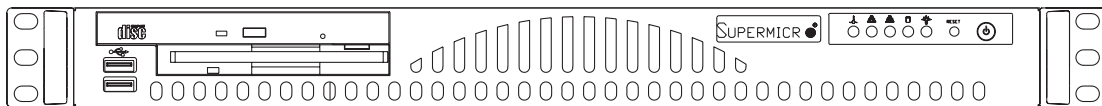


SUPERO[®]

SUPERSERVER 5014C-MR



USER'S MANUAL

Revision 1.0a

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5014C-MR. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 5014C-MR is a high-end single processor mini 1U rackmount server based on the SC512C-260 1U rackmount server chassis and the Super P8SCT motherboard. The P8SCi supports a single Intel® Pentium® 4 processor at an 800 MHz front side bus speed.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super P8SCi motherboard and the SC512C-260 chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5014C-MR into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

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

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5014C-MR.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the P8SCi motherboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC512C-260 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: Software Installation

Appendix D: System Specifications

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Chapter 1

Introduction

1-1 Overview

The Supermicro SuperServer 5014C-MR is a high-end single processor, mini 1U rackmount server. The 5014C-MR is comprised of two main subsystems: the SC512C-260 chassis and the P8SCi motherboard. The P8SCi supports a single Intel® Pentium® 4 processor with an 800 MHz front side bus or a single Intel Celeron® processor with a 533 MHz front side bus in an LGA775 type socket and up to 4 GB of DDR2-533/400 SDRAM memory. Please refer to our web site for information on operating systems that have been certified for use with the 5014C-MR (www.supermicro.com) and for regular updates on supported processor speeds.

In addition to the motherboard and chassis, various hardware components may have been included with the 5014C-MR, as listed below.

- One CPU heatsink (SNK-P0011)
- One (1) slim floppy drive [FPD-PNSC-S(B)]
- One (1) slim CD-ROM drive [CDM-TEAC-24(B)]
- One (1) SATA cable (CBL-0044)
- One (1) SATA power (CBL-0082)
- One (1) air shroud (CSE-PT66)
- One (1) 3.3V 64-bit, 66 MHz PCI-X slot riser card (CSE-RR1U-X)
- Rackmount hardware with screws (CSE-PT8) (optional):
 - Two (2) rack rail assemblies
 - Six (6) brackets for mounting the rack rails in a rack/telco rack
- One (1) CD containing drivers and utilities
- SuperServer 5014C-MR User's Manual

1-2 Motherboard Features

At the heart of the SuperServer 5014C-MR lies the P8SCi, a single processor motherboard designed to provide maximum performance. Below are the main features of the P8SCi. (See Figure 1-1 for a block diagram of the E7221 chipset.)

Processors

The P8SCi has an LGA775 ZIF socket that supports a single Intel Pentium 4 processor (hyper-threading technology enabled) at an 800 MHz FSB or a single Intel Celeron processor at a 533 MHz FSB (front side bus). Please refer to the support section of our web site for a complete listing of supported processors (<http://www.supermicro.com/support>).

Memory

The P8SCi has four (4) 240-pin DIMM sockets that can support up to 4 GB of DDR2-533/400 SDRAM modules. (Memory operates in a dual-channel, or interleaved configuration for increased performance.) Low-profile memory modules are required for use in the 1U form factor of the 5014C-MR.

Serial ATA

A Serial ATA controller is incorporated into the E7221 chipset to provide a two-port Serial ATA subsystem. The Serial ATA drive is not hot-swappable.

PCI Expansion Slots

The P8SCi has two PCI-Express 1x slots, one 64-bit, 133 MHz (3.3V) PCI-X slot and one 32-bit, 33 MHz (5V) PCI slot. When incorporated into the 5014C-MR server system, a riser card is included for use with the PCI-X slot to support one full-size, half-length expansion card.

Ethernet Ports

Two Broadcom BCM5721 gigabit Ethernet controllers are incorporated into the P8SCi to support two Gigabit LAN ports.

Onboard Controllers/Ports

An onboard IDE controller supports one floppy drive and up to four Ultra ATA 100 hard drives or ATAPI devices. Onboard I/O backpanel ports include one serial COM port, one parallel port, two USB ports, a VGA (monitor) port, PS/2 mouse and keyboard ports and two GLAN (RJ45) ports.

Other Features

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

**Figure 1-1. Intel E7221 Chipset:
System Block Diagram**

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

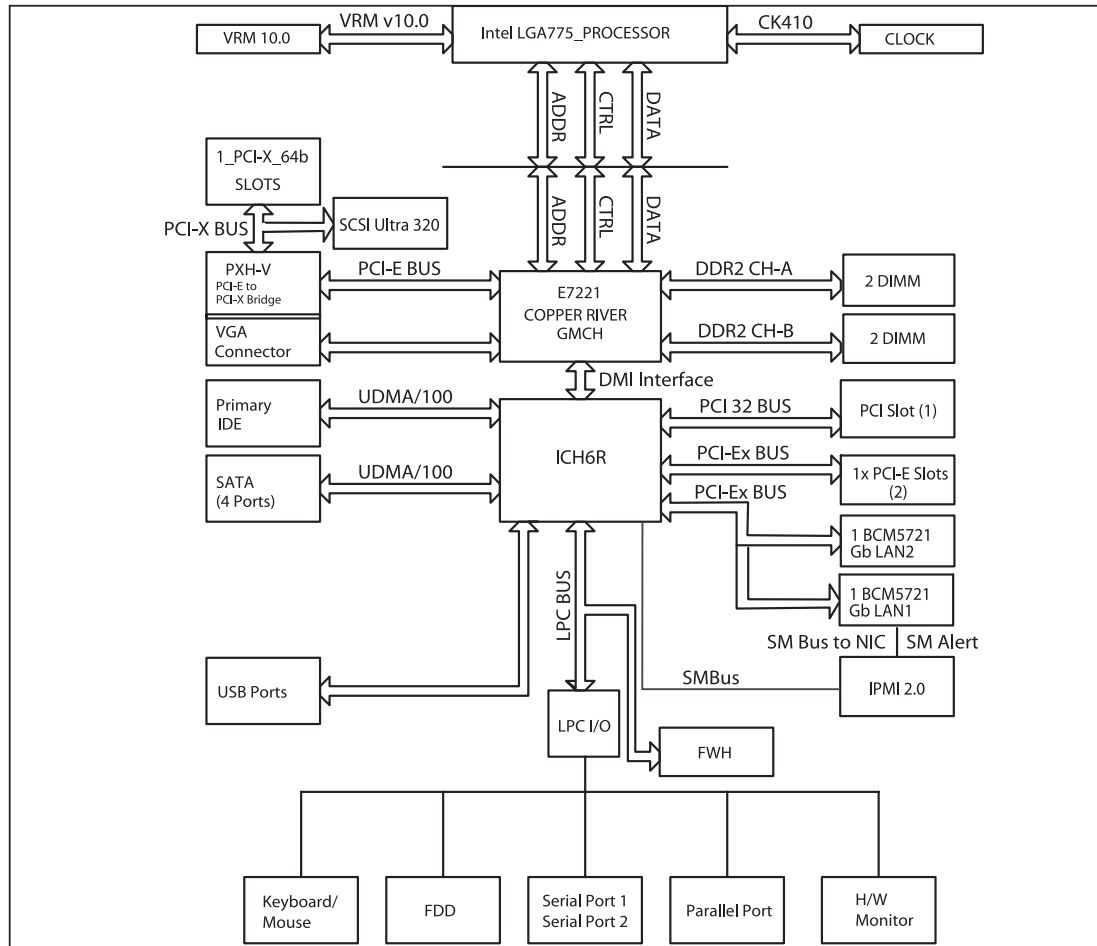
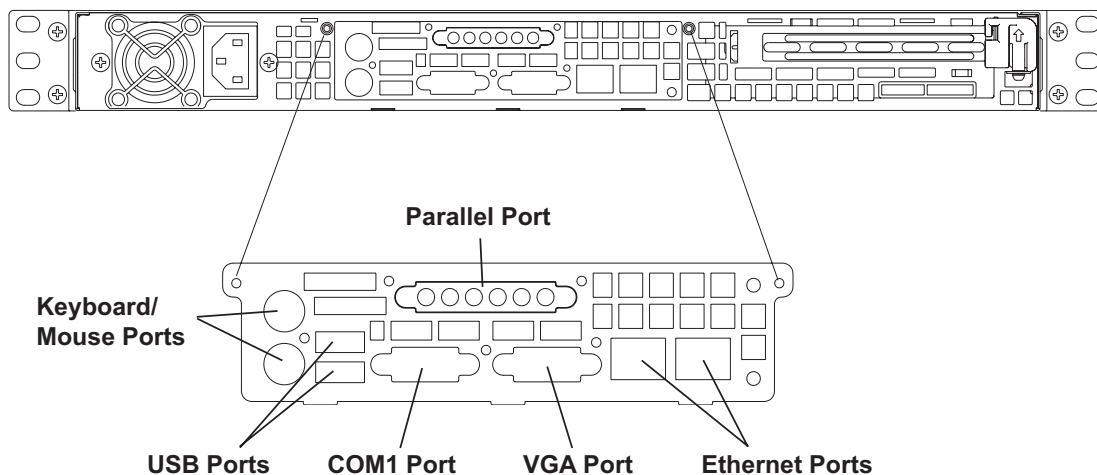


Figure 1-2. Rear I/O Panel



1-3 Server Chassis Features

The SuperServer 5014C-MR is a mini 1U rackmount server platform configuration. The following is a general outline of the main features of the SC512C-260 chassis.

System Power

When configured as a SuperServer 5014C-MR, the SC512C-260 chassis includes a single 260W power supply.

Control Panel

The SC512C-260's control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity, overheat warning and fan failure. The control panel also includes a main power button and a system reset button.

Rear I/O Panel

The rear I/O panel on the SC512C-260 provides one motherboard expansion slot, one COM port (another is internal), two USB ports, PS/2 mouse and keyboard ports, a graphics port and two Gb Ethernet ports. (See Figure 1-2.)

Cooling System

The SC512C-260 chassis has an innovative cooling design that features a 100-mm blower system cooling fan. The blower fan plugs into a chassis fan header on the motherboard and operates at full rpm continuously.

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)
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Europe

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Tel: +31 (0) 73-6400390
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rma@supermicro.nl (Customer Support)

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Chung-Ho 235, Taipei, Taiwan, R.O.C.
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5014C-MR up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. This quick setup assumes that your 5014C-MR system has come to you with the processor and memory preinstalled. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 5014C-MR was shipped in and note if it was damaged in any way. If the server itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 5014C-MR. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The SuperServer 5014C-MR does not ship with a rack rail hardware package as the system can be rack mounted without the use of rails. An optional rack rail package is available if you wish to order from Supermicro. Follow the steps in the order given to complete the installation process in a minimal amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

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



Warnings and Precautions!



Rack Precautions

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

Server Precautions

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

Rack Mounting Considerations

Ambient Operating Temperature

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

Reduced Airflow

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

Mechanical Loading

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

Circuit Overloading

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

Reliable Ground

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

2-4 Installing the System into a Rack

(Rack hardware optional)

This section provides information on installing the SuperServer 5014C-MR into a rack unit. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

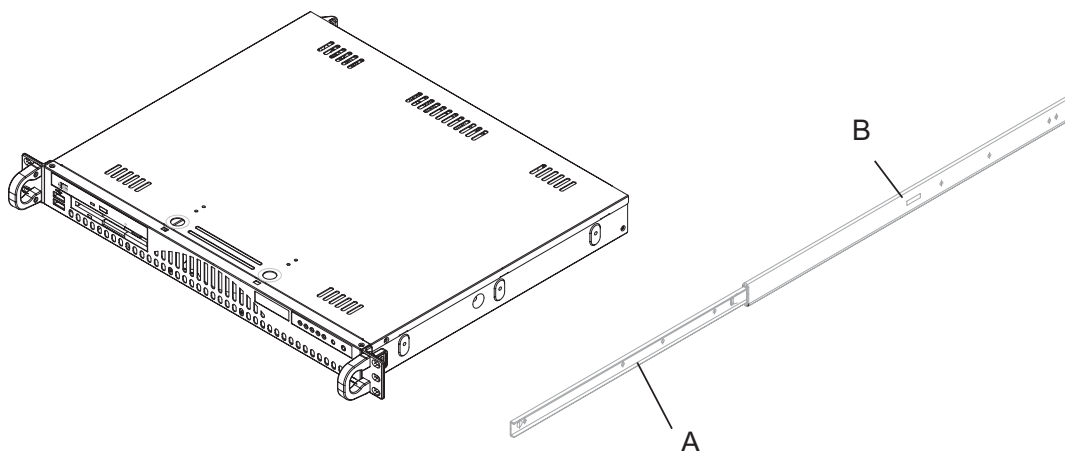
Basic Installation Procedure

The 5014C-MR server comes with two rack mounting brackets, which are located on each side at the front of the chassis. To mount the system into a rack, simply screw these brackets directly to the front of the rack (two screws for each bracket).

Installing with Rackmount Kit

This section is only for customers that have the optional rack mount kit (CSE-PT8). Each of these assemblies consist of two sections: an inner rail that secures to the chassis and an outer rail that secures directly to the rack itself (see Figure 2-1). This is a guideline for installing the unit into a rack with the optional rack kit. You should also refer to the installation instructions that came with the rack unit you are using. Be aware that there are a variety of rack units on the market, which may mean the assembly procedure will differ slightly.

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



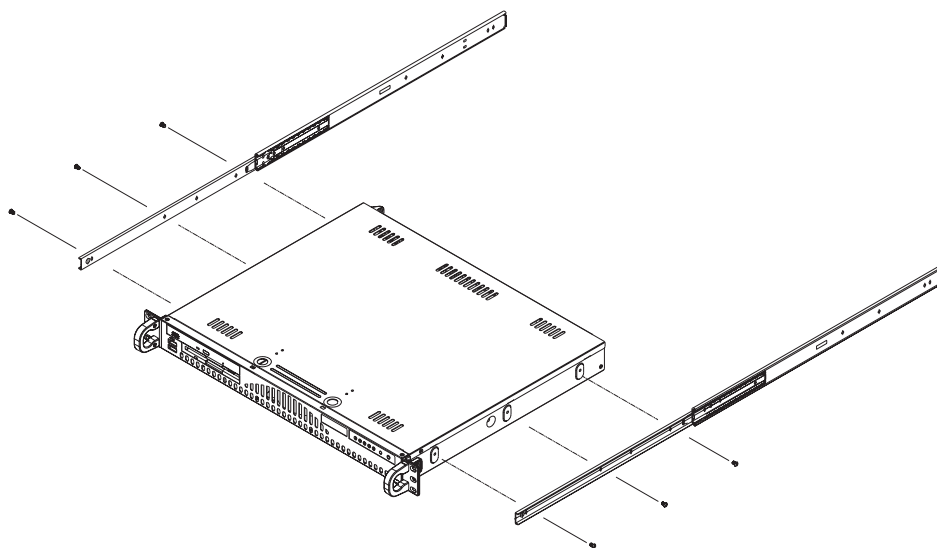
Installing the Chassis Rails

The two rail sections must be detached from each other prior to installation. Do this by depressing the locking tab on the inner rail to release it from its locked position then pull the two rails completely apart. Do this for both the left and right side rack rail assemblies.

Position the fixed chassis rail sections you just removed along the side of the chassis making sure the three screw holes line up. Note that these two rails are left/right specific. Screw the rail securely to the side of the chassis (see Figure 2-2). Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installing into a telco rack.

Locking Tabs: Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing Chassis Rails



Installing the Rack Rails

Determine where you want to place the 5014C-MR in the rack ([see Rack and Server Precautions in Section 2-3](#)). Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure that both are at the exact same height and with the rail guides facing inward.

Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

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

Figure 2-3. Installing the Server into a Rack: Basic

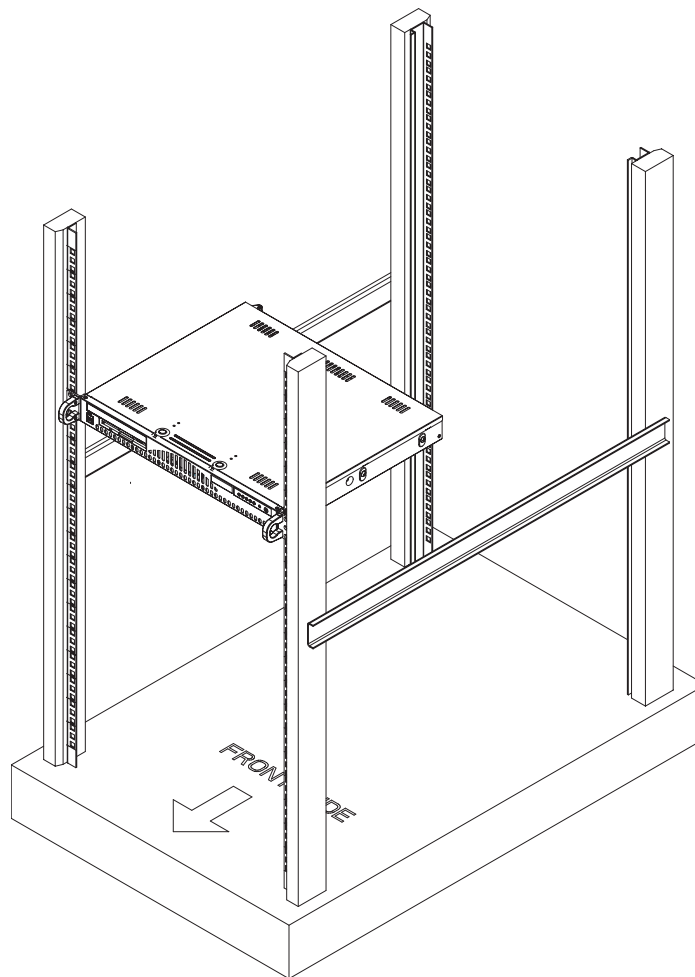
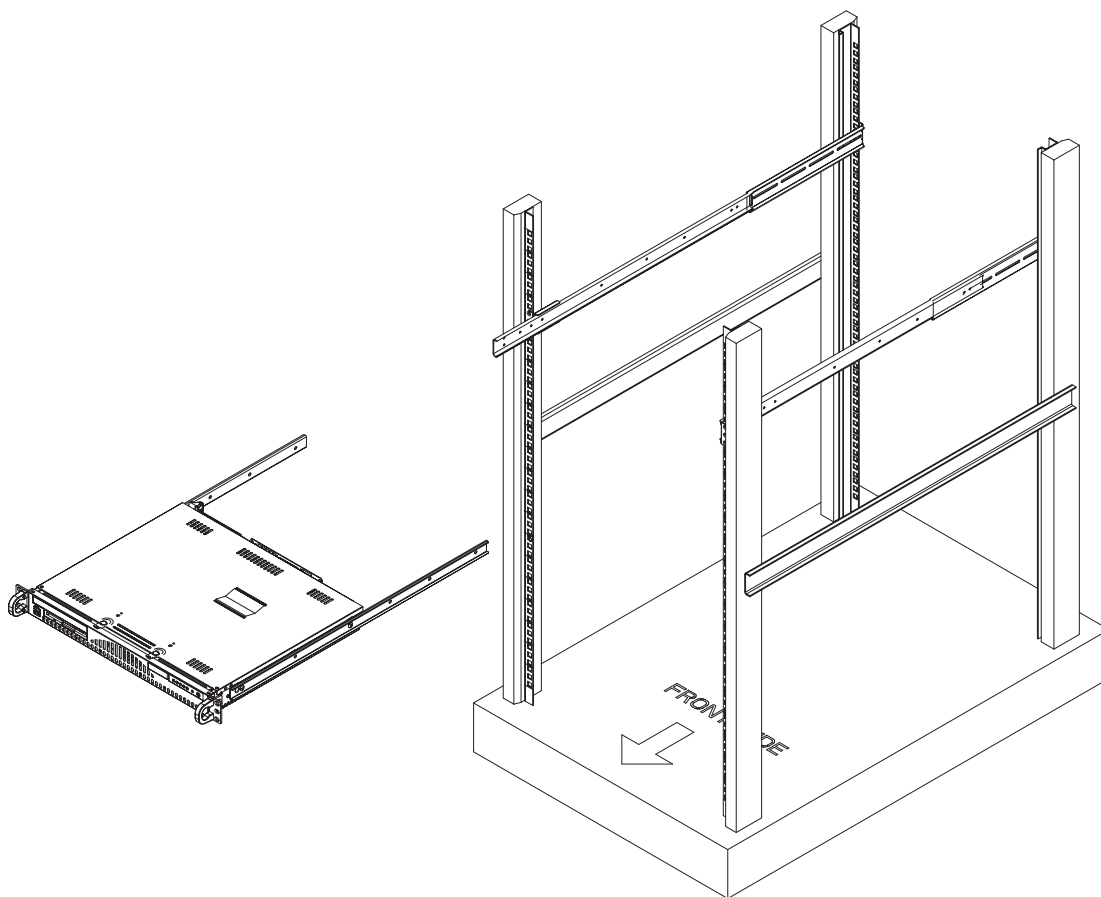
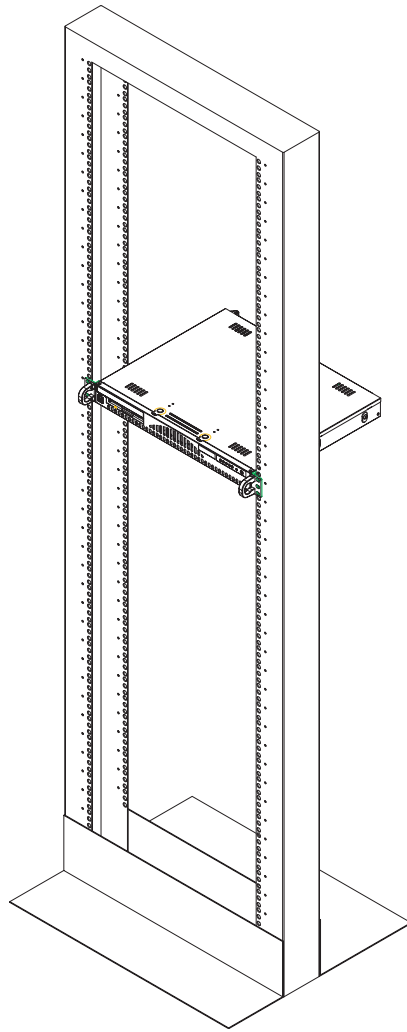


Figure 2-4. Installing the Server into a Rack: w/ Rackmount Kit

Installing the Server into a Telco Rack

If you are installing the SuperServer 5014C-MR into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

Figure 2-5. Installing the Server into a Telco Rack: Basic

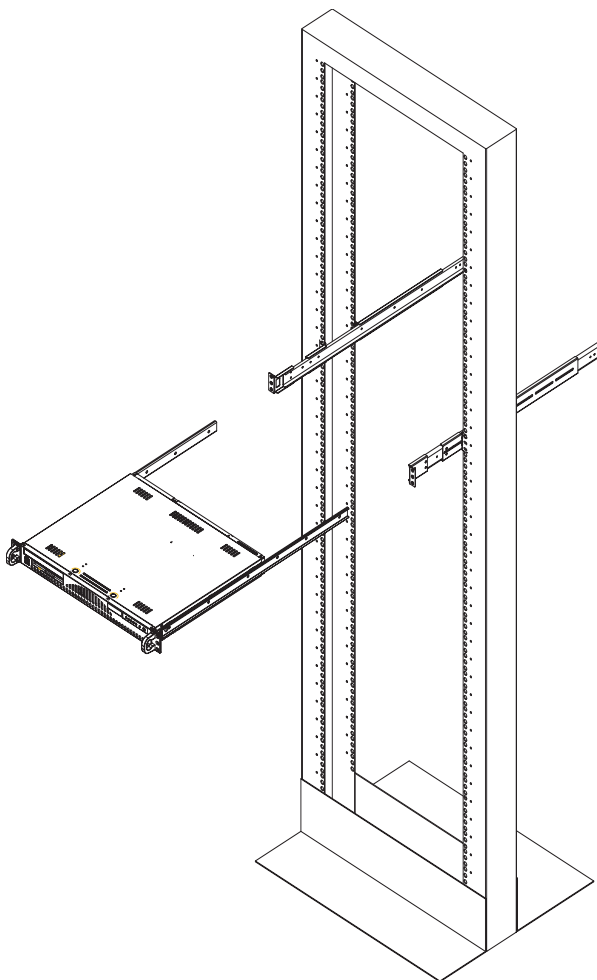


2-5 Checking the Motherboard Setup

After you install the 5014C-MR in the rack, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

1. Accessing the inside of the 5014C-MR (Figure 2-7)

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Then, remove the screws from the lips on either side of the chassis top cover (see Figure 2-5 for location). Next, depress the two buttons on the top

Figure 2-6. Installing the Server into a Telco Rack: w/ Rackmount Kit

of the chassis to release the top cover while pushing the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. Check the CPU (processor)

You may have one processor already installed into the system board. The processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

3. Check the system memory

Your 5014C-MR server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. Installing add-on cards

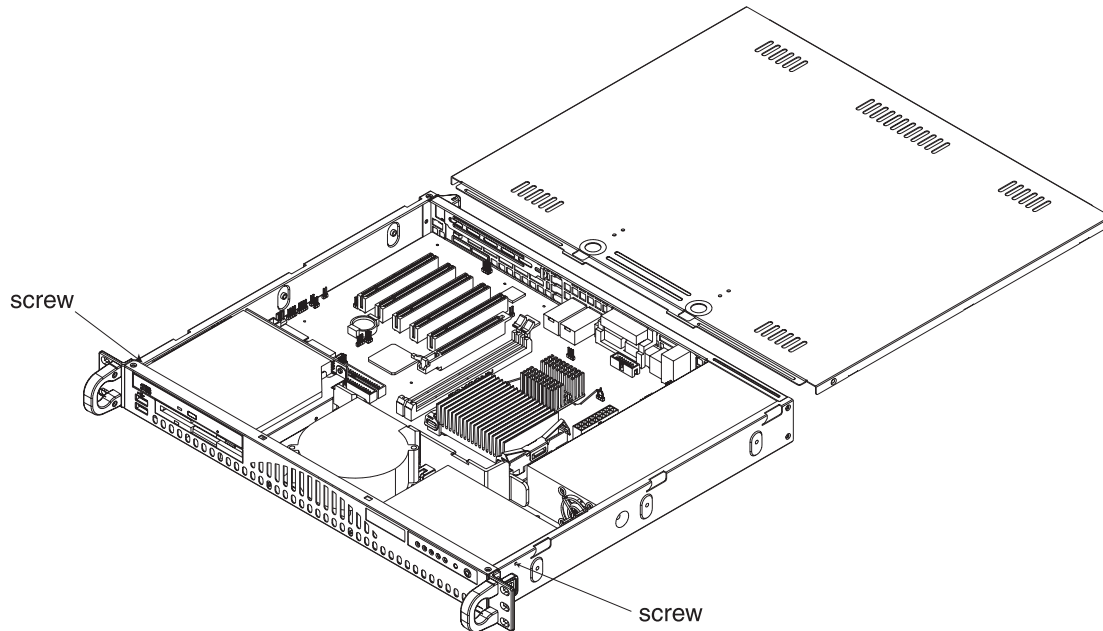
If desired, you can install an add-on card to the system. See Chapter 5 for details on installing a PCI add-on card.

5. Check all cable connections and airflow

Make sure all power and data cables are properly connected and not blocking the airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the motherboard area of the chassis.

Note: Make sure that the air seals are properly installed.

Figure 2-7. Accessing the Inside of the SuperServer 5014C-MR



2-6 Checking the Drive Bay Setup

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

1. Accessing the drive bays

For servicing the Serial ATA, CD-ROM and floppy drives, you will need to remove the top chassis cover. The Serial ATA disk drive is located at the front right side of the chassis.

2. Installing a CD-ROM and floppy disk drives

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

3. Check the Serial ATA disk drives

Depending upon your system's configuration, your system may have a Serial ATA hard drive already installed. If you need to install a Serial ATA hard drive, please refer to the appropriate section in Chapter 6.

4. Check the airflow

Airflow is provided by one 10-cm input fan. The system component layout was carefully designed to promote sufficient airflow through the small 1U rackmount space. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fan.

5. Supplying power to the system

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

Notes

Chapter 3

System Interface

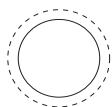
3-1 Overview

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

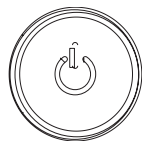
3-2 Control Panel Buttons

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

RESET



- **Reset:** The reset switch reboots the system.



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

3-3 Control Panel LEDs

The control panel located on the front of the SC512C-260 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



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



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



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



- **HDD:** Channel activity for all HDDs. This light indicates CD-ROM drive activity when flashing.



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

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 5014C-MR 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 motherboard, memory modules and floppy drive. 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 specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Motherboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the SuperServer 5014C-MR clean and free of clutter.
- The SuperServer 5014C-MR weighs approximately 23 lbs (~10.5 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions



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

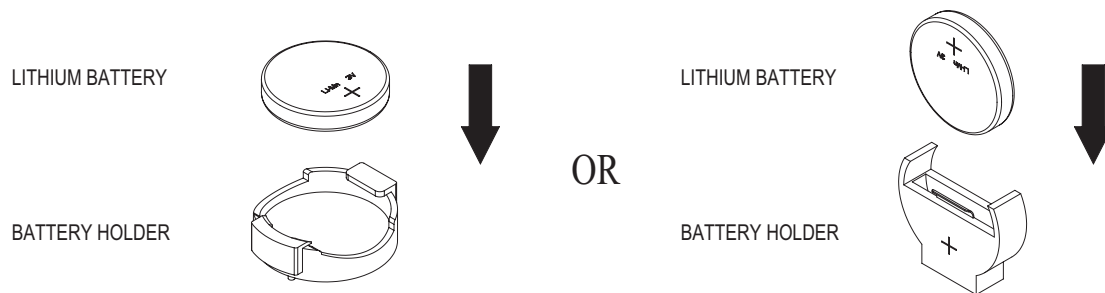
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard 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 motherboard.

4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the 5014C-MR is operating to assure proper cooling. Out of warranty damage to the 5014C-MR system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install processors and heatsinks to the P8SCi motherboard, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described and a layout and quick reference chart are included in this chapter. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

5-1 Handling the Motherboard

Electric-static discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the P8SCi motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

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

Unpacking

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

5-2 Motherboard Installation

This section explains the first step of physically mounting the P8SCi into the SC512C-260 chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

1. Accessing the inside of the 5014C-MR (see Figure 2-7)

Two release buttons are located on the top cover of the chassis. Depressing both of these buttons while pushing the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. (If already installed in a rack, you must first release the retention screws that secure the unit to the rack. Then grasp the two handles on either side and pull the unit straight out until the rails lock into place.)

2. Check compatibility of motherboard ports and I/O shield:

The P8SCi requires a chassis big enough to support a 12" x 9.5" motherboard, such as Supermicro's SC512C 1U rackmount. Make sure that the I/O ports on the motherboard align properly with their respective holes in the I/O shield at the back of the chassis.

3. Mounting the motherboard onto the motherboard tray:

Carefully mount the motherboard to the motherboard tray by aligning the board holes with the raised metal standoffs that are visible on the bottom of the chassis. Insert screws into all the mounting holes on your motherboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the motherboard ground to provide a continuous ground for the system.

5-3 Connecting Cables

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

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables should be connected. (See the layout on page 5-9 for connector locations.)

- CD-ROM Drive Cable (IDE)
- Floppy Drive Cable (Floppy)
- Serial ATA Device Cables (SATA0)
- Control Panel Cable (JF1)
- USB Cable (USB6/7)

Connecting Power Cables

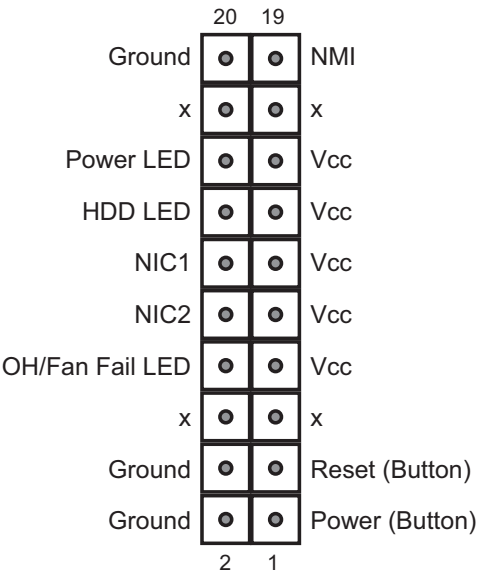
The P8SCi has one 24-pin primary power supply connector ("ATX power") at J1 and one 4-pin power connector at J2 for connection to the ATX power supply. See Chapter 5 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details.

