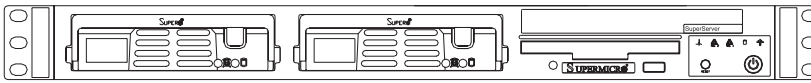
SUPERMICRO®

# SUPERSERVER 6013A-T



# USER'S MANUAL

Revision 1.1b

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**Printed in the United States of America**

# Preface

## About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6013A-T. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 6013A-T is an affordable dual Xeon processor 1U rackmount server based on the SC811T-350 chassis and the Super X5DPA-TGM+ motherboard. The X5DPA-TGM+ supports dual Intel® Xeon™ processors of up to 3.20 GHz with a 1 MB cache.

## 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 X5DPA-TGM+ motherboard and the SC811T-350 chassis.

### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6013A-T into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

### Chapter 3: System Interface

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

### Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6013A-T.

### Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the X5DPA-TGM+ motherboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

### Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC811T-350 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

### Chapter 7: AMIBIOS

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

### Appendix A: BIOS Error Beep Codes

### Appendix B: BIOS POST Checkpoint Codes

### Appendix C: Software Installation

### Appendix D: System Specifications

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## Chapter 6: Advanced Chassis Setup



## Chapter 7: AMIBIOS

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# Chapter 1
# Introduction

## 1-1 Overview

The Supermicro SuperServer 6013A-T is an economical dual Xeon processor, 1U rackmount server with state-of-the-art features. The 6013A-T is comprised of two main subsystems: the SC811T-350 chassis and the X5DPA-TGM+ motherboard. Please refer to our web site for information on operating systems that have been certified for use with the 6013A-T (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components may have been included with your SuperServer 6013A-T, as listed below.

- Two (2) 1U CPU heatsinks (SNK-039)
- Four (4) heatsink retention clips (for either 604 or 603-pin CPUs)
- Two (2) CPU mounting plates and retention modules (SKT-120)
- One (1) 3.5" floppy drive
- One (1) slim CD-ROM drive
- Serial ATA (SATA) Accessories:
  One (1) SATA backplane (CSE-SATA-810)
  Two (2) SATA cables (CBL-0058)
  One (1) SATA LED cable (CBL-0056)
  Two (2) SATA drive carriers (CSE-PT10)
- One (1) 5V 32-bit, 33 MHz PCI slot riser card (CSE-RR32-1U)
- Rackmount hardware (with screws):
  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

## 1-2 Motherboard Features

At the heart of the SuperServer 6013A-T lies the X5DPA-TGM+, a dual processor motherboard designed to provide maximum performance. Below are the main features of the X5DPA-TGM+. See Figure 1-1 for a system block diagram of the chipset.

### Chipset Overview

Intel's E7501 chipset is made up of two main components:

The Memory Controller Hub (MCH)

The I/O Controller Hub (ICH5R)

### Memory Controller Hub (MCH)

The MCH has four hub interfaces, one to communicate with the ICH5R and three for high-speed I/O communications. The MCH employs a 144-bit wide memory bus for a DDR-266 memory interface, which provides a total bandwidth of 3.2 GB/s. The ICH5R interface is a 266 MB/sec point-to-point connection using an 8-bit wide, 66 MHz base clock at a 4x data transfer rate. The P64H2 interface is a 1 GB/s point-to-point connection using a 16-bit wide, 66 MHz base clock at a 8x data transfer rate.

### I/O Controller Hub (ICH5R)

The I/O Controller Hub (Intel's ICH5R) provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE Controller, two Serial ATA (SATA) Host Controllers, SMBus 2.0 Controller, LPC/Flash BIOS Interface, PCI 2.3 Interface, and Integrated System Management Controller.

### Processors

The X5DPA-TGM+ supports dual Intel® Xeon™ processors of up to 3.20 GHz with a 1 MB cache. Please refer to the support section of our web site for a complete listing of supported processors: (http://www.supermicro.com/TechSupport.htm).

### Memory

The X5DPA-TGM+ has four (4) 184-pin DIMM sockets that can support up to 8 GB of registered ECC DDR-266/200 SDRAM modules. Low-profile memory modules are required for use in the 1U form factor of the 6013A-T. Module sizes of 128 MB, 256 MB, 512 MB and 2 GB may be used to populate the DIMM slots. (The X5DPA-TGM+ was designed to support 2 GB DIMM modules in each memory slot, but it has only been validated with 1 GB memory modules.)

### Serial ATA

The ICH5R hub supports a two-port Serial ATA subsystem, which is RAID 0 and RAID 1 supported. The Serial ATA drives are hot-swappable units.
**Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives.

### PCI Expansion Slots

The X5DPA-TGM+ has five 32-bit, 33 MHz PCI slots, one of which is available in the 6013A-T 1U configuration. One riser card is included with the system for use with a 32-bit PCI card.

### Ethernet Ports

The X5DPA-TGM+ features Intel's 82541 and 82550 Ethernet controllers, which support one Gb LAN port and one 10/100 Mb LAN port, respectively.

