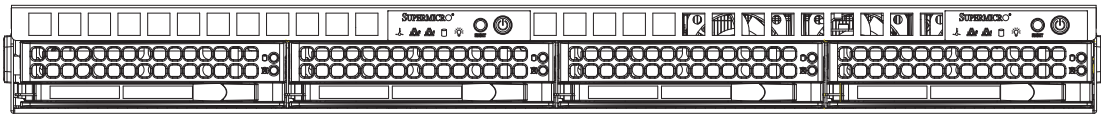


# SUPERO<sup>®</sup>

## SUPERSERVER 6015TC-LFT



## USER'S MANUAL

Revision 1.0

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Manual Revision 1.0  
Release Date: March 4, 2009

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# Preface

## About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6015TC-LFT. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 6015TC-LFT is a 1U Twin (two serverboards in a 1U chassis) rack-mount server based on the SC808T-780B server chassis and two Super X7DCT-LF serverboards. X7DCT-LF supports dual Intel® Xeon® 5400/5300/5200/5100 Series processors.

## Manual Organization

### Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super X7DCT-LF serverboard and the SC808T-780B chassis.

### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6015TC-LFT into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

### Chapter 3: System Interface

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

### Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6015TC-LFT.

## **Chapter 5: Advanced Serverboard Setup**

Chapter 5 provides detailed information on the X7DCT-LF serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

## **Chapter 6: Advanced Chassis Setup**

Refer to Chapter 6 for detailed information on the SC808T-780B 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS/SATA or peripheral drives and when replacing system power supply units and cooling fans.

## **Chapter 7: BIOS**

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

## **Appendix A: BIOS Error Beep Codes**

## **Appendix B: Installing Windows OS**

## **Appendix C: System Specifications**

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### **Appendix A BIOS POST Error Codes**

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# Chapter 1

## Introduction

### 1-1 Overview

The SuperServer 6015TC-LFT is a "1U Twin" server comprised of the SC808T-780B 1U chassis and two (twin) X7DCT-LF serverboards. Please refer to our web site for information on operating systems that have been certified for use with the 6015TC-LFT ([www.supermicro.com](http://www.supermicro.com)).

In addition to the serverboard and chassis, various hardware components may have been included with the 6015TC-LFT, as listed below.

- Four (4) CPU heatsinks (SNK-P0017)
- SATA Accessories:
  - Four (4) SATA hard drive carriers (MCP-220-00001-03)
  - One (1) internal SATA backplane (BPN-SAS-808)
  - One (1) SATA cable set (CBL-0201L)
- Two (2) PCI-E x16 riser cards (RSC-R1U-E16R)
- Six (6) 4-cm high-performance fans (FAN-0085L4)
- Rackmount hardware with screws (CSE-PT51L):
  - Two (2) rack rail assemblies
  - Six (6) brackets for mounting the rack rails in a rack/telco rack
- One (1) CD containing drivers and utilities
- SuperServer 6015TC-LFT User's Manual

## 1-2 Serverboard Features

At the heart of the SuperServer 6015TC-LFT are two X7DCT-LF dual processor serverboards, which are based on Intel's 5100/ICH9R chipset. Below are the main features of the X7DCT-LF. Note that the features on each board are doubled for the server.

### Processors

Each X7DCT-LF supports dual Intel® Xeon® 5400/5300/5200/5100 Series processors. Please refer to our web site for a complete listing of supported processors ([www.supermicro.com](http://www.supermicro.com)).

### Memory

The X7DCT-LF has six 240-pin DIMM sockets that can support up to 48 GB of registered ECC DDR2-667/533 SDRAM. Memory can be installed in both interleaved (dual-channel) and non-interleaved (single-channel) configurations. All memory modules used to populate the system should be the same size, type and speed.

### Serial ATA

The South Bridge (ICH9R) of the chipset includes a Serial ATA controller for six Gb/s SATA drives. The hot-swappable SATA drives are connected to a backplane that provides power, bus termination and configuration settings. RAID 0, 1, 5 (with optional i-Button) and 10 are supported. Refer to the support area of our web site for procedures on setting up RAID on your system.

### PCI Expansion Slots

Each X7DCT-LF board has one PCI-Express 2.0 x16 slot, so two PCI-Express x16 slots are provided in the server. In the 6015TC-LFT server configuration, riser cards have been pre-installed to support two low-profile PCI-Express x16 add-on cards.

### Ethernet Ports

Two Intel® network controllers (Intel 82575) are integrated into each of the serverboards to support a total of four Gigabit LAN ports (100/1000Base-T/1000BaseTX, RJ45 output).

### **Onboard Controllers/Ports**

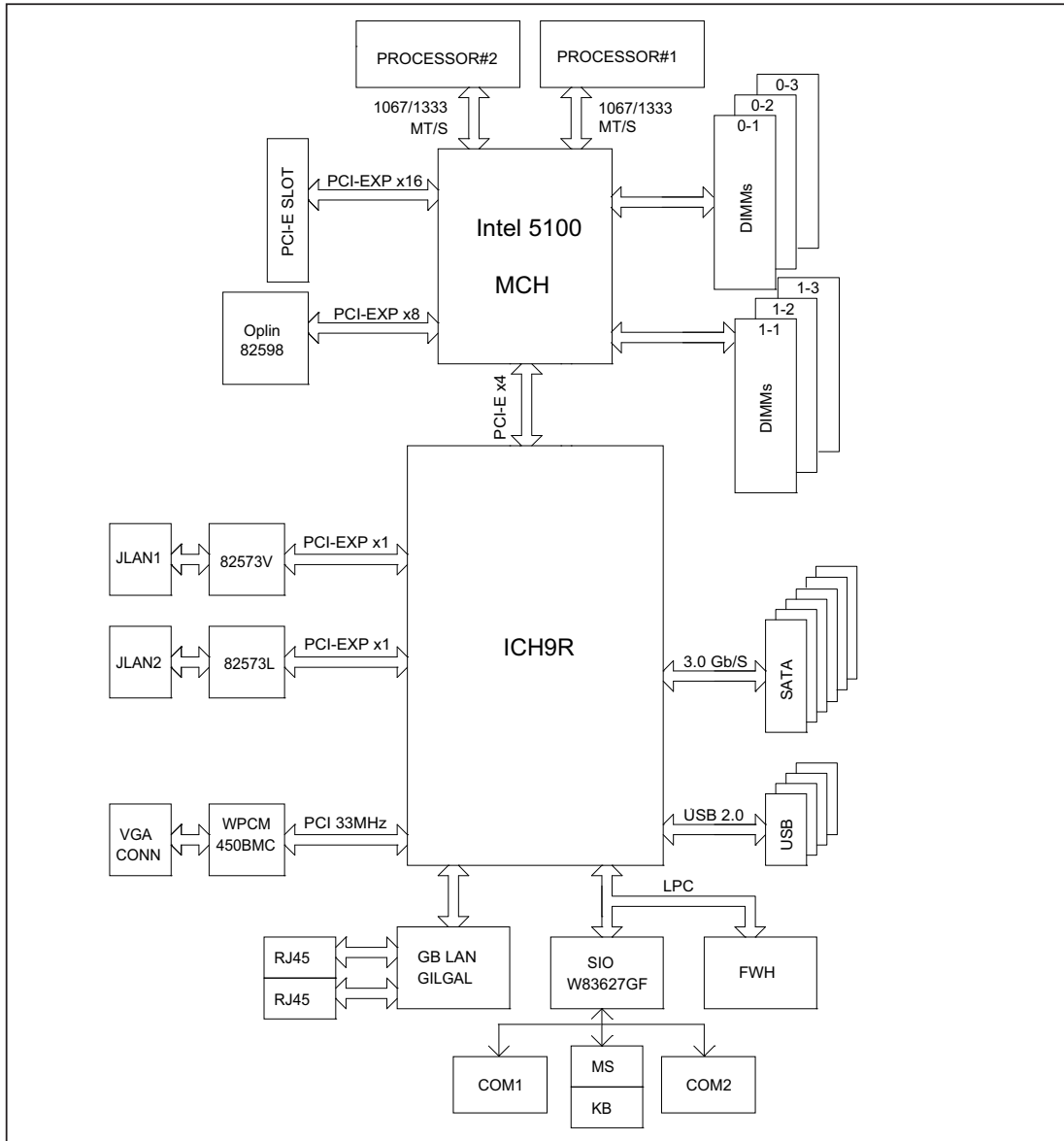
Onboard I/O backpanel ports on each serverboard include one COM port, a VGA port, two USB ports and two Gigabit LAN (NIC) ports. There are two sets of I/O ports included in the server (one set for each serverboard).

### **ATI Graphics Controller**

The X7DCT-LF features an integrated Winbond WPCM450 BMC graphics controller. The WPCM450 includes support for IPMI 2.0.

### **Other Features**

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



**Figure 1-1. Intel 5100 Chipset:  
System Block Diagram**

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

## 1-3 Server Chassis Features

The following is a general outline of the main features of the SC808T-780B 1U chassis. Details on the chassis can be found in Chapter 6.

### **System Power**

When configured as a SuperServer 6015TC-LFT, the SC808T-780B includes a single 780W cold-swap power supply, which provides the power to both serverboards housed in the chassis.

### **SATA Subsystem**

The SC808T-780B chassis was designed to support four SATA hard drives, which are hot-swappable units.

### **Control Panel**

The SC808T-780B features two independent control panels associated with each serverboard in the chassis. Each control panel has LEDs to indicate power on, network activity, hard disk drive activity and system overheat conditions. Each control panel also includes a main power button and a system reset button.

### **Rear I/O Panel**

The SC808T-780B is a 1U rackmount chassis. Its I/O panel provides a slots for two low-profile PCI-E x16 expansion cards, two COM ports, four USB ports, two VGA ports and four Gb Ethernet ports. See Chapter 6 for details.

### **Cooling System**

The SC808T-780B chassis has an innovative cooling design that features two sets of triple (for a total of six) 4-cm high-performance fans. A fan speed control setting in BIOS allows fan speed to be determined by system temperature.

## 1-4 1U Twin: System Notes

As a 1U Twin configuration, the 6015TC-LFT is a unique server system. With two system boards incorporated into a single chassis, there are several points you should keep in mind.

### System Power

A single power supply is used to provide the power for both serverboards. Each serverboard however, can be shut down independently of the other with the power button on its own control panel.

Although they share a common power supply, the I<sup>2</sup>C signals used for power supply monitoring are received by the primary serverboard only. (When viewed from the front of the chassis, the serverboard on the left is referred to as the primary board and the serverboard on the right as the secondary.)

### SATA Backplane/Drives

As a system, the 6015TC-LFT supports the use of four SATA drives. The SATA backplane works as a single backplane divided into two sections. This means that while a single power connector is used and functions such as overheating apply to both sections together, each pair of SATA drives is logically connected to its own serverboard. Consequently, RAID setup is limited to a two-drive scheme (RAID cannot be spread across all four drives).

## 1-5 Contacting Supermicro

### Headquarters

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980 Rock Ave.  
San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

Email: marketing@supermicro.com (General Information)  
support@supermicro.com (Technical Support)

Web Site: www.supermicro.com

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Web Site: www.supermicro.com.tw

Technical Support:

Email: support@supermicro.com.tw

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

**Notes**

# Chapter 2

## Server Installation

### 2-1 Overview

This chapter provides a quick setup checklist to get your 6015TC-LFT up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

### 2-2 Unpacking the System

You should inspect the box the 6015TC-LFT was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the 6015TC-LFT. 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. Be sure to read the Rack and Server Precautions in the next section.

