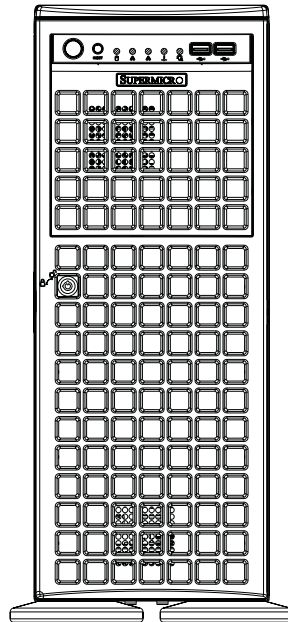


# SUPERO<sup>®</sup>

## SUPERSERVER AS-4021GA-62R+F



## USER'S MANUAL

Revision 1.0a

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Manual Revision 1.0a  
Release Date: January 29, 2010

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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 AS-4021GA-62R+F. Installation and maintenance should be performed by experienced technicians only.

The SuperServer AS-4021GA-62R+F is based on the SC747TG-R1400SQ 4U/Tower rackmount server chassis and the Super H8DA6+-F serverboard. Please refer to our web site for an up-to-date list of supported operating systems, processors and memory.

## 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 Super H8DA6+-F serverboard and the SC747TG-R1400SQ chassis.

### Chapter 2: Server Installation

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

### Chapter 3: System Interface

Refer to this chapter 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 system.

### Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the H8DA6+-F serverboard, including the locations and functions of connectors, 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 SC747TG-R1400SQ 4U/Tower rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

### **Chapter 7: BIOS**

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

### **Appendix A: BIOS POST Messages**

### **Appendix B: BIOS POST Codes**

### **Appendix C: System Specifications**

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# Chapter 1

## Introduction

### 1-1 Overview

The SuperServer AS-4021GA-62R+F is a supercomputing server that is comprised of two main subsystems: the SC747TG-R1400SQ 4U/Tower server chassis and the H8DA6+-F dual AMD Socket F type processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system ([www.supermicro.com](http://www.supermicro.com)).

In addition to the serverboard and chassis, various hardware components have been included with the server, as listed below:

- Two (2) 4-wire Active Heatsinks for Socket F processors (SNK-P0024AP4)
- Two (2) 92x38-mm 4-pin PWM cooling fans with housing (FAN-0082L4)
- Two (2) 92x38-mm 4-pin PWM cooling fan with housing (FAN-0114L4)
- SAS accessories:
  - One (1) IEEE 1394 (Firewire) Cable (CBL-0173L)
  - One (1) I/O shield (MCP-260-00025-0N)
  - One (1) HD backplane (BPN-SAS-747TQ)
  - Two (2) 23-cm IPASS to 4 SATA cables (CBL-0118L)
  - Eight (8) 3.5" hard disk drive trays (MCP-220-97301-0B)
  - One (1) 5.25" drive tray (MCP-220-00073-0B)
- Chassis cables:
  - One (1) 30-inch Round 16 to 16-pin ribbon front panel cable (CBL-0071L)
  - Four (4) 20-cm 4 to 4-pin middle fan power extension cables (CBL-0216L)
  - Two (2) 30-cm 4 to 4-pin rear fan power extension cables (CBL-0286L)
- One (1) 4U 17.2" width rail set (MCP-290-00059-0N) (optional)
- One (1) Supermicro CD containing drivers and utilities

## 1-2 Serverboard Features

At the heart of the SuperServer AS-4021GA-62R+F lies the H8DA6+-F, a dual processor serverboard based on the AMD SR5690 and AMD SP5100 chipsets. Below are the main features of the H8DA6+-F. (See Figure 1-1 for a block diagram of the chipset).

### Processors

The H8DA6+-F supports two AMD Opteron 2000 series (Socket F type) processors. and the the AMD SR5690/SP5100 chipset, which functions as a Media and Communications Processor (MCP). Controllers for the system memory are integrated directly into AMD Opteron processors Please refer to the serverboard description pages on our web site for a complete listing of supported processors ([www.supermicro.com](http://www.supermicro.com)).

### HyperTransport Technology

HyperTransport technology is a high-speed, low latency point to point link that was designed to increase the communication speed by a factor of up to 48x between integrated circuits. This is done partly by reducing the number of buses in the chipset to reduce bottlenecks and by enabling a more efficient use of memory in multi-processor systems. The end result is a significant increase in bandwidth within the chipset.

### Memory

The H8DA6+-F has Sixteen single/dual channel DIMM slots supporting up to 128 GB of DDR2-800/667/533 registered ECC SDRAM. Modules of the same size and speed are recommended (for Unbuffered ECC/Non-ECC memory, a maximum of 2 GB per DIMM is supported). See Chapter 5 for details.

### Serial ATA

A SATA controller is integrated into the SP5100 chipset to provide a six-port 3/ Gbs SATA subsystem, which is RAID 0, 1 and 10 supported. The SATA drives are hot-swappable units.

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

## SAS

An LSI2008 SAS2 controller is integrated into the chipset to provide two IPASS connectors that can serve up to 8 hot-swappable drive units. The SAS2 controller can support RAID 0, 1, 10 and JBOD. An optional AOC-IMRRAKEY-2008-LSI key provides RAID-5 support.

## PCI Expansion Slots

The H8DA6+-F has four PCI-E Gen. 2.0 x16 slots (Slot 1, Slot 3, Slot 5, Slot 7), two (2) PCI-Express x4 (in x8) Gen 2 slots (Slot 4, Slot 6) and one (1) PCI slot (Slot 2).

## Onboard Controllers/Ports

The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, ten USB 2.0 ports (six rear USB ports, two front headers, and two Type A connections), PS/2 mouse and keyboard ports, IPMI dedicated LAN port, High Definition Audio ports and two Gb Ethernet ports.

## 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, auto-switching voltage regulators, a chassis intrusion header, keyboard wakeup from soft-off, console redirection, chassis and CPU overheat sensors, fan status monitor with firmware control, Pulse Width Modulation (PWM) Fan Control, power-up mode control for recovery from AC power loss, main switch override mechanism, ACPI Power Management, system resource alert via Supero Doctor III, virus protection and BIOS rescue.

## 1-3 Server Chassis Features

The following is a general outline of the main features of the SC747TG-R1400SQ server chassis.

## **System Power**

Each SC747 chassis model includes a Gold level 1400W High-efficiency redundant (1+1) power supply (93%), rated at 1400 Watts. In the unlikely event your power supply fails, replacement is simple and can be done without tools. The AC power cord should be removed from the system before servicing or replacing the power supply. See Chapter 6 for details.

## **Mounting Rails (optional)**

The SC747 can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual in chapter 2.

## **Hard Drive/Drive Bays**

The SC747 Chassis features eight slots for SAS/SATA drives. These drives are hot -swappable. Once set up correctly, these drives can be removed without powering down the server.

Each SC747 Chassis provides three 5.25" peripheral drive bays for floppy drives, DVD-ROM/CD-ROM Drives, or additional hard drives

## **Front Control Panel**

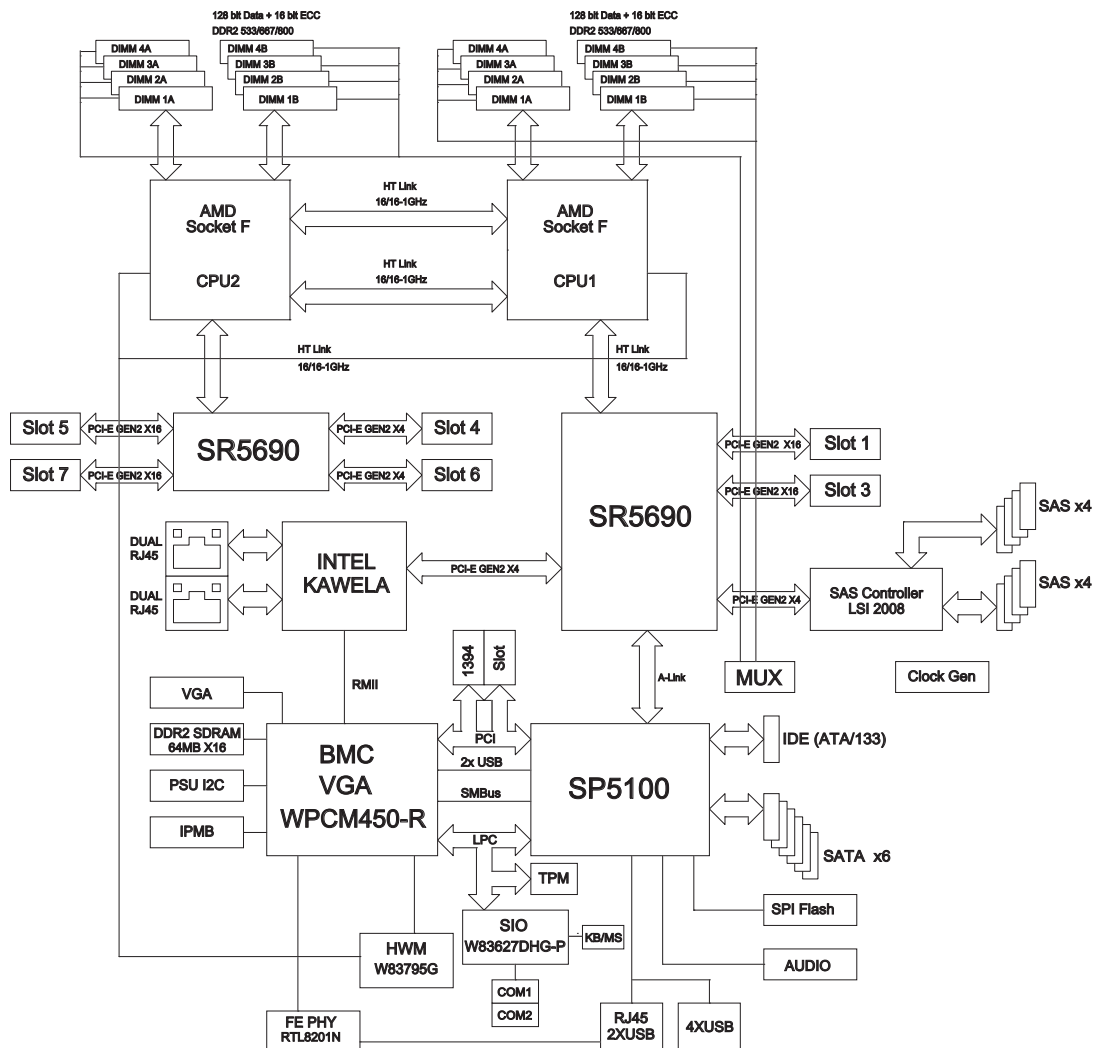
The control panel on the server provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, system overheat, UID and power supply failure. A main power button and a system reset button are also included.

## **Cooling System**

The SC747 chassis accepts four system fans and two rear exhaust fans. System fans are powered from the serverboard. These fans are 4U high and are powered by 4-pin connectors.

## **Backplane**

Each SC747 chassis comes with a 4U backplane. Depending on your order, your backplane will accept SAS/SATA. For more information regarding compatible backplanes, view the appendices found at the end of this manual. In addition, visit our Web site for the latest information: <http://www.supermicro.com>.



**Figure 1-1. AMD SR5690/SP5100 Chipset:  
System Block Diagram**

**Note:** This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

## 1-5 Contacting Supermicro

### Headquarters

Address: Super Micro Computer, Inc.  
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Tel: +886-(2) 8226-3990

Fax: +886-(2) 8226-3991

Web Site: www.supermicro.com.tw

Technical Support:  
Email: support@supermicro.com.tw

Tel: 886-2-8228-1366, ext.132 or 139

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# Chapter 2

## System Setup

### 2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer AS-4021GA-62R+F up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

### 2-2 Unpacking the System

You should inspect the box the SuperServer AS-4021GA-62R+F 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 setting up and operating the SuperServer AS-4021GA-62R+F. 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.



### Warnings and Precautions!



- Review the electrical and general safety precautions in Chapter 4.
- 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 power supply units and Serial ATA drives to cool before touching them.
- To maintain proper cooling, always keep all chassis panels closed when not being serviced.

## 2-3 Setting Up the System

You should first open the left side panel (when facing the front of the chassis) to make sure the motherboard is properly installed and all connections have been made.



**Warning:** Only qualified service technicians should access the inside of the system. Except for short periods of time, do NOT operate the system without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

### Checking the Motherboard Setup

1. Accessing the inside of the system: Begin by disconnecting the chassis from any power source. (A) Lift up and back on the main cover handle, which secures the cover to the chassis. (B) Lift the main cover off of the chassis. See Chapter 5 for details on Chassis covers and how to remove them.
2. Check the CPU (processor): You may have a processor already installed into the system board. The processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.
3. Check the system memory: Your system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.
4. Installing add-on cards: If desired, you can install up to seven 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 airflow. See Chapter 5 for details on cable connections.

### Checking the Drive Bay Setup

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

1. Accessing the peripheral drive bays: To install a component to either of the three 5.25" drive bays, you will need to remove the side chassis cover. See the installation and removal sections for the peripheral drives in Chapter 6.

2. Check the SAS/SATA disk drives: Depending upon your system's configuration, your system may have up to eight SAS/SATA drives already installed. If you need to install or remove a SAS/SATA drive, please refer to the appropriate section in Chapter 6.
3. Check the airflow: Cooling air is provided by the chassis fan and the power supply fan. The system component layout was carefully designed to promote sufficient airflow throughout 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 fan. Please keep this in mind when rerouting or adding/removing cables.
4. Supplying power to the system: The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit 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).

## 2-4 Preparing for Rack Mounting Setup

The box your chassis was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

### Choosing a Setup Location

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

### General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- 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 hard drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

## **Rack Mounting Considerations**

### **Ambient Operating Temperature**

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T<sub>mra</sub>).

### **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.).

## 2-5 Installing the Chassis onto a Rack

This section provides information on installing the SC747 chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

**NOTE:** The outer rail is adjustable from 26" to 38.25".

### Removing the Chassis Cover and Feet

The SC747 chassis is shipped with the chassis cover and feet pre-installed. Both the feet and cover must be removed for before installing the rails.

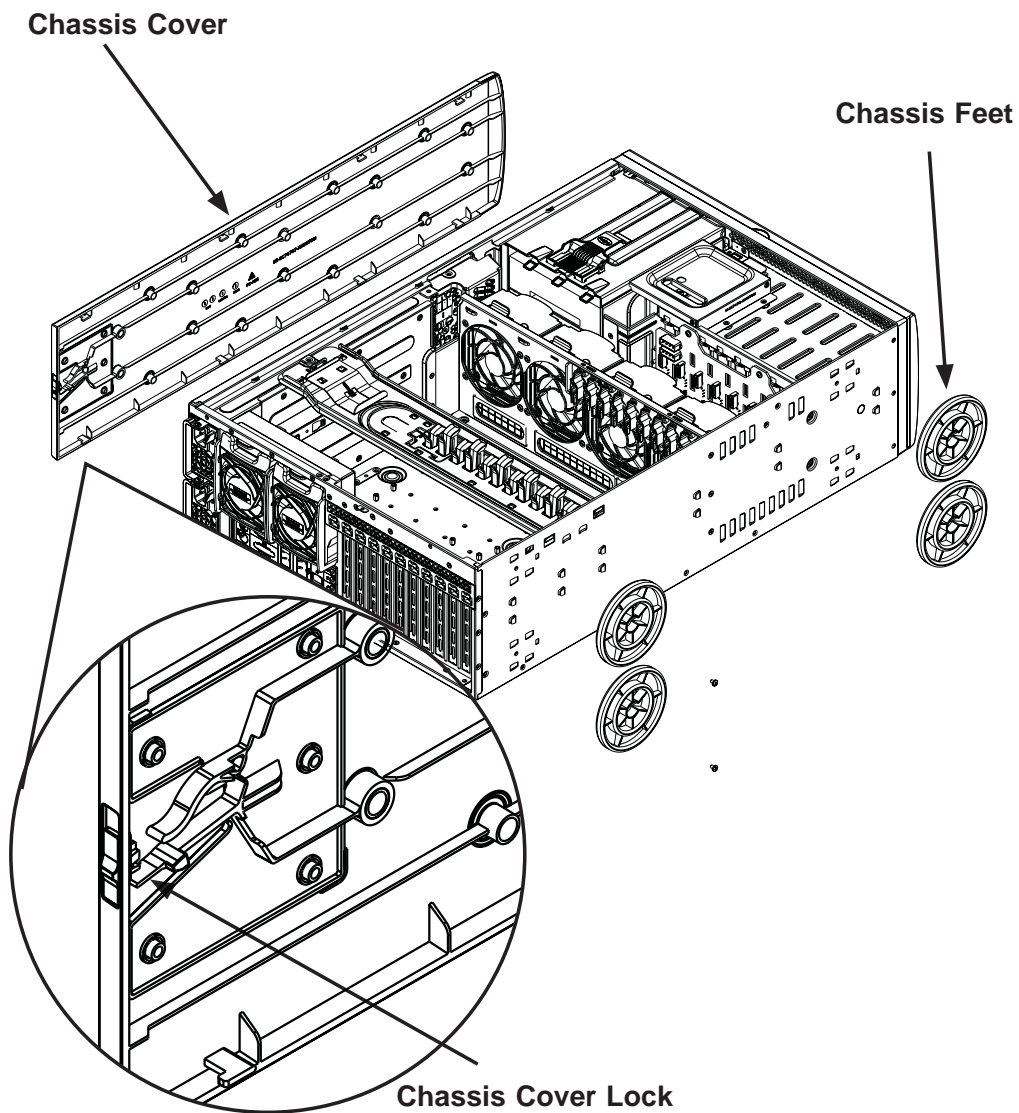


Figure 6-1: Removing the Feet and Chassis Top Cover

### ***Removing the Chassis Top Cover***

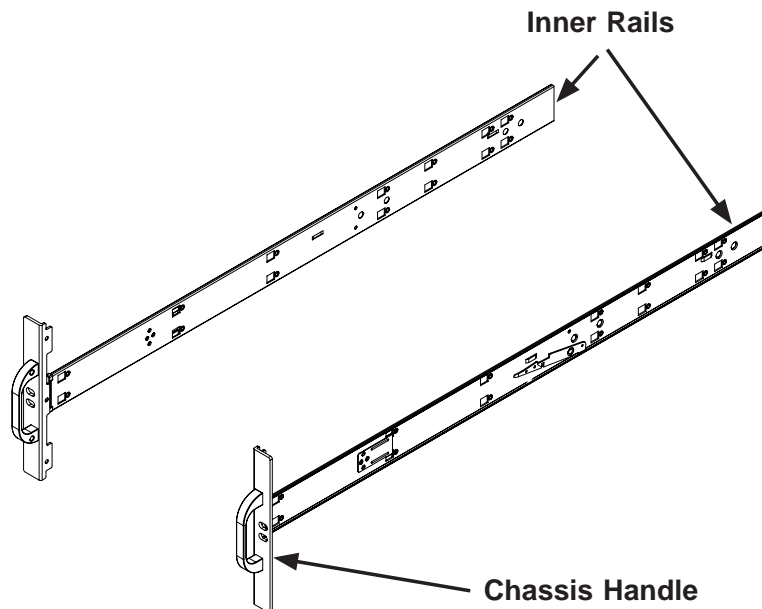
1. Locate the chassis cover lock (blue lever) at the rear of the chassis cover.
2. Slide the chassis cover lock to the right and push chassis cover forward.
3. Lift the chassis top cover off the chassis.

### ***Removing the Chassis Feet***

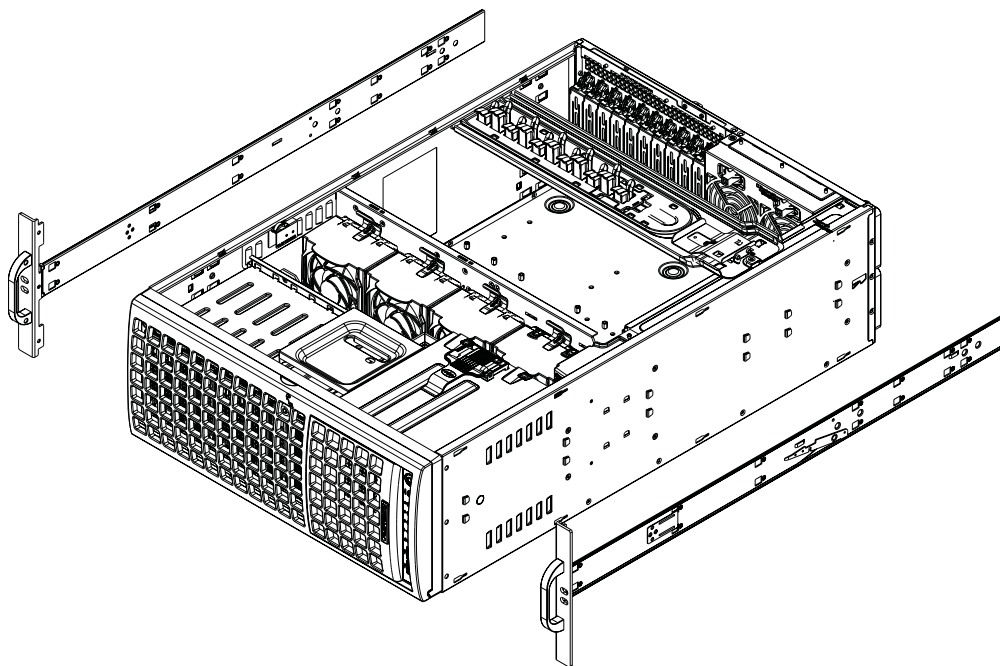
1. Place the chassis on its side with the chassis side cover facing upward.
2. Remove the screw holding the chassis foot in place.
3. The foot lock is a tab located in the center of the foot that prevents the foot from sliding. Using a flat head screwdriver, **gently** lift the foot lock upward and slide the foot toward the rear of the chassis.
4. Repeat steps 2 and 3 with each remaining foot.

