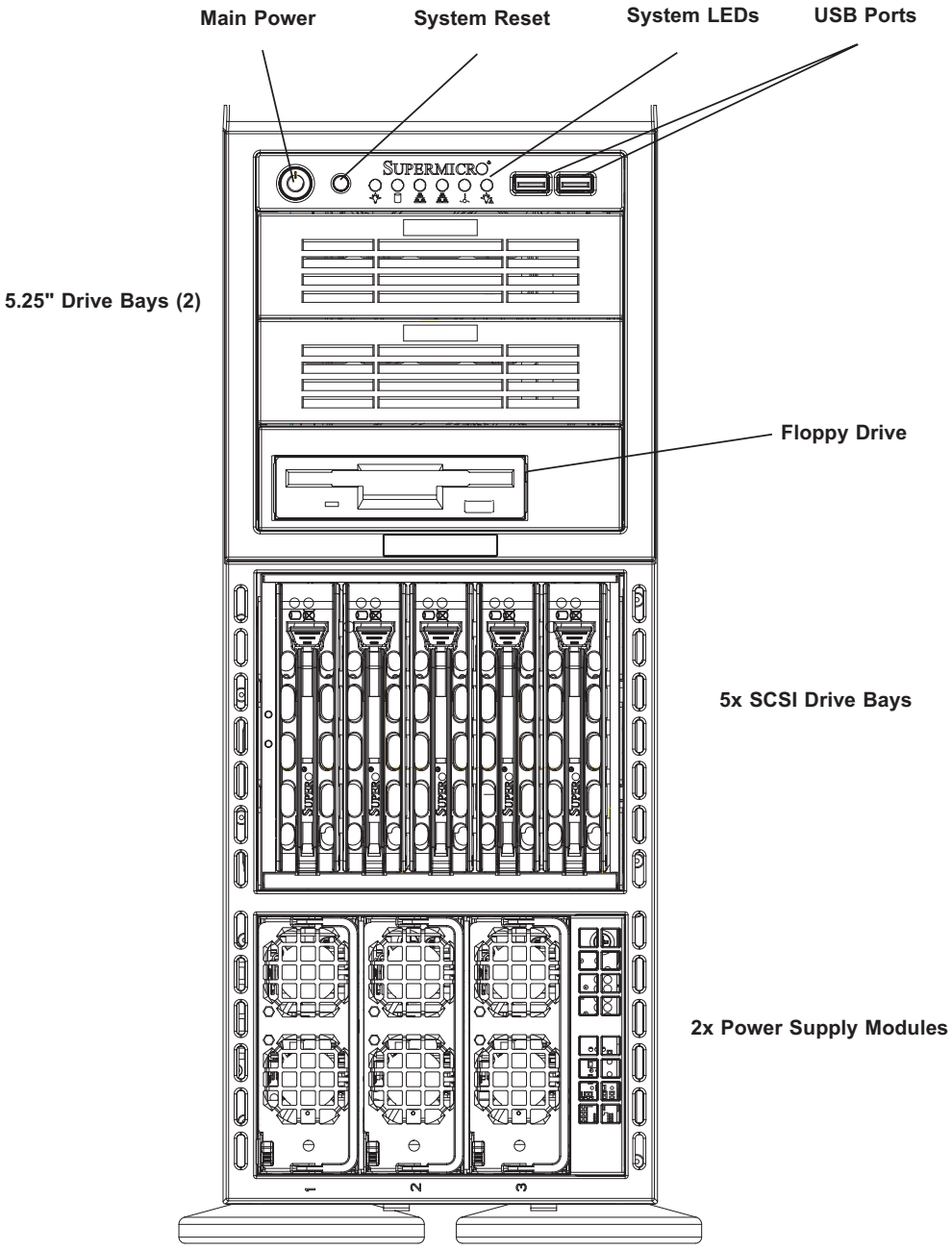
### Precautions

- 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.
- 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. When unpacking the board, make sure the person handling it is static protected.

**Figure 6-1. Chassis Front View**



## 6-2 Control Panel

The front control panel must be connected to the JF1 connector on the serverboard to provide you with system status and alarm indications. A ribbon cable has bundled these wires together to simplify this connection. Connect the cable from JF1 on the serverboard (making sure the red wire plugs into pin 1) to the appropriate comnnector on the front control panel PCB (printed circuit board). Pull all excess cabling over to the control panel side of the chassis. The LEDs on the control panel inform you of system status - see Figure 6-2 for details. See Chapter 5 for details on JF1.

**Figure 6-2. Front Control Panel LEDs**

**Power**  Indicates power is being supplied to the system.

**HDD**  Indicates IDE device and hard drive activity. On the SC748S-R1000, this LED indicates SCSI hard drive activity when flashing.

**NIC1**  Indicates network activity on LAN port 1.

**NIC2**  Indicates network activity on LAN port 2

**Overheat/Fan Fail**  When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition (see Chapter 3 for details).

**Power Fail**  Indicates a power supply failure.

## 6-3 System Fans

Three 9-cm chassis cooling fans (located in the center of the chassis) provide cooling airflow while three 8-cm exhaust fans expel hot air from the chassis. The fans should all be connected to headers on the serverboard (see Chapter 5). Each power supply module also has a cooling fan.

### Fan Failure

Under normal operation all chassis fans, exhaust fans and the power supply fans run continuously. The chassis fans are hot-swappable and can be replaced without powering down the system.

### Replacing Chassis Fans

**1. Identifying the failed fan**

To locate and replace a failed chassis fan, begin by removing the top/left chassis cover (see Chapter 2 for details on removing the cover). Locate the fan that has stopped working.

**2. Removing a hot-plug fan housing**

Depress the locking tab on the failed fan: on a chassis fan, puch the tab on the side of the housing inward, on the exhaust fan push down on the colored tab. With the tab depressed, pull the fan straight out (see Figure 6-3). The wiring for these fans has been designed to detach automatically.

**3. Installing a new system fan**

Replace the failed fan with an identical one (available from Supermicro). Install it in the same position and orientation as the one you removed; it should click into place when fully inserted. Check that the fan is working then replace the top/left side chassis panel.

**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. Begin by depressing the tabs at the front and rear of the shroud to unlock it, then lift it up and out of the chassis (see Figure 6-4). To reinstall, simply position the air shroud in its proper place and push it in until you hear it click.

