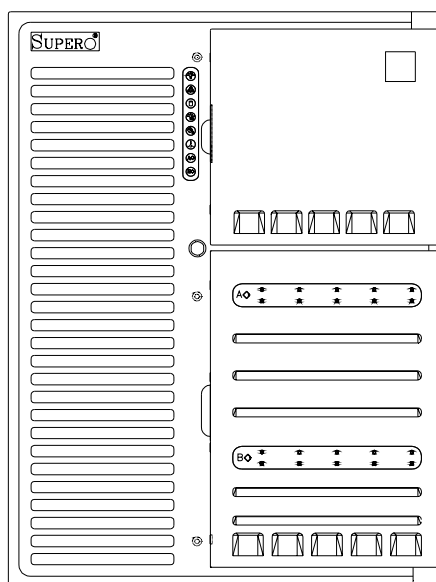


SUPERO®

SUPERSERVER 8052-8
SUPERSERVER 8052-6



USER'S MANUAL

1.0a

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates.

Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.

SUPERMICRO COMPUTER reserves the right to make changes to the product described in this manual at any time and without notice. This product, including software, if any, and documentation may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any medium or machine without prior written consent.

IN NO EVENT WILL SUPERMICRO COMPUTER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, THE VENDOR SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.

Any disputes arising between manufacturer and customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Supermicro's total liability for all claims will not exceed the price paid for the hardware product.

Unless you request and receive written permission from SUPER MICRO COMPUTER, you may not copy any part of this document.

Information in this document is subject to change without notice. Other products and companies referred to herein are trademarks or registered trademarks of their respective companies or mark holders.

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 8052-8/8052-6. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 8052-8/8052-6 is a high-end quad processor server based on the SC852 server chassis and the P4QH8/P4QH6, a quad processor serverboard that supports Intel Xeon® processors MP of up to 2.8 GHz at a Front Side (system) Bus speed of 400 MHz and up to 32 GB of DDR200 (PC1600) SDRAM main memory.

Manual Organization

Chapter 1 provides a checklist of the main components included with the server system and describes the main features of the SUPER P4QH8/P4QH6 serverboard and the SC852 chassis, which make up the SuperServer 8052-8/8052-6.

Refer to **Chapter 2** for quick setup information. You should follow the procedures in this chapter the first time you setup and run the SuperServer 8052-8/8052-6. 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.

See **Chapter 3** for details on the system interface, which includes the functions and information provided by the front control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4 gives a general overview of safety precautions that should be followed when installing and servicing the SuperServer 8052-8/8052-6.

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

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

Chapter 7 includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A offers information on BIOS error beep codes and messages.

Appendix B provides post diagnostic error messages.

Appendix C lists the system specifications.

Notes

Table of Contents

Preface

About This Manual iii

Manual Organization iii

Chapter 1: Introduction

1-1 Overview 1-1

1-2 Serverboard Features 1-2

1-3 Server Chassis Features 1-4

1-4 Contacting Supermicro 1-6

Chapter 2: Quick Setup

2-1 Overview and Precautions 2-1

2-2 Setting up the SuperServer 8052-8/8052-6 2-1

 Checking the Serverboard Setup 2-1

 Checking the Drive Bay Setup 2-2

2-3 Installing the Operating System 2-3

Chapter 3: System Interface

3-1 Overview 3-1

3-2 Switches 3-1

 Power 3-1

 Alarm 3-1

 Reset 3-1

3-3 Front Control Panel LEDs 3-1

 Power 3-1

 NIC 3-1

 HDD 3-1

 PWR Fault 3-2

 Fan Fail 3-2

 Overheat 3-2

 SCA Channel A 3-2

 SCA Channel B 3-2

3-4 SCSI Drive LEDs 3-3

3-5 Power Supply LEDs 3-3

Chapter 4: System Safety

4-1	Electrical Safety Precautions	4-1
4-2	General Safety Precautions	4-2
4-3	ESD Precautions	4-3
4-4	Operating Precautions	4-3

Chapter 5: Advanced Serverboard Setup

5-1	Handling the P4QH8/P4QH6 Serverboard	5-1
5-2	PGA Processor and Heatsink Installation	5-2
5-3	Connecting Cables	5-5
	Connecting Data Cables	5-6
	Connecting Power Cables	5-6
	Connecting the Control Panel	5-7
5-4	Installing Memory in the MEC	5-8
5-5	Adding PCI Cards	5-11
5-6	I/O Ports	5-11
5-7	Serverboard Details	5-12
	Super P4QH8/P4QH6 Layout	5-12
	P4QH8/P4QH6 Quick Reference	5-13
5-8	Connector Definitions	5-14
	Main ATX Power Supply Connection	5-14
	Secondary Power Connections	5-14
	Power LED	5-14
	IDE/HDD LED	5-14
	PWR_ON	5-15
	Reset	5-15
	NIC_LED	5-15
	PC	5-16
	Chassis Intrusion	5-16
	Keyboard Lock	5-16
	Overheat LED	5-16
	Speaker	5-16
	Fan Headers	5-17
	Serial Ports	5-17
	ATX PS/2 Keyboard and Mouse Ports	5-17
	Universal Serial Bus Connector	5-17
	IPMB	5-17
	SMB	5-18
	Wake-On-LAN	5-18

	Wake-On-Ring	5-18
	PWR Supply Fail Header	5-18
	NMI Header	5-19
5-9	DIP Switch Settings	5-19
	DIP Switch 1: Processor Speed	5-19
5-10	Jumper Settings	5-19
	Explanation of Jumpers	5-20
	CMOS Clear	5-20
	SCSI Termination Enable/Disable	5-20
	LAN Enable/Disable	5-21
	Spread Spectrum Enable/Disable	5-21
	Third Power Supply Fail Alarm Enable/Disable	5-21
	LVD Channel A SCSI Termination Enable/Disable	5-22
	LVD Channel B SCSI Termination Enable/Disable	5-22
	Overheat Fan Force On	5-22
	VGA Enable/Disable	5-22
5-11	Debug LEDs	5-23
5-12	Parallel Port, Floppy/HDD and SCSI Connections	5-24
	Parallel Port Connector	5-24
	Floppy Connector	5-25
	IDE Connectors	5-25
	SCSI Connectors	5-26
5-13	Installing Software Drivers	5-27

Chapter 6: Advanced Chassis Setup

6-1	Static-Sensitive Devices	6-1
6-2	Front Control Panel	6-3
6-3	System Cooling Fans	6-5
6-4	Drive Bay Installation	6-6
	SCSI Drives	6-6
	SCSI Backplane Jumper Settings	6-9
	IDE and Floppy Drives	6-11
6-5	Power Supply Units	6-12

Chapter 7: BIOS

7-1 Introduction 7-1

7-2 BIOS Features 7-2

7-3 Running Setup 7-2

7-4 Advanced BIOS Setup 7-4

7-5 Chipset Setup 7-14

7-6 PCI PnP Setup 7-16

7-7 Power Setup 7-18

7-8 Boot Setup 7-20

7-9 Security Setup 7-22

7-10 Exit Setup 7-24

Appendices:

Appendix A: BIOS Error Beep Codes A-1

Appendix B: BIOS POST Checkpoint Codes B-1

Appendix C: System Specifications C-1

Notes

Chapter 1

Introduction

1-1 Overview

The Supermicro SuperServer 8052-8/8052-6 is a high-end quad processor server that is comprised of two main subsystems: the SC850P4 high-end server chassis and the 8052-8/8052-6 quad Xeon processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 8052-8/8052-6.

In addition to the mainboard and chassis, various hardware components have been included with the SuperServer 8052-8/8052-6.

- Up to four (4) 603-pin Intel Xeon processors MP (optional)
- Four (4) CPU heatsinks (FAN-042-CF)
- Up to 32 GB ECC registered DDR200 (PC1600) SDRAM (optional)
- One (1) MEC (Memory Expansion Card)
- One (1) 3.5" floppy drive
- SCSI Accessories
 - Two (2) 68-pin Ultra320/160 SCSI cables (for SCA SCSI backplane)
 - Ten (10) SCA 1-inch high SCSI drive carriers
 - Two (2) SCA SCSI backplanes
 - One (1) SCSI manual
- One (1) CD containing drivers and utilities
- SuperServer 8052-8/8052-6 User's Manual

1-2 Serverboard Features

At the heart of the SuperServer 8052-8/8052-6 lies the P4QH8/P4QH6, a quad Xeon processor serverboard based on ServerWorks GC-HE chipset and designed to provide maximum performance in a four-way system. Below are the main features of the P4QH8/P4QH6. (See Figure 1-1 for a block diagram of the GC-HE chipset.)

Processors

The P4QH8/P4QH6 supports up to four Intel Xeon processors of up to 2.8 GHz at a 400 MHz front side (system) bus speed. Please refer to the support section of our web site for a complete listing of supported processors (<http://www.supermicro.com/TechSupport.htm>).

Memory

The P4QH8/P4QH6 has an MEC card that plugs into a special slot on the serverboard. The MEC card has 16 184-pin DIMM slots that can support up to 32 GB of ECC registered DDR200 (PC1600) SDRAM. Module sizes of 128MB, 256MB, 512MB, 1GB and 2GB may be used to populate the DIMM slots. (DDR266 is also supported, but only at 200 MHz.)

Onboard SCSI

8052-8: Onboard SCSI is provided with an Adaptec AIC-7902 SCSI chip, which supports dual channel, Ultra320 SCSI at a throughput of 320 MB/sec for each channel. The P4QH8 provides two Ultra320 SCSI ports.

8052-6: Onboard SCSI is provided with an Adaptec AIC-7899 SCSI chip, which supports dual channel, Ultra160 SCSI at a throughput of 160 MB/sec for each channel. The P4QH6 provides two Ultra160 SCSI ports.

PCI Expansion Slots

The P4QH8/P4QH6 has a total of six 64-bit 100 MHz PCI-X slots.

Onboard Controllers/Ports

One floppy drive controller and two onboard ATA/100 controllers, which support up to four hard drives or ATAPI devices. The color-coded I/O ports include a VGA port, one COM port, a parallel port, two USB ports, PS/2

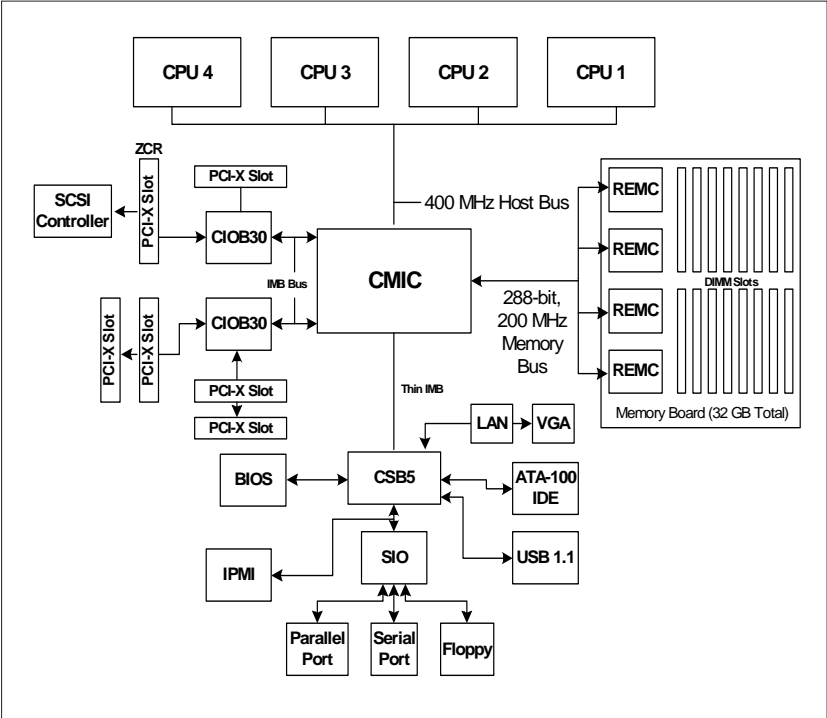
mouse and keyboard ports and one 10/100 Mb LAN (Ethernet) port.

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.

**Figure 1-1. ServerWorks GC-HE Chipset:
System Block Diagram**

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



1-3 Server Chassis Features

The SuperServer 8052-8/8052-6 is a high-end, scaleable server platform designed with today's most state-of-the-art features. The following is a general outline of the main features of the SC850P4 server chassis.

System Power

The 8052-8/8052-6 features a triple redundant power supply consisting of three hot-swappable 350 watt power modules, which supply 700 watts of continuous power with a 350 watt backup. If any of the three modules fail, you will be notified by an alarm and an LED and the remaining two modules will take up the load. The alarm reset button located on the control panel can be depressed to deactivate the power fail alarm.

