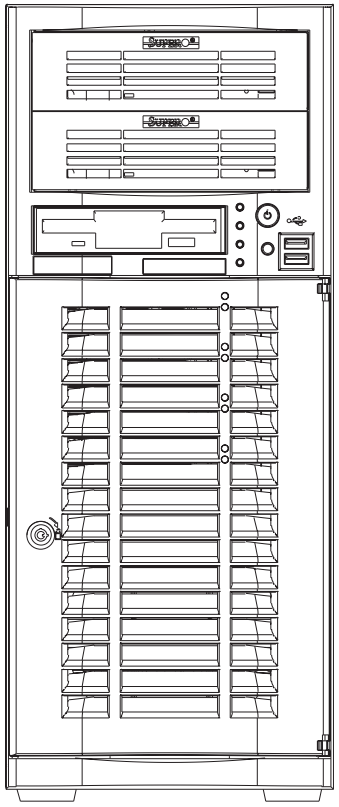
SUPERMICRO®

SUPERWORKSTATION 5035G-T



USER'S MANUAL

Revision 1.0

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Printed in the United States of America

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 SuperWorkstation 5035G-T. Installation and maintainance should be performed by experienced technicians only.

The 5035G-T is a high-end, single processor mid-tower workstation based on the SC733T-450 mid-tower workstation chassis and the Super PDSGE motherboard. The PDSGE supports a single Intel® Pentium® D or Pentium 4 processor and up to 8 GB of unbuffered ECC DDR2-667/533/400 SDRAM.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the system and describes the main features of the Super PDSGE motherboard and the SC733T-450 chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperWorkstation 5035G-T 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 SuperWorkstation 5035G-T.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the PDSGE 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 SC733T-450 workstation 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

Supermicro's 5035G-T is a high-end single processor workstation. The 5035G-T is comprised of two main subsystems: the SC733T-450 chassis and the PDSGE motherboard. The PDSGE supports a single Intel Pentium D or Pentium 4 LGA775 processor at up to 3.80 GHz and up to 8 GB of unbuffered ECC DDR2-667/533/400 SDRAM memory. Please refer to our web site for information on operating systems that have been certified for use with the 5035G-T (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 5035G-T, as listed below.

- One (1) floppy drive [FPD-Teac(B)]
- Serial ATA (SATA) Accessories:
  One (1) internal SATA backplane (CSE-SATA-733)
  Four (4) SATA cables (CBL-0061)
  One (1) SATA LED cable (CBL-0056)
  Four (4) SATA drive carriers [(CSE-PT39(B)]
- One (1) 12-cm exhaust fan (FAN-0055)
- One (1) 9-cm cooling fan with air shroud (FAN-0060)
- One (1) CD containing drivers and utilities
- SuperWorkstation 5035G-T User's Manual

Note: a "B" in the part number indicate the part is also available in black.

1-2 Motherboard Features

At the heart of the SuperWorkstation 5035G-T lies the PDSGE, a single processor motherboard. Below are the main features of the PDSGE.

Chipset Overview

The PDSGE is based on Intel's 955X chipset. See Figure 1-1 for a block diagram of the chipset. The 955X chipset is made up of two main components:

The Memory Controller Hub (MCH)

The I/O Controller Hub (6300ESB)

Memory Controller Hub (MCH)

The MCH includes the host (CPU) interface, memory interface, I/O controller hub interface, CSA interface and AGP interface. It contains advanced power management logic and supports dual-channel (interleaved) DDR memory, providing bandwidth of up to 6.4 GB/s using DDR-400 SDRAM. The MCH supports the following front side bus/memory bus configurations: 800 MHz FSB with a 400/333 memory interface, a 533 MHz FSB with a 333/266 memory interface and a 400 MHz FSB with a 266 MHz memory interface. The AGP interface supports 8x data transfers and operates at a peak bandwidth of 2.1 GB/s. The CSA (Communications Streaming Architecture) interface connects the MCH to a Gigabit Ethernet controller.

I/O Controller Hub (6300ESB)

The 6300ESB ICH controller hub provides the I/O subsystem with access to the rest of the system. It integrates two Serial ATA (SATA) host controllers, a dual-channel Ultra ATA/100 bus master IDE controller, an SMBus 2.0 controller, the LPC/Flash BIOS interface, the PCI-X (66MHz) 1.0 interface, the PCI 2.2 interface and the System Management Controller.

Processors

The PDSGE supports a single Intel® Pentium® D or Pentium 4 processor of up to 3.80 GHz in an LGA775 ZIF socket. Please refer to the support section of our web site for a complete listing of supported processors.

Memory

The PDSGE has four (4) 240-pin DIMM sockets that can support up to 8 GB of unbuffered DDR2-667/533/400 SDRAM modules. (Memory operates in a dual-channel, or interleaved configuration for increased performance.)

Serial ATA

A Serial ATA controller is incorporated into the ICH7R bridge of the 955X chipset to provide a four-port Serial ATA subsystem. The SATA drives are hot-swappable units and are RAID 0, RAID 1, RAID 5 and RAID 10 supported.

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

PCI Expansion Slots

The PDSGE has three 32-bit, 33 MHz (5V) PCI slots, two 64-bit 133 MHz (3.3V) PCI-X slots, one PCI-Express x1 slot and one PCI-Express x16 slot. The SC733T-450 chassis can accommodate cards being installed in all seven slots.

Ethernet Ports

The PDSGE has an Intel® 82573V Gigabit Ethernet controller integrated onboard, which supports one Gigabit LAN port.

Onboard Controllers/Ports

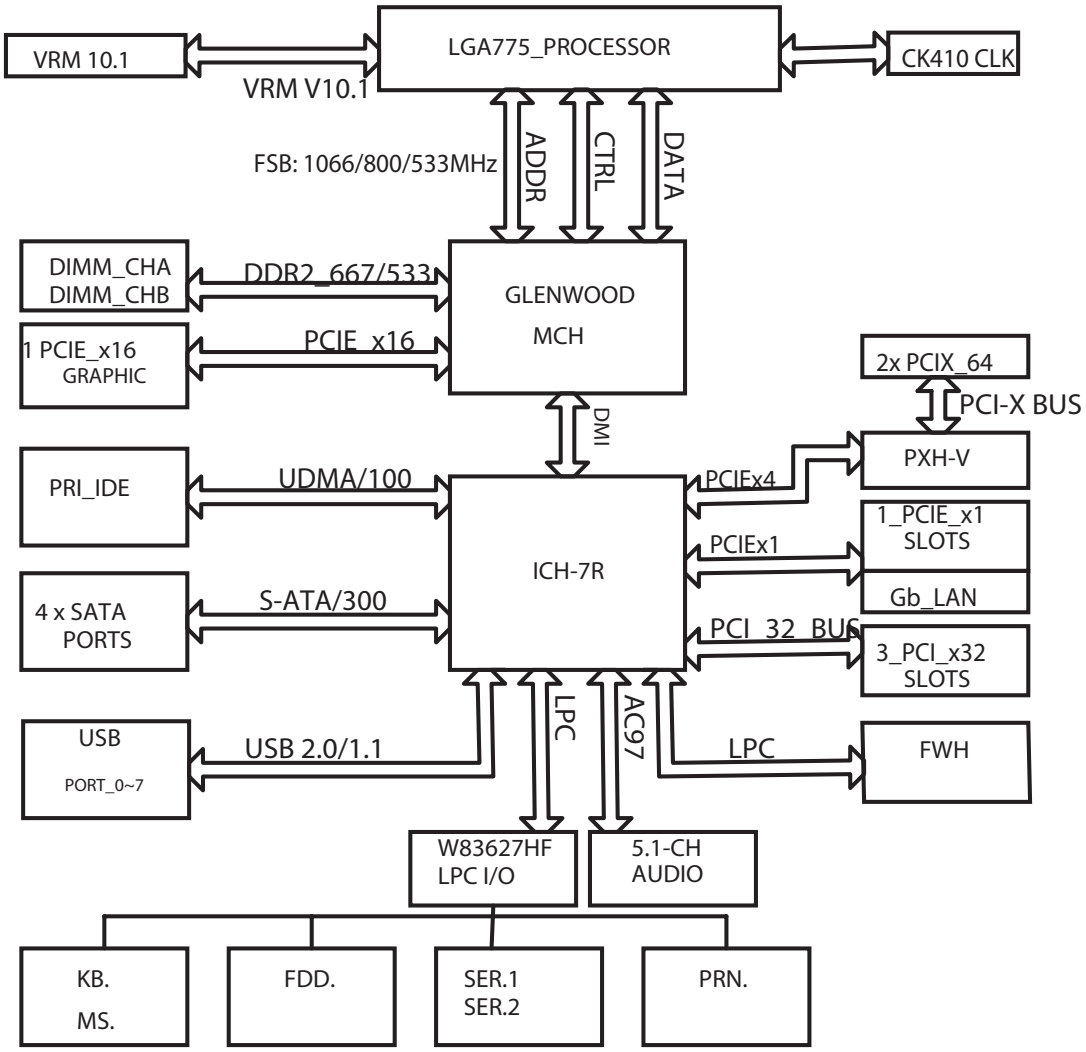
An onboard IDE controller supports one floppy drive and up to four Ultra ATA 100 hard drives or ATAPI devices. Onboard I/O backpanel ports include two serial COM ports, one parallel port, three USB ports, PS/2 mouse and keyboard ports and one Gigabit LAN (RJ45) port.

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 955X Chipset: System Block Diagram

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



1-3 Chassis Features

The SuperWorkstation 5035G-T is a mid-tower workstation type configuration. The following is a general outline of the main features of the SC733T-450 chassis.

System Power

When configured as a SuperWorkstation 5035G-T, the SC733T-450 chassis includes a single low-noise 450W power supply.

Serial ATA Subsystem

The SC733T-450 chassis was designed to support up to four Serial ATA hard drives. The Serial ATA drives are hot-swappable units. ATA/100 IDE drives are also supported.

Control Panel

The SC733T-450's control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and overheat conditions. The control panel also includes a main power button and a system reset button.

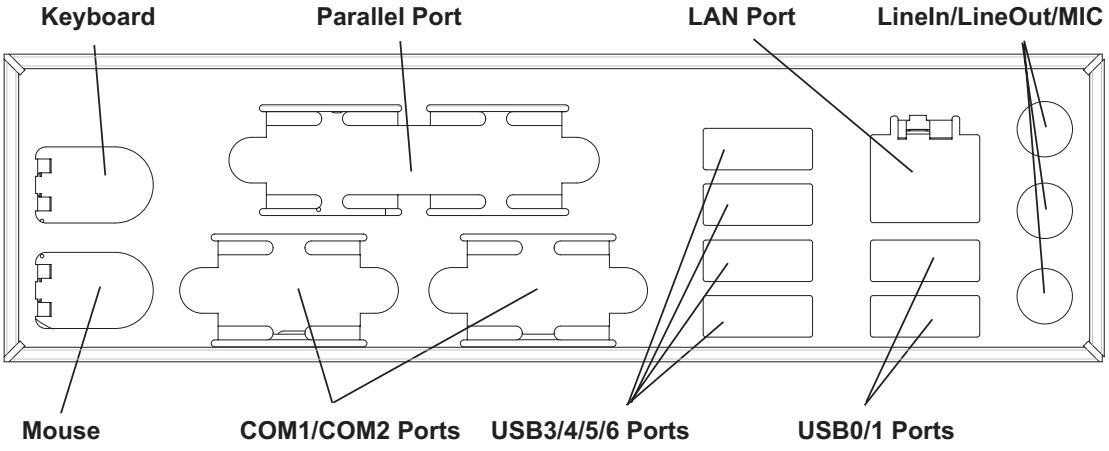
Rear I/O Panel

The rear I/O panel on the SC733T-450 provides seven motherboard expansion slots and is fitted with an I/O backplane to support the ports on the PDSGE motherboard (see Figure 1-2).

Cooling System

The SC733T-450 chassis has an innovative cooling design that features one 12-cm exhaust fan and one 9-cm thermal cooling fan. The fans plug into headers on the motherboard and operate at an rpm determined by a settiing in BIOS (see Chapter 7).

Figure 1-2. Rear I/O Panel



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

Chapter 2

System Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperWorkstation 5035G-T up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperWorkstation 5035G-T was shipped in and note if it was damaged in any way. If the server itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for setting up and operating the SuperWorkstation 5035G-T. 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.

Once the SuperWorkstation 5035G-T is placed in the appropriate location, slide the locking tabs on each caster down to keep it stationary.

Warnings and Precautions!

- Ensure that the caster wheels on the workstation are locked.
- Review the electrical and general safety precautions in Chapter 4.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the power supply units and hot-swap Serial ATA drive to cool before touching them.
- To maintain proper cooling, always keep all chassis panels closed and all SATA carriers installed when not being serviced.

2-3 Setting Up the System

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

Checking the Motherboard Setup

1. Accessing the inside of the System (Figure 2-1)

Begin by removing the two screws from the back lip of the side cover (this is the left cover when looking at the chassis from the front.) Grab the handle and gently pull the side cover out to release it from its position. Once the side cover is out of its position, slide the cover out of the chassis.

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

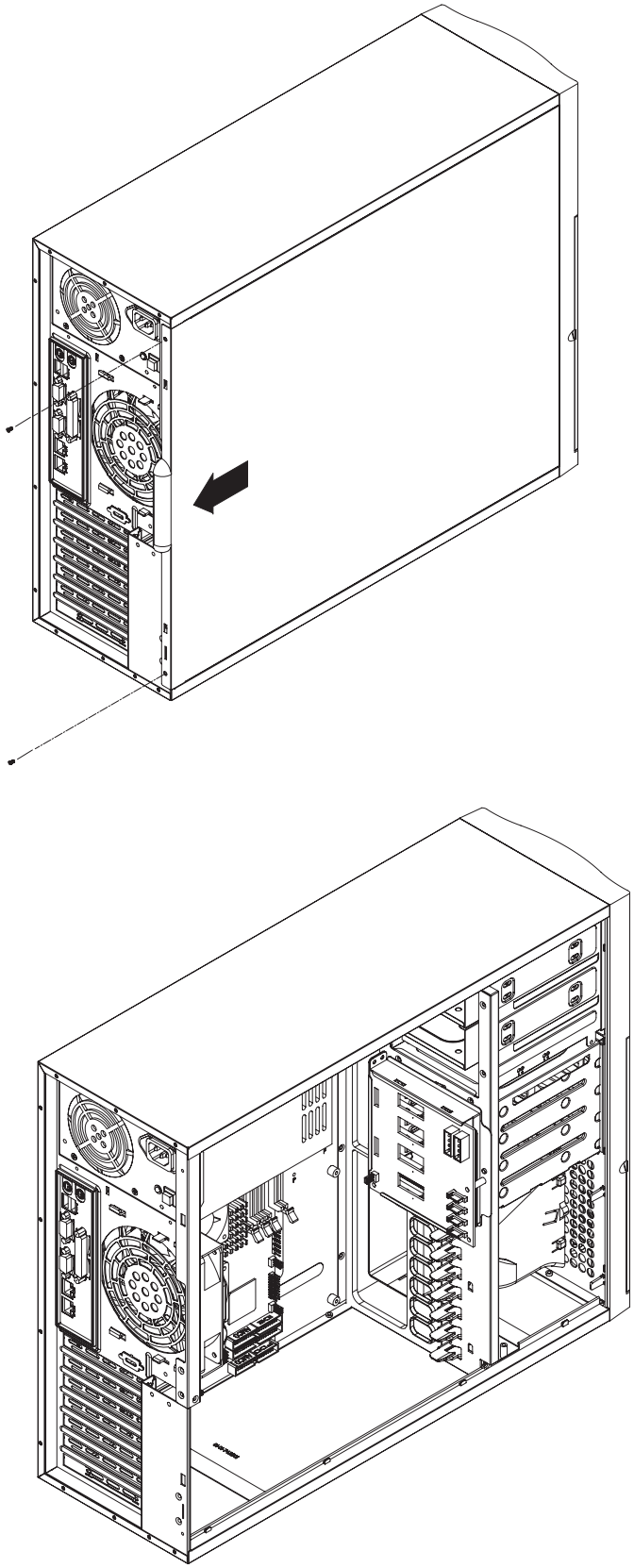
4. Installing add-on cards

If desired, you can install up to seven add-on cards to the system. See Chapter 5 for details on installing PCI-E/PCI-X/PCI add-on cards.