**Figure 6-3. Removing a Chassis Fan**

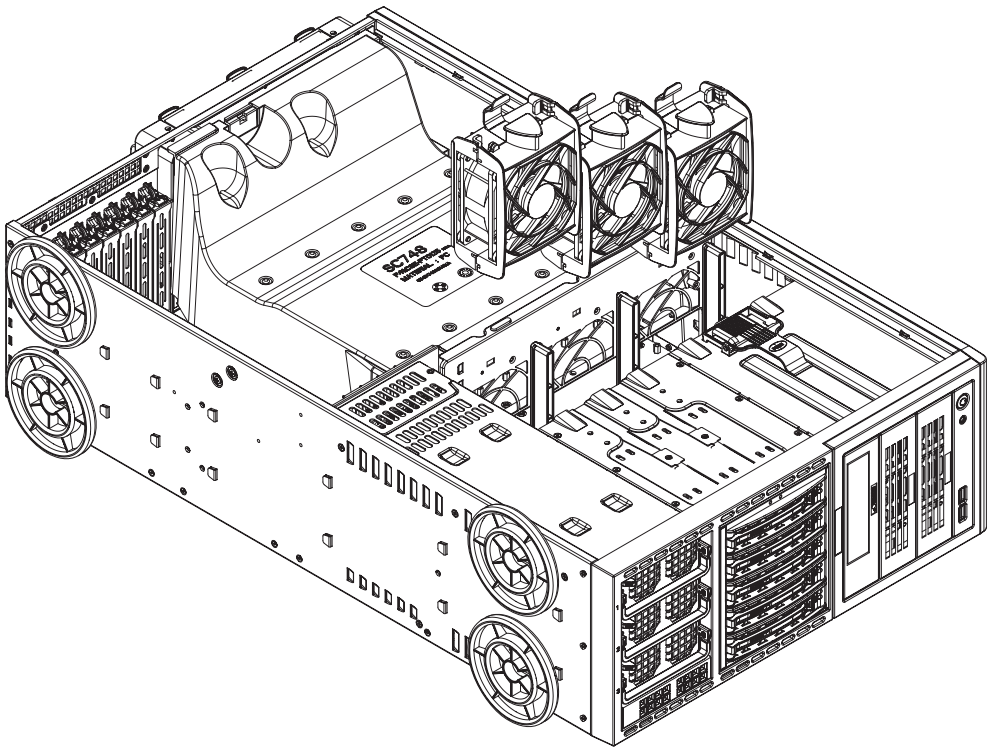
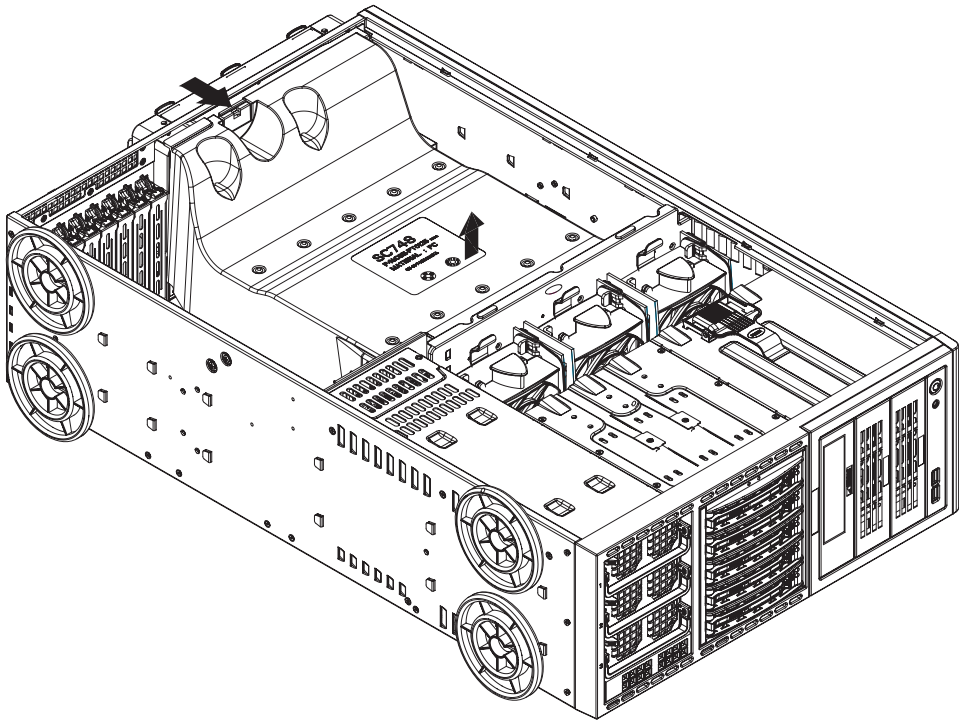


**Figure 6-4. Removing the Air Shroud**



## 6-4 Drive Bay Installation

### SCSI Drives

A total of five SCSI drives may be housed in the SC748TS-R1200P chassis. The drive IDs are preconfigured as 0 through 4 (channel A) in order from bottom to top (or from left to right if rackmounted).

**Regardless of how many SCSI drives are installed, all drive carriers must remain in the drive bays to promote proper airflow.**

#### 1. Installing/removing hot-swap SCSI drives

The SCSI drive carriers are all easily accessible at the front of the chassis. These drives are hot-swappable, meaning they can be removed and installed without powering down the system. To remove a carrier, first open the front bezel then push the release button located beside the drive LEDs. Swing the handle fully out and then use it to pull it straight out.

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

#### 2. 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 work to promote proper airflow for the system. For this reason, even carriers without SCSI drives must remain in the server. If you need to add a new SCSI drive, insert the 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 (see Figure 6-5).

#### 3. SCSI backplane

The SCSI drives plug into a SCSI backplane. The CBL-0063L cable needs to be connected from the serverboard to the appropriate connectors on the backplane. There are also two power connectors on the backplane - both should be connected. You cannot cascade the SCSI backplane.

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

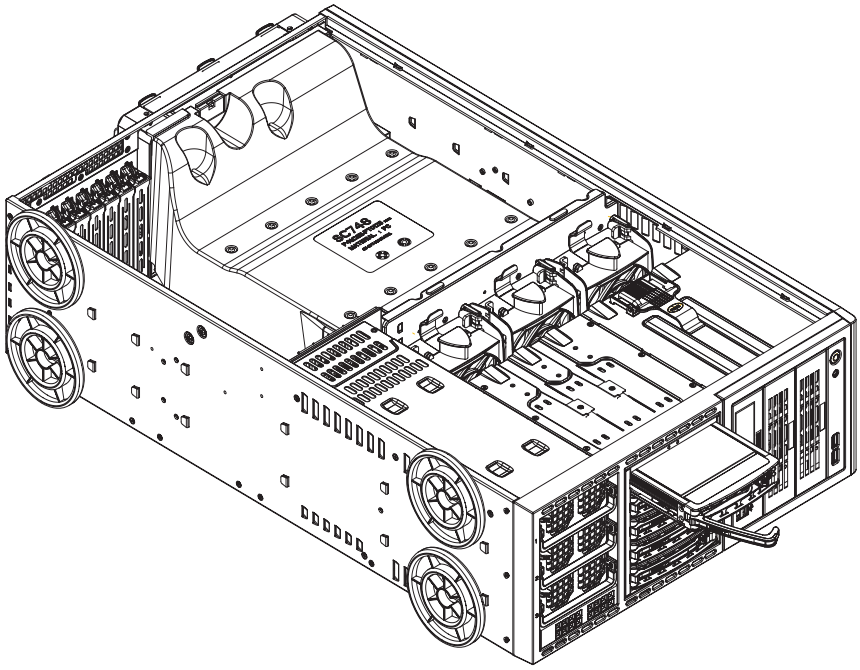
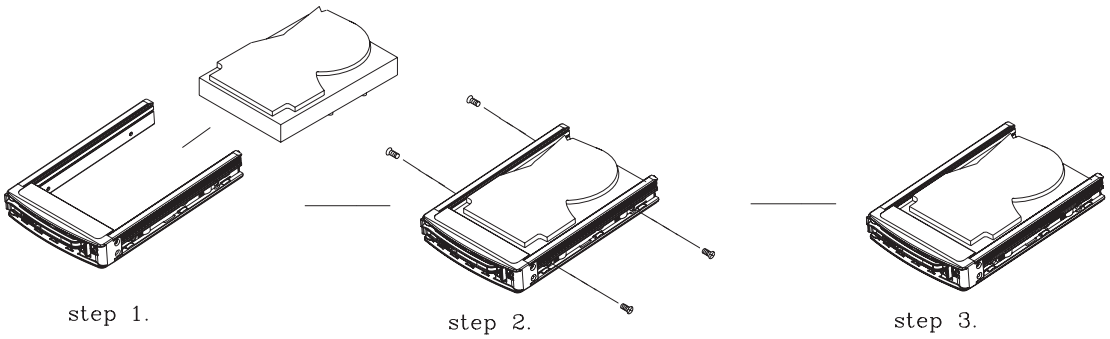


**Figure 6-5. Mounting a SCSI Drive in a Carrier**




**Important! Use extreme 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 airflow holes.**

## Installing Components in the 5.25" Drive Bays

### 1. Drive bay configuration

The 8044T-8R has three 5.25" drive bays. Components such as an extra floppy drive, IDE hard drives or DVD/CD-ROM drives can be installed into these 5.25" drive bays.