SCSI Subsystem

The SCSI subsystem supports up to 10 80-pin SCA Ultra320 (8052-8) or Ultra160 SCSI (8052-6) hard drives. (Any standard 1" drives are supported. SCA = Single Connection Attachment.) These can be configured as 10 drives on a single channel or 5 drives on two channels. The SCSI drives are connected to two SAF-TE compliant SCA backplanes that provide power, bus termination and configuration settings. The SCSI drives are hot-swap units. A RAID controller card can be used with the SCA backplanes to provide data security.

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

Front Control Panel

The control panel on the SuperServer 8052-8/8052-6 provides comprehensive system monitoring and control. LEDs indicate network activity, power supply failure, fan failure, fan status, SCSI drive activity and failure and SCA backplane overheat conditions. The main power button, system reset button and an alarm reset switch to disable audible alarms are also included.

I/O Backplane

The SC850P4 is an SWTX form factor chassis. The SWTX I/O back panel provides nine expansion slots, one COM port, a parallel port, two USB ports, one onboard video (monitor) port, PS/2 mouse and keyboard ports and an Ethernet port.

Cooling System

The SC850P4 chassis has an innovative cooling design that includes 9-cm hot-plug redundant system cooling fans and two airflow guides. All fans operate continuously. If one fails, an alarm is activated and the RPM of the remaining fans increase to compensate and maintain sufficient airflow. Additional cooling for the SCSI drive bays is provided by two 12-cm exhaust fans.

1-4 Contacting Supermicro

Headquarters

Address: SuperMicro 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: SuperMicro 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: SuperMicro, Taiwan
D5, 4F, No. 16 Chien-Ba Road
Chung-Ho 235, Taipei Hsien, 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 and Precautions

This chapter provides a quick setup checklist to get your SuperServer 8052-8/8052-6 up and operating. Following these steps in the order given should enable you to have the system operating within a minimum amount of time. This quick setup assumes that your SuperServer 8052-8/8052-6 system has come to you with processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the Chapter noted in each step for details on installing these components and configuring the system.

2-2 Setting up the SuperServer 8052-8/8052-6

You should inspect the box the SuperServer 8052-8/8052-6 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 place for setting up and operating the SuperServer 8052-8/8052-6. You will need to place it 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.

Once the 8052-8/8052-6 is placed in the appropriate location, slide the locking tabs on each caster down to keep it stationary.

Checking the Serverboard Setup

Open the left side panel (when facing the front of the chassis) to make sure the serverboard is properly installed and all connections have been made.

1. Remove the left chassis side panel:

First, make sure the keylock for the side panels (located near the top at the rear of the chassis) is unlocked. Then remove the four screws that secure the back lip of the side panel to the rear of the chassis.

Grasp the handle at the rear of the panel and pull straight back about

1/2 inch, at which point the panel should hit a stop. Swing the top of the panel out and completely lift it away from the chassis. When reinstalling this panel, make sure the raised holes along the bottom of the chassis fit into the long holes in the bottom lip of the side panel.

2. Check the MEC:

The Memory Expansion Card (MEC) should be already installed and populated with DIMMs. Make sure the MEC is secure in its slot and that the retention plate is screwed firmly to the chassis. For details on populating the MEC, refer to Chapter 5.

3. Install add-on cards:

Install any add-on cards that you want added to the system. See Chapter 5 for details on installing add-on cards.

4. Check all cable connections and airflow:

Make sure all power and data cables are properly and firmly connected and not blocking the airflow. See Chapter 5 for details on cable connections. Position the airflow guides to concentrate airflow to the processors and their heatsinks.

Checking the Drive Bay Setup

Open the right side panel to make sure the SCA backplanes are properly installed and all connections have been made.

1. Remove the right chassis side panel:

To access the drive bays, remove the right side panel (when facing the front of the chassis) by following the same procedures described on the previous page for removing the left side panel. You will also have to open the front doors on the right side of the chassis to access the front of the drive bays. These doors may be secured with a keylock located just below the system LEDs.

2. Install an IDE or floppy disk drive:

See Chapter 6 if you need to add an IDE and/or floppy disk drive to the system.

3. Check the SCSI disk drives:

Depending upon your system's configuration, your system may have some SCSI drives already installed. If you need to install SCSI drives

or wish to change the channel configuration, please refer to Chapter 6. The drives are defaulted to a dual channel (channels A and B) configuration.

4. Check the airflow:

Because most of the excess cabling is kept on this side of the chassis, you should check to make sure all cables have been routed in such a way that they do not block the airflow generated by the fans.

5. Supply power to the system:

The last thing you must do is supply power to the system. Plug all three power cords from the three power supplies into a high-quality power strip that offers protection from electrical noise and surges.

2-3 Installing the Operating System

The SuperServer 8052-8/8052-6 is normally shipped without an operating system (OS) installed. This is the last thing you need to do to make the system operational. The OS is normally installed with a CD-ROM. Refer to the documentation that came with your operating system to install it in the SuperServer 8052-8/8052-6.

Notes

Chapter 3

System Interface

3-1 Overview

There are several LEDs on the front control panel as well as others on the power supply units, the SCSI drives and the serverboard 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 three switches that allow you to take action based on the information provided by these LEDs. This chapter explains the meanings of all LED indicators and audible alarms and the appropriate responses you may need to take.

3-2 Switches

The front control panel has three push-button switches: a power on/off switch, an alarm disable switch and a reset switch. These are accessed by opening the top right door on the front of the chassis.

- **POWER:** This is the main power switch that will turn off the power supply.
- **ALARM:** Depressing the alarm switch will disable the audible alarm that is generated to notify you of chassis overheating or fan/power supply failure. The LED indicating the cause of the alarm will remain illuminated after the alarm is disabled.
- **RESET:** The reset switch reboots the system.

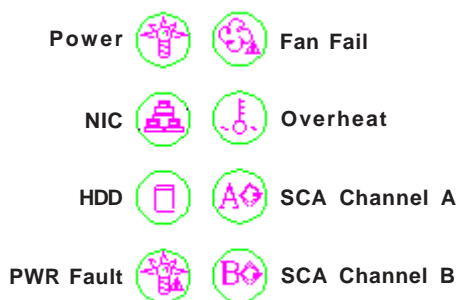
3-3 Front Control Panel LEDs

As shown in Figure 3-1, the front control panel of the SC850P4 chassis has eight LEDs. These LEDs keep you informed of the status of your system and indicate the following when illuminated.

- **Power:** Indicates power is being supplied to the system.
- **NIC:** Indicates network activity on the system.
- **HDD:** Indicates IDE drive activity.

- **PWR Fault:** Indicates a power supply failure. This should be accompanied by an audible alarm, which you can disable with the alarm switch on the control panel. Inspect the power supply units at the rear of the chassis. The unit with the amber LED illuminated has failed. Refer to Chapter 6 for instructions on replacing the failed unit. Because they are hot-swap units, you do not need to remove power from the system when replacing.
- **Fan Fail:** Indicates a system fan failure. This should be accompanied by an audible alarm, which you can disable with the alarm switch on the control panel. When a fan stops working, all the other system fans will increase their RPM to compensate until the failed unit is replaced. Refer to Chapter 6 for instructions on replacing system fans. It is unnecessary to power down the system as these are hot-swap fans. **Note:** You must use the exact same brand and rating of fan for replacement. These can be obtained directly from Supermicro.
- **Overheat:** Indicates an overheat condition in the chassis.
- **SCA Channel A:** Indicates an overheat condition with SCA SCSI back plane A (which supports the upper drive bays).
- **SCA Channel B:** Indicates an overheat condition with SCA SCSI back plane B (which supports the lower drive bays).

Figure 3-1. Front Control Panel LEDs



3-4 SCSI Drive LEDs

Each SCSI drive carrier has two LEDs.

- **Green:** The green SCSI drive LED indicates drive activity. This LED should blink on and off when that particular drive is being accessed.
- **Red:** If the red LED is illuminated, the drive has experienced a fault or has crashed. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

3-5 Power Supply LEDs

Each of the three units comprising the power supply has a single LED that can be illuminated either as green or amber.

- **Green:** When green, the unit has power applied to it and is operating normally.
- **Amber:** If the LED is amber, it indicates that no power is being applied to that unit. If system power has been turned off this is normal, however if the system is powered on and running an amber LED most likely indicates a failed power unit. First check to make sure the power cord for that unit is plugged in. If it is, then refer to Chapter 6 for instructions on replacing the unit. The power unit's fan may continue to run at low speed even if the unit has failed or has been turned off.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 8052-8/8052-6 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, the MEC, memory modules and IDE and floppy drives. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been designed as electrical insulators.

- The power supply power cords 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 (located near the COM2/4 header) is installed upside down, which will reverse its polarities. 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.

4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the SuperServer 8052-8/8052-6 clean and free of clutter.
- The SuperServer 8052-8/8052-6 weighs approx. 90 lbs (40.9 kg.). If you have to lift 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 side panels and any system components that have been removed away from the system 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 that can come into contact with electrical circuitry or be pulled into the one of the cooling fans.
- 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 servicing the system, reinstall all covers and side panels and ensure all connections have been made.

4-3 ESD Precautions



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

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold 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 all chassis covers are in place when the 8052-8/8052-6 is operating to ensure proper cooling. Out of warranty damage to the 8052-8/8052-6 system can occur if this practice is not strictly followed.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the processors and heatsinks, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in Section 5-7. Remember to close the chassis completely when you have finished working on the serverboard to sufficiently cool and protect the system.

5-1 Handling the P4QH8/P4QH6 Serverboard

Static electrical discharge can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). 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 anti-static 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 anti-static 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 PGA Processor and Heatsink Installation



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

IMPORTANT: Always connect the power cords last and always remove them before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the heatsink.

Processor Support:

Single or Dual: Intel Xeon processors MP to 2.8 GHz. Install processors into the CPU1 (single) socket or CPU1 and and CPU4 sockets (dual).

Quad: Intel Xeon processors MP to 2.8 GHz.



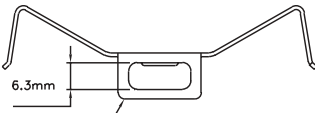
Due to differences between the Foster and Gallatin CPU packages, Supermicro provides two different types of CPU heatsink retention clips with our quad Xeon serverboards. The Foster package is about 1.5 mm shorter than the Gallatin package. The following table shows the heatsink clip usage for each CPU type.

IMPORTANT: Be sure to use the correct type of Xeon retention clips for your processor(s).

Types of CPU Retention Clips:

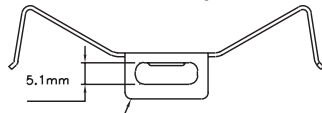
P/N	Clip Model	CPU Type/Speed
SKT095	603 (one pair for each CPU)	Gallatin: 1.9 - 2.8GHz
SKT095E	603E (one pair for each CPU)	Foster: 1.4 - 1.6GHz

603 Clip



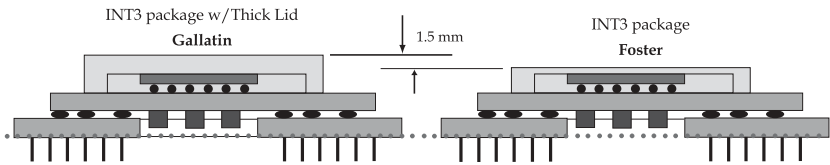
Thinner Edge & Larger Slot

603E Clip



Thicker Edge & Smaller Slot

MP Processors



Note: You need a pair of identical 603 clips (shown on left above) for **each** Gallatin 1.9 - 2.8GHz CPU. You need a pair of identical 603E clips (shown on right above) for **each** Foster 1.4 - 1.6GHz CPU.

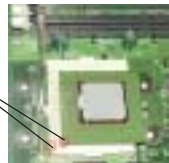
1. Lift the lever on the CPU socket: lift the lever completely or you will damage the CPU socket when power is applied. (Install CPU1 first.)

Socket lever



2. Install the CPU in the socket. Make sure that pin 1 of the CPU is seated on pin 1 of the socket (both corners are marked with a triangle). Install a CPU into CPU socket #1 first (you may install either two or four CPUs).

Pin 1



3. Press the lever down until you hear it *click* into the locked position.

Socket lever in locked position



4. Apply the proper amount of thermal compound to the CPU die and place the heatsink and fan on top of the CPU.



5. Secure the heatsink by locking the retention clips into their proper position.



6. Connect the three wires of the CPU fan to the respective CPU fan connector. Repeat steps for the other three CPUs. For a dual configuration, install the next CPU into the CPU4 socket.