5. Check all cable connections and airflow

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

Figure 2-1. Accessing the Inside of the 5035G-T



Checking the Drive Bay Setup

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

1. **Accessing the peripheral drive bays**
   To install or remove a component in the 3.5" and/or 5.25" drive bay(s), you will need to remove the side chassis cover. See the installation and removal sections for the peripheral drives in Chapter 6.

2. **Check the Serial ATA disk drives**
   Depending upon your system's configuration, your system may have up to four Serial ATA drives already installed. If you need to install or remove an SATA drive, please refer to the appropriate section in Chapter 6.

3. **Check the airflow**
   Cooling air is provided by a 9-cm internal cooling fan and a 12-cm exhaust fan. The system component layout was carefully designed to promote sufficient airflow throughout the chassis. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fan. Please keep this in mind when rerouting or adding/removing cables.

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

Chapter 3

System Interface

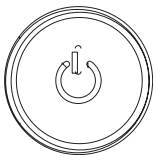
3-1 Overview

There are several LEDs on the control panel and one on each Serial ATA drive carrier 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 any 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:** 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 SC733T-450 chassis has four LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

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

- **HDD:** Channel activity for all HDDs. This light indicates SATA and (if present) CD-ROM drive activity when flashing.

- **NIC:** Indicates network activity on the Gigabit LAN when flashing.

- **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.

3-4 Serial ATA Drive Carrier LEDs

On the front of each Serial ATA drive carrier is a green LED. When illuminated, it indicates drive activity. A connection to the Serial ATA backplane enables this LED to blink on and off when that particular drive is being accessed.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperWorkstation 5035G-T 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 CD-ROM 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 polarites. 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. See Figure 4-1.

- CD-ROM Laser: **CAUTION** - this system 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 SuperWorkstation 5035G-T clean and free of clutter.

- The SuperWorkstation 5035G-T weighs approximately 40 lbs (18.2 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

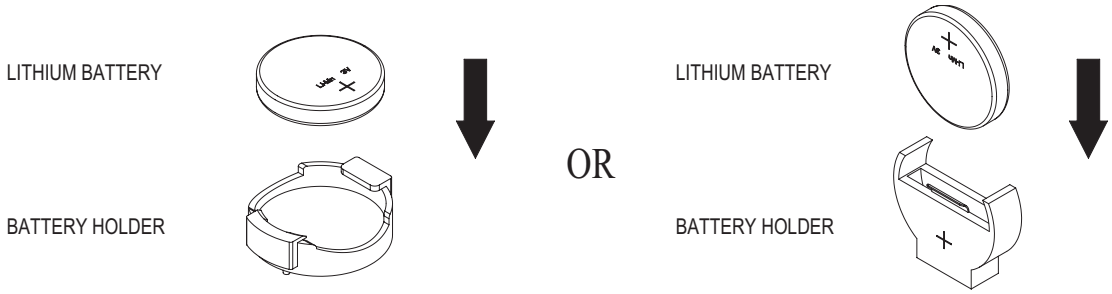
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient 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 5035G-T is operating to assure proper cooling. Out of warranty damage to the 5035G-T 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 the PDSGE motherboard into the SC733T-450 chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the 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 P8SC8 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.
- 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 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 PDSGE into the SC733T-450 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 system

Remove the two screws from the back lip of the side cover (this is the left cover when looking at the chassis from the front.) Grab the handle and gently pull the side cover out to release it from its position. Once the side cover is out of its position, slide the cover out of the chassis.

2. Removing the rear exhaust fan

You will need to remove the rear exhaust fan before installing the motherboard. Refer to the appropriate section in Chapter 6 for details on removing the rear exhaust fan.

3. Check compatibility of motherboard ports and I/O shield

The PDSGE requires a chassis big enough to support a 12" x 9.6" motherboard, such as Supermicro's SC733T-450. 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.

4. 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 in 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. Finish by replacing the fan (reversing the procedure in step 2) and the side cover of the chassis.

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 (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- Front side USB port cables (J12)
- SATA drive cable (SATA#0-3)
- Control Panel cable (JF1)
- Floppy cable (Floppy)

Connecting Power Cables

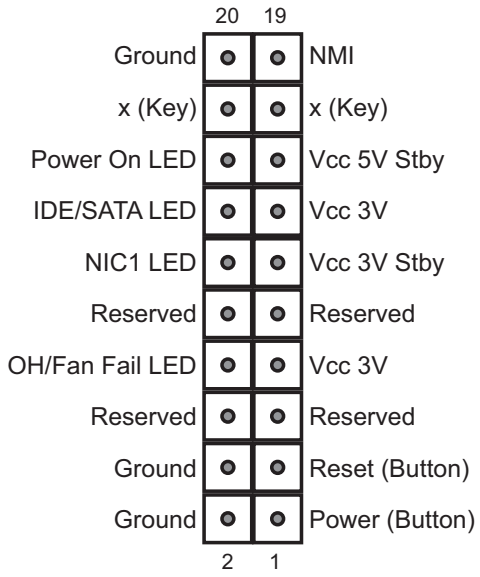
The PDSGE has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, there is an 8-pin secondary power connector (JPW2) that also must be connected to your power supply. See Section 5-9 for power connector pin definitions.

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 and pin descriptions.

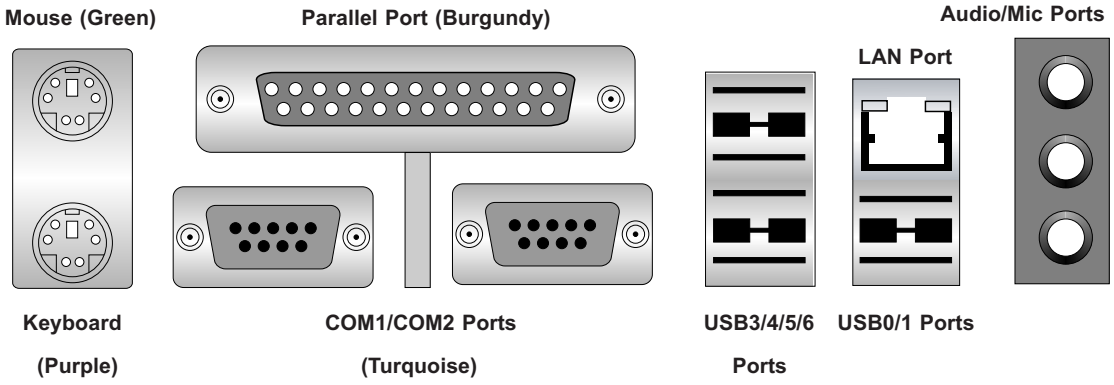
Figure 5-1. Control Panel Header Pins



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

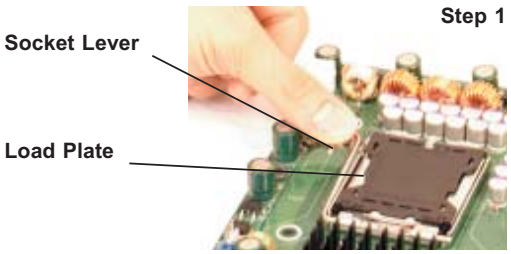


5-5 Installing the Processor and Heatsink

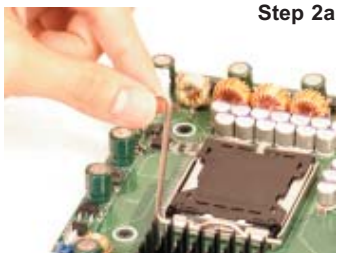
Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

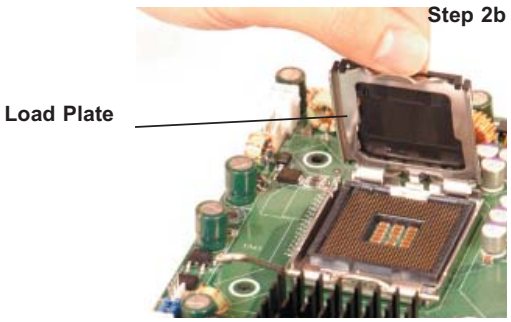
The PDSGE has a single LGA775 socket that supports Intel Pentium D or Pentium 4 processors. Intel's boxed Pentium 4 CPU package contains a CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use a Intel-certified multi-directional heatsink and fan only.

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

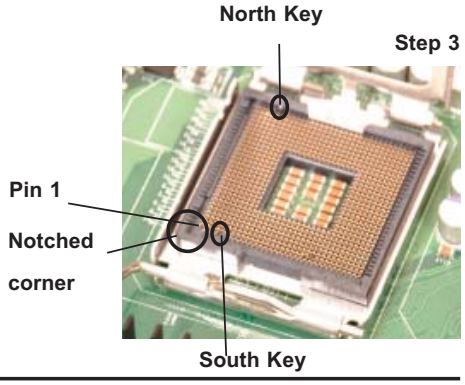


2. Carefully lift the socket lever up to open the load plate.





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.

North Center Edge

Step 4

South Center Edge

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.*

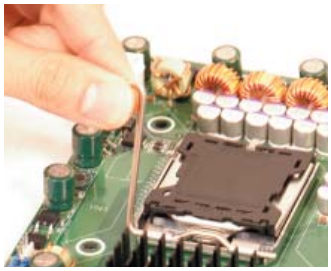
Steps 5 & 6

Socket Lever

CPU in 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.

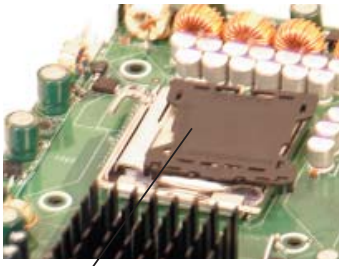
Step 7



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.

Step 8



Plastic cap is released from the load plate when the CPU is properly installed.

Note: Keep the plastic cap. If you need to ship the motherboard, the CPU must have the plastic cap properly installed to protect the CPU pins. Shipping without the CPU plastic cap properly installed will void the warranty.

Installing the Heatsink

1. Locate the "CPU FAN1" header on the motherboard.

2. Position the heatsink in such a way that the heatsink fan wires are closely routed to the CPU fan and do not interfere with other components.

3. Inspect the CPU fan wires to make sure that the wires are routed through the bottom of the heatsink.

4. Remove the thin layer of the protective film from the copper core of the heatsink. **Warning:** the CPU may overheat if the protective film is not removed from the heatsink.

5. Apply the proper amount of thermal grease on the CPU. (If your heatsink came with a thermal pad, please ignore this step.)

6. If necessary, rearrange the wires so that they are not pinched between the heatsink and the CPU. Also make sure there is clearance between the fan wires and the fins of the heatsink.

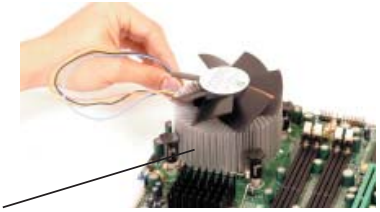
7. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push diagonal pairs of fasteners (#1 & #2 and #3 & #4) into the mounting holes until you hear a click. Orient each fastener so that the narrow end of the groove points outward.

Note: not all steps are pictured.

Step 5

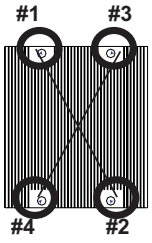
Thermal Grease

Step 6



Heatsink Fins

Step 7



Narrow end of the groove points outward

5-6 Installing Memory

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

Memory support

The PDSG4 supports dual-channel, unbuffered ECC DDR2-667/533/400 SDRAM. Both interleaved and non-interleaved memory configurations are supported, so you may populate any number of DIMM slots. Populating both slots of a bank (DIMM#1A and DIMM#1B and/or DIMM#2A and DIMM#2B) with DIMMs of the same size, type and speed will result in dual-channel, interleaved memory, which is faster than single-channel, non-interleaved memory. Note than when ECC memory is used, it may take 25-40 seconds for the VGA to display.

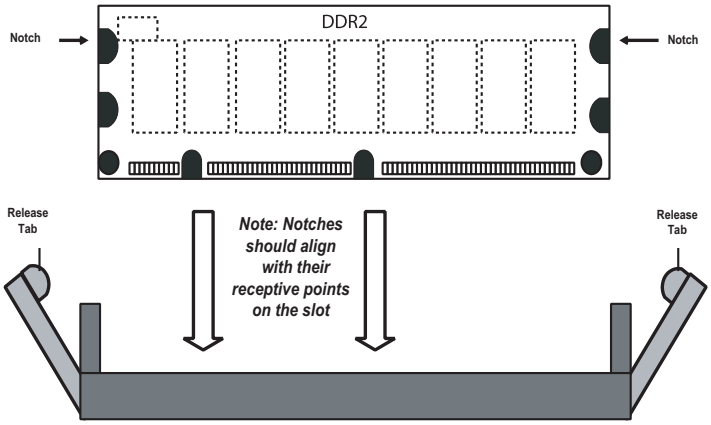
Notes:

1. Due to a chipset limitation, 8GB Memory can only be supported by the following operating systems:
   32-Bit: Windows 2000 Advanced Server, Windows Server 2003 Enterprise Edition
   64-Bit: Windows Server 2003 Standard x64 Edition, Windows XP Professional x64 Edition, Windows Server 2003 Enterprise x64 Edition
2. You may install a maximum of 2GB DIMMs on each slot; however, only DDR2-533 2GB DIMMs are may be used in this configuration.
3. Some older versions of DDR2-667 may not match Intel's ODT (On-Die-Temperature) requirement and will be automatically down-graded to run at 533 MHz. If this occurs, contact your memory vendor to check the ODT value.