## **Identifying the Sections of the Rack Rails**

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.



**Figure 6-2: Identifying the Inner Rails and Chassis Handles**



**Figure 6-3: Installing the Inner Rack Rails**

## **Installing the Chassis Handles and Inner Rails**

### ***Installing the Inner Rails***

1. Locate the chassis handles and handle screws.
2. Align the chassis handle with the front of the chassis and secure with the three chassis handle screws.
3. Repeats steps 1 and 2 with the other handle.
4. Locate the inner rails and screws in the shipping package.
5. Align the inner rails against the chassis, as shown. Confirm that the rails are flushed against the edge of the chassis.
6. Tighten the screws. Do not over-tighten.
7. Repeat steps 5 and 6 with the other inner rail.

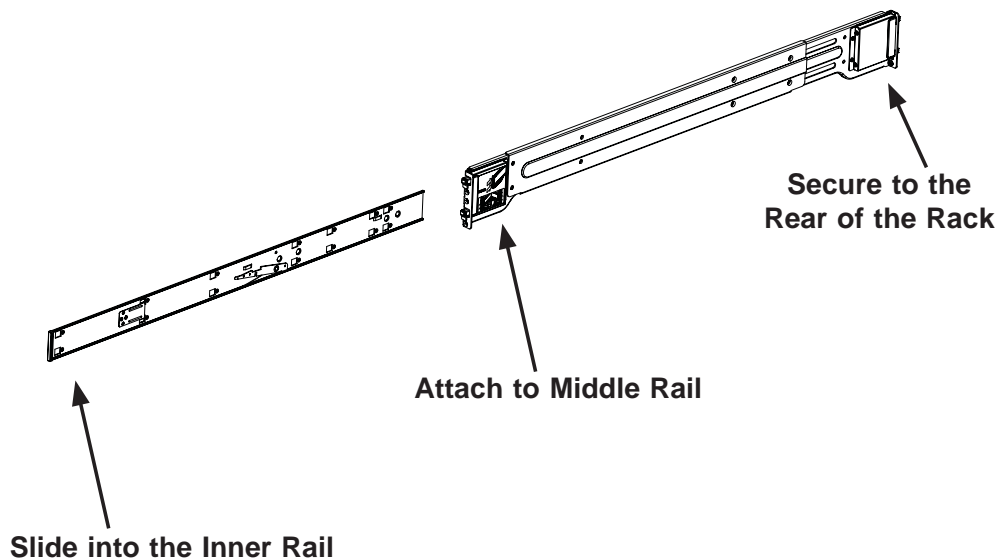
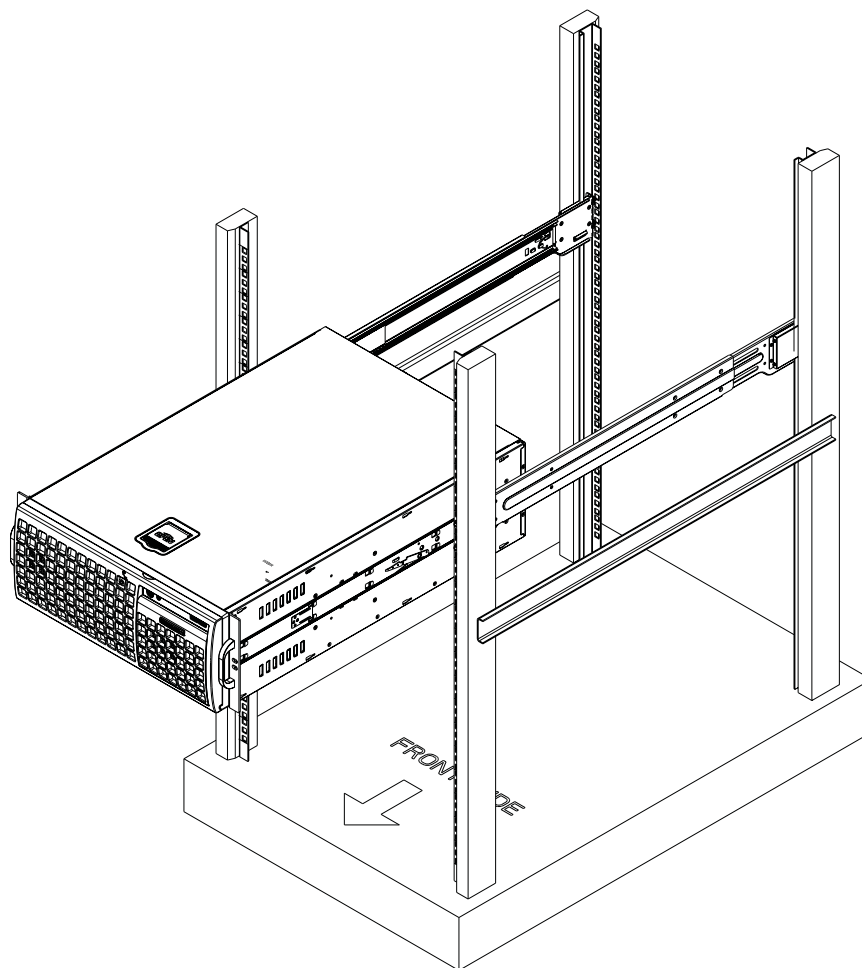


Figure 6-4: Assembling the Outer Rails

## Installing the Outer Rails to the Rack

### *Installing the Outer Rails*

1. Attach the rear bracket to the middle bracket.
2. Adjust both the brackets to the proper distance so that the rail fits snugly into the rack.
3. Secure the rear of the outer rail with two M5 screws and the rear of the rack.  
**NOTE:** The outer rail is adjustable from approximately 26" to 38.25".
4. Repeat steps 1-3 for the left outer rail.



**Figure 6-5: Installing the Rack Rails**

## **Installing the Chassis into a Rack**

### ***Installing the Chassis***

1. Confirm that chassis includes the inner rails and the outer rails.
2. Align the inner chassis rails with the front of the outer rack rails (C).
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the chassis has been pushed completely into the rack, you should hear the locking tabs "click" into the locked position.

## 2-6 Tower Mounting Instructions

The SC747 chassis is shipped with the chassis cover and feet pre-installed. To use the chassis as a desktop server, no other installation is required.

Use the instructions in this section if you have converted the chassis for rack use and need to return the chassis to tower mounting.

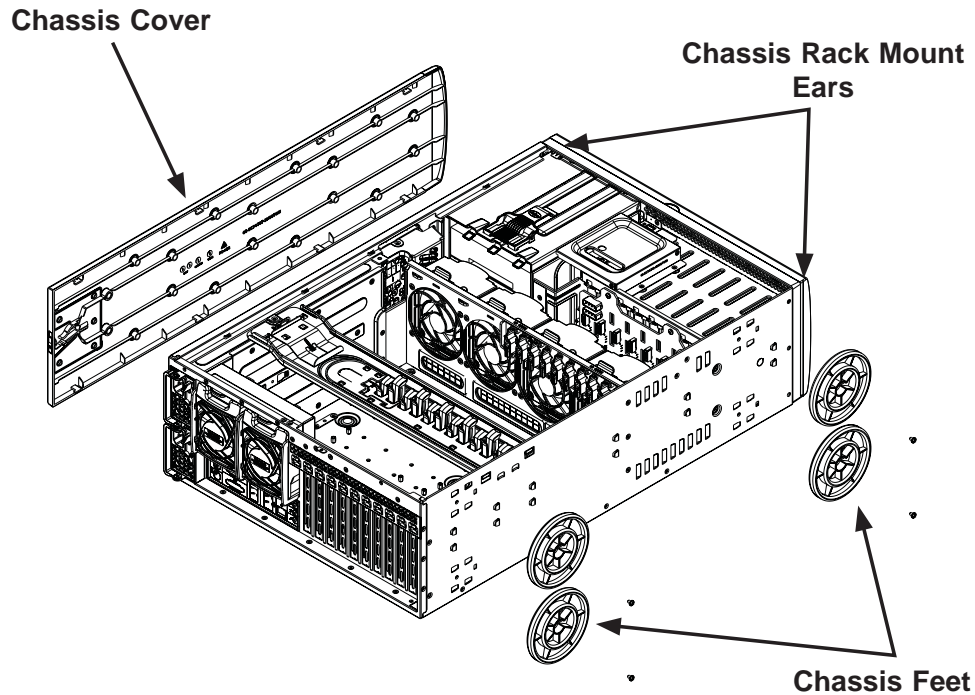
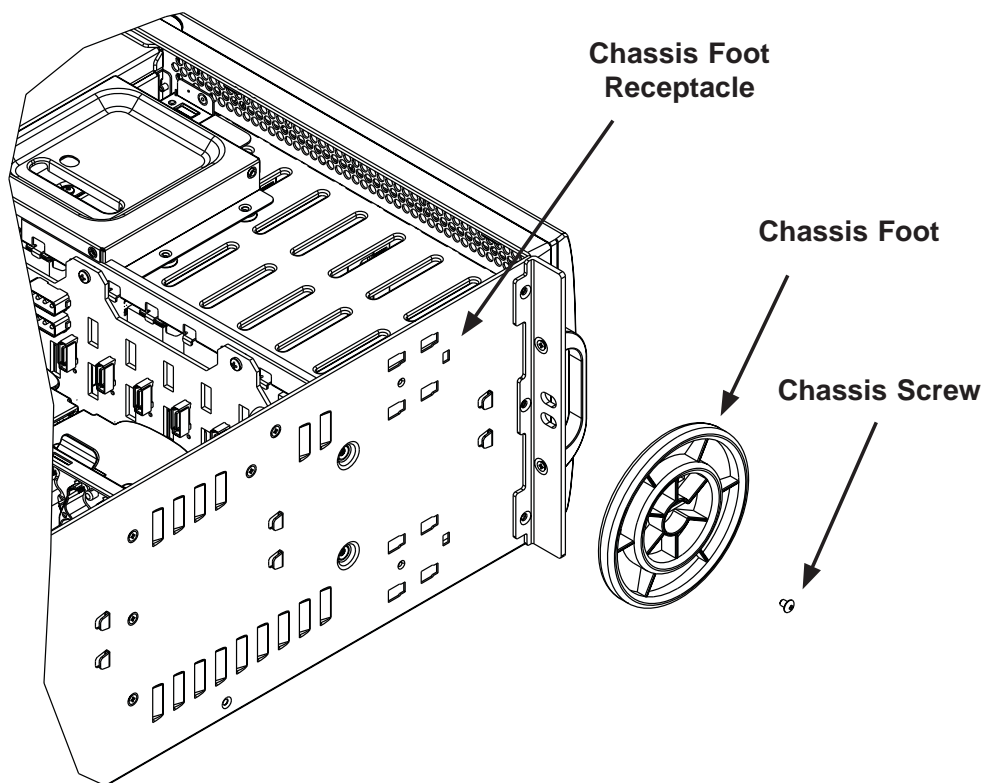


Figure 6-6: Adding Chassis Feet and Top Cover

### Installing the Chassis Cover

#### *Installing the Cover*

1. Remove the rack mount ears.
2. Align the cover post with the corresponding holes on the top of the chassis and place the cover on top of the chassis. The cover should overhang approximately one-half inch over the front of the chassis.
3. Slide the chassis cover toward the rear of the chassis to lock the cover into place.



**Figure 6-7: Placing Chassis Feet**

## **Installing Feet on the Chassis**

### ***Installing the Chassis Feet***

1. Place the chassis foot in the foot receptacle and slide the foot toward the front of the chassis. The foot should lock into place.
2. Secure the foot to the chassis using one screw enclosed in the packaging.
3. Repeat steps 1 and 2 for the remaining three chassis feet.

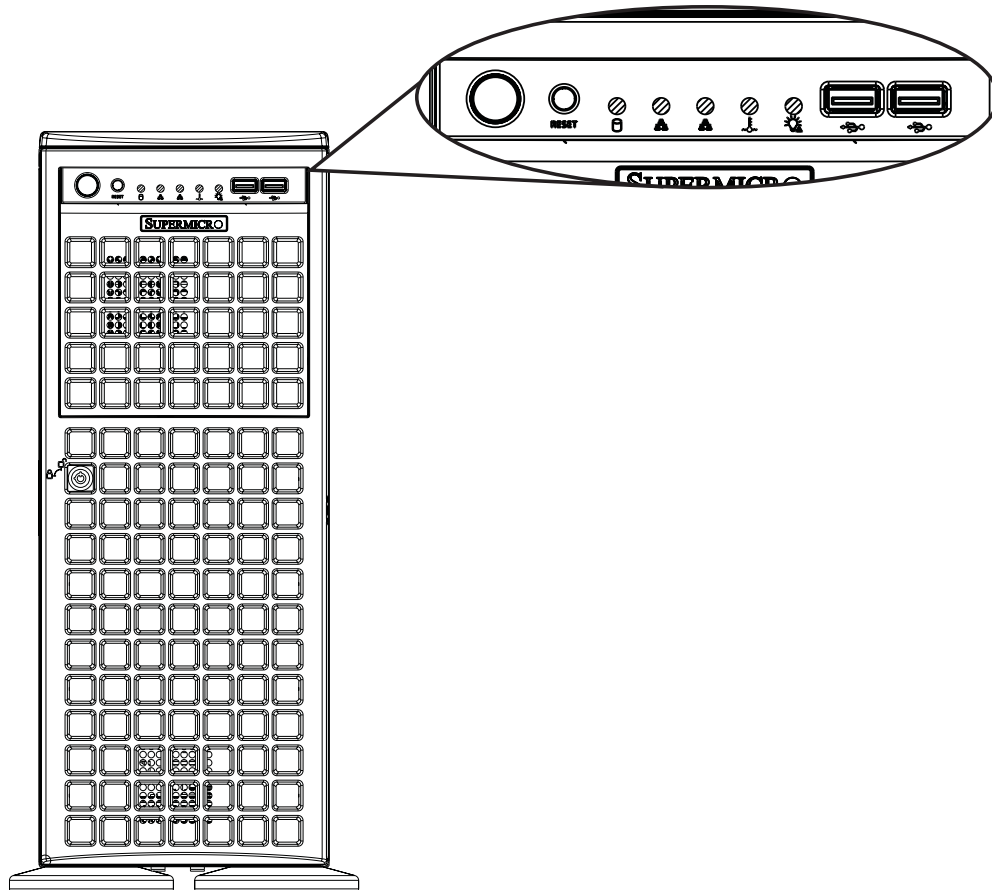
# Chapter 3

## System Interface

### 3-1 Overview

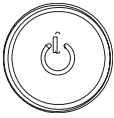
There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. Most SC747 models have two buttons on the chassis control panel: a reset button and an on/off switch. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

Figure 4-1: Front LEDs

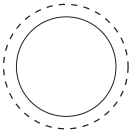


## 3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are power on/off button and a reset button.



- **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. Therefore, you must unplug system before servicing.



- **Reset:** The reset button is used to reboot the system.

## 3-3 Control Panel LEDs

The control panel located on the front of the SC747 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.



- **HDD:** Indicates IDE channel activity. SAS/SATA drive, SCSI drive, and/or DVD-ROM drive activity when flashing.



- **NIC1:** Indicates network activity on GLAN1 when flashing.



- **NIC2:** Indicates network activity on GLAN2 when flashing.



- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When continuously on (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. This LED will remain flashing or on as long as the overheat condition exists.



- **Power Fail:** Indicates a power failure to the system's power supply units.

## 3-4 Drive Carrier LEDs

Your chassis uses SAS/SATA drives.

### SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- **Green:** Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular SATA drive is being accessed. SAS drives are always on and do not blink.
- **Red:** The red LED to indicate an SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

## Chapter 4

# System Safety

### 4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer AS-4021GA-62R+F 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 floppy drive. When disconnecting power, you should first power down the operating system first and then unplug the power cords. The unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.
- 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 static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).
- 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.
- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

## 4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the AS-4021GA-62R+F clean and free of clutter.
- The AS-4021GA-62R+F weighs approximately 72 lbs (32.7 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:

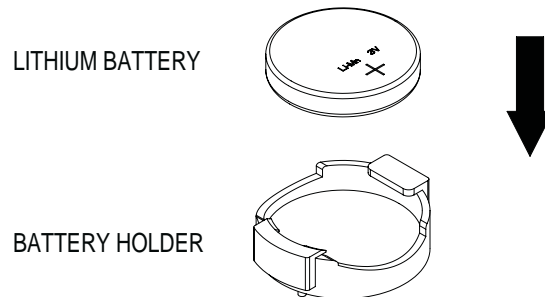
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact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

## 4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the AS-4021GA-62R+F is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

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



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

## Chapter 5

### Advanced Serverboard Setup

This chapter covers the steps required to install the H8DA6+-F serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

#### 5-1 Handling the Serverboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). 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 electric static discharge.

##### Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- 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 to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

## 5-2 Serverboard Installation

This section describes how to install the serverboard into the SC747 chassis system.



**Warning:** To avoid damaging the serverboard and its components, do not apply any force greater than 8 lbs. per square inch when installing a screw into a mounting hole.

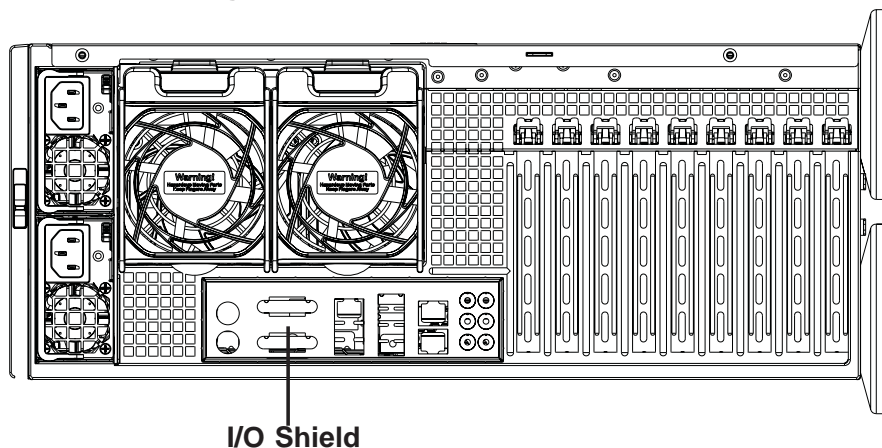
### I/O Slot Shield Installation

The I/O shield holds the motherboard ports in place. Install the I/O shield before you install the motherboard.

#### *Installing the I/O shield:*

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.
2. Open the chassis cover.
3. Choose the proper I/O shield for the motherboard you are installing.
4. With the illustrations facing the outside of the chassis, place the shield into the space provided. Once installed, the motherboard ports will hold the I/O shield in place.