### 2-3 Preparing for Setup

The box the 6015TC-LFT was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

#### Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

## Rack Precautions



### Warnings and Precautions!



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

## Server Precautions

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

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.
- Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

## **Rack Mounting Considerations**

### ***Ambient Operating Temperature***

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

### ***Reduced Airflow***

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

### ***Mechanical Loading***

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

### ***Circuit Overloading***

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

### ***Reliable Ground***

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

## 2-4 Installing the System into a Rack

This section provides information on installing the 6015TC-LFT into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

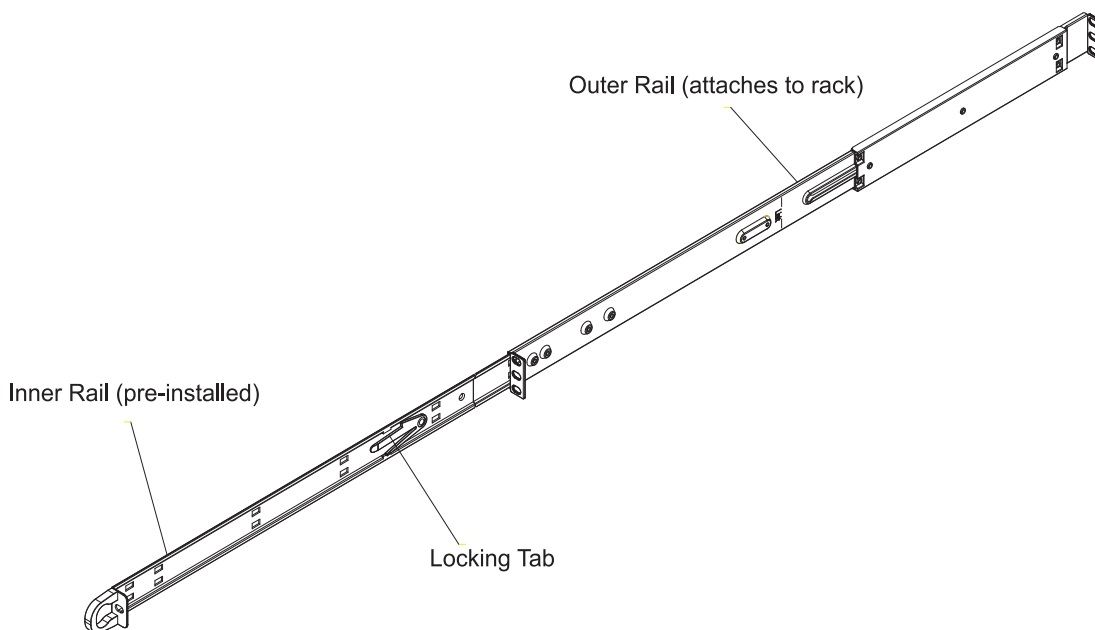
### Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself (see Figure 2-1). Two pairs of short brackets to be used on the front side of the outer rails are also included.

### Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step.

**Figure 2-1. Identifying the Sections of the Rack Rails  
(right side rail shown)**



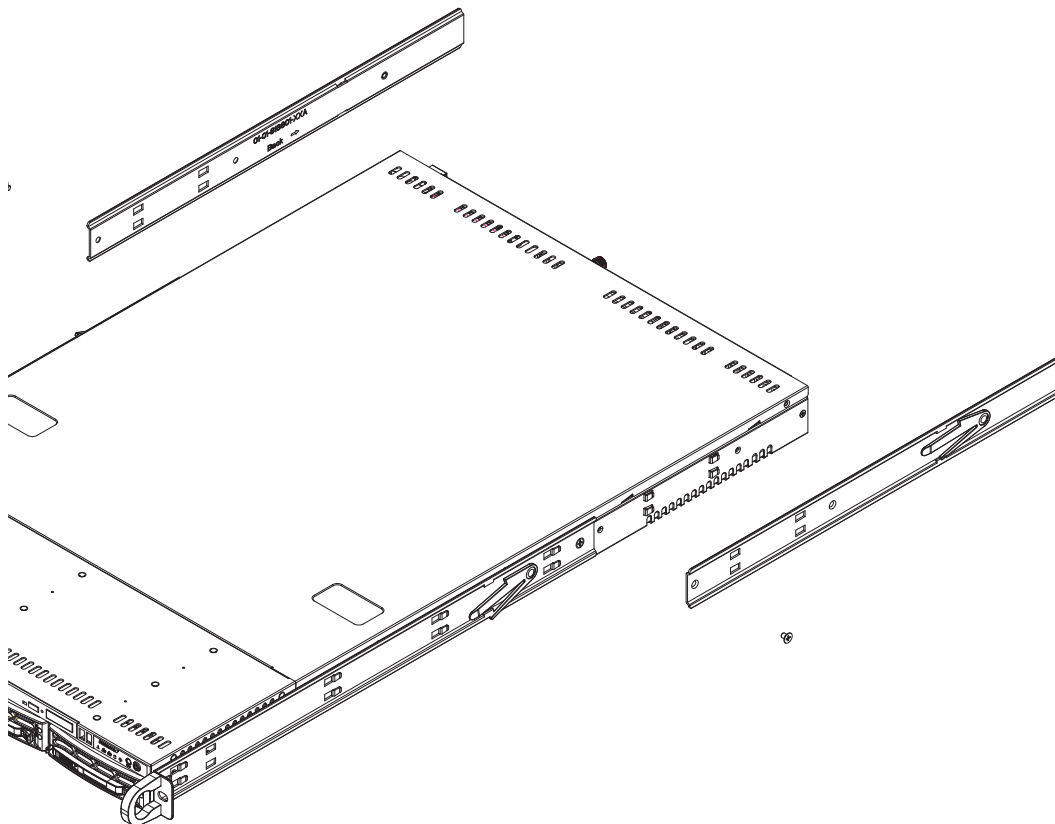
## Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two M4 screws and the long bracket to the rear side of the outer rail with three M4 screws. Repeat these steps for the left outer rail.

### *Locking Tabs*

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

Figure 2-2. Installing the Rack Rails



## Installing the Server into the Rack

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

When the server has been pushed completely into the rack, you should hear the locking tabs "click".

## Installing the Server into a Telco Rack

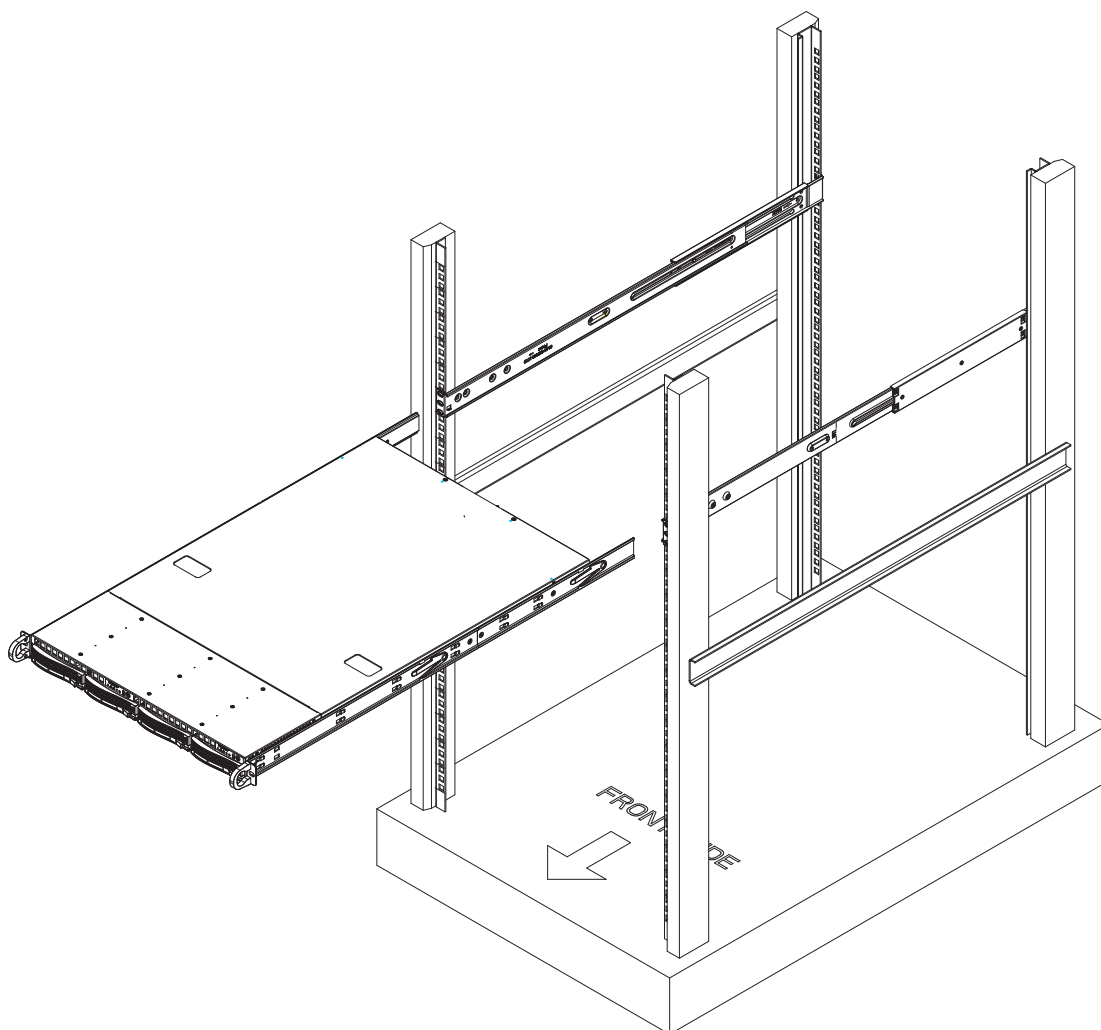
To install the SuperServer 6015TC-LFT into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

## 2-5 Checking the Serverboard Setup

After you install the 6015TC-LFT in the rack, you will need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

### *Accessing the Inside of the System*

1. Grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click").
2. Remove the four screws (two on the sides and two on the top) that secure the top cover to the chassis. Place your thumbs in the two rectangular recesses and push the cover away from you (toward the rear of the chassis) until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server (see Figure 2-4).
3. To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

**Figure 2-3. Installing the Server into a Rack*****Checking the Components and Setup***

1. You may have one or two processors already installed in each of the two serverboards. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.
2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.
3. You can install two add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.
4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

## 2-6 Preparing to Power On

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

### ***Checking the SATA drives***

1. The SATA disk drives are accessible from the front of the server and can be installed and removed from the front of the chassis without removing the top chassis cover.
2. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SATA drives, please refer to Chapter 6.

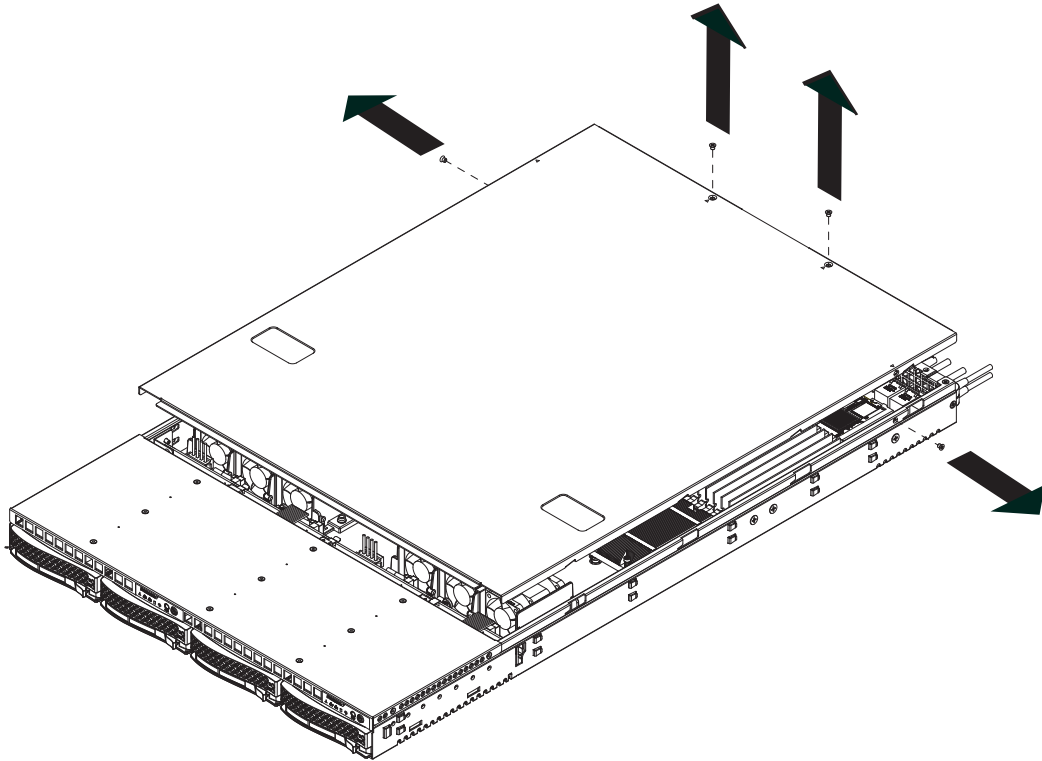
### ***Checking the Airflow***

1. Airflow is provided by six sets of 4-cm PWM fans (each set of fans consists of two fans that are mounted back to back) and an air shroud. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.
2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

### ***Providing Power***

1. Plug the power cords from the power supplies unit into a high-quality power strip that offers protection from electrical noise and power surges.
2. It is recommended that you use an uninterruptible power supply (UPS).
3. Finally, depress the power on button on the front of the chassis.

Figure 2-4. Accessing the Inside of the System



**Notes**

# Chapter 3

## System Interface

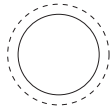
### 3-1 Overview

There are several LEDs on the two control panels as well as others on the SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on each control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take. Note that the server has two control panels, one for each serverboard installed in the system. This allows each serverboard to be controlled independently of the other.