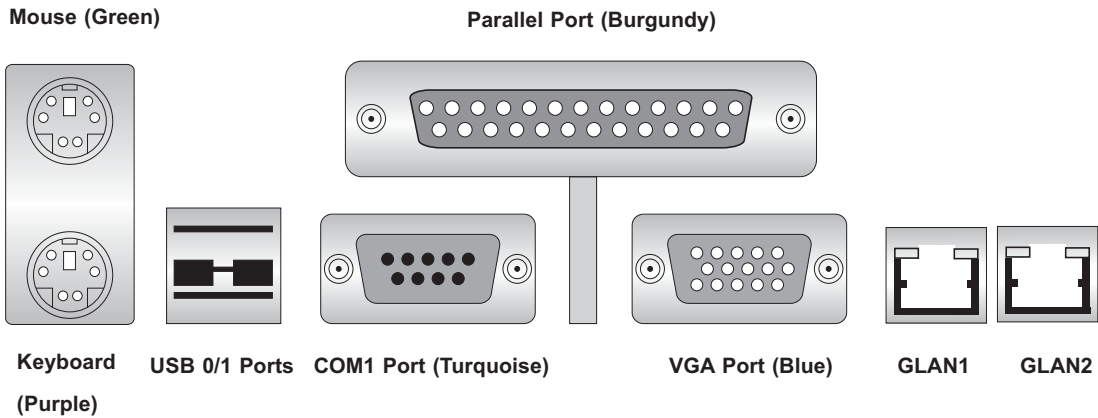
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

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

Figure 5-2. I/O Ports



Note: The COM2 port is a header on the motherboard, located near the floppy connector.

5-5 Installing Processors

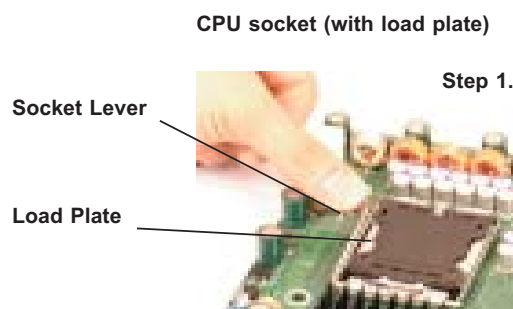


Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

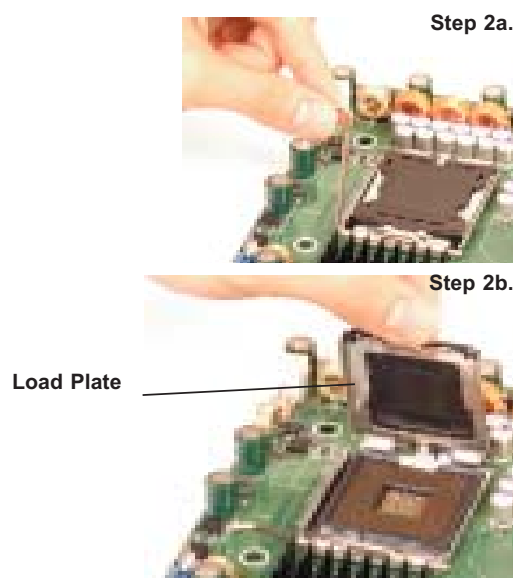
Processor Support

The P8SCi has a single LGA775 socket, which supports Intel Pentium 4 and Intel Celeron processors.

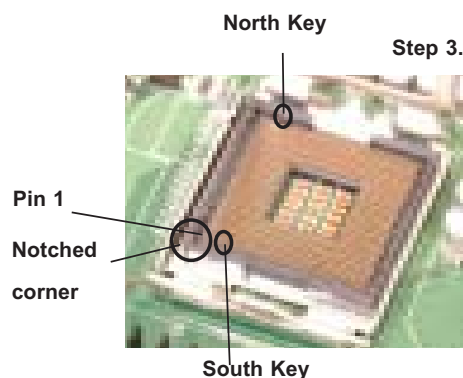
1. Press the socket lever to release the load plate that covers the CPU socket from its locked position.



2. Carefully lift the socket lever up to open the load plate.



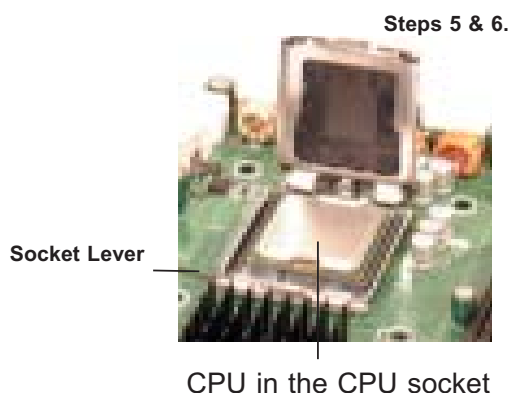
3. Locate Pin 1 on the CPU socket. (Pin 1 is closest to the notched corner of the housing.) Please note that a North Key and a South Key (notches) are located at opposite sides of the CPU housing.



4. Use your thumb and index finger to hold the CPU at the north center and south center edges of the CPU.



5. Align Pin 1 of the CPU with Pin 1 of the socket. Once aligned, carefully lower the CPU straight down and into the socket. *Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface of the socket or against any pins of the socket, which may damage the CPU and/or the socket.*

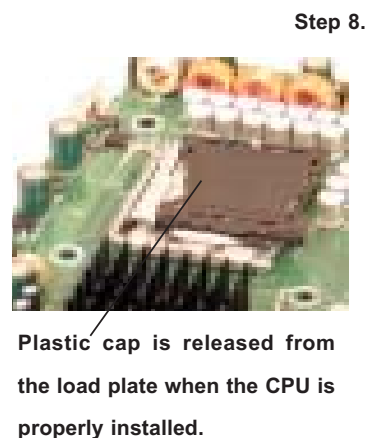


6. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

7. Use your thumb to gently press the lever down and lock it in the hook.

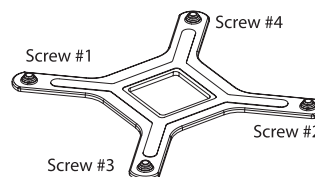
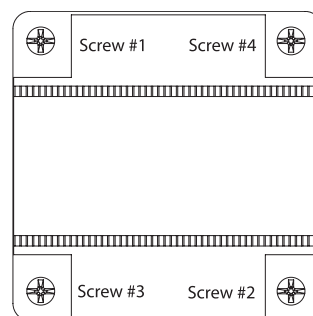
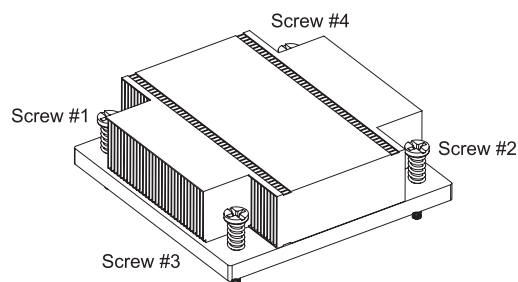


8. If the CPU is properly installed into the socket, the black plastic cover will be automatically released from the load plate when the lever is pushed into the hook. Remove the cover from the motherboard.



Heatsink Installation

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
3. Screw in two diagonal screws (eg. the #1 and the #2 screws) until just snug (do not fully tighten the screws, which may damage the CPU).
4. Finish the installation by fully tightening all four screws.



Retention mechanism
(preinstalled)

Heatsink Removal

1. Unscrew and remove the heatsink screws from in the sequence as show in the picture on the right.
2. Hold and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when loosening the heatsink!)
3. Once the heatsink is loosened, remove it from the CPU socket.
4. Clean the surfaces of the CPU and the heatsink to remove the old thermal grease. Reapply the proper amount of thermal grease on the surface before re-installing the heatsink.

5-6 Installing Memory



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

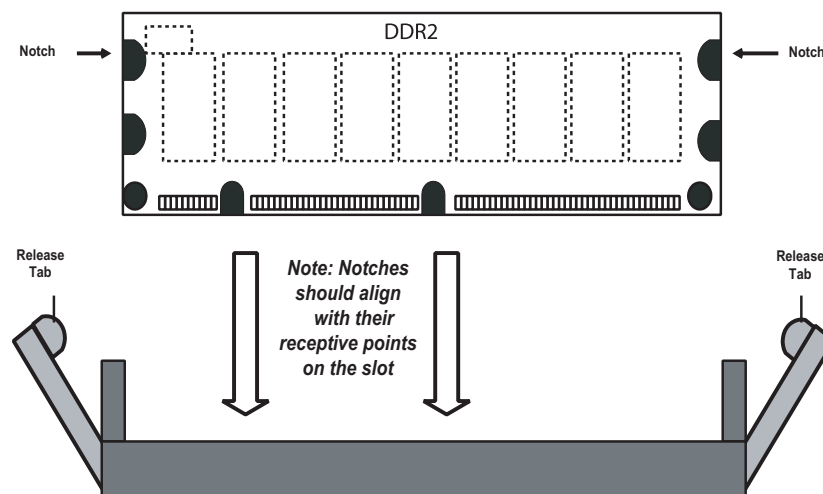
1. Memory support

The P8SCi supports up to 4 GB of DDR2-533/400 unbuffered ECC SDRAM. The P8SCi employs a dual-channel memory configuration, meaning DIMM sockets must be populated in pairs with the same size/same type of memory modules.

2. Installing memory modules

Insert each memory module vertically. 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 5-3).

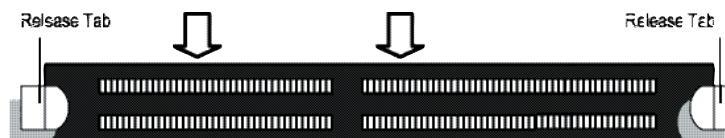
Figure 5-3. DIMM Installation



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.

Top View of DDR2 Slot



5-7 Adding PCI Cards

1. 64-bit PCI-X slot

The 5014C-MR has a riser card (p/n CSE-RR1U-X) designed specifically for use in the SC512C-260 1U rackmount chassis (included with the system). This riser card allows an installed PCI-X card to sit at a 90 degree angle so it can fit inside the chassis. This riser card accommodates one 64-bit, 133 MHz (3.3V) PCI-X card.

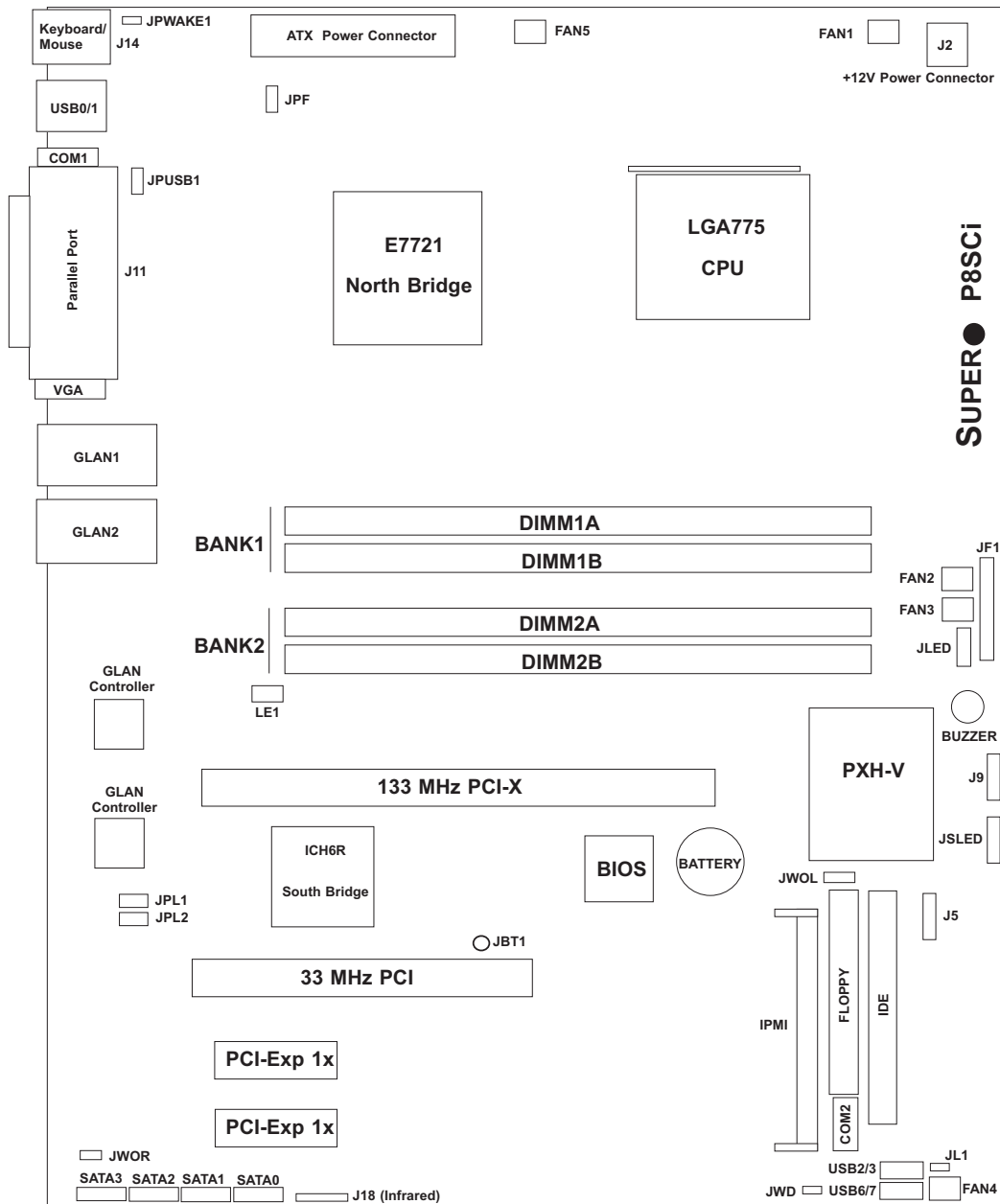
2. Card installation

Before installing a PCI add-on card, locate the PCI riser card mentioned in Step 1. Begin by removing the PCI slot shield. Fully seat the PCI card into the riser card and screw it into the metal retention rail. Then, insert the riser card into the PCI slot on the motherboard, 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 rear of the chassis. The expansion slot shield protects the motherboard and its components from EMI and aids in proper ventilation, so make sure the shield covers the PCI slot if there is no expansion card installed.

5-8 Motherboard Details

Figure 5-4. P8SCi Layout

(not drawn to scale)



Jumpers not indicated are for test purposes only.

P8SCi Quick Reference

Jumpers	Description	Default Setting
J9	Speaker Setting	Pins 3-4 (Internal)
JBT1	CMOS Clear	See Section 5-8
JPF	Power Force On	Open (Disabled)
JPL1/PL2	GLAN1/2	Pins 1-2 (Enabled)
JPUSB1	USB1/2 Wake Up	Pins 1-2 (Disabled)
JPWAKE1	Keyboard Wake-up	Pins 1-2 (Disabled)
JWD	Watch Dog Reset/NMI	Pins 1-2 (Reset)

Connector	Description
COM1/COM2	COM Port 1 Connector /COM Port2 Header
Fan1-5	Fan Headers
Floppy	Floppy Disk Drive Connector
IDE	IDE Port
IPMI	IPMI Connector
J1	ATX Power Connector
J2	4-Pin Power Connector
J5	System Management Bus (SMB) Header
J11	Parallel Printer Port
J14	Keyboard/Mouse Connectors
J18	Infrared Connector
JF1	Front Control Panel
JL1	Chassis Intrusion Header
GLAN1/GLAN2	Gigabit LAN (Ethernet Ports)
JLED	Power LED Header
JSLED	SATA LED Connector
JWOL	Wake-On-LAN
JWOR	Wake-On-Ring
LE1	+5V Standby Power LED
SATA0-3	Serial ATA 1 through 3 Connectors
USB0/1	Universal Serial Ports 0/1
USB2/3 & USB6/7	Universal Serial Port Headers

Jumpers not indicated are for test purposes only.