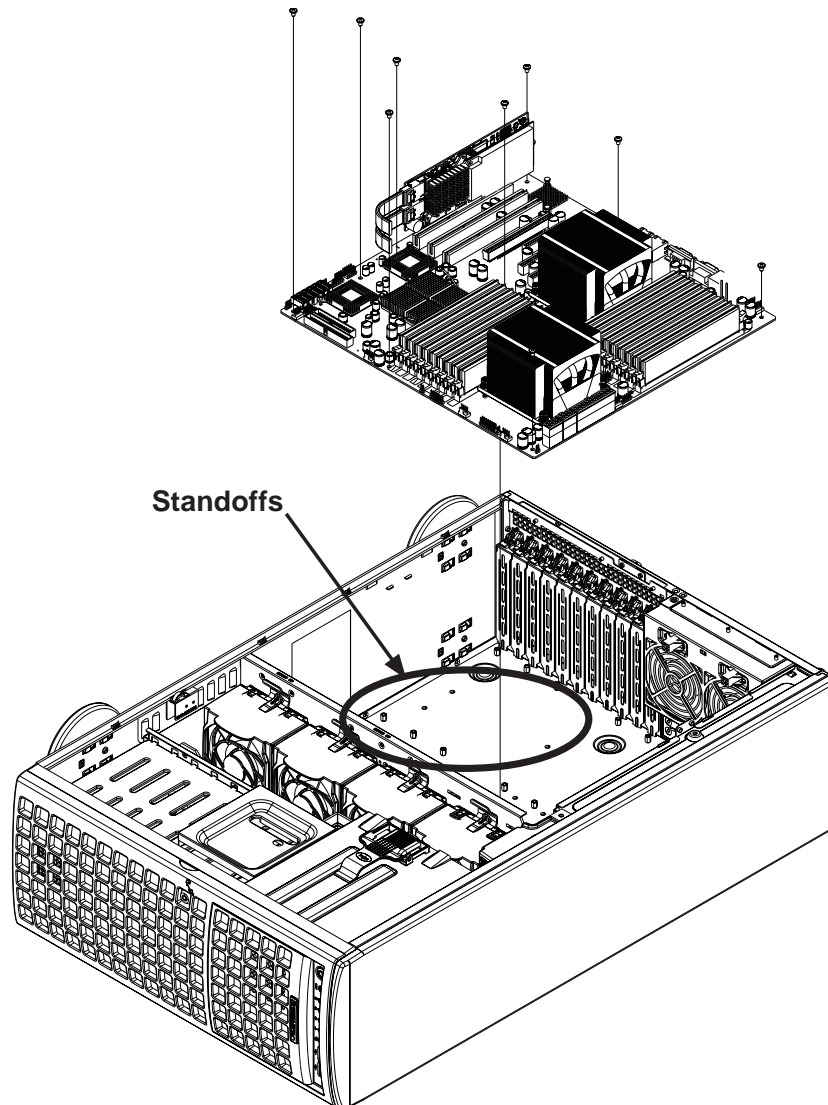
**Figure 5-1: SC747 Chassis I/O Shield**



## Permanent and Optional Standoffs

Standoffs prevent short circuits by securing space between the motherboard and the chassis surface. The SC747 chassis packaging includes optional standoffs (hexagon shaped posts). These standoffs accept the rounded Phillips head screws included in the SC747 accessories packaging.

**Figure 5-2: Chassis Standoffs**

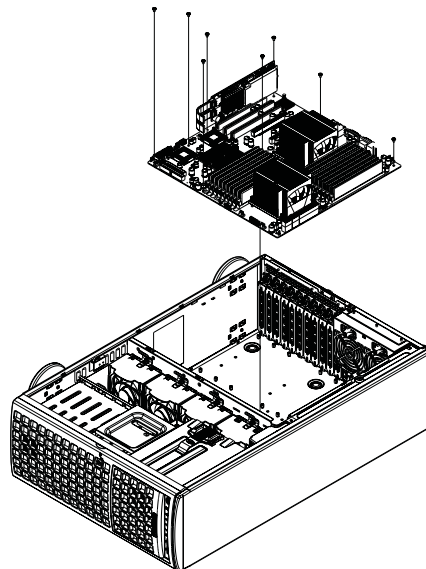


## Installing the Motherboard

### *Installing the Motherboard into the Chassis*

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.
2. Disconnect the power supply and lay the chassis on a flat surface.
3. Open the chassis cover.
4. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff. To do this:
  - a. Place a hexagonal standoff screw through the bottom the chassis.
  - b. Secure the screw with the hexagon nut (rounded side up). Do not exceed more than eight pounds of torque when tightening the motherboard.
5. Lay the motherboard on the chassis aligning the permanent and optional standoffs.
6. Secure the motherboard to the chassis using the rounded, Phillips head screws. Do not exceed eight pounds of torque on the motherboard.
7. Secure the CPU(s), heatsinks, and other components to the motherboard, chassis, and/or backplane as needed.

**Figure 5-3: Installing the Motherboard**



## 5-3 Connecting Cables

Now that the serverboard is installed, the next step is to connect the cables to the board. 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 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 keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-17 for connector locations.)

- SATA drive data cable (SATA0 ~ 5)
- Control Panel cable (JF1)

**Important!** Make sure the the cables do not come into contact with the fans.

### Connecting Power Cables

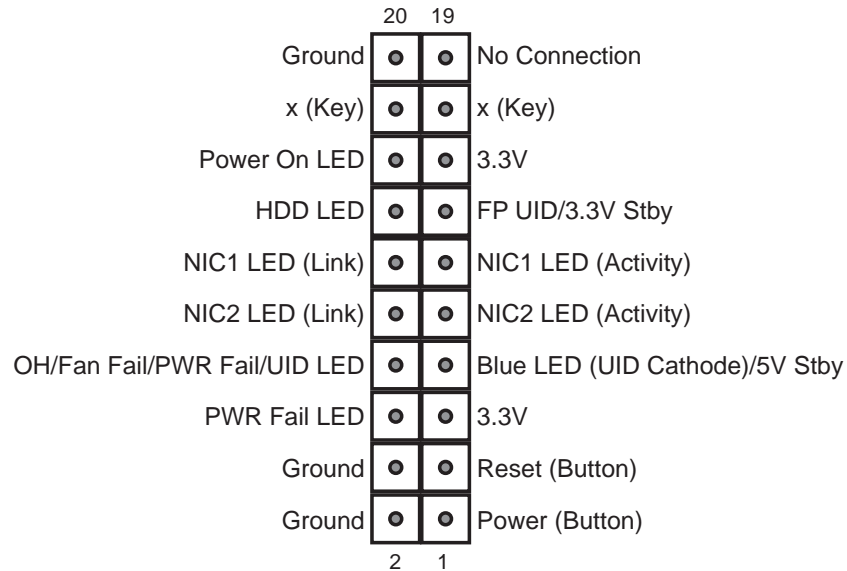
The H8DA6+-F has a 24-pin proprietary power supply connector (JPW1) for connection to the ATX power supply. In addition, there are two 8-pin secondary power connectors (JPW2, JPW3) that also must be connected to your power supply. See Section 5-8 for power connector pin definitions.

### Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-4 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See below for details and pin descriptions.

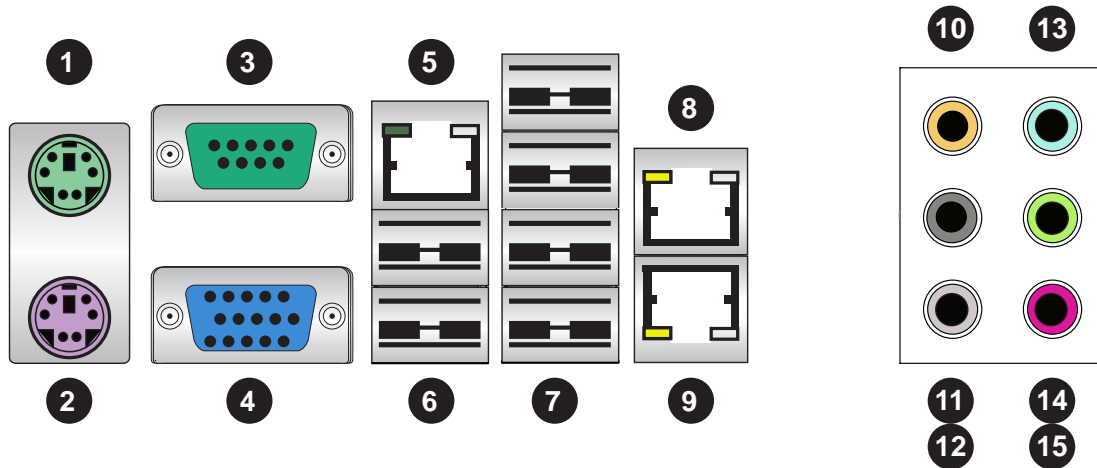
**Figure 5-4. Control Panel Header Pins**



## 5-4 I/O Ports

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

**Figure 5-5. I/O Port Locations and Definitions**



Rear I/O Ports		
1. PS/2 Keyboard	6. USB 0/1	11. Back Surround
2. PS/2 Mouse	7. USB 2/3/4/5	12. Side Surround
3. COM Port	8. LAN1	13. Line In
4. VGA Port	9. LAN2	14. Front
5. IPMI LAN Port	10. CEN/LFE	15. Microphone In

## 5-5 Installing the Processor and Heatsink



**Warning:** Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

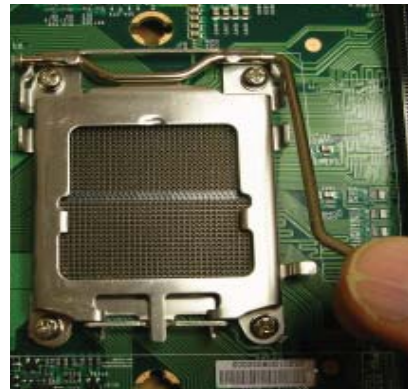
### Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

## Installing a CPU Processor

### *Installing the Processors*

1. Begin by removing the cover plate that protects the CPU. Lift the lever on the CPU socket until it points straight up. With the lever raised, lift open the silver CPU retention plate.



2. Use your thumb and your index finger to hold the CPU. Locate and align pin 1 of the CPU socket with pin 1 of the CPU. Both are marked with a triangle.

Triangles



3. Align pin 1 of the CPU with pin 1 of the socket. Once aligned, carefully place the CPU into the socket. *Do not drop the CPU on the socket, move the CPU horizontally or vertically or rub the CPU against the socket or against any pins of the socket, which may damage the CPU and/or the socket.*



4. With the CPU inserted into the socket, inspect the four corners of the CPU to make sure that it is properly installed and flush with the socket. Then, gently lower the silver CPU retention plate into place.



5. Carefully press the CPU socket lever down until it locks into its retention tab. For a dual-CPU system, repeat these steps to install another CPU into the CPU#2 socket (and into CPU#2, #3 and #4 sockets for a quad-CPU configuration).



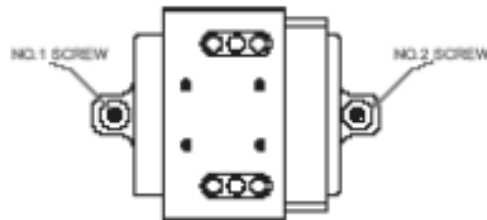
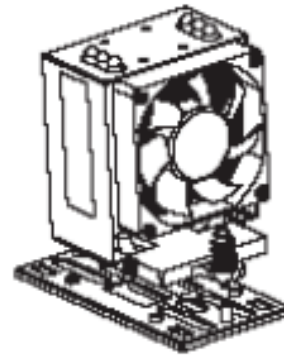
**Note:** in single and dual-CPU configurations, memory must be installed in the DIMM slots associated with the installed CPU(s). Memory is limited to a maximum of 64 for single CPU and 128 GB for dual CPU configurations.

## Installing a CPU Heatsink

Use the following procedure for installing the SNK-P0024AP4 active heatsink.

### *Installing the CPU Heatsink*

1. Do not apply any thermal grease to the heatsink or the CPU die because the required amount has already been pre-applied.
2. Pre-attach the base plate and insulation slice under the serverboard.
3. Place the heatsink directly on top of the CPU so that the fan faces the front of the chassis and the mounting holes are aligned with those on the base plate.
4. Screw in the two screws slightly.
5. Tighten each screw a few turns at a time while alternating between the two until fully tightened.
6. Connect the fan cable to the serverboard CPU fan header.



## Removing the Heatsink

Use the procedure below to remove a heatsink from a CPU.



**Warning:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to remove the heatsink, please follow the instructions below to uninstall the heatsink and prevent damage to the CPU or other components.

### *Removing a CPU Heatsink*

1. Unplug the power cord from the power supply.
2. Disconnect the heatsink fan wires from the CPU fan header.
3. Using a screwdriver, loosen and remove the heatsink screws from the serverboard.
4. Hold the heatsink and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink.)
5. Once the heatsink is loosened, remove it from the CPU socket.
6. Remove the base plate and insulation slice from under the serverboard.
7. To reinstall the CPU and the heatsink, 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 reinstalling them on the serverboard.

## 5-6 Installing Memory



CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

### Memory Support

The H8DA6+-F supports single or dual-channel, DDR2-667/533/400 registered ECC SDRAM.

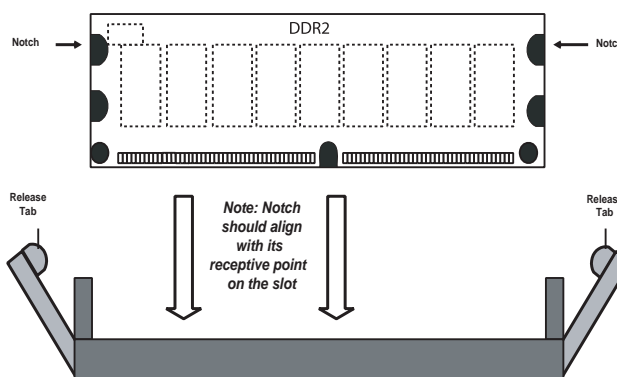
Populating two adjacent slots at a time with memory modules of the same size and type will result in interleaved (128-bit) memory, which is faster than non-interleaved (64-bit) memory.

**Note:** Due to a CPU limitation, fully populating DIMM slots with DDR2-667 will pull the speed down to 533 MHz. Please see our web site for possible updates to this limitation.

### Installing Memory Modules

1. Insert each memory module vertically into its slot, paying attention to the notch along the bottom of the module to prevent inserting the module incorrectly (see Figure 5-6).
2. Install to slots CPU1/DIMM1A and CPU1/DIMM1B first, then to CPU1/ DIMM2A and CPU1/DIMM2B, etc. Always install in pairs and in the numerical order of the DIMM slots. See support information below.

Figure 5-6. DIMM Installation



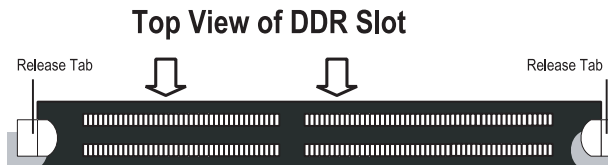
Note the notch in the slot and on the bottom of the DIMM. These prevent the DIMM from being installed incorrectly.

#### To Install:

Insert module vertically and press down until it snaps into place. The release tabs should close - if they do not you should close them yourself.

#### To Remove:

Use your thumbs to gently push each release tab outward to release the DIMM from the slot.



3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.
4. With two CPUs installed, repeat step 2 to populate the CPU2 DIMM slots. Always install pairs of DIMMs to both CPU DIMM slots for more efficient operation.

**Note:** 256 MB, 512 MB, 1 GB, 2 GB, 4 GB and 8 GB memory modules are supported. It is highly recommended that you remove the power cord from the system before installing or changing memory modules. Please refer to our web site for memory that has been tested on the H8DA6+/I+(-F) serverboard.

### ***Memory Support***

The H8DA6+-F supports up to 128 GB of DDR2-800/667/533 registered ECC SDRAM.

<b>Possible System Memory Allocation &amp; Availability</b>		
<b>System Device</b>	<b>Size</b>	<b>Physical Memory Available (4 GB Total System Memory)</b>
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-M boundary-	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS & other applications		2.84 GB

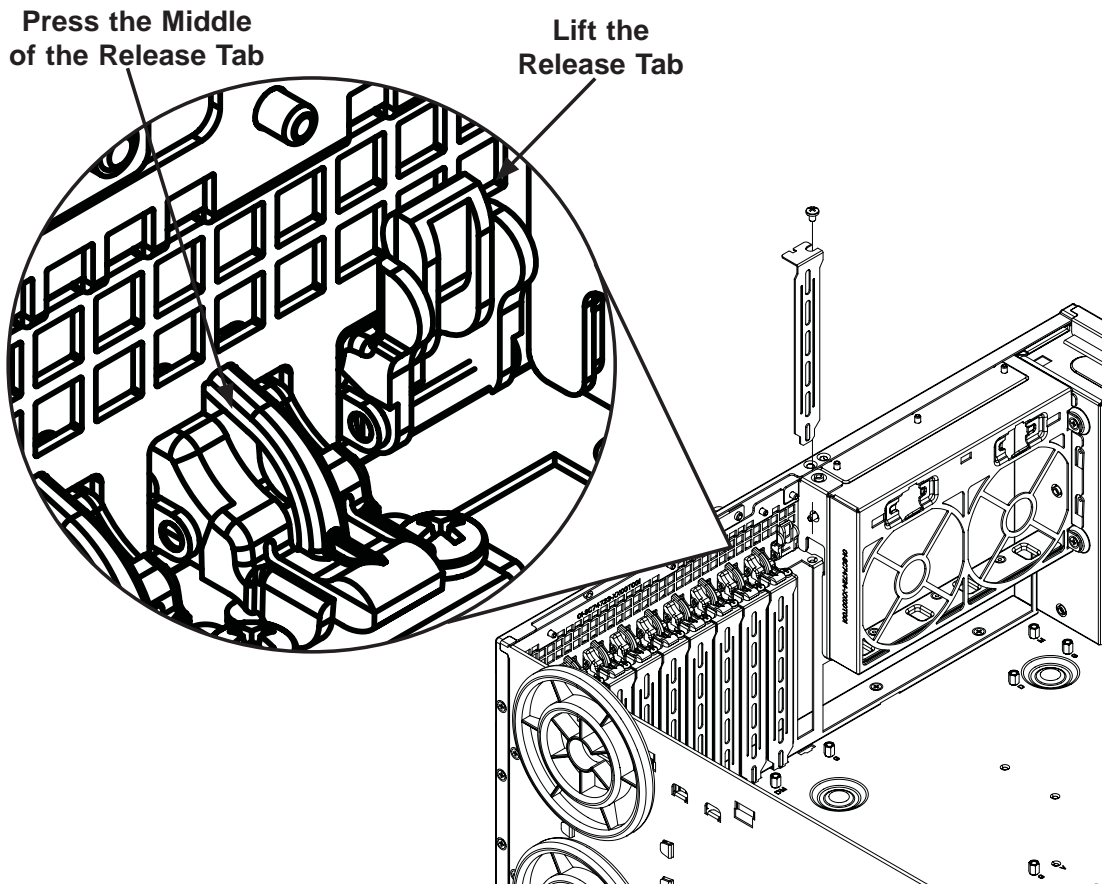
## 5-6 Adding PCI Add-On Cards

The SuperServer AS-4021GA-62R+F can support four PCI-E Gen. 2.0 x16 cards (in Slot 1, Slot 3, Slot 5, Slot 7), two PCI-E Gen. 2.0 x4 (in x8) cards (Slot 4, Slot 6), and one PCI 33 MHz cards (Slot 2) for a total of seven (7) PCI expansion cards.

### *Installing an Add-on Card*

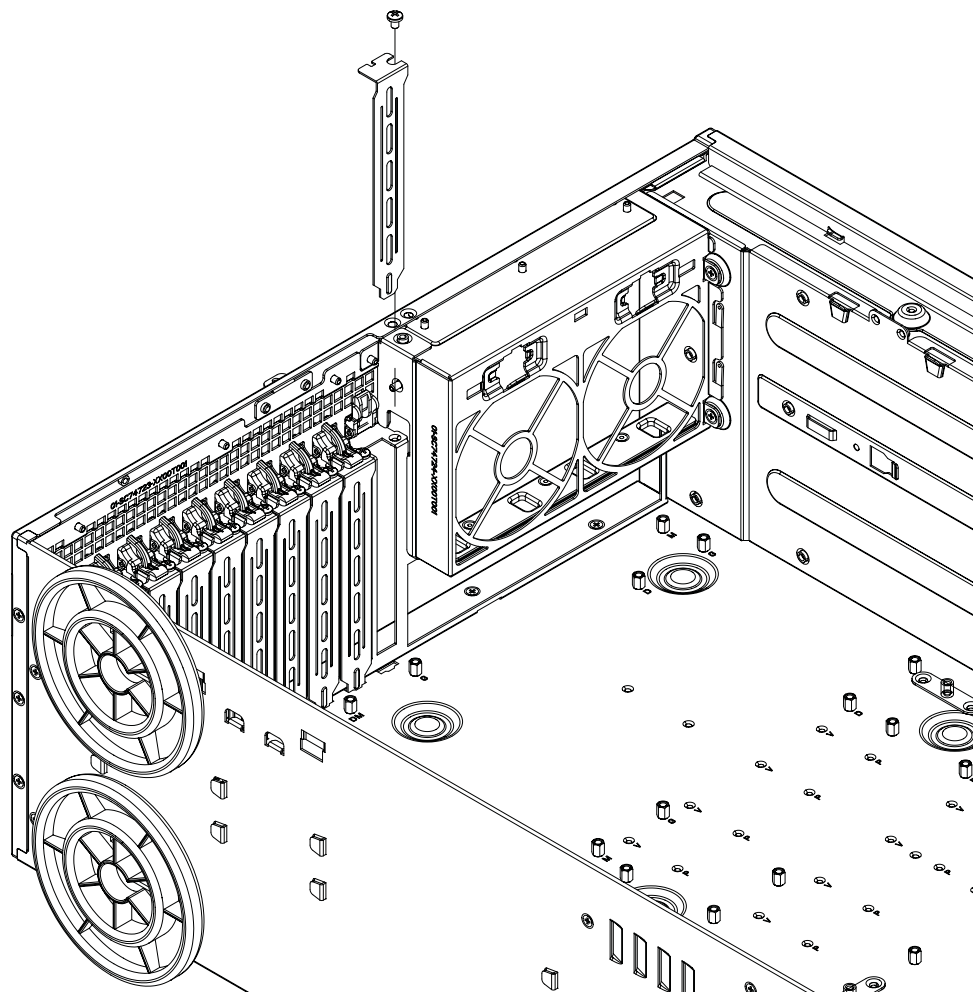
1. Locate the release tab on the top of the PCI slot bracket.
2. Gently apply pressure in the middle of the release tab to unlock the PCI slot bracket.
3. Pull the release tab upward.
4. Remove the screw holding the bracket in place and pull the bracket from the chassis.

