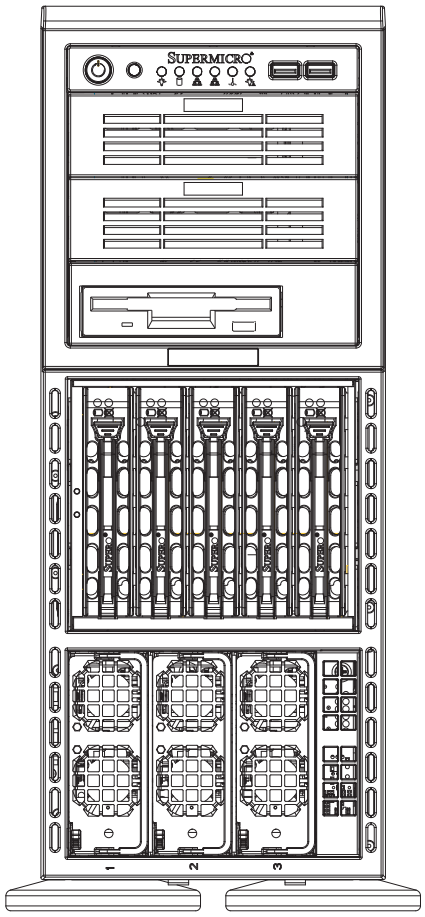
SUPER®

AS 4041M-32R+



USER'S MANUAL

1.0a

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Manual Revision 1.0a
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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 AS4041M-32R+. Installation and maintainance should be performed by experienced technicians only.

The 4041M-32R+ is a high-end tower based on the SC748TQ-R1200 server chassis and the H8QM3-2 serverboard, which supports four AMD Opteron™ 8300/8000 series processors and up to 128 GB of registered ECC DDR2-667/533/400 SDRAM.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the H8QM3-2 serverboard and the SC748TQ-R1200 chassis, which make up the 4041M-32R+.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the 4041M-32R+ into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

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

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the 4041M-32R+.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the H8QM3-2 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 SC748TQ-R1200 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS/SATA or peripheral drives and when replacing the system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS Error Beep Codes

Appendix B: BIOS POST Checkpoint Codes

Appendix C: System Specifications

Notes

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Chapter 1

Introduction

1-1 Overview

The AS4041M-32R+ is a high-end quad processor server that is comprised of two main subsystems: the SC748TQ-R1200 1U server chassis and the H8QM3-2 serverboard. Please refer to our web site for information on operating systems that have been certified for use with the 4041M-32R+.

In addition to the serverboard and chassis, various hardware components have been included with the 4041M-32R+:

- One (1) floppy drive (FPD-PNSC-01)
- Three (3) 9-cm hot-swap chassis fans (FAN-0090)
- Three (3) 8-cm exhaust fans (FAN-0081)
- Four (4) passive CPU heatsinks (SNK-P0023P+)
- Four (4) heatsink retention modules with 8 screws (BKT-0005L)
- Four (4) CPU backplates, pre-installed (BKT-0004L)
- Three (3) 5.25" dummy drive trays w/ rails (CSE-PT36)
- One (1) air shroud (MCP-310-74802-0B)
- SAS Accessories (4041M-32R+ only)
  One (1) SAS backplane (CSE-SAS-M35TQ)
  Five (5) SAS cables (CBL-0206L)
  Five (5) SAS drive carriers [CSE-PT39(B)]
- One (1) CD containing drivers and utilities
- Optional:
  One (1) rackmount kit (MCP-290-00001-00)

1-2 Serverboard Features

At the heart of the 4041M-32R+ lies the H8QM3-2, a quad processor serverboard based on the nVidia MCP55 Pro/IO55 chipset. Below are the main features of the H8QM3-2. (See Figure 1-1 for a block diagram of the chipset).

Processors

The H8QM3-2 supports four Socket F AMD Opteron 8300/8000 Series 64-bit processors. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com/aplus/).

Memory

The H8QM3-2 has thirty-two dual-channel DIMM slots supporting up to 128 GB of registered ECC DDR2-667/533/400 SDRAM. Both interleaved and non-interleaved memory configurations are supported.

Onboard SAS

SAS is provided with an LSI 1068E SAS controller supporting eight SAS ports (RAID 0, 1, 10 and JBOD, optional RAID 5 support with iButton installed).

Onboard SATA

SATA is provided with an on-chip 3 GB/sec SATA controller to support six SATA ports (RAID 0, 1, 0+1, 5 and JBOD).

Onboard Controllers/Ports

One floppy drive controller and one ATA/133/100 controller are provided to support up to four hard drives or ATAPI devices. The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two G-bit Ethernet ports.

ATI Graphics Controller

The H8QM3-2 features an integrated ATI video controller based on the Rage XL graphics chip.

Other Features

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

1-3 Server Chassis Features

The 4041M-32R+ is a high-end, scaleable server platform. The following is a general outline of the main features of the SC748TQ-R1200 server chassis.

System Power

The SC748TQ-R1200 features a redundant 1200W power supply composed of two separate power modules. This power redundancy feature allows you to replace a failed power supply without shutting down the system.

SAS Subsystem

The SAS subsystem supports up to eight 3 Gb/sec SAS hard drives, which are hot-swappable. The SAS drives are connected to a SAS backplane. A RAID controller card can be used with the backplane to provide data security. **Note:** The operating system you use must have RAID support to enable the hot-swap capability of the SAS drives. For documentation on SAS RAID, please refer to the LSI manual on the driver CD that came with the system.

SATA Subsystem

The SATA subsystem supports up to six 3 Gb/sec SATA hard drives, which are hot-swappable. The SATA drives are connected to a SATA backplane. A RAID controller card can be used with the backplane to provide data security. **Note:** The operating system you use must have RAID support to enable the hot-swap capability of the SATA drives.

PCI Expansion Slots

The SC748TQ-R1200 chassis supports the use of up to seven standard size (full-height, full-length) expansion cards.

Front Control Panel

The control panel provides you with system monitoring and control. LEDs indicate system power, power fail, HDD activity, network activity and overheat/fan fail. A main power button and a system reset button are also included.

I/O Backplane

The I/O backplane on the SC748TQ-R1200 provides seven PCI expansion slots for standard size add-on cards, one COM port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports.

Cooling System

The SC748TQ-R1200 chassis has an innovative cooling design that includes three 9-cm hot-swap chassis fans and three 8-cm exhaust fans located at the rear of the chassis. The power supply modules also include a cooling fan. All chassis and power supply fans operate continuously.

A setting in BIOS (see Chapter 7) is used to control the system fan speed. This setting uses voltage control to allow fans to run at different speeds.

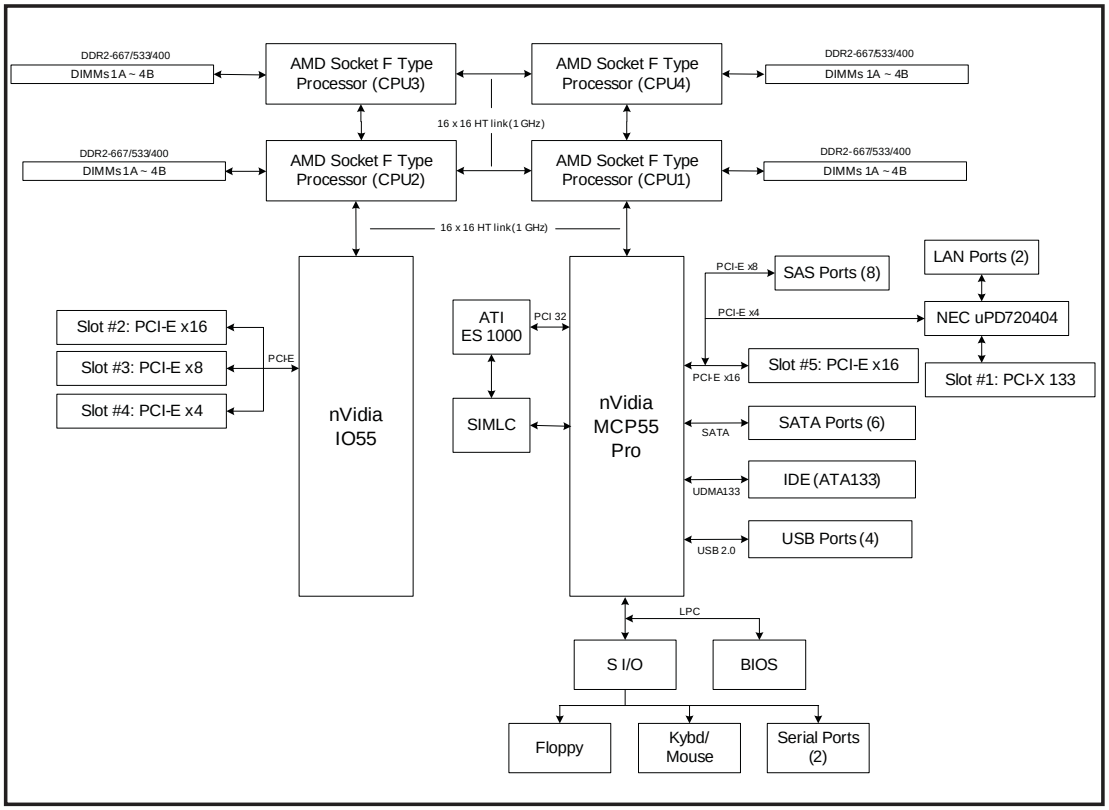


Figure 1-1. nVidia MCP55 Pro/IO55 Chipset: System Block Diagram

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

1-4 Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web Site:	www.supermicro.com

Europe

Address:	Super Micro Computer B.V.
	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	sales@supermicro.nl (General Information)
	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)

Asia-Pacific

Address:	Super Micro, Taiwan
	4F, No. 232-1, Liancheng Rd.
	Chung-Ho 235, Taipei County
	Taiwan, R.O.C.
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

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your AS4041M-32R+ up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

The 4041M-32R+ may be employed either as a tower or mounted in a rack as a 4U rackmount chassis. If using it as a tower unit, please read the Server Precautions in the next section and then skip ahead to Section 2-5.

2-2 Unpacking the System

You should inspect the box the 4041M-32R+ was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the 4041M-32R+. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the 4041M-32R+ was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and 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).
- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

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

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug SATA 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 (Tmra).