### Onboard Controllers/Ports

An onboard IDE controller supports one floppy drive and up to four* Ultra ATA 100 hard drives or ATAPI devices. Onboard I/O backpanel ports include one COM port, a VGA port, two USB ports, PS/2 mouse and keyboard ports, a Gb LAN and a Mb LAN port. (*Only two IDE drives can be housed in the chassis.)

### Other Features

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

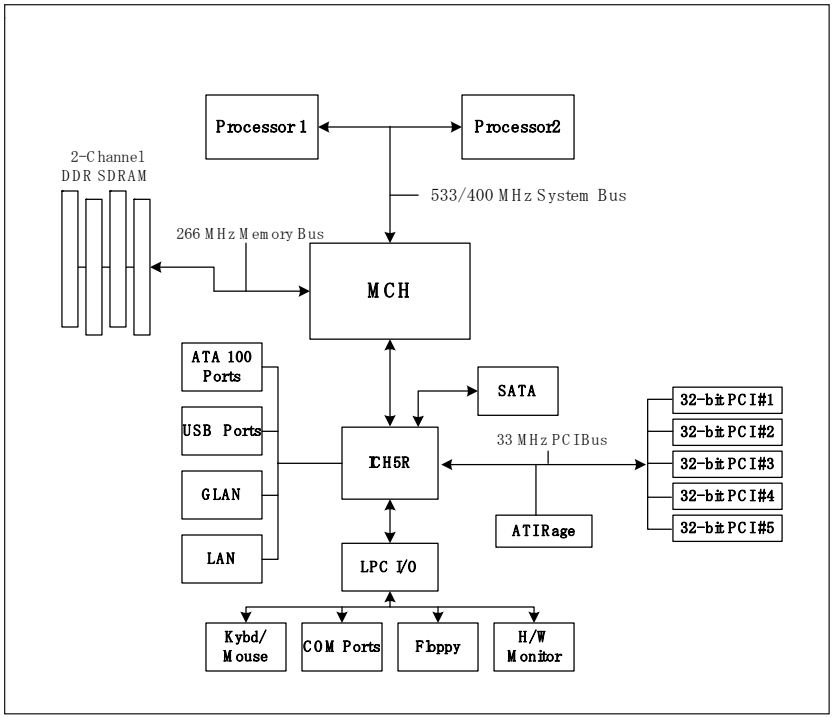



**Figure 1-1. Intel E7501 Chipset: System Block Diagram**

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

## 1-3 Server Chassis Features

The SuperServer 6013A-T is a 1U rackmount server platform designed with some of today's most state-of-the-art features. The following is a general outline of the main features of the SC811T-350 chassis.

### System Power

When configured as a SuperServer 6013A-T, the SC811T-350 chassis includes a single 350W power supply.

### Serial ATA Subsystem

For the 6013A-T, the SC811T-350 chassis was designed to support two Serial ATA hard drives. The Serial ATA drives are hot-swappable units. (ATA/100 IDE drives are also supported.)
**Note:** The operating system you use must have RAID support to enable the hot-swap capability of the Serial ATA drives.

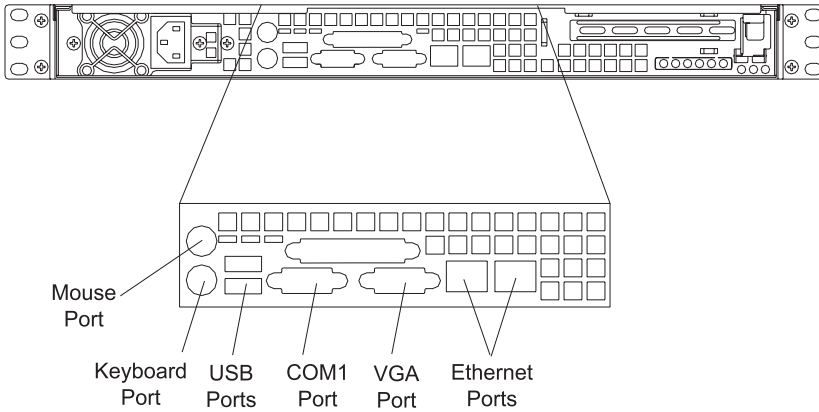
### Control Panel

The control panel on the SC811T-350 provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and system overheat conditions. The control panel also includes a main power button and a system reset button.

### Rear I/O Panel

The SC811T-350 is a 1U rackmount chassis. Its I/O panel provides one motherboard expansion slot, one COM port (another is internal), two USB ports, PS/2 mouse and keyboard ports, a graphics port and two Ethernet ports (see Figure 1-2).

**Figure 1-2. Rear I/O Panel**




### Cooling System

The SC811T-350 chassis has an innovative cooling design that includes two 10-cm blower fans for system cooling located in the midsection of the chassis. The blower fans plug into chassis fan headers on the motherboard and operate at full rpm continuously. If either break down, the ambient air temperature inside the chassis will rise and activate an overheat LED.