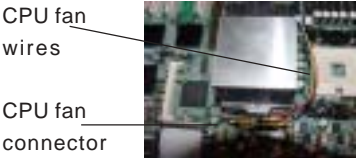


Figure 5-1. 603PGA Socket: Empty and with Processor Installed



Warning! Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

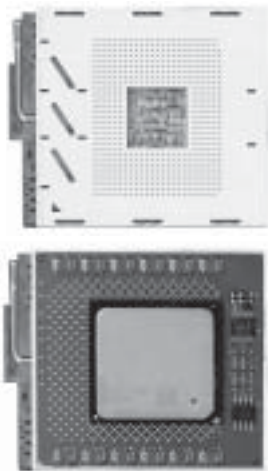
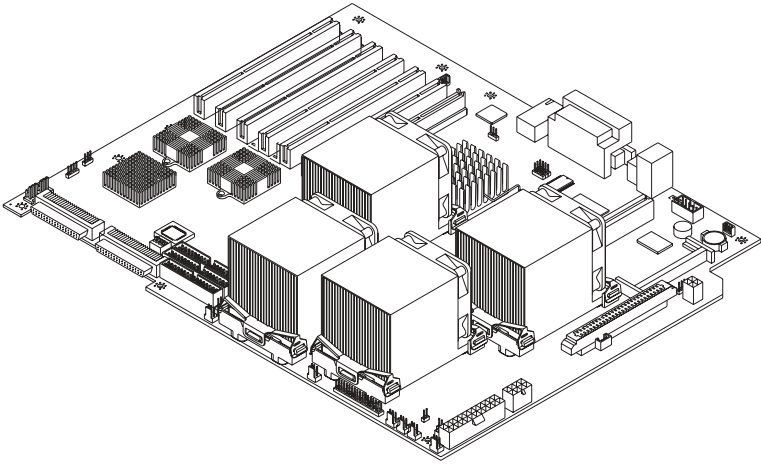


Figure 5-2. Heatsink/Fan Installation



5-3 Connecting Cables

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

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system yourself, 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 figure in this chapter for connector locations. See Section 5-8 for data cable pin definitions.

- IDE Device Cables (J14, J15)
- Floppy Drive Cable (J19)
- Ultra320/160 LVD SCSI Cables (JA1 and JA2)
- Control Panel Cable (JF1, see next page)

Connecting Power Cables

The P4QH8/P4QH6 has a 24-pin primary power supply connector designated "ATX Power" for connection to the ATX power supply. There are also 8-pin and 4-pin power connectors which must be connected to your power supply. See Section 5-8 for power connector pin definitions.

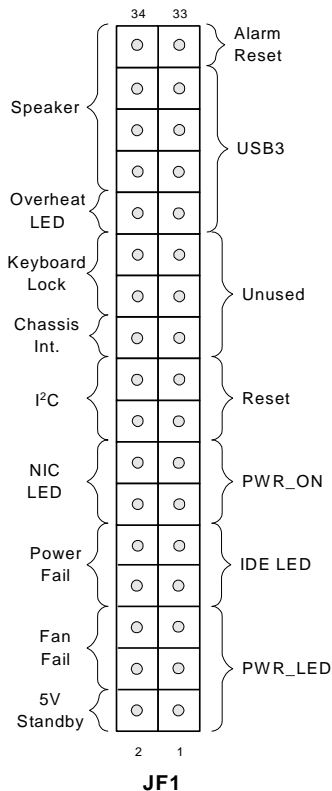
Connecting the Control Panel

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

All JF1 wires have been bundled into a single ribbon cable to simplify their connection. Make sure the red wire plugs into pin 1 as marked on the serverboard. The other end connects to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See Section 5-8 for details and pin descriptions of JF1.

Figure 5-3. JF1: Front Control Panel Header Pins



5-4 Installing Memory in the MEC

Note: Check the Supermicro web site for recommended memory modules:
http://www.supermicro.com/TECHSUPPORT/FAQs/Memory_vendors.htm

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. The MEC must be populated in the manner described in Step 2 below.

Memory Support: The P4QH8/P4QH6 supports 128MB/256MB/512MB/1GB and 2GB registered ECC DDR200 (PC1600) SDRAM DIMM memory modules. Non-ECC or unbuffered SDRAM memory is not supported.

1. Removing the MEC (Memory Expansion Card):

You should remove the MEC whenever installing or removing DIMMs. The MEC is attached to a retention plate with seven screws. Do not remove these. Instead, remove only the two screws that secure the MEC retention plate to the chassis (one on each end). After removing the board, place it on an antistatic bag before inserting the DIMMs.

2. Populating the MEC:

Important: Because memory is accessed by a four-way interleaving scheme, you must install modules four at a time and in the order shown in Figure 5-4 and described here: Always install DIMMs from the bottom of the MEC card up and in groups of four. If four DIMMs are to be installed, you must populate the four DIMM slots along the bottom of the MEC (see Figure 5-4). If eight are to be installed, you must populate the eight bottom DIMM slots, and so on. It is recommended that **all** installed DIMMs be the same brand, type, size and speed.

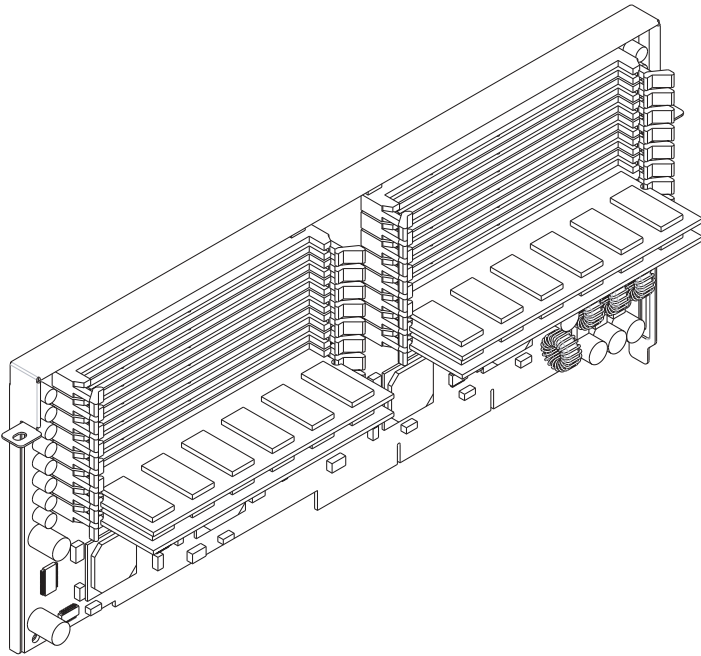
3. Inserting DIMMs:

Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting it incorrectly. Gently press down on the DIMM module until it snaps into place in the slot (see Figure 5-5). If you use too much pressure when inserting the DIMMs you may bend and damage the MEC.

4. Installing the MEC:

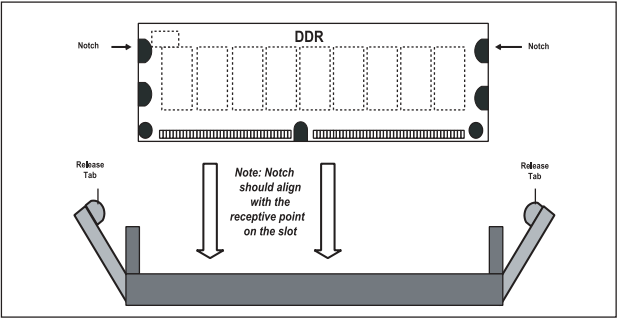
After populating the MEC, carefully install it back into its slot on the serverboard, making sure it is fully seated. Finish by securing each end of the retention plate to the chassis with the two screws you removed as described in step one.

Figure 5-4. Populating the MEC
(Four DIMM installation shown)



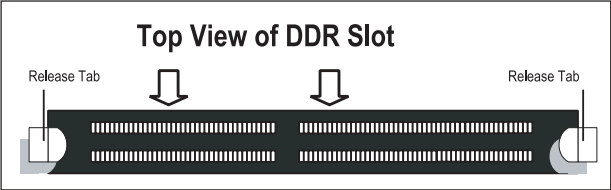
Note: Always install DIMMs from the bottom of the MEC card up and in groups of four. If four DIMMs are to be installed, you must populate the four DIMM slots along the bottom of the MEC (as shown in Figure 5-4). If eight are to be installed, you must populate the eight bottom DIMM slots, and so on.

Figure 5-5. Side and Top View of DIMM Installation into Slot



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

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



5-5 Adding PCI Cards

1. PCI expansion slots:

The P4QH8/P4QH6 system board has six 64-bit 100 MHz PCI-X slots. The backplane of the 8052-8/8052-6 has seven I/O slots that allows you to have a full complement of PCI cards installed on the system.

2. PCI card installation:

Begin by removing the I/O shield from the backplane of the server corresponding to the PCI slot you wish to populate. Insert the card into the slot on the serverboard, pushing down with your thumbs evenly on both sides of the card. Finish by using a screw to secure the top of the card shield to the chassis. The I/O shields protect the serverboard and its components from EMI (electromagnetic interference) and aids in proper ventilation of the server, so make sure there is always a shield covering each slot.

5-6 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-6 below for the colors and locations of the various I/O ports.

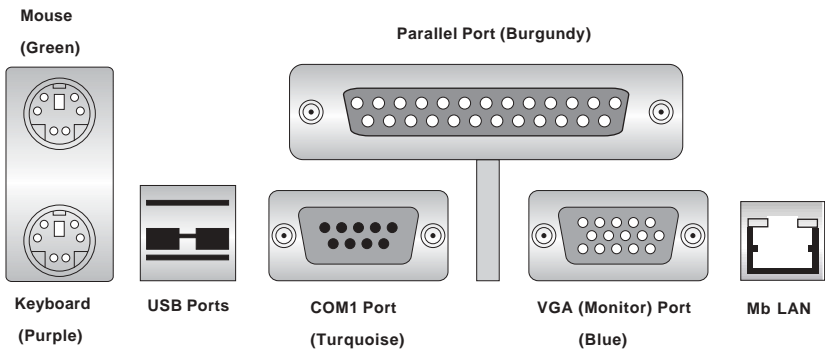
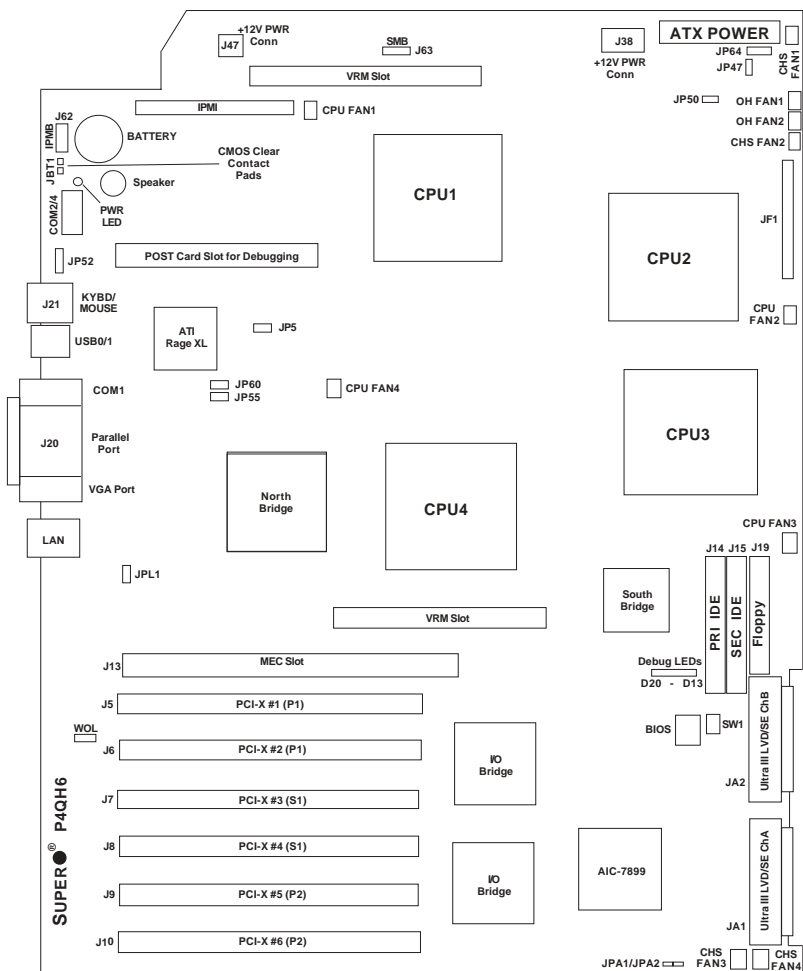


Figure 5-6. P4QH8/P4QH6 I/O Ports

5-7 Serverboard Details

Figure 5-7. SUPER P4QH8/P4QH6 Layout*
(not drawn to scale)



* The P4QH8 includes an AIC7902 controller for Ultra320 SCSI.

Notes: Memory modules must be installed in fours (see Section 5-4).

DIP Switch 1 sets the processor speed (see Section 5-9).

VRM slots are included to support future processors with different voltage requirements (VRM modules not included).

Jumpers not indicated are for test purposes only.