### 3-2 Control Panel Buttons

There are two push-buttons located on each control panel: a reset button and a power on/off button.

RESET



**Reset**

Depressing the reset button will reboot only the serverboard it is associated with.



**Power**

This is the main power button, which is used to apply or turn off the main system power only to the serverboard it is connected to. Depressing this button removes the main power but keeps standby power supplied to the serverboard.

### 3-3 Control Panel LEDs

Each of the two control panels located on the front of the SC808T-780B chassis has five LEDs. Each LED provides you with critical information related its own specific serverboard. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



#### Overheat/Fan Fail

When this LED flashes, it indicates a fan failure. When on continuously 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 indicated condition exists.



#### NIC2

Indicates network activity on LAN2 when flashing



#### NIC1

Indicates network activity on LAN1 when flashing.



#### HDD

Channel activity for the hard disk drives. This light indicates SATA drive activity on the 6015TC-LFT when flashing.



## **Power**

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

### **3-4 SATA Drive Carrier LEDs**

Each SATA drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SATA drive carrier indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red:** There is no function associated with the red LED.

**Notes**

# Chapter 4

## System Safety

### 4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6015TC-LFT from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the 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.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.
- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

## 4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the 6015TC-LFT clean and free of clutter.
- The 6015TC-LFT 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 after ensuring that all connections have been made.

### 4-3 ESD Precautions



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

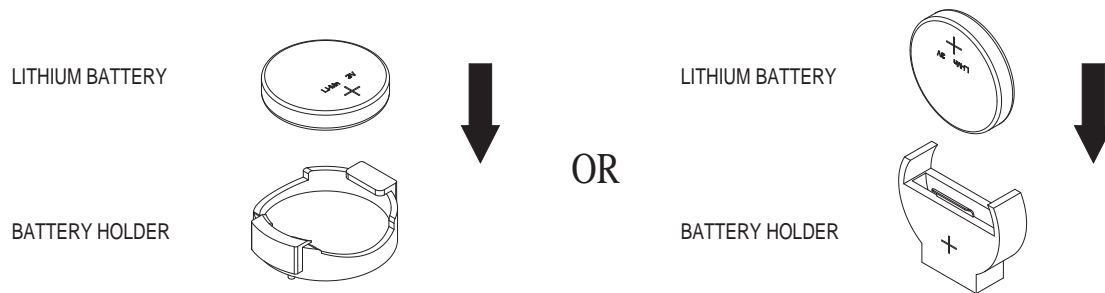
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact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

## 4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the 6015TC-LFT is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

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



## Chapter 5

### Advanced Serverboard Setup

This chapter covers the steps required to install the X7DCT-LF serverboard into the SC808T-780B chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

#### 5-1 Handling the Serverboard

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the X7DCT-LF serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

##### Precautions

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

## Unpacking

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

## 5-2 Serverboard Installation

This section explains the first step of physically mounting the X7DCT-LF into the SC808T-780B chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

### ***Accessing the Inside of the System***

1. Remove all four screws securing the top cover of the chassis: two at the top rear of the cover and one on each side lip, also near the back.
2. Place both thumbs in the indentations and push the cover back until it slides off.
3. Lift the top cover from the chassis to gain full access to the inside of the server. (If already installed in a rack, grasp the two handles on either side and pull the unit straight out until the rails lock into place. See Figure 2-5.)

### ***Check Compatibility of Serverboard Ports and I/O Shield***

1. The X7DCT-LF in a Twin 1U configuration requires the use of Supermicro's specially designed 1U Twin chassis: the SC808T-780B.
2. Make sure that the I/O ports on the serverboards align properly with their respective holes in the I/O shield at the back of the chassis when installing.

### ***Mounting the Serverboard onto the Serverboard Tray***

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

## 5-3 Connecting Cables

Now that the serverboards are installed, the next step is to connect the cables to the boards. These include the data cables for the peripherals and control panel and the power cables.

### Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed 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 serverboard layout for connector locations.) Note that each connection listed should be made for both serverboards in the chassis.

- SATA drive cables (SATA0 ~ SATA1)
- Control Panel cable (JF1)

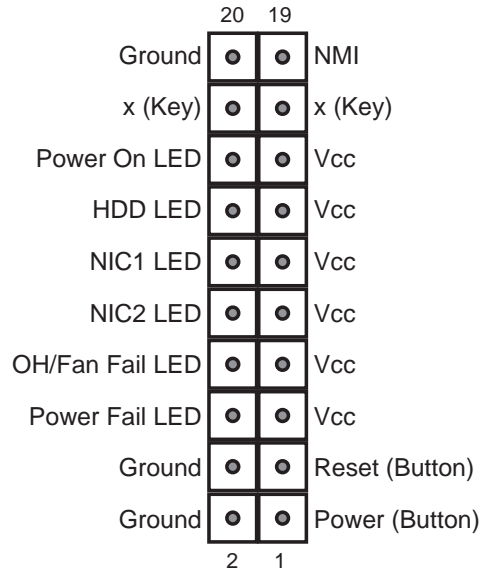
### Connecting Power Cables

The X7DCT-LF has two 20-pin ATX power supply connectors for connection to the ATX power supply. Only one of these from each board should be connected to the power supply. The "Primary ATX Power Header" (JWR1) is used to supply power to the primary serverboard and the "Secondary ATX Power Header" (JWR2) is used to supply power to the secondary serverboard. Connect the power supply to only one of these on both boards (primary = left, secondary = right when viewed from front of server). 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.

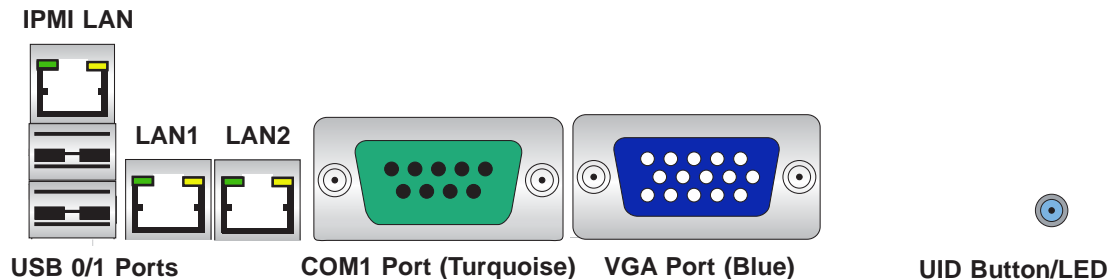
**Figure 5-1. Control Panel Header Pins**



## 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 Processor and Heatsink Installation



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

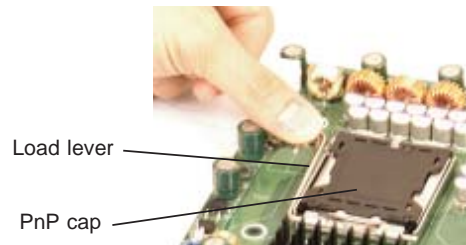
**IMPORTANT!** Always connect the power cord last and remove it first before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket *before* you install the heatsink and fan. The X7DCT-LF can support either one or two processors. If installing one processor only, install it into the CPU1 socket.

### Notes:

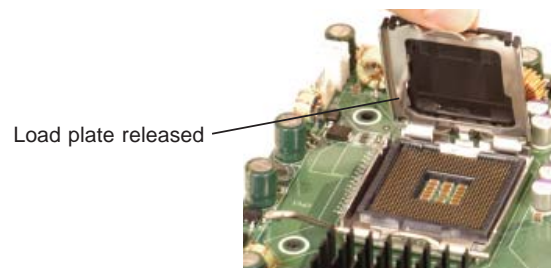
1. Intel's boxed Xeon CPU package contains a CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel-certified multi-directional heatsinks and fans.
2. When purchasing a Xeon CPU or when receiving a serverboard with a CPU pre-installed, make sure that the CPU plastic cap is in place and none of the CPU pins are bent; otherwise, contact the retailer immediately.

### Installing the Processor

1. A black PnP cap is attached to the load plate to protect the CPU socket. Press the load lever down and away from the retention clasp to release the load plate from its locked position.



2. Gently lift the load lever to open the load plate.



3. Use your thumb and your index finger to hold the CPU at opposite sides.

4. Align pin1 of the CPU (the corner marked with a triangle) with the notched corner of the CPU socket.

5. Find the corner of the CPU that has a semi-circle cutout below a gold dot (CPU key). This corner should be aligned with the cutout on the socket (socket key).

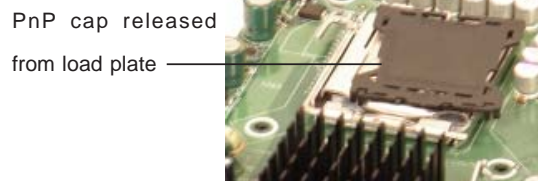
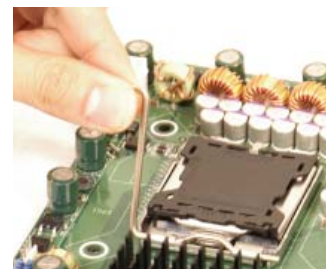
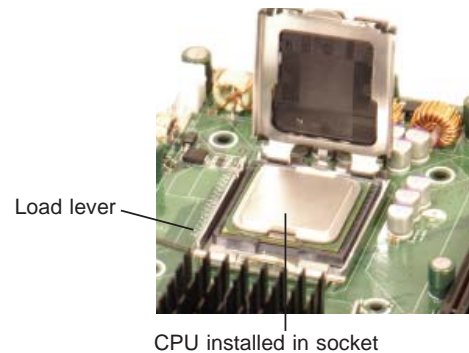
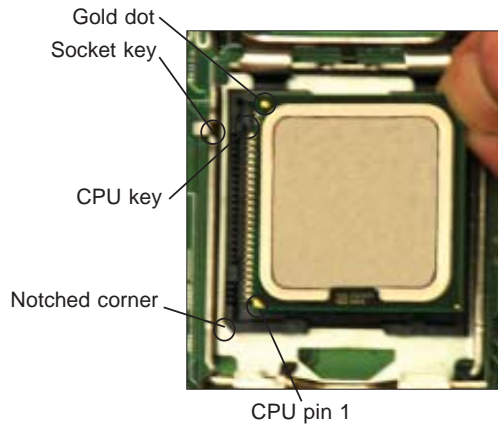
6. Once aligned, carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket, do not move the CPU horizontally or vertically and do not rub the CPU against any surface or any of the contacts, which may damage the CPU and/or contacts.

7. With the CPU in the socket, inspect the four corners of the CPU to make sure that it is properly installed.

8. Use your thumb to gently push the load lever down until it snaps into the retention clasp.

9. If the CPU is properly installed into the socket, the PnP cap will be automatically released from the load plate when the lever locks. Repeat steps to install a second CPU if desired.

**Warning!** Keep the plastic PnP cap. The serverboard must be shipped with the PnP cap properly installed to protect the CPU socket. Shipment without the PnP cap properly installed will void the warranty.



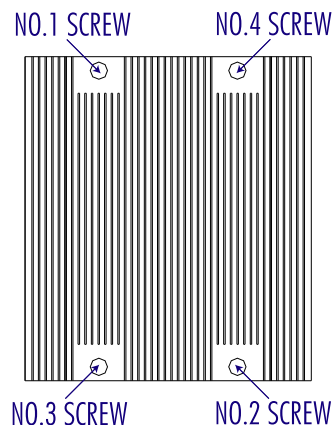
## Installing the Heatsink

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

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the (preinstalled) heatsink retention mechanism.

3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug. Do not fully tighten the screws or you may damage the CPU.)

4. Add the two remaining screws then finish the installation by fully tightening all four screws.



## Removing the Heatsink



**Warning!** We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to prevent damage to the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws from the serverboard in the sequence as show in the picture above.
2. Hold the heatsink and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)
3. Once the heatsink is loose, remove it from the CPU.
4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the heatsink.

## 5-6 Installing Memory



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

### Memory Support

The X7DCT-LF has six 240-pin DIMM slots that can support up to 48 GB of registered ECC DDR2-667/533 SDRAM (for a total of 96 GB in the system).

The memory scheme is interleaved, so you must populate two slots at a time, beginning with slot 1A and 1B, then slots 2A and 2B, and finally into slots 3A and 3B if six DIMMs are to be installed. See table below.