## 1-4 Contacting Supermicro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## Notes

# Chapter 2
# Server Installation

## 2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6013A-T up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. This quick setup assumes that your 6013A-T system has come to you with the processor and memory preinstalled. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

## 2-2 Unpacking the SuperServer 6013A-T

You should inspect the box the SuperServer 6013A-T was shipped in and note if it was damaged in any way. If the server itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 6013A-T. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

## 2-3 Preparing for Setup

The box the SuperServer 6013A-T 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 minimal amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

## Choosing a Setup Location

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

## Warnings and Precautions!

## Rack Precautions

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

## Server Precautions

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

## Rack Mounting Considerations

### Ambient Operating Temperature

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

### Reduced Airflow

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

### Mechanical Loading

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

### Circuit Overloading

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

### Reliable Ground

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

## 2-4 Installing the 6013A-T into a Rack

This section provides information on installing the SuperServer 6013A-T into a rack unit. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the unit into a rack with the rack rails provided with the system. 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 with the SuperServer 6013A-T. Each of these assemblies consist of two sections: an inner fixed chassis rail that secures to the unit (A) and an outer fixed rack rail that secures directly to the rack itself (B). A sliding rail guide sandwiched between the two should remain attached to the fixed rack rail (see Figure 2-1). The A and B rails must be detached from each other to install.

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

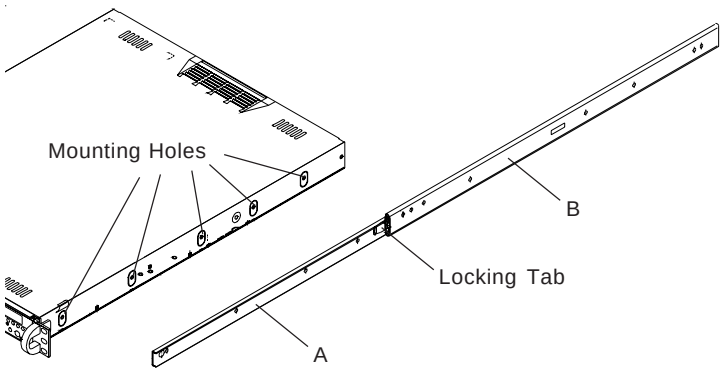



**Figure 2-1. Identifying the Sections of the Rack Rails**

## Installing the Chassis Rails

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

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

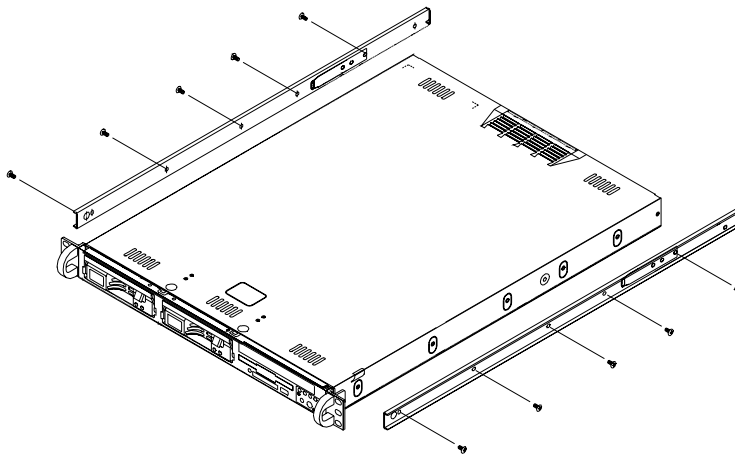


**Figure 2-2. Installing Chassis Rails**

## Installing the Rack Rails

Determine where you want to place the SuperServer 6013A-T in the rack (see Rack and Server Precautions in Section 2-3). Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly

securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure that both are at the exact same height and with the rail guides facing inward.