Reduced Airflow

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

Mechanical Loading

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

Circuit Overloading

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

Reliable Ground

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

2-4 Installing the System into a Rack

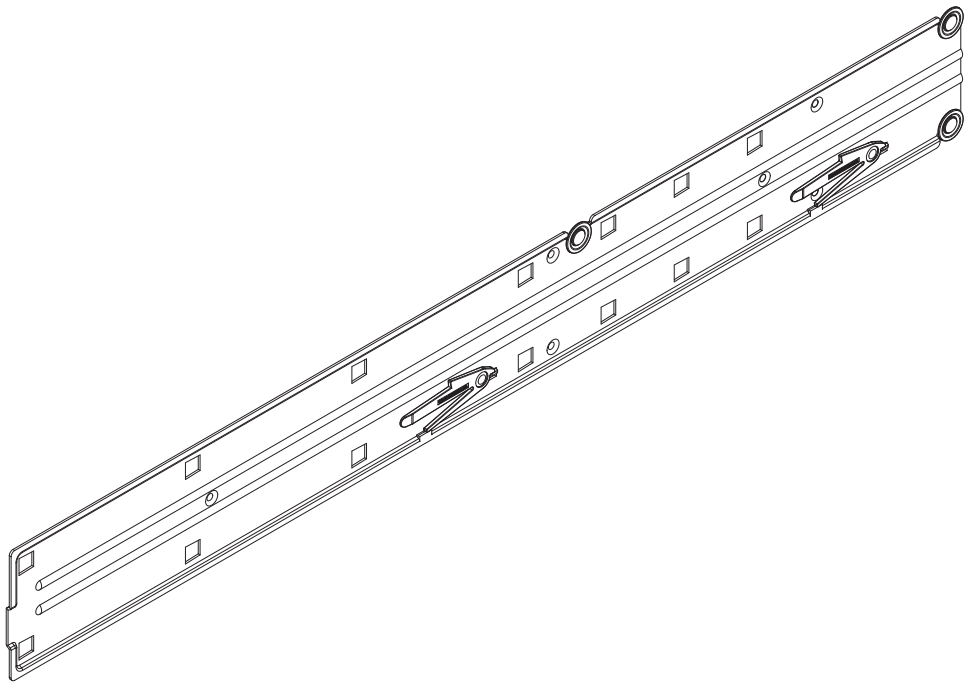
This section provides information on installing the system into a rack unit. Rack installation requires the use of the optional rackmount kit If the system has already been mounted into a rack or if you are using it as a tower, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units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

Identifying the Sections of the Rack Rails

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

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

Figure 2-1. Inner Fixed Chassis Rail



Installing the Chassis Rails

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

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

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

Figure 2-2. Preparing to Install the Chassis Rails

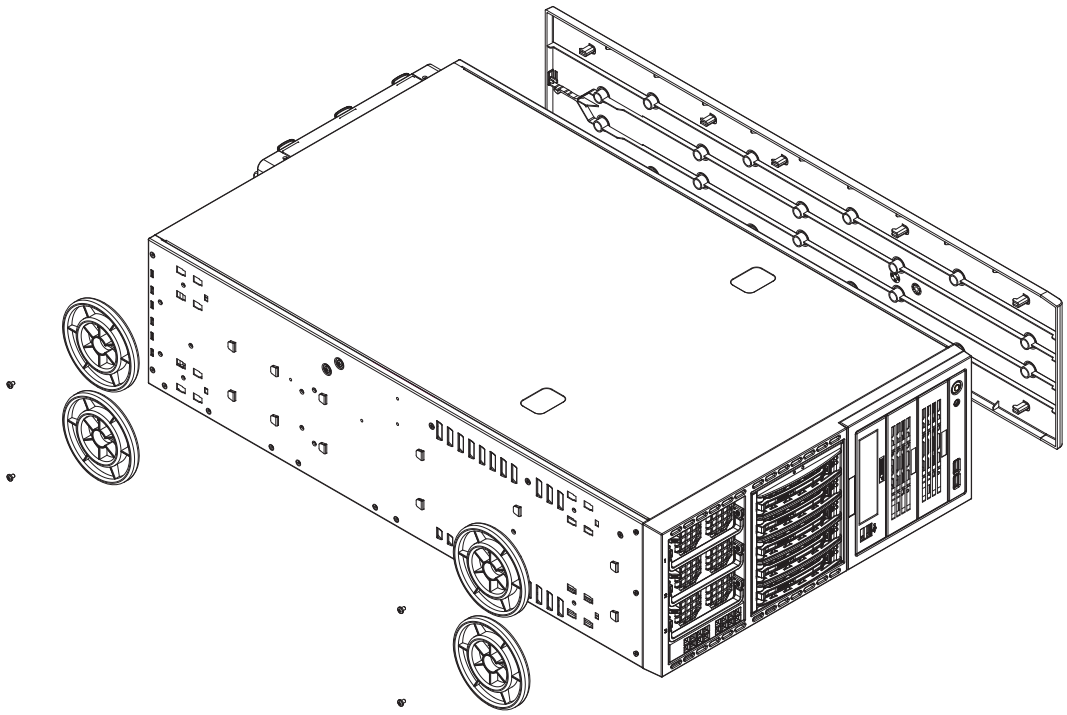
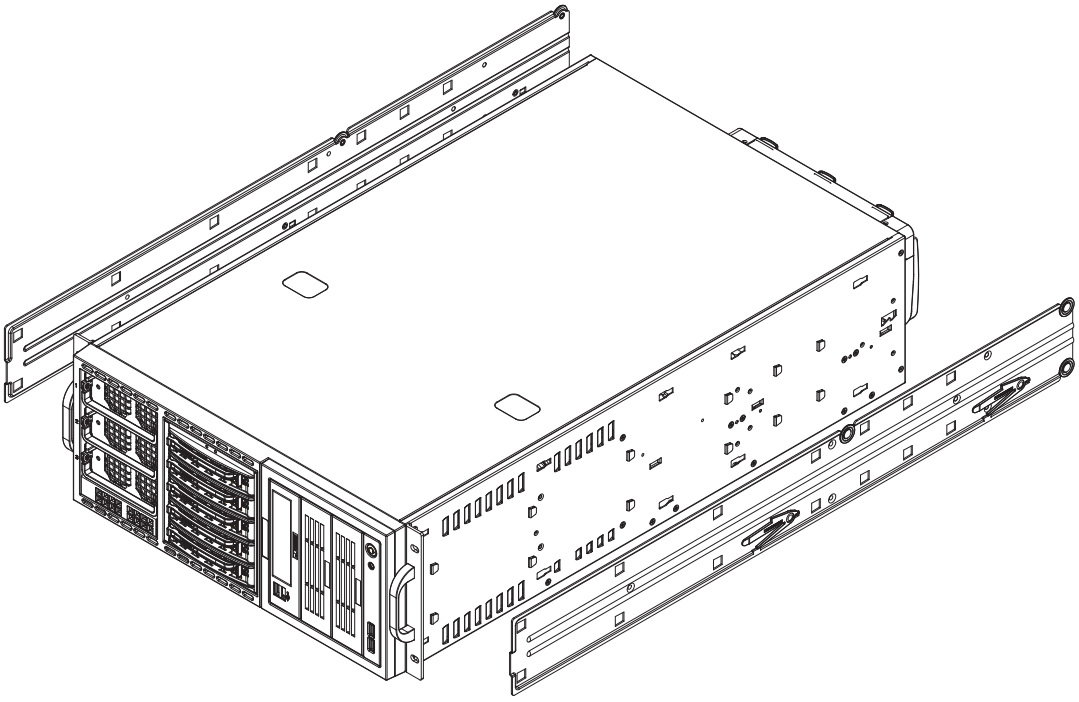


Figure 2-3. Installing the Rails to the Chassis



Installing the Rack Rails

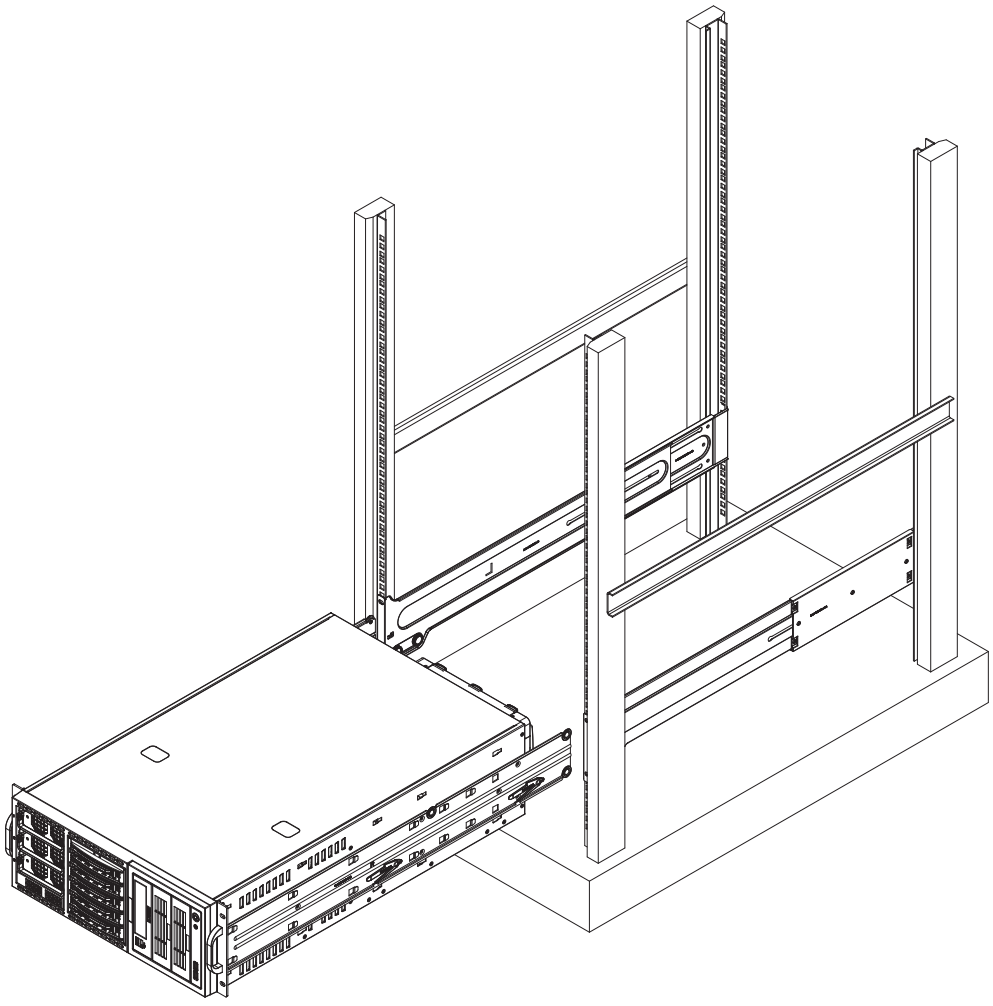
Determine where you want to place the 4041M-32R+ in the rack. (See Rack and Server Precautions in Section 2-3.) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward.

Installing the Server into the Rack

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

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

Figure 2-4. Installing the Server into a Rack



2-5 Checking the Serverboard Setup

After setting up the the system, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

Accessing the Inside of the System

1. If rack mounted, first release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

2. There are two screws that secure the cover to the chassis - remove these first.

3. Using the indentations on the side cover (see Figure 2-5), push the cover to slide it off the chassis.

4. Lift the cover from the chassis to gain full access to the inside of the server.

Checking the Components and Setup

1. You may have four processors already installed into the serverboard. Each processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

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

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

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

2-6 Checking the Drive Bay Setup

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

Checking the Drives

1. All drives can be accessed from the front of the server. For servicing the CD-ROM, IDE hard drives and floppy drives, you will need to remove the top/left

chassis cover. The SAS/SATA disk drives can be installed and removed from the front of the chassis without removing any chassis covers.

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

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

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

Checking the Airflow

1. Airflow is provided by three 9-cm hot-swap chassis fans working in conjunction with three 8-cm exhaust fans, which are located at the rear of the chassis.