### 2. Mounting components in the drive bays

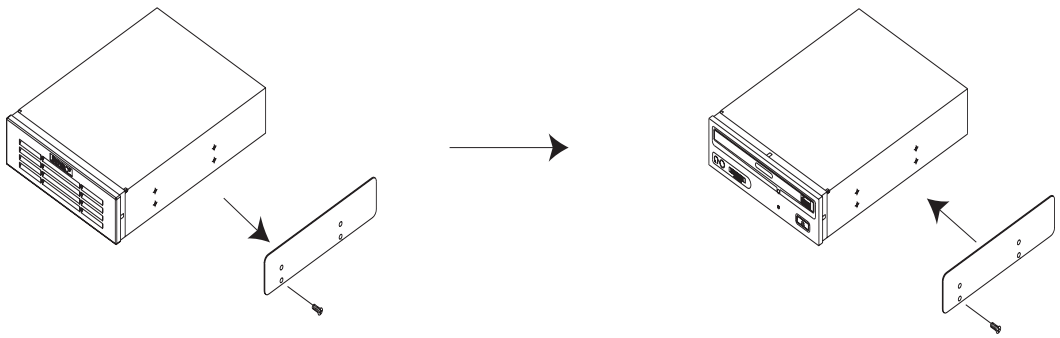
First power down the system and then remove the top/left chassis cover to access the drive components. With the cover off, remove the two or four screws that secure the drive carrier to the chassis (one side only) then push the entire empty drive carrier out from the back.

Adding a DVD/CD-ROM drive: remove the guide plates (one on each side) from the empty drive carrier and screw them into both sides of the DVD/CD-ROM drive using the holes provided. Then slide the DVD/CD-ROM into the bay and secure it to the chassis with the drive carrier screws you first removed. Attach the power and data cables to the drive. Replace the top/left chassis cover before restoring power to the system.

Adding an IDE or floppy drive: to add one of these drives, install it into one of the removed empty drive carriers with the printed circuit board side toward the carrier so that the drive's mounting holes align with those in the carrier. Secure the drive to the carrier with four screws then slide the assembly into the bay and secure it to the chassis with the drive carrier screws you first removed. Attach the power and data cables to the drive. Replace the top/left chassis cover before restoring power to the system.

**Note:** A red wire typically designates the location of pin 1. You should keep the drive carriers inserted in any unused drive bays to reduce EMI and noise and to facilitate the airflow inside the chassis.

**Figure 6-7. Adding a Component Without a Drive Carrier**



# 6-5 Power Supply

The SuperServer 8044T-8R has a redundant 1200 watt power supply consisting of two 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 module 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. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The hot-swap capability of the power supply modules allows you to 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 redundant feature will keep the system up and running while you replace the failed hot-swap module. Replace with the same model - (see Appendix C).

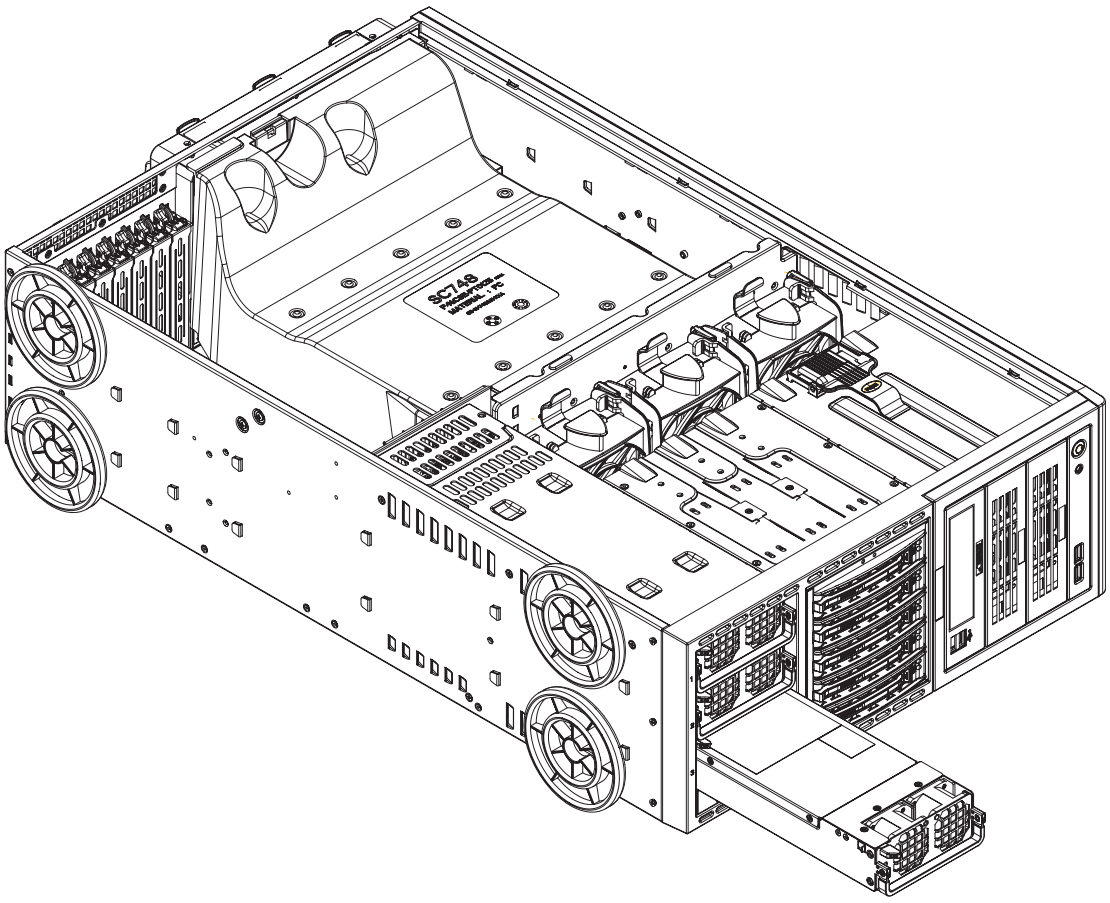
**1. Removing the power supply**

First unplug the power cord from the failed power supply module. Then depress the locking tab on the power supply module and pull it straight out by the handle. See Figure 6-8.

**2. Installing a new power supply**

Replace the failed module with another power supply module (must be the exact same - refer to Appendix C for part number). Simply push the new power supply module into the power bay until you hear a click. Finish by plugging the AC power cord back into the module.

**Figure 6-8. Removing a Power Supply Module**



# Chapter 7

# BIOS

## 7-1 Introduction

This chapter describes the AMIBIOS Setup Utility for the X6QT8. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated using a floppy disk-based program. This chapter describes the basic navigation of the AMIBIOS Setup Utility setup screens.

### The BIOS Setup Utility

Each main BIOS menu option is described in this user's guide. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. **Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.

The AMIBIOS Setup Utility uses a key-based navigation system called hot keys. Most of the AMIBIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, and etc. **Note**: Options printed in **Bold** are default settings.

### How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

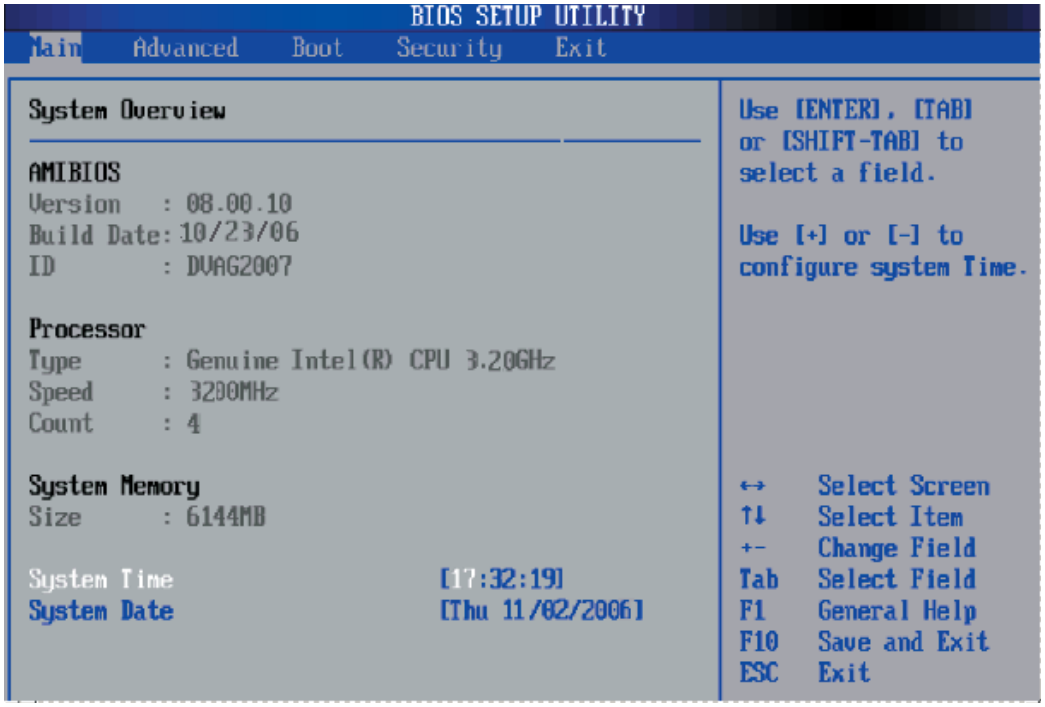
### Starting the Setup Utility

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 AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMIBIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.