### Installing the Server into the Rack

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

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

**Figure 2-3a. Installing the Server into a Rack**

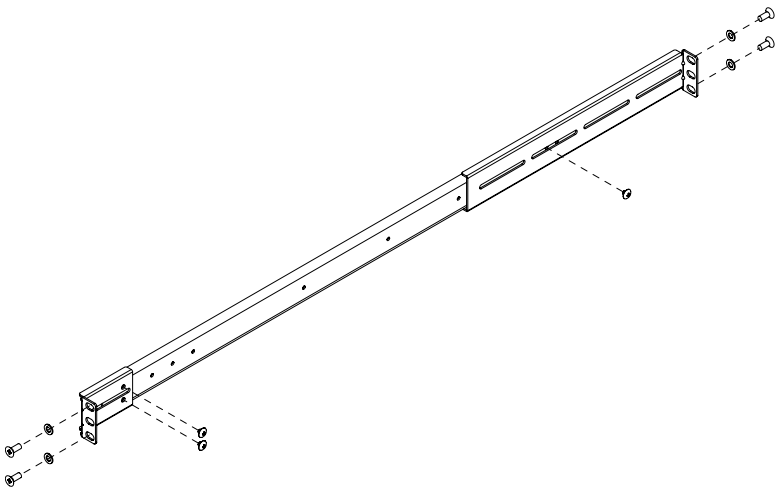
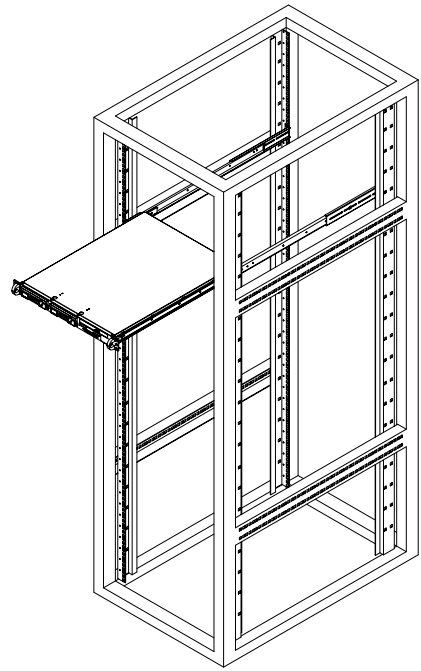


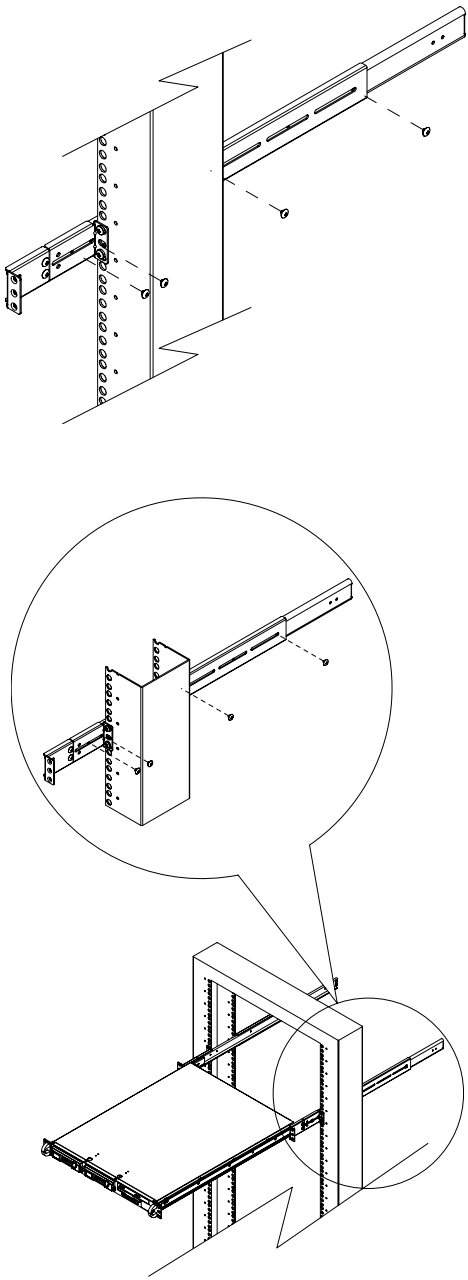
**Figure 2-3b. Installing the Server into a Rack**



## Installing the Server into a Telco Rack

If you are installing the SuperServer 6013A-T into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accomodate the width of the telco rack.

**Figure 2-4. Installing the Server into a Telco Rack**



## 2-5 Checking the Motherboard Setup

After you install the 6013A-T in the rack, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

**1. Accessing the inside of the 6013A-T (Figure 2-5)**

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover. There is a large rectangular recess in the middle front of the top cover to help you push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

**2. Check the CPUs (processors)**

You may have one or two processors already installed in the system board. Each processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

**3. Check the system memory**

Your 6013A-T server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

**4. Installing add-on cards**

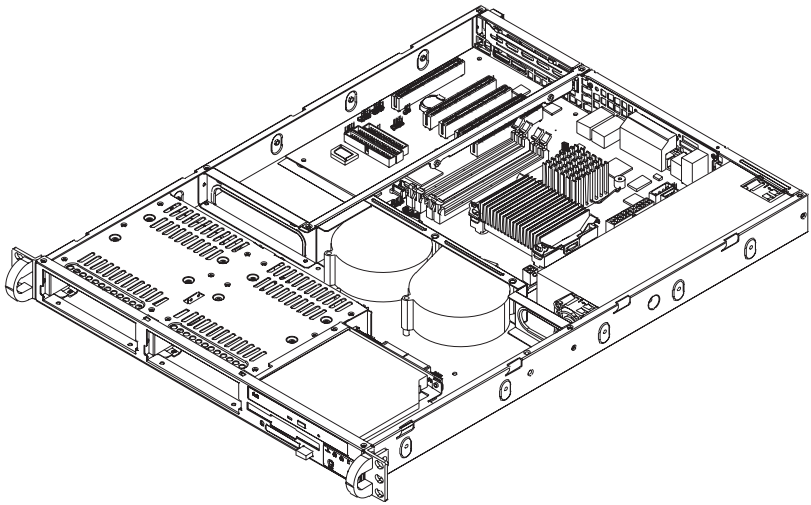
If desired, you can install an add-on card to the system. See Chapter 5 for details on installing a PCI add-on card.