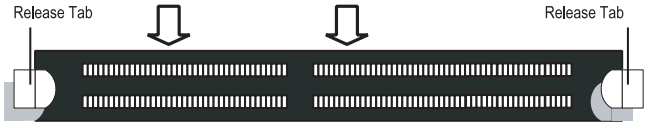
Installing memory modules

Insert each memory module vertically. Pay attention to the notches 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



Top View of DDR2 Slot



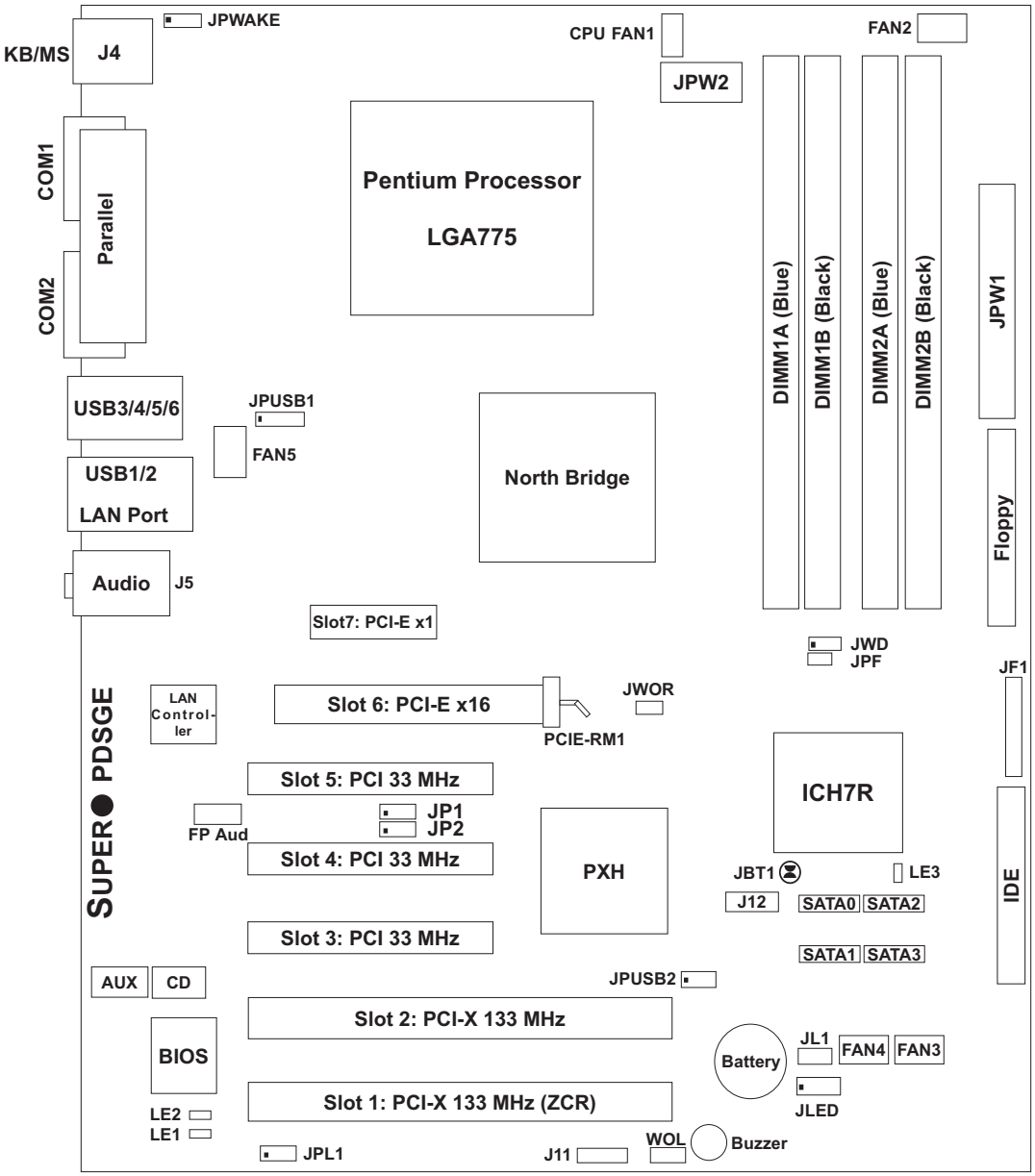
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

5-7 Adding PCI Add-On Cards

The SC733T-450 chassis can accommodate all seven PCI expansion slots on the PDSGE being populated with cards. To install an add-on card, begin by removing the PCI slot shield for the slot you wish to populate. Fully seat the card into the card 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 backpanel of the chassis. The PCI slot shields protect the motherboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused PCI-E/PCI-X/PCI slot.

5-8 Motherboard Details

Figure 5-4. PDSGE Layout
(not drawn to scale)



Jumpers not indicated are for test purposes only.

Warning: Using the wrong type of onboard CMOS battery or installing it upside down may result in explosion.

PDSGE Quick Reference

Jumper	Description	Default Setting
J11	Onboard Speaker	Pins 3-4 (Int. Speaker)
JBT1	CMOS Clear	See Section 5-10
JP1/JP2	SMB to PCI Slots	Both Open (Disabled)
JPF	Power Force-on	Open (Disabled)
JPL1	Giga-bit LAN Enable	Pins 1-2 (Enabled)
JPUSB1	BP USB Wake Up (USB 1-6)	Pins 2-3 (Disabled)
JPUSB2	FP USB Wake Up (USB7/8)	Pins 2-3 (Disabled)
JPWAKE	KB/Mouse Wake-Up	Pins 2-3 (Disabled)
JWD	Watch Dog Enable	Pins 1-2 (Reset)

Connector	Description
AUX	Auxiliary (Audio) Input Header
CD	Audio CD Input Header
COM1, COM2	COM 1 & 2 Ports
FAN 1-5	FAN1: CPU Fan, FAN2/3/4/5: Chassis Fan Headers
Floppy	Floppy Disk Connector
FP Aud	Front Panel Audio Header
IDE	IDE Connector
J4	PS/2 Keyboard/Mouse
J5	Audio Port (Line-In, Line-Out, Microphone)
J11	Speaker Header/Jumper
J12	Front Panel USB Headers (USB7/8)
JF1	Front Control Panel Connector
JL1	Chassis Intrusion Header
JLED	Power LED
JPW1	ATX 24-Pin Power Connector
JPW2	12V 8-pin Power Connector (Required Connection)
JWOR	Wake On Ring Header
LAN Port	Ethernet RJ45 (Gigabit LAN)
Parallel	Parallel (Printer) Port
SATA0-3	Serial ATA Headers
USB1/2, USB3-6	Back Panel Universal Serial Ports 1-6
WOL	Wake On LAN Header

Onboard Indicator	Description
LE1/LE2	System Debug Indicators (See Appendix A)
LE3	+5V Standby PWR LED Indicator (On = AC PWR On)

5-9 Connector Definitions

Power Supply Connectors

The primary power supply connector (JPW1) on the PDSGE 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. You must also connect the 8-pin (JPW2) processor power connector to your power supply. Refer to the table below right for the JPW2 (12V) connector.

Important: you must connect PW2 to your power supply to meet the ATX safety requirements.

ATX Power 24-pin Connector Pin Definitions (JPW1)

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

Required Connection

+12V 4-pin Power Pin Definitions (JPW2)

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

PW_ON Connector

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

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

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

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Overheat LED (OH)

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

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

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

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

IDE/SATA LED

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

IDE/SATA LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1 (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 Stby
16	Control

NMI Button

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

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Fan Headers

There are five fan headers on the PDSGE, which are designated FAN1, FAN2, FAN3, FAN4 and FAN5. Connect the fan on your CPU heatsink to the FAN1 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
4	PWM Control

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J4. 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 (J4)

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

Chassis Intrusion

The Chassis Intrusion header is designated JL1. See the board layout for the location of JL1 and the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

Universal Serial Bus (USB)

There six Universal Serial Bus ports located on the I/O panel and two additional USB headers located on the motherboard. The headers, labeled J12, can be used to provide front side USB access (cables not included). See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions (USB)

USB0 -USB6		USB7	
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 WOL on the motherboard. See the table on the right for pin definitions. You must enable the appropriate 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 (WOL)

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

LAN (Ethernet Port)

An Ethernet port (designated LAN and JLAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.

CD Header/Auxiliary Audio Header

A 4-pin CD header (CD) and an Auxiliary header (AUX) are included on the motherboard. These headers provide support for audio CD playback. Connect the audio cable from your CD drive to the header that fits your cable's connector. Only one of these two headers can be used at any one time. See the tables at right for pin definitions.

Audio CDHeader Pin Definitions (CD)

Pin#	Definition
1	Left Stereo Signal
2	Ground
3	Ground
4	Right Stereo Signal

Auxiliary Header Pin Definitions (AUX)

Pin#	Definition
1	Right Stereo Signal
2	Ground
3	Ground
4	Left Stereo Signal

Power LED

The Power LED header is located on JLED. This header provides LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JLED)

Pin#	Definition
1	Anode
2	Key
3	Cathode

Serial Ports

Two serial ports are included on the motherboard. Both are COM1 located under the parallel port. See the table on the right for pin definitions.

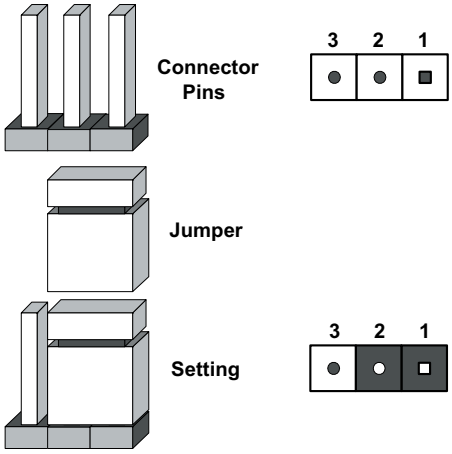
Serial Port Pin Definitions (COM1/COM2)

Pin #	Definition	Pin #	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

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

Note: *Do not use the PW_ON connector to clear CMOS*.

Speaker Connector

To use the internal (onboard) speaker, place a jumper on pins 3-4 of J11. If you wish to use an external speaker, connect the speaker header to all four pins of J11.

Speaker Jumper Pin Definitions (J11)	
Setting	Definition
Jump pins 3-4	Internal Speaker
Connect to 1-4	External Speaker

USB Wake-Up

JPUSB1 and JPUSB2 are used to enable or disable USB Wake-Up, which allows you to wakeup the system by depressing a key on the keyboard or by clicking the mouse when either is connected to a USB port. The JPUSB jumpers are used together with the USB Wake-Up function in the BIOS. Enable both the jumpers and the BIOS setting to allow the system to "wake-up via a USB device". See the table on the right for jumper settings and jumper connections. JPUSB1 is for USB1/2/3/4/5/6 and JPUSB2 is for the USB7/8 headers.

USB Wake-Up Jumper Settings (JPUSB1/2)

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

Note: The default jumper setting is "Disabled". However, when the "USB Wake-Up" function is enabled in BIOS and the desired USB ports are enabled via the JPUSB jumper, please be sure to remove all USB devices from the USB ports whose USB jumpers are set to "Disabled" before the system goes into standby mode.

Keyboard Wake-Up

The JPWAKE1 jumper 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	Disabled
Pins 2-3	Enabled

System Power Force On

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

System Power Force On Jumper Settings (JPF)

Jumper Setting	Definition
Closed	Force On
Open	Disabled

Watch Dog Enable/Disable

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

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

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

LAN Enable/Disable

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

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

SMBus to PCI

Jumpers JP1 and JP2 allow you to connect PCI/PCI-X slots to the System Management Bus. The default setting is "Open" to disable the connection. See the table on the right for jumper settings.

SMBus to PCI Enable/Disable Jumper Settings (JP1/JP2)	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled

5-11 Onboard Indicators

LAN LEDs

The Ethernet port has two LEDs. 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.

JLAN Right LED (Connection Speed Indicator	
LED Color	Definition
Off	10 MHz
Green	100 MHz
Amber	1 GHz

5-12 Parallel Port, Floppy and IDE Drive Connections

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

- A red mark on a wire typically designates the location of pin 1.

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

Parallel Port Connector

The parallel port is located above the COM ports. See the table at right for pin definitions.

Parallel (Printer) Port Connector Pin Definitions (Parallel)

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 located beside the main ATX power connector. See the table below for pin definitions.

Floppy Drive Connector Pin Definitions (Floppy)

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

IDE Connector

There are no jumpers to configure the onboard IDE interface. 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

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform simple maintenance on the SC733T-450 chassis. Following the component installation steps in the order given will eliminate most common problems. If some steps are unnecessary, skip ahead to the next step.

Tools Required

The only tool you will need is a Philips screwdriver.

6-1 Static-Sensitive Devices

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

Precautions

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

6-2 Front Control Panel

The front control panel must be connected to the JF2 connector on the motherboard to provide you with system status and alarm indications. A ribbon cable has bundled these wires together to simplify this connection. Connect the cable from JF2 on the motherboard (making sure the red wire plugs into pin 1) to the appropriate comnnector on the front control panel PCB (printed circuit board). Pull all excess cabling over to the control panel side of the chassis. The LEDs inform you of system status - see Figure 6-1 for details. Figure 6-2 shows the SC733T-350 features included on the front of the chassis. See Chapter 5 for details on JF2.