Figure 5-7: Add-on Card/Expansion Card Port



5. Install your PCI card or other add-on card into the PCI slot bracket and motherboard. To do this, slide the PCI card (with "L" bracket) into the PCI slot

**Figure 5-8: Removing the PCI Card Slot Guard**



and secure the card to the motherboard.

6. Push the PCI bracket release tab down until it locks into place with an audible "click".
7. Secure the PCI card with the screw previously removed from the chassis.
8. Repeat this process with each PCI card you want to install into the chassis.

## Installing Double-Width Graphics Cards

The SC747 chassis is designed to support up to four double-width, high-end graphics cards. A (part number) bracket is recommended for this application and may be purchased by visiting the Supermicro Web site at <http://www.supermicro.com> and clicking on the Where to Buy link.

### *Installing Double-Width Graphics Cards*

1. Insert the graphics card into the appropriate add-on card slot (Figure 5-9)
2. Slide the graphics card down onto the motherboard.

Figure 5-9: Installing Graphics Cards

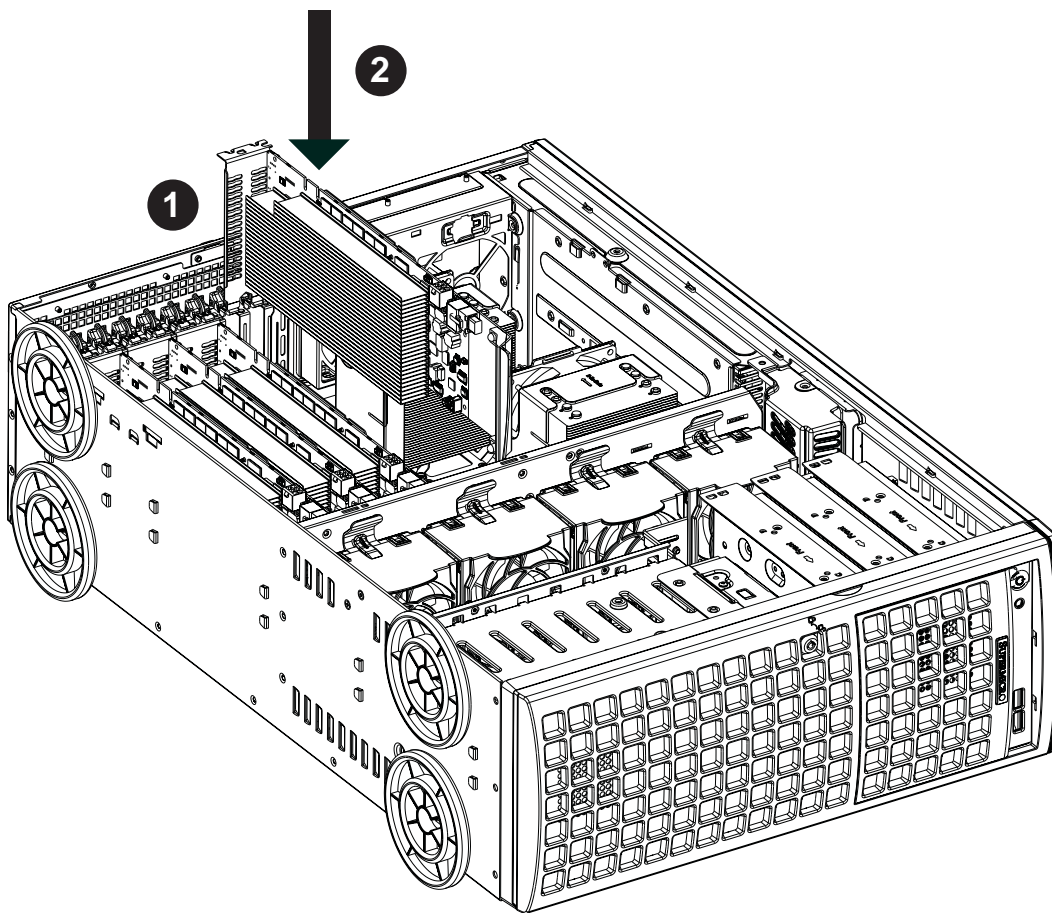
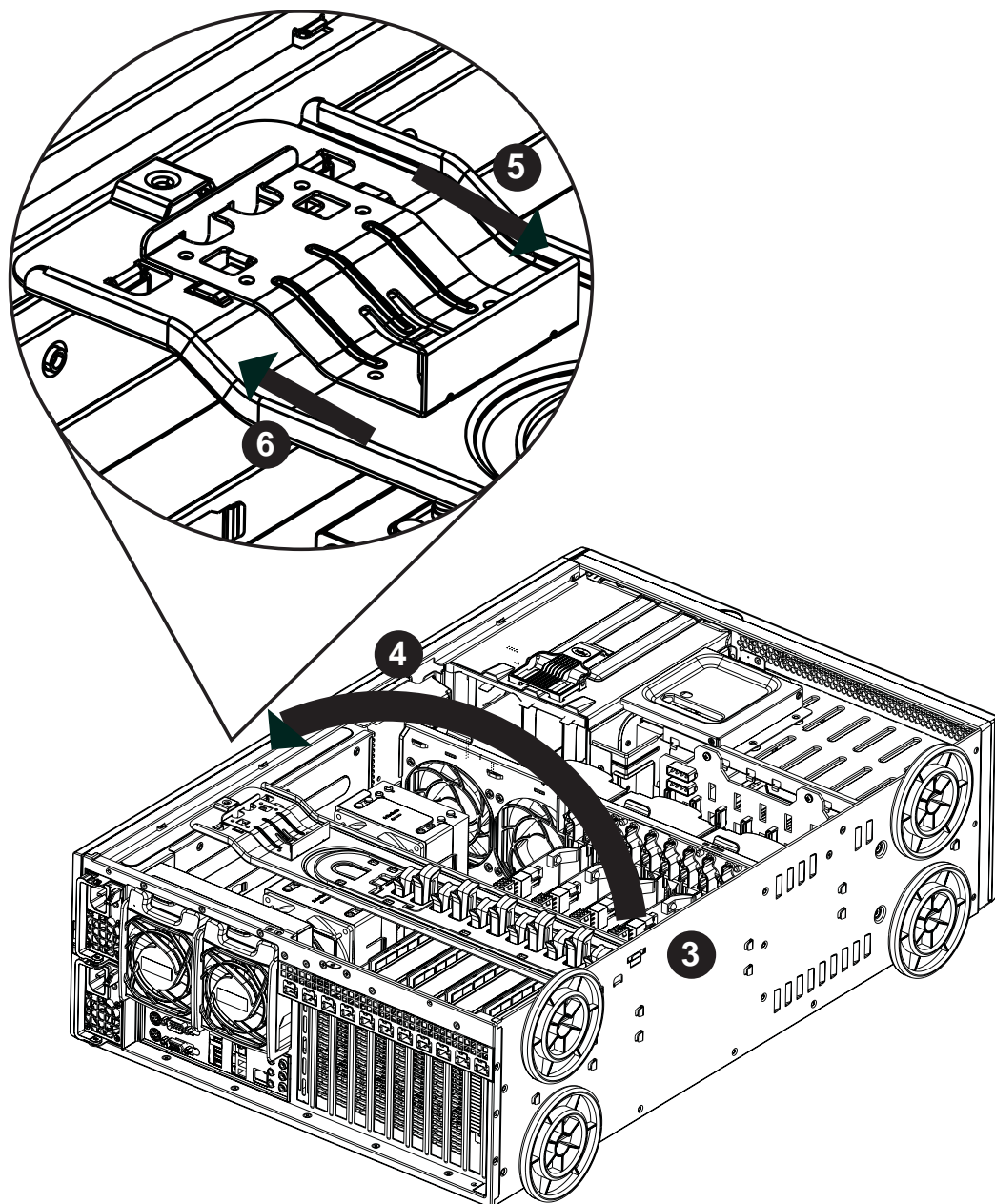


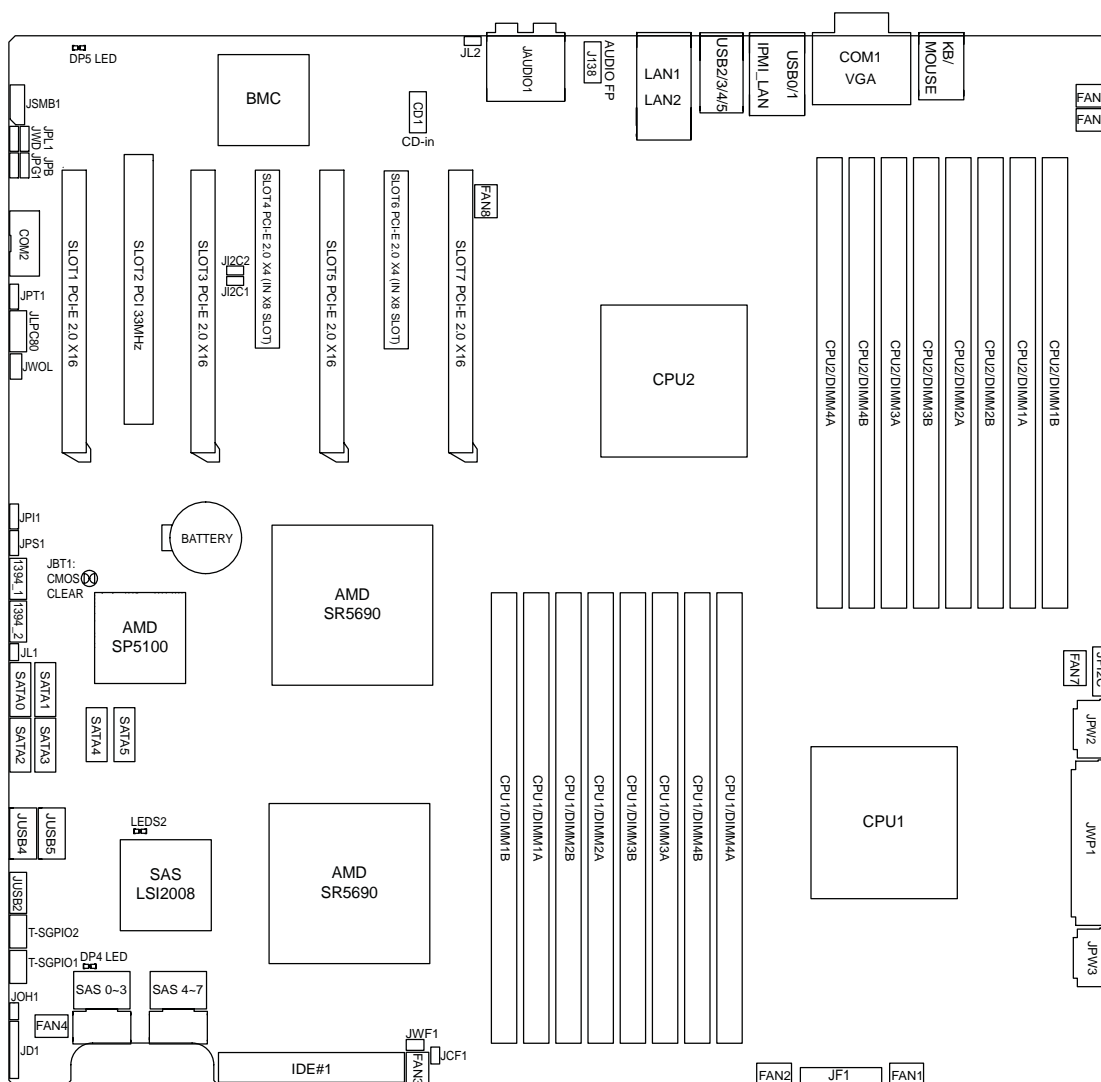
Figure 5-10: Closing the Graphics Card Bracket



3. Place the tabs of the (part number) graphics card bracket into the slots on the wall of the chassis as illustrated in Figure 5-10.
4. Lower the bracket down onto the card
5. Pull back the slide lock and lower it over the raised tab as illustrated.
6. Push the slide lock forward, allowing the pins of the slide lock to penetrate the thru holes in the raised tab.
7. Connect cables to the add-on card as necessary.

## 5-7 Serverboard Details

Figure 5-11. H8DA6+-F Layout  
(not drawn to scale)



**Note:** Jumpers not indicated are for test purposes only. For more information on jumpers or components, refer to further sections in this chapter.

### H8DA6+/I+(-F) Quick Reference

<b>Jumper</b>	<b>Description</b>	<b>Default Setting</b>
JBT1	CMOS Clear	(See Section 2-7)
JCF1	Compact Flash Master/Slave	Closed (Master)
J <sup>2</sup> C1/JI <sup>2</sup> C2	I <sup>2</sup> C to PCI-E Slot Enable/Disable	Both Closed (Enabled)
JL2	Audio Mode Select	Open (HD Mode)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPI1	IEEE 1394 Firewire Enable	Pins 1-2 (Enabled)
JPL	LAN Enable/Disable	Pins 1-2 (Enabled)
JPS1	SAS Controller Enable/Disable	Pins 1-2 (Enabled)
JPT1	Trusted Platform Modules Jumper	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

<b>Connector</b>	<b>Description</b>
1394_1/1394_2	IEEE 1394 Firewire connectors
COM1/COM2	COM1 Serial Port/Header
FAN 1-8	Chassis/CPU Fan Headers
(HD) Audio/CD-In/FP Audio	7.1 Channel High Definition Audio (JAUDIO1)/CD-In (CD-1)/Front Panel Audio (J138)
IDE#1	IDE Drive Connector
IPMI LAN	Dedicated IPMI LAN Port
JD1	Speaker Header
JF1	Front Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat Warning Header
JPI2C	Power I <sup>2</sup> C Header
JPW1	24-pin Main ATX Power Connector
JPW2/3	+12V 8-pin CPU Power Connectors
JS_IBTN1	AOC-IMRRAKEY-2008-LSI Connector/
JSMB1 (SMBus)	System Management Bus Header
JWF1	Compact Flash Card Power Connector
JWOL	Wake-On-LAN Header
LAN1/2	Gigabit Ethernet (RJ45) Ports
PS2 Mouse/Keyboard	PS2 Mouse/Keyboard connectors
SAS0~3, SAS4~7	SAS Ports
SATA0 ~ SATA5	SATA Ports
T-SGPIO-1/TSGPIO-2	Serial General Purpose Input/Output Headers
USB0/1, USB2/3/4/5, JUSB2, JUSB4/5	Universal Serial Bus (USB) Ports, Headers, Type-A Ports
VGA	VGA Connector

LED	Description
LAN Ports	LEDs for the LAN Ethernet ports
Dedicated IPMI LAN	LEDs for the dedicated IPMI LAN Ethernet port
DP5	LED for BMC Activity
DP4	Power LED
LEDS2	SAS2008 heartbeat LED

## 5-8 Connector Definitions

### Power Connectors

A 24-pin main power supply connector (JPW1) and two 8-pin CPU PWR connectors (JPW2/JPW3) on the motherboard. These power connectors meet the SSI EPS 12V specification. In addition to the 24-pin ATX power connector, the 12V 8-pin CPU PWR connectors at JPW2/JPW3 must also be connected to your power supply. See the table on the right for pin definitions.

**Warning:** To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

### PW\_ON Connector

The PW\_ON connector is on pins 1 and 2 of JF1. This header should be connected to the chassis power button. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions			
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

### 12V 8-pin PWR Connector Pin Definitions

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

### Required Connection

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

### Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	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 failure. Refer to the table on the right for pin definitions and status indicators.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Control

OH/Fan Fail LED Status	
State	Indication
Solid	Overheat
Blinking	Fan fail

### NIC2 (LAN2) LED

The LED connections for LAN2 are on pins 9 and 10 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

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

### NIC1 (LAN1) LED

The LED connections for LAN1 are on pins 11 and 12 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

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

### HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SAS, Serial ATA and IDE). See the table on the right for pin definitions.

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

### Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	5V Stby
16	Control

### 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

### LAN1/2 (Ethernet Ports)

Two Gigabit Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port. Additionally, there is a dedicated LAN port for IPMI above the two rear USB ports. These Ethernet ports accept RJ45 type cables.



### Universal Serial Bus Ports

Six Universal Serial Bus ports (USB 2.0) are located beside the LAN ports. Two additional Type A ports (USB4/5) are included on the motherboard near the PCI Slot 1. See the table on the right for pin definitions.

Universal Serial Bus Ports Pin Definitions (USB0/1, USB4/5)			
USB0		USB1	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground

### USB Headers

Two USB 2.0 headers (USB2/3) are also included on the motherboard. These may be connected to provide 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 (USB2/3)			
USB2		USB3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	NC

**Note:** NC indicates no connection.

### Fan Headers

This motherboard has eight fan headers (Fan1 to Fan8). These 4-pin fans headers are backward compatible with 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by the BIOS. See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation

### Serial Ports

The COM1 serial port is located beside the VGA port. Refer to the motherboard layout for the location of the COM2 header. 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:** NC indicates no connection.

### SGPIO

The T-SGPIO1/ T-SGPIO2 (Serial General Purpose Input/Output) headers provide a bus between the SATA controller and the backplane to provide SATA enclosure management functions. Connect the appropriate cable from the backplane to these headers to utilize SATA management functions on your system.

SGPIO Header Pin Definitions (T-SGPIO1)			
Pin#	Definition	Pin #	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

**Note:** NC indicates no connection.

### SMBus Header

The header at SMBus is for the System Management Bus. Connect the appropriate cable here to utilize SMB on the system. See the table on the right for pin definitions.

SMBus Header Pin Definitions (SMBus)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

### Wake-On-LAN

The Wake-On-LAN header is designated JWOL. See the table on the right for pin definitions. You must have a LAN card with a Wake-On-LAN connector and cable to use the Wake-On-LAN feature.

Wake-On-LAN Pin Definitions (JWOL)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

### Power I<sup>2</sup>C

The JPI2C header is for power I<sup>2</sup>C, which may be used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

Power I <sup>2</sup> C Pin Definitions (JPI2C)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	NC

### Overheat LED

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

Overheat LED Pin Definitions (JOH1)	
Pin#	Definition
1	3.3V
2	OH Active

### Power LED/Speaker

On the JD1 header, pins 1~3 are used for power LED indication, and pins 4~7 are for the speaker. See the tables on the right for pin definitions. If you wish to use the onboard speaker, you should close pins 6~7 with a jumper. Connect a cable to pins 4~7 of JD1 to use an external speaker.

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 4~7	External Speaker
Pins 6~7	Internal Speaker

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

The ATX PS/2 keyboard and PS/2 mouse are located next to the Back Panel USB Ports 0~3 on the motherboard. See the table at right for pin definitions.

PS/2 Keyboard/Mouse Pin Definitions			
PS2 Keyboard		PS2 Mouse	
Pin#	Definition	Pin#	Definition
1	KB Data	1	Mouse Data
2	No Connection	2	No Connection
3	Ground	3	Ground
4	Mouse/KB VCC (+5V)	4	Mouse/KB VCC (+5V)
5	KB Clock	5	Mouse Clock
6	No Connection	6	No Connection

VCC: with 1.5A PTC (current limit)

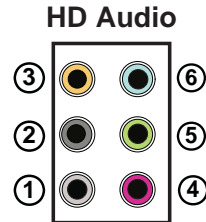
### Chassis Intrusion

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	Battery voltage
2	Intrusion signal

### (Back\_Panel) High Definition Audio (HD Audio)

This serverboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback with 2 channels of independent stereo output for front L&R, rear L&R, center and subwoofer speakers. Use the software included in the CD-ROM with your motherboard to use this feature.



(BP) HD Audio	
Conn#	Signal
1	Side_Surround
2	Back_Surround
3	CEN/LFE
4	Microphone_In
5	Front
6	Line_In

### CD & 10-pin Audio Headers

A 4-pin CD header (CD1) and a 10-pin Front Panel Audio header (J138) are also located on the motherboard. These headers allow you to use the onboard sound for audio CD playback. Connect an audio cable from your CD drive to the CD header that fits your cable's connector. See the tables at right for pin definitions for these headers.