5-9 Connector Definitions

Power Supply Connectors

The primary power supply connector on the P8SCi meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector (J1). You must also connect the 4-pin J2 power connector to your power supply. Refer to the table below right for the J2 (12V) connector.

Important: you must connect both J1 and J2 to your power supply to meet the ATX safety requirements.

ATX Power 20-pin Connector Pin Definitions (J1)			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Required Connection

+12V 4-pin Power Pin Definitions (J2)	
Pins	Definition
1 & 2	Ground
3 & 4	+12V

IR Connector

The infrared connector is located on J18. See the table on the right for pin definitions. See the Technical Support section of our web page for information on the infrared devices you can connect to the system.

Infrared Connector Pin Definitions (J18)	
Pin#	Definition
1	+5V
2	CIRRX
3	IRRX
4	Ground
5	IRTX
6	NC

Power LED

The Power LED header is designated JLED. Use this header to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Header Pin Definitions (JLED)	
Pin#	Definition
1	+5V
2	Key
3	Ground

Power Button Connector

The power button connector is located on pins 1 and 2 of JF1. This header should be connected to the chassis power button, which you may also configure to put the system into suspend mode (see the Power Button Mode setting in BIOS). To turn off the power when the suspend mode is enabled, depress the power button for at least 4 seconds. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	+3V Standby

Reset Connector

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

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Overheat/Fan Fail LED

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

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

Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash- ing	Fan Fail

GLAN1/GLAN2 LED

The LED connections for the Ethernet ports are located on pins 9 and 10 (for GLAN2) and 11 and 12 (for GLAN1) of JF1. Attach LAN LED cables to display network activity. Pin definitions are shown at right.

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

HDD LED

The IDE/SATA LED is located on pins 13 and 14 of JF1. This LED is used to display all IDE and SATA activity on all drives. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+5V
14	HD Active

Power_LED Connector

The Power LED connector is located on pins 15 and 16 of JF1 (use JLED for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+5V
16	Ground

Serial Ports

Two serial ports are included on the motherboard: COM1 is a port located under the parallel port and COM2 is a header located near the floppy connector. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

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

Fan Headers

There are five fans on the P8SCi, which are designated Fan1 through Fan5. Connect the fan on your CPU heatsink to the Fan1 or Fan5 header. See the table on the right for pin definitions.

Fan Header Pin Definitions (Fan1-5)	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer

Note: Fan headers use DC power.

Chassis Intrusion

The Chassis Intrusion header is designated JL1 and located near the FAN4 header. See the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are designated J14. The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J14)	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

SATA LED

The SATA LED header is designated JSLED. This header is used to display all SATA activities. See the table on the right for pin definitions.

SATA LED Pin Definitions (JSLED)	
Pin#	Definition
1	SATA1
2	SATA2
3	NC
4	NC
5	NC

Universal Serial Bus (USB)

There are two Universal Serial Bus ports located on the I/O panel and an additional four USB headers located on the motherboard. These headers, labeled USB2/3 and USB6/7, can be used to provide front side chassis access (cables not included). See the tables on the right for pin definitions.

Universal Serial Bus Pin Definitions (USB0/1)			
USB0/1		USB2/3/6/7	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

Wake-On-LAN

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

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

Wake-On-Ring

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

Wake-On-Ring Pin Definitions (JWOR)	
Pin#	Definition
1	Ground (Black)
2	Wake-up

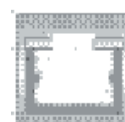
SMB Header

A System Management Bus header is located at J5. Connect the appropriate cable here to utilize SMB on your system.

SMB Header Pin Definitions (J11)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

GLAN1/2 (Ethernet Ports)

Two gigabit Ethernet ports (designated GLAN1 and GLAN2) are located on the I/O backplane.

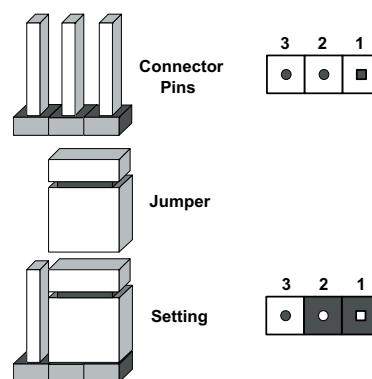


5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

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

To clear CMOS:

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

USB Wake-Up

Use JPUSB1 to enable or disable USB Wake-Up, which allows you to wake up the system by depressing a key on the keyboard or by clicking the mouse when either is connected to the USB0 or USB1 port. Enable the jumper to allow the system to be woken up from an S1 or S3 state in Windows OS. See the table on the right for jumper settings. This feature works with the USB0 and USB1 ports only.

USB Wake-Up Jumper Settings (JPUSB1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

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

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

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

Speaker Jumper

The speaker jumper is located on J9 and allows you to choose between using the internal or an external speaker. For the internal speaker, jump pins 3 and 4. To use an external speaker, place the speaker cable header on all four pins. See the table on the right.

Speaker Jumper Settings (J9)	
Jumper Setting	Definition
Pins 1-2	Internal Speaker
Pins 1-4	External Speaker

Keyboard Wake-Up

The JPWAKE1 jumper (and the corresponding BIOS setting) is used to allow the system to be woken up by depressing a key on the keyboard from an S1 or S3 state in Windows OS. See the table on the right for jumper settings. Your power supply must meet ATX specification 2.01 or higher and supply 720 mA of standby power to use this feature.

Keyboard Wake-Up Jumper Settings (JPWAKE1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

GLAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the GLAN1 port and JPL2 to enable or disable the GLAN2 port. See the table on the right for jumper settings. The default setting is Enabled.

GLAN1/2 Enable/Disable Jumper Settings (JPL1/2)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Power Force On Enable/Disable

Jumper JPF allows you to enable (force on) or disable the Power Force On function. If enabled, the power will always stay on automatically. If this function is disabled (the normal setting), the user needs to press the power button to power on the system.

Power Force On Enable/Disable Jumper Settings (JPF)	
Jumper Setting	Definition
Open	Normal
Closed	Force On

5-11 Onboard Indicators

GLAN LEDs

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

GLAN Left LED Connection Speed Indicator	
LED Color	Definition
Off	No Connection
Green	10/100 MHz
Amber	1 GHz

5-12 Parallel Port, Floppy and Hard Drive Connections

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

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.
- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Parallel Port Connector

The parallel port is located on J11. See the table on the right for pin definitions.

Parallel (Printer) Port Connector Pin Definitions (J11)			
Pin#	Definition	Pin #	Definition
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	Write Data
23	PE	24	Write Gate
25	SLCT	26	NC

Floppy Connector

The floppy connector is designated "Floppy". See the table on the right for pin definitions.

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

IDE Connector

There are no jumpers to configure the onboard IDE interface, which is designated "IDE". See the table below for pin definitions.

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

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC512C-260 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

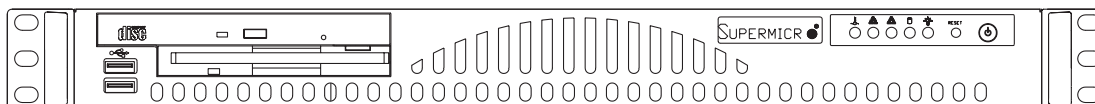
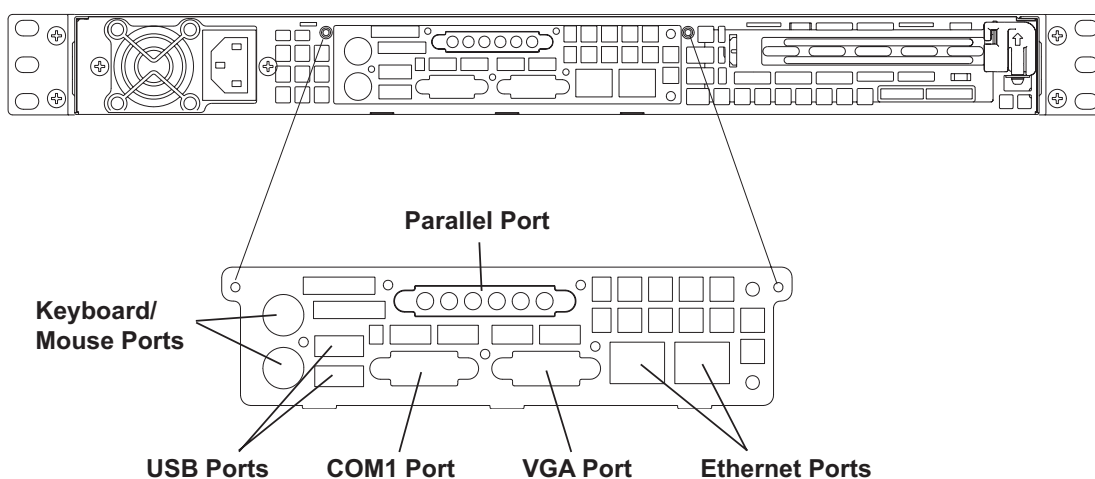
Electric Static Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

Precautions

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

Unpacking

The motherboard 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**Figure 6-2. Chassis Rear View**

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system control buttons and status indicators. These wires have been bundled together in a ribbon cable to simplify the connection. Connect the cable from JF1 on the motherboard to JP4 on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both JF1 and JP4. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

6-3 System Fans

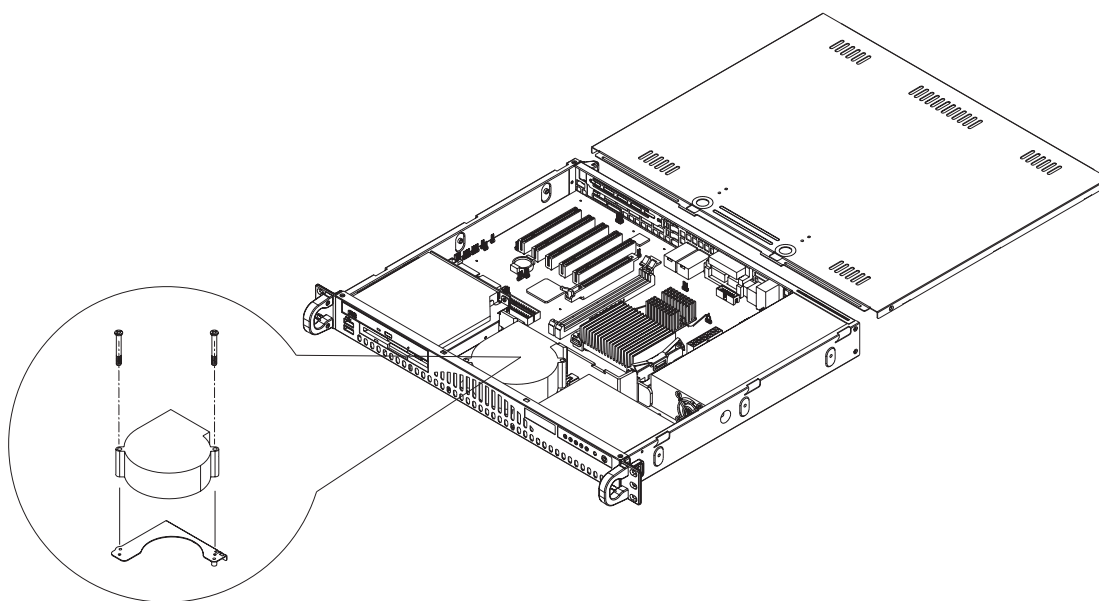
One 100-mm blower fan provides the cooling for the SuperServer 5014C-MR. The chassis includes air seals under the blower fans and at the chassis cross section, which separates the drive bay area from the motherboard area of the chassis to promote better airflow. It is highly important that the air seal is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis.

The fan can adjust its speed according to the heat level sensed in the system, which results in more efficient and quieter fan operation. Fan speed is controlled by a setting BIOS (see page 7-13).

System Fan Failure

If the fan fails, you will need to have it replaced with the same type. Contact your vendor or Supermicro for information on replacement fans. The fan sits on two mounting posts secured with screws. See Figure 6-3.

Figure 6-3. Replacing the System Cooling Fan



6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

CD-ROM/Serial ATA/Floppy Disk Drives: For installing or removing the CD-ROM, Serial ATA or floppy disk drive, you will need to gain access to the inside of the 5014C-MR by removing the top cover of the chassis.

Note: Only a "slim" CD-ROM and a "slim" floppy drive will fit in the 5014C-MR.

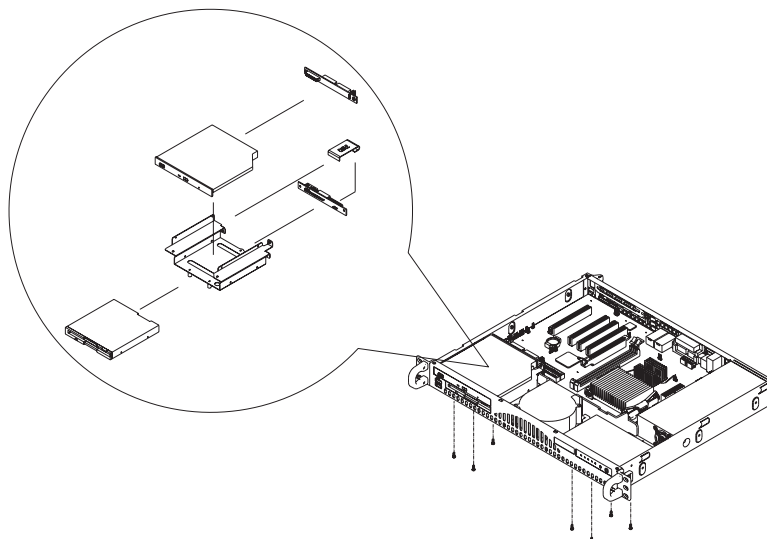
Serial ATA Drive Installation

The SATA drive is located at the front of the chassis, making it easily accessible for installation and removal. The SATA drive is not hot-swappable, meaning system power must be turned off before installing or removing.

To install or remove the drive, first power down the system and then remove the top cover of the chassis. Unscrew the retention screw at the top center of the drive, then push the drive tray out from the back until you can grasp and pull it out through the front of the chassis. Remove the drive from the drive tray.

To add a new SATA drive, install a drive into the tray with the printed circuit board side facing down and so that the mounting holes align with those in the tray. Secure the drive to the tray with the four screws. Replace the top cover when finished. See Figure 6-4.

Figure 6-4. Removing the SATA/CD-ROM/Floppy Drive



CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM and floppy drive bays. Both the CD-ROM and the floppy drives must have a "slim" profile to fit into the 5014C-MR. If you cannot remove the top cover with the system remaining in the rack, follow the procedure below.

First, shutdown the system and disconnect all cables from the back of the server chassis. Make sure the system is supported from underneath then remove the front bracket screws that secure the unit to the rack. Carefully lift the server out of the rack.

To open the cover, depress the two buttons on the top of the chassis and at the same time, push the cover away from you until it stops. You can then lift off the top cover to gain full access to the inside of the server. You must power down the system before installing or removing CD-ROM, floppy or Serial ATA drives. See Figure 6-4.

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

- The floppy disk drive cable has seven twisted wires.
- A 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

The SuperServer 5014C-MR has a single 260 watt power supply. This power supply has the capability of operating at 100 - 240 input volts. Power down the system and then unplug the AC power cord to completely remove power from the system before removing the power supply.

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro (PWS-0055 - see contact information in Chapter 1).

Replacing the Power Supply

1. Accessing the inside of the system

To replace a power supply, you must first remove the top chassis cover. To do so, first release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and push it away from you. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. Removing the power supply

First unplug the power cord from the system. To remove the failed power unit, remove the two screws on the back of the power supply and a third from the front of the power supply, which secures it to the bottom of the chassis. You can then lift the unit straight out of the chassis. (The power cord should have already been removed.)

3. Installing a new power supply

Replace the failed unit with another unit of the same wattage. It is highly recommended to replace it with the exact same power supply. Carefully insert the new unit into position in the chassis and secure it with the two screws at the rear of the unit and the third at the front. Then reconnect the power cord, replace the chassis top cover and push the unit back into the rack. Finish by turning the power switch on the power supply on, and then depress the power button on the front of the system.