Figure 6-1. Front Control Panel LEDs

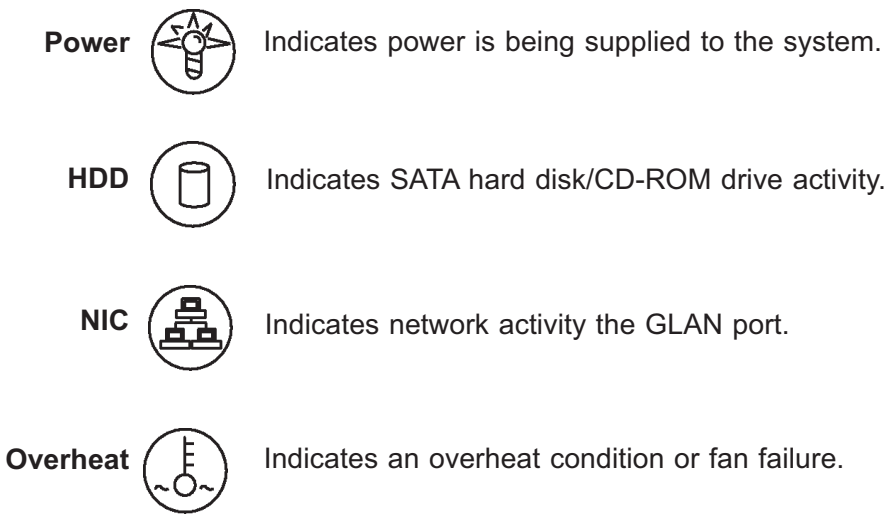
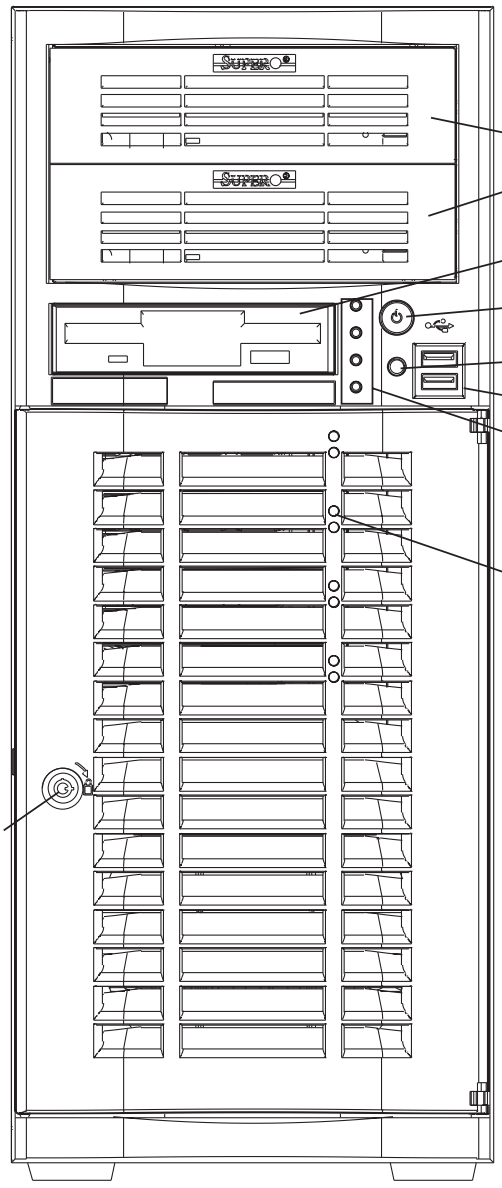


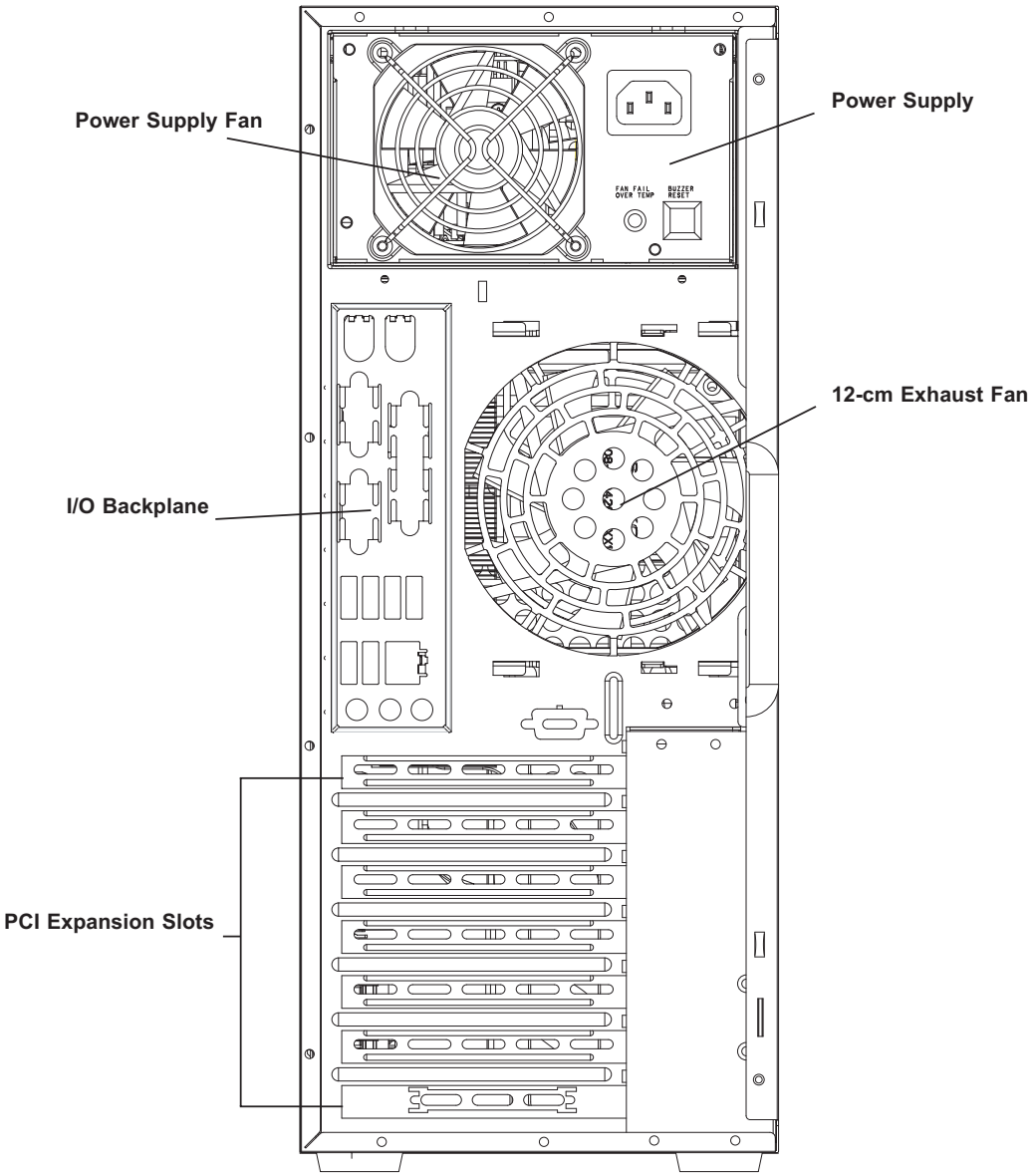
Figure 6-2. Chassis Front View



SATA Drive Configuration

Drive IDs are marked on the front bezel. From bottom to top they are Drive 0, Drive 1, Drive 2 and Drive 3

Figure 6-3. Chassis Rear View



6-3 System Fans

A 9-cm chassis cooling fan housed in a fan duct is located just below the peripheral drive bays to provide cool air intake for the system. A 12-cm exhaust fan at the rear of the chassis pulls the cool air through the system and expels the hot air.

Fan Failure

Under normal operation, the chassis, the exhaust and the power supply fans all run continuously. If any of these three fans fail, the system must be powered down before replacing them.

Replacing System Fans

1. Identifying and accessing the fan

First, inspect the back of the chassis to see if it is the 12-cm fan that has failed. Power down the system and remove the left chassis cover by first removing the two screws from the back lip of the cover. Push in the release tab on the cover and push the cover toward the rear of the chassis until it stops (after moving about ½ inch). Then lift the cover out and away from the chassis. (See Figure 2-1 for accessing the inside of the chassis.)

2. Removing the fan duct assembly

9-cm fan: After removing the side chassis cover, release the clips that secure the fan duct to the chassis. You can then pull the fan duct out from its location in the chassis. Remove the four screws at the front of the fan duct that hold the fan in place. Then release the two fasteners along the side of the fan duct. You can now separate it into two pieces and easily remove the fan (see Figure 6-4). Add a new fan of the same type (see step 3).

The 12-cm exhaust fan is also in a housing that can be removed from the chassis after removing the left chassis cover (see Figure 6-5).

3. Installing a new fan

Replace the failed fan with an identical one (available from Supermicro). After the new fan has been installed into the fan duct, reassemble the fan duct and perform the removal procedure in reverse to install the entire fan duct assembly back into the chassis. Make sure the wiring for the fan is also reattached to its proper header. Finish by replacing the left chassis cover, then restore power to the system. Check that the replaced fan is working properly.

Figure 6-4. Removing the Fan Duct Assembly (9-cm Fan)

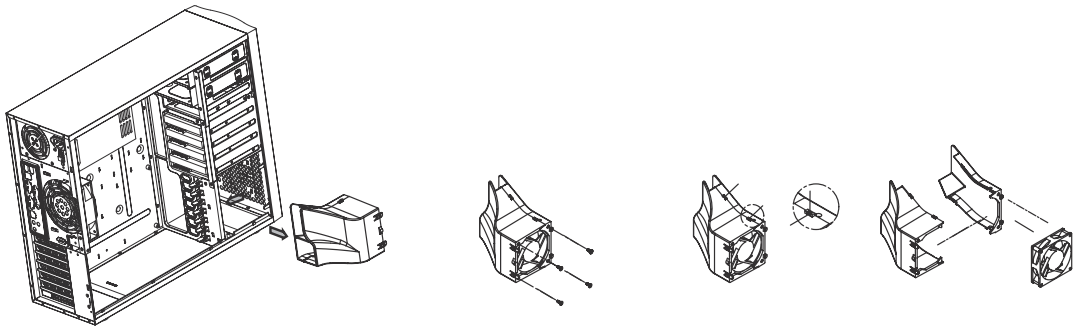
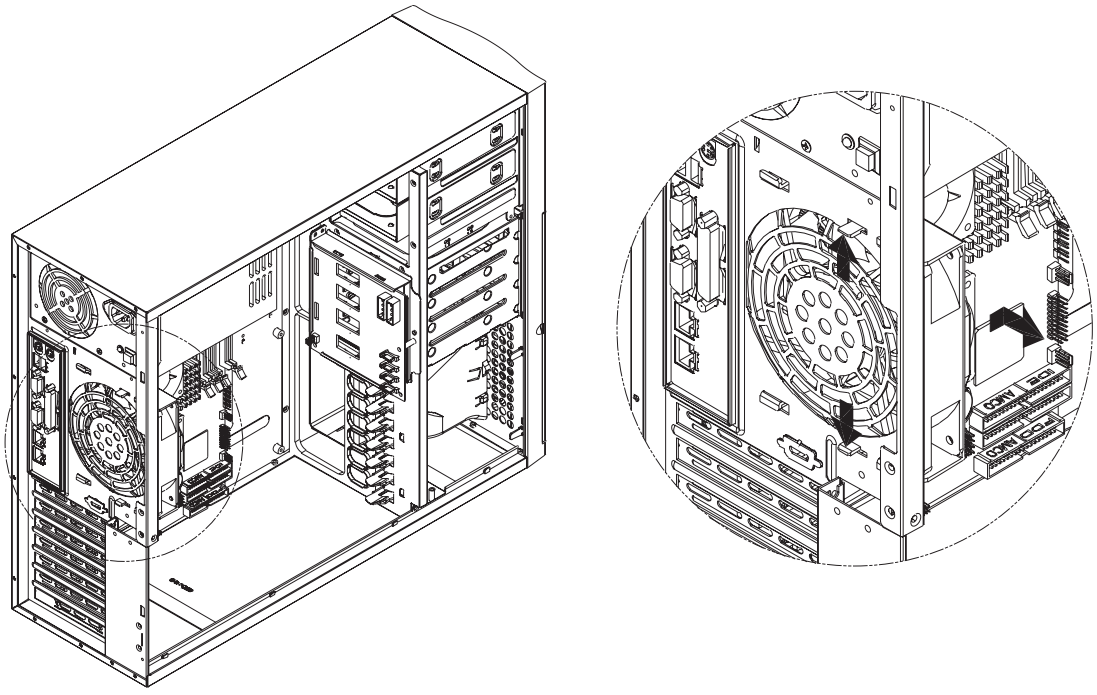


Figure 6-5. Removing the 12-cm Exhaust Fan



6-4 Drive Bay Installation

A bezel covers the front of the chassis but does not need to be removed to access the drives. If you wish to remove the bezel piece, push on the three tabs on the inside left side lip of the front chassis cover. Then slightly swing out the same (left) side of the cover - about ½ inch only. Remove by pushing on the open side of the cover to remove it from the chassis (do not try to swing or pull it straight out after opening the left side.

Serial ATA Drives

After unlocking the Serial ATA (SATA) drive bay door, swing it open to access the SATA drive. The drive IDs are preconfigured as 0 through 3 in order from bottom to top.

Important! Use extreme caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the airflow holes in the SATA backplane. Regardless of how many SATA hard drives are installed, all four SATA drive carriers must remain in the drive bays to promote proper airflow.

1. Installing/removing hot-plug SATA drives

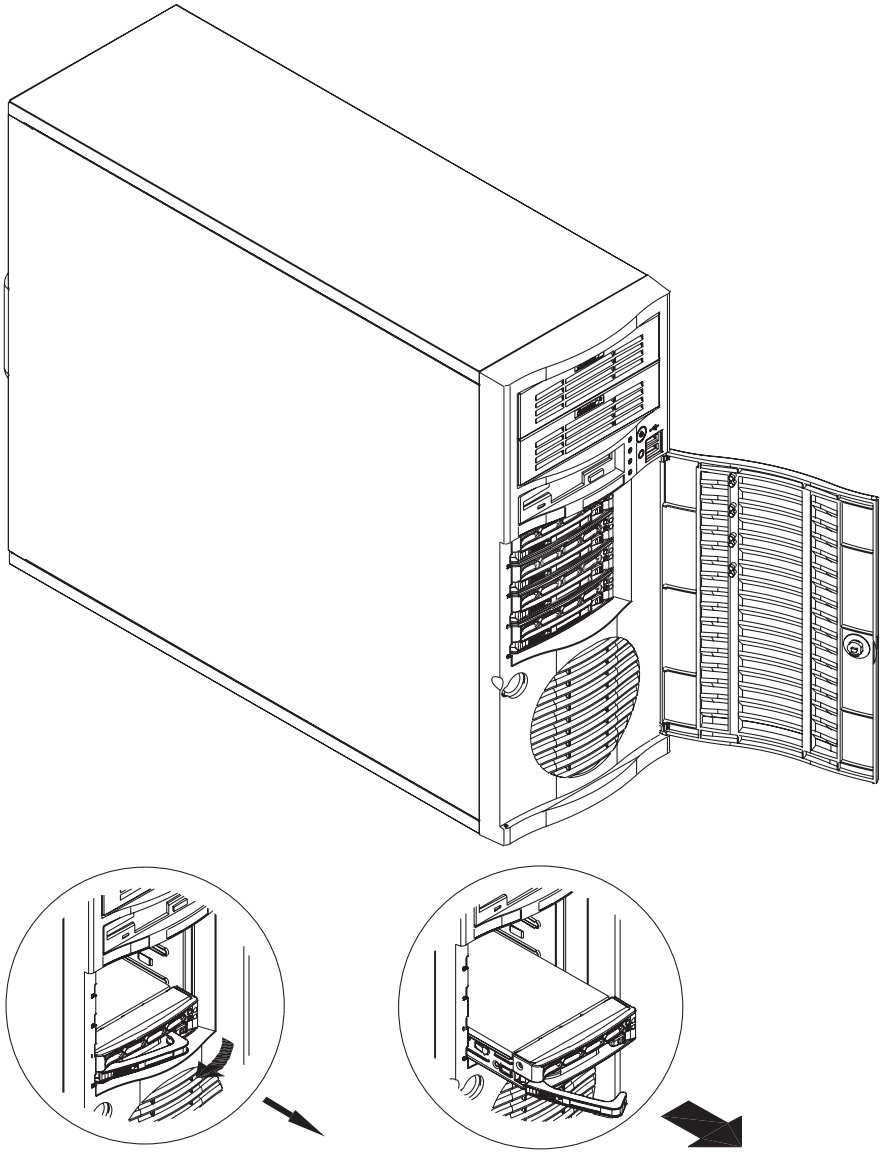
The four SATA drive carriers are all easily accessible at the front of the chassis. These SATA drives are hot-pluggable, meaning they can be removed and installed without powering down the system. To remove a carrier, first open the front bezel then push the release button located beside the drive LEDs. Swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-6).