CD1 Pin Definition	
Pin#	Definition
1	Left
2	Ground
3	Ground
4	Right

10-in Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

**IEEE 1394 Connection**

Connectors 1394\_1 and 1394\_2 provide connectivity for IEEE 1394 (Firewire) devices. See the tables on the right for pin definitions.

<b>1394_1 Pin Definitions</b>			
Pin #	Definition	Pin #	Definition
1	PTPAO+	2	PTPAO-
3	GND	4	GND
5	PTPB1+	6	PTPB1-
7	PWR 1394	8	PWR 1394
		10	ZY

<b>1394_2 Pin Definitions</b>			
Pin #	Definition	Pin #	Definition
1	PTPAO+	2	PTPAO-
3	GND	4	GND
5	PTPB1+	6	PTPB1-
7	PWR 1394	8	PWR 1394
		10	ZY

**Video Connector**

A Video (VGA) connector is located below the COM Port on the IO backplane. This connector is used to provide video and CRT display.

**Compact Flash Card PWR Connector**

A Compact Flash Card Power Connector is located at JWF1. For the Compact Flash Card to work properly, you will need to enable with JCF1 and connect a Compact Flash Card power cable to JWF1 first.

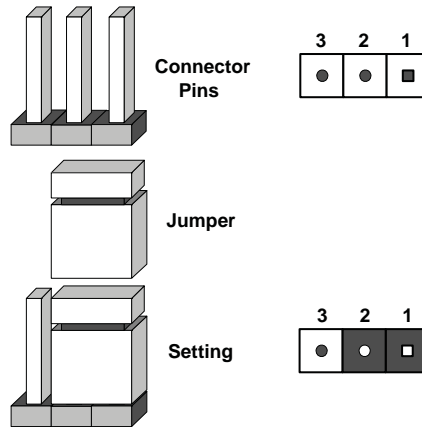
**JS\_IBTN1 Connection**

This connector allows you to install the optional AOC-IMRRAKEY-2008-LSI add-on card to the serverboard. This add-on card allows you to use RAID 5 for your system RAID with LSI 2008 controller.

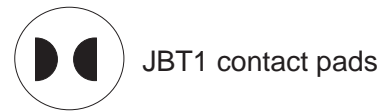
## 5-9 Jumper Settings

### Explanation of Jumpers

To modify the operation of the motherboard, 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 motherboard 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, which 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.

### I<sup>2</sup>C to PCI-Express Slot

J1<sup>2</sup>C1/J1<sup>2</sup>C2 allows you to enable the I<sup>2</sup>C bus to communicate with the PCI-Express slot. For the jumpers to work properly, please set both jumpers to the same setting. If enabled, both jumpers must be enabled. If disabled, both jumpers must be disabled. See the table on the right for jumper settings.

I <sup>2</sup> C to PCI-Express Slot Jumper Settings (J1 <sup>2</sup> C1/J1 <sup>2</sup> C2)	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled

### Watch Dog Enable/Disable

JWD enables the Watch Dog function, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will have WD reboot the system if a program freezes. Jumping pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

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

**Note:** when Watch Dog is enabled, the user must write their own application software to disable the Watch Dog Timer.

### TPM Support Enable

JPT1 allows the user to enable TPM (Trusted Platform Modules) support to enhance data integrity and system security. See the table on the right for jumper settings. The default setting is enabled.

TPM Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

### VGA Enable/Disable

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

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled

### SAS Enable/Disable

JPS1 allows you to enable or disable the SAS controller. The default position is on pins 1 and 2 to enable SAS. See the table on the right for jumper settings.

SAS Enable/Disable Jumper Settings (JPS1)	
Jumper Setting	Definition
Pins 1-2	Enabled

### LAN Enable/Disable

Change the setting of jumper JPL to enable or disable the LAN Ethernet ports. See the table on the right for jumper settings. The default setting is enabled.

LAN Jumper Settings (JPL)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

### Compact Flash Master/Slave Select

A Compact Flash Master (Primary)/Slave (Secondary) Select Jumper is located at JCF1. Close this jumper to enable Compact Flash Card. For the Compact Flash Card or the Compact Flash Jumper (JCF1) to work properly, you will need to connect the Compact Flash Card power cable to JWF1 first. Refer to the board layout below for the location.

Compact Flash Card Master/Slave Select (JCF1)	
Jumper Setting	Definition
Open	Slave (Secondary)
Closed	Master (Primary)

### Audio Mode Select

Jumper JL2 allows you to select the Audio mode. You can choose using AC '97 Audio or HD (High-definition) Audio. The default setting is Open to use HD Audio. See the table on the right for jumper settings.

Audio Mode Select Jumper Settings	
Jumper Setting	Definition
Closed	AC'97 Panel
Open	HD Audio (Default)

### IEEE 1394 Firewire Enable/Disable

Jumper JPI1 allows you to enable or disable the IEEE 1394 Firewire ports. See the table on the right for jumper settings. The default setting is enabled.

IEEE 1394 Firewire Jumper Settings (JPI1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

## 5-10 Onboard Indicators

### LAN1/LAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gb LAN port, one LED blinks to indicate activity while the other 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

### Dedicated IPMI LAN LEDs

A dedicated IPMI LAN is also included on the H8DA6+/I+(-F). The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.

IPMI LAN Link LED (Left) & Activity LED (Right)		
Color	Status	Definition
Link (Left)	Green: Solid	100 Mb/s
Activity (Right)	Amber: Blinking	Active

### BMC Heartbeat LED

A BMC (Baseboard Management Control) Heartbeat LED is located at DP5 on the motherboard. When DP5 is on, the BMC Controller functions normally. See the tables at right for more information.

BMC Heartbeat (DP5) LED Settings		
Color	Status	Definition
Green	Blinking	BMC: Normal
Off	Off	Not functioning normally

### Power LED

The DP4 Power LED is located near FAN4. When this LED is lit, it means power is present on the serverboard. Be sure to turn off the system and unplug the power cord(s) before removing or installing components.

Power LED (DP4)	
State	System Status
On	Standby power present on serverboard
Off	No power connected

### SAS2008 Heartbeat LED

The LEDS2 SAS2008 Heartbeat LED shows SAS2 activity on the serverboard. See the table to the right for information on this LED.

SAS2008 Heartbeat LED (LEDS2)	
State	System Status
Blinking	SAS Controller is Active
Off	SAS Connector Inactive

## 5-11 Floppy, IDE, SAS and SATA Drive Connections

Use the following information to connect the IDE hard disk drive cables.

- A red mark on a wire typically designates the location of pin 1.
- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

### IDE Connectors

There are two IDE connectors (one blue and one white) on the serverboard. IDE#1 (blue) is designated as the Primary IDE drive. The white connector is designated as the Secondary IDE drive and is reserved for Compact Flash Card use only. (See the note below.) See the table on the right for pin definitions.

**Note:** The white slot is reserved for Compact Flash Cards only. Do not use it for other devices. If populated with a Compact Flash Card, IDE#1 (the blue slot) will be available for one device only. For the Compact Flash Card to work properly, you will first need to enable with JCF1 and connect a power cable to JWF1.

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

### SATA Ports

There are no jumpers to configure the SATA ports, which are designated SATA0 through SATA5. See the table on the right for pin definitions.

SATA Ports Pin Definitions (SATA0-SATA3)	
Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

### SAS Ports

There are two SAS2 port connectors near the IDE and floppy connectors. One is for the SAS0~3 ports and the other is for SAS4~7 ports. See the table on the right for pin definitions.

**Note:** SAS2 is enabled in BIOS (refer to Chapter 7). See LSI's SAS2008 manual for details on creating and working with SAS2 RAID arrays.

**Note:** JPS1 must be set correctly to enable the SAS2008 controller.

SAS Ports Pin Definitions (SAS0~3/SAS4~7)			
Pin#	Definition	Pin #	Definition
1	Rx0+	2	Rx0-
3	Rx1+	4	Rx1-
5	Rx2+	6	Rx2-
7	Rx3+	8	Rx3-
9	Tx3-	10	Tx3+
11	Tx2-	12	Tx2+
13	Tx1-	14	Tx1+
15	Tx0-	16	Tx0+

## 5-12 Enabling SATA RAID

Now that the hardware is set up, you must install the operating system and the SATA RAID drivers, if you wish to use RAID with your SATA drives. The installation procedure differs depending on whether you wish to have the operating system installed on a RAID array or on a separate non-RAID drive. See the instructions below for details.

### **Serial ATA (SATA)**

Serial ATA (SATA) is a physical storage interface that employs a single cable with a minimum of four wires to create a point-to-point connection between devices. This connection is a serial link that supports a SATA transfer rate from 150 MBps. The serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA) and can extend up to one meter in length, compared to only 40 cm for PATA cables. Overall, SATA provides better functionality than PATA.

### **Installing the OS/SATA Driver**

Before installing the OS (operating system) and SATA RAID driver, you must decide if you wish to have the operating system installed as part of a bootable RAID array or installed to a separate non-RAID hard drive. If on a separate drive, you may install the driver either during or after the OS installation. If you wish to have the OS on a SATA RAID array, you must follow the procedure below and install the driver during the OS installation.

### ***Building a Driver Diskette***

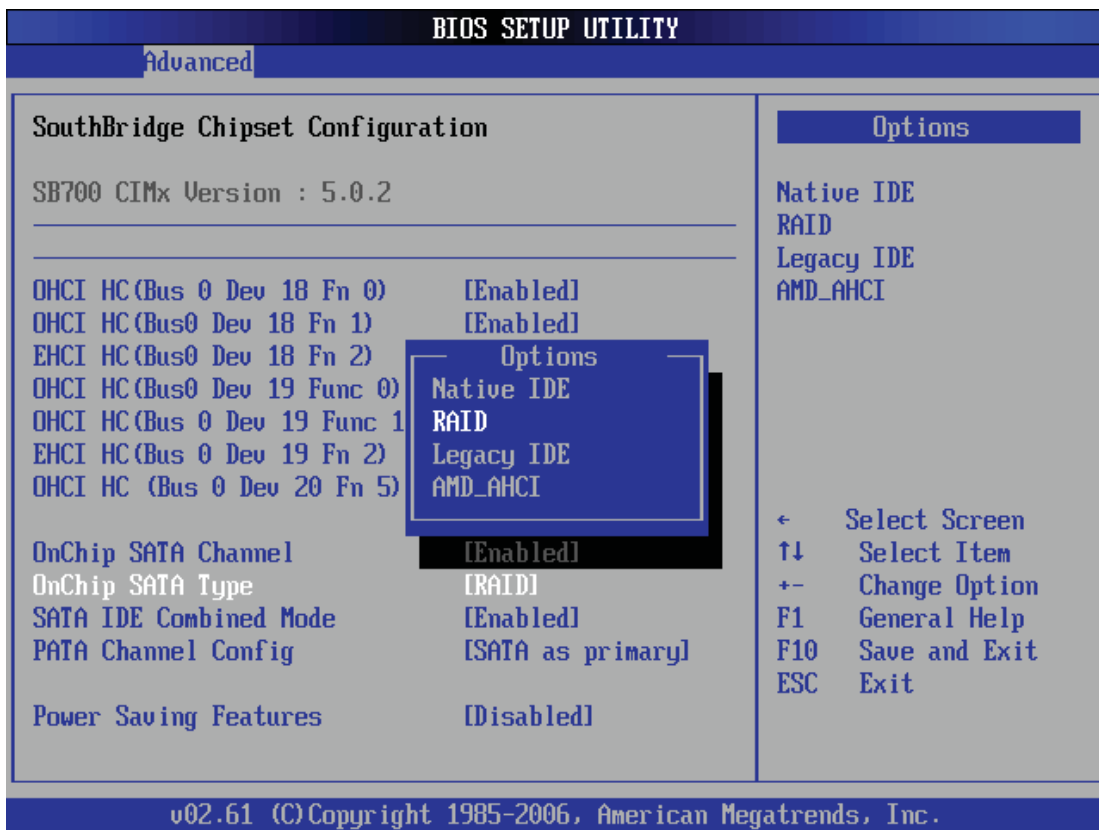
You must first build a driver diskette from the Supermicro CD-ROM that was included with the system. (You will have to create this disk on a computer that is already running and with the OS installed.) Insert the CD into your CD-ROM drive and start the system. A display as shown in Figure 5-13 will appear. Click on the icon labeled "Build Driver Diskettes and Manuals" and follow the instructions to create a floppy disk with the driver on it. Once it's been created, remove the floppy and insert the installation CD for the Windows Operating System you wish to install into the CD-ROM drive of the new system you are about to configure.

### Enabling SATA RAID in the BIOS

Before installing the Windows Operating System, you must change some settings in BIOS. Boot up the system and hit the <Del> key to enter the BIOS Setup Utility. After the Setup Utility loads,

1. Use the arrow keys to move to the Exit menu. Scroll down with the arrow keys to the "Load Optimal Defaults" setting and press <Enter>. Select "OK" to confirm, then <Enter> to load the default settings.
2. Use the arrow keys to move to the "Advanced" menu, then scroll down to "Chipset Configuration". Next enter "SouthBridge Configuration" and press the <Enter> key. Once in this submenu, scroll down to "OnChip SATA Type" and choose the "RAID" option (see Figure 5-11).

Figure 5-11. BIOS Setup Screen

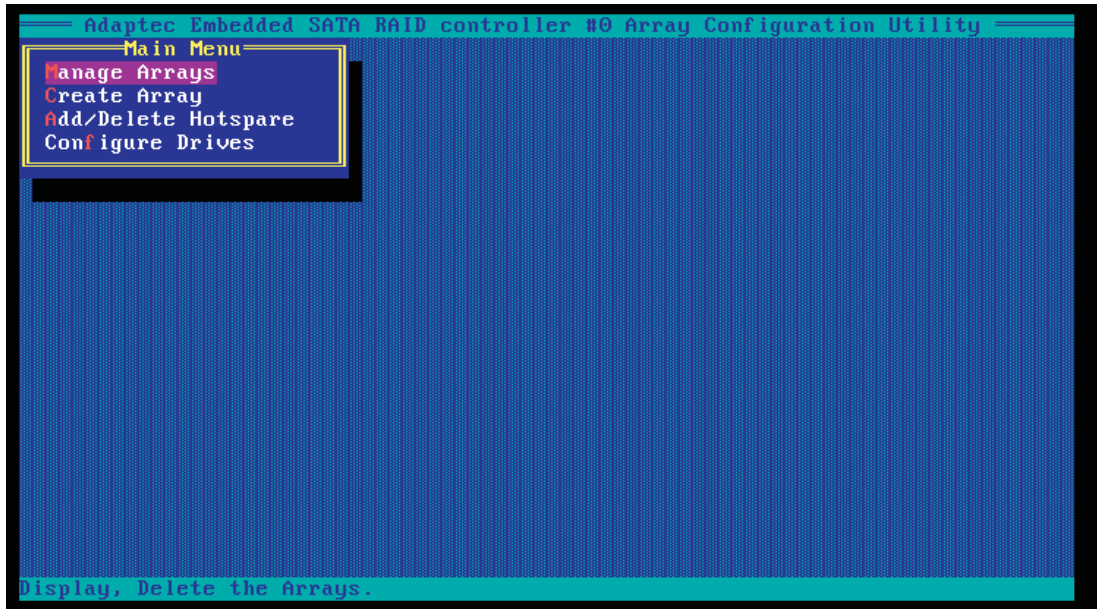


3. Hit the <Esc> key twice and scroll to the Exit menu. Select "Save Changes and Exit" and hit <enter>, then hit <Enter> again to verify.
4. After exiting the BIOS Setup Utility, the system will reboot. When prompted during the startup, press the <CTRL+A> key when prompted to run the Dot-Hill RAID Utility program (see Figure 5-12).

## Using the Adaptec RAID Utility

The Adaptec® RAID Utility program is where you can define the drives you want to include in the RAID array and the mode and type of RAID.

**Figure 5-12. Adaptec RAID Utility Program Screen**



## Installing the RAID Driver During OS Installation

You may also use the procedure below to install the RAID driver during the Windows OS installation:

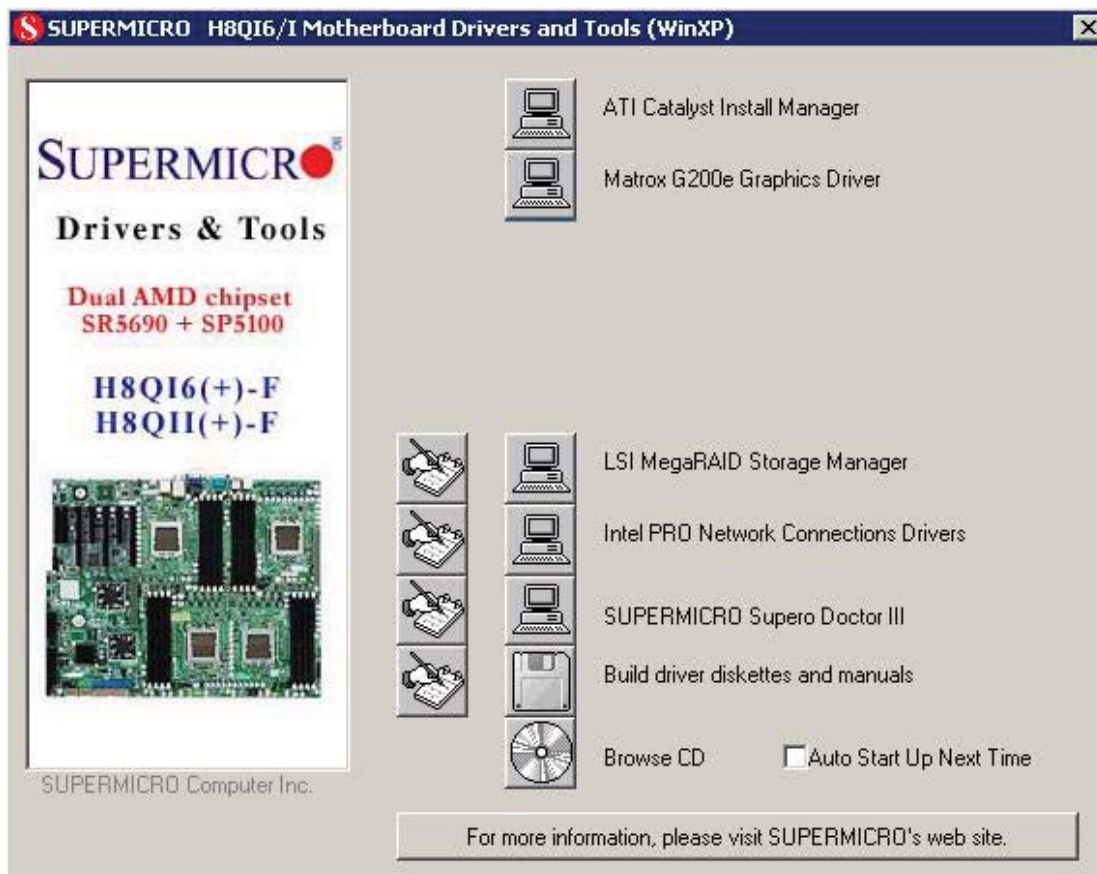
1. With the Windows OS installation CD in the CD-ROM drive, restart the system.
2. When you see the prompt, hit the <F6> key to enter Windows setup.
3. Eventually a blue screen will appear with a message that begins "Windows could not determine the type of one or more storage devices . . ." When you see the screen, hit the <S> key to "Specify Additional Device", then insert the driver diskette you just created into the floppy drive.
4. Highlight "Manufacturer Supplied Hardware Support Disk" and hit the <Enter> key.
5. Highlight the first "Adaptec RAID" driver shown and press the <Enter> key to install it.
6. Press <Enter> again to continue with the Windows setup.

## 5-13 Installing Drivers

The CD that came bundled with the system contains drivers, some of which must be installed, such as the chipset driver. After inserting this CD into your CD-ROM drive, the display shown in Figure 5-13 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CD-ROM drive. Finally, double click on the S "Setup" icon.)

Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. After installing each item, you should reboot the system before moving on to the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

**Figure 5-13. Driver/Tool Installation Display Screen**



## Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

**Note:** The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

**Note:** When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

**Figure 5-14. Supero Doctor III Interface Display Screen (Health Information)**

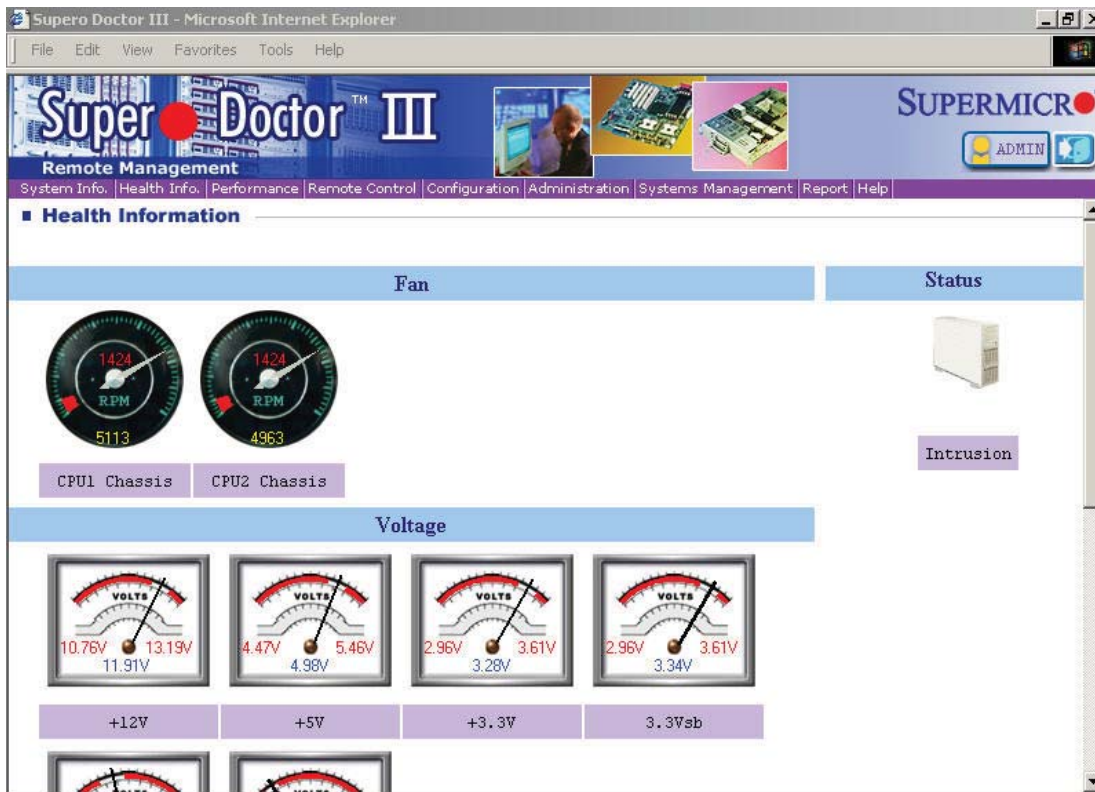


Figure 5-15. Supero Doctor III Interface Display Screen (Remote Control)



**Note:** Super Doctor III Software Revision 1.0 can be downloaded from our Web Site at: [ftp://ftp.supermicro.com/utility/Supero\\_Doctor\\_III/](ftp://ftp.supermicro.com/utility/Supero_Doctor_III/). You can also download the Super Doctor III User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we recommend that you use the Supero Doctor II application instead.

**Notes**

## Chapter 6

### Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool you will need to install components and perform maintenance is a Phillips screwdriver. Print this page to use as a reference while setting up your chassis.

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



Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 4: System Safety and the warning/precautions listed in the setup instructions.

Figure 6-1. Chassis: Front and Rear Views

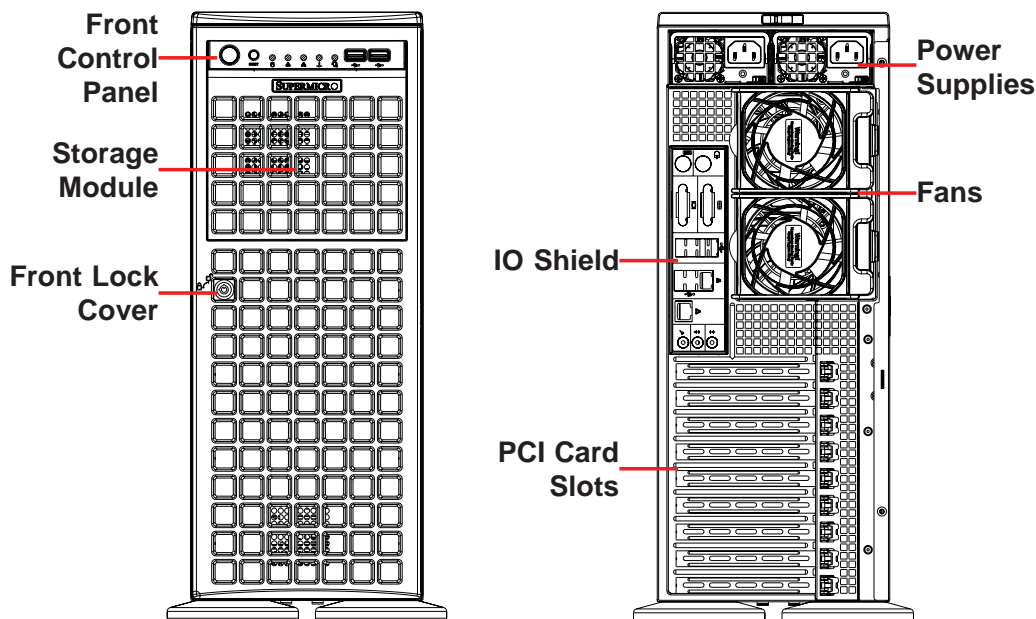
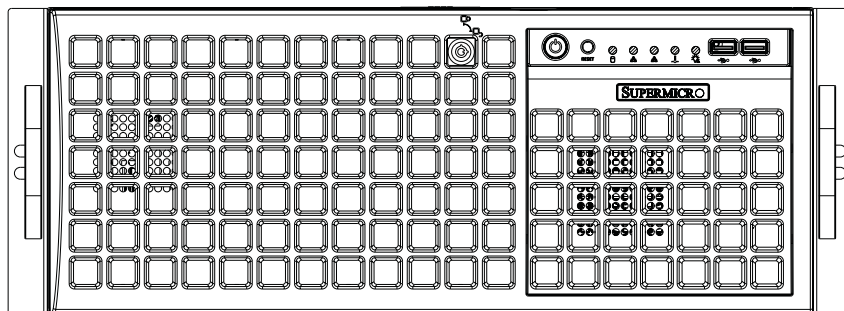


Figure 6-2: Chassis in Rack Mount Mode



## 6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully.

The following measures are generally sufficient to protect your equipment from ESD damage:

### Precautions

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

## 6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Installation."

## 6-3 System Cooling

Six heavy-duty fans provide cooling for the chassis. There are 2+2 (optional) fans that are located in the mid-section of the chassis, with two fans in the rear. These fans circulate air through the chassis as a means of lowering the chassis internal temperature.

The fans come pre-installed to the chassis. Each fan is hot-swappable and can be replaced without removing any connections.

### System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

### Replacing System Fans

The SC747 chassis contains two types of system fans: mid-system fans and rear system fans.

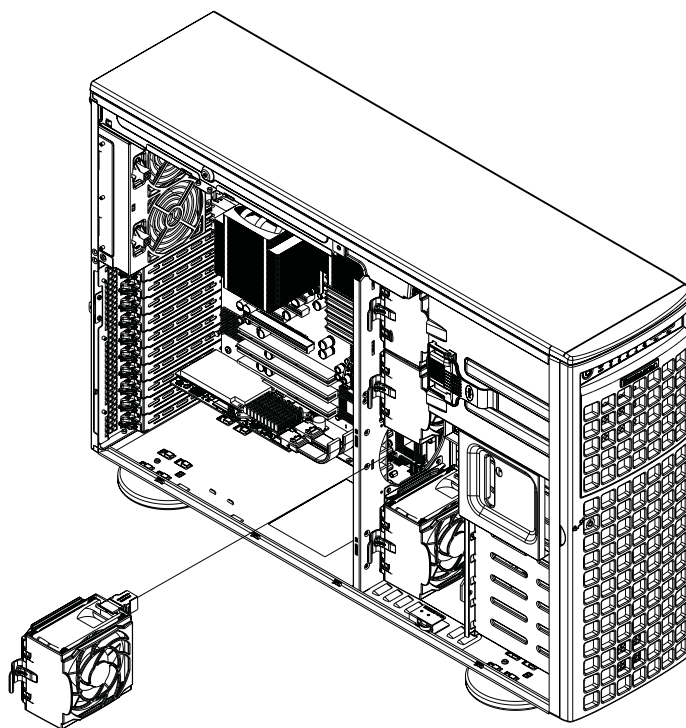
#### *Replacing Mid-System Fans*

1. Determine which fan has failed. Because the fans are hot-swappable, the chassis does not need to be powered-down.
2. Press the fan release tab and lift the failed fan from the chassis. Mid fans must be pulled straight out of the chassis (see Figure 6-3).
3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. As soon as the fan is connected, it will begin working.

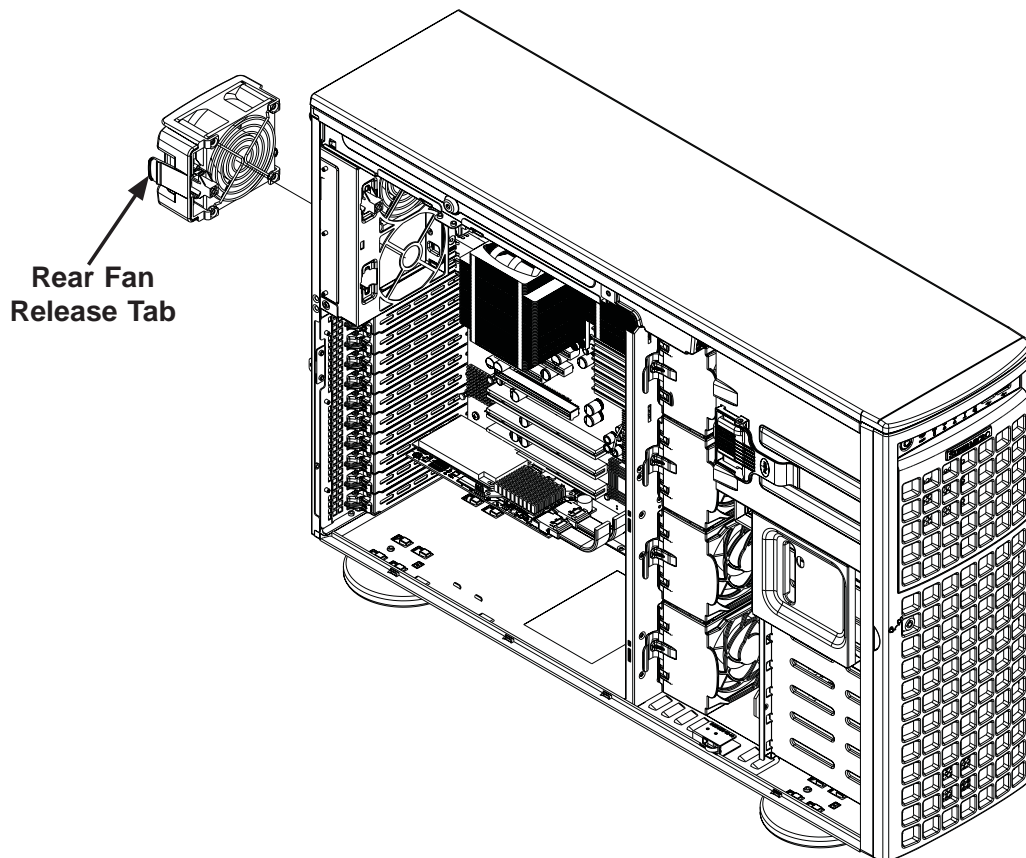
#### *Replacing the Rear System Fan*

1. Determine which fan is not operation
2. Press the rear fan release tab (see Figure 6-4).

**Figure 6-3: Mid-System Chassis Fans**



**Figure 6-4: Rear System Chassis Fans**



## 6-4 Power Supply

The SC747 chassis has a 1400W (redundant) power supply. This power supply is auto-switching capable. This enables it to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

### Power Supply Failure

If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface).

As there is only one power supply module in the system, power must be completely removed from the server before removing and replacing the power supply for whatever reason.

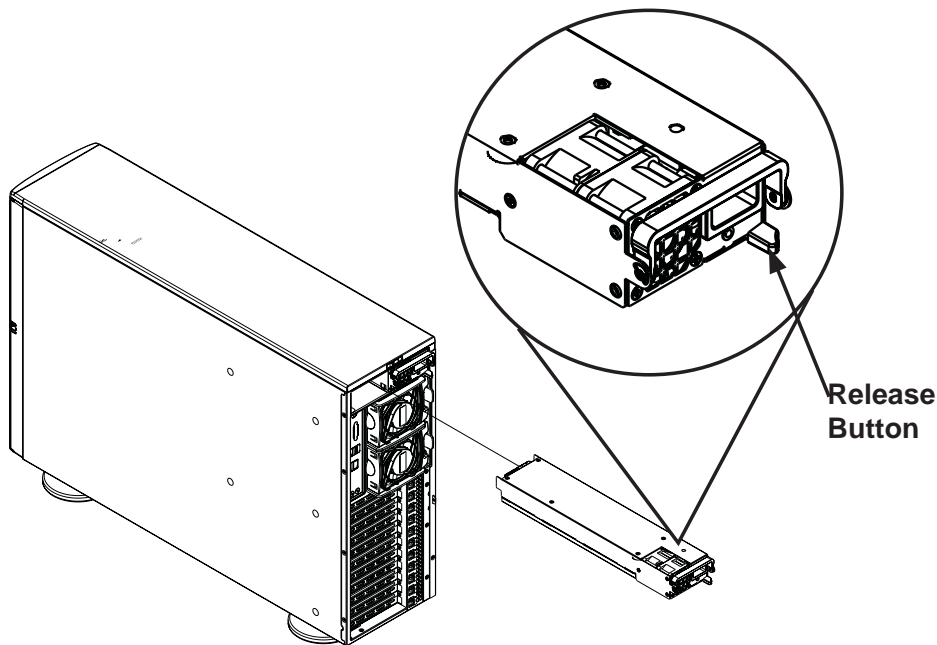
### Replacing the Power Supply

With a redundant power supply, the system automatically switches to the second power supply if the first should fail.

#### *Replacing the Power Supply*

1. Power down the chassis and unplug the power cord. If your chassis includes a redundant power supply (at least two power modules), you can leave the server running and remove only one power supply.
2. Push the release tab (on the back of the power supply) as illustrated in Figure 6-5.
3. Pull the power supply out using the handle provided.
4. Replace the failed power module with the same model.
5. Push the new power supply module into the power bay until you hear a click.
6. Plug the AC power cord back into the module and power up the server.

**Figure 6-5: Power Supply Release Button**



### Power Supply Connections

Connect each of the following cables, as required, by your motherboard manufacturer. In some instances, some cables may not need to be connected. Some cables may not be available with your model.

Power Supply Cables			
Name	Qty	Connects to:	Description
20-pin or 24-pin power cable	1	Motherboard	20-pin or 24-pin power cable provides electricity to the motherboard. and has twenty to twenty-four yellow, black, gray, red, orange, green and blue wires.
HDD (Hard Drive) power cable	2	Backplane	Each cable has three connectors (two Hard Drive [HDD] and one Floppy Drive [FDD]). Attach the HDD connectors to the backplane. <b>If you are using a Supermicro backplane, the FDD connector does not need to be attached.</b>
8-pin motherboard cable	1	Motherboard	Provides power to the motherboard CPU. This cable has two black and two yellow wires.
4-pin motherboard cable	1	Motherboard	Provides power to PCI expansion card. This cable has two black and two yellow wires.
5-pin SMBus power cable (small)	1	Motherboard	Allows the SM (System Management) bus to monitor power supply
2-pin INT cable	1	Motherboard	Intrusion detection cable allows the system to log when the server chassis has been opened.

## 6-5 Configuring the the Storage Module

This section covers configuring the storage module in the SC747 chassis.

Figure 6-6: Chassis in Rack Mount Mode

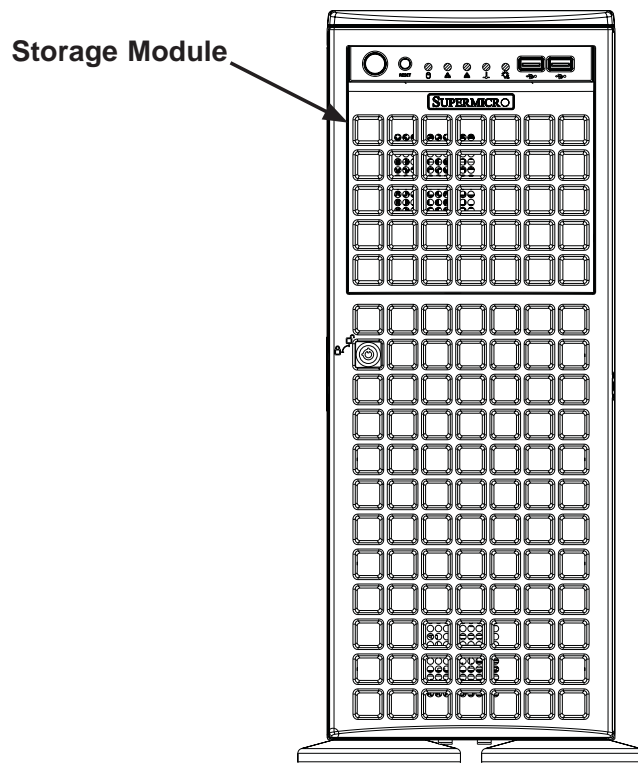
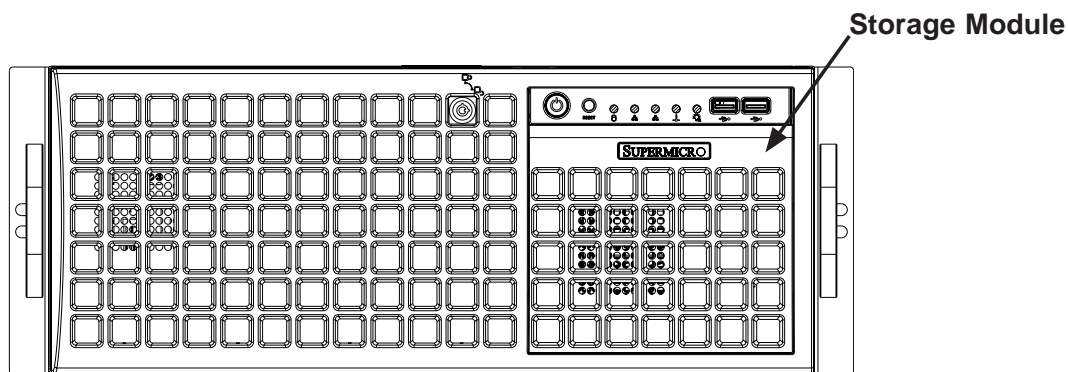


Figure 6-7: Chassis in Tower Mode



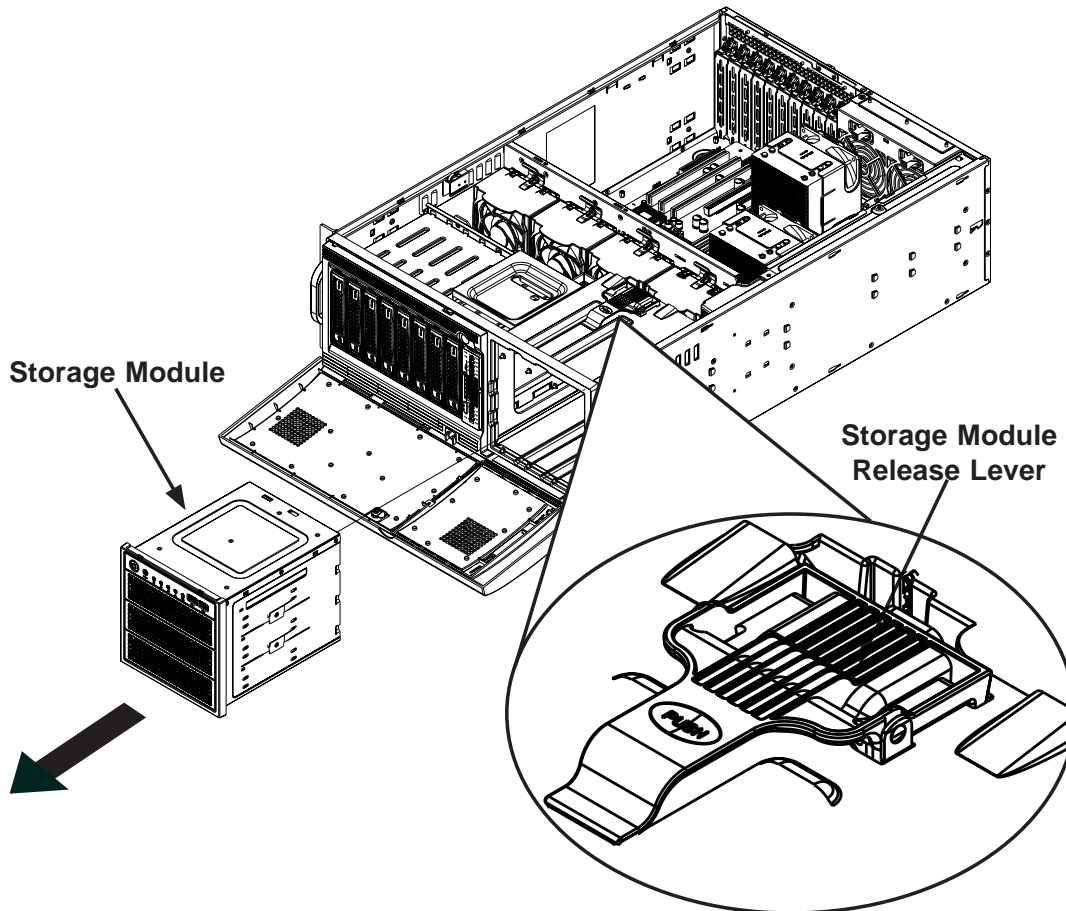
### Tower or Rack Configuration

The SC747 chassis is shipped in tower mode and can be immediately used as desktop server. If the chassis is to be used in a rack, the storage module must be rotated 90 degrees and the storage module cover must be replaced (see Figure 6-7). This can be done before, during, or after setup. It is not necessary to replace the storage module cover when the chassis is in the tower configuration.