P4QH8/P4QH6 Quick Reference*

<u>Jumper</u>	<u>Description</u>	<u>Default Setting</u>
JA4	SCSI Enable/Disable	Pins 1-2 (Enabled)
JBT1	CMOS Clear	See Section 5-9
JPA1/JA2	SCSI Ch A/B Term En/Dis	Open (Enabled)
JPL1	LAN Enable/Disable	Pins 1-2 (Enabled)
JP5	Spread Spectrum	Closed (Enabled)
JP47	3rd P/S Fail Alarm En/Dis	Closed (Enabled)
JP48	Overheat Fan Force On	Open (Normal)
JP55,60	VGA Enable/Disable	Pins 1-2 (Enabled)

<u>Connector</u>	<u>Description</u>
ATX PWR CONN	Primary ATX Power Connector
COM1/3	COM1/3 Serial Port Connector
COM2/4	COM2/4 Serial Port /Header
CPU/CH/OH FAN	CPU/Overheat/Chassis Fan Headers
D13-D20	Debug LEDs (see Section 5-10)
IPMI	IPMI Slot (optional)
JA1/JA2	Ultra320/160 Channel A/B LVD SCSI
JF1	Front Control Panel Header
JP46	Power Supply Fail Header
JP50	NMI Header
JP52	Wake-On-Ring (WOR) Connector
JP62	IPMB Connector
J14	Primary IDE Hard Disk Drive Connector
J15	Secondary IDE Hard Disk Drive Connector
J19	Floppy Disk Drive Connector
J20	Parallel Printer Port
J21	PS/2 Keyboard/Mouse
J38	+12V 8-pin Power Connector
J47	+12V 4-pin Power Connector
J63	System Management Bus Connector
LAN	Ethernet Port (Mb LAN)
MEC Slot	Memory Expansion Card Slot
USB 0/1	Universal Serial Bus Ports
WOL	Wake-on-LAN Header

*P4QH8: Ultra320 SCSI, P4QH6: Ultra160 SCSI

5-8 Connector Definitions

Main ATX Power Supply Connection

24-pin connector:

The power supply connector on the P4QH8/P4QH6 meets the SSI (Superset ATX) 24-pin specification. See the table on the right for pin definitions.

Note: the use of a 20-pin power connector is not recommended.

**24-pin Power Connector
Pin Definitions (ATX Power Conn)**

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

Secondary Power Connections

In addition to the Primary ATX power connector (above), the two secondary power connections (at J38 and J47) must also be connected to your power supply. See the tables on the right for pin definitions.

**8-Pin +12v Power Supply
Connector (J38)**

Required

connection

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v

**4-Pin +12v Power Supply
Connector (J47)**

Required

connection

Pins	Definition
1 & 2	Ground
3 & 4	+12v

Power LED

The Power LED connection is located on pins 1, 3 and 5 of JF1. Refer to the table on the right for pin definitions.

**PWR_LED Pin Definitions
(JF1)**

Pin Number	Definition
1	+5V
3	Key
5	GND

IDE/HDD LED

The IDE/HDD (Hard Disk Drive) LED connection is located on pins 7 and 9 of JF1. Attach the IDE hard drive LED cable to the correct pins to display disk activity. Refer to the table on the right for pin definitions.

**IDE_LED Pin
Definitions
(JF1)**

Pin Number	Definition
7	+5V
9	HD Active

PWR_ON

The PWR_ON connection is located on pins 11 and 13 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.

**PWR_ON Connector
Pin Definitions
(JF1)**

Pin Number	Definition
11	PW_ON
13	Ground

Reset

The Reset connection is located on pins 15 and 17 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

**Reset Pin
Definitions
(JF1)**

Pin Number	Definition
15	Reset
17	Ground

NIC_LED

The Network Interface Controller LED connection is located on pins 12 and 14 of JF1. Attach an NIC LED cable to display network activity. Refer to the table on the right for pin definitions.

**NIC_LED Pin
Definitions
(JF1)**

Pin Number	Definition
12	+5V
14	GND

I²C

The I²C connection is located on pins 16 and 18 of JF1. Refer to the table on the right for pin definitions.

**I²C Pin Definitions
(JF1)**

Pin Number	Definition
16	SDA
18	SCL

Chassis Intrusion

A Chassis Intrusion connection is located on pin 20 of JF1. See the table on the right for pin definitions.

**Chassis Intrusion
Pin Definitions (JF1)**

Pin Number	Definition
20	Intrusion Input

Keyboard Lock

The Keyboard Lock connection is located on pins 22 and 24 of JF1. See the table on the right for pin definitions.

**Keyboard Lock
Pin Definitions
(JF1)**

Pin Number	Definition
22	+5V
24	GND

Overheat LED (OH)

Connect an LED to pin 26 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

**Overheat LED
Pin Definitions
(JF1)**

Pin Number	Definition
26	Signal

Speaker

The speaker connection is located on pins 28, 30, 32 and 34 of JF1. See the table on the right for pin definitions.

Note: if you don't use a bundled wire connector on JF1, you must short pins 32 and 34 with a jumper to enable the speaker.

**Speaker Connector Pin
Definitions (JF1)**

Pin Number	Function	Definition
28	+ Key	Red wire, Speaker data
30		No connection
32		Key
34		Speaker data

Fan Headers*

The serverboard has four CPU fans, four chassis fans and two overheat fan headers. See the table on the right for pin definitions.

**Fan Header Pin Definitions
(CPU/CHS/OH Fans)**

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: These fan headers are DC power.

Serial Ports

COM1/COM3 is located under the parallel port (see Figure 5-6). See the table on the right for pin definitions. The COM2/COM4 header is located near the battery on the serverboard.

**Serial Port Pin Definitions
(COM1/COM3)**

Pin Number	Definition	Pin Number	Definition
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	Ground
5	Serial Out	10	NC

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J21. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See Figure 5-6.)

**PS/2 Keyboard and Mouse Port Pin Definitions
(J18)**

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

Universal Serial Bus (USB)

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

**Universal Serial Bus Pin Definitions
USB0 USB1**

Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

IPMB (Optional)

An IPMB (Intelligent Platform Management Bus) connection is located at J62. Connect the appropriate cable here and an IPMI daughter card in the IPMI slot to utilize IPMI. See the serverboard layout for locations of the IPMI slot and IPMB header.

SMB

An SMB (System Management Bus) connection is located at J63. Connect the appropriate cable here to utilize SMB on your system.

Wake-On-LAN

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

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

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

Wake-On-Ring

The Wake-On-Ring header is designated as JP52. This function allows your system to receive and be "woken up" by an incoming call to the LAN port 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-LAN Pin
Definitions (JP52)**

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

Power Supply Fail Header

Connect a cable from your power supply to the header labelled JP46 to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin on JF1 to provide indication of a power failure on the chassis. This feature is only available when using triple-redundant Supermicro power supplies. See the table on the right for pin definitions.

**Power Supply Fail Header
Pin Definitions
(JP46)**

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

NMI Header

A header for use with an NMI button is located at JP50. NMI allows you to issue a non-maskable interrupt to force the system to a halt state. This is used for diagnostic purposes and allows you to perform a memory download to determine the cause of a problem.

5-9 DIP Switch Settings

DIP Switch 1: Processor Speed

The red "DIP" switch labeled SW1 has four individual switches, which are used to set the processor speed.

Refer to the table on the right for the correct settings for the various speeds of supported processors.

Note: Most Intel processors have a fixed processor speed that overwrites the setting of DIP Switch 1.

**Processor Speed Selection
(DIP Switch1)**

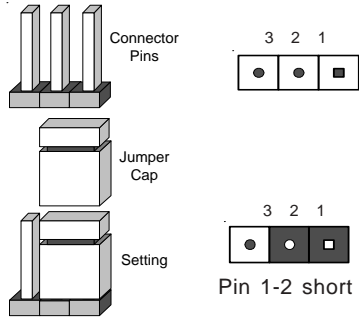
CPU Speed	SW #1	SW #2	SW #3	SW #4
1.6 GHz	OFF	OFF	OFF	ON
1.7 GHz	ON	OFF	OFF	ON
1.8 GHz	OFF	ON	OFF	ON
1.9 GHz	ON	ON	OFF	ON
2.0 GHz	OFF	OFF	ON	ON
2.1 GHz	ON	OFF	ON	ON
2.2 GHz	OFF	ON	ON	ON
2.3 GHz	ON	OFF	OFF	OFF
2.4 GHz	ON	ON	ON	ON

5-10 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 serverboard layout pages 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. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

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

Note: Do not use the PW ON connector to clear CMOS.

SCSI Termination Enable/Disable

The SCSI Termination jumpers (JPA1 and JPA2) allow you to enable or disable termination for the two SCSI channels. The normal (default) position is open to enable SCSI termination. See the table on the right for jumper settings.

SCSI Termination
Enable/Disable
Jumper Settings
(JPA1, JPA2)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard LAN (Ethernet port) on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

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

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Spread Spectrum Enable/Disable

Jumper JP5 is used to enable or disable the Spread Spectrum feature. Spread Spectrum is a technique used to stabilize operation when a system is being affected by electromagnetic interference. The normal (default) position is closed to enable Spread Spectrum. See the table on the right for jumper settings.

**Spread Spectrum
Jumper Settings (JP5)**

Jumper Position	Definition
Open	Disabled
Closed	Enabled

Third Power Supply Fail Alarm Enable/Disable

This feature was designed specifically for systems with triple redundant power supplies, such as the 8052-8/8052-6. When enabled, the system will notify you in the event of a power supply failure. If you only have one or two power supply units installed, you should disable this with JP47 to prevent false alarms. See the table on the right for jumper settings.

**3rd Power Supply Fail
Alarm Enable/Disable
Jumper Settings (JP47)**

Jumper Position	Definition
Open	Disabled
Closed	Enabled

LVD Channel A SCSI Termination Enable/Disable

Jumper JPA1 allows you to enable or disable termination for the LVD Channel A SCSI connector. The normal (default) position is open to enable SCSI termination. See the table on the right for jumper settings.

**LVD CH A SCSI
Termination
Jumper Settings (JPA1)**

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LVD Channel B SCSI Termination Enable/Disable

Jumper JPA2 allows you to enable or disable termination for the LVD Channel B SCSI connector. The normal (default) position is open to enable SCSI termination. See the table on the right for jumper settings.

**LVD CH B SCSI
Termination
Jumper Settings (JPA2)**

Jumper Position	Definition
Open	Enabled
Closed	Disabled

Overheat Fan Force On

JP48 is used to control the function of Overheat Fans #1 and #2. The normal (default) position is open, which means these two fans will activate only in the event of an overheat condition. Closing the jumper forces both fans on to provide continuous operation. See the table on the right for jumper settings.

**Overheat Fan Force On
Jumper Settings (JP48)**

Jumper Position	Definition
Open	Disabled
Closed	Enabled

VGA Enable/Disable

JP55 and JP60 allow you to enable or disable the VGA port. The default position is pins 1 and 2 on both jumpers to enable VGA. See the table on the right for jumper settings.

Note: both jumpers must be either enabled or disabled.

**VGA Enable/Disable
Jumper Settings
(JP55, JP60)**







Jumper Position	Definition
1-2	Enabled
2-3	Disabled

5-11 Debug LEDs

D13-D20


Eight surface-mounted debug LEDs located near the primary IDE connector (D13-D20) are used to provide POST code information. See the diagrams below for reading the debug LEDs and refer to Appendix B for a complete list of POST codes (a partial listing of the most common codes are given below). The LED closest to the IDE connector (D13) is the low digit.


Value LED

8		D20
4		D19
2		D18
1		D17
8		D16
4		D15
2		D14
1		D13



Primary IDE
Connector

 = Unilluminated LED

 = Illuminated LED (1)

Reading the Debug LEDs:

When on, each of the eight separate LEDs represent the value shown to the left of it in the diagram. Add up the values of the illuminated LEDs in D13 to D16 to get the low (right) digit and those in D17 to D20 to get the high (left) digit of the corresponding hexadecimal POST code.

Example:

The example on the left indicates a hexadecimal POST code of C6. This is determined in the following manner:

D17-D20 (high digit): $8 + 4 = 12$

(decimal 12 = hexadecimal C)

D13-D16 (low digit): $4 + 2 = 6$

Decimal	Hexadecimal Equivalent
0-9	0-9
10	A
11	B
12	C
13	D
14	E
15	F

Common POST Codes:

The following is a list of the most common POST codes that you may see.

POST Code	Meaning
01	Displayed while in BIOS Setup
31	No video card
40	Displayed while counting memory
83	Displayed when memory count is finished
85	CMOS Clear
95	Displayed while detecting IDE devices
DE	No memory
DE	Wrong type of memory installed
DE	One memory module (two minimum required)

5-12 Parallel Port, Floppy/Hard Disk Drive and SCSI Connections

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

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

Parallel Port Connector

The parallel port is located on J20. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions
(J20)

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

Floppy Connector

The floppy connector is located on J19. See the table on the right for pin definitions.

Floppy Connector Pin Definitions (JP19)

Pin Number	Function	Pin Number	Function
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 Connectors

There are no jumpers to configure the onboard IDE connectors J14 and J15. See the table on the right for pin definitions.

**IDE Connector Pin Definitions
(J14, J15)**

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
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	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

SCSI Connectors

Refer to the table below for the pin definitions of the SCSI connectors located at JA1 and JA2.