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

2. Mounting an SATA drive in a drive carrier

The SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also work to promote proper airflow for the system. For this reason, even carriers without SATA drives must remain in the server. If you need to add a new SATA drive, insert the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws.

Figure 6-6. Removing an SATA Drive Carrier

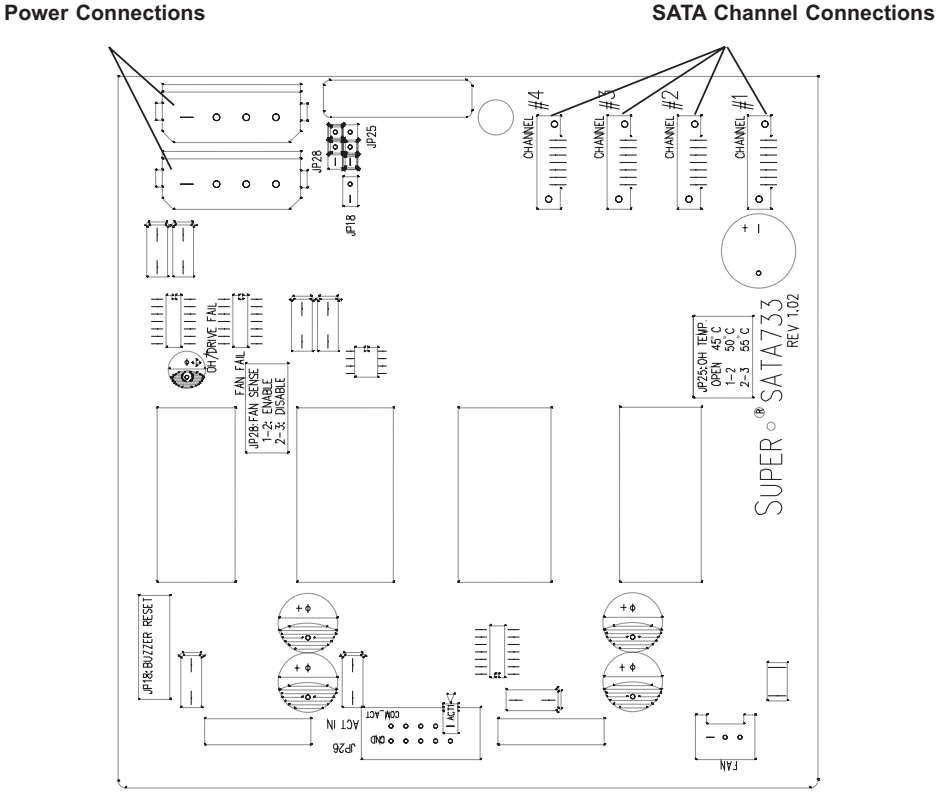


3. SATA backplane

All four SATA drives plug into the SATA backplane. There are two jumpers and two headers on the SATA backplane, as noted below. A ribbon cable from JA1 on the motherboard should be connected to the JP26 connector on the SATA backplane. There are also two power connectors on the backplane - both should be connected. See Figure 6-7 for the locations of backplane connectors - the reverse side of the backplane has four channel connectors that the SATA drives plug into when inserted with a SATA drive carrier. See Figure 6-2 for drive number configuration. You cannot cascade the SATA backplane.

Jumper	Description	Setting
JP18	Buzzer Reset	Alarm Reset Header
JP25	OH Temperature	Open: 45 degrees C
		Pins 1-2: 50 degrees C (default)
		Pins 2-3: 55 degrees C
JP26	SATA Drive Activity	Drive Activity
JP28	Fan Sense	Pins 1-2: Enable
		Pins 2-3: Disable (default)

Figure 6-7. SATA733 Backplane



Installing Components in the 5.25" Drive Bays

1. Drive bay configuration

The 5035G-T has two 5.25" drive bays above the SATA drive bays. Components such as a floppy drive, IDE hard drives or CD-ROM drives can be installed in these 5.25" drive bays.

2. Mounting components in the drive bays

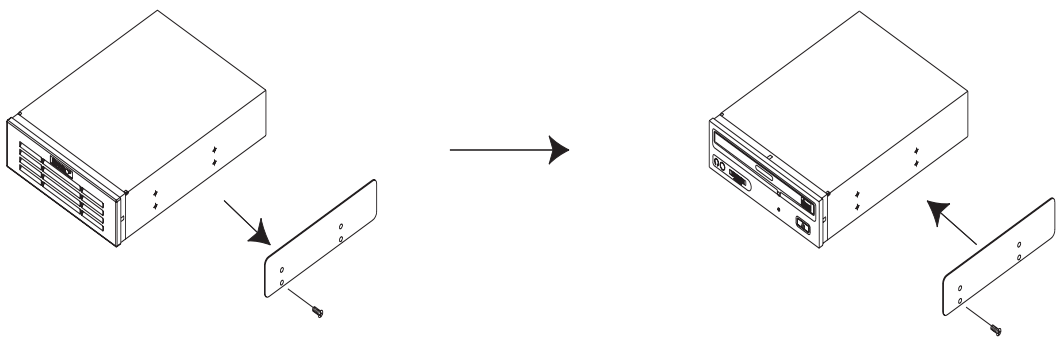
First power down the system and then remove the top/left chassis cover to access the drive components. With the cover off, remove the two or four screws that secure the drive carrier to the chassis (one side only) then push the entire empty drive carrier out from the back.

Adding a CD-ROM drive: remove the guide plate from right side of the empty drive carrier and screw it into the right side of the CD-ROM drive using the holes provided (see Figure 6-8). Then slide the CD-ROM into the bay and secure it to the chassis with the drive carrier screws you first removed. Attach the power and data cables to the drive. Replace the top/left chassis cover before restoring power to the system.

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

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

Figure 6-8. Adding a Component Without a Drive Carrier



6-5 Power Supply

The 5035G-T has a single 450W power supply that features noise-suppression technology for silent operation. The power supply has the capability to automatically sense and operate at 100 or 240V AC. This power supply also has the PFC (Power Factor Correction) feature built in.

Replacing the Power Supply

1. Accessing the power supply

After powering down the system, you'll need to remove the left chassis cover to access the power supply for removal.

2. Removing the power supply

First, unplug the power cord from the power supply. Then remove the power supply connectors going to the motherboard and the SATA backplane. Finally, remove the screws that secure the unit to the mounting brackets in the chassis and then pull the unit completely out.

3. Installing a new power supply module

Replace the failed unit with another unit having the exact same part number (PWS-0045). Gently but firmly push the new unit all the way into the open bay. Secure it to the mounting brackets in the chassis with the screws provided. Connect two power cables to the SATA backplane and two to the motherboard (ATX PWR CONN and J21 connectors). Finish by replacing the chassis left cover and then restoring power to the system.

Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AwardBIOS for the PDSGE. The Award ROM BIOS is stored in a Flash chip and can be easily upgraded using a floppy disk-based program.

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

System BIOS

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

How To Change the Configuration Data

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

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Chipset and Power menus. Section 7-3 gives detailed descriptions of each parameter setting in the Setup utility.

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.

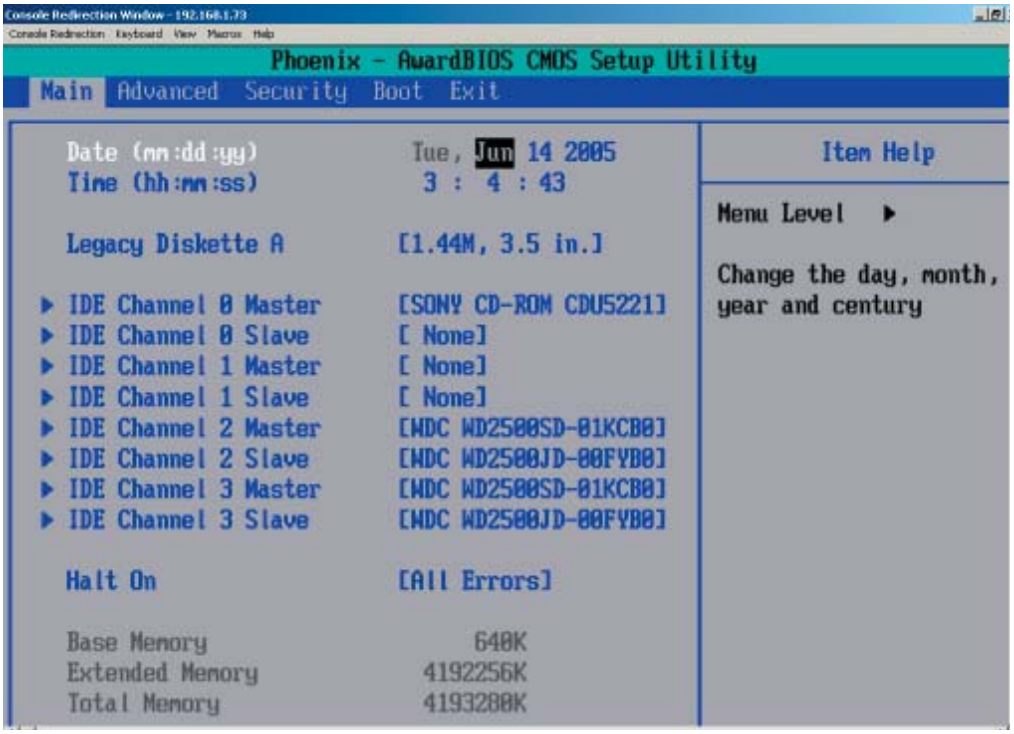
Press DEL to enter SETUP

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

This setting allows the user to 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

This setting allows the user to set the type of floppy disk drive installed as diskette A. 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.

▶ 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 Channels 0-1 Master/Slave slots. Hit <Enter> to activate the following sub-menu screen for detailed options. Be sure to set the correct configurations accordingly. The items included in the submenu are listed below:

IDE HDD Auto-Detection

This option allows the user to determine the manner in which the AwardBIOS sets the settings for the IDE Channels 0-1 Master Devices. The options are None, **Auto** and Manual.

IDE Channels 0 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 size, number of cylinders, and the configurations of items such as Head, Precomp, Landing Zone and Sector.

Access Mode

This item allows the user to select the location through which the AwardBIOS accesses the IDE Primary Master Device. The settings are CHS, LBA, Large, and **Auto**.

Halt On

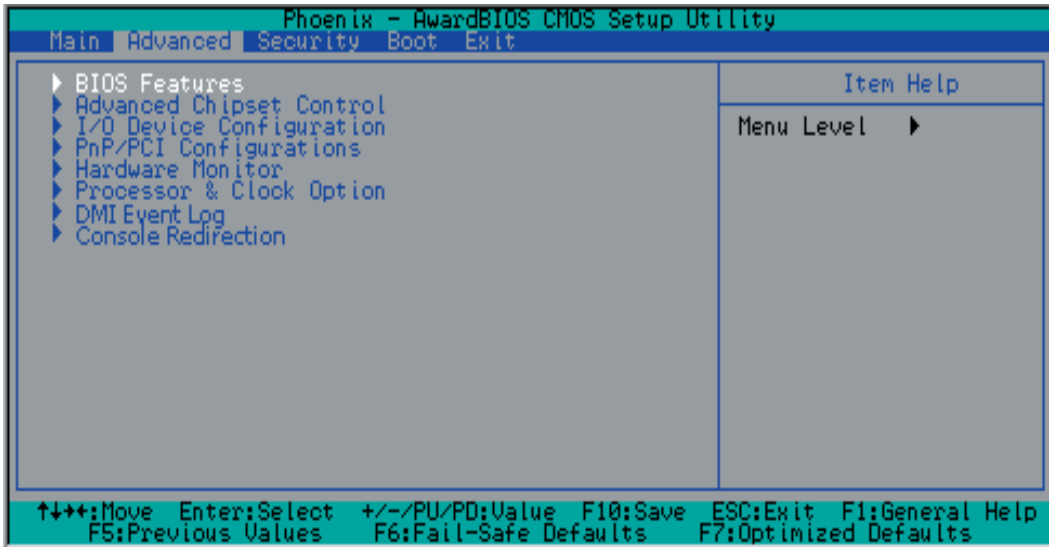
This item sets the condition that activates the function of Halt On The options are **All Error**, No Error, All But Keyboard, All, But Diskette, and All, But Disk/Key.

Base Memory/Extended Memory/Total 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 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. 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 BIOS Features

With BIOS Features highlighted, press the <Enter> key to display the following items:

Quick Boot

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

Quiet Boot

This feature allows the user to activate Quiet Boot option. The options are **Enabled** and Disabled. Disabled allows the POST messages to be displayed.

ACPI Function

Select Enabled to activate BIOS support for Advanced Configuration and Power Interface features. The settings are **Enabled** or Disabled.

ACPI Suspend Type

If enabled, this option allows the user to select the ACPI Suspend type. The options are **S1 (POS)**, S3 (STR) and S1&S3.

MPS Version Control

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

Watch Dog Timer Select

This setting allows the user to enable and set the Watch Dog Timer. The options are **Disabled,** 10 Seconds, 20 Seconds, 30 Seconds, 40 Seconds, 1 Minute, 2 Minutes and 4 Minutes.

7-4.2 Advanced Chipset Control

Be careful when changing the Advanced Chipset settings. Incorrect values entered may cause a system malfunction. Also, a very high DRAM frequency or incorrect DRAM timing may cause system instability. When this occurs, revert to the default setting.

DRAM Timing Select

This setting allows you to set the DRAM timing. The options are Manual and **By SPD**.

DRAM Data Integrity Mode

This setting allows you to set the Data Integrity Mode for DRAM slots. The options are Non-ECC and **ECC**.

PEG Force X1

Enable this option to force the PCI-E x16 slot to function as a PCI-E x1 slot. The options are **Disabled** and Enabled.

SATA Mode

This setting allows you to select the Serial ATA mode for the system. The options are **IDE,** RAID and APCI.

On-Chip Serial ATA

Select Disabled to disable the SATA Controller. Select **Auto** to allow the BIOS to make arrangements automatically. Select Combined Mode to use the PATA and SATA Combined Mode. A maximum of two IDE drives in each channel is allowed. Select **Enhanced** Mode to enable both SATA and PATA. This mode will support up to six IDE drives. Select SATA Only to allow SATA to operate in Legacy Mode.

PATA IDE Mode

This feature allows you to select the channel for the PATA IDE mode. The options are **Primary** and Secondary.

SATA Port

This feature allows you to set the mode for SATA ports. The default setting is **"P1, P3 is Secondary."**

AC97 Auto Select

This feature allows the user to select AC97 functions. The options are **Auto,** AC97 Audio Only, AC97 Modem Only and All Disabled.

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 the USB 2.0 (EHCI) controller. The options are **Enabled** and Disabled.