2. The system component layout was carefully designed to promote sufficient airflow through the chassis.

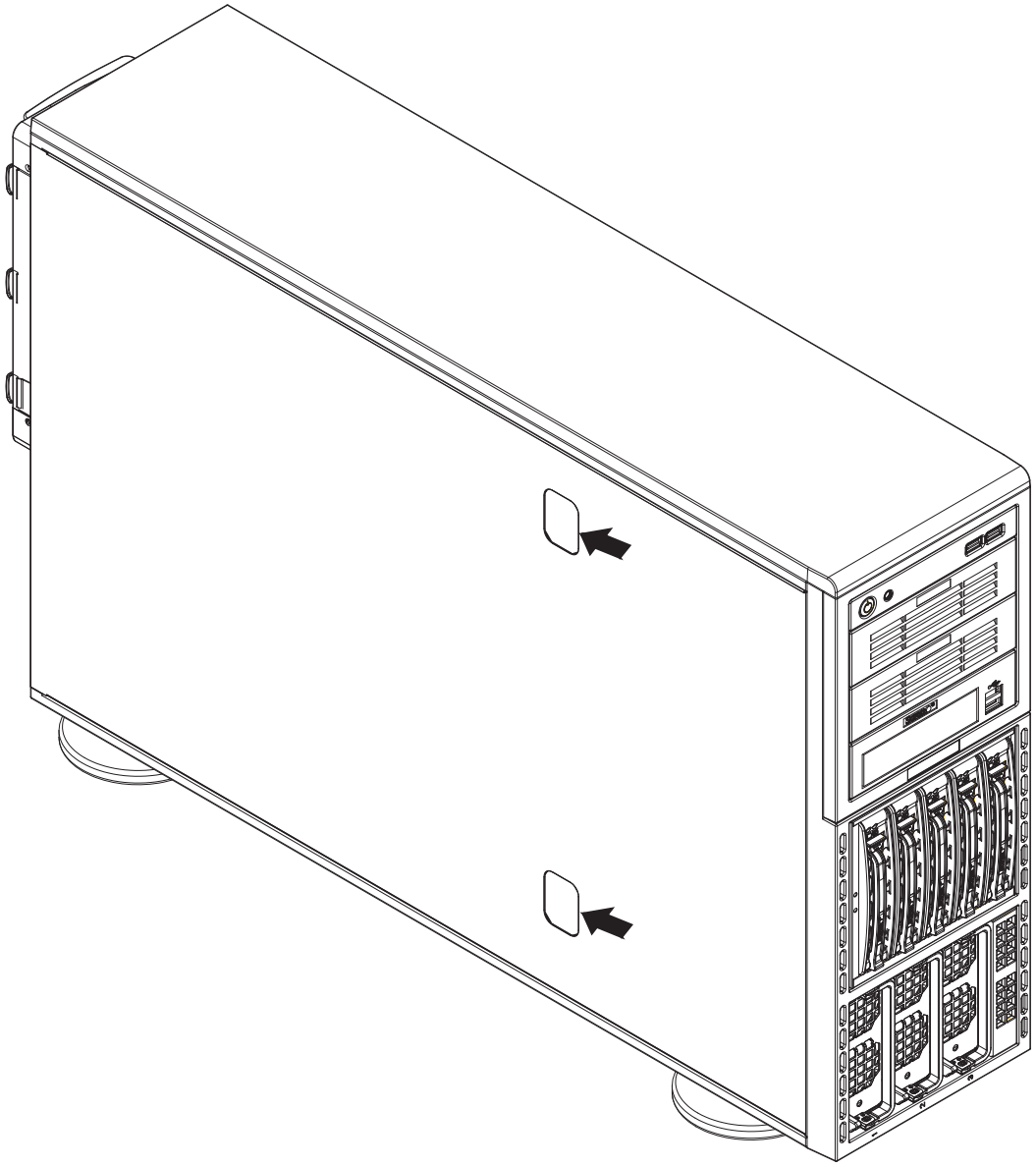
3. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans. Keep this in mind when you reroute them after working on the system.

Providing Power

1. Plug the power cords from the power supplies 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. Finally, depress the power on button on the front of the chassis.

Figure 2-5. Accessing the Inside of the System (Rack Configuration shown)



Chapter 3

System Interface

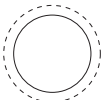
3-1 Overview

There are several LEDs on the control panel as well as others on the SAS/SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

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

RESET



Reset

Use the reset button to reboot the system.

Power

The main power button is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC748TQ-R1200 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Power Fail

Indicates a power supply module has failed. This should be accompanied by an audible alarm. A backup power supply module will take the load and keep the system running but the failed module will need to be replaced. Refer to Chapter 6 for details on replacing failed power supply modules. This LED should be off when the system is operating normally.

Overheat/Fan Fail

When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the overheat condition exists.

NIC2

Indicates network activity on JLAN2 when flashing

NIC1

Indicates network activity on JLAN1 when flashing.

HDD

Indicates IDE channel activity. On the 4041M-32R+, this light indicates SAS/SATA and/or CD-ROM drive activity when flashing.

Power

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

3-4 Drive Carrier LEDs

SAS Drives

Each SAS drive carrier has two LEDs:

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

- **Red:** The SES2 compliant backplane activates the red LED to indicate a drive failure. If one of the SAS drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SAS drives.

SATA Drives

Each SATA drive carrier has two LEDs.

- **Green:** When illuminated, the 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 drive is being accessed.

- **Red:** The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure. If a SATA drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the AS4041M-32R+ from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the CD-ROM and floppy drives (not necessary for SAS or SATA drives). When disconnecting power, you should first power down the system with the operating system. The unit has more than one power supply cord. Disconnect both 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 electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

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

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

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-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 4041M-32R+ clean and free of clutter.

- The 4041M-32R+ weighs approximately 65.5 lbs (29.7 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 any board from its antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

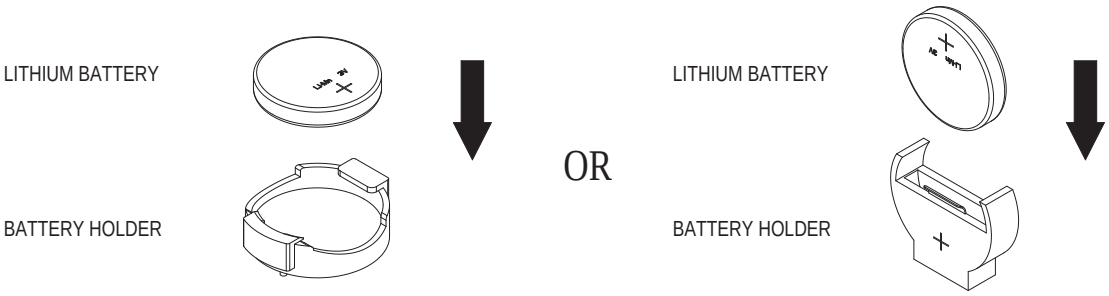
- Put the serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 4041M-32R+ is operating to ensure proper cooling. Out of warranty damage to the 4041M-32R+ system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors and heat sinks to the H8QM3-2 serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

5-1 Handling the Serverboard

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

Precautions

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

Unpacking

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

5-2 Processor and Heat Sink Installation

Exercise extreme caution when handling and installing the processor. Always connect the power cords last and always remove them before adding, removing or changing any hardware components.

Installing the CPU Backplates

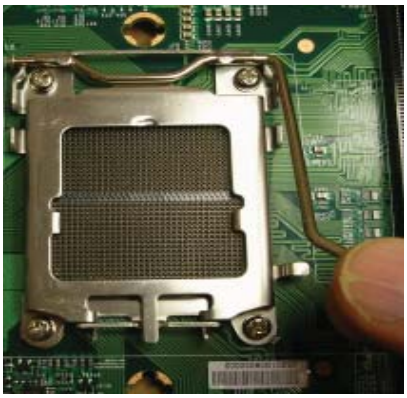
Four CPU backplates (BKT-0011L) have been preinstalled to the serverboard to prevent the CPU area of the serverboard from bending and to provide a base for attaching the heat sink retention modules.

Single, dual or quad-CPU configurations only are supported. For a single-CPU configuration, install to the CPU1 socket. For a dual-CPU configuration, install to the CPU1 and CPU2 sockets.

Installing the Processors

(Install to the CPU#1 socket first)

1. Begin by removing the cover plate that protects the CPU. Lift the lever on CPU socket #1 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.

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-processor system, repeat these steps to install another CPU into the CPU#2 socket or install to all four sockets for a quad-CPU configuration

CPU Heat Sinks

The use of active type heat sinks are recommended. Connect the heat sink fans to the appropriate fan headers on the serverboard.

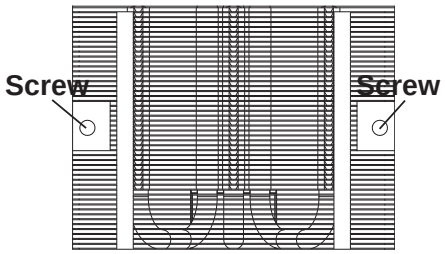
Installing the Heat Sink

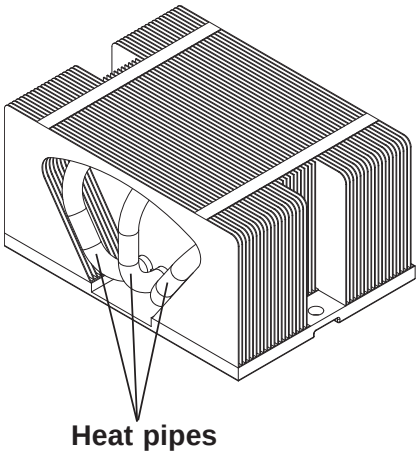
1. Do not apply any thermal grease to the heat sink or the CPU die; the required amount has already been applied.

2. Place the heat sink on top of the CPU so that the two mounting holes are aligned with those on the retention mechanism. Also, the the heat pipes of all four heat sinks (visible on one side of the heat sink) should face toward the edge of the serverboard.

3. Screw in both screws until just snug. (Do not over-tighten the screws, which may damage the CPU.)

4. After checking that the heat sink is sitting level on the CPU, fully tighten the twoscrews.





Uninstalling the Heat Sink

Warning: We do not recommend removing the CPU or the heat sink. However, if you do need to uninstall the heat sink, please follow these instructions to avoid damaging the CPU or the CPU socket.

1. Unscrew and remove the heat sink screws in the sequence shown in the picture on the right.

2. Hold the heat sink as shown in the picture on the right and gently wriggle to loosen it from the CPU. (Do not use excessive force when doing this!)

3. Once the heat sink is loosened, remove it from the CPU socket.

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

5-3 Connecting Cables

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

Connecting Data Cables

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

The following data cables (with their serverboard connector locations noted) should be connected. See the serverboard layout diagram in this chapter for connector locations.

- Floppy Drive cable (JFDD1)
- DVD-ROM Drive cable (IDE#1)
- Control Panel cable (JF1, see next page)
- SAS cables (SAS0 ~ SAS4)

Connecting Power Cables

The H8QM3-2 has a 24-pin primary power supply connector designated "J1B1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the serverboard. See the Connector Definitions section in this chapter for power connector pin definitions.

In addition, your power supply must be connected to both 8-pin Processor Power connections at JPW1 and JPW2.