**Warning!!** Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

## 7-2 Main Setup

The Main BIOS Setup screen is shown below.




**System Overview:** The following BIOS information will be displayed:

**AMIBIOS**

Version, Build Date, ID

**Processors**

Type, Speed, Count

**System Memory**

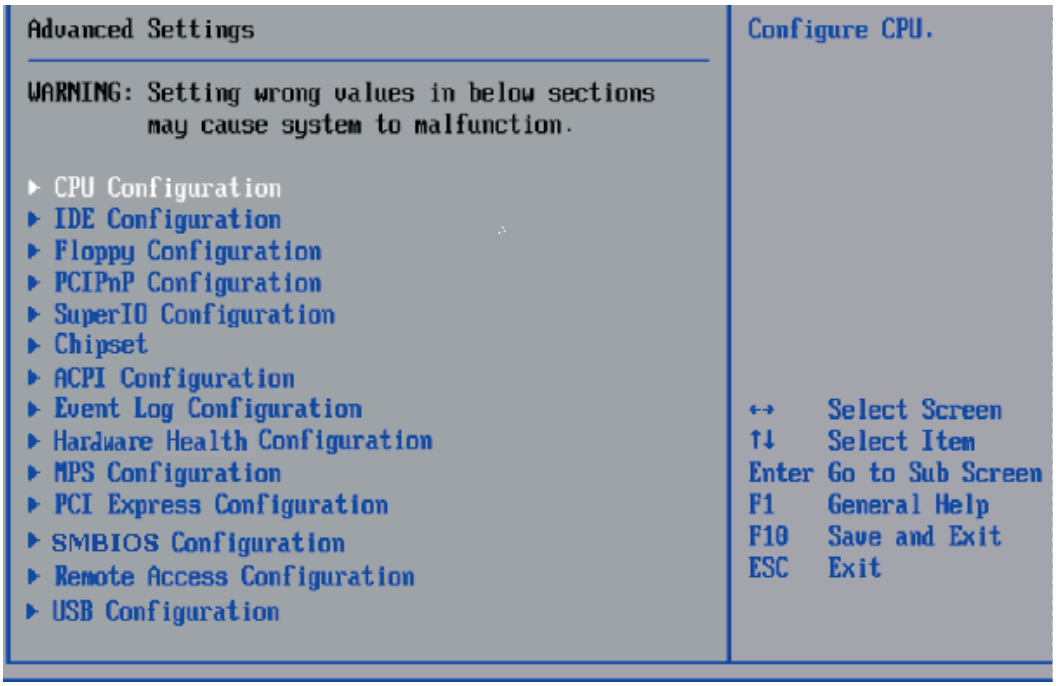
This option allows the AMI BIOS to display the status of memory installed in the system.

### System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in DAY/MM/DD/YY format. The time is entered in HH:MM:SS format. **Note:** The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30P. M. as 17:30:00.

## 7-3 Advanced Settings

The Advanced Settings screen and sub menus are listed below:




When you first enter the Advanced Setup screen, the Setup Warning will be displayed. Please follow the instruction and set the correct value for each item to prevent the system from malfunctioning.

### ▶CPU Configuration Sub-Menu

#### Configure Advanced CPU Settings

This option allows the user to configure the Advanced CPU settings for the processor(s) installed in the system.

**Ratio CMOS Setting** (Available when SpeedStep is disabled.)

This option allows the user to set the ratio between the CPU Core Clock and the FSB frequency. The default setting is 16.

**L3 Cache** (Available when supported by the OS and the CPU.)

Select **Enabled** to enable L3 (Level 3) Cache in the CPU. The options are **Enabled** and Disabled.

**Hardware Prefetcher** (Available when supported by the OS and the CPU.)

If set to "Enabled," the hardware prefetcher will pre-fectch streams of data and instructions from main memory to L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

**Adjacent Cache Line Prefetch** (Available when supported by the OS and 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**.

### Max CPUID Value Limit

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled**.

**Vanderpool Technology** (Available when supported by the CPU.)

Set to Enabled to utilize enhanced virtualization capabilities provided by the Intel Vanderpool Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. (**Note:** If there is any change to this setting, you will need to power off and restart the system for the change to take effect.) **Refer to Intel's web site for detailed information.**

**Execute Disable Bit** (Available when supported by the OS and the CPU.)

Set to **Enabled** to enable the Execute Disable Bit to allow the processor to classify areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from creating a flood of codes to overwhelm the processor or damage the system during an attack. (Note: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.

**Single Logical Processor Mode** (Available when supported by the CPU.)

Select Enabled to allow the processor to operate in the single core mode, allowing Logical Processor 0 CORE 0 to remain active. The options are Enabled and **Disabled**.

### Hyper-Threading Technology

This setting allows you to **Enable** or Disable the function of Hyper-Threading. Enabling Hyper-Threading results in increased CPU performance.

**Intel (R) SpeedStep (tm) Technology** (Available when supported by the CPU.)

The Enhanced Intel SpeedStep Technology allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Select Maximum to set the CPU speed to the maximum. Select Minimum to set the CPU speed to the minimum. Select Auto to allow the CPU speed to be controlled by the OS. Select **Disabled** to disable this feature. (**Refer to Intel's web site for detailed information.)**

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

Select **Standard** to enable the C1 Halt State to partially turn off the CPU internal clocks to conserve energy and prevent system overheating when the OS is idle. Select Enhanced to enable the Enhanced C1 Halt State to lower the CPU clock frequency and the supply voltage before turning off the clocks.

## ▶IDE Configuration Sub-Menu

When this sub-menu is selected, the AMI BIOS automatically displays the following items:

### IDE Configuration

This feature allows the user to configure the IDE mode. The options are Disabled, P-ATA (Parallel ATA) only, S-ATA (Serial ATA) only and **P-ATA & S-ATA**.

#### Combined Mode Operation

This feature allows the user to select the IDE Combined Mode. The options are **P-ATA 1st Channel** and S-ATA 1st Channel.

#### S-ATA Ports Definition

This feature allows the user to configure the Serial ATA Ports. The options are **P0-Master/P1-Slave** and P0-Slave/P1-Master.

### Primary IDE Channel Master/Slave, Secondary IDE Channel Master/Slave

These settings allow the user to set the parameters of Primary IDE Channel Master/Slave and Secondary IDE Channel Master/Slave 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

Select the type of device connected to the system. The options are Not Installed, **Auto**, CDROM and ARMD.

#### LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

#### Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select "Disabled" to allow the data to be transferred from and to the device one sector at a time. Select "**Auto**" to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it.

### PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4. Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs. Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs. Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs. Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs. Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

### DMA Mode

Select Auto to allow the BIOS to auto detect the DMA mode. Use this value if the IDE disk drive support cannot be determined. Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MBs. Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MBs. Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MBs. Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MBs. Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MBs. Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MBs. Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2. Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MBs. Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MBs. Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MBs. Select UDMA4 to allow the BIOS to use Ultra DMA mode 4 . It has a data transfer rate of 100 MBs. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

### S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "Auto" to allow the AMI BIOS to auto detect hard disk drive support. Select "Disabled" to prevent the AMI BIOS from using the S.M.A.R.T. Select "Enabled" to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

### 32-Bit Data Transfer

Select **Enabled** to activate the function of 32-Bit data transfer. Select "Disabled" to disable this function. The options are **Enabled** and Disabled.

### Hard Disk Write Protect

Select Enabled to enable the function of Hard Disk Write Protect to prevent data from being written to HDD. The options are Enabled or **Disabled**.

### IDE Detect Time Out

This feature allows the user to set the time-out value for detecting ATA, ATA PI devices installed in the system. The options are 0 (sec), 5, Mode 1.0, 15, 20, 25, 30, and **35**.

### ATA(PI) 80Pin Cable Detection

This feature allows the AMI BIOS to auto-detect 80Pin ATA(PI) Cable. The options are **Host & Device**, Host and Device.

## ▶Floppy Configuration

This option allows the user to configure the settings for the Floppy Drives installed in the system.

### Floppy A/Floppy B

Move the cursor to these fields via up and down arrow keys to select the floppy type. The options are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3½", **1.44 MB 3½"**, and 2.88 MB 3½".

## ▶PCI/PnP Configuration

This feature allows the user to set the PCI/PnP configurations for the following items:

### Clear NVRAM

Select Yes to clear NVRAM during system boot. The options are Yes and **No.**

### Plug & Play OS

Select Yes to allow the OS to configure Plug & Play devices. (This is not required for system boot if you system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

### PCI Latency Timer

This option sets the latency of all PCI devices on the PCI bus. The default setting is "**64**." Select "32" to set the PCI latency to 32 PCI clock cycles. Select "64" to set the PCI latency to 64 PCI clock cycles. Select "96" to set the PCI latency to 96 PCI clock cycles. Select "128" to set the PCI latency to 128 PCI clock cycles. Select "160" to set the PCI latency to 160 PCI clock cycles. Select "192" to set the PCI latency to 192 PCI clock cycles. Select "224" to set the PCI latency to 224 PCI clock cycles. Select "248" to set the PCI latency to 248 PCI clock cycles.

### Allocate IRQ to PCI VGA

Set this value to allow or restrict the system from giving the VGA adapter card an interrupt address. The options are **Yes** and No.

### Palette Snooping

Select Enabled to inform the PCI devices that an ISA graphics device is installed in the system in order for the graphics card to function properly. The options are Enabled and **Disabled**.

### PCI IDE BusMaster

Set this value to allow or prevent the use of PCI IDE busmastering. Select "Enabled" to allow the BIOS to use the PCI busmaster for reading and writing to IDE drives. The options are **Disabled** and Enabled.

### Offboard PCI/ISA IDE Card

This option allows the user to assign a PCI slot number to an off-board PCI/ISA IDE card in order for it to function properly. The options are **Auto**, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5, and PCI Slot6.

### IRQ3/IRQ4/IRQ5/IRQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15

This feature specifies the availability of an IRQ to be used by a PCI, PnP device. Select Reserved for an IRQ to be used by a Legacy ISA device. The options are **Available** and Reserved.

### DMA Channel 0/Channel 1/Channel 3/Channel 5/Channel 6/Channel 7

Select Available to indicate that a specific DMA channel is available to be used by a PCI/PnP device. Select Reserved if a DMA channel specified is reserved for a Legacy ISA device.

### Reserved Memory Size

This feature specifies the size of memory block to be reserved for Legacy ISA devices. The options are **Disabled**, 16K, 32K and 64K.

## ▶Super IO Configuration Submenu

### Onboard Floppy Controller

Set to enabled to enable the onboard floppy controller. The options are **Enabled** and Disabled.

### Serial Port1 Address/Serial Port2 Address

This option specifies the base I/O port addresses and the Interrupt Request addresses of Serial Port 1 and Serial Port 2. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable. Select "3F8/IRQ4" to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The

options for Serial Port 1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port 2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4 and 2E8/IRQ3.

## ▶Advanced Chipset Settings

This item allows the user to configure the Advanced Chipset settings for the system.

### ▶NorthBridge Configuration

This feature allows the user to configure the settings for the Intel E7520 NorthBridge chipset.

### Memory Remap Feature

Select Enabled to allow remapping of the overlapped PCI memory above the total physical memory. The options are **Enabled** and Disabled.

### Max. Payload of Slot#5/Slot#6

This feature allows the user to set the maximum payload size that PCI-Exp. Slot#5/ Slot#6 can support for Transaction Layer Packets (TLPs). The options are **128B** and 256B.

### ▶SouthBridge Configuration

This feature allows the user to configure the settings for the Intel ICH South Bridge chipset.

### Power Button Instant-Off

If set to Enabled, the system will power off immediately as soon as the user hits the power button. If set to Disabled, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Enabled** and Disabled.

### ▶Intel PCI-X Hub Configuration

### Slot#1/Slot#2/Slot#3/Slot#4 Bus Frequency

This option allows the user to set the maximum PCI speed to be used in the PCI slot specified. Select "Auto" to allow the BIOS automatically detect the capability of the device installed on the bus. The options for Slot 1 are Auto, 33 MHz PCI, 66 MHz PCI, 66 MHz PCI-X, and 100 MHz PCI-X. The options for Slot 2 to Slot 4 are Auto, 33 MHz PCI, 66 MHz PCI, 100 MHz PCI-X, and 133 MHz PCI-X.

### I/O Port Decode

This option allows the user to select the decode range for the I/O connections. The options are **4K Decode** and 1K Decode.

### VGA 1G-Bit Decode

Select Enabled to enable the function of decoding VGA for the devices installed behind the PXH PCI Controller Hub. The options are **Enabled** and Disabled.

## ▶APCI Configuration

This item allows the user to enable or disable the ACPI support for the operating system.

### ACPI OS

Select Yes to enable ACPI support for your operating system. The options are **Yes** and No.

### ▶Advanced ACPI Configuration

Use this feature to configure additional ACPI options. Select Yes if the operating system supports ACPI. Select No if the operating system does not support ACPI. The options are No and **Yes**.

#### ACPI 2.0 Features

Select Yes to allow the RSDP pointers to point to the Fixed System Description Tables. Select No to deactivate this function. The options are Yes and **No**.

#### ACPI APIC Support

Select Enabled to allow the ACPI APIC Table Pointer to be included in the RSDP pointer list. The options are **Enable** and Disabled.

#### AMI OEMB Table

Select Enabled to allow the OEMB Table Pointer to be included in the R(x)SDT pointer lists. The options are **Enabled** and Disabled.

#### Headless Mode

Select Enabled to activate the Headless Operation Mode through the ACPI and will allow the BIOS to boot up the system without any keyboard, mouse and video. The options are Enabled and **Disabled**.

## ▶Event Log Configuration

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

### View Event Log

This feature allows the user to view all unread events.

#### Mark All Events as Read

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

### Clear Event Log

This setting will clear all event logs when set to OK. The options are OK and **Cancel**.

## ▶Hardware Health Configuration

This feature allows the AMI BIOS to automatically display the status of the following items:

### ▶Temperatures

### CPU Overheat Temperature

This feature allows the user to set the CPU Overheat temperature threshold. The options range from 65°C to 90°C. Use the <+> and <-> keys to set the desired setting. The default setting is **78°C**.

The AMI BIOS will automatically monitor and display the following information:

**CPU1 Temperature, CPU2 Temperature, CPU3 Temperature, CPU4 Temperature and System Temperature**

### ▶Fan Speed

**Fan Speed Control:**

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 vice versa. 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 constantly run at full speed (12V). The options are **Disable**, 3-pin (Server), and 3-pin (Workstation).

**Fan1-Fan9 Speeds**

### ▶Voltage

**Voltage Monitoring**

CPU1-CPU4 Vcore
+3.3V,
+5V,
+12Vcc,
-12Vcc,
+3.3V Standby

## ▶MPS Configuration

This section allows the user to configure the multiprocessors table.