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AwardBIOS Setup utility for the P8SCi. The AwardBIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program. Due to periodic changes in the BIOS, some settings may have been added or deleted that might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site (www.supermicro.com) for any such changes.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, and so on.)

Each main BIOS menu option is described in this manual. The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note: BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.) Options printed in **Bold** are the default settings.

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

Note: fan speed is controlled by the “Fan Speed Control Mode” setting in BIOS. The recommended setting for this server is “3-pin (Server)” (see page 7-13).

7-2 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 Main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

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

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

1. By pressing <Del> immediately after turning the system on, or
2. When the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Del> key to activate the Main Setup Menu.

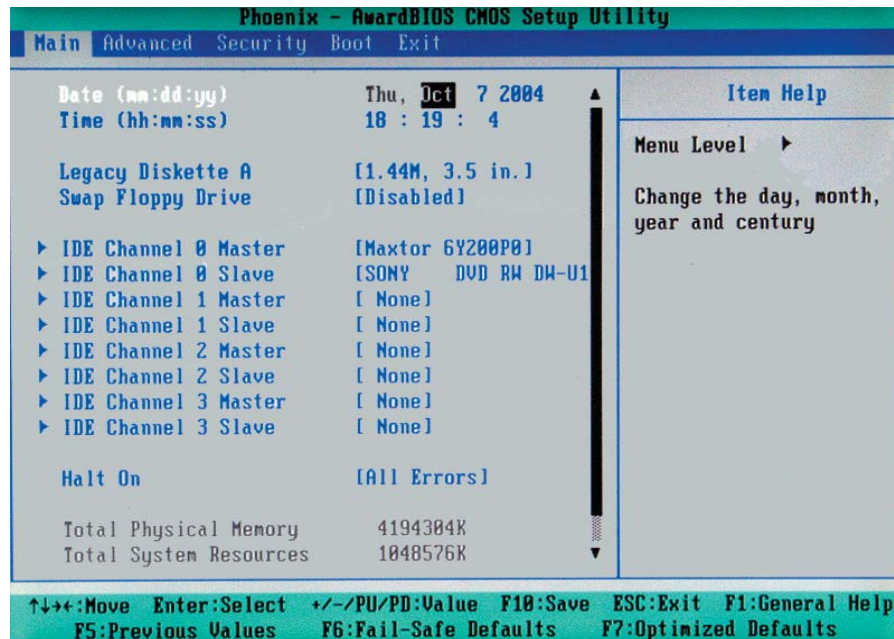
Press DEL to enter SETUP

7-3 Main BIOS Setup

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

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

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



Date/Time

Set the system date and time. Key in the correct information in the "mm", "dd" and "yy" fields. Press the "Enter" key to save the data.

Legacy Diskette A/Legacy Diskette B

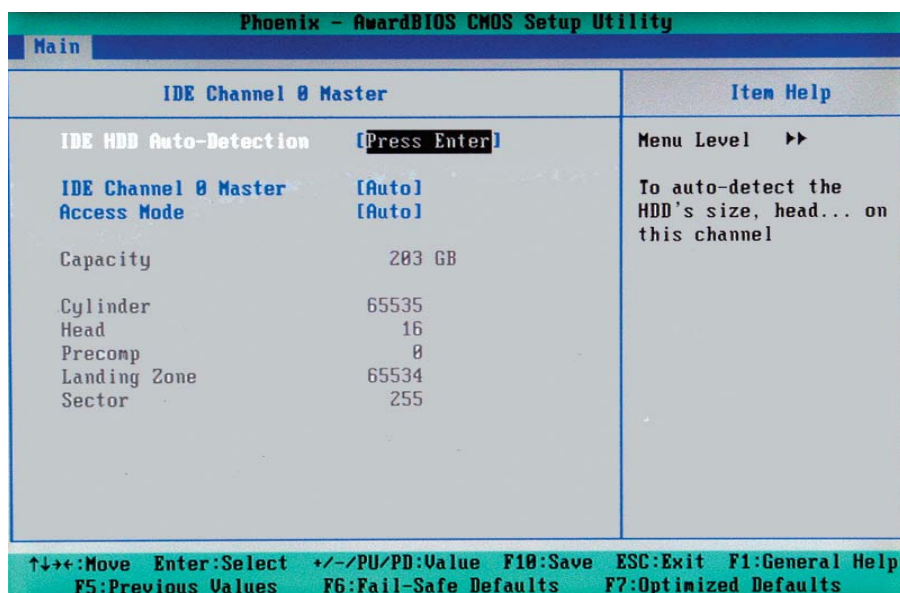
This setting allows the user to set the type of floppy disk drive installed as diskette A and diskette B. The options are None, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Swap Floppy Drive

If the system has two floppy drives, enable this feature to assign physical drive B to logical drive A or physical drive A to logic drive B. The options are Enabled and **Disabled**.

► IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master/Slave, IDE Channel 3 Master/Slave

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



IDE HDD Auto-Detection

This option allows the user to determine the manner in which the AwardBIOS sets the settings for IDE Channel 0 to IDE Channel 3 Master Devices. The options are "None", "**Auto**" and "Manual."

IDE Channel 0 to IDE Channel 3 Master

Press the <Enter> key to activate the "IDE HDD Auto-Detection" function, which will allow the BIOS to automatically detect the status of the IDE HDD installed in the system, such as the size, the number of cylinders, the configurations of items such as Head, Precomp, Landing Zone and Sector. The options are None, **Auto** and Manual.

Access Mode

This item determines the location through which the AwardBIOS accesses the IDE Primary Master Device. The settings are "CHS", "LBA", "Large", and "**Auto**".

Halt On

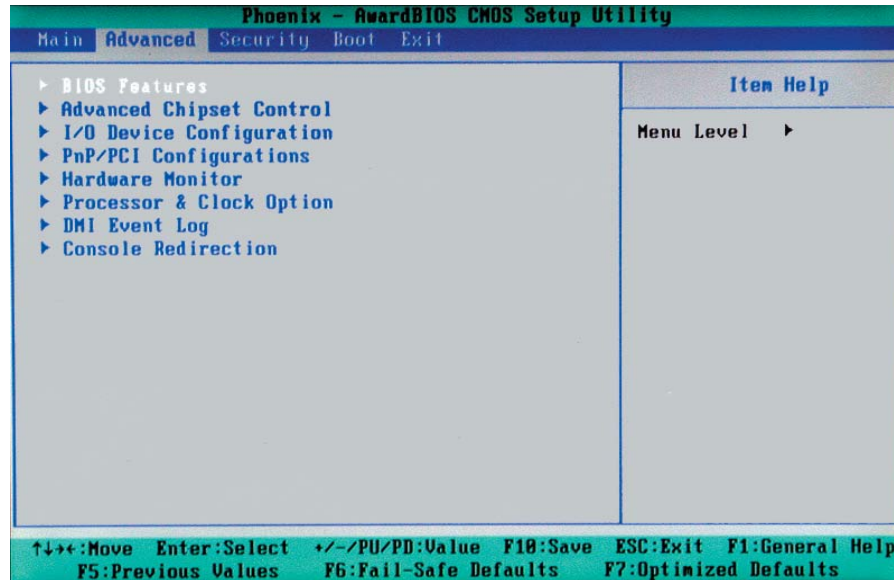
This item allows the user to select what condition will stop the POST process and notify you about the status of the system. The settings are "**All Errors**", "No Errors", "All, But Keyboard", "All, But Diskette", and "All, But Disk/Key".

Total Physical Memory/Total System Resources/Total Available Memory

These are displays that inform you how much of each type of memory is recognized as being present in the system.

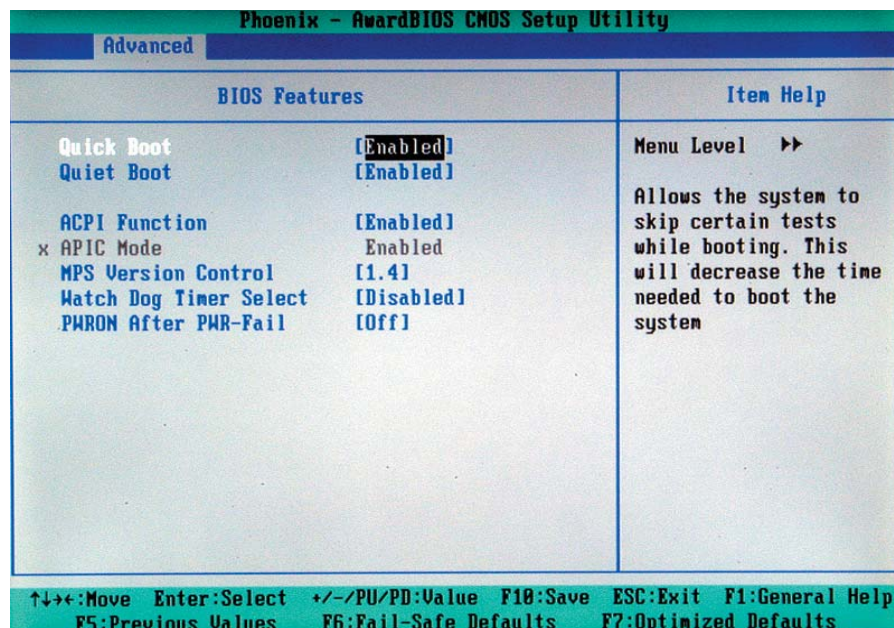
7-4 Advanced BIOS Setup

Choose the Advanced BIOS Setup from the Award BIOS 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 to go to the sub screen for that item. The Advanced BIOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced BIOS Setup options are described in this section.



7-4.1 Advanced BIOS Features

When the item of Advanced BIOS Features is highlighted, press the <Enter> key to activate the screen below:



Quick Boot

If enabled, this feature allows the system to skip certain tests while booting. This will decrease the time needed to boot the system. The settings are **"Enabled"** and **"Disabled"**.

Quiet Boot

This feature allows the user to enable "Quiet Boot". When set to Enabled, the BIOS is in the graphic mode and displays only an OEM Logo during POST while booting. If an error occurs, The system will automatically switch to the text mode. The options are **"Enabled"** and **"Disabled"**.

ACPI Function

Select "Enabled" to enable BIOS Support for the Advanced Configuration and Power Interface features. The settings are **"Enabled"** or **"Disabled"**.

APIC Mode

This setting allows you to **Enable** or Disable APIC. APIC is used to assign interrupt signals to a specific processor on a multiprocessor system and provides IRQs beyond the conventional 16 under Windows 2000 or XP. It has no effect on single processor systems.

MPS Version Control

This setting allows you to select the MPS version for your operating system. The options are **"1.1"** and **"1.4"**.

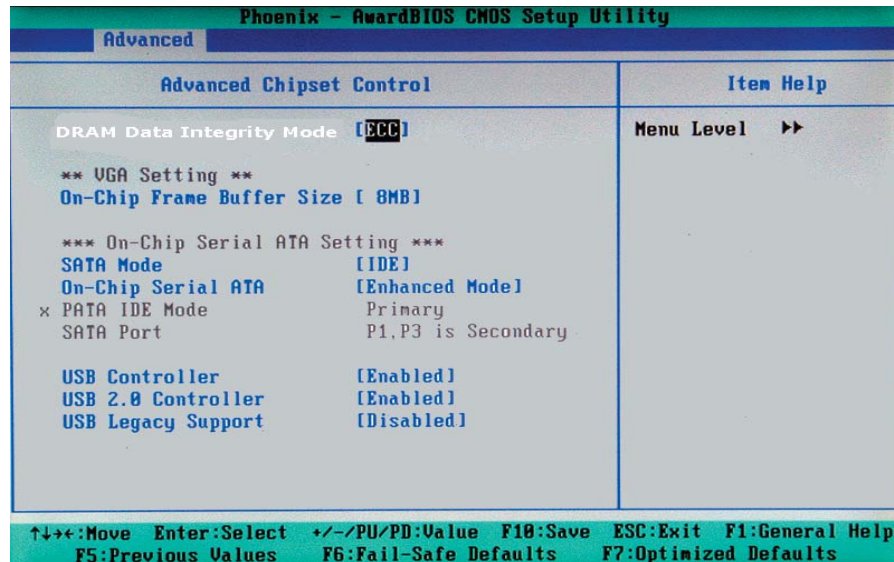
Watch Dog Timer Select

This setting is for enabling the Watch Dog feature. The options are **Enabled** and **Disabled**. (Please refer to Chapter 2 for more details.)

PWRON After PWR-Fail

This setting allows the user to determine how the system will respond when power is reapplied after a system shut down caused by power failure. The options are **"Off"**, **"On"** and **"Former-Sts"**.

7-4.2 Advanced Chipset Control



DRAM Data Integrity Mode

If enabled, this feature allows the data stored in the DRMA memory to be integrated for faster data processing. The options are **ECC** and Non-ECC.

On-Chip Frame Buffer Size

This setting allows you to set On-Chip Frame Buffer Size. The options are "1 MB" and "8 MB."

SATA Mode

This feature allows you to select the channel for SATA mode. The options are "IDE", "RAID" and "AHCI (-Advanced Host Controller Interface)."

On-Chip Serial ATA

Select "Disabled" to disable the SATA Controller. Select "**Auto**" to allow the BIOS to configure the SATA Controller automatically. Select "Combined Mode" to use PATA and SATA Combined Mode. The maximum of 2 IDE drives in each channel is allowed. Select "Enhanced Mode" to enable both SATA and PATA. This mode will support up to 6 IDE drives. Select "SATA Only" to allow SATA to operate in "Legacy Mode".

PATA IDE Mode

When the item -On-chip Serial ATA is set to Combined Mode, the user can select either Primary or Secondary for Parallel ATA IDE. The options are **Primary** and Secondary. If On-chip Serial ATA is set to Enhanced Mode, only Serial ATA will be activated, and Primary PATA IDE will be available. Secondary PATA IDE will not be available.

SATA Port

This setting allows you configure the setting for the SATA port. The options are **P1** and P3 is Secondary.

USB Controller

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

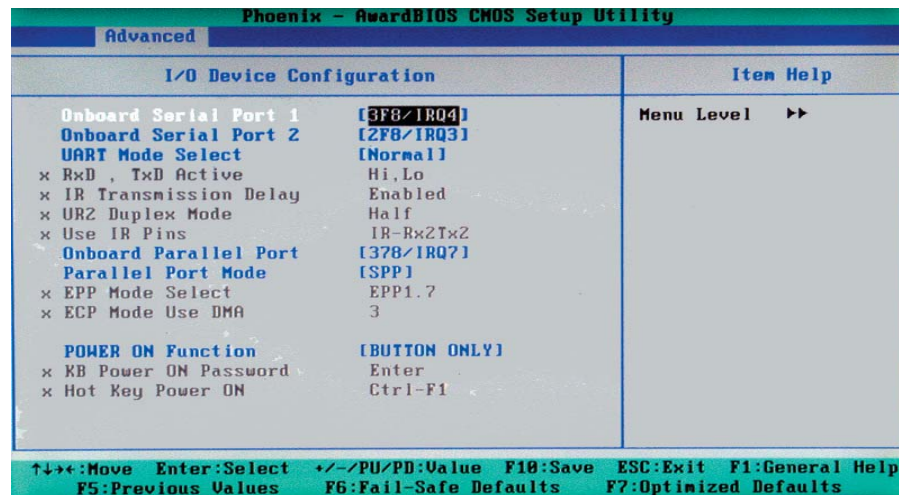
USB 2.0 Controller

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

USB Legacy Support

This setting allows you to enable or disable the functions of USB, Keyboard/Mouse under POST and DOS. The options are **Disabled** and Enabled.

7-4.3 I/O Device Configuration



Onboard Serial Port1/Onboard Serial Port2

This setting allows the user to set the address and the corresponding IRQ for Serial Port1 and Serial Port 2. The options are "Disabled" , "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3" and "Auto". The default setting for Serial Port1 is "**3F8/IRQ4**" and the default for Port 2 is "**2F8/IRQ3**".

UART Mode Select

This setting allows the user to select the UART mode for the BIOS. The options are "IrDA", "ASKIR" and "**Normal.**"

RxD, TxD Active

This allows the user to change the settings for the "RxD, TxD Active" function. The options are "Hi, Hi", "**Hi, Lo**", "Lo, Hi" and "Lo, Lo".