USB Legacy Support

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

USB KB Wake-up From S3 (S4)

If enabled, Suspend to RAM will be activated to allow the system to store data in RAM for a quick restore in the event of a system crash. The options are **Disabled** and Enabled.

7-4.3 I/O Device Configuration

KBC Input Clock

This setting allows you to configure the KBC input clock. The options are 6 MHz, 8 MHz, **12 MHz** and 16 MHz**.**

Onboard FDC Controller

This setting allows you to set the onboard floppy disk controller. The options are Disabled and **Enabled.**

Onboard Serial Port1/Onboard Serial Port2

This setting allows the user to set the address and the corresponding IRQ for the serial ports. 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 setting 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**.

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

Sets the mode for the parallel port. The options are **SPP**, EPP, ECP, ECP+EPP and Normal.

PWRON After PWR-Fail

Allows the user to specify how the system will respond when power is reapplied after a power failure. The options are **Off**, On and Former-State.

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, **Button Only** and Keyboard 98.

KB Power On Password

This setting allows the user to enter a password to power on the system. Key in a password and press <Enter>.

7-4.4 PCI/PnP Configuration

Onboard LAN Boot ROM

Select Enable to boot from LAN. The options are **Disabled** and Enabled.

Initial Display First

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

PCI-X Slot Frequency

This setting allows the user to set PCI- slot frequency. The options are: PCI-33 (MHz), PCI-66 (MHz), PCIX-66 (MHz), PCIX-100 (MHz), and PCIX-133 (MHz).

▶ PCI Express Root Related Items

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 4**096 (bytes)**.

7-4.5 Hardware Monitors

Note: Please read the CPU and chipset documentation before setting the warning temperatures below. Incorrect settings may cause damage to components and result in system failure.

CPU Warning Temperature

These features allows you to set the CPU warning temperature. If the CPU temperature reaches this pre-set threshold, an alarm will be activated and a warning message will be displayed on screen. To prevent CPU overheat, the system fan will run at full speed when the CPU temperature reaches 10^0C below the threshold. The options are Disabled, 70^0C/158^0F, 75^0C/167^0F, **80^0C/176^0F**, 85^0C/185^0F, 90^0C/194^0F, 95^0C/203^0F and 100^0C/212^0F.

Chipset Warning Temperature

These features allows you to set the chipset warning temperature. If the chipset temperature reaches the pre-set threshold, an alarm will be activated and a warning message will be displayed on screen. The options are Disabled, 50^0C/122^0F, 55^0C/131^0F, **60^0C/140^0F,** 65^0C/149^0F, 70^0C/158^0F, 75^0C/167^0F and 80^0C/176^0F.

The following temperatures are also monitored:

Current System Temperature, Current CPU Temperature, Current Chipset Temperature.

The following fan speed items will be displayed:

CPU Fan 1 Speed/Fan 2 Speed/Fan 3 Speed//Fan 4 Speed/Fan 5 Speed

The following voltages will be monitored:

V_CORE (CPU)/V_CORE (Chipset), +1.8V, +12V, -12V, +5V, +3.3V (Main), +3.3V (Standby), +3.3V (Analog) and +3.3V (Battery)

7-4.6 Processor & Clock Options

Thermal Management

This setting allows the user to select the method to be 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).

Limit CPUID MaxVal

Select Enabled to allow the user set the limit on the CPUID Maximum Value. The options are Enabled and **Disabled.**

Hyper-Threading

Set this option to Enabled to activate the hyper-threading function of the CPU. Hyper-threading makes each CPU appear as two to any programs that support it (including OS support). The settings are Disabled and **Enabled**. (Set to Enabled for Windows XP and Linux 2.4x operating systems. Disable for operating systems that do not support Hyper-Threading.)

Auto Detect PCI CLK

Select Enabled to allow the system to automatically detect the PCI clock. The options are **Enabled** and Disabled.

Spread Spectrum

Spread Spectrum is a technique used to stabilize a system by reducing the level of electro-magnetic interference. The options are Enabled and **Disabled**.

CPU Overclocking

Select Enabled to increase CPU frequency and system performance. The options are Enabled and **Disabled**.

Caution: Improper overclocking may result in system instability or system

7-4.7 DMI Event Log

DMI Event Log

This setting allows you to Enable or Disable 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 **Yes.**

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.

7-4.8 Console Redirection

Console Redirection

Allows you to Enable or Disable Console Redirection. The options are **Disabled** and Enabled.

Agent Connect Via

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

Agent Wait Time (Min)

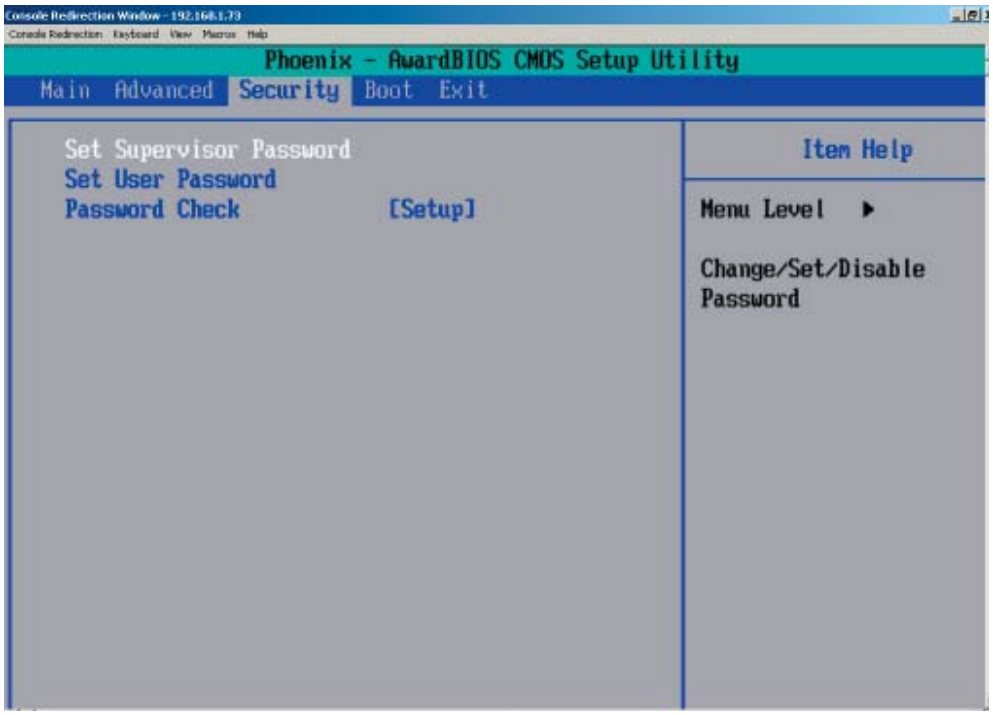
This setting allows you to set the wait time for the Console Redirection "Agent". The options are **1 (Min),** 2 (Min), 4 (Min) and 8 (Min).

Agent After Boot

Select Enabled to keep the "Agent" running after boot. The options are **Disabled** and Enabled.

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

Set User Password

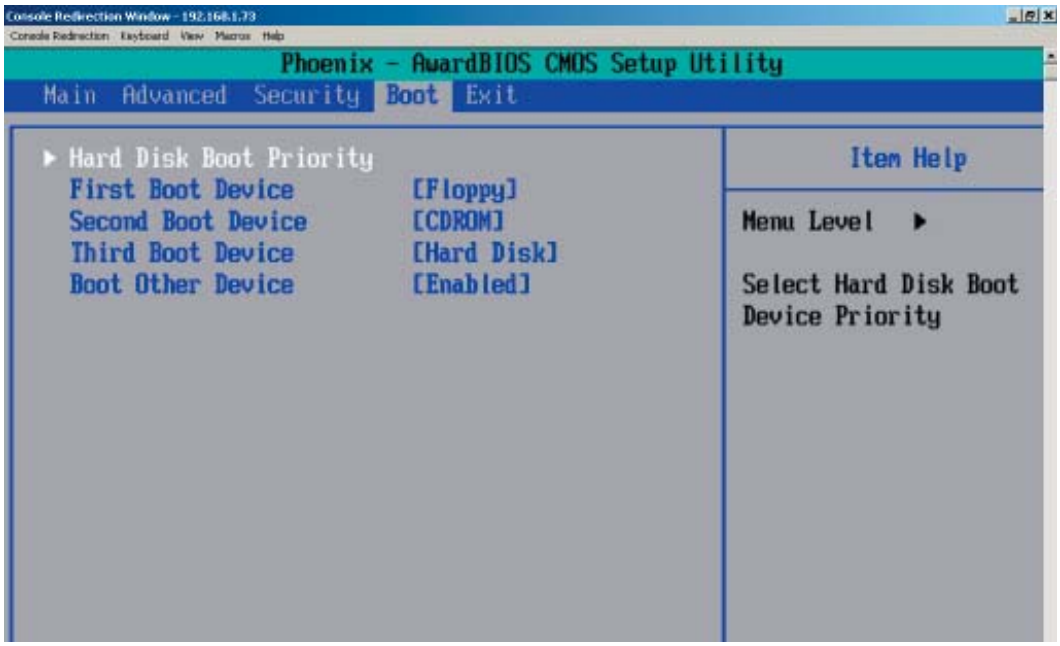
When "Set User Password" is highlighted on the above screen, press the <Enter> key. When prompted, type a password in the dialogue box to set or to change the user password.

Password Check

This setting allows the user to determine if the password is required every time the system boots up or 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:



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

Hard Disk Boot Priority

This item allows the user to select the boot priority of the hard disk devices.

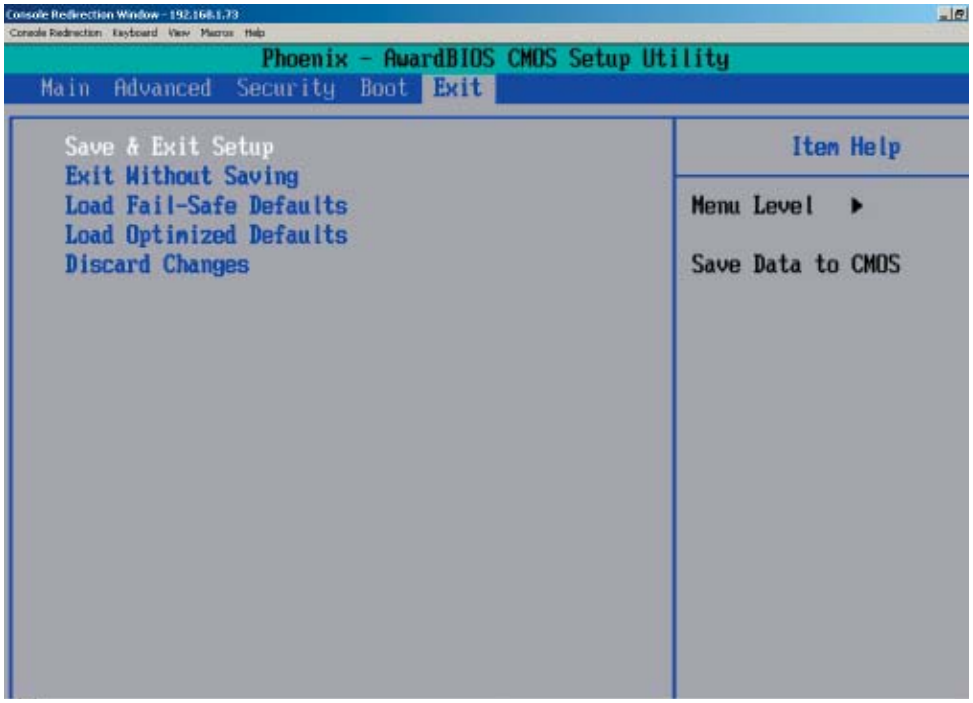
First Boot Device/Second Boot Device/Third Boot Device

This item allows the user to set the first boot-up device. The options are Removable, Hard Disk, CDROM, Legacy LAN, IBA GE Slot21 and Disabled. The default setting for the First Boot Device is **Removable,** for the Second Boot Device is **CDROM, and** for the Third Boot Device is **Hard Disk.**

Boot Other Device

Enabling this option forces the BIOS to load the OS from a device other 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



Save & Exit Setup

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

Exit without Saving

With "Exit without Saving" 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

With "Discard Changes" highlighted, press <Enter> to discard any changes you made to the BIOS settings and stay in the BIOS Setup.

Appendix A

Beep Codes and POST Messages

During the Power-On Self-Test (POST), BIOS will check for problems. If a problem is found, BIOS will activate an alarm or display a message using the LE2 and LE3 debug LEDs. The following are lists of such messages.

A-1 Beep Codes

Beep Code	Description
1 long repetitive beep	Memory module errors
1 long beep + 2 short beeps	VGA errors

A-2 LE2/LE3 Indicators

LE2 State (Green)	LE3 State (Yellow)	Description
On	On	Power On to POST
Flashing	Flashing	ECC Memory Testing
On	Flashing	PCI Bus Initializing
Flashing	On	VGA Initializing
Off	Off	System Normal (after POST)

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 segement 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 ICH7R SATA RAID software before you install the Windows Operating System and other software drivers.

If you do not wish to configure onboard SATA RAID functions, please go directly to Section C-5 for operating system & other software installation procedures.

C-1 Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH7R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2000/2003 operating system and other software drivers. (The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard.) Note that the current version of the ICH7R SATA RAID Utility can only support Windows XP/2000/2003 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3Gbps. 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 are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to Intel ICH7R Serial RAID

Located in the South Bridge of the 955X Glenwood chipset, the I/O Controller Hub (ICH7R) provides the I/O subsystem with access to the rest of the system. It supports a 2-channel UltraATA/100 Bus Master IDE controller (PATA) and four Serial ATA (SATA) ports. The ICH7R supports the following PATA and SATA device configurations: Legacy mode and Native mode.

RAID Configurations

The following types of RAID configurations are supported:

RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

RAID1 (Data Mirroring): an identical data image from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

Intel Matrix Storage

The Intel Matrix Storage, supported by the ICH7R, allows the user to create RAID 0 and RAID1 set by using only two identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive and generate a virtual RAID0 and RAID1sets. It also allows you the change the HDD partition size without any data.

Configuring BIOS settings for SATA RAID Functions (Native Mode)

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

Note: If it is 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" section in BIOS.