**MPS Revision**

This feature allows the user to select the MPS Revision. Please follow the instructions given on the screen to select the MPS Revision Number. The options are 1.1 and **1.4.**

## ▶PCI Express Configuration

This section allows the user to configure the PCI Express slots.

**Active State Power Management**

Select Enabled to activate the function of power management for signal transactions between the PCI Express L0 and L1 Links. The options are Enabled and **Disabled**.

## ▶SMBIOS Configuration

### SMBIOS SMI Support

Select Enabled to enable the function of SMBIOS SMI Wrapper support for PnP Func 50h-54h. The options are **Enabled** and Disabled.

## ▶Remote Access Configuration

You can use this screen to select options for the Remote Access Configuration. Use the up and down arrow keys to select an item. Use the <+> and <-> keys to change the value of the selected option.

### Remote Access

This feature allows the user to enable the function of Remote Access. The options are Enabled and **Disabled**.

If the item "Remote Access" is set to Enabled, you can select a Remote Access type and configure the following settings:

#### Serial Port Number

This feature allows the user to select the serial port for Console Redirection. The options are **COM1** and COM2.

#### Base Address

This feature allows the user to set Base Address for the Serial Port Selected. The default setting is **2F8h, 8**.

#### Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, N, 1**, 57600 8, N, 1, 38400 8, N, 1, 19200 8, N, 1 and 9600 8, N, 1.

#### Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None,** Hardware, and Software.

#### Redirection After BIOS POST

This feature allows the user to select Disabled to turn off Console Redirection after POST. Select **Always** to keep Console Redirection active all the time. Note: this setting may not be supported by some operating systems. Select Boot Loader to keep Console Redirection active during POST and Boot Loader.

### Terminal Type

This feature allows the user to select the target terminal type for Console Redirection.The options are **ANSI**, VT100, and VT-UTF8.

### VT-UTF8 Comb Key Support

This feature allows the user to select Enabled to enable the VT-UTF8 Combination Key support for the ANSI/VT100 Terminals. The options are **Enabled** and Disabled.

### Sredir Memory Display Delay

This feature allows the user to decide how many seconds the BIOS shall wait before memory information is displayed. The options are: **No Delay**, Delay 1 Sec., Delay 2 Sec. and Delay 4 Sec.

## ▶USB Configuration

This feature allows the user to configure the USB settings.

### USB Function

This feature allows you to enable the USB Ports. The options are Disabled, 2 USB Ports, 4 USB Ports, and **Enabled.**

### Legacy USB Support

Select Enabled to enable USB Legacy support. Disable legacy support if there are no USB devices installed in the system. The options are Disabled, **Enabled**, and Auto.

### USB 2.0 Controller

This setting allows you to enable or disable the USB 2.0 Controller. The options are Disabled and **Enabled**.

### USB 2.0 Controller Mode

This setting allows you to configure the USB 2.0 Controller Mode. The options are **Hi-Speed (480 Mbps)** and Full Speed-(12Mbps).

### Stop EHCI HC in OHCI Handover

Select Enabled to halt an ECHI Host Controller during OHCI OS handover calls when the EHCI Host Controller is not supported by the Operating System.

### Hot Plug USB FDD Support

Set to Enabled to create a dummy FDD device to be used as a hot-plug FDD. Set to Auto for a hot-plug FDD device to be automatically created if a USB FDD is not detected. The options are **Auto,** Enabled and Disabled.

## ▶BIOS Settings Configuration

**Quick Boot**

If Enabled, this option will skip certain tests during POST to reduce the time needed for system bootup. The options are **Enabled** and Disabled.

**Quiet Boot**

This option allows the boot up screen options to be modified between POST messages or the OEM logo. Select **Disabled** to allow the computer system to display the POST messages. Select Enabled to allow the computer system to display the OEM logo.

**Add-On ROM Display Mode**

This option allows the BIOS to display add-on ROM (read-only memory) messages. Select **Force BIOS** to display a third party BIOS during system boot. Select "Keep Current" to display the current BIOS information during system boot.

**Boot up Num-Lock**

This option allows the Number Lock setting to be modified during boot up. The default setting is **On**. The options are On and Off.

**PS/2 Mouse Support**

This option allows the PS/2 mouse support to be modified. The options are **Auto**, Enabled and Disabled.

**System Keyboard**

This option allows the user to enable or disable all keyboards connected to the system. The options are **Present** and Absent.

**Wait for 'F1' If Error**

Select Enable to activate the function of Wait for F1 if Error. The options are **Enabled** and Disabled.

**Hit 'DEL' Message Display**

Select Enabled to display the Setup Message when the user hits the DEL key. The options are **Enabled** and Disabled.

**Onboard SCSI RAID**

Select Enable to enable the Onboard SCSI RAID devices. The options are Enabled and **Disabled**.

### Interrupt 19 Capture

Select Enabled to allow ROMs to trap Interrupt 19. The options are Enabled and **Disabled**.

### Watch Dog Timer

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**.

### Resume On Modem Ring

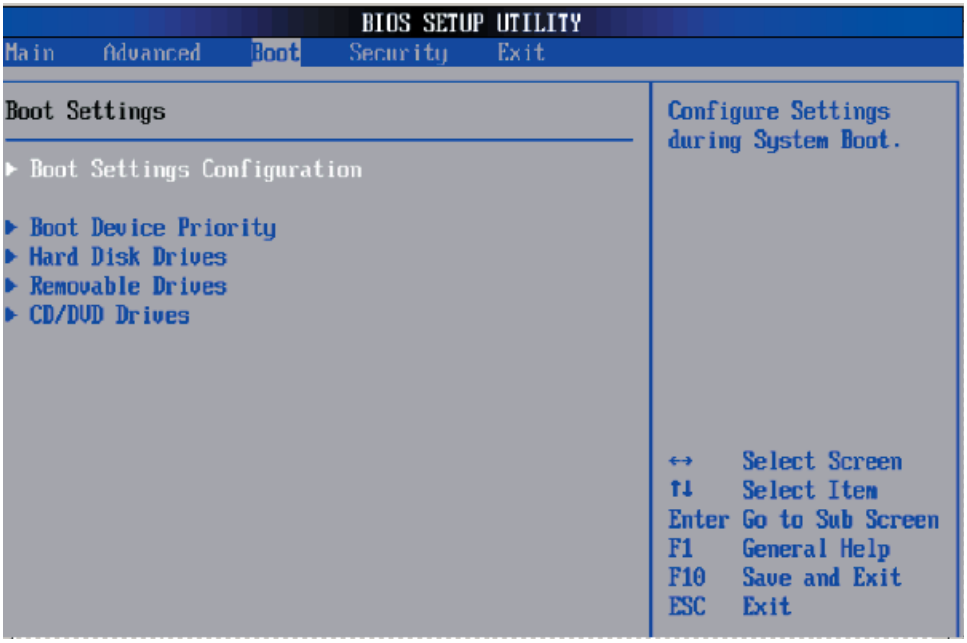
Select On to "wake your system up" when an incoming call is received by your modem. The options are On and **Off**.

### Restore on AC Power Loss

The feature allows the user to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before the power loss. The options are Power-On, Power-Off and **Last State**.

## 7-4 Boot Settings

This feature allows the user to configure the following items:



## ▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device.

The settings are 1st Floppy Drive, CD-ROM, ATAPI CD-ROM and Disabled. The default settings are:

· 1st boot device – 1st Floppy Drive

· 2nd boot device – CD/DVD: PS-UJDA770

· 3rd boot device – SCSI: 00, AIC-7902B

· 4th boot device – Network: IBA GE Slot

· 5th boot device – Network: IBA GE Slot

· 6th boot device – Network: IBA GE Slot

## ▶Hard Disk Drives

This feature allows the user to specify the boot sequence from available Hard Drives.

### 1st Drive

· 1ST boot device – SCSI: 00, AIC-7902B

## ▶Removable Drives

This feature allows the user to specify the boot sequence from available removable drives.

### 1st Drive

This option allow the user to specify the boot sequence for 1st removable drive. The options are **1st Floppy Drive** and Disabled.