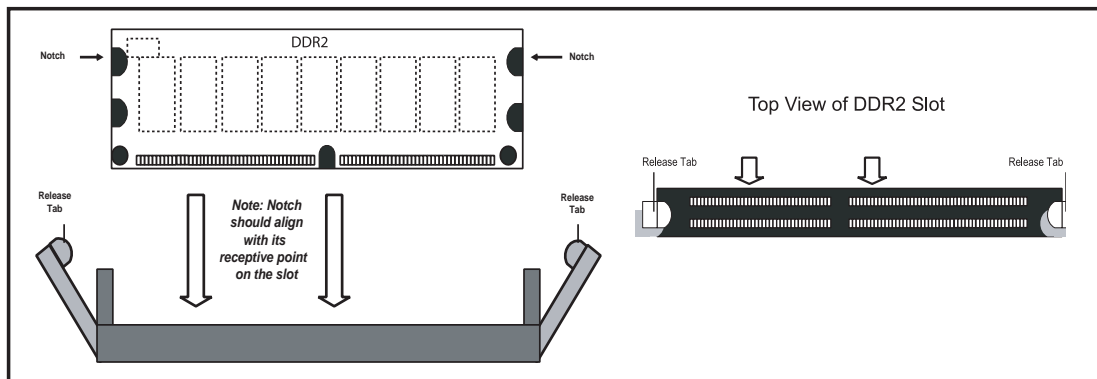
### Installing Memory Modules

1. Insert each memory module vertically, beginning with slots 1A and 1B (see above). Pay attention to the notches along the bottom of the module to prevent inserting it incorrectly.
2. Gently press down on the DIMM module until it snaps into place in the slot (see Figure 5-3).
3. Repeat to install a total of four or six DIMMs.

Optimized DIMM Configurations						
No. of DIMMs	Channel 0			Channel 1		
2	DIMM1A	-----	-----	DIMM1B	-----	-----
4	DIMM1A	DIMM2A	-----	DIMM1B	DIMM2B	-----
6	DIMM1A	DIMM2A	DIMM3A	DIMM1B	DIMM2B	DIMM3B

Notes: i. DIMM slot# specified = DIMM slot to be populated; “---” = DIMM slot not to be populated. ii. Both 533 MHz and 667MHz memory is supported; however, you need to use modules of the same speed and type. iii. For memory to work properly, you need to follow the restrictions listed above.

**Figure 5-3. DIMM Installation**



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.

**Note:** Due to memory allocation to system devices, memory remaining available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional (see the following table for details).

Possible System Memory Allocation & Availability			
System Device	Size	Physical Memory Remaining (Available) (3 GB Total System Memory)	Physical Memory Remaining (Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.00	3.99
Local APIC	4 KB	3.00	3.99
Area Reserved for the chipset	2 MB	3.00	3.99
I/O APIC (4 Kbytes)	4 KB	3.00	3.99
PCI Enumeration Area 1	256 MB	3.00	3.76
PCI Express (256 MB)	256 MB	3.00	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.00	3.01
VGA Memory	16 MB	2.85	2.85
TSEG	1 MB	2.84	2.84
Memory available to OS & other applications		2.84	2.84

## 5-7 Adding PCI Cards

### *PCI-Express Slot*

The 6015TC-LFT includes two preinstalled riser cards designed specifically for use in the SC808T-780B 1U rackmount chassis. These riser cards support two low-profile PCI-Express x16 cards to fit inside the chassis.

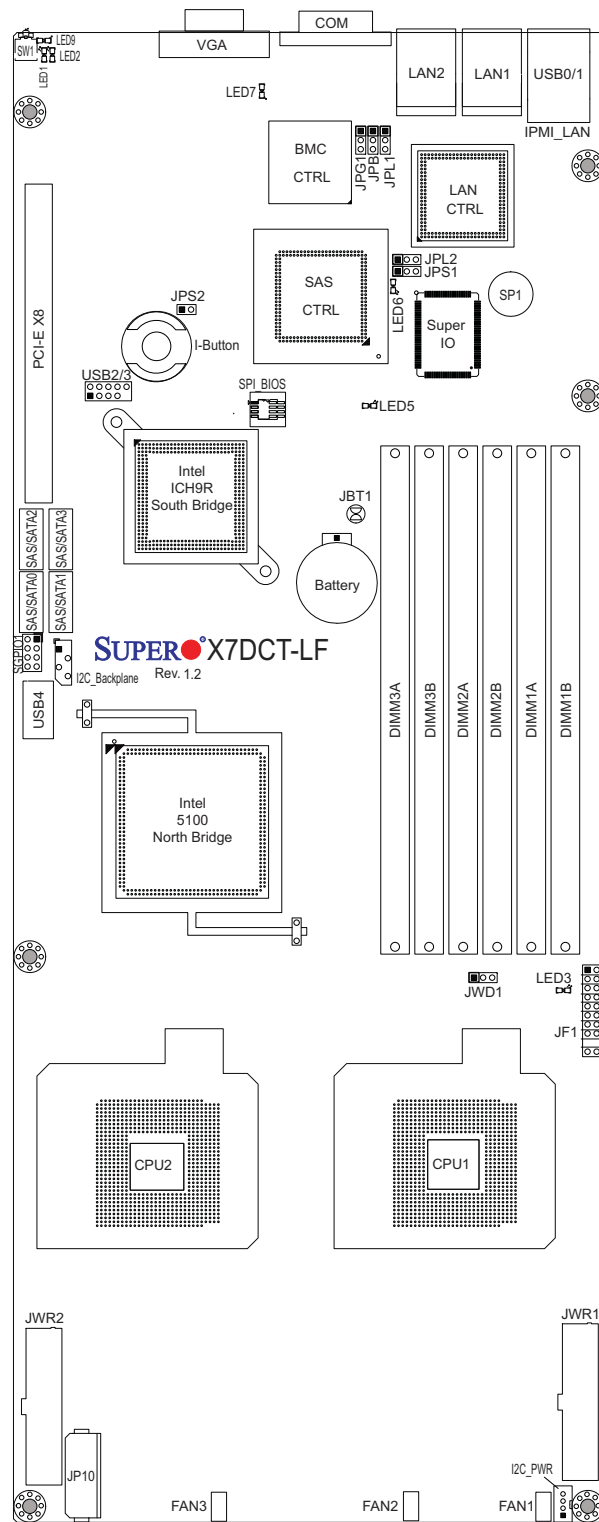
### *PCI Card Installation*

The riser card has already been preinstalled into the serverboard. Perform the following steps to add a PCI add-on card:

1. Remove the PCI slot shield on the chassis by releasing the locking tab.
2. Insert the add-on card into the riser card.
3. Secure the add-on card with the locking tab.

## 5-8 Serverboard Details

Figure 5-4. X7DCT-LF Layout



## X7DCT-LF Quick Reference

<b>Jumper</b>	<b>Description</b>	<b>Default Setting</b>
JBT1	CMOS Clear	(See Section 5-10)
JPB	BMC Enable/Disable	Pins 1-2 (Enabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1/JPL2	LAN1/2 Enable/Disable	Pins 1-2 (Enabled)
JPS1	SAS Enable/Disable	Pins 1-2 (Enabled)
JPS2	SAS Mode Select	Open (IT RAID)
JWD	Watch Dog	Pins 1-2 (Reset)

<b>Connector</b>	<b>Description</b>
COM	COM (Serial) Port
FAN 1-3	System Fan Headers
I <sup>2</sup> C_PWR	I <sup>2</sup> C Power Connector
IPMI LAN	IPMI LAN Port
JF1	Control Panel Header
JP10	4-pin Power Connector (for HDDs)
JWR1	20-pin ATX Power Connector
JWR2	20-pin ATX Power Connector
LAN1/2	Gigabit Ethernet (RJ45) Ports
SATA 0 ~ SATA 3	Intel ICH9R SATA Ports 0 ~ 3
SAS 0 ~ SAS 3	LSI SAS Ports 0 ~ 3
SGPIO	Serial General Purpose Input/Output Header
SW1	UID (Unit Identifier) Switch
USB0/1	Universal Serial Bus (USB) Ports
USB2/3, USB4	Universal Serial Bus (USB) Headers

<b>LED</b>	<b>Description</b>
LE3	Onboard Power LED
LE5	SAS Activity LED
LE6	SAS Heartbeat LED
LE7	BMC Heartbeat LED
LE9	UID (Unit Identifier) LED

Note: Jumpers not indicated are for test purposes only.

## 5-9 Connector Definitions

### ATX Power Connector

The main ATX power supply connectors on the X7DCT-LF are proprietary 20-pin connections. Refer to the table on the right for the pin definitions. Only one of the two ATX power connectors from each serverboard should be connected to the power supply.

ATX Power 20-pin Connector Pin Definitions (ATX Power 1/2)			
Pin#	Definition	Pin #	Definition
11	PS On	1	Ground
12	5VSB	2	Ground
13	Ground	3	Ground
14	Ground	4	Ground
15	Ground	5	Ground
16	NC2	6	NC1
17	12V	7	12V
18	12V	8	12V
19	12V	9	12V
20	12V	10	12V

### Auxiliary Power Connector

A 4-pin 12V auxiliary power connector is included to provide power to hard drive disks. See the table on the right for pin definitions.

Auxiliary Power Pin Definitions (JP10)	
Pin#	Definition
1	+12V
2	Ground
3	Ground
4	+5V

### 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.

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

**NIC2 (LAN2) LED**

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

<b>NIC2 LED Pin Definitions (JF1)</b>	
Pin#	Definition
9	Vcc
10	Ground

**NIC1 (LAN1) LED**

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

<b>NIC1 LED Pin Definitions (JF1)</b>	
Pin#	Definition
11	Vcc
12	Ground

**HDD LED**

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

<b>HDD LED Pin Definitions (JF1)</b>	
Pin#	Definition
13	Vcc
14	HD Active

**Power On LED**

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

<b>Power LED Pin Definitions (JF1)</b>	
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

The X7DCT-LF has three 4-pin fan headers. See the table on the right for pin definitions.

**Note:** The onboard fan speed is controlled by the CPU die temperature.

Fan Header Pin Definitions (FAN1-3)	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

### LAN1/2 (Ethernet Ports)

Two gigabit Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.



### Universal Serial Bus (USB)

There are two Universal Serial Bus ports located on the I/O panel, two USB headers located on the serverboard and a third USB port (USB4) located onboard near the SGPIO header. The headers, labeled USB2 and USB3, can be used to provide front side USB access (cables not included). See the tables on the right for pin definitions.

USB Ports Pin Definitions (USB0/1/4)	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	N/A

USB Headers Pin Definitions (USB2/3)			
USB2		USB3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	No connection

## Serial Ports

One serial port is included on the serverboard. The COM port is located beside the VGA port. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

**Note:** NC indicates no connection.

## SGPIO Header

An SGPIO (Serial General Purpose Input/Output) header is included on the serverboard. This header is used to communicate with the System Monitoring chip on the backplane to monitor SATA activity. See the table on the right for pin definitions.

SGPIO Header Pin Definitions (SGPIO)			
Pin#	Definition	Pin	Definition
1	NC	2	*NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	*NC

**Note:** NC indicates no connection.

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

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

I <sup>2</sup> C Power Connector Pin Definitions (I <sup>2</sup> C_PWR)	
Pin#	Definition
1	Clock
2	Data
3	Power Fail
4	Ground
5	+3.3V

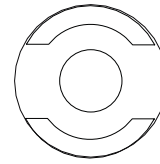
## Unit Identification Switches

There are two Unit Identification (UID) switches on each motherboard. The Control Panel UID Switch is connected to a JF1 pin. The Rear UID Switch (SW1) is located next to the VGA port. When you push the UID switch on the Control Panel, both the rear and control panel UID LEDs will be turned on. Push the front or rear UID switch again to turn off both Indicators.

UID Switch	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

## I-Button

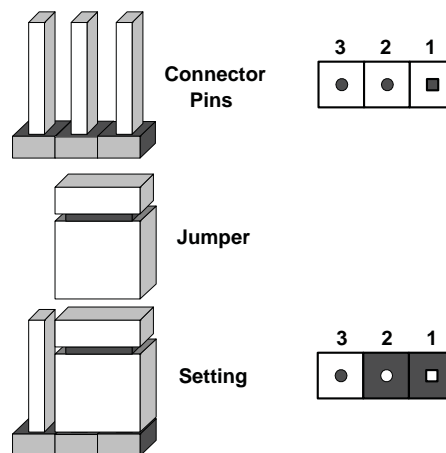
An onboard I-Button, located next to USB Ports 2~3, is a 1-wire computer chip enclosed in a durable stainless steel cylinder. The I-Button stores instructions, provides electronic interface and allows HostRAID to operate with Mega-RAID firmware.



## 5-10 Jumper Settings

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

**Note:** On 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.

### LAN1/LAN2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1 port and JPL2 to enable or disable the LAN2 port on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings (JPL1/2)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

### VGA Enable/Disable

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

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

### BMC IPMI Enable (X7DCT-3IBXF)

JPB allows the user to enable or disable BMC (Baseboard Management Control) Chip and the onboard IPMI connections. This jumper is to be used together with the IPMI settings in the BIOS. If this jumper is set to Enabled, please also enable IPMI settings in the BIOS and vice versa. The default position is on pins 1 and 2 to Enable BMC. See the table on the right for jumper settings.