**5. Check all cable connections and airflow**

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

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

**Figure 2-5.**
**Accessing the Inside of the SuperServer 6013A-T**
**(with drives removed)**



## 2-6 Checking the Drive Bay Setup

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

**1. Accessing the drive bays**

All drives can be accessed from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The Serial ATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

**2. Installing a CD-ROM and floppy disk drives**

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

**3. Check the Serial ATA disk drives**

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

**4. Check the airflow**

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

**5. Supplying power to the system**

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

## Notes

# Chapter 3
# System Interface

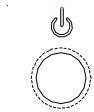
## 3-1 Overview

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

## 3-2 Control Panel Buttons

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


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



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

## 3-3 Control Panel LEDs

The control panel located on the front of the SC811T-350 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- **OVERHEAT:** Indicates an overheat condition in the chassis. This may be caused by cables obstructing the airflow in the system, or the ambient room temperature being too warm. You should also check to make sure that the chassis cover is installed and that all fans are present and operating normally. Finally, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the motherboard area of the chassis.

NIC2

- **NIC2:** Indicates network activity on LAN2 (Gb port) when flashing .

NIC1

- **NIC1:** Indicates network activity on LAN1 (Mb port) when flashing.

- **HDD:** Indicates IDE channel activity. On the SuperServer 6013A-T this light indicates SATA and CD-ROM drive activity when flashing.

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

## 3-4 Serial ATA Drive Carrier LED

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

## Notes

# Chapter 4
# System Safety

## 4-1 Electrical Safety Precautions


Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6013A-T from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and Serial ATA/IDE/floppy drives. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

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

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

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

## 4-2 General Safety Precautions


Follow these rules to ensure general safety:

- Keep the area around the SuperServer 6013A-T clean and free of clutter.

- The SuperServer 6013A-T weighs approximately 35 lbs (15.9 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

## 4-3 ESD Precautions

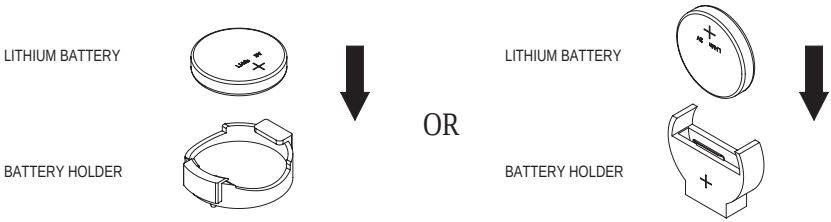
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient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

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

## 4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 6013A-T is operating to assure proper cooling. Out of warranty damage to the 6013A-T system can occur if this practice is not strictly followed.

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



# Chapter 5
# Advanced Motherboard Setup

This chapter covers the steps required to install the X5DPA-TGM+ motherboard into the SC811T-350 chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

## 5-1 Handling the X5DPA-TGM+ Motherboard

Electric-static discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the X5DPA-TGM+ motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

### Precautions

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

### Unpacking

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

## 5-2 Motherboard Installation

This section explains the first step of physically mounting the X5DPA-TGM+ into the SC811T-350 chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

**1. Accessing the inside of the 6013A-T (see Figure 2-5)**

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

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

The X5DPA-TGM+ requires a chassis big enough to support a 12" x 10" motherboard, such as Supermicro's SC811T-350 1U rackmount. Make sure that the I/O ports on the motherboard align properly with their respective holes in the I/O shield at the back of the chassis.

**3. Mounting the motherboard onto the motherboard tray:**

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

## 5-3 Connecting Cables

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

### Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-10 for connector locations.)

- IDE Device Cable (J3)
- Floppy Drive Cable (JP7)
- Serial ATA Device Cables (J13 and J14)
- Serial ATA Cable (J5)
- Control Panel Cable (JF2)

### Connecting Power Cables

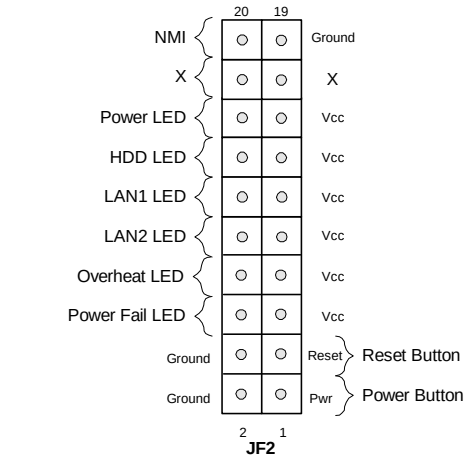
The X5DPA-TGM+ has a 24-pin primary power supply connector (designated ATX Power) for connection to the ATX power supply. In addition, there is a 8-pin secondary power connector at J15 that also must be connected to your power supply. See Section 5-8 for power connector pin definitions.