68-pin SCSI Connectors (JA1, JA2)

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

5-13 Installing Software Drivers

After all the hardware has been installed you must install the software 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 5-8 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.)

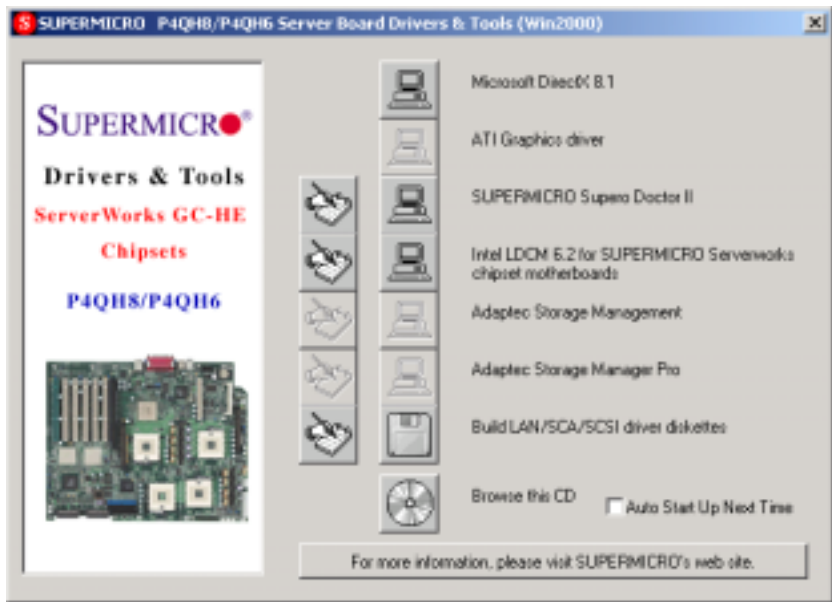


Figure 5-8. Driver/Tool Installation Display Screen

Click the icons showing a hand writing on paper to view the readme files for each item. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC850P4 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required

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

6-1 Static-Sensitive Devices

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.

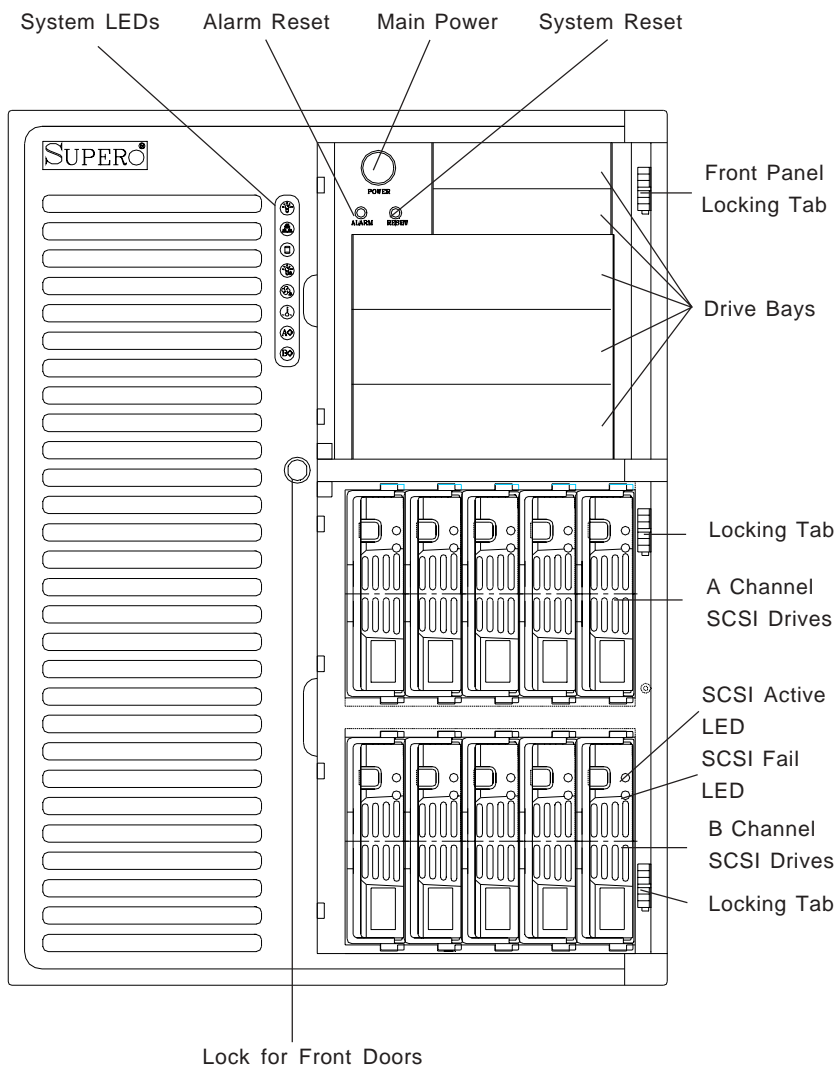
Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its anti-static 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 anti-static bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

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

Figure 6-1. Chassis Front View
(with right front doors removed)



6-2 Front 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 been included to simplify this connection. Connect the cable from JF1 on the serverboard (making sure the red wire plugs into pin 1) to JP9 on the front control panel PCB (printed circuit board). Pull all excess cabling over to the control panel side of the chassis. The LEDs inform you of system status - see Figure 6-2 for details. Figure 6-3 shows the connections, jumpers and indicators located on the front control panel PCB. See the Advanced Serverboard Installation chapter for details on JF1.

Figure 6-2. Front Control Panel LEDs









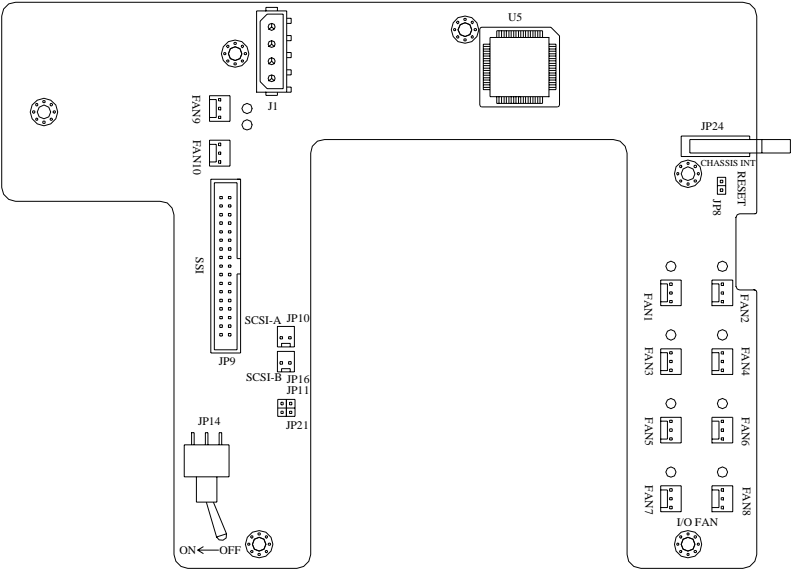
Power		Indicates power is being supplied to the system.
NIC		Indicates network activity on the system.
HDD		Indicates IDE hard disk drive activity.
PWR Fault		Indicates a power supply failure.
Fan Fail		Indicates a system fan failure.
Overheat		Indicates an overheat condition in either the chassis or any one or more of the processors.
SCA Channel A		Indicates an overheat condition at SCA SCSI backplane A
SCA Channel B		Indicates an overheat condition at SCA SCSI backplane B

Figure 6-3. Front Control Panel PCB



Fan Headers: FAN1 + FAN2 are for cooling CPU3 and CPU4
FAN3 + FAN4 are for cooling CPU1 and CPU2
FAN5 + FAN6 are for cooling main memory.
FAN7 + FAN8 are for cooling the add-on cards.
FAN9 + FAN10 are for cooling the hard drive bay.

Fan LEDs: The red LEDs located above each fan header allow you to identify which fan needs replaced in the event of a fan failure.

Headers: JP8 can be shorted to reset the microcontroller on this PCB
JP10 connects to SCA backplane A to sense for overheating.
JP16 connects to SCA backplane B to sense for overheating.

Fan Power Override Switch: Turn this switch ON to manually supply power to the system fans. The default setting for this switch is OFF.

6-3 System Cooling Fans

Four redundant fans (two in each of four fan housings for a total of eight) are located in the serverboard side of the chassis to provide the air intake for cooling the system (see Figure 6-4).

System Cooling Fan Failure

Under normal operation, all eight fans run at 80% of their maximum speed, which supplies sufficient airflow while prolonging fan life. If any fan fails, the rest will automatically increase their RPM to the full 100% to compensate. An audible alarm and an LED on the front control panel will notify you of any fan failure. Disable the alarm with the alarm button located by the control panel. The system cooling fans are hot-swap components, which allows you to replace them without powering down the system.

Replacing System Cooling Fans

1. Identifying the failed fan:

To identify and replace a failed fan, you must first remove the left side panel of the chassis. Look at the back of the circuit board that the fans plug into. The red LED that is illuminated indicates which fan has failed. As each fan housing contains two fans, examine it closely to verify which of the two has failed.

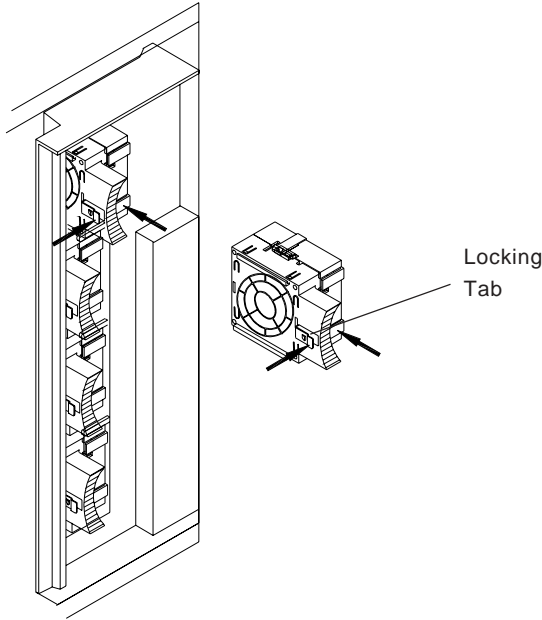
2. Removing a hot-plug fan housing:

Unplug the fan cable corresponding to the failed fan and remove the fan housing from the chassis by depressing its locking tab and pulling the unit straight out. The fan housings come apart in the middle to allow you access to each set of redundant fans.

3. Installing a new system fan:

Replace the failed fan with an identical 9-cm, 12 volt fan (available from Supermicro). After the new fan has been installed, reassemble the fan housing and plug the housing back into its slot. You should hear it click into place when fully inserted. Then plug the fan cable back into the header on the circuit board you removed it from. You should then wind the excess cable around the tabs on the fan housing to keep it out of the way. Check that the fan is working properly and that the LEDs on the front control panel circuit board (Figure 6-3) and the front control panel have turned off. Finish by replacing the left side chassis panel.

Figure 6-4. System Cooling Fans



6-4 Drive Bay Installation

Accessing the Drive Bays

There are two doors on the right front of the chassis that cover the peripheral and SCSI drive bays. Both are open-hinged for easy removal. To remove these doors, swing them open to about 90 degrees and then pull straight out from the hinges. Refer to Figure 6-6 when configuring your SCSI drives. **Note: You must use standard 1" high, 80-pin SCA SCSI drives in the SuperServer 8052-8/8052-6.**

SCSI Drives

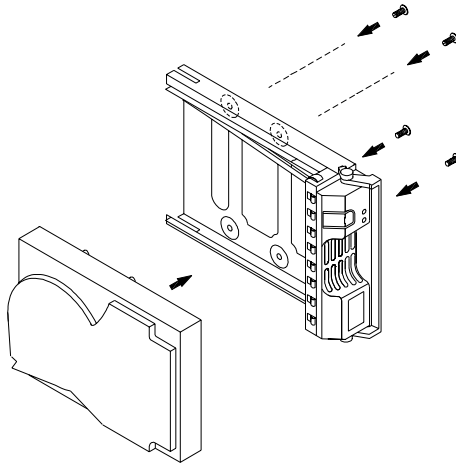


Exercise caution when working around the SCSI backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the airflow holes in the SCSI backplane.

1. Mounting a SCSI drive in a drive carrier:

The SCSI drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also work to promote proper airflow for the SCSI drive bays. For this reason, even those carriers without SCSI drives must remain installed. If you need to add a new SCSI drive, insert the drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws. (See Figure 6-5.)