## Rotating the Storage Module

Use the procedure below to rotate the storage module for rack configuration.

**Figure 6-8: Removing the Storage Module**



### ***Rotating the Storage Module for Rack Mounting***

1. Open the chassis cover.
2. Locate the storage module and disconnect any cables from the storage module to any component in the chassis.
3. Push the storage module release lever. This lever unlocks the storage module (see Figure 6-8).
4. Grasp the external edges of the storage module and pull the unit from the chassis.

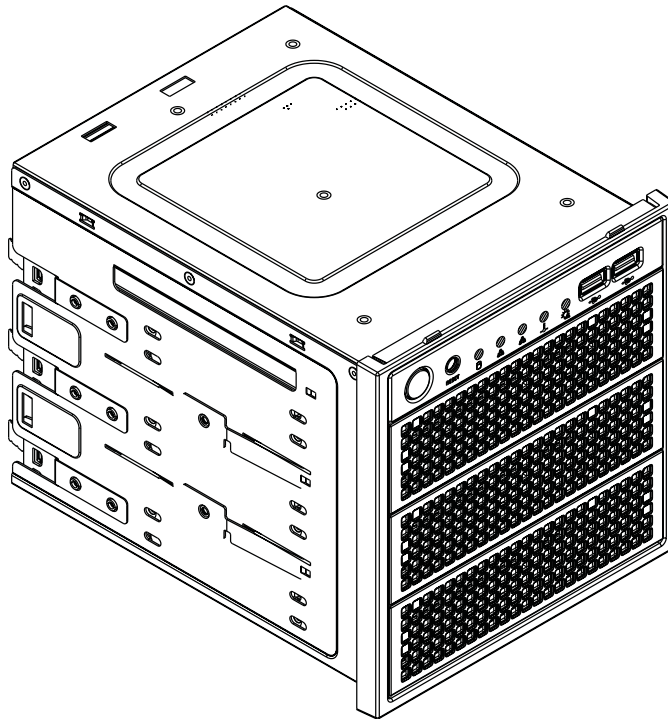
5. Turn the storage module 90 degrees (as illustrated).
6. Reinsert the module into the chassis and reconnect the cords.

### Installing Drives in the Storage Module

The storage module (Figure 6-9) includes three full sized drive bays and the front LED panel. The storage module can be configured in one of three ways:

- Add up to three extra hard drives to the drive trays.
- Add up to three peripheral drives (CD-ROM, DVD-ROM, etc.) drive trays.
- Add five hot-swappable hard drives to the storage module. This configuration requires a mobile rack. More information on mobile rack installation can be found in the appendices at the end of this manual.

**Figure 6-9: Chassis Storage Module**



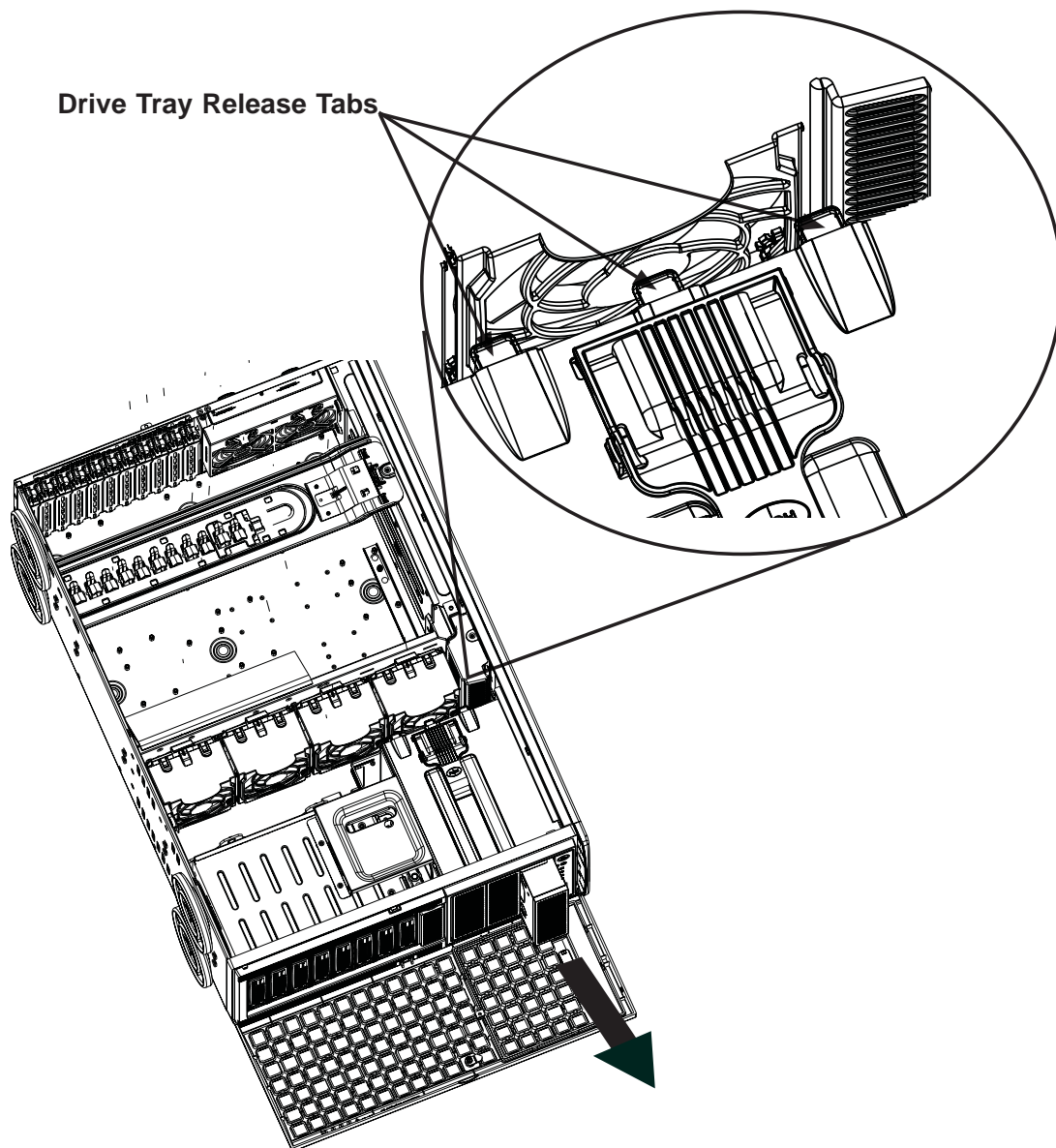
## Removing a Drive Carrier

Use the procedure below to add hard drives to the drive carriers.

### *Adding Hard Drives to the Drive Carriers*

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive (see Figure 6-10).
3. Push the drive tray toward the front of the chassis.

**Figure 6-10: Removing a Drive Carrier**

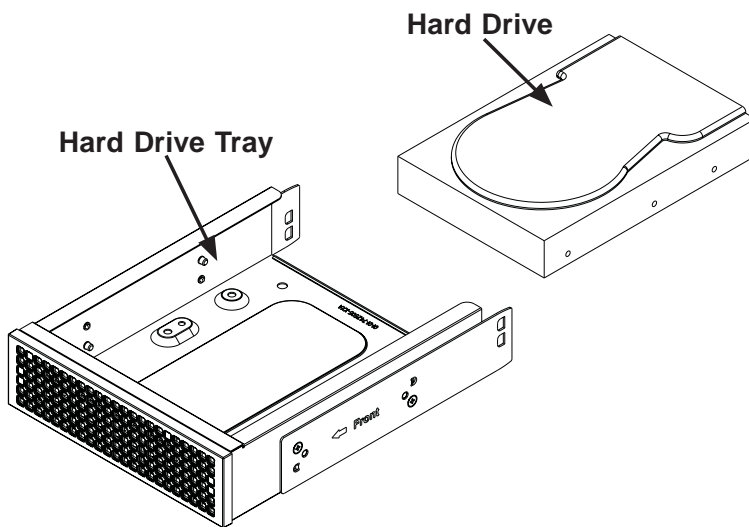


4. Place the hard drive to the hard drive tray. Make sure The hard drive can be SAS or SCSI depending on your motherboard. The hard drive may not completely fill the tray. See Figure 6-11 for details.
5. Secure the hard drive to the carrier with four screws from the bottom.
6. Slide the hard drive into the chassis until the carrier clicks into place.
7. Repeat these steps for each hard drive carrier.



**Warning:** Except for short periods of time (swapping hard drives), do not operate the server with the hard drive carriers removed.

**Figure 6-11: Adding a Hard Drive to the Drive Carrier**



**Warning:** It is recommended that only Enterprise level Hard Disk Drives be used. Please see <http://www.supermicro.com/products/nfo/files/storage/SAS-1-CompList-110909.pdf> for details.

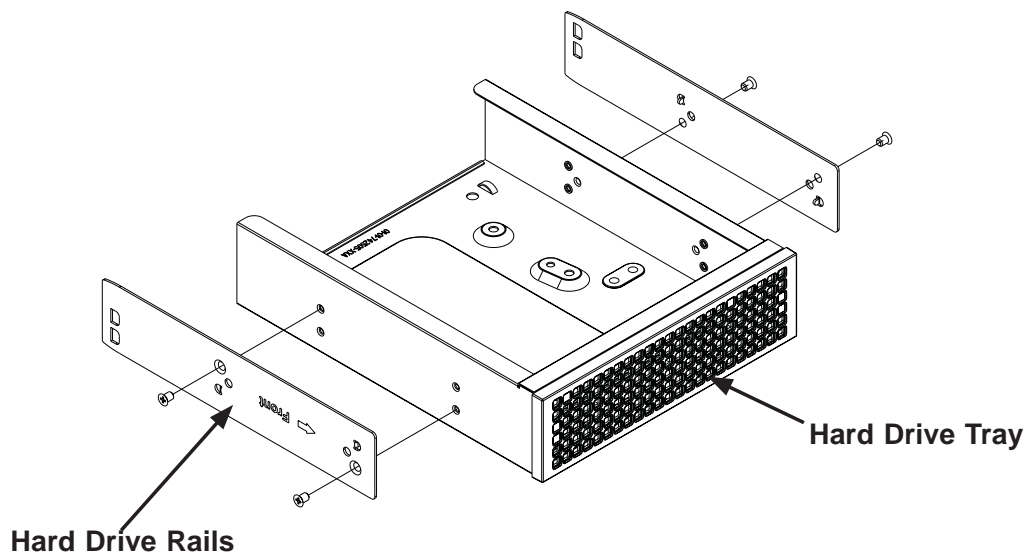
## Adding Peripheral Drives

You can add up to three peripheral drives (DVD-ROM, CD-ROM, floppy drive, etc.) to the drive trays using the procedure below.

### *Adding Peripheral Drives*

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive.
3. Push the drive tray toward the front of the chassis.
4. Remove the hard drive tray rails from the hard drive tray. To do this, you must remove two screws from each side (see Figure 6-12).
5. Attach the rails to a DVD-ROM, CD-ROM, floppy drive, or other peripheral. The rails should fit any standard sized peripherals.
6. Slide the peripheral into the chassis until the tray clicks into place.
7. Repeat these steps for each hard drive tray.

**Figure 6-12: Adding Hard Drive Rails to the DVD-ROM Drive**



## Adding Five Hard Drives Using a Supermicro Mobile Rack

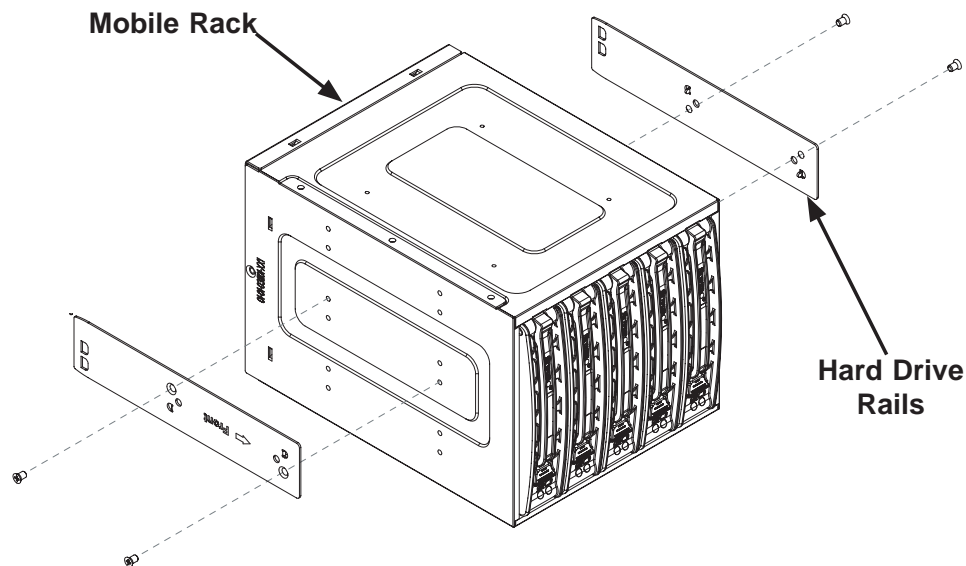
The SC747 chassis accepts a CSE-M35S (SCSI) or CSE-M35T-1/CSE-M35TQ mobile rack to install extra hot swappable hard drives. The mobile rack goes into the storage module which goes into the chassis.

For more information on mobile rack installation and use, refer to the appendix located at the end of this manual.

### *Adding Hard Drives to a Supermicro Mobile Rack*

1. Open the chassis cover.
2. Locate the drive release tabs.
3. Pull the first drive release tab and push the drive tray toward the front of the chassis. Repeat this for all three tabs.
4. Remove the hard drive tray rails from the hard drive tray. To do this, you must remove two screws from each side. Do this for all three hard drive trays. See Figure 6-11 for details.
5. Attach the rails to a DVD-ROM, CD-ROM, floppy drive, or other peripheral. The rails should fit any standard sized peripherals.
6. Install all six hard drive rails to the mobile rack. Each individual rail requires two screws. Also, make sure the arrow on the rail points toward the front of the chassis (see Figure 6-13).
7. Slide the mobile rack into the storage module and chassis.

**Figure 6-13: Adding Hard Drive Rails to a Storage Rack**



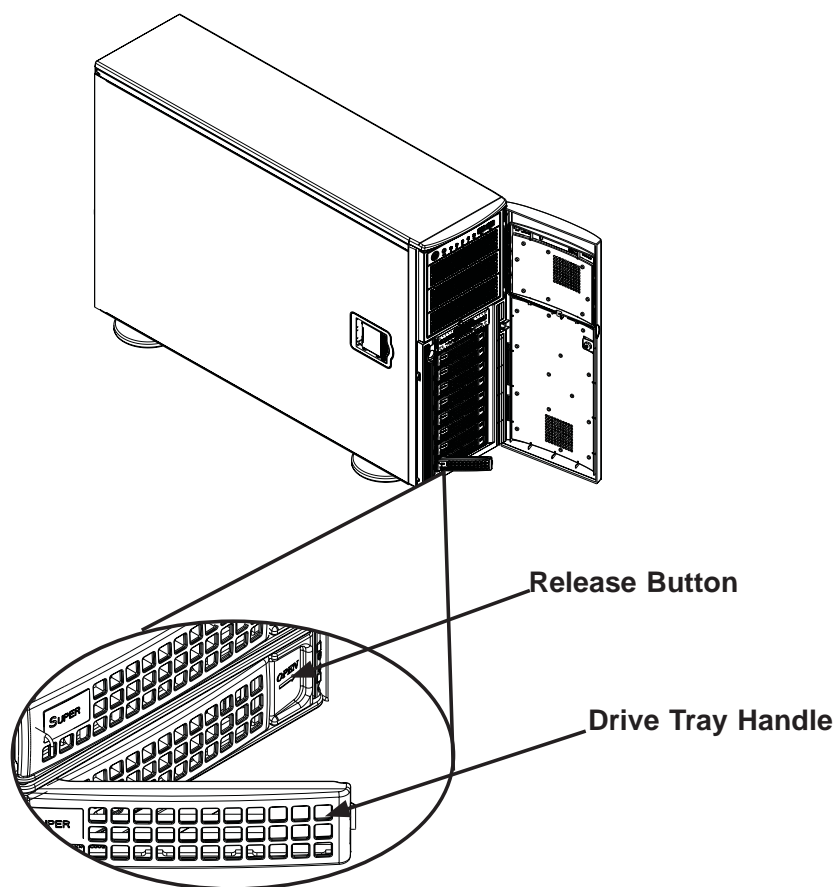
## 6-6 Installing Hard Drives in the Chassis

Chassis hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays.

### *Installing Hard Drives*

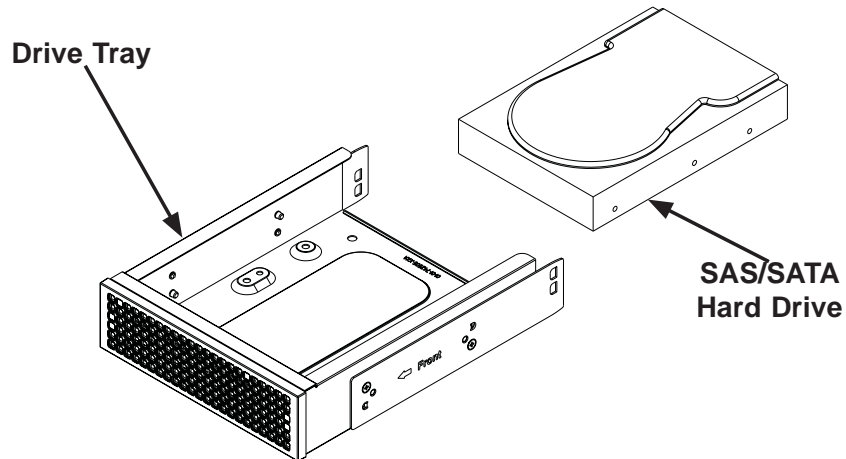
1. Unlock and open the chassis cover.
2. Press the release button to extend the drive tray handle (see Figure 6-14).
3. Using the handle, pull the drive tray out by the handle. The drive is hot swappable; there are no cables to disconnect.
4. Remove the screws holding the drive tray to the dummy drive.

**Figure 6-14: Installing Hard Drives**



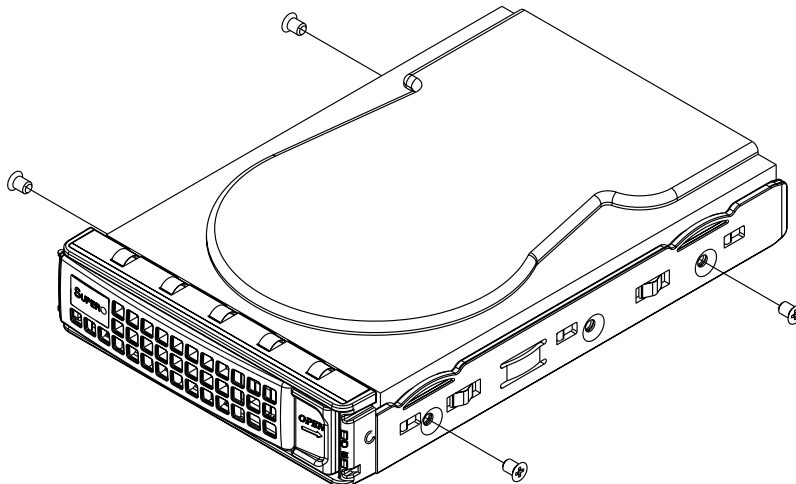
5. Place a hard drive in the drive tray (see Figure 6-15).
6. Secure the hard drive to the tray using four screws.

**Figure 6-15: Removing a Dummy Drive Tray**



7. Insert the hard drive into the chassis. To do this:
  - a. Press the hard drive release button to extend the drive tray handle.
  - b. Insert the hard drive into the chassis and close the handle to lock the hard drive into place (see Figure 6-16).

**Figure 6-16: Installing a Hard Drive**



**Notes**

# Chapter 7

## BIOS

### 7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the H8DA6+-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

#### Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.