IR Transmission Delay

If "Enabled", the transmission of IR (infrared) signals will be delayed. The settings are "**Enabled**" and "Disabled".

UR2 Duplex Mode

This setting sets the mode for the UR2 Duplex Mode. The options are "Full" and "**Half**".

Use IR Pins

This item sets the usage of the IR pins. The options are "RxD2, TxD2" and **"IR-Rx2Tx2"**.

Onboard Parallel Port

This setting allows the user to set the address and the corresponding IRQ for the onboard parallel port. The options are "Disabled", **"378/IRQ7"**, "278/IRQ5" and "3BC/IRQ7".

Parallel Port Mode

This setting sets the mode for the onboard Parallel port. The options are **"SPP,"** "EPP", "ECP" "ECP+EPP" and "Normal".

EPP Mode Select

This setting allows the user to select the EPP port type. The options are "EPP 1.9" and **"EPP 1.7"**.

ECP Mode Use DMA

This setting allows the user to select the DMA channel for the ECP mode (port) to use. The options are "1" and **"3"**.

Power On Function

This setting allows the user to decide which method to use to power on the system. The options are "Password", "Hot Key", "Mouse Left", "Mouse Right", "Any Key", and **"Button Only"**.

KB Power On Password

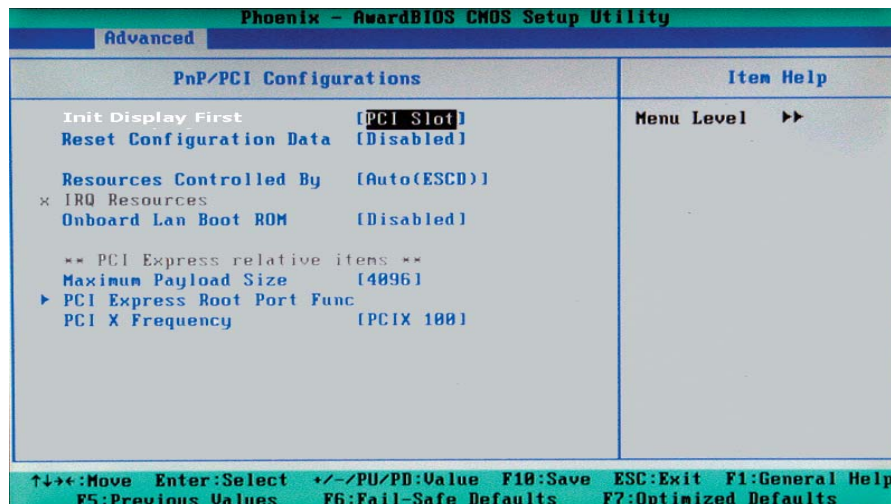
This setting allows the user to enter the Password when the system is powered on via keyboard.

Hot Key Power On

This setting allows the user to decide which hot-keys to use in order to power on the system. The options are **"Ctrl-F1"**, "Ctrl-F2, Ctrl-F3", "Ctrl-F4", "Ctrl-F5", "Ctrl-F6", "Ctrl-F7", and "Ctrl-F8".

7-4.4 PnP/PCI Configuration

Choose PCI/PnP Configurations from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Initial Display From

This feature sets the device that will initiate the monitor display when the system is first turned on. The options are "**PCI Slot**" and "PCI Ex(press)".

Reset Configuration Data

Enabling this setting resets the extended system configuration data when you exit setup. Do this when you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot reboot the system. The options are "Enabled" and "**Disabled.**"

Resources Controlled By

This setting allows the BIOS to automatically configure all boot and Plug and Play compatible devices. If you choose Auto, you cannot select the IRQ, DMA and memory base address fields, because the BIOS automatically assigns them. The options are "**Auto (ESCD)**" and "Manual".

IRQ Resources

If the above item-Resources Controlled By" is set to manual, the user may assign an IRQ to a PCI Device or Reserve an IRQ for other purpose. The options are **Auto (ESCD)** and Manual.

IRQ-3, IRQ-4, IRQ-5, IRQ-7, IRQ-9, IRQ-10, IRQ-12, IRQ-14, IRQ-15

Onboard LAN Boot ROM

This feature allows the user to determine if the Boot ROMs of the Onboard LAN chips should be activated. If activated, the user can boot the system from the Onboard LAN chips. The options are Disabled, **LAN1**, LAN2 and Both.

Maximum Payload Size

This setting allows the BIOS to set the maximum TLP Payload size for the PCI Express devices in the system. The options are: "128 (bytes)", "256 (bytes)", "512 (bytes)", "1024 (bytes)", "2048 (bytes)", and **"4096 (bytes)"**.

►PCI Express Root Port Function

PCI Express Port 1/PCI Express Port 2/PCI Express Port 3/PCI Express Port 4

Select "Enabled" to enable the PCI Express Root Port Functions for the PCI Express port specified. The options are: "Disabled", "Enabled", and **"Auto"**.

PCI-E Compliance Mode

This features allows the BIOS to set the version of PCI-E Compliance Mode for the system. The options are: **"v.1.0a"** and "v.1.0".

PCI-X Frequency

This features allows the user to configure the default setting for PCI-X Frequency. The options are: "Auto, PCI-33 MHz, PCI-66 MHz, PCIX-66 MHz, **PCI-X 100 MHz**, PCI-X 133 MHz."

7-4.5 Hardware Monitors

There are only three settings on this menu (below). The rest of this menu shows various temperatures and voltage levels as indicated.

Phoenix - AwardBIOS CMOS Setup Utility	
Advanced	
Hardware Monitor	Item Help
CPU Warning Temperature [75°C/167°F]	Menu Level ▶▶
CPU Temperature 52°C/125°F	
System Temperature 33°C/ 91°F	
FAN1 Speed 0 RPM	
FAN2 Speed 0 RPM	
FAN3 Speed 0 RPM	
FAN4 Speed 0 RPM	
FAN5 Speed 0 RPM	
Processor Vcore(V) 1.39 V	
3.3V Vcc(V) 3.37 V	
5V Vcc(V) 5.05 V	
-12V Vcc(V) 13.55 V	
12V Vcc(V) 12.22 V	
5VSB 4.92 V	
VBAT 3.20 V	
Fan Speed Control [Disabled]	
↑↓:Move Enter:Select +/-:PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults	

CPU Warning Temperature

This allows you to set the CPU warning temperature. If the CPU temperature reaches this threshold, an alarm will activate and a warning message will be displayed onscreen. The options are "Disabled", "60°C/140°F", "65°C/149°F", "70°C/158°F", **"75°C/167°F"**, "80°C/176°F" and "85°C/185°F".

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

CPU Temperature

System Temperature

In addition to temperature monitoring, the status of the following items will also be displayed:

Fan 1 Speed-Fan 5 Speed

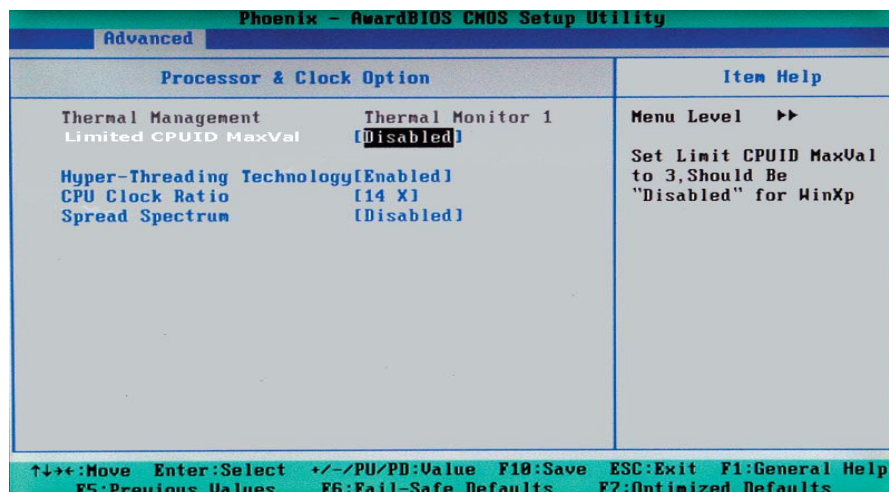
Voltage Monitoring

Processor Vcore (V), 3.3V Vcc (V), 5V Vcc (V), -12V Vcc (V), +12V Vcc (V), 5V Standby, VBAT

Fan Speed Control (Fan1-Fan5)

When set to 3-pin, the onboard fan speed is controlled by the CPU temperature. When the CPU temperature is higher, the fan speed will be higher as well. If set to "Disable," the fan speed control is disabled and the onboard fan will run at the full speed (12V) at all times. The options are "Disabled" and **"3-pin Server"**.

7-4.6 Processor & Clock Options



Thermal Management

This setting determines the method used by the BIOS to control the thermal management of the system. The options are "Thermal Monitor 1 (On die throttling)" and "Thermal Monitor 2 (Ratio & VID transition)." (See Section 1-4 for details.)

Limit CPUID MaxVal

Select "Enabled" to set CUPID maximum value to 3. Select "Disabled" for Windows XP OS. The options are "Enabled" and "**Disabled**."

Hyper-Threading

Set this option to "Enabled" to activate the hyper-threading function of the CPUs. Enabling the hyper-threading function makes each CPU appear as two to any programs that support it (you must have OS support also). The settings are "Disabled" and "**Enabled**."

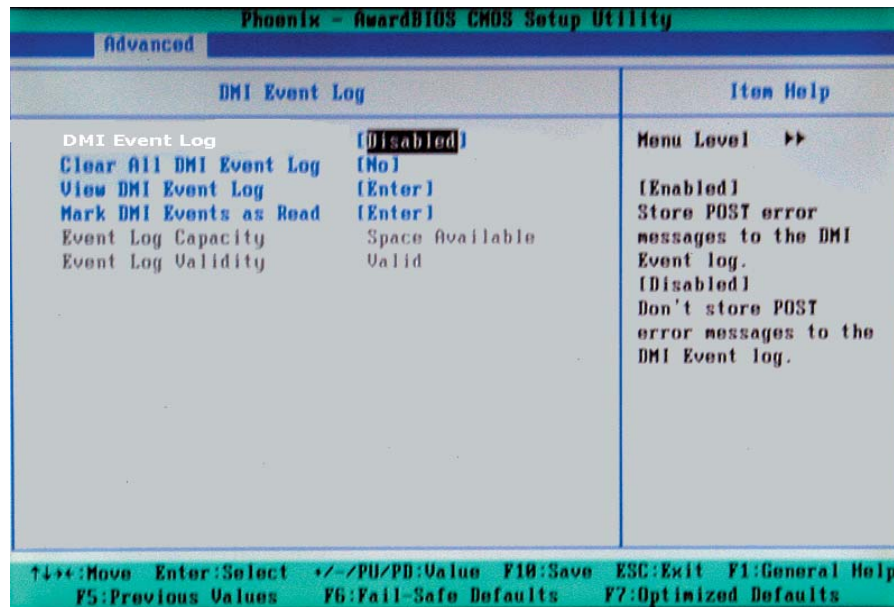
CPU Clock Ration

Use this option to set the clock ratio of the processor. Use number keys to enter a number. The default setting is "14".

Spread Spectrum

Spread Spectrum is a technique used to stabilize a system by reducing the level of ElectroMagnetic Interference. The options are "Enabled" and "**Disabled**."

7-4.7 DMI Event Log



DMI Event Log

This setting allows you to Enable or Disable the function of DMI Event Logging. The options are **Disabled** and Enabled.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The default setting is "No."

View DMI Event Log

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

Mark DMI Events as Read

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

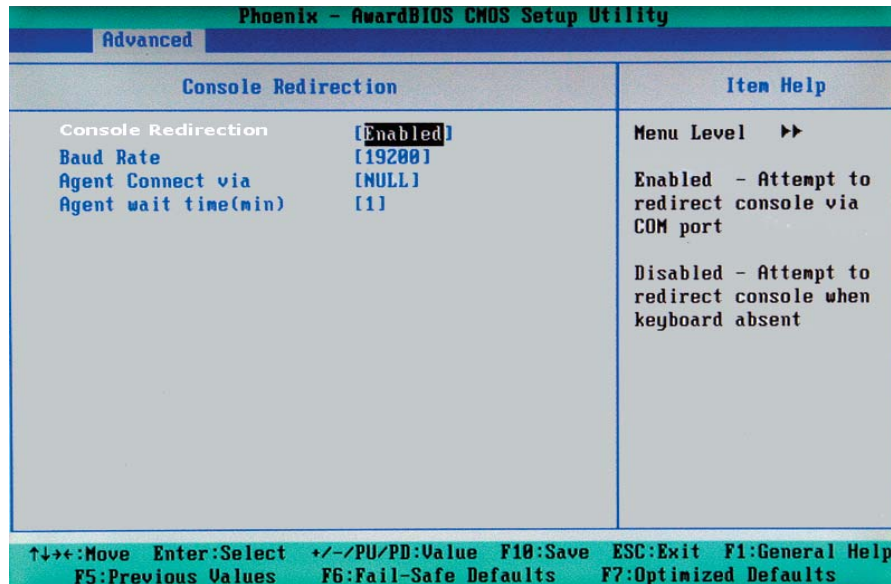
Event Log Validity

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

Event Log Capacity

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

7-4.8 Console Redirection



Console Redirection

This setting allows you to Enable or Disable the function of Console Redirection. The options are **Disabled** and Enabled.

BAUD Rate

Select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K and 115.2K.

Agent Connect Via

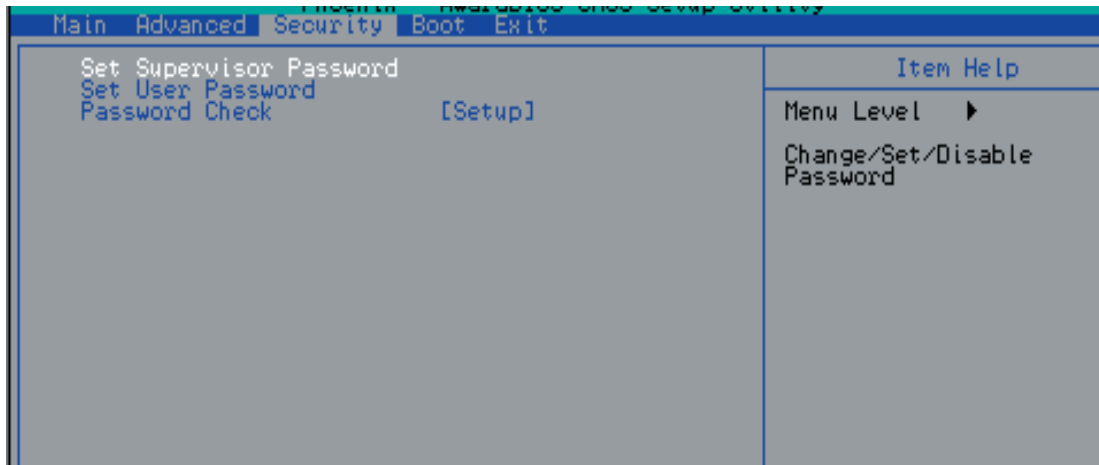
This setting allows you to select the device to be used for Console Redirection.

Agent Wait Time (Min)

This setting allows you to set the wait time for the Console Redirection "Agent". The options are **1 (Min)**, 2 (Min), 4 (Min) and 8 (Min).

7-5 Security

Choose Security from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Set Supervisor Password

When the item "Set Supervisor Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the Supervisor Password in the dialogue box to set or to change the Supervisor Password.

Set User Password

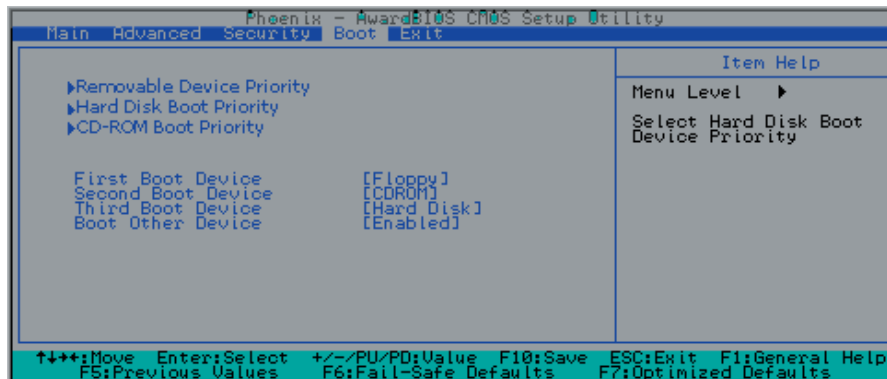
When the item "Set User Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the User Password in the dialogue box to set or to change the User Password.