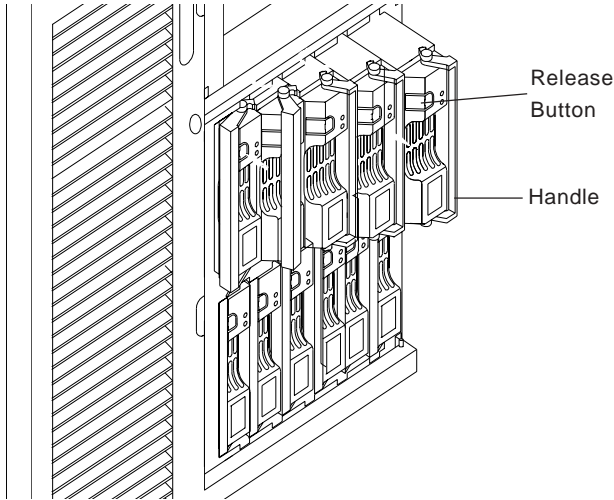
Figure 6-5. Mounting a SCSI Drive in a Carrier

**2. Installing/removing hot-plug SCSI drives:**

Open or remove the lower front door as described above to access the 10 SCSI drive bays. The SCSI drives can be removed and installed without powering down the system (hot-plug). To remove, first push the release button located beside the drive LEDs, then swing the burgundy colored



Important: Regardless of how many SCSI hard drives are installed, all 10 SCSI drive carriers must remain in the drive bays for proper airflow.

Figure 6-6. Removing SCSI Drives

3. Configuring the hot-plug SCSI drives:

The SCSI backplane has several jumpers and connectors used for assigning IDs to the drives and for configuring them for either single or dual channel operation. The top drive bay holds the channel A drives and the bottom bay holds the channel B drives. See Figure 6-3 for the locations of backplane connectors and jumpers.

Dual channel: Connect the SCSI cables from the serverboard to the LVD2 connectors on both the A and B SCSI backplanes. Do this by routing the A channel (as noted on the board) to the A (upper) backplane and the B channel to the B (lower) backplane so that the LEDs will reflect status for the correct drives. See the jumper settings in the next section to finish configuring your SCSI drives for dual channel operation.

Single channel/daisy chain: If you prefer to run all 10 SCSI drives on a single channel, first connect the SCSI cable from the SCSI controller to the LVD2 connector on backplane A. Then chain the backplanes together by connecting another SCSI cable from the LVD1 connector on backplane A to the LVD2 connector on backplane B. See the jumper settings in the next section to finish configuring your SCSI drives for single channel operation.

SCSI Backplane Jumper Settings

The SCSI subsystem is preset to provide dual channel operation. The easiest way to reconfigure for single channel operation is to simply remove both JP5 and JP21 from backplane A only (leaving those on backplane B unchanged) and setting JP24 to different settings on each backplane. See Figure 6-7 for jumper locations.

- **JP5:** SCSI SAF-TE ID jumper. This jumper determines how the backplane assigns IDs to the drives.

ON: SCSI SAF-TE ID set to 8. **OFF:** SCSI SAF-TE ID set to 6.

Dual Channel: Set JP5 to the same pins on both backplanes.

Single Channel: Set JP5 differently on both backplanes.

- **JP21:** SCSI termination jumper (ON for termination and OFF for non-termination). SCSI channels **must** be terminated to operate. The termination settings must be changed when reconfiguring channels.

Dual Channel: Set JP21 to ON on both back planes to provide the termination for each channel.

Single channel: Set to OFF (remove the jumper) on backplane A and ON on backplane B to provide a single termination.

- **JP24:** SCSI ID. This jumper determines how indicator IDs are to be assigned to the drives. This is used for the front control panel to allow you to identify the current status of each individual drive.

1-2: SCSI ID's set to 0,1,2,3 and 4.

2-3: SCSI ID's set to 9,10,11,12 and 13.

Dual Channel: **N/A** (settings have no effect)

Single channel: Set JP24 differently on both backplanes.

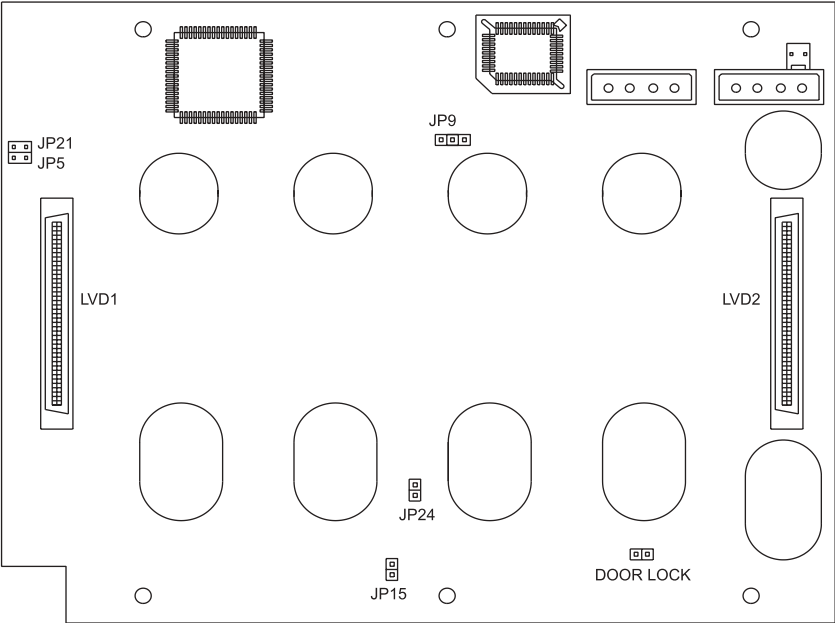
- **JP9:** I2C Link

- **JP15:** Delay Start

- **JP6:** Manufacturer's setting. You do not need to change this jumper.

Figure 6-7. SCSI Backplane Connectors and Jumpers

(See previous section for jumper definitions and settings)



Note: SCSI power cables should be routed through the bottom of the power supply housing in the SC850P4 chassis. There are two 4-pin connectors on each of two sets of cables. Connect both connectors on each set to both backplanes as noted in Step 3 ("Configuring the hot-plug SCSI drives").

Door Lock Header: This two-pin header connects to a microswitch mounted at the door that covers the SCSI drive bays. When the SCSI drive bay door is opened, as message will be sent to the system administrator to inform you of a possible unauthorized access.

IDE and Floppy Drives

Installing IDE and floppy drives:

The main front chassis door must be opened to access the IDE and floppy drive bays. To do so, first remove the two front doors as described at the beginning of this section. Then push the three locking tabs on the right side of the front chassis panel up to unlock the main chassis door, which you can then swing out. (You must power down the system before installing or removing floppy or IDE drives.) Drives mount on rails and should "click" into place to be correctly and fully installed in their bays. You should keep the metal shields in place on any unused drives to reduce EMI and noise and to facilitate the airflow inside the chassis.

- 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.

6-5 Power Supply Units

The SC850P4 has a set of 700W Triple Redundant Power Supply (PWS 039 p/n: YH-5711C) which consists of three individual Power Supply Modules (PWS 040M p/n: YM-6361A). All three units are active to provide a continuous 700 watts of power to the system. If any one fails, the other two units will pick up the load to continue operations. All three are hot-swap units, allowing you to replace faulty units without powering down the system. These power supply units also have an auto-switching capability, which enables them to automatically sense and operate at either 110 or 220 volt inputs. When replacing failed units, it is recommended that you use the exact same model. The power supply units must be P4-ready with an "Option B: +12V" and provide 24-pin, 8-pin and 4-pin connectors.

Power Supply Failure

If any one of the three power units fails, the remaining two units will automatically assume the system load to continue system operations without interruption. An audible alarm will notify you of a power unit failure, which you can disable by pressing the alarm switch on the front control panel. The PWR Fail LED will also illuminate and remain on until the failed unit has been replaced.

Replacing Power Units

1. Identifying the failed power unit:

Inspect the power units mounted in the rear of the chassis. The unit with the illuminated amber LED indicates the failed unit and should be replaced as soon as possible.

2. Removing a hot-plug power unit:

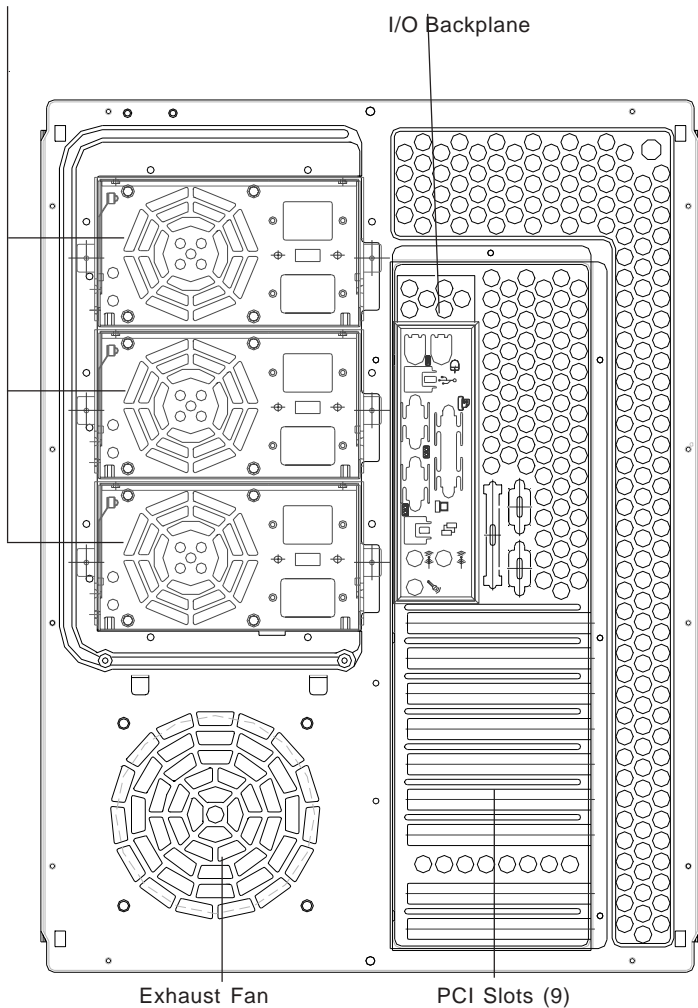
You do not need to power down the system to replace a failed power unit. First, unplug the power cord **from the failed unit only**. Remove the screws that secure the unit to the chassis and then grasp the handles and pull the unit completely out.

3. Installing a new hot-plug power unit:

Replace the failed unit with another unit of the same type and wattage. It is highly recommended that all three power units are exactly the same (see above). Gently but firmly push the new unit all the way into the open bay. Secure it to the chassis with the screws provided. After connecting the power cable, the green LED should illuminate to show that the unit is powered up and operational.

Figure 6-8. Chassis Rear View

A set of 700W Triple Redundant Power Supply (PWS 039 p/n: YH-5711C) which consists of three individual Power Supply Modules (PWS 040M p/n: YM-6361A).



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMIBIOS for the P4QH8/P4QH6. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily upgraded using a floppy disk-based program.

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

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The BIOS ROM stores the system parameters, such as amount of memory, type of disk drives and video displays, etc. BIOS ROM requires very little power. When the computer is turned off, a back-up battery provides power to the BIOS ROM, enabling it to retain the system parameters. Each time the computer is powered-on, the computer is then configured with the values stored in the BIOS ROM by the system BIOS, which gains control when the computer is powered on.

How To Change the Configuration Data

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

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Chipset and Power menus. Section 4-3 gives detailed descriptions of each parameter setting in the Setup utility.

An AMIBIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.

7-2 BIOS Features

- Supports Plug and Play V1.0A and DMI 2.3
- Supports Intel PCI (Peripheral Component Interconnect) (PME) local bus specification 2.2
- Supports Advanced Power Management (APM) specification v 1.1
- Supports ACPI
- Supports Flash ROM

AMIBIOS supports the LS120 drive made by Matsushita-Kotobuki Electronics Industries Ltd. The LS120:

- Can be used as a boot device
- Is accessible as the next available floppy drive

AMIBIOS supports PC Health Monitoring chips. When a failure occurs in a monitored activity, AMIBIOS can sound an alarm and display a message. The PC Health Monitoring chips monitor:

- CPU temperature
- Chassis intrusion detector
- Five positive voltage inputs
- Four fan speed monitor inputs

7-3 Running Setup

**Optimal default settings are in bold text unless otherwise noted.*

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

The Main BIOS Setup Menu

Press the <Delete> key during the POST (Power On Self Test) to enter the Main Menu of the BIOS Setup Utility. All Main Setup options are described in this section. The Main BIOS Setup screen is displayed below.

BIOS SETUP UTILITY		
Main	Advanced Chipset	PCIPnP Power Boot Security Ex
AMIBIOS Version: 07.00xx BIOS Build Date: 06/19/02 BIOS ID: GCH0618 Processor Type: Intel®Xeon® Processor Speed: 1500 MHz System Memory: 2048 MB System Date [10:10:00] System Time [06/22/02]		↔ Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
V02.03 (C)Copyright 1985-2002, American Megatrends, Inc		

Use the Up/Down arrow keys or the <Tab> key to move between the different settings in the above menu.

When the items "System Time", and "System Date" are highlighted, type in the correct time/date in the time field, and then press "Enter". The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format. The time is in also 24-hour format. For example, 5:30 a.m. appears as 05:30:00 and 5:30 p.m. as 17:30:00.