## ▶CD/DVD Drives

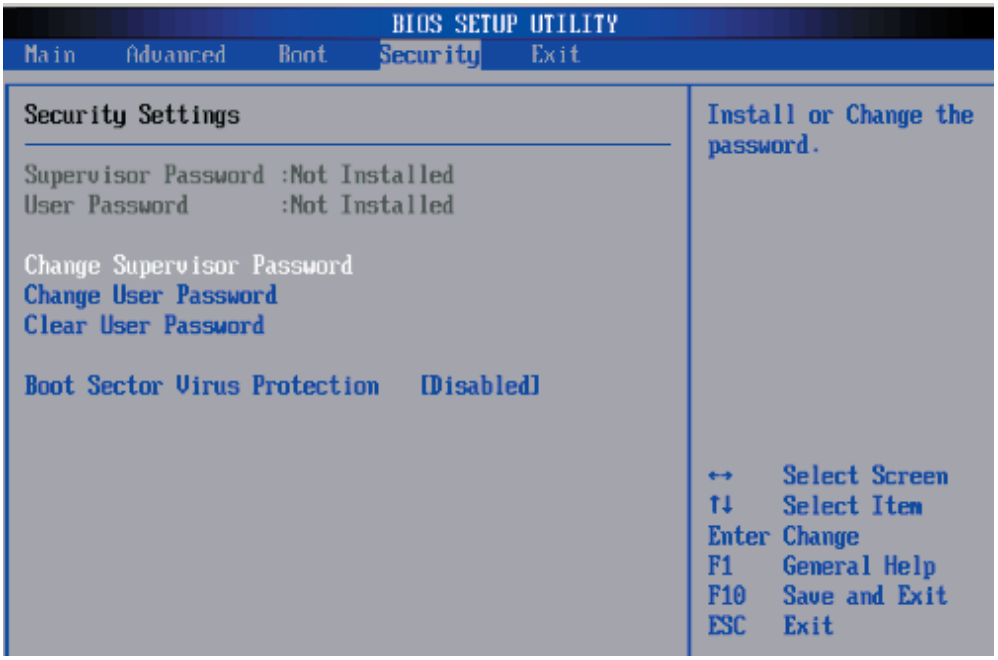
This feature allows the user to specify the boot sequence from available CD/DVD-Drives.

### 1st Drive

This option allows the user to specify the boot sequence for the 1st CD/DVD drive. The options are CD/DVD: PS-UJDA770, CD/DVD and Disabled.

## 7-5 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.




### Change Supervisor Password

Select this option and press <Enter> to access the sub-menu, and then type in the password.

### Change User Password

Select this option and press <Enter> to access the sub-menu, and then type in the password.

### Clear User Password

This option allows the user to clear a password that has been previously entered into the system.

### Password Check

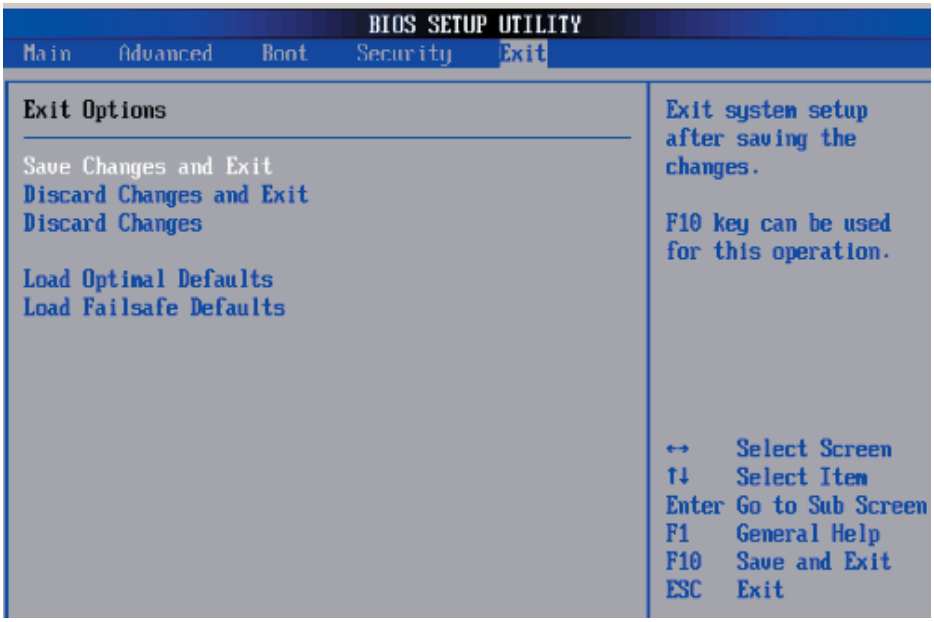
Set to **Setup** to allow the system to perform a password check when the BIOS Setup is invoked. Set to Always to allow the system to perform a password check when the BIOS Setup is invoked or when the system boots up.

### Boot Sector Virus Protection

This option is near the bottom of the Security Setup screen. Select "Disabled" to deactivate the Boot Sector Virus Protection. Select "Enabled" to enable boot sector protection. When Enabled, the AMIBOIS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

## 7-6 Exit Options

Select the Exit tab from the AMIBIOS Setup Utility screen to enter the Exit BIOS Setup screen.




### Saving Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

### Discarding Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

### Discarding Changes

Select this option and press <Enter> to discard all the changes and return to the AMIBIOS Utility Program.

### Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, Select "OK" to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

### Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

# Appendix A

# BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

**Non-fatal errors** are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

**Fatal errors** are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list, on the following page, correspond to the number of beeps for the corresponding error.

| Beep Code | Error Message | Description |
|---|---|---|
| 1 beep | Refresh | Circuits have been reset. (Ready to power up.) |
| 5 short, 1 long | Memory error | No memory detected in system |
| 8 beeps | Display memory read/write error | Video adapter missing or with faulty memory |

# Notes

# Appendix B

# BIOS POST Checkpoint Codes

When AMIBIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, diagnostic equipment can be attached to the computer to read I/O port 0080h.

## B-1 Uncompressed Initialization Codes

The uncompressed initialization checkpoint codes are listed in order of execution:

| Checkpoint | Code Description |
|---|---|
| D0h | The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified. |
| D1h | Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh and entering 4 GB flat mode next. |
| D3h | Starting memory sizing next. |
| D4h | Returning to real mode. Executing any OEM patches and setting the Stack next. |
| D5h | Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0. |
| D6h | Control is in segment 0. Next, checking if <Ctrl> <Home> was pressed and verifying the system BIOS checksum. If either <Ctrl> <Home> was pressed or the system BIOS checksum is bad, next will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h. |

## B-2 Bootblock Recovery Codes

The bootblock recovery checkpoint codes are listed in order of execution:

| Checkpoint | Code Description |
|---|---|
| E0h | The onboard floppy controller if available is initialized. Next, beginning the base 512 KB memory test. |
| E1h | Initializing the interrupt vector table next. |
| E2h | Initializing the DMA and Interrupt controllers next. |
| E6h | Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory. |
| Edh | Initializing the floppy drive. |
| Eeh | Looking for a floppy diskette in drive A:. Reading the first sector of the diskette. |
| Efh | A read error occurred while reading the floppy drive in drive A:. |
| F0h | Next, searching for the AMIBOOT.ROM file in the root directory. |
| F1h | The AMIBOOT.ROM file is not in the root directory. |
| F2h | Next, reading and analyzing the floppy diskette FAT to find the clusters occupied by the AMIBOOT.ROM file. |
| F3h | Next, reading the AMIBOOT.ROM file, cluster by cluster. |
| F4h | The AMIBOOT.ROM file is not the correct size. |
| F5h | Next, disabling internal cache memory. |
| FBh | Next, detecting the type of flash ROM. |
| FCh | Next, erasing the flash ROM. |
| FDh | Next, programming the flash ROM. |
| FFh | Flash ROM programming was successful. Next, restarting the system BIOS. |