Password Check

This setting allows the user to determine if the password is required every time when the system boots up or if the password is required only when you enter the CMOS setup. The options are "System" and "**Setup**".

7-6 Boot

Choose Boot from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



The Award BIOS attempts to load the operating system from devices specified by the users in a user-specified sequence.

Removable Device Boot Priority/Hard Drive Boot Priority/CD-ROM Boot Priority

This item allows the user to select the Boot Priority of Hard Disk Devices.

First Boot Device

This item allows the user to set the first boot-up device. The options are "**Floppy**", "LS120", "HDD", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Second Boot Device

This item allows the user to set the second boot-up device. The options are "Floppy", "LS120", "HDD", "**CDROM**", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Third Boot Device

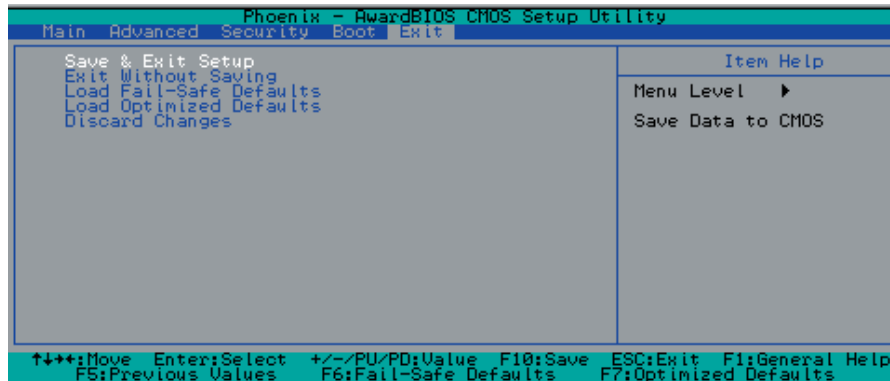
This item allows the user to set the third boot-up device. The options are "Floppy", "LS120", "**HDD**", "SCSI", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Boot Other Device

If enabled, this option enables the BIOS to load the OS from another device rather than the ones that have been specified as the first, second and third boot up devices. The settings are "**Enabled**" and "Disabled".

7-7 Exit

Choose Exit from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Save & Exit Setup

When the item "Save & Exit Setup" is highlighted, press <Enter> to save the changes you've made in the BIOS program (CMOS) and exit. Your system should, then, continue with the boot-up procedure.

Exit without Saving

When the item "Exit without Saving" is highlighted, press <Enter> to exit the Setup routine without saving any changes you may have made. Your system should then continue with the boot-up procedure.

Load Fail-Safe Defaults

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

Load Optimized Defaults

Highlight this item and hit <Enter> to load the optimized settings for all items in the BIOS Setup. These settings provide you with optimal system performance.

Discard Changes

When the item "Discard Changes" is highlighted, press <Enter> to discard any changes you made to the BIOS settings and to stay in the BIOS Setup. Your system should then continue with the boot-up procedure.

Appendix A

BIOS POST Messages

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

Beeps

(1 long beep+1 short pause) continuously
1 long beep+2 short beeps

Error Messages

Memory Modules Errors
VGA Errors

Notes

Appendix B

Award BIOS POST Codes

This section lists the POST (Power On Self Testing) Codes for the Award BIOS.

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: - Disable shadow RAM - Disable L2 cache (socket 7 or below) - Program basic chipset registers
C1h	Detect memory - Auto detection of DRAM size, type and ECC. - Auto detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM.
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes located in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch
04h	Reserved
05h	1. Blank out screen. 2. Clear CMOS error flag.
06h	Reserved
07h	1. Clear 8042 interface. 2. Initialize 8042 self-test.
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard and mouse followed by a port and interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.

POST (hex)	Description
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program cipset defaults into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table, If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform).
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value, e.g. a value of 5Ah is an invalid value for RTC minute 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI and PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI and DIMM slots. 5. Early PCI initialization: - Enumerate PCI bus number. - Assign memory and I/O resource. - Search for a valid VGA device and VGA BIOS and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer.
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-64K memory address. 2. Initialize the APIC for Pentium clas CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.

POST (hex)	Description
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	1. Initialize multi-language. 2. Put information on screen display, including Award title, CPU type, CPU speed, etc.
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot.
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved

POST (hex)	Description
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU. 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB.
51h	Reserved
52h	Test all memory (clear all extended memory to 0).
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform).
56h	Reserved
57h	1. Display PnP logo. 2. Early ISA PnP initialization. - Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	Show message for entering AWDFLASH.EXE from FDD (optional feature)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Ok to enter setup utility; i.e. not until this POST stage can users enter the CMOS utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 mouse.
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache.
70h	Reserved

POST (hex)	Description
71h	Reserved
72h	Reserved
73h	(Optional feature) Enter AWDFLASH.EXE if: - AWDFLASH is found in floppy drive. - ALT+F2 is pressed
74h	Reserved
75h	Detect and install all IDE devices: HDD, LS120, ZIP, CD-ROM, etc.
76h	Reserved
77h	Detect serial ports and parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect and install co-processor.
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. - If errors occur, report errors and wait for keys. - If no errors occur or F1 key is pressed to continue: Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text font used by EPA logo (not for full screen logo).
83h	Save all data in stack back to CMOS.
84h	Initialize ISA PnP boot devices.
85h	1. USB final initialization. 2. NET PC: Build SYSID structure. 3. Switch screen back to text mode. 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMS. 6. Assign IRQs to PCI devices. 7. Initialize APM. 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved

POST (hex)	Description
93h	Read HDD boot sector information for Trend Anti-Virus.
94h	1. Enable L2 cache. 2. Program boot up speed. 3. Chipset final initialization. 4. Power management final initialization. 5. Clear screen and display memory table. 6. Program K6 write allocation. 7. Program P6 class write combining.
95h	1. Program daylight saving 2. Update keyboard LED and typematic rate.
96h	1. Build MP table. 2. Build and update ESCD. 3. Set CMOS century to 20h or 19h. 4. Load CMOS time into DOS timer tick. 5. Build MSIRQ routing table.
Ffh	Boot attempt (INT 19h).

Appendix C

Software Installation

After all the hardware has been installed, you must first configure Intel's ICH6R SATA RAID before installing the Windows Operating System and other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard. (If you do not wish to configure onboard SATA RAID functions, please go directly to Section C-5 to install the Operating System & software.)

C-1 Configuring Intel ICH6R SATA RAID Function

To configure SATA RAID functions, you must first configure the desired RAID Level in the Intel ICH6R SATA RAID Utility program. Note that the current version of the ICH6R SATA RAID Utility can only support Windows XP/2000 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. SATA is a serial link which supports transfer rates from 150 MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while SATA cables can extend up to one meter. Overall, SATA provides better functionality than PATA.

Intel's ICH6R Serial RAID

Located in the South Bridge of the E7221 Chipset, the I/O Controller Hub (ICH6R) provides the I/O subsystem with access to the rest of the system. It supports a one-channel Ultra ATA/100 Bus Master IDE controller (PATA) and a Serial ATA (SATA) Host Controller that supports up to four Serial ATA ports and up to two sets of RAID drives. The ICH6R supports the following Parallel ATA and Serial ATA device configurations:

ATA Operating Modes

You can select from the following two modes: Legacy mode and Native mode.

SATA Operating Modes

You can select from the following modes: Auto, Combined, Enhanced and SATA Only Mode. The number of devices supported by these modes are listed below:

SATA Only: a maximum of 4 devices are supported (4 SATA)

Auto Mode: a maximum of 6 devices supported (4 SATA + 2 IDE)

Enhanced Mode: a maximum of 6 devices supported (4 SATA + 2 IDE)

Combined Mode: a maximum of 4 devices supported (2 SATA + 2 IDE)

Configuring BIOS Settings (Native Mode)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility.

Note: for the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Advanced" BIOS heading.

4. Scroll down to "Advanced Chipset Control" and press the <Enter> key to select.

5. Select "On-Chip Serial ATA", and press the <Enter> key. When the sub-menu appears, "Enhanced Mode".

6. Scroll up to "SATA Mode" and press the <Enter> key to select. When the sub-menu appears, select "RAID".

7. Tap "Esc" and scroll down to "Exit". Select "Save and Exit" from the "Exit" menu, then press <Enter> to save the changes and exit the BIOS.

8. Once you've exited the BIOS Utility, the system will re-boot.

Using the ICH6R SATA RAID Utility Program

Creating, Deleting and Reseting RAID Volumes

1. After the system exits the BIOS Setup Utility, the system will automatically reboot. The following screen appears after the Power-On Self Test.

```

Intel(R) RAID for Serial ATA - RAID BIOS v3.0.0.2307
Copyright (C) 2003 Intel Corporation. All Rights Reserved.

RAID Volumes:
None defined.

Non-RAID Disks:
Port Drive Model      Serial #      Size      Status      Bootable
0  ST3120023AS      3KA0J1ZJ      111.7GB   Normal      Yes
1  ST3120023AS      3KA0H0M0      111.7GB   Normal      Yes

Press <CTRL-I> to enter Configuration Utility...
```

2. When you see the above screen, press the <Ctrl> and the <i> keys simultaneously, the following screen of the main menu of the SATA RAID Utility will appear:

```

Intel(R) RAID for Serial ATA - RAID Configuration Utility
Copyright (C) 2003 Intel Corporation. All Rights Reserved. v3.0.0.2307

[ MAIN MENU ]

1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]

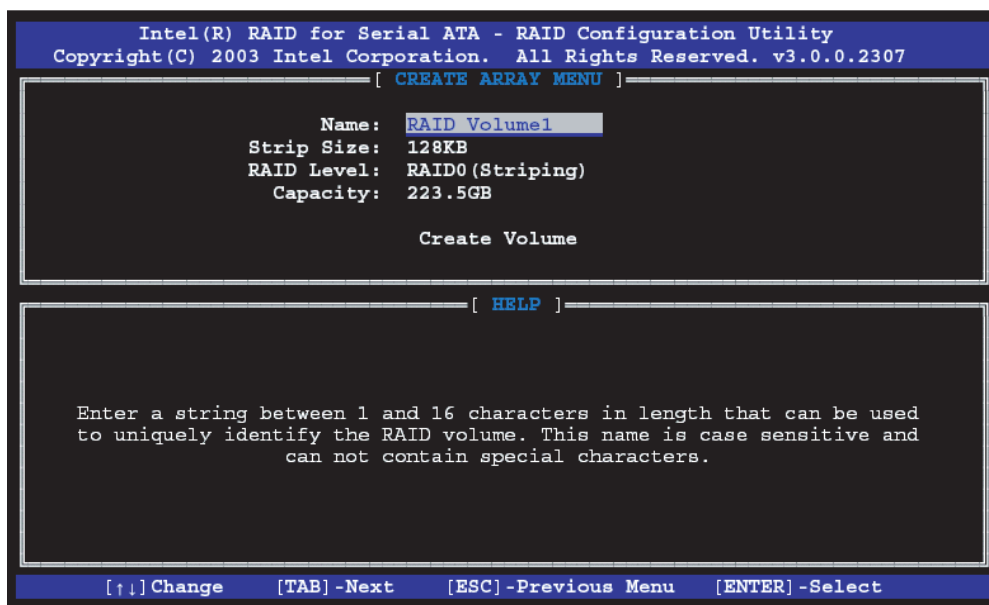
RAID Volumes:
None defined.

Non-RAID Disks:
Port Drive Model      Serial #      Size      Status      Bootable
0  ST3120023AS      3KA0J1ZJ      111.7GB   Normal      Yes
1  ST3120023AS      3KA0H0M0      111.7GB   Normal      Yes

[↑↓]-Select      [ESC]-Exit      [ENTER]-Select Menu
```

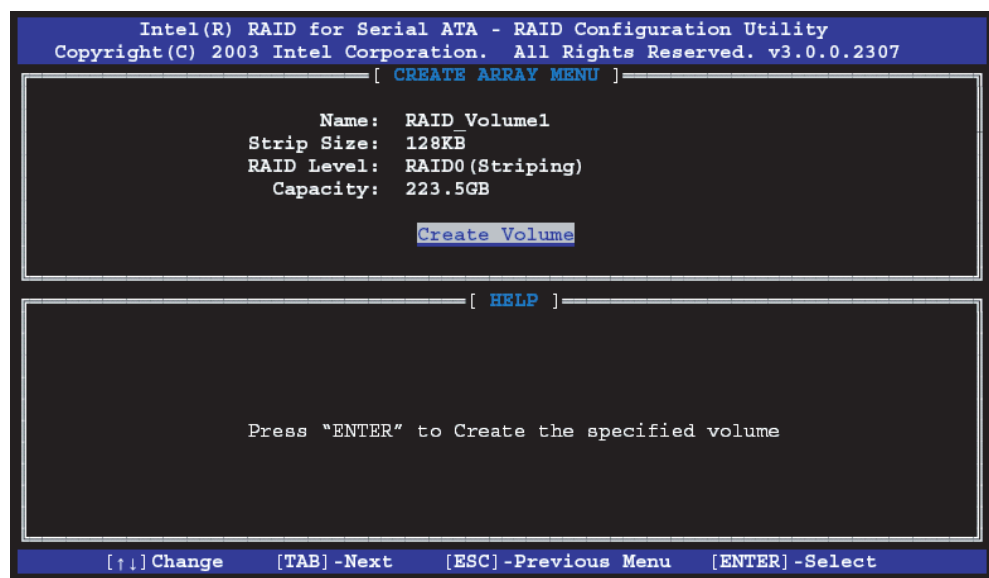
Creating a RAID Volume

1. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:

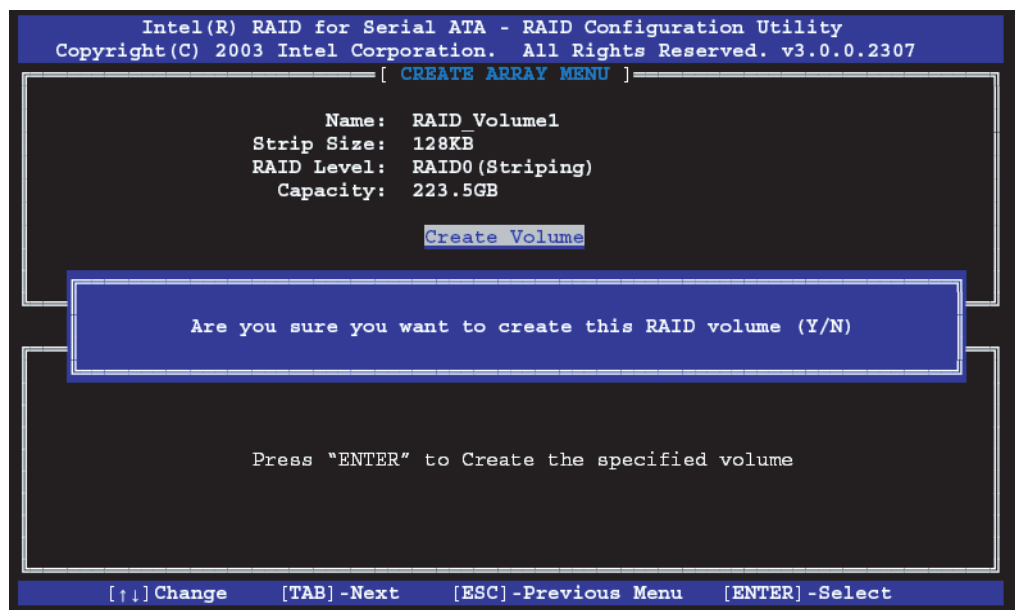


2. Specify the RAID volume name and press the <Tab> key or the <Enter> key to go to the next field. (Use the <Esc> key to return to the previous menu.)

3. Use the <Tab>, <Up Arrow>, <Down Arrow> and <Enter> keys to enter the appropriate values for the items selected and go to the next field.