Press the <ESC> key to exit the Main Menu and use the Left/Right arrow keys to enter the the other categories of BIOS settings. The next section is described in detail to illustrate how to navigate through the menus.

Note: Items displayed in gray are preset and cannot be selected. Items with a blue arrow are commands, not options (i.e. Discard Changes).

7-4 Advanced BIOS Setup

Choose Advanced from the AMIBIOS Setup Utility main menu with the Left/Right arrow keys. You should see the following display. Select one of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub screen for that item. Advanced BIOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced BIOS Setup options are described in this section.

BIOS SETUP UTILITY	
Main	Advanced
Chipset PCI/PnP Power Boot Security	
Setup Warning Setting items on this screen to incorrect values may cause the system to malfunction!	
> SuperIO Configuration > IDE Configuration > Floppy Configuration > Boot Settings Configuration > Event Log Configuration > Peripheral Device Configuration > System Health Monitor > Remote Access Configuration	
Configure Sup Chipset Winbo	
↔ Select Sc ↑↓ Select It Enter Go to S F1 General H F10 Save and Exit	
V02.03 (C)Copyright 1985-2002, American Megatrends, Inc.	

Use the Up/Down arrow keys to select the "Super I/O Configuration line.

When the "Super IO Configuration" line is highlighted, hit "ENTER" to display its menu.

The following Super IO Configuration screen will appear. Here you can select your options for the your computer's I/O (Input/Output) devices.

Super IO Configuration

BIOS SETUP UTILITY	
Advanced	
Configure Winbond627F Serial Port(s) and Parallel P	
Serial Port1 Address	[3F8]
Serial Port1 IRQ	[4]
Serial Port2 Address	[2F8]
Serial Port2 IRQ	[3]
Serial Port2 Mode	[Normal]
Parallel Port Address	[378]
Parallel Port IRQ	[7]
Parallel Port Mode	[ECP]
ECP Mode DMA Channel	[3]
↔ Select ↑↓ Select +- Change F1 General F10 Save an ESC Exit	
V07.00 (C)Copyright 1985-2001, American Megatrends, Inc	

The Super IO Configuration includes the following items:

Serial Port 1 Address

This option specifies the base I/O port address of serial port 1. The settings for this item include Disabled, **3F8** and 3E8 and 2E8. Select the desired setting and then press "Enter".

Serial Port 1 IRQ

This option specifies the Interrupt Request address of serial port 1. The settings for this item include Disabled, **4** and 3.

Serial Port 2 Address

This option specifies the base I/O port address of serial port 2. The settings for this item include Disabled, **2F8**, 3E8 and 2E8.

Serial Port 2 IRQ

This option specifies the Interrupt Request address of serial port 2. The settings for this item include Disabled, 4 and **3**.

Serial Port 2 Mode

Use this option to choose the Serial Port 2 Mode. The settings are **Normal**, Sharp-IR, SIR and consumer.

Parallel Port Address

This option specifies the I/O address used by the parallel port. The settings for this item include Disabled, **378**, 278 and 3BC. Select your setting and then press "Enter".

Parallel Port IRQ

This option allows the user to set the Parallel Port IRQ. The settings for this item include 5 and **7**.

Parallel Port Mode

This option specifies the parallel port mode. The settings for this item include Normal, Bi-directional, EPP and **ECP**.

ECP Mode DMA Channel

This option allows the user to set the setting for the ECP Mode of the DMA Channel. The settings for this item include **0**, 1 and 3.

IDE Configuration

Primary IDE Master

When entering "Setup", BIOS automatically detects the presence of IDE devices. This displays the auto detection status of the IDE devices. You can also manually configure the IDE drives by providing the following information:

This option allows the user to configure the IDE devices. When the desired item is highlighted (selected), press "Enter" and the following items will be displayed:

Type

This option sets the type of device that the AMIBIOS attempts to boot from after AMIBIOS POST is completed. The settings include Not installed, **Auto**, CDROM and ARMD. The "Auto" setting allows BIOS to automatically detect the presence of the IDE controller.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB. The settings are Disabled and **Auto**. Select "Disabled" to disable LBA mode. Select "Auto" to enable LBA mode if your device supports it and is not already formatted with the LBA mode.

Block (Multi-Sector Transfer) Mode

This option sets the block mode multi sector transfers option. The settings include Disabled and **Auto**. Disabled: This option prevents the BIOS from using Multi-Sector Transfer on the specified channel. The data to and from the device will occur one sector at a time. Auto: This option allows the BIOS to auto detect device support for Multi-Sector Transfers on the specified channel. If supported, this option allows the BIOS to auto detect the number of sectors per block for transfer from the hard disk drive to memory. The data transfer to and from the device will occur multiple sectors at a time (if the device supports it).

PIO Mode

IDE PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The settings are: **Auto**, 0, 1, 2, 3 and 4.

DMA Mode

This item allows the users to select the DMA mode. The settings are: **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0, MWDMA1, MWDMA2, UWDMA0, UWDMA1, UWDMA2, UWDMA3 and UWDMA4. Select Auto to auto detect the DMA Mode. Select SWDMA0 through SWDMA2 to set single word DMA0 through DMA2. Select MWDMA0 through MWDMA2 to set Multi-word DMA0 through DMA2. Select UDMA0 through UDMA4 to set Ultra DMA0 through Ultra DMA4.

S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring Analysis and Reporting Technology, a feature that can help predict impending drive failures. The settings are **Auto**, Disabled and Enabled. Select "Enabled" or "Disabled" to enable or disable the S.M.A.R.T. Select "Auto" to auto detect S.M.A.R.T.

32Bit Data Transfer

The settings are Auto, Disabled and **Enabled**. Select "Enabled" or "Disabled" to enable or disable the 32-bit Data Transfer function. Select "Auto" to auto detect the 32-bit Data Transfer function.

ARMD Emulation Type

This option is used to select the ARMD emulation type used when configuring an LS120, MO (Magneto-Optical), or Iomega Zip drive. The settings are **Auto**, Floppy and HardDisk. (ARMD stands for ATA(PI) Removable Media Disk).

Primary IDE Slave

When the system enters "Setup", BIOS automatically detects the presence of IDE devices. This option displays the auto detection status of IDE devices. The settings for "Primary IDE Slave" are the same as those for the "Primary IDE Master".

Secondary IDE Master

This displays the status of auto detection of IDE devices. The settings for "Secondary IDE Master" are the same as those for the "Primary IDE Master".

Secondary IDE Slave

This displays the status of auto detection of IDE devices. The settings for "Secondary IDE Slave" are the same as those for the "Primary IDE Master".

Hard Disk Write Protect

This item allows the user to prevent the hard disk from being overwritten. The options are Enabled or **Disabled**. Enabled allows the drive to be used normally; read, write and erase functions can all be performed. Disabled prevents the hard disk from being erased. This function is effective only

when the device is accessed through BIOS.

ATA(PI) Detect Timeout (Seconds)

Set this option to stop the system search for ATAPI devices within the specified number of seconds. The options are 0, 5, 10, 15, 20, 25, 30 and **35** (seconds). Most ATA disk drives can be detected within 5 seconds.

ATA(PI) 80pin Cable Detection

This option allows you to select the mechanism used to detect the 80-pin ATA(PI) cable. The settings are Host, Device and **Host & Device**.

Floppy Configuration

Floppy A

Use this option to specify which of floppy drive you have installed in the A drive. The settings are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2".

Floppy B

Use this option to specify which of floppy drive you have installed in the B drive. The settings are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2".

Diskette Write Protect

This option allows you to prevent any writing to your floppy diskette. The settings are **Disabled**, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2". The Enabled setting is effective only if the device is accessed through BIOS.

Floppy Drive Seek

Use this option to Enable or **Disable** the floppy seek routine on bootup.

Boot Settings Configuration

Quick Boot

This option allows the BIOS to skip certain tests that are normally performed on boot up. You can disable the option to speed up boot time. The settings are **Disabled** and **Enabled**.

Quiet Boot

If **Disabled**, this option will cause the normal POST messages to be displayed upon setup. When **Enabled**, the OEM logo is displayed instead of the POST messages. The settings are **Enabled**, and **Disabled**.

Add-On ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. The settings for this option are **Force BIOS** and **Keep Current**. **Force BIOS**

allows the computer to force a third party BIOS to display during system boot. **Keep Current** has the system display AMIBIOS information on bootup.

BootUp Num Lock

This option is used to select the status of the Number Lock function on your keyboard on bootup. The settings are **On** and **Off**.

BootUp CPU Speed

This option is used to set the CPU speed to either **High** or **Low**.

PS/2 Mouse Support

This option specifies whether a PS/2 Mouse will be supported. Settings are **Enabled** and **Disabled**.

Typematic Rate

Set this option to select the rate at which the computer repeats a key that is held down. Settings are **Fast** and **Slow**. **Fast**: This sets the rate the computer repeats a key to over 20 times per second. Under normal operations, this setting should not be changed. **Slow**: This sets the rate the computer repeats a key to under 8 times per second.

System Keyboard

This option is to let the system know if a keyboard is **Present** or Absent.

Primary Display

This option specifies the type of monitor display you have installed on the system. The settings are Absent, **VGA/EGA**, Color 40 x 25, Color 80 x 25 and monochrome.

Parity Check

Use this option to either Enable or **Disable** the use of memory parity checking.

Boot to OS/2

This option can be used to boot the system to an OS/2 operating system. The settings are **No** and Yes.

Wait for F1 if Error

This settings for this option are **Enabled** and Disabled. Disabled: This prevents the AMIBIOS to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to bootup in to the operating system. If 'F1' is enabled, the system will wait until the BIOS setup is entered. Enabled: This option allows the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and the BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognize it.

Hit "Delete" Message Display

This option tells the system to display or not display the "Hit Delete to Enter Setup" message. The settings are **Enabled** and Disabled.

Cache

This option is for enabling or disabling the internal CPU L1 cache. Settings include Disabled, Write-Thru, **Write-Back** and Reserved. Disabled: This option prevents the system from using the internal CPU L1 cache. This

setting should be used to slow the computer system down or to troubleshoot error messages. Write-Thru: This option allows the computer system to use the internal CPU L1 cache as Write-Through cache. Write-Through cache is slower than Write-Back cache. It performs write operations to the internal L1 CPU cache and system memory simultaneously. Write-Back:

This option allows the computer system to use the internal CPU L1 cache as Write-Back cache. Write-Back cache is faster than Write-Through cache. Write-Back cache is a caching method in which modifications to data in the cache aren't copied to the cache source until absolutely necessary. Write-back caching is available on all CPUs supported by this BIOS. With these CPUs, write operations stored in the L1 cache aren't copied to main memory until absolutely necessary. This is the default setting.

System BIOS Cacheable

This option enables you to move the system BIOS to the memory cache to improve performance. Settings are **Enabled** and **Disabled**.

Event Log Configuration

Event Logging

This option **Enables** or **Disables** the logging of events. You can use this screen to select options for the Event Log Configuration Settings. You can access sub screens to view the event log and mark all events as read. Use the up and down arrow keys to select an item, and the plus (+) and minus (-) keys to change the option setting. The settings are described on the following pages. The screen is shown below.

View Event Log

Highlighting this and pressing <Enter> will allow you to view the unread events from the event log area.

Mark All Events As Read

Highlighting [OK] and pressing <Enter> will mark all events in the log area as having been read. The settings are **OK** and **Cancel**.

Peripheral Device Configuration

Power Lost Control

This option determines how the system will respond when power is reapplied after a power loss condition. Choose **Always On** to automatically start up the system when power is reapplied. Always Off means you must push the main power button to restart the system after power is restored.

PME Wakeup

This option allows you to **Enable** or Disable PME Wakeup.

System Health Monitor

The BIOS continuously monitors the health of your system by measuring certain voltage levels and temperatures. Clicking this option and hitting <Enter> will display a list of monitored temperatures and voltages on the system.

Remote Access Configuration

This option allows the user to redirect the console (display) through the COM port when enabled. This is useful when two computers are hooked up to a single monitor. When enabled, the user can toggle the display from one system to the other using the <Tab> key. The function keys are disabled when this setting is enabled. The settings are "Serial ANSI" and "**Disabled.**"

7-5 Chipset Setup

Choose Chipset from the AMIBIOS Setup Utility main menu. The screen is shown below. All Chipset Setup options are described following the screen.

BIOS SETUP UTILITY						
Main	Advanced	Chipset	PCIPnP	Power	Boot	Security
C000, 16k Shadow			[Cached]		Options for M 	

C000, 16k Shadow

C400, 16k Shadow

C800, 16k Shadow

CC00, 16k Shadow

D000, 16k Shadow

D400, 16k Shadow

D800, 16k Shadow

DC00, 16k Shadow

These options specify how the 16 KB of video ROM at each of the above addresses is treated. When Disabled, the contents of the video ROM are not copied to RAM. When Enabled, the contents of 16 KB of video ROM beginning at the above address are copied (shadowed) from ROM to RAM

for faster application. The settings for this option are Disabled and Enabled. (The optimal settings are **Cached** for C000, C400, C800 and CC00 and **Disabled** for all the other addresses.