### Connecting the Control Panel

JF2 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 JF2 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Section 5-8 for details and pin descriptions.

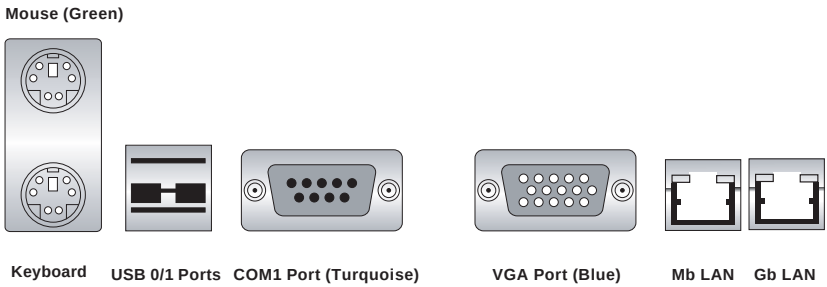
**Figure 5-1. Control Panel Header Pins**




## 5-4 I/O Ports

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

**Figure 5-2. I/O Port Locations and Definitions**

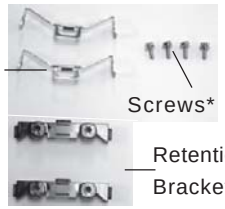


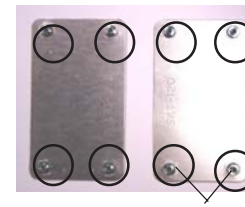

**Note:** The COM2 port is a header on the motherboard, located near the PCI #5 slot.

## 5-5 Processor and Heatsink Installation

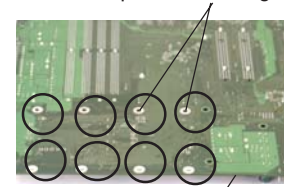
**IMPORTANT:** Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the heatsink. If installing one processor only, install it into CPU socket #1.

1. Locate the following components, which are included in the shipping package.



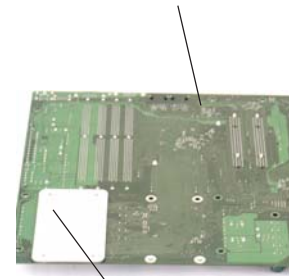




2. Locate the CPU retention plate mounting holes (four for each CPU) on the back side of the motherboard and the four standoffs on each of the retention plates (shown in the pictures on the right).



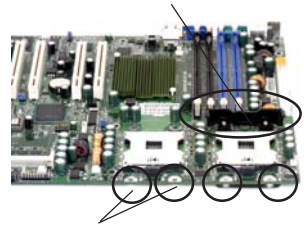

3. Make sure that the small sheet of mylar is attached to the surface of the retention plate. Align the standoffs of a retention plate with the four CPU#1 mounting holes on the motherboard.

4. Place the retention plate on the back side of the motherboard and lock it into the proper position by inserting its standoffs into the CPU mounting holes on the motherboard (with the mylar sheet in between).



Place the retention plate on the back of the motherboard with its standoffs inside the mounting holes.

5. On the front side of the motherboard, place a retention bracket on top of the CPU socket. Line up the bracket's mounting holes with those on the motherboard. Secure the retention bracket to the retention plate (on the back) with the screws provided. Repeat this step for the second retention bracket.

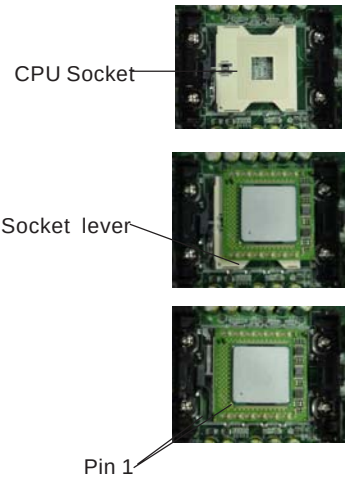



6. Repeat Steps 2-5 to install the second CPU Retention plate and brackets to the CPU#2 socket.

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

8. Install the CPU in the socket. Make sure that pin 1 of the CPU is seated on pin 1 of the socket (both corners are marked). When using only one CPU, install it into CPU socket #1 (CPU socket #2 is automatically disabled if only one CPU is used).

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




10. Apply the proper amount of thermal compound to the CPU die and place the heatsink on top of the CPU. Make sure the heatsink sits completely flat on the CPU - if not completely flat, the space between the two will degrade the heat dissipation function of the heatsink, which may cause the processor to overheat.