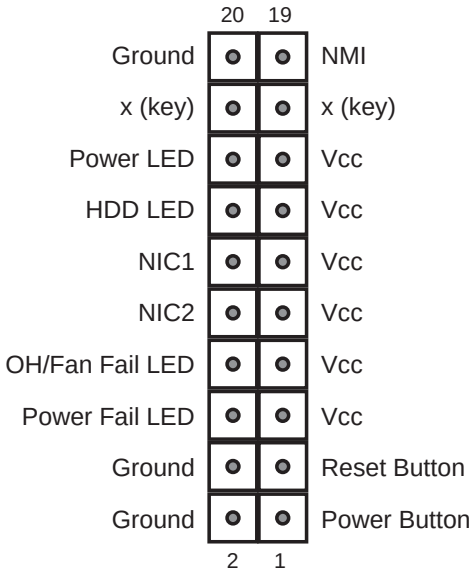
Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. Please note that even and odd numbered pins are on opposite sides of each header.

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

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

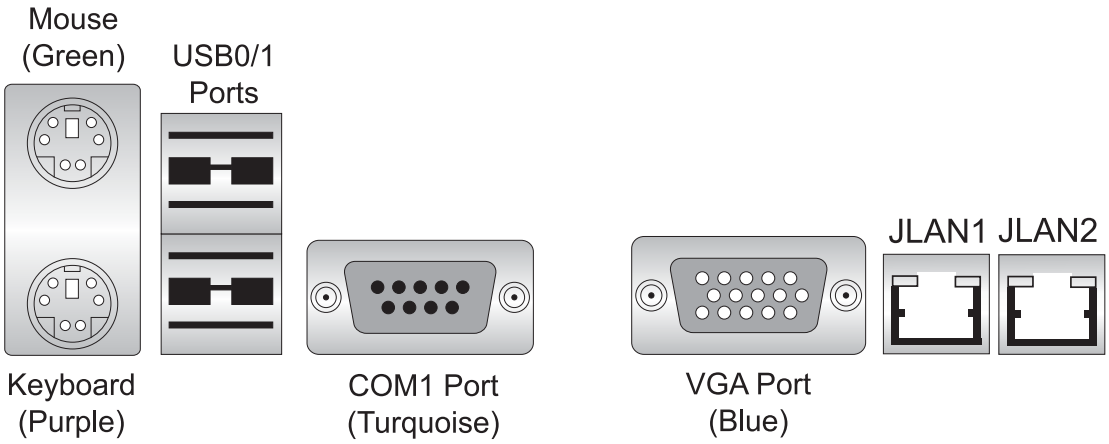
Figure 5-2. Front Control Panel Header Pins (JF1)



5-4 I/O Ports

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

Figure 5-3. Rear Panel I/O Ports



5-5 Installing Memory

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

CAUTION

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

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 5-4). Insert first into the 1B slot(s), then the 1A slot(s), etc. See support information below.

2. Gently press down on the memory module until it snaps into place.

Note: Each processor has its own built-in memory controller, consequently each CPU has an eight-slot memory bank associated with it. (Memory installed into a bank with no CPU present cannot be accessed.) 256 MB, 512 MB, 1 GB, 2 GB and 4 GB memory modules are supported. It is highly recommended that you remove the power cord from the system before installing or changing DIMMs.

Support

The H8QM3-2 supports single or dual-channel, registered ECC DDR2-667/533/400 SDRAM.

Both interleaved and non-interleaved memory are supported, so you may populate any number of DIMM slots (see note on previous page). 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.

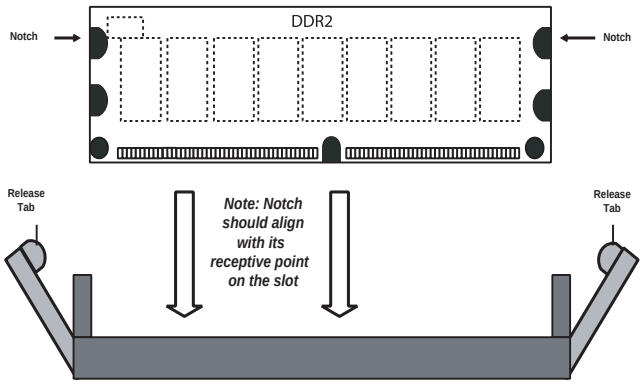
Optimizing memory performance

It is better to spread pairs of DIMMs across all memory banks with a CPU installed than to fill up one CPU memory bank while leaving another empty. For example, if you were to install eight DIMMs in a quad-CPU configuration, you should install two in the CPU1 DIMM slots (slots 1A and 1B) , two in the CPU2 DIMM slots, two in the CPU3 DIMM slots and two in the CPU4 DIMM slots rather than four in any two CPU DIMM slots. If you install four more, install in the next two CPU1 DIMM slots (2A and 2B) and the next two CPU2 DIMM slots, etc. This balances the load over all CPUs to optimize performance. In a single or dual-CPU configuration, memory can only be installed in the banks associated with CPU#1 or CPU#1 and CPU#2, respectively.

Maximum memory: 128 GB of DDR2-667/533/400. (Dual-CPU configuration: 64 GB maximum, single-CPU configuration: 32 GB maximum.)

Figure 5-4. Installing DIMM into Slot

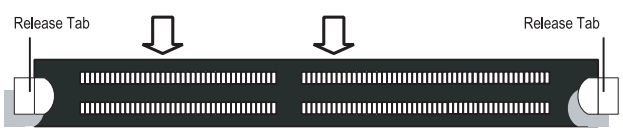
To Install:
Insert module vertically and press down until it snaps into place. The release tabs should close - if they do not you should close them yourself.



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

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

Top View of DDR2 Slot



5-6 Adding PCI Cards

PCI Expansion Slots

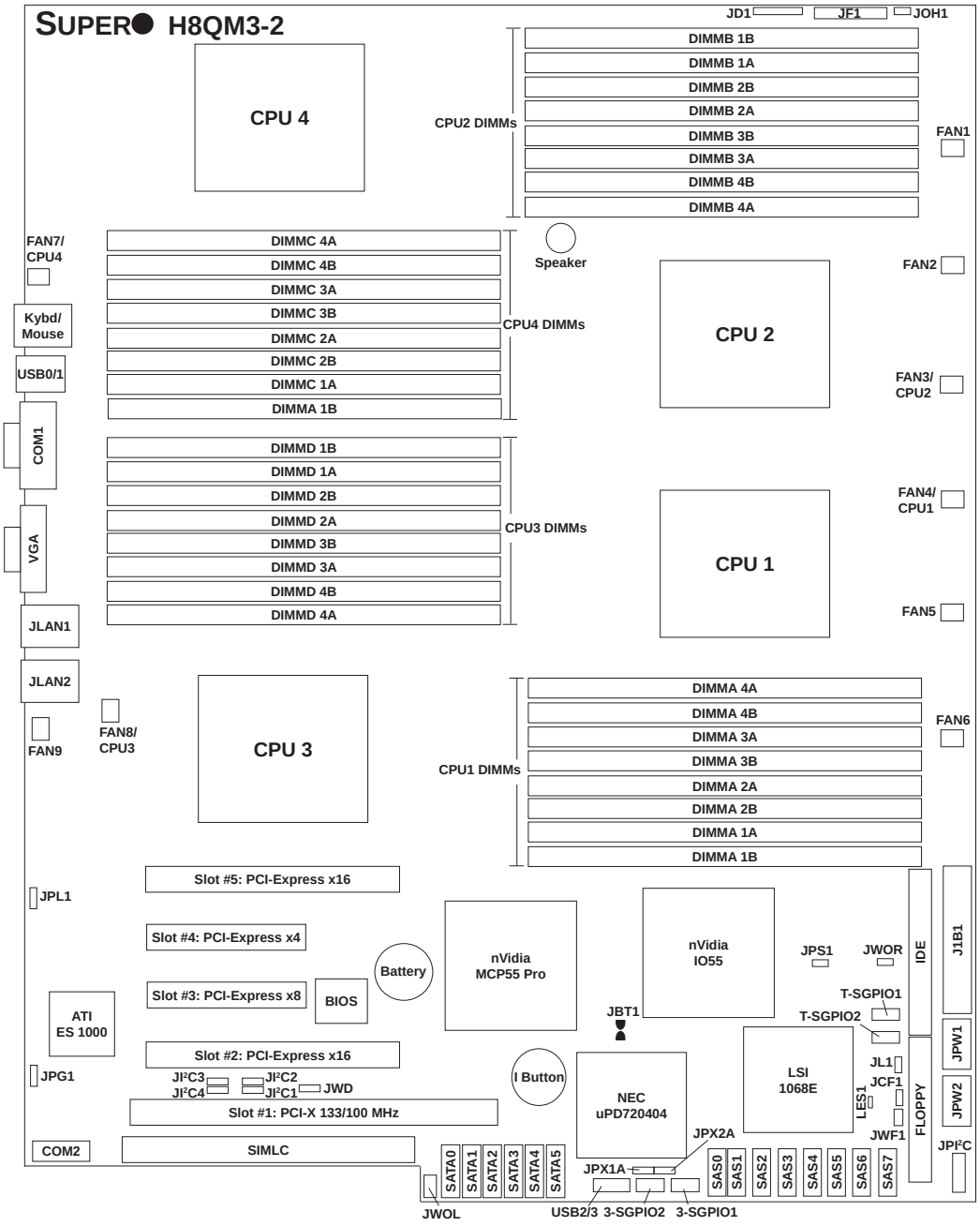
The SC748TQ-R1200 chassis can accommodate up to five PCI add-on cards.

PCI card installation

Before installing a PCI add-on card, remove the screw that secures the shield on the slot you will be populating. Insert the expansion card into its slot, pushing down with your thumbs evenly on both sides of the card.

5-7 Serverboard Details

Figure 5-5. Serverboard Layout
(not drawn to scale)



Notes:

Jumpers not indicated are for test purposes only.

H8QM3-2 Quick Reference

Jumpers	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-9)
JCF1	Compact Flash Card Master/Slave	Closed (Master)
JPS1	SAS RAID Select	Closed (SR RAID)
JPX1A	PCI-X Slot Speed Select	Pins 2-3 (133 MHz)
JPX2A	PCI-X Slot Speed Select	Open (Disabled)
JI²C1/JI²C2	I²C to PCI-X	Pins 2-3 (Disabled)
JI²C3/JI²C4	I²C to PCI-E	Pins 2-3 (Disabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	JLAN Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connectors	Description
COM1/COM2	COM1 Serial Port/Header
FAN 1-9	Chassis/CPU Fan Headers
Floppy	Floppy Disk Drive Connector
I Button	I Button (for RAID 5 support)
IDE	IDE Drive/Compact Flash Card Connector
J1B1	24-Pin ATX Power Connector
JD1	Onboard Speaker/Power LED
JF1	Front Panel Connector
JL1	Chassis Intrusion Header
JLAN1/2	Gigabit Ethernet (RJ45) Ports
JOH1	Overheat Warning Header
JPI²C	I²C Header
JPW1/JPW2	8-Pin Processor Power Connectors
JWF1	Compact Flash Card Power Connector
JWOL	Wake-On-LAN Header
JWOR	Wake-On-Ring Header
SAS0 ~ SAS7	Serial Attached SCSI (SAS) Ports
SATA0 ~ 5	Serial ATA (SATA) Ports
SGPIO1/SGPIO2	SGPIO Headers
SIMLC	IPMI 2.0 (with virtual media over LAN) Slot
USB0/1	Universal Serial Bus (USB) Ports
USB2/3	USB Headers

5-8 Connecting Cables

ATX Power Connector

The primary ATX power supply connector (J1B1) meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. This connection supplies power to the chipset, fans and memory.