**Note:** In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. 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 AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, 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 Power-On Self-Test (POST) 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 AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.



**Warning!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

## 7-2 Main Setup

When you first enter AMI BIOS Setup Utility, you will see the Main Menu screen. You can always return to the Main Menu by selecting the **Main** tab on the top of the screen with the arrow keys.

The Main Menu screen provides you with a system overview, which includes the version, built date and ID of the AMIBIOS, the type, speed and number of the processors in the system and the amount of memory installed in the system.

### System Time/System Date

You can edit this field 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/YYYY format. The time is entered in HH:MM:SS format. Please note that time is in a 24-hour format. For example, 5:30 A.M. appears as 05:30:00 and 5:30 P.M. as 17:30:00.

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 the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

## 7-3 Advanced Settings Menu

### ► Boot Features

#### Quick Boot

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

#### Quiet Boot

If Disabled, normal POST messages will be displayed on boot-up. If **Enabled**, this display the OEM logo instead of POST messages.

#### Add On ROM Display Mode

This option sets the display mode for Option ROM. The options are **Force BIOS** or Keep Current.

#### Bootup Num Lock

This option selects the power-on state for the NUM lock to either **On** or Off.

#### PS/2 Mouse Support

Use this option to select support for the PS/2 mouse. Options are Disabled, Enabled or **Auto**.

#### Wait for F1 if Error

This setting controls the system response when an error is detected during the boot sequence. When enabled, BIOS will stop the boot sequence when an error is detected, at which point you will need to press the F1 button to re-enter the BIOS setup menu. The options are **Enabled** and Disabled.

#### Hit 'DEL' Message Display

Use this option to **Enable** or Disable the "Press DEL to run setup" message in POST.

#### Watch Dog Function

This option allows the system to restart when it is not active more than 5 minutes. Options are Enabled or **Disabled**.

#### Power Mode Button

This option selects the Power Button functionality. Options are **Instant Off** or 4-seconds Override.

**Restore on AC Power Loss**

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

**Interrupt 19 Capture**

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

**► Processor and Clock Options****CPU Configuration**

This displays static information on the Module Version, AGESA Version, Physical Count and Logical Count for the system's processor(s) and clock.

**CPU Information**

This setting is used to select which physical CPU's information to display. Options include **Processor 0** or Processor 1. The information for the selected processor includes Processor number, Revision, Cache L1/L2/L3, Speed, NB CLK, Able to Change Frequency and uCode Patch Level.

**Note:** Zero is always the "Boot Strap Processor" or main CPU with all others being "Application Processors".

**GART Error Reporting**

This option should remain disabled for normal operation. The driver developer may enable this option for testing purposes. Options are Enabled or **Disabled**.

**Microcode Update**

This setting **Enables** or Disables microcode updating.

**Secure Virtual Machine Mode**

This setting is used to **Enable** or Disable SVM.

**Power Now**

This setting is used to **Enable** or Disable the AMD Power Now feature.

**Power Cap**

This setting is used to describe and set the highest performance P-state in the operating system. Options include **P-state 0**, P-state 1, P-state 3 and P-state 4.

**ACPI SRAT Table**

This option **Enables** or Disables the building of the ACPI SRAT Table.

**CPU Prefetching**

Use this setting to **Enable** or Disable CPU prefetching.

**IO Prefetching**

Use this setting to **Enable** or Disable IO prefetching.

**Probe Filter**

Use this setting to enable the Probe Filter. Options include **Auto** or Disabled.

**Clock Spread Spectrum**

Use this setting to Enable or **Disable** Clock Spread Spectrum.

**► Advanced Chipset Control****► NorthBridge Configuration****► Memory Configuration****Bank Interleaving**

Select Auto to automatically enable a bank-interleaving memory scheme when this function is supported by the processor. The options are Auto and **Disabled**.

**Node Interleaving**

Use this setting to enable the Node interleaving memory scheme when this function is supported by the processor. The options are Enabled or **Disabled**.

**Channel Interleaving**

Selects the channel-interleaving memory scheme when this function is supported by the processor. The options are Disabled, Address Bits 6, Address Bits 12, **XOR of Address Bits [20:16, 6]** and XOR of Address Bits [20:16, 9].

**MemCik Tristate C3/ALTVID**

Use this setting to Enable or **Disable** memory clock tristate during C3 and ALT VID.

### **Memory Hole Remapping**

When "Enabled", this feature enables hardware memory remapping around the memory hole. Options are **Enabled** and Disabled.

### **CS Sparing Enable**

This setting will reserve a spare memory rank in each node when enabled. Options are Enable and **Disable**.

### **DCT Unganged Mode**

This setting enables unganged DRAM mode (64-bit). Options are Auto (ganged mode) and **Always** (unganged mode).

### **Power Down Enable**

This setting enables or disables DDR power down mode. Options are **Enabled** and Disabled.

#### **Power Down Mode**

This sets the power down mode. Options are **Channel** and Chip Select.

## **► ECC Configuration**

### **ECC Mode**

This submenu affects the DRAM scrub rate based on its setting. Options include Disabled, **Basic**, Good, Super, Max and User. Selecting User activates the other options for user setting.

### **DRAM ECC Enable**

This setting allows hardware to report and correct memory errors automatically, maintaining system integrity. Options are **Enabled** or Disabled.

### **DRAM Scrub Redirect**

This setting allows the system to correct DRAM ECC errors immediately when they occur, even if background scrubbing is off. Options are Enabled or **Disabled**.

### **4-Bit ECC Mode**

Allows the user to enabled 4-bit ECC mode (also known as ECC Chipkill). Options are **Enabled** and Disabled.

**DRAM BG Scrub**

Corrects memory errors so later reads are correct. Options are Disabled and various times in nanoseconds and microseconds. The default is **Disabled**.

**Data Cache BG Scrub**

Allows L1 cache RAM to be corrected when idle. Options are Disabled and various times in nanoseconds and microseconds. The default is **Disabled**.

**L2 Cache BG Scrub**

Allows L2 cache RAM to be corrected when idle. Options are Disabled and various times in nanoseconds and microseconds. The default is **Disabled**.

**L3 Cache BG Scrub**

Allows L3 cache RAM to be corrected when idle. Options are Disabled and various times in nanoseconds and microseconds. The default is **Disabled**.

**► DRAM Timing Configuration****Memory Clock Mode**

This setting specifies the memory clock mode. Options are **Auto**, Limit and Manual.

**DRAM Timing Mode**

This setting specifies the DRAM timing mode. Options are **Auto** and DCT0, DCT1 and Both.

**Alternate VID**

Specify the alternate VID while in low power states. Options are **Auto** and various voltages from .800V to 1.050V in increments of .025V.

**Memory Timing Parameters**

This setting selects which nodes timing parameters to display (**CPU Node 0** or CPU Node 1).

## ► Hyper Transport Configuration

### NODE0: PCI-X2 HT Link

#### Link Speed

The Hyper Transport link will run at this speed if it is slower than or equal to the system clock speed. Options include 1 GHz and **Auto**.

#### Link Width

Hyper Transport runs at this width. Options include **Auto**, 4 Bit, 8 Bit and 16 Bit.

### NODE0: NODE1 HT Link Speed

#### Link Speed

The Hyper Transport link will run at this speed if it is slower than or equal to the system clock speed and what the board is capable. Options include 1 GHz and **Auto**.

### NODE0: NODE1 HT Link Width

#### Link Width

Hyper Transport runs at this width. Options include **Auto**, 4 Bit, 8 Bit and 16 Bit.

## IOMMU

This setting is used to disable or set the GART size in systems without AGP. Options include AGP Present, **Disabled**, 32 MB, 64 MB, 128 MB, 256 MB, 512 MB and 1 GB.

## HD Audio Azalia Device

This setting allows you to enable or disable your HD Audio Azalia device. Options include Enabled, Disabled and **Auto**.

## Frontside Audio Mode

Use this setting to set the frontside audio mode. The default is **HD Audio**.

## OHCI/EHCI HC Device Functions

These settings allow you to either **Enable** or Disable functions for OHCI or EHCI bus devices.

## USB 2.0 Controller

This setting allows you to **Enable** or Disable the USB 2.0 Controller.

---

### **Legacy USB Support**

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

## **► IDE Configuration**

### **Onboard PCI IDE Controller**

This setting allows you to **Enable** or Disable the PCI IDE controller.

### **On Chip SATA Channel**

This setting allows you to **Enable** or Disable the OnChip SATA channel.

### **On Chip SATA Type**

Use this setting to set the On Chip SATA type. Options include **Native IDE**, RAID, AHCI and Legacy IDE.

### **SATA IDE Combined Mode**

This setting allows you to **Enable** or Disable the SATA IDE combined mode.

### **PATA Channel Configuration**

This allows you to set PATA channel configuration. Options include **SATA as Primary** or SATA as secondary.

## **► Primary/Secondary/Third/Fourth IDE Master/Slave**

### **Type**

This selects the type of device connected to the system. Options include **Auto**, CD/DVD, Not Installed and ARMD

### **LBA/Large Mode**

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and **Auto**.

**Block (Multi-Sector Transfer)**

Block mode boosts 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 allow the data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

**PIO Mode**

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 BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow BIOS to use PIO mode 0, which has a data transfer rate of 3.3 MBs. Select 1 to allow BIOS to use PIO mode 1, which has a data transfer rate of 5.2 MBs. Select 2 to allow BIOS to use PIO mode 2, which has a data transfer rate of 8.3 MBs. Select 3 to allow BIOS to use PIO mode 3, which has a data transfer rate of 11.1 MBs. Select 4 to allow BIOS to use PIO mode 4, which 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**

Selects the DMA Mode. Options are **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0, MDWDMA1, MWDMA2, UDMA0, UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.)

**S.M.A.R.T.**

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

**IDE Detect Timeout (Sec)**

Use the +/- keys to adjust and select the time out for detecting ATA/ATAPI devices. The default value is **35**.

**► PCI/PnP Configuration****Clear NVRAM**

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

**Plug & Play O/S**

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

**PCI Latency Timer**

This option sets the latency of all PCI devices on the PCI bus. Select a value to set the PCI latency in PCI clock cycles. Options are 32, **64**, 96, 128, 160, 192, 224 and 248.

**PCI IDE Busmaster**

Use this setting to **Enable** or Disable BIOS enabled uses of PCI Busmastering for reading or writing to IDE drives.

**ROM Scan Ordering**

This setting determines which kind of option ROM activates before another. Options are **Onboard First** or Add On First

**PCI Slot 1 ~ 7 Optrom**

Use these settings to **Enable** or Disable the OPROM (Option ROM firmware) for slot 1 through 7.

**Onboard LAN Option ROM Select**

This setting allows you to select iSCSI support instead of PCI-Express support for Intel 82576 or 82574L communication chips. Options are **PXE** or iSCSI.

**Load Onboard LAN 1/2 Option ROM**

Use these settings to Enable or **Disable** the onboard option ROM for LAN 1 or 2. This setting must be enabled for each LAN port to view the Boot Menu settings for it.

**Load Onboard SAS Option ROM**

Use this setting to **Enable** or Disable the onboard SAS option ROM.

### **Boots Graphic Adapter Priority**

This setting allows you to select the boot priority for your graphics adapters in your system. Options include **Onboard VGA**, Slot 6 or Other.

## ► **Remote Access Configuration**

### **Remote Access**

Use this option to **Enable** or Disable Remote Access in your system. If enabled, the settings below will appear.

### **Serial Port Number**

Use this setting to select the serial port for console redirection. Options include COM1, COM2 or **COM3\***. The displayed base address and IRQ for the serial port changes to reflect the selection you make.

**Note:** Make sure the selected port is enabled.

### **Serial Port Mode**

Selects the serial port settings to use. Options are **(115200 8, n, 1)**, (57600 8, n, 1), (38400 8, n, 1), (19200 8, n, 1) and (09600 8, n, 1).

### **Flow Control**

Selects the flow control to be used for console redirection. Options are **None**, Hardware and Software.

### **Redirection After BIOS POST**

Options are Disable (no redirection after BIOS POST), Boot Loader (redirection during POST and during boot loader) and **Always** (redirection always active). Note that some OS's may not work with this set to Always.

### **Terminal Type**

Selects the type of the target terminal. Options are **ANSI**, VT100 and VT-UTF8.

### **VT-UTF8 Combo Key Support**

Allows you to **Enable** or Disable VT-UTF8 combination key support for ANSI/VT100 terminals.

### **Sredir Memory Display Delay**

Use this setting to set the delay in seconds to display memory information. Options are **No Delay**, 1 sec, 2 secs and 4 secs.

## ► Hardware Health Configuration

### CPU Overheat Alarm

Use the "+" and "-" keys to set the CPU temperature threshold to between 65° and 90° C. When this threshold is exceeded, the overheat LED on the chassis will light up and an alarm will sound. The LED and alarm will turn off once the CPU temperature has dropped to 5 degrees below the threshold set. The default setting is **72° C**.

### Fan Speed Control Modes

This feature allows the user to determine how the system will control the speed of the onboard fans. 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 continuously run at full speed (12V). The options are Full Speed (FS), Performance (PF), Balanced (BL) and **Energy Saving (ES)**.

### FAN1 Speed through FAN8 Reading

The speeds of the onboard fans (in rpm) are displayed here.

Other items in the submenu are systems monitor displays for the following information:

NB 1 Temperature, NB2 Temperature, SAS Temperature, CPU1 VCore, CPU2 VCore, CPU1 Mem VTT, CPU2 Mem VTT, CPU1 Mem, CPU2 Mem, NB1 1.1V, NB2 1.1V, 5V, +12V, -12V, 3.3Vcc, 3.3VSB, VBAT and HT Voltage.

## ► ACPI Configuration

### High Performance Event Timer

This setting **Enables** or Disables the high performance event timer.

### PS/2 KB/MS Wakup

This option Enables or **Disables** the keyboard/mouse wakeup for these devices.

### USB Device Wakup

Use this setting to Enable or **Disable** USB device wakup from S3/S4.

### ACPI Aware O/S

This setting enables or disables ACPI support for the operating system. Use Enable (Yes) if the OS supports ACPI. Use Disable (No) if the OS does not support ACPI. Options are **Yes** or No.

### **Suspend Mode**

This setting selects the ACPI state used for system suspend. Options include **S1 (POS)**, S3 (STR) and Auto.

### **ACPI APIC Support**

Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

### **Headless Mode**

Use this setting to Enable or **Disable** headless operation mode through ACPI.

### **ACPI Version Features**

Use this setting to determine which ACPI version to use. Options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0.

## **▶ Trusted Computing**

### **TCG/TPM Support**

This setting allows you to enable or disable TPM TCG (TPM 1.1/1.2) support in the BIOS. Options are Yes or **No**.

## **▶ IPMI Configuration**

This menu shows static information about the IPMI firmware revision and status of the BMC, as well as options for IPMI configuration.

### **▶ View BMC System Event Log**

Pressing the Enter key will open the following settings. Use the "+" and "-" keys to navigate through the system event log.

### **Clear BMC System Event Log**

Selecting this and pressing the Enter key will clear the BMC system event log.

### **▶ Set LAN Configuration**

Use the "+" and "-" keys to choose the desired channel number.

#### **Channel Number**

This option sets the channel number for the SEI LAN CONFIG Command to any proper value below 16.

### **IP Address Source**

This setting sets the IP address source as either Static or **DHCP**. Selecting Static allows you to manually set the IP Address, Subnet Mask and Gateway Address/

#### ▶ **IP Address**

Push a number key to modify the parameter and enter the IP Address. The IP address and current IP address in the BMC are shown.

#### ▶ **Subnet Mask**

Push a number key to modify the parameter and enter the Subnet Mask Address. The subnet address and current subnet address in the BMC are shown.

#### ▶ **Gateway Address**

Push a number key to modify the parameter and enter the Gateway Address. The Gateway address and current Gateway address in the BMC are shown

#### ▶ **MAC Address**

Push a number key to modify the parameter and enter the MAC Address. The MAC address and current MAC address in the BMC are shown.

### **BMC Watch Dog Timer Action**

This setting is used to set the Watch Dog function. The options are **Disabled**, Reset System, Power Down and Power Cycle.

#### ▶ **Event Log Configuration**

##### **View Event Log**

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

##### **Mark All Events as Read**

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

##### **Clear Event Log**

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

### **PCI Express Error Logging**

This setting allows you to Enable or **Disable** PCI Express Advanced Error Logging.

## **7-4 Security Menu**

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.

### **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", AMI BIOS 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**.

## **7-5 Boot Menu**

The Boot Menu is accessible only when the "Load Onboard LAN Option ROM" setting (in the PCI/PnP Configuration menu) is enabled.

### **► Boot Device Priority**

This feature allows the user to prioritize the boot sequence from the available devices.

### **► Hard Disk Drives**

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

### **► CD/DVD Drives**

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

## 7-6 Exit Menu

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

### **Save Changes and Exit**

When you have completed the system configuration changes, select this option to leave 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>.

### **Discard Changes and Exit**

Select this option to quit 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>.

### **Discard Changes**

Select this option and press <Enter> to discard all the changes and return to AMI BIOS 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 BIOS to automatically load the Optimal Defaults as 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 maximum performance.

**Notes**

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## 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.

#### A-1 BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

# Notes

## Appendix B

### Installing Windows

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides posted on our web site at [www.supermicro.com/support/manuals](http://www.supermicro.com/support/manuals).

**Note:** the following instructions apply to installing Windows XP or Windows 2003 only. If installing Windows 2008 or Windows Vista, please follow the instructions displayed on your screen after loading the Operating System CD.

#### B-1 Installing Windows for a RAID System

1. Insert Microsoft's Windows XP/Windows 2003 Setup CD in the CD drive and the system will start booting up from the CD.
2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.
3. When the Windows XP/Windows 2003 Setup screen appears, press "S" to specify additional device(s).
4. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.
5. From the Windows setup screen, press the <Enter> key. The program will automatically load all device files and then continue the Windows installation.
6. After the installation is complete, the system will automatically reboot.

## **B-2 Installing Windows for a Non-RAID System**

1. Insert Microsoft's Windows XP/Windows 2003 setup CD in the CD drive and the system will start booting up from the CD.
2. Continue with the OS installation. The Windows OS Setup screen will display.
3. From the Windows setup screen, press the <Enter> key. The XP/2003 Setup will automatically load all device files and then continue with the installation.
4. After the installation is complete, the system will automatically reboot.
5. Insert the Supermicro Setup CD that came with your system into the CD drive during the system boot, and the main screen will display.

## Appendix C

### System Specifications

#### Processors

Dual AMD Opteron 2000 series (Socket F type) processors

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

#### Chipset

Two AMD SR5690 and one AMD SP5100 chipsets

#### BIOS

16 Mb AMIBIOS® SPI Flash ROM

#### Memory Capacity

Sixteen single/dual channel DIMM slots supporting up to 128 GB of DDR2-800/667/533 registered ECC SDRAM

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

#### GPUs (Graphics Processing Units)

Onboard Matrox® G200 graphics controller with 16 MB DDR2 memory

#### SATA Controller

AMD SP5100 on-chip controller for 3 Gb/s SATA ports (RAID 0, 1 and 10 support)

#### SAS Controller

LSI2008 SAS2 on-chip controller for 2 IPASS connectors that can serve up to 8 hot-swappable drive units (RAID 0, 1, 10 and JBOD with optional RAID-5 support)

#### Drive Bays

Eight (8) hot-swap drive bays to house Eight (8) standard SAS/SATA drives  
Peripheral drive bays for three (3) 5.25" drive bays in storage module and one (1) 3.5" fixed drive bay

### **Expansion Slots**

- Four (4) PCI-Express x16 Gen 2 slots
- Two (2) PCI-Express x4 (in x8) Gen 2 slots
- One (1) PCI slot

### **Serverboard**

H8DA6+-F (extended ATX form)

Dimensions: 13.68" (L) x 13.05" (W) (347 x 331 mm)

### **Chassis**

SC747TG-R1400SQ (4U/Tower rackmount)

Dimensions: (WxHxD) 11.8 x 7 x 29.4 in. (452 x 178 x 746 mm)

### **Weight**

Gross (Bare Bone): 72 lbs. (32.7 kg.)

### **System Cooling**

Four 9.2x3.8-cm and two 3.8-cm cooling fans (fan speed controlled by BIOS setting)

### **System Input Requirements**

AC Input Voltage: 180-240 VAC

Rated Input Current: 7.2A (180V) to 9.5 (240V)

Rated Input Frequency: 50-60 Hz

### **Power Supply**

Rated Output Power: 1400W w/PFC (Part# PWS-1K41F-1R)

Rated Output Voltages: +12V (116A), +5Vsb (4A)

### **Operating Environment**

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-Operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-Operating Relative Humidity: 5 to 95% (non-condensing)

## **Regulatory Compliance**

Electromagnetic Emissions: FCC Class B, 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: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:  
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

## Notes

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The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.