11. Secure the heatsink by locking the retention clips into position. When correctly installed, the clips should *click* into place and the three black tabs on the CPU retention pieces should protrude fully through the corresponding holes on the retention clips. See Figures 5-4a and 5-4b for diagrams of the retention clips and the heatsink installation procedure.

**IMPORTANT!** Please note that special, new silver heatsink retention clips must be used with all Xeon 533 MHz FSB (front side bus) 604-pin processors. These new retention clips have “604P” clearly marked on them. Using the old clips will not keep the proper amount of pressure applied and may cause the processor to overheat. You should not use these new retention clips with Xeon 400 MHz FSB processors (even if the CPU socket is 604-pin) as they will too tight and damage the CPU socket.

**Figure 5-3. 604-pin Socket: Empty and with Processor Installed**

**Figure 5-4a. Retention Clips (left: 603-pin, right: 604-pin)**

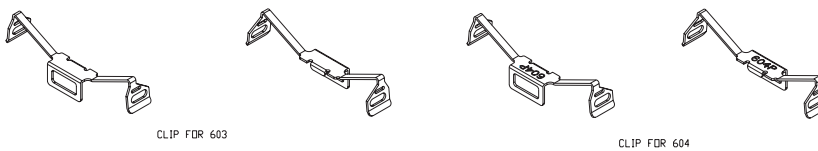
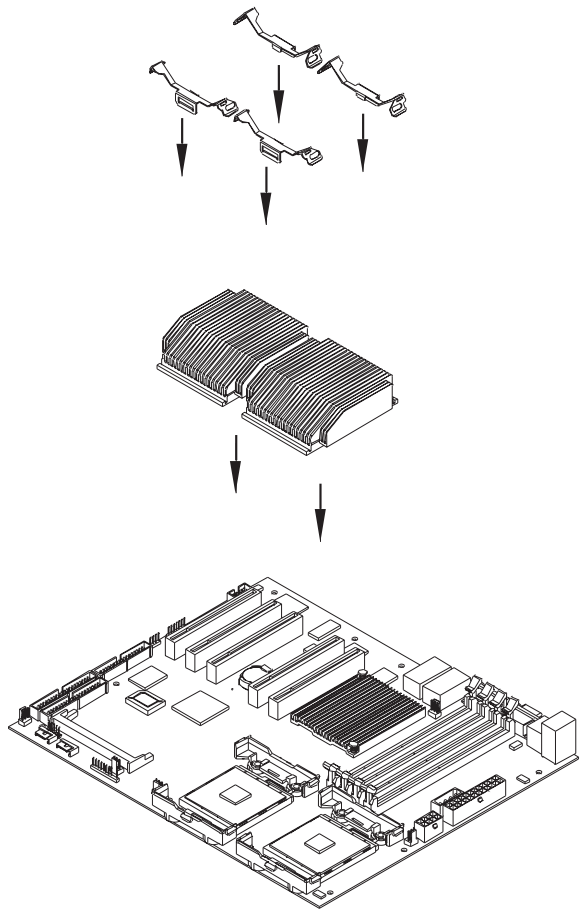


**Figure 5-4b. Heatsink Installation**



## 5-6 Installing Memory

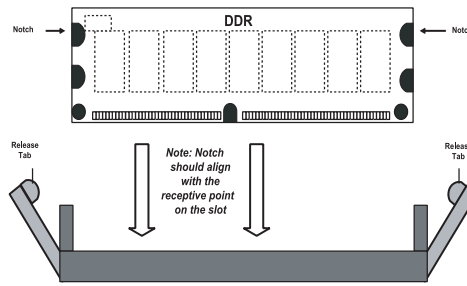
**CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.**

1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

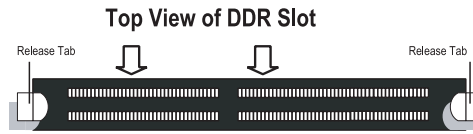
### Memory Support

The X5DPA-TGM+ only supports registered ECC DDR-266/200 MHz SDRAM memory. If you are using 533 MHz front side bus processor(s), you must use DDR-266 SDRAM. If you are using 400 MHz FSB (front side bus) processor(s), you may use either DDR-266 or DDR-200 SDRAM. However, if 400 MHz FSB processor(s) are used, DDR-266 will run at 200 MHz.

**Figure 5-5. DIMM Installation**




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

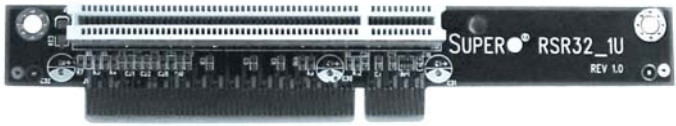


## 5-7 Adding PCI Cards

### 1. 32-bit PCI slot

The X5DPA-TGM+ has one 32-bit, 33 MHz 5V PCI slot available in the 1U configuration. A riser card designed specifically for use in the 811 1U rackmount chassis is included with your system and allows an installed PCI card to sit at a 90 degree angle so it can fit inside the chassis. This riser card accommodates one 32-bit, 33 MHz 5V PCI card (see Figure 5-6).