**Note:** For more information on IPMI configuration, please refer to the Embedded IPMI User's Guide posted on our website: <http://www.supermicro.com/support/manuals/>.

BMC IPMI Enable/Disable Jumper Settings (JPB)	
Settings	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### SAS Enable/Disable

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

SAS Enable/Disable Jumper Settings (JPS1)	
Both Jumpers	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### SAS RAID Mode Select

JPS2 allows the user to select RAID Configuration Mode. The default position is open to use Integrated RAID (Hardware RAID). See the table on the right for jumper settings.

**Note:** For more information on the LSI SAS MegaRAID configuration, please refer to the LSI MegaRAID User's Guide posted on our website: <http://www.supermicro.com/support/manuals/>.

SAS RAID Mode Select Jumper Settings (JPS2)	
Both Jumpers	Definition
Open	IT RAID (Default)
Closed	Software RAID

## 5-11 Onboard Indicators

### LAN1/LAN2 LEDs

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

LAN LED (Connection Speed Indicator)	
LED Color	Definition
Off	No connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

### Onboard Power LED (LED3)

There is an Onboard Power LED (LE3) located near JF1. When this LED Indicator is on, the system power is on. Be sure to unplug the power cable before removing or adding any components. See the table on the right for indications.

Onboard Power LED Indicator (LED3)	
LED Color	Definition
Off	Power Off
Green: On	Power On

### SAS Activity LED

A SAS Activity LED Indicator is located at LED5 on the motherboard. When the green light is blinking, SAS connections are active. Refer to the table on the right for details. Also see the layout below for the LED location.

SAS Activity LED (LED5)		
Color	Status	Definition
Green	Blinking	SAS: Active
Off	Off	No Activity

### SAS Heartbeat LED

A SAS Heartbeat LED Indicator is located at LED6 on the motherboard. When this LED is blinking, SAS connections function normally. Refer to the table on the right for details. Also see the layout below for the LED location.

SAS Heartbeat LED (LED6)		
Color	Status	Definition
Green	Blinking	SAS: Normal
Off	Off	Not functioning normally

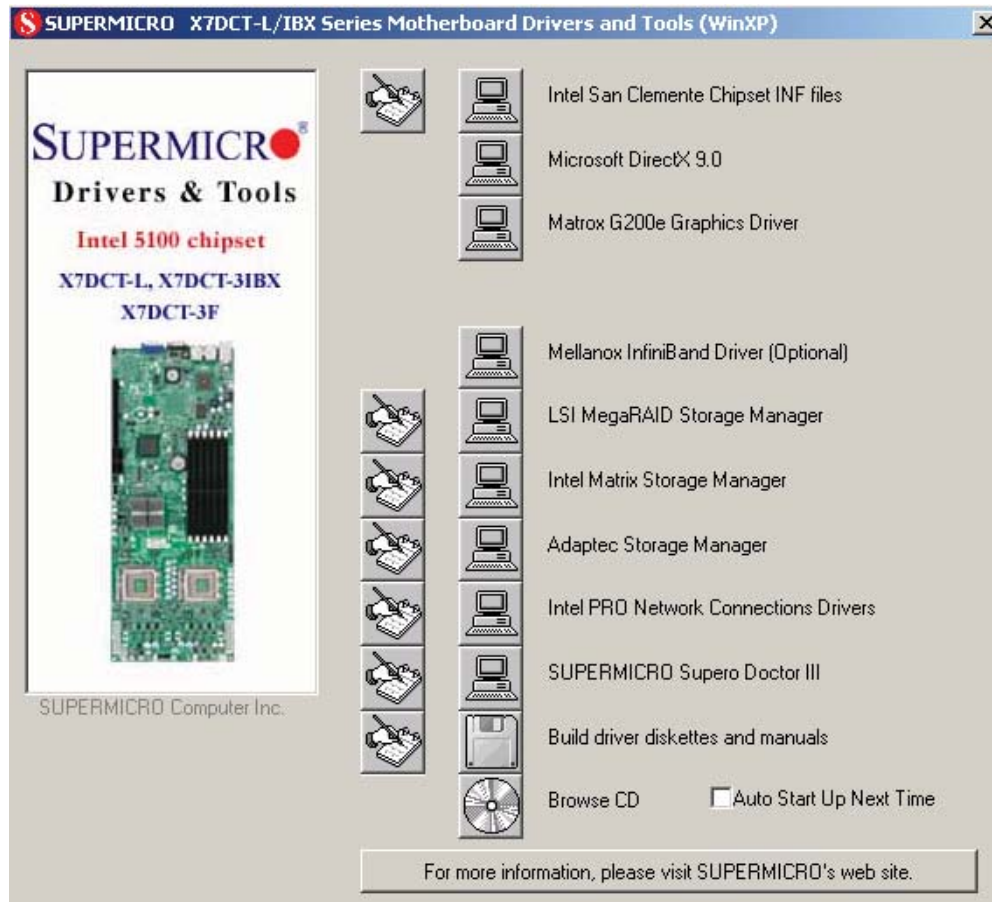
### BMC Heartbeat LED

A BMC (Baseboard Management Control) Heartbeat LED Indicator is located at LED7 on the motherboard. When this LED is blinking, BMC Controller functions normally. Refer to the table on the right for details. Also see the layout below for the LED location.

BMC Heartbeat LED (LED7)		
Color	Status	Definition
Green	Blinking	BMC: Normal
Off	Off	Not functioning normally

## 5-12 Installing Additional Drivers

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.



### Driver/Tool Installation Display Screen

**Note:** Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before proceeding with the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

## 5-13 Configuring 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 the 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.

**Notes:** The default User Name and the Password are ADMIN.

In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

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





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

**Notes**

## Chapter 6

### Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC808TS-780BP chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows. The only tool you will need to install components and perform maintenance is a Philips screwdriver.

#### 6-1 Static-Sensitive Devices

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

##### Precautions

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

##### Unpacking

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

Figure 6-1. Chassis Front View

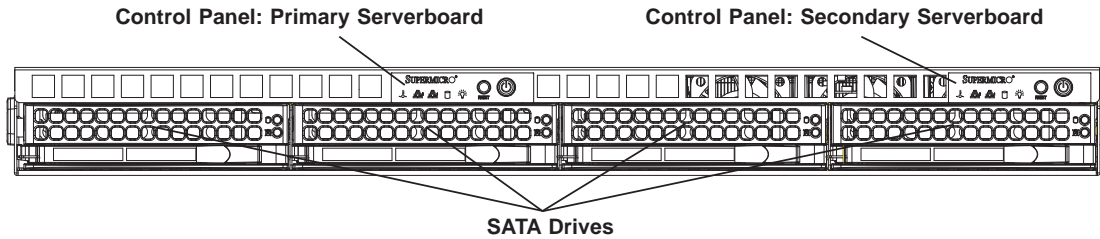
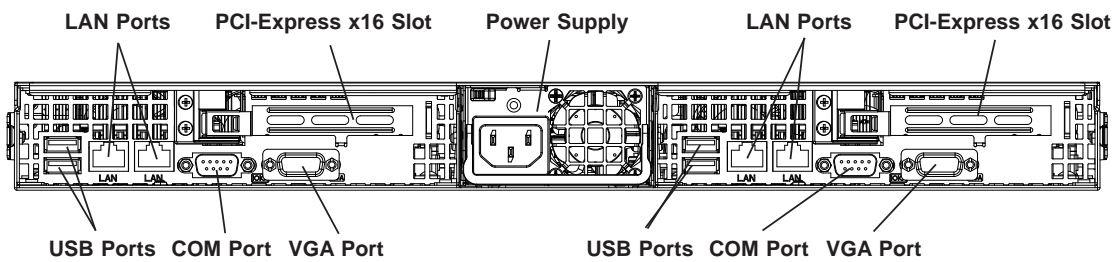


Figure 6-2. Chassis Rear View



## 6-2 Control Panel

Each control panel on the front of the chassis must be connected to the JF1 connector on its associated serverboard to provide you with system control buttons and status indicators. (When viewed from the front of the chassis, the serverboard on the left is referred to as the primary serverboard and the serverboard on the right as the secondary.)

These wires have been bundled together in a ribbon cable to simplify the connection. Connect the cable from JF1 on the serverboard to the control panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status for the serverboard it is connected to. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

## 6-3 System Fans

Each serverboard has its own set of three 4-cm high-performance PWM fans (for a total of six in the chassis) to provide the cooling for the 6015TC-LFT. Fan speed may be controlled by a setting in BIOS (see Chapter 7).

### System Fan Failure

If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will blink on and off. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the fans has failed. Then power down the system before replacing a fan. Removing the power cord is also recommended as a safety precaution.

## 6-4 Drive Bay Installation/Removal

### Accessing the Drive Bays

SATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SATA drives. Proceed to the next step for instructions. **Note:** The operating system you use must have RAID support to enable the hot-swap capability of the SATA drives.



***Use caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no cables touch the backplane. Also, regardless of how many SATA drives are installed, all four drive carriers must remain in the chassis to maintain proper airflow.***

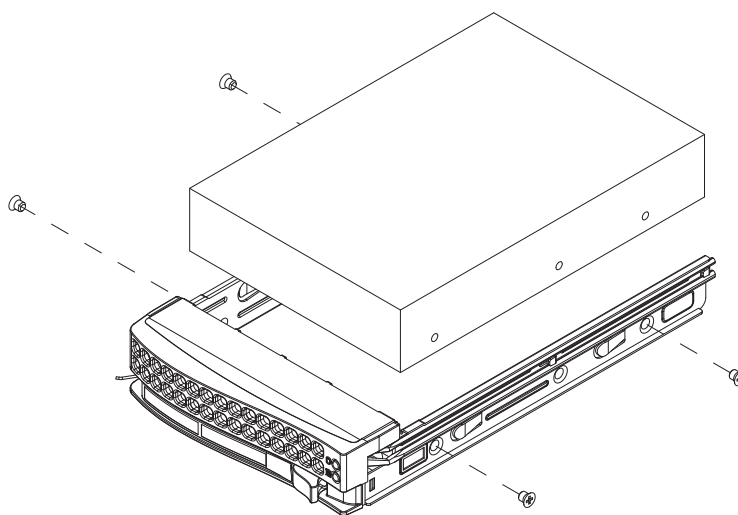
#### SATA Drive Installation

The SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the system. For this reason, even empty carriers without drives installed must remain in the chassis.

#### ***Mounting a SATA Drive in a Carrier***

1. Install the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.
2. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

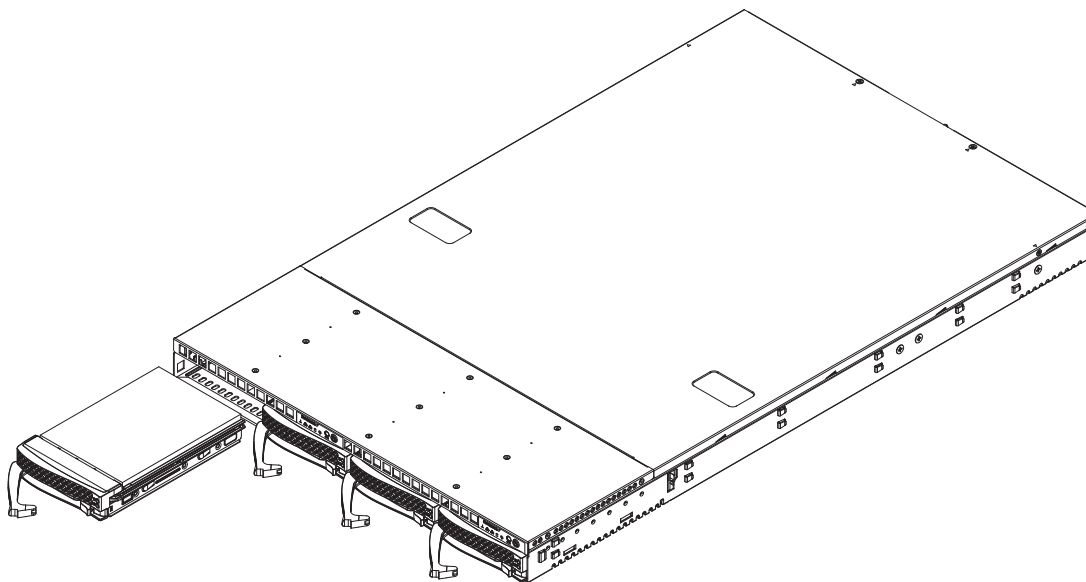
**Figure 6-3. Mounting a Drive in a Carrier**



***Installing/Removing Hot-swap SATA Drives***

1. To remove a carrier, push the release button located beside the drive LEDs.
2. Swing the handle fully out and use it to pull the unit straight out (see Figure 6-4).