Note: You must also connect the 8-pin JPW1 and JPW2 power connectors to your power supply (see below).

ATX Power 24-pin Connector Pin Definitions (J1B1)

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

Processor Power Connectors

In addition to the primary ATX power connector (above), the 8-pin processor power connectors at JPW1 and JPW2 must also be connected to your power supply. See the table on the right for pin definitions.

Processor Power Connector 1 Pin Definitions (JPW1, JPW2)

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

Required Connections

NMI Button

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

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Power LED

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

Power LED Pin Definitions (JF1)

Pin#	Definition
15	Vcc
16	Control

HDD LED

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

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

NIC1 LED

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

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

NIC2 LED

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

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

Overheat/Fan Fail LED

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

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions. (Only available with redundant power supply systems.)

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Control

Reset Button

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

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Button

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

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

USB Ports

Two Universal Serial Bus ports (USB2.0) are located beside the keyboard/mouse ports. See the table on the right for pin definitions.

Universal Serial Bus Ports Pin Definitions (USB0/1)

USB0		USB1	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground

USB Headers

Two additional USB2.0 headers (USB2/3) are included on the serverboard. 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	No connection

Serial Ports

The COM1 serial port is located beside the USB ports on the I/O backplane. COM2 is a header located near the SIMLC slot. Refer to 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.

Fan Headers

The serverboard has nine fan headers, which are designated FAN1 through FAN9. Fans speed may be set to full or variable speed with a BIOS setting. See the table on the right for pin definitions.

Note: when using active heat sinks, FAN4 is for CPU1, FAN3 is for CPU2, FAN8 is for CPU3 and FAN7 is for CPU4.

Fan Header Pin Definitions (FAN1-9)

Pin#	Definition
1	Ground (Black)
2	+12V/9V (Red)
3	Tachometer

Note: Fan speed may controlled by a BIOS setting to change with system temperature. As a result, pin 2 may be either 12V or 9V. See Chapter 4 for BIOS settings.

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

Speaker Connector Pin Definitions (JD1)

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

JLAN1/2 (Ethernet Ports)

Two Gigabit Ethernet ports (designated JLAN1 and JLAN2) are located beside the COM2 port. These Ethernet ports accept RJ45 type cables.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are located at J3. The mouse is the top (green) port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J3)

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

Chassis Intrusion

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

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

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

I^2C Header

The JPI^{2}C header is for I^{2}C, which may be used to monitor the status of the power supply. See the table on the right for pin definitions.

I^{2}C Header (JPI^{2}C) Pin Definitions

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

Wake-On-Ring

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

Wake-On-Ring Pin Definitions (JWOR)

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

Compact Flash Power Headers

A Compact Flash Card Power Connector is located at JWF1. For the Compact Flash Card to work properly, you will first need to connect the device's power cable to JWF1 and correctly set the Compact Flash Jumper (JP1).

Compact Flash Power Header Pin Definitions (JWF1)

Pin#	Definition
1	+5V
2	Ground
3	Signal

SGPIO

SGPIO1 and SGPIO2 (Serial General Purpose Input/Output) provide a bus between the SATA controller and the SATA drive backplane to provide SATA enclosure management functions. Connect the appropriate cables from the backplane to the SGPIO1 and SGPIO2 header(s) to utilize SATA management functions on your system.

SGPIO Header Pin Definitions (SGPIO1, SGPIO2)

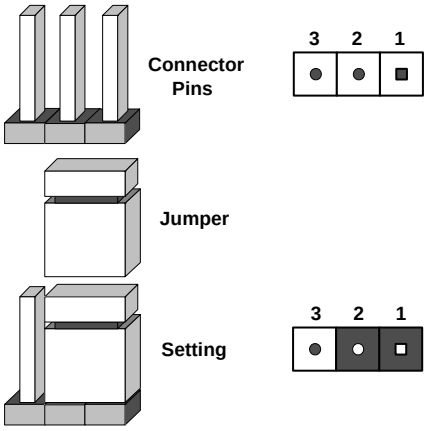
Pin#	Definition	Pin #	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

Note: NC indicates no connection.

5-9 Jumper Settings

Explanation of Jumpers

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



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

CMOS Clear

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

To Clear CMOS

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.
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. The onboard battery does not need to be removed when clearing CMOS, however you must short JBT1 for at least four seconds.


JBT1 contact pads

VGA Enable/Disable

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

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

JLAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the JLAN1 and JLAN2 Gb Ethernet ports. See the table on the right for jumper settings. The default setting is enabled.

JLAN1/2 Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

I^2C to PCI-X Slots

Jumpers JI^2C1 and JI^2C2 allow you to connect the PCI-X slots to the I^2C (System Management) bus. The default setting is disabled. Both jumpers must be set to the enabled or disabled setting for this feature to function. See the table on the right for jumper settings.

I^2C to PCI-X Slots Jumper Settings (JI^2C1, JI^2C2)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

I^2C to PCI-E Slots

Jumpers JI^2C3 and JI^2C4 allow you to connect the PCI-E slots to the I^2C (System Management) bus. The default setting is disabled. Both jumpers must be set to the enabled or disabled setting for this feature to function. See the table on the right for jumper settings.

I^2C to PCI-E Slots Jumper Settings (JI^2C3, JI^2C4)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Compact Flash Master/Slave

The JCF1 jumper allows you to assign either master or slave status to a compact flash card installed in the IDE#1 slot. You will need to connect compact flash power to JWF1 to use. See the table on the right for jumper settings.

Compact Flash Master/Slave Jumper Settings (JCF1)

Jumper Setting	Definition
Closed	Master
Open	Slave

PCI-X Slot Speed

Jumpers JPX1A and JPX2A can be used to change the speed of the PCI-X slot #1. Note that any JPX2A setting overrides all JPX1A settings. (To use a JPX1A setting, JPX2A should be left "open".) See the table on the right for jumper settings.

PCI-X Slot Speed Jumper Settings (JPX1A/JPX2A)

JPX1A	JPX2A	Definition
Pins 1-2	Open	PCI-X 100 MHz
Pins 2-3	Open	PCI-X 133 MHz
N/A	Pins 1-2	PCI-X 66 MHz
N/A	Pins 2-3	PCI 66 MHz

Note: The default setting is PCI-X 133 MHz.

SAS RAID Select

JPS1 allows you to select between SR RAID, which is the default and enables SAS RAID, or IT RAID, which treats SAS drives as non-RAID drives and requires a firmware flash. See the table on the right for jumper settings and below for the IT firmware flash procedure.

SAS RAID Select Jumper Settings (JPS1)

Jumper Setting	Definition
Open	IT RAID
Closed	SR RAID

Note: SR = Software RAID IT = Integrate Target mode

Flashing IT Firmware

1. Download the appropriate IT firmware from the web site: ftp://ftp.supermicro.com/driver/SAS/LSI/Firmware/IT/
2. Unzip it to a bootable floppy or USB pen.
3. With JPS1 on (closed) boot to the device with the unzipped firmware and type "clear" to erase the SR firmware.
4. Remove AC power and open JPS1.
5. Boot to the disk again and type "H8QM32".
6. When prompted for the SAS address, type in the 16-digit SAS address labeled on the board.
7. Power off the system before restarting.

Watch Dog Enable/Disable

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

Watch Dog Jumper Settings (JWD)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog timer.

5-10 Onboard Indicators

JLAN1/JLAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gb LAN port, one LED indicates activity when blinking while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

JLAN LED (Connection Speed Indicator)

LED Color	Definition
Off	10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Onboard Power LED (DP2)

DP2 is an Onboard Power LED. When this LED is lit, it means power is present on the serverboard. In suspend mode this LED will blink on and off. Be sure to turn off the system and unplug the power cord(s) before removing or installing components.

SAS Activity LED (LES1)

LES1 is used to indicate SAS hard drive activity.

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

Use the following information to connect the floppy and hard disk drive cables.

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.
- The 80-wire ATA133 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.

Floppy Connector

The floppy connector is located beside the IDE#1 connector. See the table on the right for pin definitions.

Floppy Drive Connector Pin Definitions (Floppy)

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

IDE Connector

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

IDE Drive Connector Pin Definitions (IDE)

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 ~ SATA5. See the table on the right for pin definitions.

SATA Drive Port Pin Definitions (SATA0 ~ SATA5)

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

SAS Ports

There are two SAS ports, one located on the backplane and the other on the serverboard near the floppy connector. See the table on the right for pin definitions.

Note: refer to the FAQ section in Chapter 3 for details on enabling SAS.

SAS Ports
Pin Definitions
(JSM1/JSM2)

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

SIMLC (IPMI Slot)

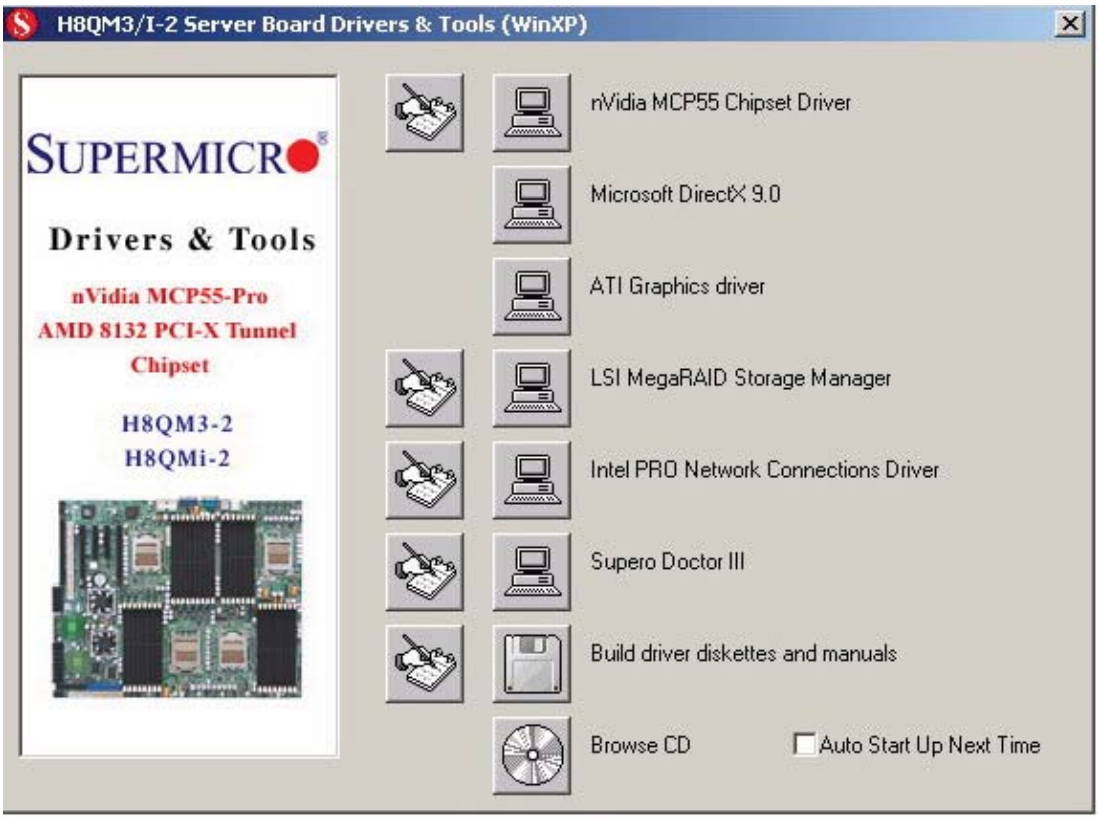
The SIMLC slot on the H8QM3-2 is reserved for an optional IPMI card.