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

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

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

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

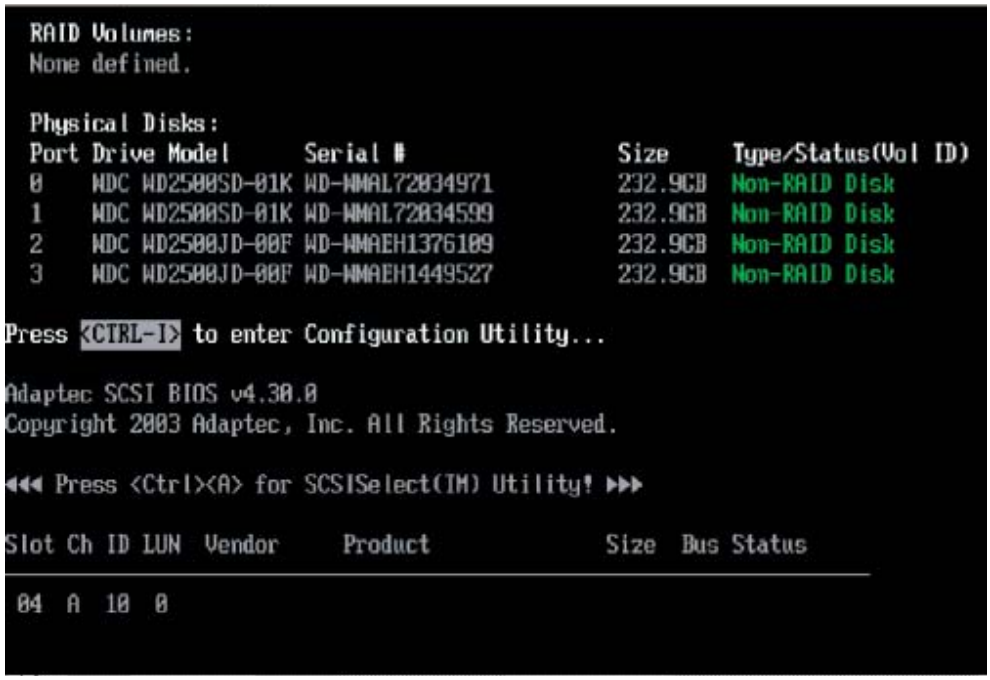
8. Once you've exited the BIOS Utility, the system will re-boot.

9. During the system boot-up, press the <Ctrl> and <I> keys simultaneously to run the Adaptec RAID Configuration Utility when prompted by the following message: *Press <Ctrl> <I> for Adaptec RAID Configuration Utility*.

Using the Intel ICH7R SATA RAID Utility Program

1. Creating, Deleting and Resetting RAID Volumes:

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



b. When you see the above screen, press the <Ctrl> and the <I> keys simultaneously to have the main menu of the SATA RAID Utility appear:

Note: All graphics and screen shots shown in the manual are for reference only. The screen shots shown in the manual do not imply Supernicro's endorsement or non-endorsement of any 3rd party product. Your screens may or many not look exactly the same as the graphics shown in this manual.)

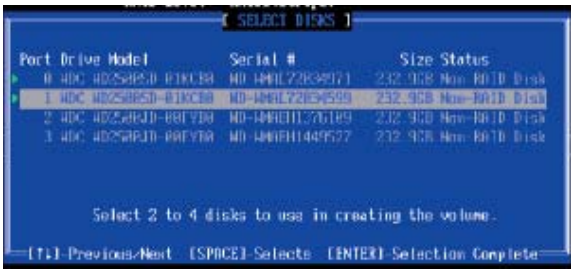
Creating a RAID 0 Volume:

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

b. Specify a name for the **RAID 0** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 0 (Stripe)** and hit <Enter>.

d. When the Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See Note on Page C-3) displays:



e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

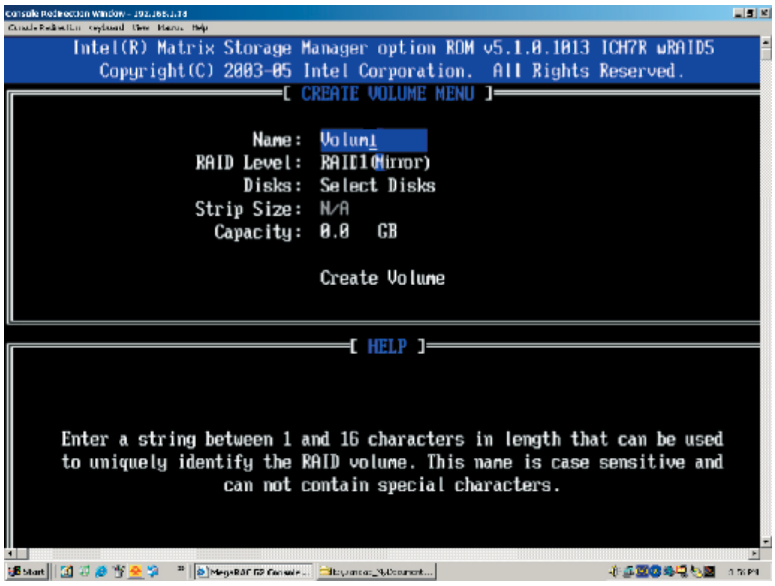
f. Use the <Up Arrow>, <Down Arrow> keys to selet the stripe size, ranged from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.The default stripe size is 128 KB.)

g. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume:

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



b. Specify a name for the **RAID 1** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 1 (Mirror)** and hit <Enter>.

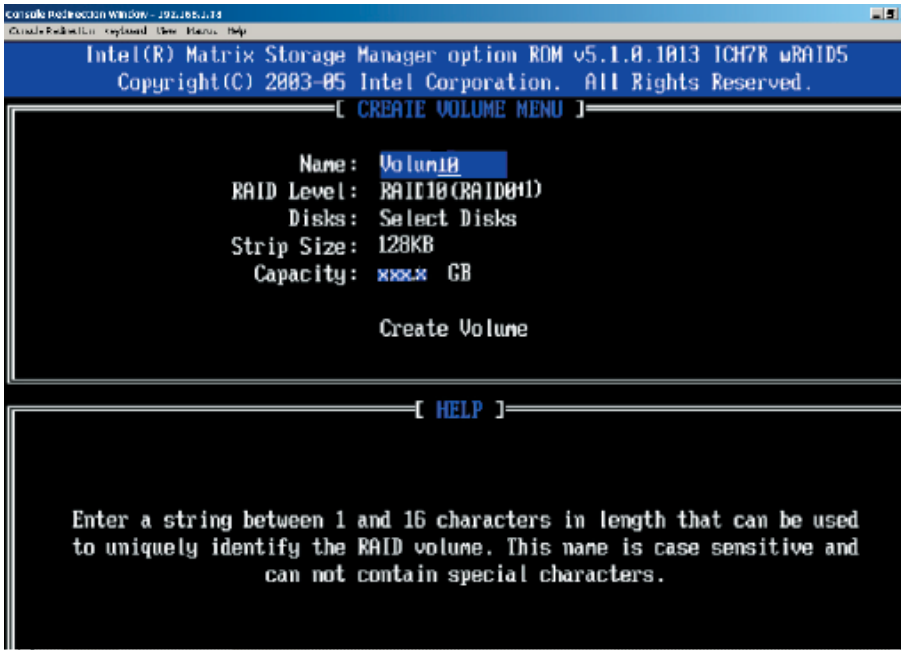
d. When the Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

e. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

f. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+ RAID 0):

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



b. Specify a name for the **RAID 10** set and press <Enter>.

c. When RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 10 (RAID1 + RAID0)** and hit <Enter>.

d. When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys to select the stripe size from 4 KB to 128 KB for your RAID 10 and hit <Enter>. The default setting is 6 4KB. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.)

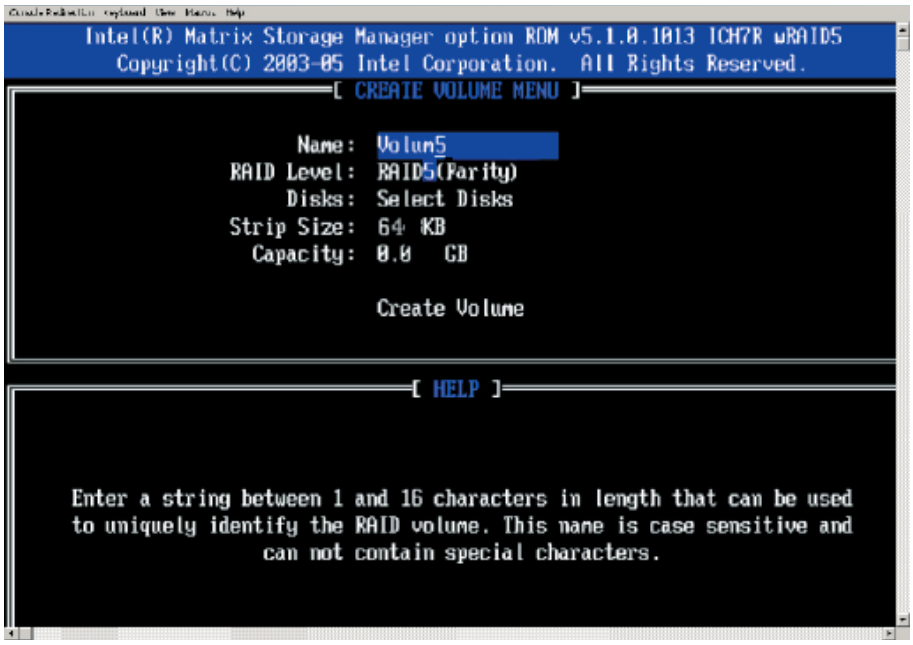
e. When the RAID Volume Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

f. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

g. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 Set (Parity):

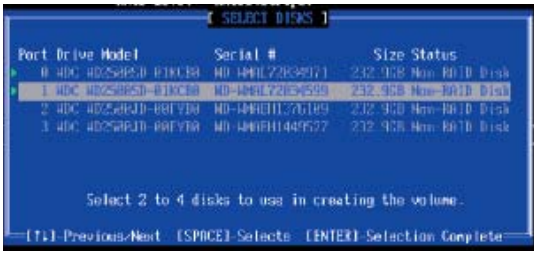
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



b. Specify a name for the **RAID 5** set and press <Enter>.

c. When the Raid Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 5 (Parity)** and hit <Enter>.

d. When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See Note on Page C-3) displays:



e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranged from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)

g. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.

h. Press Enter when the Create Volume item is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting RAID Volume:

(Warning: Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.)

a. From the main menu, select item2-Delete RAID Volume, and press <Enter>.

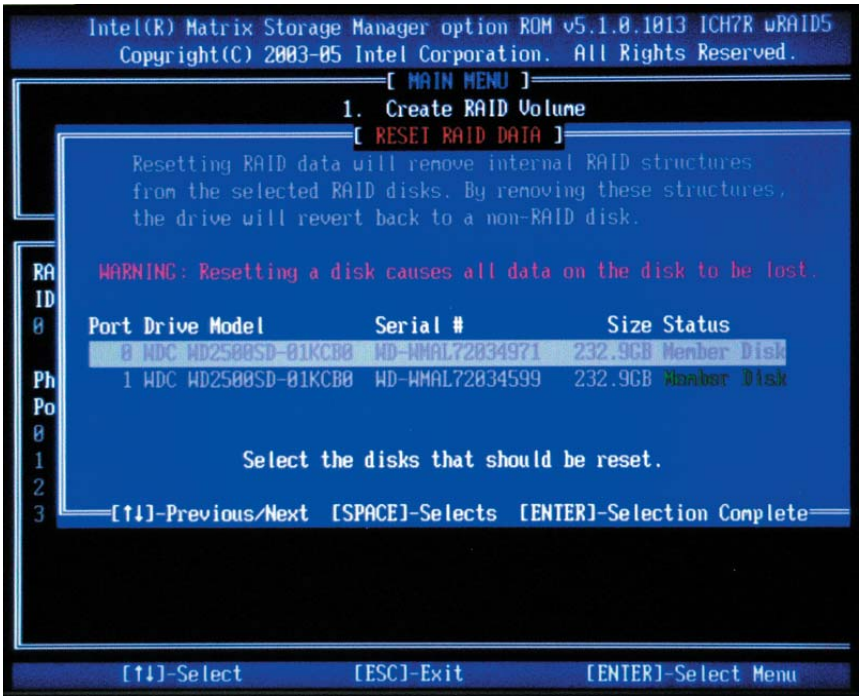
b. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press <Del>. A Warning message displays.

c. When asked "Are you sure you want to delete this volume (Y/N), press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

Resetting to Non-RAID and Resetting a RAID HDD

Warning: Use cautioun when resetting a RAID volume HDD to non-RAID or resetting a RAID HDD. Resetting a RAID volume HDD or resetting a RAID HDD will reformat the HDD and delete all internal RAID structure on the drive.

a. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>. The following screen will appear:



b. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset and press <Space> to select.

c. Press <Enter> to reset the RAID set drive. A Warning message displays.

d. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility:

a. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.

b. Press "Y" to reset the drive, or type "N" to go back to the main menu.

C-2 Installing Windows XP/2000/2003 (for systems with RAID Functions)

New Operating System-Windows XP/2000/2003 Installation

a. Insert the Microsoft Windows XP/2000/2003 Setup CD in the CD Drive and the system will start booting up from CD.

b. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

c. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).

d. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH7R into Drive A: and press the <Enter> key.

e. Choose Intel(R)82801GR/GH *SATA RAID Controller* from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.

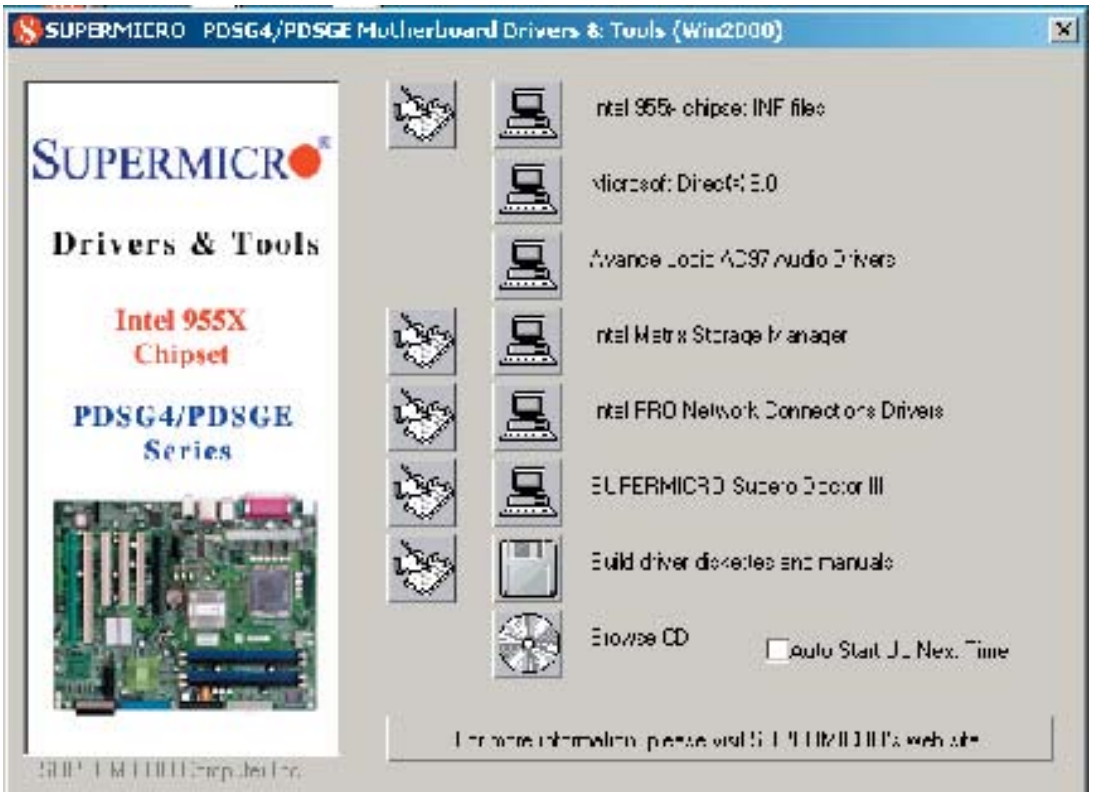
f. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

g. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

h. After Windows XP/2000/2003 Installation is completed, the system will automatically reboot.