**Figure 6-4. Removing a SATA Drive**



## 6-5 Power Supply

The SuperServer 6015TC-LFT has a single 780 watt power supply. This power supply has the capability of operating at 100 - 240 input volts. Depress both main power buttons on the front of the chassis and then unplug the AC power cord to completely remove power from the system before removing the power supply.

### Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro (PWS-781-1S - see contact information in Chapter 1).

### Replacing the Power Supply

#### *Accessing the Inside of the System*

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").
2. The top cover of the chassis is secured with four screws: two at the top rear of the cover and one on each side lip, also near the back. Remove all four, then place both thumbs in the indentations and push the cover back until it slides off.
3. Lift the top cover from the chassis to gain full access to the inside of the server.

#### *Removing the Power Supply*

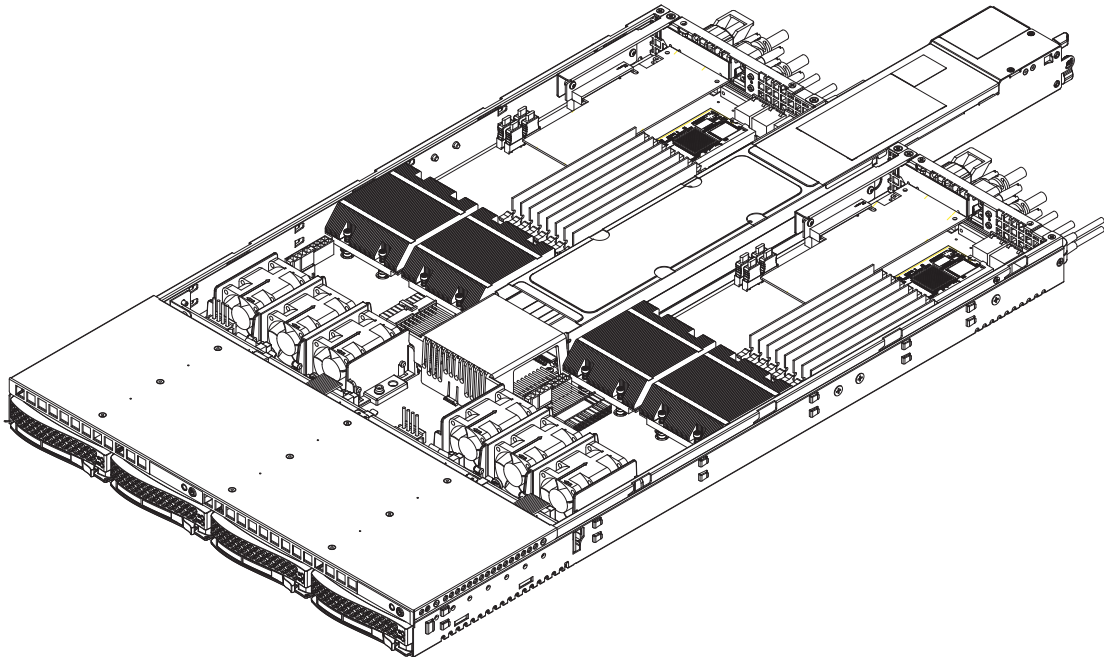
1. First, shut down the system and unplug the power cord.
2. To remove the failed power unit, remove the two screws on the back of the power supply, which secure it to the chassis.
3. Lift the unit straight out of the chassis. (See Figure 6-5.)

#### *Installing a New Power Supply*

1. Replace the failed unit with the exact same power supply model from Supermicro.
2. Carefully insert the new unit into position in the chassis and secure it with the two screws at the rear of the unit.

3. Before reconnecting the power cord, make sure the power switch on the power supply is in the off position.
4. Reconnect the power cord, replace the chassis top cover and push the unit back into the rack.
5. Finish by turning the power switch on the power supply on, and then depress the power buttons on the front of the chassis.

**Figure 6-4. Removing the Power Supply**



## Chapter 7

### BIOS

#### 7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X7DCT-LF. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

**Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <<http://www.supermicro.com>> for any changes to the BIOS that may not be reflected in this manual.

#### System BIOS

BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. Phoenix BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS Logic, enabling it to retain system parameters. When the computer is powered on, the computer is configured with the values stored in the CMOS Logic by the system BIOS, which gains control at boot up.

#### 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 the <Delete> key at the appropriate time during system boot. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 7-3, detailed descriptions are given for each parameter setting in the Setup utility.



**Warning:** Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

## 7-2 Running Setup

*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 as shown on the following page.

When you first power on the computer, the Phoenix BIOS Setup utility is immediately activated.

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

1. By pressing <Delete> immediately after turning the system on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

**Press the <Delete> key 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 to move between the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ► icon. With the item highlighted, press the <Enter> key to access the submenu.

## Main BIOS Setup Menu

PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.		
Main	Advanced	Security Boot Exit
System Time:	[10:21:18]	Item Specific Help  <Tab>, <Shift-Tab>, or <Enter> selects field.
System Date:	[12-18-2008]	
BIOS Date		
Legacy Diskette A:	[1.44/1.25 MB 3½"]	
▶ IDE Primary /Master		
▶ IDE Primary / Slave		
▶ IDE Channel 1 Master		
IDE Channel 1 Slave		
▶ Serial ATA Port 3		
▶ Serial ATA Port 4		
▶ Ext. Primary Master		
▶ Ext. Primary Slave		
Serial ATA:	[Enabled]	
Native Mode Operation:	[Auto]	
SATA Controller Mode Option:	[Compatible]	
SATA RAID Enable	[Disabled]	
ICH Raid CodeBase	[Intel]	
SATA AHCI Enable	[Disabled]	
System Memory:	[XXXX KB]	
F1 Help	↑↓ Select Item	~/+ Change Values
Esc Exit	↔ Select Menu	Enter Select ▶ Sub-Menu
		F9 Setup Defaults
		F10 Previous Values

### Main Setup Features

#### System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

#### System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

#### BIOS Date

This field displays the date when this version of BIOS was built.

### ▶ SATA Port 0/SATA Port 1/SATA Port 2/SATA Port 3

These settings allow the user to set the parameters for the slots indicated above. Hit <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

#### Type

This option allows the user to select the type of IDE hard drive. Select **Auto** to allow the BIOS to automatically configure the parameters of the SATA drive installed at the connection. Select **User** to allow the user to enter the parameters of the SATA drive installed. Select **CDROM** if a CDROM drive is installed. Select **ATAPI** if a removable disk drive is installed.

### **LBA Format**

The following items will be displayed by the BIOS:

**Total Sectors:** This item displays the number of total sectors available in the LBA Format.

**Maximum Capacity:** This item displays the maximum capacity in the LBA Format.

### **Multi-Sector Transfers**

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors, and 16 Sectors.

### **LBA Mode Control**

This item determines whether the Phoenix BIOS will access the IDE Primary Master Device via the LBA mode. The options are Enabled and **Disabled**.

### **32 Bit I/O**

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

### **Transfer Mode**

This option allows the user to set the transfer mode. The options are **Standard**, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

### **Ultra DMA Mode**

This option allows the user to configure the Ultra DMA Mode setting. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

### **Serial ATA**

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled**.

### **Native Mode Operation**

Select the native mode for ATA. The options are: Serial ATA, and **Auto**.

### **SATA Controller Mode Option**

Select **Compatible** to allow the SATA and PATA drives to be automatically-detected and be placed in the Legacy Mode by the BIOS. Select Enhanced to allow the SATA and PATA drives to be to be automatically-detected and be placed in the

Native IDE Mode. (**Note: The Enhanced mode is supported by the Windows 2000 OS or a later version.**)

When the SATA Controller Mode is set to Enhanced, the following items will display:

#### **Serial ATA (SATA) RAID Enable**

Select Enable to enable Serial ATA RAID Functions. (For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: "ICH RAID Code Base" will be available for you to use the Intel or Adaptec Host RAID firmware. If this item is set to Disabled, the item-SATA AHCI Enable will be available.) The options are Enabled and **Disabled**.

#### **ICH RAID Code Base**

Select Intel to enable the Intel SATA RAID utility. Select Adaptec to use the Adaptec HostRAID utility. The options are **Intel** and Adaptec.

#### **SATA AHCI Enable**

Select Enable to enable the feature of SATA Advanced Host Interface. (Take caution when using this feature. This is for advanced programmers only. The options are Enabled and **Disabled**.)

#### **System Memory**

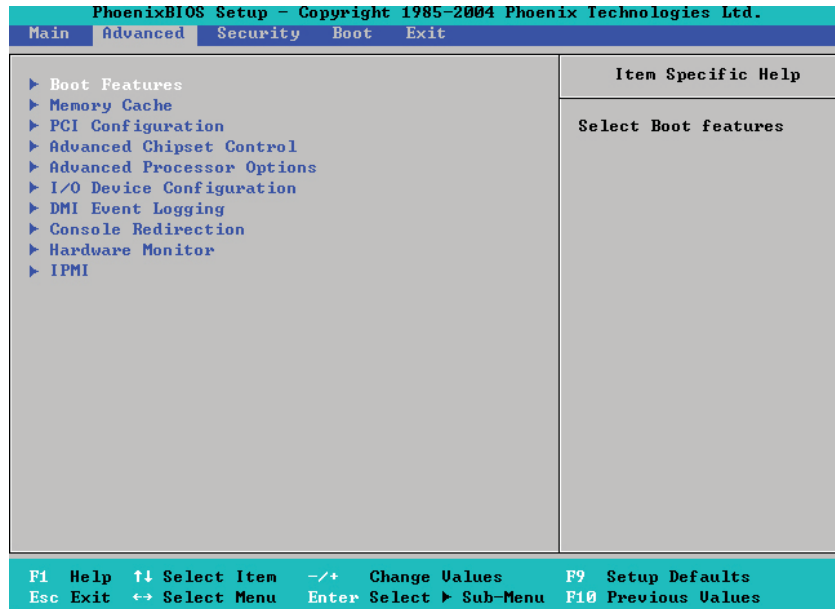
This item informs you how much system memory is detected by the BIOS.

#### **Extended Memory**

This item informs you how much extended memory in the system is detected by the BIOS.

## 7-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility menu with the arrow keys. You should see the following display. The items with a triangle beside them have submenus that can be accessed by highlighting the item and pressing <Enter>.



### ► Boot Features

Access the submenu to make changes to the following items.

#### QuickBoot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

#### QuietBoot Mode

This setting allows the user to **Enable** the graphic logo screen during bootup. The settings are **Enabled** and Disabled

#### POST Errors

Set to **Enabled** to display a POST (Power-On-Self-Test) Error Message if an error occurs during bootup. If set to Disabled, the system will continue to boot without displaying any error message even when a boot error occurs. The options are **Enabled** and Disabled.

#### ACPI Mode

Use the setting to determine if you want to use the ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

**Power Button Behavior**

If set to **Instant-Off**, the system will power off immediately as soon as the user hits the power button. If set to 4-sec. Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **instant-off** and 4-sec override.

**Resume On Modem Ring**

Select On to “wake your system up” when an incoming call is received by your modem. The options are On and **Off**.

**Power Loss Control**

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

**Watch Dog**

If enabled, this option will automatically reset the system if the system is not active for more than a predefined time period. The options are Enabled and **Disabled**.

**Summary Screen**

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration at bootup.

## ► Memory Cache

### Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS to write (cache) its data into this reserved memory area. Select **Write Protect** to enable the function and reserve this area for the Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

### Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) its data into this reserved memory area. Select **Write Protect** to enable the function and reserve this area for the Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

### Cache Base 0-512K

If enabled, this feature allows the data stored in the base memory area of block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or to be written into L1, L2 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

### Cache Base 512K-640K

If enabled, this feature allows the data stored in the memory area of 512K-640K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into L1, L2 or L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 512-640K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the system memory to speed up CPU's operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

### Cache Extended Memory Area

If enabled, this feature allows the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the extended memory area above 1 MB. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

### Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write-combining configuration with 4GB or more memory. The options are Enabled and **Disabled**.

## ► PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

### Onboard GLAN1 (Gigabit- LAN)/Onboard GLAN2 OPROM Configure

Select Enabled to allow the system to boot from GLAN1 connection or GLAN2 connection. The default setting is **Disabled**.

### Default Primary Video Adapter

This feature allows the user to specify which video adapter to be used as the default primary video adapter. The options are Other and **Onboard Video**.

### Reset Configuration Data

If set to Yes, this item clears the Extended System Configuration Data- (ESCD) area. The options are Yes and **No**.

## ► PCI-Exp x8

Access the submenu for each of the settings above to make changes to the following:

### Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

**Enable Master**

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

**Latency Timer**

This setting allows you to set the clock rate for the Bus Master. A high-priority, high-throughput device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: Other. If a drive fails after a new software is installed, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate.