5-12 Installing Software Drivers

After all the hardware and operating system have been installed, you need to install certain drivers. The necessary drivers are all included on the Supermicro CD that came packaged with your serverboard. After inserting this CD into your CD-ROM drive, the display shown in Figure 5-6 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.

Figure 5-6. Driver Installation Display Screen



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

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform simple maintenance on the SC748TQ-R1200 chassis. Following the component installation steps in the order given will eliminate most common problems. If some steps are unnecessary, skip ahead to the step that follows. Refer to Chapter 2 for instructions on installing the system as a 4U rackmount.

Tools Required: The only tool you will need is a Philips screwdriver.

6-1 Static-Sensitive Devices

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

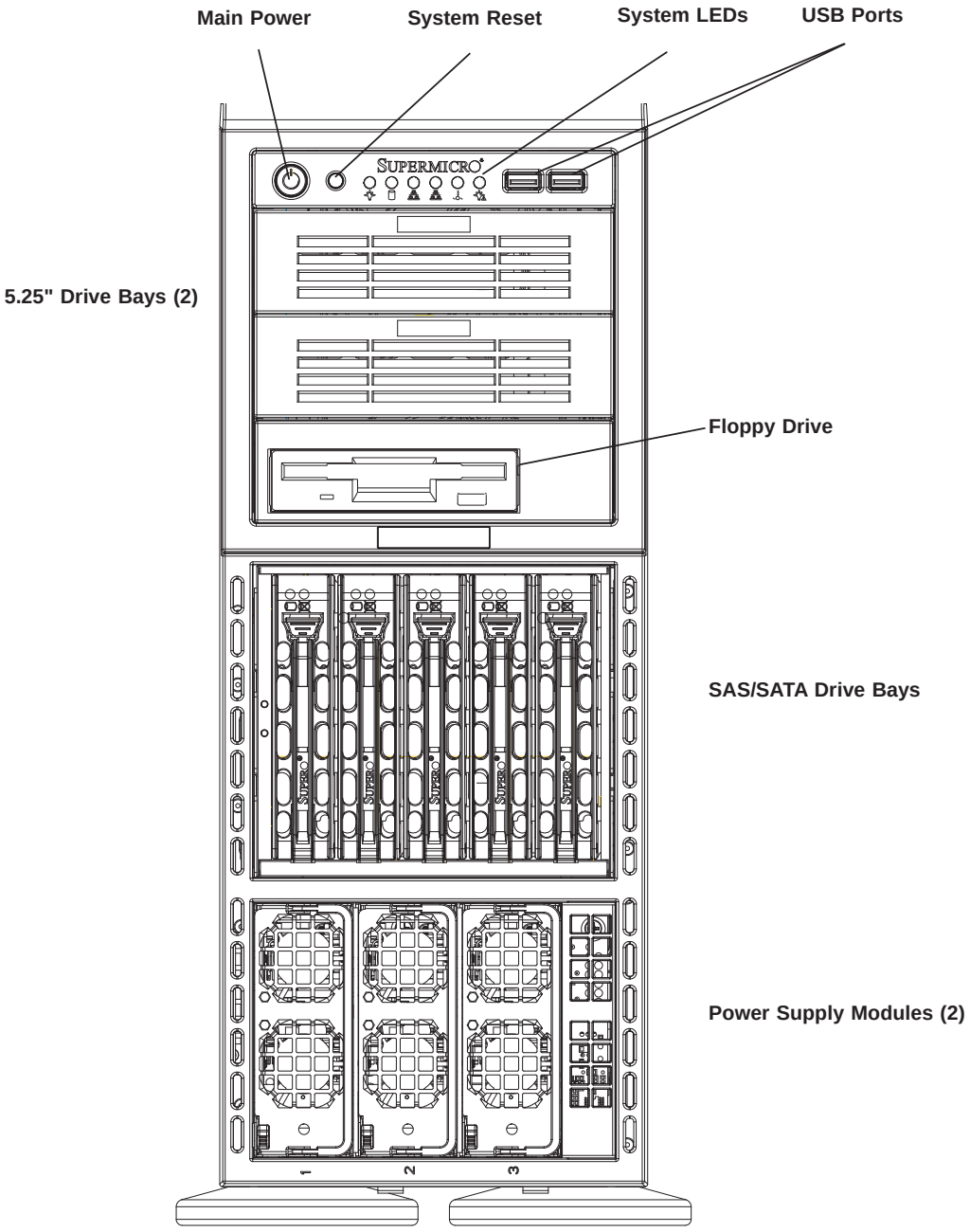
Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

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

Figure 6-1. Chassis Front View



6-2 Control Panel

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

Figure 6-2. Front Control Panel LEDs

Power  Indicates power is being supplied to the system.

HDD  This LED indicates SAS/SATA hard drive activity when flashing.

NIC1  Indicates network activity on LAN port 1.

NIC2  Indicates network activity on LAN port 2

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

Power Fail  Indicates a power supply failure.

6-3 System Fans

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

Fan Failure

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

Replacing Chassis Fans

1. First identify the failed chassis fan by removing the top/left chassis cover (see Chapter 2 for details). Locate the fan that has stopped working.

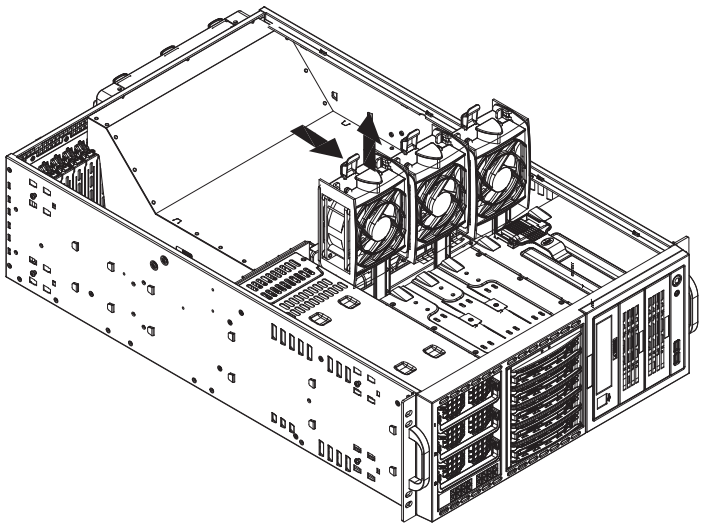
2. Depress the locking tab on the failed fan: on a chassis fan, push the tab on the side of the housing inward, on the exhaust fan push down on the colored tab.

3. With the tab depressed, pull the unit straight out (see Figure 6-3). The wiring for these fans has been designed to detach automatically.

4. Replace the failed fan with an identical one (available from Supermicro). Install it in the same position and orientation as the one you removed; it should click into place when fully inserted.

5. Check that the fan is working then replace the top/left side chassis panel.

Figure 6-3. Removing a Chassis Fan



Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency and should always remain in place when the system is operating. The air shroud does not require tools to install.

Removing the Air Shroud

Normally, you will not need to remove the air shroud to work on the system. However, if you wish to temporarily remove it (the air shroud should always be in place when the system is operating), please follow this procedure.

1. Begin by depressing the tabs at the front and rear of the shroud to unlock it, then lift it up and out of the chassis (see Figure 6-4).

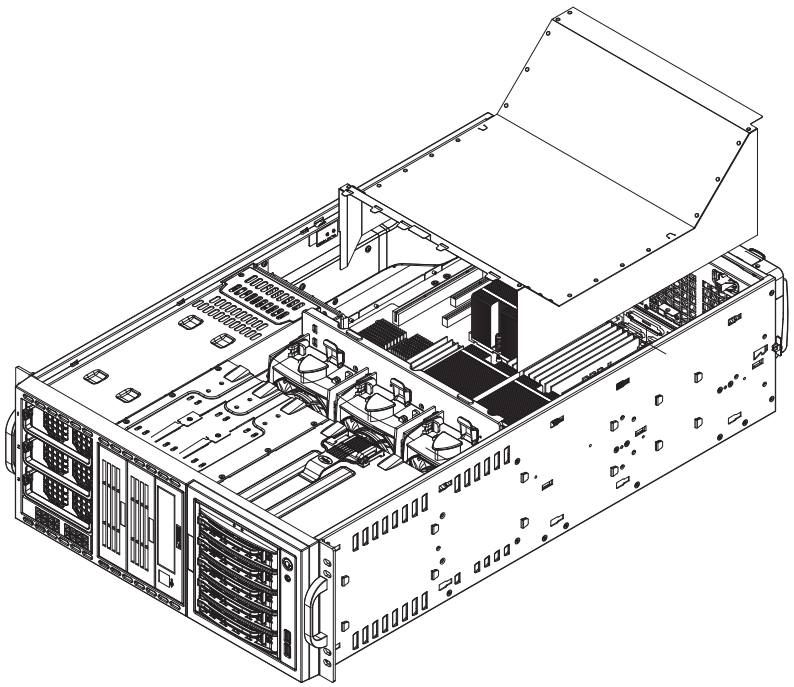
Installing the Air Shroud

1. Position the air shroud in the chassis so that the end with the multiple tabs and holes are toward the fan section.

2. Put the side of the air shroud nearest the top/right side chassis cover into place, then the end nearest the I/O shield into place and secure with the tabs.

3. Place the other end of the air shroud toward the chassis cross-section where than fans are located, securing it into place by inserting the tabs and holes in the shroud with those on the blue plastic bracket.

Figure 6-4. Removing the Air Shroud



6-4 Drive Bay Installation

SAS and SATA Drives

A total of eight SAS or six SATA drives may be housed in the SC748TQ-R1200 chassis. The drive IDs are preconfigured as 0 through 5 in order from bottom to top (or from left to right if rackmounted).

The drives are mounted in drive carriers to simplify their installation and removal from the chassis. These drives are hot-swappable, meaning they can be removed and installed without powering down the system. The carriers also work to promote proper airflow for the system. For this reason, even carriers without drives must remain in the server.

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

Installing/removing Hot-Swap SAS/SATA drives

1. Open the front bezel then push the release button on the drive carrier.

2. Swing the handle fully out and then use it to pull the unit straight out.

Note: Your operating system must have RAID support to enable the hot-swap capability of the SAS/SATA drives.

Mounting a SAS/SATA Drive in a Drive Carrier

1. Insert the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with four screws (see Figure 6-5).

SAS/SATA Backplane

The SAS/SATA drives plug into a SAS/SATA backplane

Five data cables (CBL-0206L) need to be connected from the serverboard to the appropriate connectors on the backplane to provide dual-channel operation for the SAS drives. There are also two power connectors on the backplane - both should be connected.