i. Insert Supermicro CD that came with the package into the CD Drive during system reboot, and the following screen will appear:

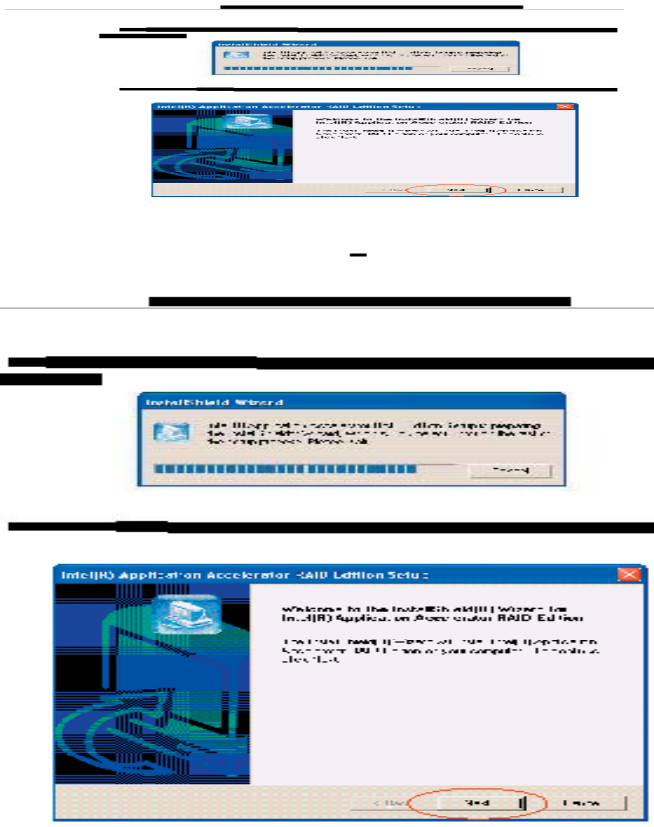
Note: the current version of the ICH7R SATA RAID Utility can only support Windows XP/2000/2003 Operating Systems.



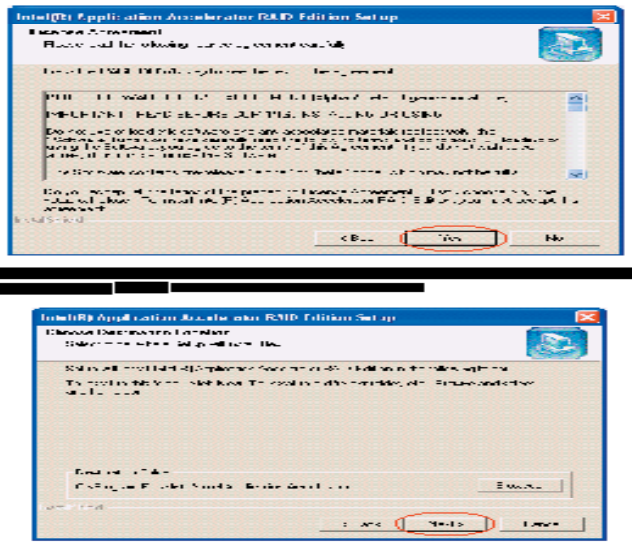
Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on 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.

C-3 Installing the Intel Application Accelerator Utility

a. When the above screen appears, click on the icon marked "Application Accelerator RAID Edition" on the screen, and the following screen will appear:

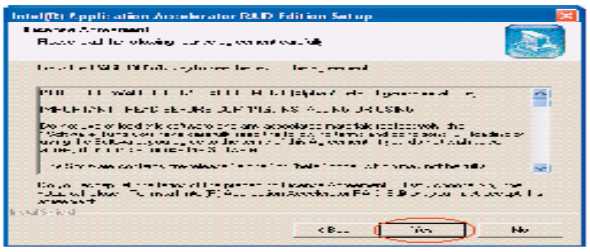


b. When the above screen appears, click on the icon marked "Next" on the screen, and the following screen will appear:

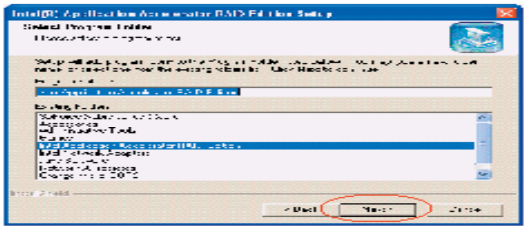


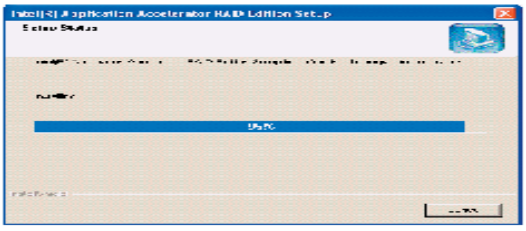
c. After reading the License Agreement, click on the icon marked "Yes" on the screen, and the following screen will appear:

d. Specify the folder that you want the program to be installed in and then, click on the icon marked "Next" to begin the installation process.

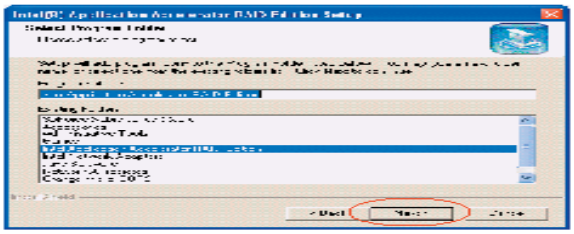


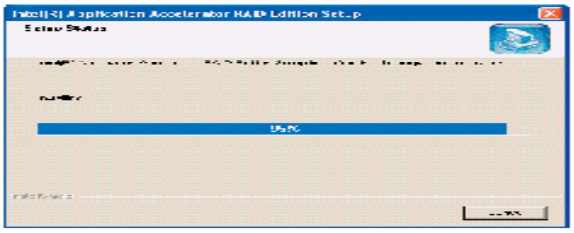
e. Specify a program folder where you want the Setup to add the program icon as shown in the following screen and click on the icon marked "Next".



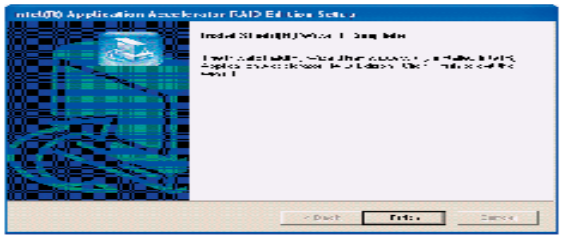


f. The following screen will appear to display the status of the Intel Application Accelerator RAID Edition Installation.





g. Once the Application Accelerator RAID Edition installation is completed, the following screen will appear and the system will start to re-boot.

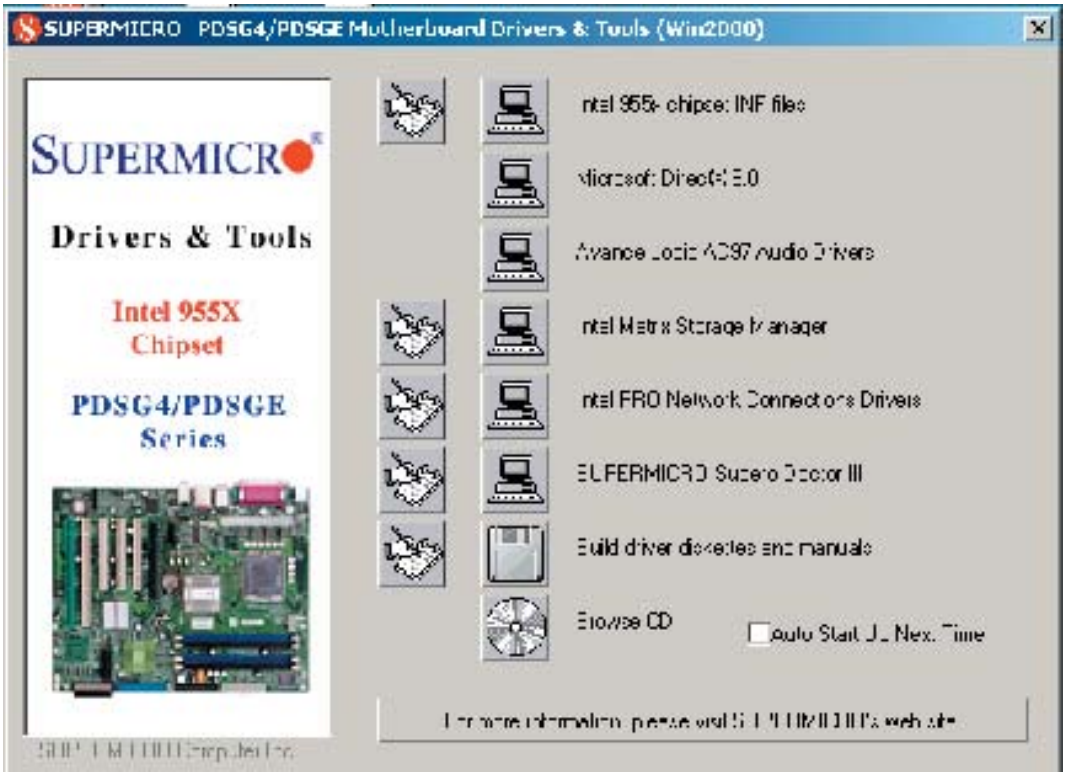


Note: Once the XP/2000/2003 Operating System is installed, please read the "Readme text files" for the instructions to use the SATA RAID Utility in the Windows XP/2000/2003 OS environment.

C-4 Installing the Operating System and other Software Programs

After all the hardware has been installed, you must first install the operating system and then other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

Note: for Windows 2003, please refer to Page C-14.



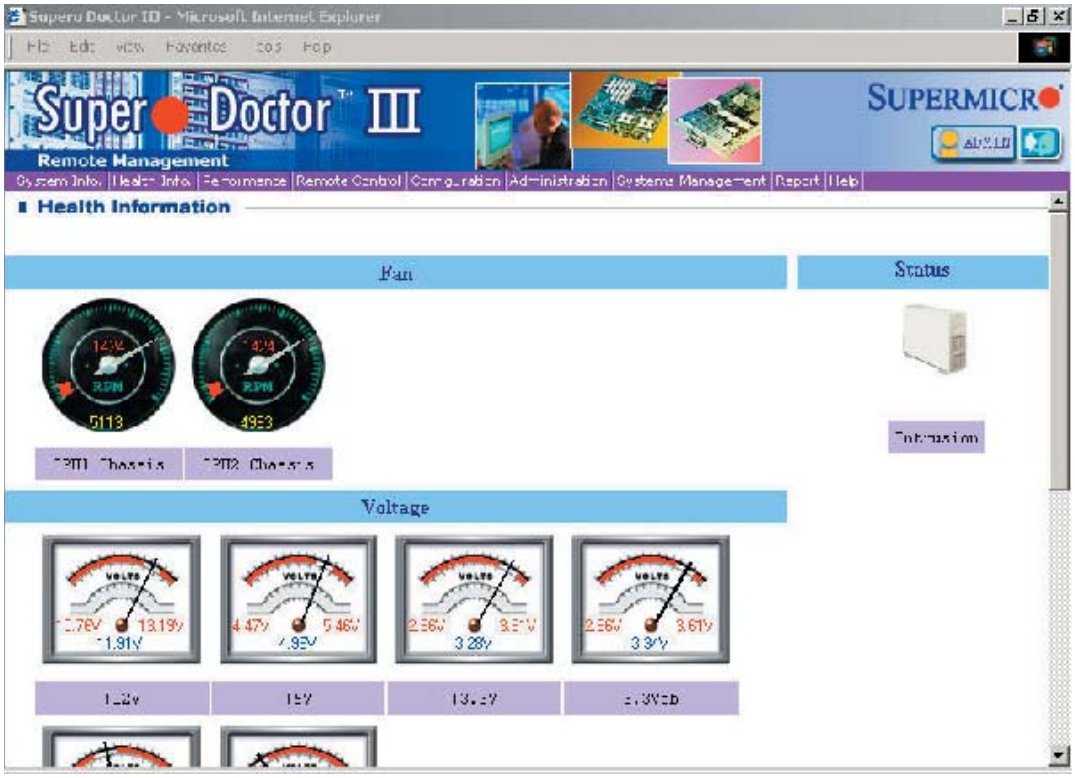
Driver/Tool Installation Display Screen

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

Supero Doctor III Interface Display Screen-I (Health Information)



Supero Doctor III Interface Display Screen-II (Remote Control)

Note: SD III Software Revision 1.0 can be downloaded from our Website at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend Supero Doctor II.

Notes

Appendix D

System Specifications

Processors

Single Intel Pentium D or Pentium 4 LGA775 processors to 3.80 GHz at a front side (system) bus speed of 1066/800/533 MHz.

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

Chipset

Intel 955X chipset

BIOS

8 Mb Award® Flash ROM

Memory Capacity

Four 240-pin DIMM sockets supporting up to 8 GB of unbuffered ECC DDR2-666/533/400 SDRAM (single or dual-channel)

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 ICH7R on-chip controller for 4-port Serial ATA (RAID0, 1, 5 and 10 supported)

Serial ATA Drive Bays

Four (4) hot-swap drive bays to house four (4) standard 1" Serial ATA drives

Peripheral Drive Bays

One (1) 3.5" floppy drive
Two (2) 5.25" drive bays

Expansion Slots
Chassis: Seven (7) I/O chassis slots
Motherboard: total of seven (7) PCI-E/PCI-X/PCI slots

Motherboard
Model: PDSGE (ATX form factor)
Dimensions: 12 x 9.6 in (305 x 244 mm)

Chassis
SC733T-450
Form Factor: Mid Tower
Dimensions: (WxHxD) 7 x 16.7 x 20.8 in. (178 x 424 x 528 mm)

Weight
Gross (Bare Bone): 34 lbs. (15.5 kg.)

System Cooling
One (1) 12-cm exhaust fan
One (1) 9-cm cooling fan

System Input Requirements
AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 100 (10A) ~ 240V (5A)
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 450W (Model# SP450-RP, Part# PWS-045)
Rated Output Voltages: +3.3V (30A), +5V (30A), +12V (34A), -12V (1A), +5Vsb (2A)

BTU Rating
2825 BTUs/hr (for rated output power of 450W)

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

Regulatory Compliance

Electromagnetic Emissions:
FCC Class 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