## B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution. These codes are uncompressed in F0000h shadow RAM.

| Checkpoint | Code Description |
|---|---|
| 03h | The NMI is disabled. Next, checking for a soft reset or a power on condition. |
| 05h | The BIOS stack has been built. Next, disabling cache memory. |
| 06h | Uncompressing the POST code next. |
| 07h | Next, initializing the CPU and the CPU data area. |
| 08h | The CMOS checksum calculation is done next. |
| 0Ah | The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next. |
| 0Bh | The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued. |
| 0Ch | The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller. |
| 0Eh | The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test. |
| 0Fh | The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next. |
| 10h | The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command. |
| 11h | Next, checking if <End or <Ins> keys were pressed during power on. Initializing CMOS RAM if the Initialize CMOS RAM in every boot AMIBIOS POST option was set in AMIBCP or the <End> key was pressed. |
| 12h | Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2. |
| 13h | The video display has been disabled. Port B has been initialized. Next, initializing the chipset. |
| 14h | The 8254 timer test will begin next. |
| 19h | Next, programming the flash ROM. |
| 1Ah | The memory refresh line is toggling. Checking the 15 second on/off time next. |
| 2Bh | Passing control to the video ROM to perform any required configuration before the video ROM test. |
| 2Ch | All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it. |
| 2Dh | The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control |
| 23h | Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors. |
| 24h | The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin. |

| Checkpoint | Code Description |
|---|---|
| 25h | Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on. |
| 27h | Any initialization before setting video mode will be done next. |
| 28h | Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next. |
| 2Ah | Bus initialization system, static, output devices will be done next, if present. See the last page for additional information. |
| 2Eh | Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next. |
| 2Fh | The EGA/VGA controller was not found. The display memory read/write test is about to begin. |
| 30h | The display memory read/write test passed. Look for retrace checking next. |
| 31h | The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next. |
| 32h | The alternate display memory read/write test passed. Looking for alternate display retrace checking next. |
| 34h | Video display checking is over. Setting the display mode next. |
| 37h | The display mode is set. Displaying the power on message next. |
| 38h | Initializing the bus input, IPL, general devices next, if present. See the last page of this chapter for additional information. |
| 39h | Displaying bus initialization error messages. See the last page of this chapter for additional information. |
| 3Ah | The new cursor position has been read and saved. Displaying the Hit <DEL> message next. |
| 3Bh | The Hit <DEL> message is displayed. The protected mode memory test is about to start. |
| 40h | Preparing the descriptor tables next. |
| 42h | The descriptor tables are prepared. Entering protected mode for the memory test next. |
| 43h | Entered protected mode. Enabling interrupts for diagnostics mode next. |
| 44h | Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next. |
| 45h | Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next. |
| 46h | The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next. |
| 47h | The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next. |
| 48h | Patterns written in base memory. Determining the amount of memory below 1 MB next. |
| 49h | The amount of memory below 1 MB has been found and verified. |
| 4Bh | The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next. |

| Checkpoint | Code Description |
|---|---|
| 4Ch | The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next. |
| 4Dh | The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next. |
| 4Eh | The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next. |
| 4Fh | The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next. |
| 50h | The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next. |
| 51h | The memory size display was adjusted for relocation and shadowing. |
| 52h | The memory above 1 MB has been tested and initialized. Saving the memory size information next. |
| 53h | The memory size information and the CPU registers are saved. Entering real mode next. |
| 54h | Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next. |
| 57h | The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next. |
| 58h | The memory size was adjusted for relocation and shadowing. Clearing the Hit <DEL> message next. |
| 59h | The Hit <DEL> message is cleared. The <WAIT...> message is displayed. Starting the DMA and interrupt controller test next. |
| 60h | The DMA page register test passed. Performing the DMA Controller 1 base register test next. |
| 62h | The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next. |
| 65h | The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next. |
| 66h | Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next. |
| 67h | Completed 8259 interrupt controller initialization. |
| 7Fh | Extended NMI source enabling is in progress. |
| 80h | The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next. |
| 81h | A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next. |
| 82h | The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next. |
| 83h | The command byte was written and global data initialization has completed. Checking for a locked key next. |
| 84h | Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next. |
| 85h | The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next. |

| Checkpoint | Code Description |
|---|---|
| 86h | The password was checked. Performing any required programming before WINBIOS Setup next. |
| 87h | The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next. |
| 88h | Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next. |
| 89h | The programming after WINBIOS Setup has completed. Displaying the power on screen message next. |
| 8Ch | Programming the WINBIOS Setup options next. |
| 8Dh | The WINBIOS Setup options are programmed. Resetting the hard disk controller next. |
| 8Fh | The hard disk controller has been reset. Configuring the floppy drive controller next. |
| 91h | The floppy drive controller has been configured. Configuring the hard disk drive controller next. |
| 95h | Initializing the bus option ROMs from C800 next. See the last page of this chapter for additional information. |
| 96h | Initializing before passing control to the adaptor ROM at C800. |
| 97h | Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next. |
| 98h | The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control. |
| 99h | Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next. |
| 9Ah | Set the timer and printer base addresses. Setting the RS-232 base address next. |
| 9Bh | Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next. |
| 9Ch | Required initialization before the Coprocessor test is over. Initializing the Coprocessor next. |
| 9Dh | Coprocessor initialized. Performing any required initialization after the Coprocessor test next. |
| 9Eh | Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next. |
| A2h | Displaying any soft errors next. |
| A3h | The soft error display has completed. Setting the keyboard typematic rate next. |
| A4h | The keyboard typematic rate is set. Programming the memory wait states next. |
| A5h | Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next. |
| A7h | NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next. |
| A8h | Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next. |

| Checkpoint | Code Description |
|---|---|
| A9h | Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next. |
| Aah | Initialization after E000 option ROM control has completed. Displaying the system configuration next. |
| Abh | Uncompressing the DMI data and executing DMI POST initialization next. |
| B0h | The system configuration is displayed. |
| B1h | Copying any code to specific areas. |
| 00h | Code copying to specific areas is done. Passing control to INT 19h boot loader next. |

# Notes

# Appendix C

# System Specifications

### Processors

Quad Intel® Xeon® processor 7100 Series

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

### Chipset

Intel E8501

### BIOS

8 Mb AMIBIOS® Flash ROM

### Memory Capacity

Sixteen 240-pin DIMM sockets supporting up to 64 GB of registered ECC DDR2-400 SDRAM

**Note: See the memory section in Chapter 5 for details.**

### SATA Controller

ICH5 (South Bridge) on-chip controller for 3 Gb/s Serial ATA (supports RAID 0, 1, and JBOD)

### SCSI Controller

AIC-7902W for dual channel Ultra320 SCSI (supports RAID 0, 1, 10 and JBOD)

### Drive Bays

Five (5) hot-swap drive bays to house five (5) standard SCSI drives

### Expansion Slots

Supports the use of six PCI expansion slots: one PCI-Express x8 slot, one PCI-Express x4 slot, three 64-bit 133 MHz PCI-X slots and one 64-bit 100 MHz PCI-X slot. (The 100 MHz PCI-X slot supports Zero Channel RAID.)

### Serverboard

H8QT8 (proprietary ATX form factor)
Dimensions: 16" x 14.3" (406 x 363 mm)

### Chassis
SC748TS-R1200P (1U rackmount)
Dimensions (both): (WxHxD) 17.2 x 7 x 25.5 in. (437 x 178 x 648 mm)

### Weight
Gross (Bare Bone): 65.5 lbs. (29.8 kg.)

### System Cooling (fan speed controlled by BIOS setting, Chp 7)
Three (3) 9-cm chassis fans
Three (3) 8-cm exhaust fans

### System Input Requirements
AC Input Voltage: 100-240 VAC
Rated Input Current: 15A (115V) to 6A (240V)
Rated Input Frequency: 50-60 Hz

### Power Supply
Rated Output Power: 1200W (Part# PWS-1K22-1R)
Rated Output Voltages: +5V (20A), +12V (100A), -12V (0.6A), +3.3V (20A), +5Vsb (4A)

### BTU Rating
5882 BTUs/hr (for rated output power of 1200W)

### 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