Figure 6-4. Removing a SAS Drive Carrier

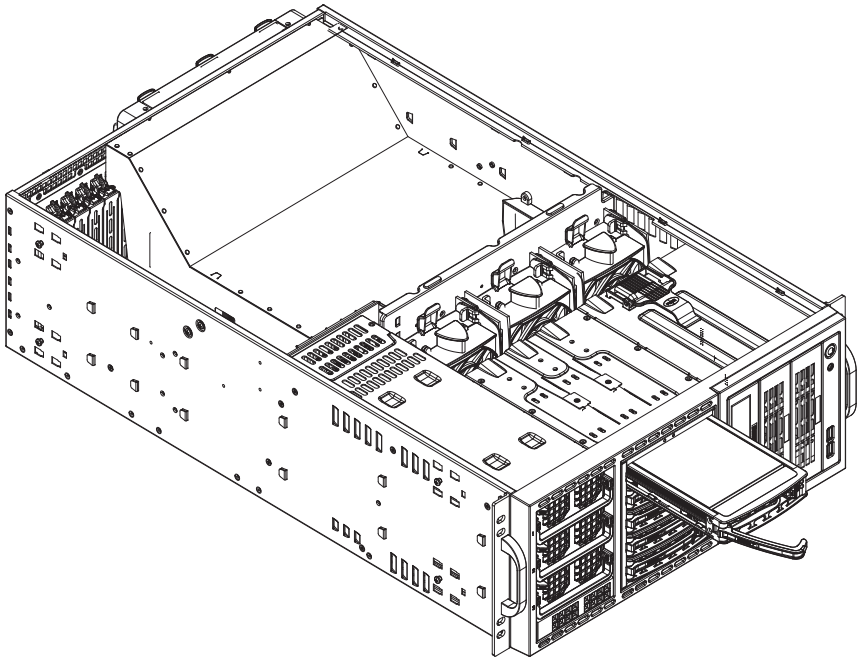
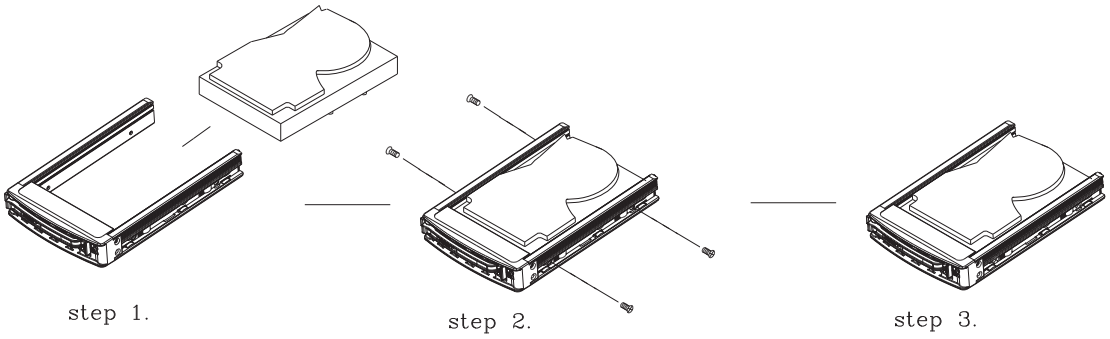


Figure 6-5. Mounting a Drive in a Carrier



Important! Use extreme caution when working around the SAS/ SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the airflow holes.

Installing Components in the 5.25" Drive Bays

The 4041M-32R+ has three 5.25" drive bays. Components such as an extra floppy drive, IDE hard drives or DVD/CD-ROM drives can be installed into these 5.25" drive bays.

Mounting Components in the Drive Bays

1. First power down the system and then remove the top/left chassis cover to access the drive components.

2. With the cover off, remove the two or four screws that secure the drive carrier to the chassis (one side only) then push the entire empty drive carrier out from the back.

Adding a DVD-CD-ROM Drive

1. Remove the guide plates (one on each side) from the empty drive carrier and screw them into both sides of the DVD/CD-ROM drive using the holes provided.

2. Slide the DVD/CD-ROM into the bay and secure it to the chassis with the drive carrier screws you first removed.

3. Attach the power and data cables to the drive.

4. Replace the top/left chassis cover before restoring power to the system.

Adding an IDE or Floppy Drive

1. Install one of these drives into one of the removed empty drive carriers with the printed circuit board side toward the carrier so that the drive's mounting holes align with those in the carrier.

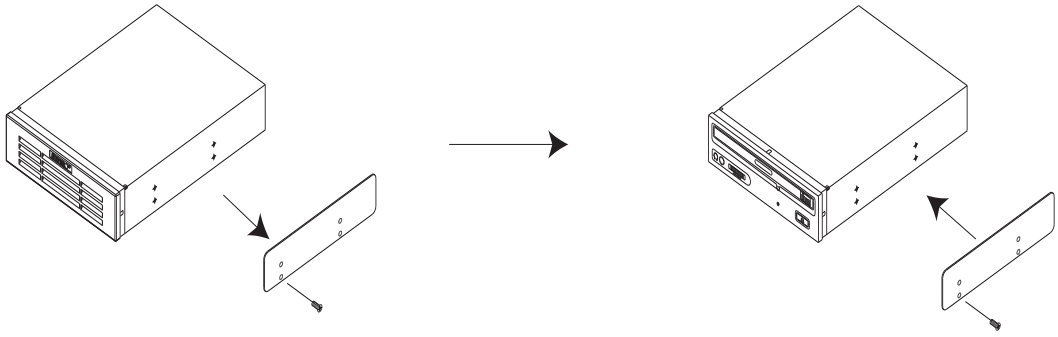
2. Secure the drive to the carrier with four screws then slide the assembly into the bay and secure it to the chassis with the drive carrier screws you first removed.

3. Attach the power and data cables to the drive.

4. Replace the top/left chassis cover before restoring power to the system.

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

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



6-5 Power Supply

The SuperServer 4041M-32R+ has a redundant 1200 watt power supply consisting of two power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

Power Supply Failure

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

Removing/Replacing the Power Supply

You do not need to shut down the system to replace a power supply unit. The redundant feature will keep the system up and running while you replace the failed hot-swap unit. Replace with the same model (see Appendix C).

Removing the Power Supply

1. First unplug the power cord from the failed power supply unit.

2. Depress the locking tab on the power supply unit and pull the unit straight out by the handle. See Figure 6-8.

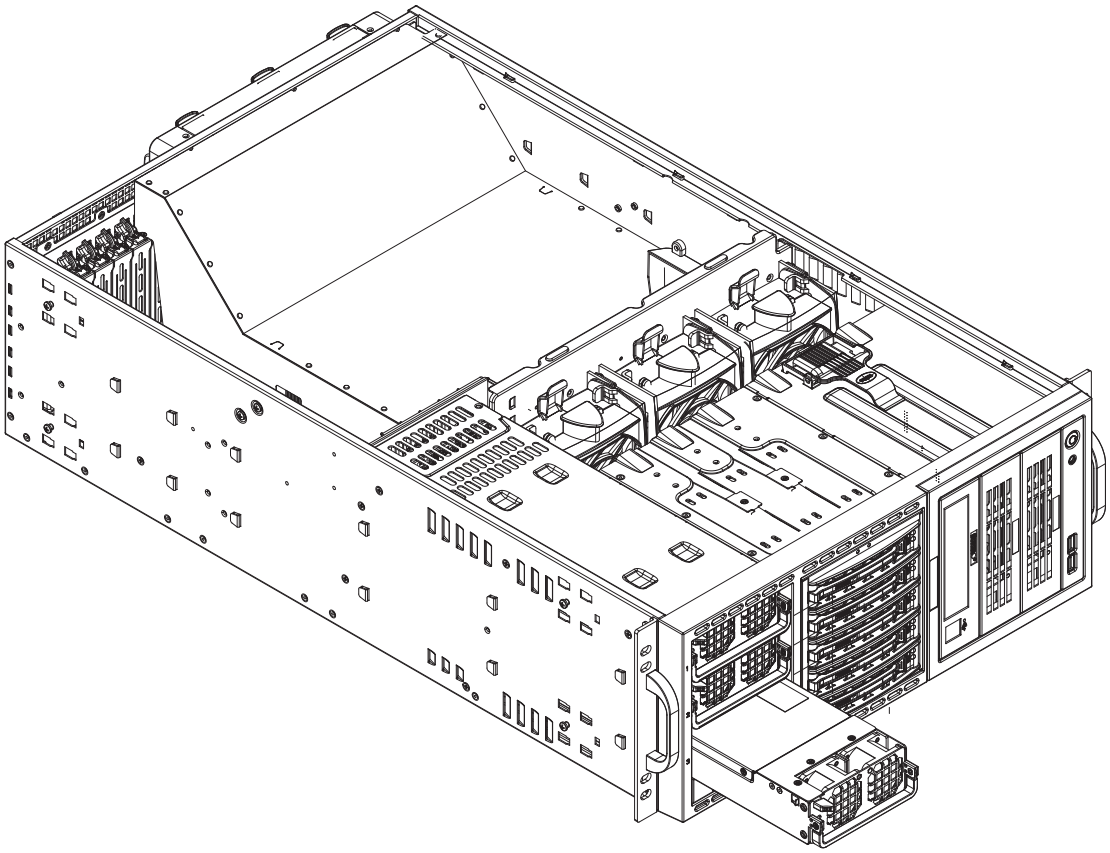
Installing a New Power Supply

1. Replace the failed module with another power supply module (must be the exact same).

2. Push the new power supply unit into the power bay until you hear a click.

3. Finish by plugging the AC power cord back into the unit.

Figure 6-8. Removing a Power Supply Module



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the H8QM3-2. The AMI ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our web site for any changes to BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the 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 screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. 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 that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.
A "▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

7-2 Main Menu

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.

7-3 Advanced Settings Menu

▶ BOOT Settings Configuration

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

Set this option to display add-on ROM (read-only memory) messages. The default setting is **Force BIOS**. Select Force BIOS to allow the computer system to force a third party BIOS to display during system boot. Select Keep Current

to allow the computer system to display the BIOS information during system boot. The options are **Force BIOS** and Keep Current.

Boot up Num-Lock

Set this value to allow the Number Lock setting to be modified during boot up. The options are **On** and Off.

PS/2 Mouse Support

Set this value to modify support for a PS/2 mouse. The options are **Auto**, Enabled and Disabled.

Wait for 'F1' If Error

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

Hit 'DEL' Message Display

Select Enabled to display message to hit the DEL key to enter Setup. The options are **Enabled** and Disabled.

Interrupt 19 Capture

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

OS Installation

Change this setting if using a 64-bit Linux operating system. The available options are **Other** and Linux.

ACPI Configuration:

ACPI Version Features

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

ACPI APIC Support

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

ACPI OEMB Table

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.

MCP55 ACPI HPET Table

Use this setting to either **Enable** or Disable the MCP55 ACPI HPET table.

Power Configuration:

Power Button Mode

Allows the user to change the function of the power button. Options are **On/ Off** and Suspend.

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**.

Watch Dog Timer

This setting is used to Enable or **Disable** the Watch Dog Timer function. It must be used in conjunction with the Watch Dog jumper (see Chapter 2 for details).

MPS Configuration

MPS Revision

This setting allows the user to select the MPS revision level. The options are 1.1 and **1.4.**

Smbios Configuration

Smbios Smi Support

This setting allows SMI wrapper support for PnP function 50h-54h. The options are **Enabled** and Disabled**.**

▶ CPU Configuration

This submenu lists CPU information and contains the following settings:

GART Error Reporting

This setting is used for testing only.

Microcode Update
This setting is used to **Enable** or Disable microcode updates.

Secure Virtual Machine Mode
This setting is used to Enable or **Disable** processor-assisted virtualization.

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

ACPI SRAT Table
This setting is used to **Enable** or Disable **the building of an ACPI SRAT table**.