Memory Timing Control

Determines how the memory timing is controlled. **Auto** lets BIOS program the memory timing from SPD data. Manual allows the user to select the appropriate memory timing.

MPS 1.4 Support

The settings for this option are **Enabled** and Disabled.

Jackson Technology

Enables Jackson Technology if supported by the operating system. Jackson Technology is a method of creating an additional "virtual" processor by means of "hyper-threading", which uses parallelism to process multiple instructions simultaneously. The settings for this option are **Enabled** and Disabled.

Watchdog Timer

This option is used to configure the Watchdog timer. Settings are **Disabled**, 2 minutes, 5 minutes, 10 minutes and 15 minutes.

REMC Buffer Strength

This option is used to set the REMC buffer strength to either High or **Low**.

7-6 PCI PnP Setup

Choose PCI/PnP from the AMIBIOS Setup main menu. All PCI/PnP options are described in this section. The PCI/PnP Setup screen is shown below.

BIOS SETUP UTILITY	
Main	Advanced Chipset PCIPnP Power Boot Security Ex
Plug & Play O/S	[No]
Reset Config Data	[No]
PCI Latency Timer	[64]
Allocate IRQ to VGA	[Yes]
Palette Snooping	[Disabled]
PCI IDE BusMaster	[Disabled]
USB Function	[Enabled]
Legacy USB Support	[Auto]

↔ Select Scr
 ↑↓ Select Item
 +- Change Opti
 F1 General Hel
 F10 Save and Ex
 ESC Exit

V02.03 (C)Copyright 1985-2002, American Megatrends, Inc

Plug & Play OS

This option specifies how Plug and Play devices will be configured. The settings are Yes and **No**. **No** lets BIOS configure all devices in the system. Yes lets the operating system (if supported) configure PnP devices not required for bootup.

Reset Configuration Data

Choosing the Yes setting will cause the PnP configuration data in the BIOS to be cleared on the next boot up. Choosing the **No** setting does not force PnP data to be cleared on the next boot.

PCI Latency Timer

This option specifies the latency timing of the PCI clocks for all PCI devices. Settings include 32, **64**, 96, 128, 160, 192, 224 and 248 PCI clocks.

Allocate IRQ to PCI VGA

This option lets you allocate an interrupt request (IRQ) to the PCI VGA adapter card (if used). The settings are **Yes** and **No**.

Palette Snooping

When enabled, this option informs PCI devices that an ISA graphics device is installed. The settings are **Disabled** and **Enabled**. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with your adapter card manuals first, before modifying the default settings in the BIOS.

PCI IDE BusMaster

The settings for this option are **Disabled** and **Enabled**. Enable to specify that the IDE controller on the PCI bus has bus mastering capabilities.

USB Function

The settings for this option are **Disabled** and **Enabled**. Disabled prevents the use of the USB ports and Enabled allows the use of the USB ports.

Legacy USB Support

This option allows you to enable support for Legacy USB. The settings are **Auto**, **Enabled** and **Disabled**.

7-7 Power Setup

Choose Power from the AMIBIOS Setup main menu. All Power Setup options are described in this section. The Power Setup screen is shown below.

BIOS SETUP UTILITY						
Main	Advanced	Chipset	PCIPnP	Power	Boot	Security
ACPI Aware O/S				[Yes]		
Power Management				[Enabled]		
				<div>↔ Select ↑↓ Select +- Change F1 General F10 Save & Exit ESC Exit</div>		
V02.03 (C)Copyright 1985-2002, American Megatrends, Inc.						

ACPI Aware O/S

This option allows the system to utilize Intel's ACPI (Advanced Configuration and Power Interface) specification. Settings are No and **Yes**. DOS®, Windows 3.x®, and Windows NT® are examples of non-ACPI aware operating systems. Windows 95®, Windows 98®, Windows ME® and Windows 2000® are examples of ACPI aware operating systems.

Power Management

When enabled, this option displays the following four options relating to power management. The settings are **Disabled** and Enabled.

Power Button Mode

This option allows you to change the function of the chassis power button. The settings are **On/Off** and Suspend. When set to Suspend, depressing the power button when the system is up will cause it to enter a suspend state.

Sleep Button Enable

This option allows you to enable the use of a sleep button that can be connected to the serverboard. The settings are **Disabled** and Suspend.

Video Power Down

This option specifies the power state that the VGA video subsystem enters after the specified period of display inactivity has expired. The settings include Disabled, Standby, **Suspend** and Sleep.

Suspend Timeout (Minutes)

This option specifies the length of hard disk inactivity time that should expire before entering the power conserving state. The settings are **Off**, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 (minutes).

7-8 Boot Setup

Choose Boot from the AMIBIOS Setup main menu. All Boot Setup options are described in this section. The Boot Setup screen is shown below.

BIOS SETUP UTILITY						
Main	Advanced	Chipset	PCIPnP	Power	Boot	Security
> <u>Boot Device Priority</u> > Hard Disk Drives > Removable Devices > ATAPI CDROM Drives					↔ Select ↑↓ Select Enter Go to F1 Genera F10 Save ESC Exit	
V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.						

Boot Device Priority

1st Boot Device

This option is used to specify the order of the boot sequence that will be followed from the available system devices. The settings for the 1st Boot Device are **Removable Device**, ATAPI CDROM, Hard Drive and Intel UNDI, PXE-2.0.

2nd Boot Device

The settings for the 2nd Boot Device are Removable Device, **ATAPI CDROM**, Hard Drive and Intel UNDI, PXE-2.0.

3rd Boot Device

The settings for the 3rd Boot Device are Removable Device, ATAPI CDROM, **Hard Drive** and Intel UNDI, PXE-2.0.

4th Boot Device

The settings for the 4th Boot Device are Removable Device, ATAPI CDROM, Hard Drive and **Intel UNDI, PXE-2.0**.

Hard Disk Drives

Use this screen to view the hard drives that have been auto-detected or entered manually on your system.

Removable Devices

Use this screen to view the removeable devices that have been auto-detected or entered manually on your system.

ATAPI CDROM Drives

Use this screen to view the ATAPI CDROM drives that have been auto-detected or entered manually on your system.

7-9 Security Setup

Choose Security from the AMIBIOS Setup main menu. All Security Setup options are described in this section. The Security Setup screen is shown below.

BIOS SETUP UTILITY						
Main	Advanced	Chipset	PCIPnP	Power	Boot	Security
Supervisor Password : Not Installed						Install or Change password.
User Password : Not Installed						
> Change Supervisor Password						<div>↔ Select</div> <div>↑↓ Select</div> <div>Enter Go to</div> <div>F1 General</div> <div>F10 Save & Exit</div> <div>ESC Exit</div>
> Change User Password						
> Clear User Password						
Boot Sector Virus Protection [Disabled]						
V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.						

Supervisor Password

User Password

AMIBIOS provides both Supervisor and User password functions. If you use both passwords, the Supervisor password must be set first. The system can be configured so that all users must enter a password every time the system boots or when AMIBIOS Setup is executed, using either or both the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a 1 – 6 character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure. **Remember your Password!** Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in CMOS.

Change Supervisor Password

This option allows you to change a supervisor password that was entered previously.

Change User Password

This option allows you to change a user password that was entered previously.

Clear User Password

Use this option to clear the user password so that it is not required to be entered when the system boots up.

Boot Sector Virus Protection

This option allows you to enable or disable a virus detection program to protect the boot sector of your hard disk drive. The settings for this option **Disabled** and Enabled. If Enabled, AMIBIOS will display 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.

7-10 Exit

Choose Exit from the AMIBIOS Setup main menu. All Exit Setup options are described in this section. The Exit Setup screen is shown below.

BIOS SETUP UTILITY						
Main	Advanced	Chipset	PCIPnP	Power	Boot	Security
<div>> Exit Saving Changes</div> <div>> Exit Discarding Changes</div> <div>> Load Optimal Defaults</div> <div>> Load Fail-Safe Defaults</div> <div>> Discard Changes</div>						<div>Exit system saving the cl</div> <div><div>↔</div> Selec</div> <div><div>↑↓</div> Selec</div> <div>Enter Go to</div> <div>F1 Gener</div> <div>F10 Save</div> <div>ESC Exit</div>
V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.						

Exit Saving Changes

Highlighting this setting and then pressing <Enter> will save any changes you made in the BIOS Setup program and then exit. Your system should then continue with the boot up procedure.

Exit Discarding Changes

Highlighting this setting and then pressing <Enter> will ignore any changes you made in the BIOS Setup program and then exit. Your system should then continue with the boot up procedure.

Load Optimal Defaults

Highlighting this setting and then pressing <Enter> provides the optimum performance settings for all devices and system features.

Load Failsafe Defaults

Highlighting this setting and then pressing <Enter> provides the safest set of parameters for the system. Use them if the system is behaving erratically.

Discard Changes

Highlighting this setting and then pressing <Enter> will ignore any changes you made in the BIOS Setup program but will not exit the BIOS Setup program.

Notes

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 Section 5-10.

A-1 AMIBIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up.)
6 beeps	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 diagnostic codes 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 <i>Initialize CMOS RAM in every boot</i> 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	The 8254 timer test is over. Starting the memory refresh test next.
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 <i>Hit </i> message next.
3Bh	The <i>Hit </i> 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.

Checkpoint	Code Description
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. Determining the amount of memory above 1 MB memory next.
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.
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. Testing the memory above 1 MB next.
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 <i>Hit </i> message next.
59h	The <i>Hit </i> message is cleared. The <i><WAIT...></i> message is displayed. Starting the DMA and interrupt controller test next.

Checkpoint	Code Description
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.
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.
8Bh	The first screen message has been displayed. The <WAIT...> message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check 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.

Checkpoint	Code Description
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.
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

Up to four Intel® Xeon™ processors MP of up to 2.8 GHz with a 400 MHz System Bus

Chipset

ServerWorks Grand Champion HE

Memory Capacity

MEC (Memory Expansion Card) with 16 DIMM slots to support a maximum of 32 GB of DDR200 (PC1600) SDRAM

DIMM Sizes

128 MB / 256 MB / 512 MB / 1 GB / 2 GB SDRAM modules supported
(The MEC has been designed to support 2 GB DIMM modules for each memory slot, but it has only been validated on 1GB memory modules.

Operating Systems Supported

Windows NT, Windows 2000, Netware and Linux

SCSI Controller

P4QH8: Adaptec AIC-7902 for dual channel Ultra320 SCSI

P4QH6: Adaptec AIC-7899 for dual channel Ultra160 SCSI

SCSI Backplane Controller

QLogic GEM354 controller for SAF-TE compliant SCA backplane (two on 8052-8, one on 8052-6)

SCSI Drive Bays

Ten (10) drive bays to house four (10) standard 1" 80-pin SCA SCSI drives

Peripheral Bays

One (1) floppy drive

PCI Expansion Slots

Six (6) 64-bit, 100 MHz PCI slots

Serverboard

Model: P4QH8 (8052-8) or P4QH6 (8052-6): (SWTX Form Factor)

Dimensions: 16 x 13 in (406 x 330 mm)

Chassis

Model: SC850P4, tower form factor

Dimensions: (WxHxD) 15 x 19.9 x 22.8 in. (381 x 505 x 579 mm)

Weight

Net: 90 lb. (40.9 kg.)

Gross: 110 lb. (50 kg.)

Operating Environment

Operating Temperature: 0 to +35 degrees C

Non-operating Temperature: -35 to +60 degrees C

Operating Relative Humidity: 5-90%, (non-condensing)

Non-operating Relative Humidity: 5-95%, (non-condensing)

System Cooling

System: Four (4) 9-cm, hot-plug ball bearing fans

Exhaust: Two (2) 9-cm ball bearing fans

Onboard Fan Headers: Four CPU, four chassis and two overheat headers;
max. current = .035 amps/ea. or 1.2 amps/set of four

System Input Requirements

AC Input Voltage: 100-240 VAC (autorange)

Rated Input Current: 10A (115V) to 5A (230V)

Rated Input Frequency: 50 to 60 Hz

Power Supply

A set of 700W Triple Redundant Power Supply (-PWS 039 p/n: YH-5711C) which consists of three individual Power Supply Modules (-PWS 040M p/n: YM-6361A).

Rated Output Power: 700W (3 x 350W triple redundant modules)

Rated Output Voltages: +3.3V (60A), +5V (80A), +12V (48A), -5V (0.7A), -12V (1.5A), +5Vsb (1.5A)

Regulatory Compliance

Electromagnetic Emissions:

FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity:

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

Safety:

EN 60950/IEC 60950-Compliant

UL Listed (USA)

CUL Listed (Canada)

TUV Certified (Germany)

CE Marking (Europe)

Notes