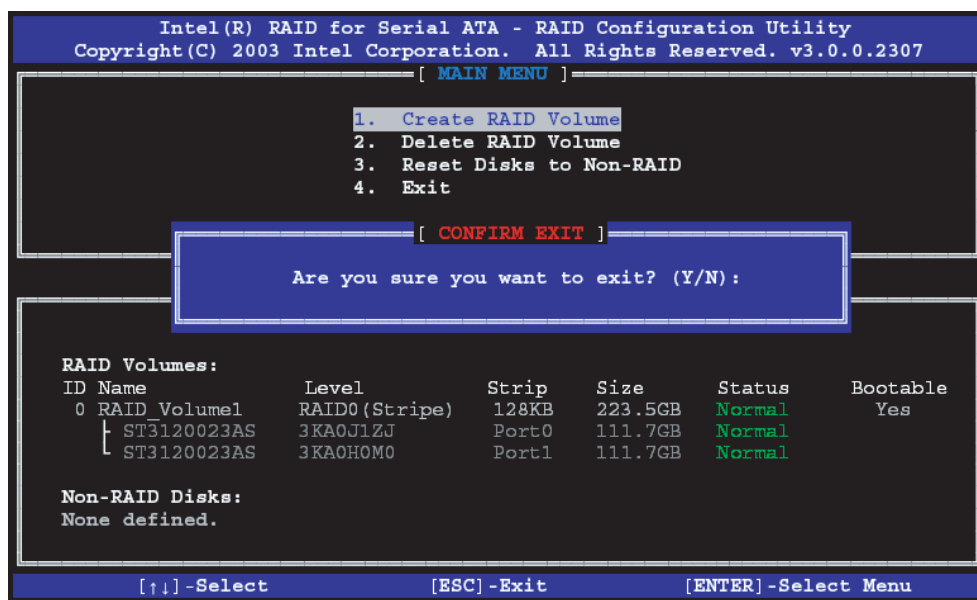
4. When asked "Are you sure you want to create this volume (Y/N)", press "Y" to confirm the selection, or type "N" to change and to recreate the RAID volume. Then, press the <Enter> key to enter the value and return to the main menu.



5. You will return to the main menu with DISK/VOLUME INFORMATION updated as shown in the following screen.



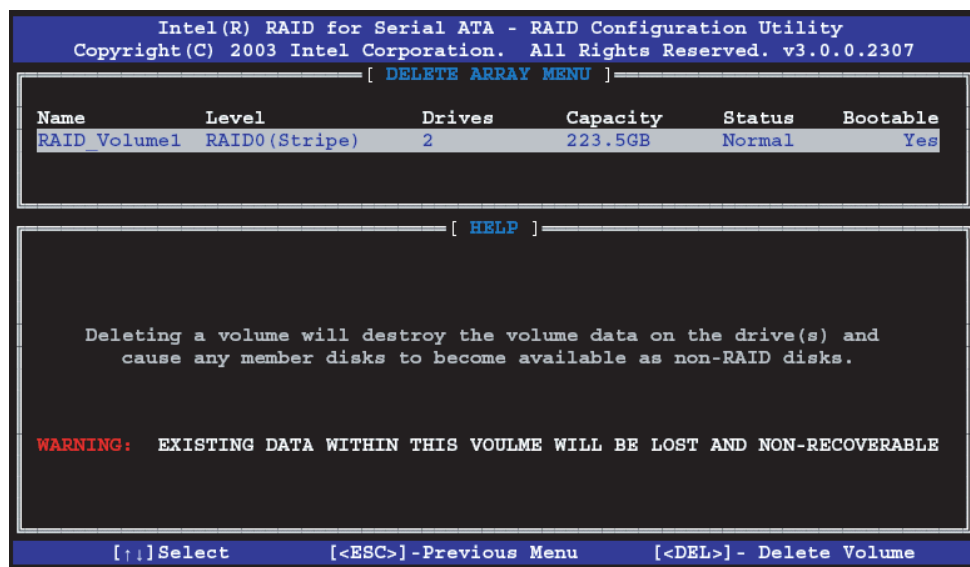
6. Once the above screen appears, use the <Down Arrow> key to select "Exit" and press the <Enter> key. The following screen will appear:



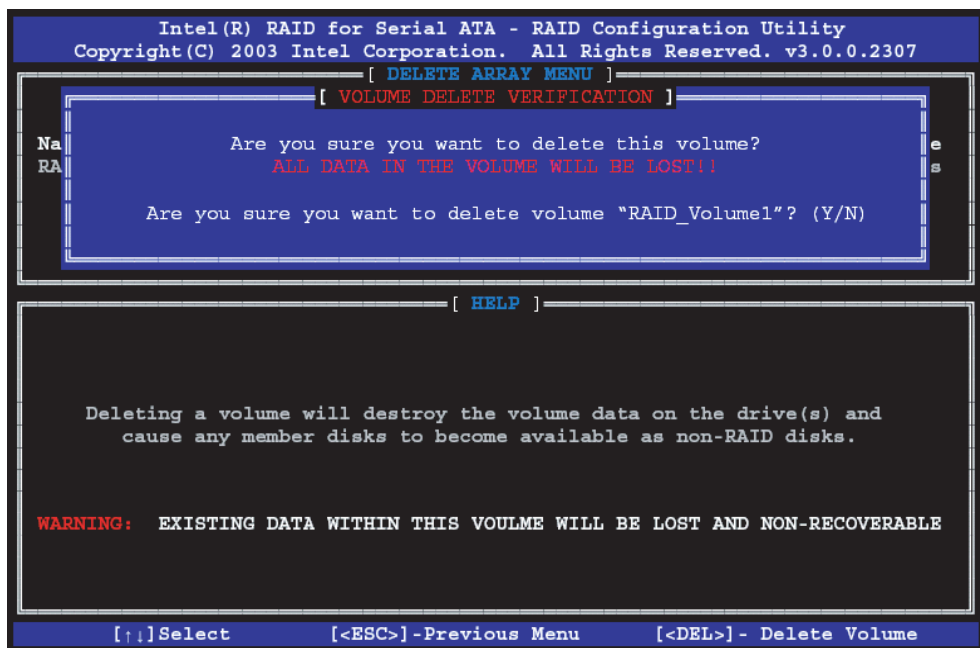
7. When asked "Are you sure you want to exit? (Y/N):", type "Y" to confirm the selections and exit the "Create RAID Volume" menu. Press the <Enter> key to return to the main menu.

Deleting a RAID Volume

1. In the main menu, use the <Down> and the <Up> arrow keys to select "Delete RAID Volume" in the main menu. Press the <Enter> key and the following screen will appear:



2. Select the volume and press the <Delete> key to delete the RAID volume. The following screen will appear:



3. When asked "Are you sure you want to delete this volume?", type "Y" to confirm and press the <Enter> key to return to the main menu. (Use the <Esc> key to return to the previous menu.)

Reset Disks to Non-RAID

1. In the main menu, use the <Down> and the <Up> arrow keys to select "Reset Disks to Non-RAID". Press the <Enter> key and the following screen will appear:



2. When asked "Are you sure you want to reset all RAID data (Y/N):", type "Y" to confirm the selection, and press the <Enter> key to return to the main menu.

Exiting the ICH6R SATA RAID Configuration Utility Program

1. In the main menu, use the <Down> and the <Up> arrow keys to select "Exit" and then press the <Enter> key.
2. When asked "Are you sure you want to exit? (Y/N):" type "Y" to confirm the selection and press the <Enter> key to exit the ICH6R SATA RAID Configuration Utility Program. The system will then re-boot.

C-2 Installing Windows XP/2000 for Systems with RAID Functions

Windows XP/2000: New Installation

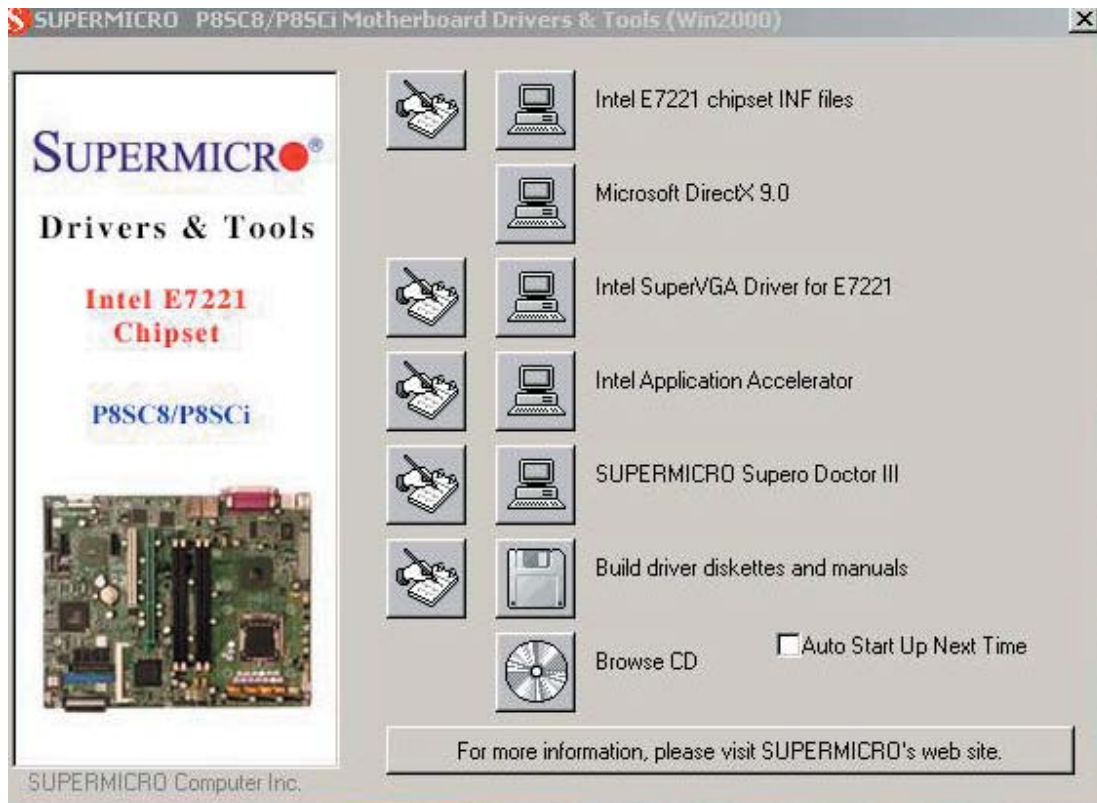
1. Insert the Microsoft Windows XP/2000 Setup CD in the CD_ROM drive so the system can boot from the CD.
2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" is displayed.
3. When the Windows XP/2000 Setup screen appears, press "S" to specify additional device(s).
4. Insert the "Intel AA RAID XP/2000 Driver for ICH6R" disk into your floppy drive and press the <Enter> key.
5. Choose Intel(R)82801ER SATA RAID Controller from the list indicated in the XP/2000 setup screen and press the <Enter> key.
6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.
- 7 . From the Windows XP/2000 Setup screen, press the <Enter> key. Setup will automatically load all device files and then continue with the installation.

Note: the current version of the ICH6R SATA RAID Utility can only support Windows XP/2000 Operating Systems.

C-3 Installing Drivers and Other Software Programs

After the operating system has been installed, you may need to install some additional software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

Insert the Supermicro CD that came with the package into the CD-ROM drive, and the following screen will appear:

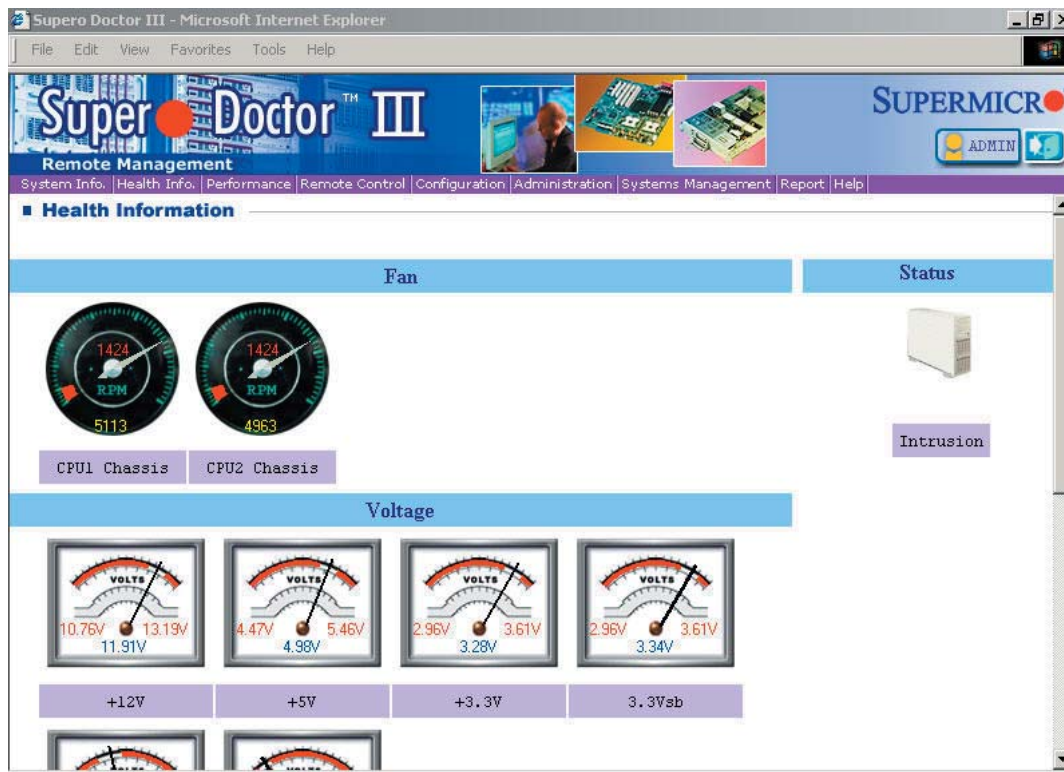


Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the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

Supero Doctor III

The Supero Doctor III program is a web-based management tool that supports remote management capabilities with both remote and local management tools. The local management tool is called the Supero Doctor III Client. Supero Doctor III (which is included on the CD-ROM that came with your motherboard) allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a view of the Supero Doctor III interface.

Supero Doctor III Interface (Health Information Screen)



Supero Doctor III Interface (Remote Control Screen)



Supero Doctor III revision 1.0 can be downloaded from our website at ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we recommend using Supero Doctor II.

Notes

Appendix D

System Specifications

Processors

Single Intel® Pentium® LGA775 processors at a front side (system) bus speed of 800 MHz or single Intel® Celeron® processors at a front side bus speed of 533 MHz

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

Chipset

Intel E7221 chipset

BIOS

8 Mb Award® Flash ROM

Memory Capacity

Four 240-pin DIMM sockets supporting up to 4 GB of DDR2-533/400 SDRAM

Note: Dual channel memory - requires memory to be installed two modules at a time. See the memory section in Chapter 5 for details.

Serial ATA Controller

- Intel ICH6R on-chip controller (RAID 0, 1 and JBOD supported)

Serial ATA Drive Bays

One (1) internal drive bay

Peripheral Drive Bays

One (1) slim 3.5" floppy drive

One (1) slim CD-ROM drive

Expansion Slots (provided with included riser card)

One (1) riser card to support the use of one full size, half-length 64-bit PCI-X expansion card

Motherboard

Model: P8SCi (Extended ATX form factor)

Dimensions: 12 x 9.5 in (305 x 241 mm)

Chassis

Model: SC512C-260 Form Factor: 1U rackmount

Dimensions: (WxHxD) 16.7 x 1.7 x 14 in. (424 x 43 x 356 mm)

Weight

Net (Gross): 23 lbs. (10.5 kg.)

System Cooling

One (1) 10-cm ball bearing blower fan

System Input Requirements

AC Input Voltage: 100-240 VAC (auto-range)

Rated Input Current: 4A max.

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 260W (Model# SP262-1S, Part# PWS-0055)

Rated Output Voltages: +3.3V (15A), +5V (25A), +12V (18A), -12V (1A), +5Vsb (2A)

BTU Rating

1400 BTUs/hr (for rated output power of 260W)

Operating Environment

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

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

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

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

Regulatory Compliance

Electromagnetic Emissions:

FCC Class B, EN 55022 Class 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