CPU Prefetching
This setting is used to **Enable** or Disable CPU prefetching.

IO Prefetching
This setting is used to **Enable** or Disable IO prefetching.

Probe Filter
This setting is used to initiate the probe filter, which filters broadcast probes to improve link bandwidth and performance for multimode systems. It uses a portion of the L3 data cache as a directory to track cache lines in the system. Options are **Auto,** Disabled and MP Mode (MP = Multi-Processor).

Thermal Throttling
This setting is used to Enable or **Disable** Thermal Throttling.

CPU Page Translation Table
This setting is used to **Enable** or Disable the CPU page translation table.

▶ Floppy/IDE/SATA Configuration

Floppy A

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

Floppy B

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

Onboard Floppy Controller

Use this setting to **Enable** or Disable the onboard floppy controller.

Onboard IDE Controller

There is a single floppy controller on the motherboard, which may be **Enabled** or Disabled with this setting.

Serial ATA Devices

This setting is used to determine if SATA drives will be used and how many. Options are Disabled, Device 0, Device 0/1 and **Device 0/1/2**.

nVidia RAID Function

This setting is used to Enable or **Disable** the nVidia ROM.

Primary IDE Master/Slave

Highlight one of the items above and press <Enter> to access the submenu for that item.

Type

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

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. 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 allows the data transfer from and to the device occur multiple sectors at a time if the device supports it.

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 AMI BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support

cannot be determined. Select 0 to allow AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs. Select 1 to allow AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs. Select 2 to allow AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs. Select 3 to allow AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs. Select 4 to allow AMI BIOS to use PIO mode 4. It has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are 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**.

Serial ATA0/1/2 Primary/Secondary Channel

Highlight one of the items above and press <Enter> to access the submenu for that item. If a drive is present, information on that drive will be displayed here.

Type

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

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. 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 allows the data transfer from and to the device occur multiple sectors at a time if the device supports it.

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 AMI BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs. Select 1 to allow AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs. Select 2 to allow AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs. Select 3 to allow AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs. Select 4 to allow AMI BIOS to use PIO mode 4. It has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are 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**.

Hard Disk Write Protect

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

IDE Detect Time Out (Sec)

This feature allows the user to set the time-out value for detecting ATA, ATAPI devices installed in the system. Options are 0 (sec), 5, 10, 15, 20, 25, 30 and **35**.

ATA(PI) 80Pin Cable Detection

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

▶ PCI/PnP Configuration

Clear NVRAM

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

Plug & Play OS

Select Yes to allow the OS to configure Plug & Play devices. (This is not required for system boot if 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.

Allocate IRQ to PCI VGA

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

Palette Snooping

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

PCI IDE BusMaster

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

Offboard PCI/ISA IDE Card

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

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

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

DMA Channel0/Channel 1/Channel 3/Channel 5/Channel 6/Channel 7

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

Reserved Memory Size

You may set reserved memory with this setting. The options are **Disabled**, 16k, 32k and 64k.

Onboard SAS Controller

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

▶ Super IO Configuration

Serial Port1 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 1. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable. Select "3F8/IRQ4" to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options are Disabled, **3F8/IRQ4**, 3E8/IRQ4 and 2E8/IRQ3.

Serial Port2 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 2. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to "Disabled", the serial port physically becomes unavailable. Select "2F8/IRQ3" to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. The options are Disabled, **2F8/IRQ3**, 3E8/IRQ4 and 2E8/IRQ3.

Serial Port 2 Mode

Tells BIOS which mode to select for serial port 2. The options are **Normal**, IrDA and ASKIR.

▶ Hyper Transport Configuration

CPU: CPU HT Link Speed

Link Speed

The HT Link will run at the chosen speed if it is less than or equal to the system clock and if the motherboard is capable. Options are 200 MHz, 400 MHz, 600 MHz, 800 MHz, 1 GHz, 1.2 GHz, 1.4 GHz, 1.6 GHz, 1.8 GHz, 2.0 GHz, 2.2 GHz and **Auto**.

CPU: CPU HT Link Width

Link Width

The HT Link will run at this chosen width. Options are **Auto**, 8 bit and 16 bit.

▶ Chipset Configuration

▶ NorthBridge Configuration

▶ Memory Configuration

Bank Interleaving

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

Channel Interleaving

Select to enable channel interleaving 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].

Enable Clock to All DIMMs

Use this setting to enable unused clocks to all DIMMs, even if some DIMM slots are unpopulated. Options are Enabled and **Disabled**.

Mem Clk 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

Use this setting to Enable or **Disable** the CS Sparing function.

DCT Unganged Mode

Enabling this setting allows selection of unganged DRAM mode (64-bit width). Options are Auto and **Always**.

Power Down Enable

EUse this setting to **Enable** or Disable the DDR power down mode.

Power Down Mode

This allows you to set the DDR power down mode. Options are **Channel** and Chip Select.

8-DIMM Drive Strength

This option allows you to Enable or **Disable** the 8-DIMM drive strength. Some memory may have stability issues when all DIMM slots are populated. Enabling this setting may help stabilize such memory issues.

▶ **ECC Configuration**

ECC Mode

This setting allows you to set the level of ECC protection. Options are Disabled, **Basic**, Good, Super, Max and User.

DRAM ECC Enable

DRAM ECC allows hardware to report and correct memory errors automatically. Options are **Enabled** and Disabled.

DRAM Scrub Redirect

Allows system to correct DRAM ECC errors immediately, even with background scrubbing on. Options are Enabled and **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.

Data Cache BG Scrub

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

L2 Cache BG Scrub

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

L3 Cache BG Scrub

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

▶ DRAM Timing Configuration

Memory Clock Mode

Allows you to choose between **Auto**, Limit and Manual for the memory clock mode.

DRAM Timing Mode

Allows you to choose between **Auto**, DCT 0, DCT 1 and Both for the DRAM timing mode.

Alternate VID

Specifies and alternate VID while in low power states. Options are **Auto** and various voltages between .8V and 1.115V.

Memory Timing Parameters

Allows the user to select which CPU Node's timing parameters (memory clock, etc.) to display. Options are **CPU Node 0,** CPU Node 1, CPU Node 2 and CPU Node 3.

▶ SouthBridge/MCP55 Configuration

CPU/LDT Spread Spectrum

Enables spread spectrum for the CPU/LDT. Options are **Center Spread**, Down Spread or Disabled.

PCIE Spread Spectrum

Allows you to **Enable** or Disable spread spectrum for PCI-Express.

SATA Spread Spectrum

Enables spread spectrum for the SATA. Options are **Enabled** and Disabled.

PCI Bus Scan Order

Sets the PCI Bus scan order to High → Low or **Low → High**.

USB 1.1 Controller

Enable or disable the USB 1.1 controller.

USB 2.0 Controller

Enable or disable the USB 2.0 controller.

USB Devices Enabled

This field dsiplays the USB devices currently enabled.

Legacy USB Support

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

USB 2.0 Controller Mode

Select the controller mode for your USB ports. Options are **HiSpeed** and FullSpeed. (HiSpeed=480 Mbps, FullSpeed=12 Mbps**)**.

BIOS EHCI Hand-Off

Enable or Disable a workaround for OS's without EHCI hand-off support.

▶ **USB Mass Storage Configuration**

USB Mass Storage Reset Delay

Determines the number of seconds POST waits for the USB mass storage device after the start unit command. Options are 10 sec., **20 sec.**, 30 sec. and 40 sec.

Emulation Type

If set to Auto, USB devices having less than 530MB will be emulated as a floppy and the remaining as a hard drive. The Forced FDD option can be used to force a formatted HDD drive to boot as a FDD. Options are **Auto**, Floppy, Forced FDD, Hard Disk and CDROM.

▶ 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 Configuration

Active State Power Management

Used to Enable or **Disable** the PCI L0 and L1 link power states.

▶ Remote Access Configuration

Remote Access

Allows you to Enable or **Disable** remote access. If enabled, the settings below will appear.

Serial Port Number

Selects the serial port to use for console redirection. Options are **COM1** and COM2.

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: **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.

▶ System Health Monitor

CPU Overheat Temperature

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**.

Other items in the submenu are systems monitor displays for the following information: CPU1 Temperature, CPU2 Temperature, CPU3 Temperature, CPU4 Temperature, (for 4U systems), System Temperature, CPU1 Vcore, CPU2 Vcore, CPU3 Vcore, CPU4 Vcore (for 4U systems), 3.3V Vcc, +5Vin, +12Vin, 5V standby and battery voltage.

▶ System Fan Monitor

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 **1) Disabled (Full Speed)** 2) Optimized for Server and 3) Optimized for Workstation.

FAN1 Speed through FAN9 Speed

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

7-4 Boot Menu

This feature allows the user to configure the following items:

▶ Boot Device Priority

This feature allows the user to prioritize the boot sequence from the available devices. The devices to set are:

- 1st Boot Device
- 2nd Boot Device
- 3rd Boot Device
- 4th Boot Device

▶ Removable Drives

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

7-5 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**.

7-6 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.

Appendix A

BIOS Error Beep Codes

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

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

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

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list, on the following page, correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

POST codes may be read on the debug LEDs located beside the LAN port on the serverboard backplane. See the description of the Debug LEDs (LED1 and LED2) in Chapter 5.

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

Notes

Appendix B

BIOS POST Checkpoint Codes

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

B-1 Uncompressed Initialization Codes

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

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

B-2 Bootblock Recovery Codes

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

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

B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution.

These codes are uncompressed in F0000h shadow RAM.

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

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

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

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

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

Notes

Appendix C

System Specifications

Processors

Four AMD Opteron™ 8300/8000 Series 64-bit processors

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

Chipset

nVidia MCP55 Pro/IO55

BIOS

8 Mb AMIBIOS® Flash ROM

Memory Capacity

Thirty-two dual-channel DIMM slots supporting up to 128 GB of registered ECC DDR2-667/533/400 SDRAM

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

SAS Controller

LSI 1068E SAS controller supporting eight (8) SAS ports (RAID 0, 1, 10 and JBOD, optional RAID 5 support with iButton installed) (See the driver CD included with the system for SAS RAID documentation)

SATA Controller

On-chip SATA controller supporting six (6) 3 Gb/s SATA ports (RAID 0, 1, 0+1, 5 and JBOD)

SAS/SATA Drive Bays

Five (5) hot-swap drive bays to house five (5) SAS or SATA drives

Peripheral Drive Bays

One (1) floppy drive

Serverboard
H8QM3-2 (proprietary form factor)
Dimensions: 16 x 13 in (406 x 330 mm)

Chassis
SC748TQ-R1200 Form Factor: tower/4U rackmount
Dimensions (both): (HxWxD) 7 x 17.8 x 29.4 in. (178 x 452 x 747 mm)

Weight
Gross (Bare Bone): 65.5 lbs (29.7 kg)

System Cooling
Three (3) 9-cm chassis fans
Three (3) 8-cm exhaust fans

System Input Requirements
AC Input Voltage: 100-240 VAC
Rated Input Current: 15A (115V) to 5A (230V)
Rated Input Frequency: 50-60 Hz

Power Supply
Rated Output Power: 1200W (Part# PWS-1K22-1R)
Rated Output Voltages: +12V (83A), +5Vsb (4A)

BTU Rating
4900 BTUs/hr (for rated output power of 1000W)

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

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

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

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

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”

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