**Large Disk Access Mode**

This setting defines the area in a hard drive that can be accessed by the user. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

**► Advanced Chipset Control**

Access the submenu to make changes to the following settings.



**Warning:** Take caution when changing the Advanced settings. An Incorrect value, timing or a very high DRAM frequency may cause system instability. When this occurs, reset the setting to the default setting.

**Accelerate MRC**

Select Disable to skip Memory Reference Code (MRC) processing at bootup if there is no change to DIMM population. The options are Enabled and **Disabled**.

**Clock Spectrum Feature**

If Enabled, the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

**Crystal Beach Configuration Enable**

Select Enabled to use the Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. (**Note:** A TOE device is a specialized, dedicated processor installed on an add-on card or a network card to handle some or all packet processing of this add-on card. For this motherboard, the TOE device is built inside the Intel ICH9 South Bridge chip.) The options are **Enabled** and Disabled.

**SERR Signal Condition**

This setting specifies the ECC Error conditions that an SERR# is to be asserted. The options are None, **Single Bit**, Multiple Bit, and Both.

---

**4GB PCI Hole Granularity**

This feature allows you to select the granularity of a PCI hole for PCI slots. If MTRRs are not enough, this option may be used to reduce MTRR occupation. The options are: **256 MB**, 512 MB, 1GB and 2GB.

**Channel 0 Rank Sparing/Channel 1 Rank Sparing**

Select Enable to enable memory sparing for Memory Bus Branch 0 or Branch 1. The options are Enabled and **Disabled**.

**Enhanced x8 Detection**

Select **Enabled** to enable the BIOS to detect errors on Enhanced x8 DRAM UC memory modules. The options are Disabled and **Enabled**.

**Demand Scrub**

Scrubbing is a process that allows the North Bridge to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are **Enabled** and Disabled.

**Patrol Scrub**

Scrubbing is a process that allows the North Bridge to correct correctable memory errors detected on a memory module, and send the correction to the requestor (the original source). When this item is set to **Enabled**, the North Bridge will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the North Bridge will be scrubbed every day. The options are **Enabled** and Disabled.

**Enable Multi-Media Timer**

Select Yes to activate a set of timers that are alternative to the traditional 8254 timers for the OS use. The options are Yes and **No**.

**USB Host Controller 1/ USB Host Controller 2**

Select Enabled to activate the USB Host Controllers. The settings are **Enabled** and Disabled.

**Legacy USB Support**

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

## ► Advanced Processor Options

Access the submenu to make changes to the following settings.

### **CPU Speed**

This is a display that indicates the speed of the installed processor.

### **Frequency Ratio (Available when supported by the CPU)**

The feature allows the user to set the internal frequency multiplier for the CPU. The options are: **Default**, x6, x7, x8, and x9.

### **Core Multi-Processing (Available when supported by the CPU)**

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are Disabled and **Enabled**.

### **Machine Checking (Available when supported by the CPU)**

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are Disabled and **Enabled**.

### **Thermal Management 2 (Available when supported by the CPU)**

Set to **Enabled** to use Thermal Management 2 (TM2) which will lower CPU voltage and frequency when the CPU temperature reaches a predefined overheat threshold. Set to Disabled to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via the CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

### **C1 Enhanced Mode (Available when supported by the CPU)**

Set to Enabled to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are Enabled and **Disabled**. (**Note:** please refer to Intel's web site for detailed information.)

### **Execute Disable Bit (Available when supported by the CPU and the OS)**

Set to **Enabled** to enable Execute Disable Bit and allow the processor to classify areas in the memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack. **Note:** this feature is available when your OS and your CPU support the function of Execute Disable Bit. The options are Disabled and **Enabled**. For more information, please refer to Intel's and Microsoft's web sites.

**Adjacent Cache Line Prefetch (Available when supported by the CPU)**

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are **Disabled** and Enabled.

**Hardware Prefetcher (Available when supported by the CPU)**

Set to this option to Enabled to enable the hardware components that are used in conjunction with software programs to prefetch data in order to shorten execution cycles and maximize data processing efficiency. The options are Disabled and **Enabled**.

**Intel <R> Virtualization Technology (Available when supported by the CPU)**

Select Enabled to use the feature of Virtualization Technology and allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. **Note:** If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

**Intel EIST Support (Available when supported by the CPU)**

Select Enabled to use the Enhanced Intel SpeedStep Technology and allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. The options are Enabled and **Disabled**. Please refer to Intel's web site for detailed information.

**► CPU Cache Control****DCU Prefetch (Available when supported by the CPU)**

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are **Disabled** and Enabled.

**IP Prefetch (Available when supported by the CPU)**

Select Enabled to use CPU Cache Line IP Prefetch. The options are Disabled and **Enabled**.

**Direct Cache Access (Available when supported by the CPU)**

Set to Enable to route inbound network IO traffic directly into processor caches to reduce memory latency and improve network performance. The options are **Disabled** and Enabled.

### **DCA Delay Clocks (Available when supported by the CPU)**

This feature allows the user to set the clock delay setting from snoop to prefetch for Direct Cache Access. Select a setting from 8 (bus cycles) to 120 (bus cycles) (in 8-cycle increment). The default setting is **32 (bus cycles)**.

## **► I/O Device Configuration**

Access the submenu to make changes to the following settings.

### **Serial Port A**

This setting allows the user to decide if Serial Port A should be controlled by the BIOS or by the OS. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

### **Base I/O Address**

This setting allows you to select the base I/O address for Serial Port A. The options are **3F8**, 2F8, 3E8, and 2E8.

### **Interrupt**

This setting allows you to select the IRQ (interrupt request) for Serial Port A. The options are IRQ3 and **IRQ4**.

## **► DMI Event Logging**

Access the submenu to make changes to the following settings.

### **Event Log Validity**

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

### **Event Log Capacity**

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

### **View DMI Event Log**

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

### **Event Logging**

This setting allows you to **Enable** or Disable event logging.

### **ECC Event Logging**

This setting allows you to **Enable** or Disable ECC event logging.

**Mark DMI Events as Read**

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

**Clear All DMI Event Logs**

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

## ► Console Redirection

Access the submenu to make changes to the following settings.

### COM Port Address

This item allows you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. The options are COM A, COM B and **Disabled**.

**Note:** The default setting for the X7DCT-LF is set to **Onboard IPMI** when the BMC Controller is installed on the motherboard and the item-Exit Saving Changes in the Exit menu has been selected.

### BAUD Rate

This item allows you to set the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

### Console Type

This item allows you to set console redirection type. The options are VT100, VT100/8bit, PC-ANSI/7bit, **PC ANSI**, VT100+, VT-UTF8 and ASCII.

### Flow Control

This item allows you to select the flow control option for the console. The options are: None, XON/XOFF, and **CTS/RTS**.

### Console Connection

This item allows you to decide how console redirection is to be connected: either **Direct** or Via Modem.

### Continue CR after POST

Select on to continue with console redirection after the POST routine. The options are On and **Off**.

**Note:** The default setting for the X7DCT-LF is set to **On** when the BMC Controller is installed on the motherboard and the item-Exit Saving Changes in the Exit menu has been selected.

## ► Hardware Monitoring

### CPU Temperature Threshold

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU overheat alarm will be activated to provide warnings of possible CPU overheat. The options are Tcontrol, **Tcontrol+5° C**, and Tcontrol+10° C.

Highlight this and hit <Enter> to see the display of the following items:

### CPU1 Temperature/CPU2 Temperature/System Temperature

#### Fan1-Fan3:

If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of the fans indicated in this item.

#### Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. The fan speed is controlled by Pulse Width Modulation (PWM). Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select Disable to disable fan speed control and allow the onboard fans to constantly run at full speed (12V). The Options are: 1. **Full-Speed at 12V**, 2. Optimized Server (w/4-pin), and 3. Optimized Workstation (w/4-pin).

#### Voltage Monitoring

The following items will be monitored and displayed:

VcoreA, VcoreB, 12V, 1.8V, 5V, +3.3V, +3.3Vsb, and Vbatt.

**Note:** In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

## ► IPMI (Available only when an IPMI card is installed)

PhoenixBIOS Setup Utility		Item Specific Help
Advanced		
IPMI		
IPMI Specification Version	2.0	Enable/Disable IPMI event logging. Disabling will still log events received via the system interface.
Firmware Version	2.1	
System Event Logging	[Enabled]	
Clear System Event Log	[Disabled]	
Existing Event Log number	282	
Event Log Control		
SYS Firmware Progress	[Disabled]	
BIOS POST Errors	[Enabled]	
BIOS POST Watchdog	[Disabled]	
OS boot Watchdog	[Disabled]	
Timer for loading OS (min)	[ 10]	
Time out action	[No Action]	

**IPMI Specification Version:** This item displays the current IPMI Version.

**Firmware Version:** This item displays the current Firmware Version.

### System Event Logging

Select **Enabled** to enable IPMI Event Logging. When this function is set to Disabled, the system will continue to log events received via system interface. The options are **Enabled** and Disabled.

### Clear System Event Logging

Enable this function to force the BIOS to clear the system event logs during the next cold boot. The options are Enabled and **Disabled**.

### Existing Event Log Number

This item displays the number of the existing event log.

### Event Log Control

#### System Firmware Progress

Enable this function to log POST progress. The options are Enabled and **Disabled**.

#### BIOS POST Errors

Enable this function to log POST errors. The options are **Enabled** and Disabled.

### BIOS POST Watch Dog

Set to Enabled to enable POST Watch Dog. The options are Enabled and **Disabled**.

### OS Boot Watch Dog

Select Enabled to enable the function of OS Boot Watch Dog. The options are Enabled and **Disabled**.

### Timer for Loading OS (Minutes)

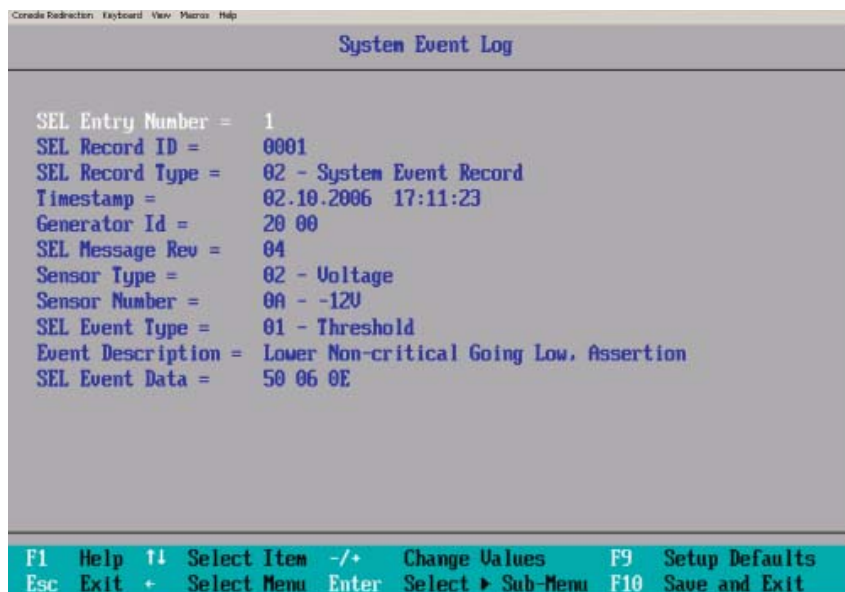
This feature allows the user to set the time value (in minutes) for the previous item: OS Boot Watch Dog by keying-in a desired number in the blank. The default setting is **10** (minutes.) (Please ignore this option when OS Boot Watch Dog is set to Disabled.)

### Time Out Action

This feature allows the user to determine what action to take in an event of a system boot failure. The options are **No Action**, Reset, Power Off and Power Cycles.

## ► System Event Log/System Event Log (List Mode)

These options display the System Event (SEL) Log and System Event (SEL) Log in List Mode. Items include: SEL (System Event Log) Entry Number, SEL Record ID, SEL Record Type, Time Stamp, Generator ID, SEL Message Revision, Sensor Type, Sensor Number, SEL Event Type, Event Description, and SEL Event Data.



### ► Realtime Sensor Data

This feature display information from motherboard sensors, such as temperatures, fan speeds and voltages of various components.

Sensor Type	Sensor Name	Sensor Data	Sensor Units	Lower Limit	Upper Limit
<b>Temp</b>					
	CPU1 CoreA	48.00	degrees C	0.00	75.00
	CPU1 CoreB	54.00	degrees C	0.00	75.00
	CPU2 CoreA	47.00	degrees C	0.00	75.00
	CPU2 CoreB	46.00	degrees C	0.00	75.00
	System	44.00	degrees C	0.00	75.00
<b>Voltage</b>					
	CPU1 Core	1.13	Volts	0.97	1.47
	CPU2 Core	1.16	Volts	0.97	1.47
	3.30	3.30	Volts	2.95	3.62

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults  
 Esc Exit ← Select Menu Enter Select ► Sub-Menu F10 Save and Exit

### ► IPMI LAN Configuration

The following features allow the user to configure and monitor IPMI LAN settings.

PhoenixBIOS Setup Utility	
Advanced	
IPMI Lan Configuration	Item Specific Help
ULAN Tagging	[Disabled]
ULAN ID	[ 1h]
IP Address Source	[DHCP]
IP Address	[000.000.000.000]
IP Subnet Mask	[000.000.000.000]
Default Gateway	[000.000.000.000]
MAC Address	[00h:00h:00h:00h:00h:00h]
Update LAN Setting	[No]

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults  
 Esc Exit ← Select Menu Enter Select ► Sub-Menu F10 Save and Exit

**VLAN Tagging**

Select Enabled to enable Virtual LAN(s) for IPMI connections and allow the user to configure VLAN settings. The options are Enabled and **Disabled**.

**VLAN ID**

If VLAN Tagging above is set to Enabled, this item allows the user to change the VLAN ID. If VLAN Tagging is disabled, this item will be ignored by the firmware.

**IP Address Source**

This item allows the user to select the IP address source for the connection. The options are **DHCP** and Static.

**IP Address**

This item displays the IP address for the IPMI connection detected.

**IP Subnet Mask**

This item displays the IP Subnet Mask for the IPMI connection detected.

**Default Gateway**

This item displays the Default Gateway for the IPMI connection detected.

**MAC Address**

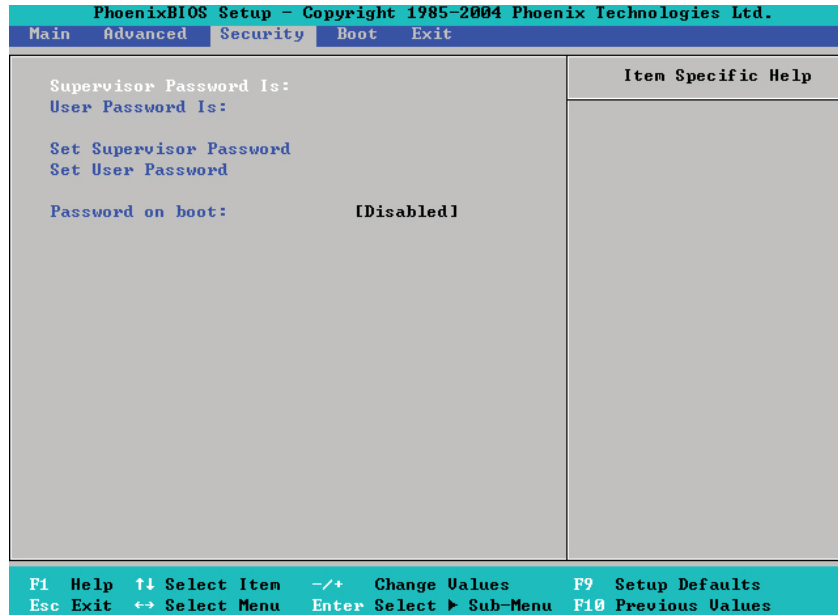
This item displays the MAC Address for the IPMI connection detected.

**Update LAN Settings**

Select Yes to allow BIOS update LAN setting. The options are Yes and **No**.

## 7-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.



### Supervisor Password Is:

This feature indicates if a supervisor password has been entered into the system. Clear means such a password has not been used, and Set means a supervisor password has been entered.

### User Password Is:

This feature indicates if a user password has been entered into the system. Clear means such a password has not been used, and Set means a user password has been entered.

### Set Supervisor Password

When the item Set "Supervisor Password" is highlighted, hit the <Enter> key. When prompted, enter the Supervisor's password in the dialogue box to set or to change supervisor's password which will allow the user to access the BIOS with the privilege as a supervisor.

### Set User Password

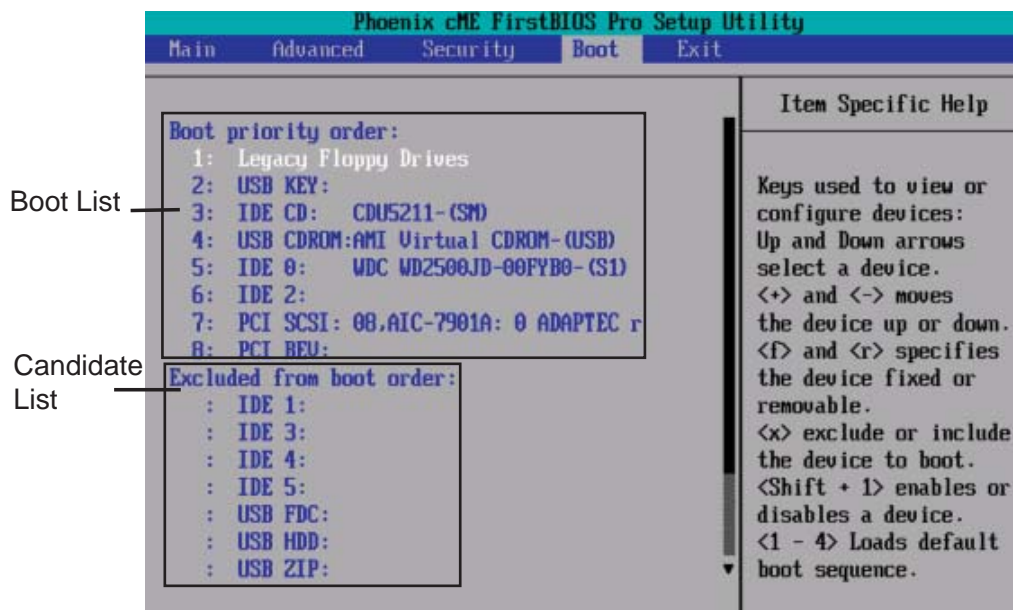
When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, enter the user's password in the dialogue box to set or to change the user's password, which allows the user to access the system at bootup.

## Password on Boot

This setting allows you to determine if a password is required for a user to enter the system at system boot. The options are **Enabled** (password required) and **Disabled** (password not required).

## 7-6 Boot

Choose **Boot** from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. See details on how to change the order and specifications of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.



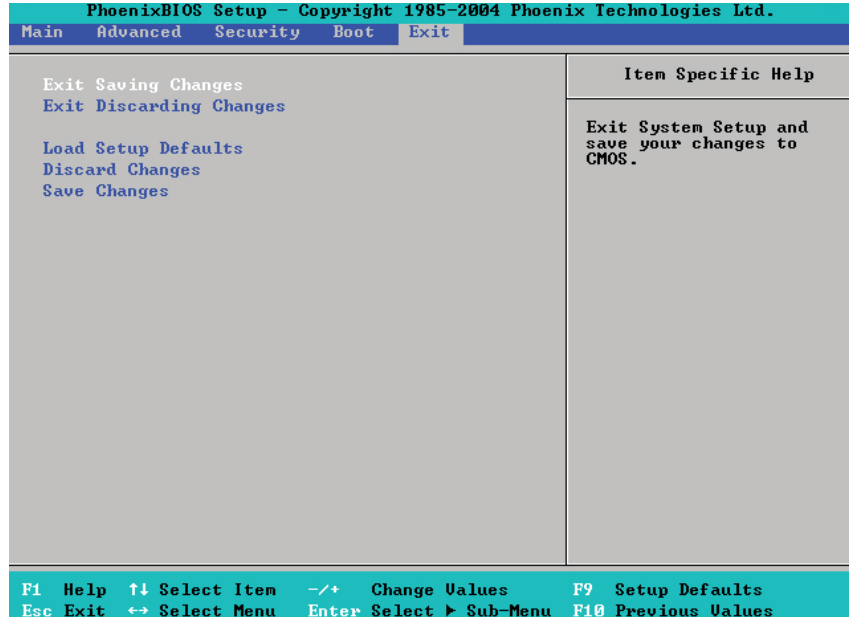
(The picture shown above is for reference only. Your screen may appear differently; it depends on the devices installed in your system.)

### Boot Priority Order/Excluded from Boot Orders

The devices included in the boot list section (above) are bootable devices listed in the sequence of boot order as specified. The boot functions for the devices included in the candidate list (above) are currently disabled. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the type of an USB device, either fixed or removable. You can select one item from the boot list and hit the <x> key to remove it from the list of bootable devices (to make its resource available for other bootable devices). Subsequently, you can select an item from the candidate list and hit the <x> key to remove it from the candidate list and put it in the boot list. This item will then become a bootable device. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

## 7-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.



### Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you have made and to exit the BIOS Setup utility.

### Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

### Load Setup 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.

### Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you have made. You will remain in the Setup utility.

### Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

## Appendix A

### BIOS POST Error Codes

This section lists Recoverable POST (Power On Self Test) Error codes for the Phoenix BIOS.

#### Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display a POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error

1 repetitive long beep - no memory detected

1 continuous beep with Front Panel Overheat LED on - system overheat

**Notes**

## Appendix B

### Installing the Windows OS

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

Please note that the Intel ICH10R South Bridge used on this motherboard does not support HostRAID settings.

#### B-1 Installing Windows on RAID Systems

1. Insert Microsoft's Windows XP/2003 Setup CD in the CD drive and the system will start booting up from CD.
2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.
3. When the Windows XP/2003 Setup screen appears, press "S" to specify additional device(s).
4. Insert the driver diskette "Intel AA RAID XP/2003 Driver for ICH10R" into Drive A: and press the <Enter> key.
5. Choose the Intel(R) ICH9R *SATA RAID Controller* from the list indicated in the XP/2003 Setup Screen and press the <Enter> key.
6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.
7. From the Windows XP/2003 Setup screen, press the <Enter> key. The XP/2003 Setup will automatically load all device files and then continue installing Windows.
8. After the Windows XP/2003 OS installation is complete, the system will automatically reboot.

## **B-2 Installing Windows on Non-RAID Systems**

1. Insert Microsoft's Windows XP/2003 Setup CD in the CD drive and the system will start booting up from the CD.
2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.
3. When the Windows XP/2003 Setup screen appears, press "S" to specify additional device(s).
4. Insert the driver diskette you want to install into Drive A: and press the <Enter> key.
5. Press the <Enter> key to proceed with 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.
6. From the Windows XP/2003 Setup screen, press the <Enter> key. The XP/2003 Setup will automatically load all device files and then continue with the Windows XP/2003 installation.
7. After the Windows XP/2003 OS installation is complete, the system will automatically reboot.
8. Insert the Supermicro Setup CD that came with your system into the CD drive during system boot, and the main screen shown on page 5-26 will display. Follow the instructions given to complete the installation.

# Appendix C

## System Specifications

**Note:** unless noted specifications apply to a complete system (two serverboards).

### Processors

Four Intel® Xeon® 5400/5300/5200/5100 Series processors in LGA771 sockets

**Note:** please refer to our website for details on supported processors.

### Chipset

Intel 5100/ICH9R

### BIOS

Phoenix BIOS in 16 Mb Flash EEPROM (each serverboard)

### Memory Capacity

Twelve (12) DIMM slots to support a maximum up to 96 GB of registered ECC DDR2-667/533 SDRAM

**Note:** interleaved memory requires DIMMs to be installed in pairs - refer to Section 5-6 for details.

### Serial ATA Controller

Intel ICH9R on-chip controller to support four 3 Gb/s Serial ATA (RAID 0, 1)

### SATA Drive Bays

Four (4) hot-swap drive bays to house four (4) standard SATA drives

### PCI Expansion

Two (2) low-profile PCI-Express x16 slots (with pre-installed riser cards)

### Serverboard

X7DCT-LF

Dimensions (both): 6.5 x 16.4 in (165 x 417 mm)

### Chassis

SC808T-780B (1U Rackmount)

Dimensions: (WxHxD) 17.2 x 1.7 x 27.75 in. (437 x 43 x 705 mm)

### Weight

Gross Weight: 40 lbs. (18.2 kg.)

## System Cooling

Six (6) high-performance 4-cm PWM (Pulse Width Modulated) fans

## System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range

Rated Input Current: 9.5 - 6A max @ 700W, 5 - 3.5A @ 780W\*

Rated Input Frequency: 50 to 60 Hz

\*Power supply operates at 700W with a 100-140V input and at 780W with a 180-240V input

## Power Supply

Rated Output Power: 780W (Part# PWS-781-1S)

Rated Output Voltages: +12V (81A), +5Vsb (4A)

## Operating Environment

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

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

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

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

## Regulatory Compliance

Electromagnetic Emissions:

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

Electromagnetic Immunity:

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

Safety:

EN 60950/IEC 60950-Compliant

UL Listed (USA)

CUL Listed (Canada)

TUV Certified (Germany)

CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:

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

## Notes

(continued from front)

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