**Figure 5-6. 32-bit, 33 MHz 5V Riser Card**



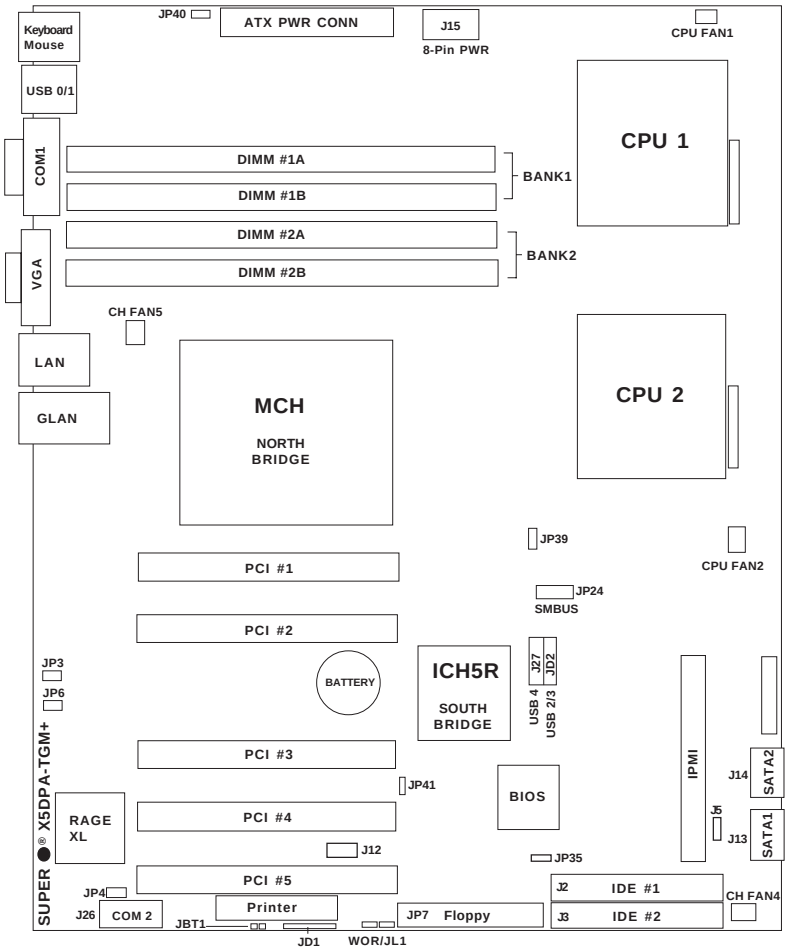

### 2. PCI card installation

Before installing a PCI add-on card, locate the PCI riser card mentioned in Step 1. Begin by removing the shield for the PCI slot you wish to populate. Fully seat the PCI card into the riser card and screw it into the metal retention rail. Then, insert the riser card into the PCI slot on the motherboard, pushing down with your thumbs evenly on both sides of the card. Finish by using a screw to secure the top of the card shield to the rear of the chassis. The PCI slot shields protect the motherboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused PCI slot.

## 5-8 Motherboard Details

**Figure 5-7. Super X5DPA-TGM+ Layout**

(not drawn to scale)



# X5DPA-TGM+ Quick Reference

| Jumper | Description | Default Setting |
|---|---|---|
| J12 | SMBus header | Pins 1-2,3-4(Enabled) |
| JBT1 | CMOS Clear | See Jumper Section |
| JD1 | PWR LED/Speaker Header | Pins 6-7 (Onboard Speaker Enabled) |
| JP3 | LAN Enable/Disable | Pins 1-2 (Enabled) |
| JP6 | GLAN Enable/Disable | Pins 1-2 (Enabled) |
| JP4 | VGA Enable/Disable | Pins 1-2 (Enabled) |
| JP39 | CPU Clock | Pins 1-2 (Auto) |
| JP40 | Force Power On | Open (Disabled) |
| JP41 | Watch Dog | Pins 1-2 (Reset) |

| Connector | Description |
|---|---|
| ATX PWR CONN | Primary ATX Power Connector |
| DIMM#1A-DIMM#2B | Memory (RAM) Slots |
| CPU/CHASSIS FANS | CPU/Chassis Fan Headers |
| LAN | 10/100 Mbps Fast Ethernet Port (Intel 82541) |
| GLAN | Gigabit Ethernet Port (Intel 82550 controller) |
| J2/J3 | IDE#1/IDE#2 Connectors |
| J5 | SATA LED Header |
| J7 | Parallel (Printer) Port |
| J8, J26 | COM1, COM2 |
| J13/J14 | SATA0/SATA1 Connectors |
| J15 | Secondary ATX (8-Pin) Power Connector |
| J22 | IPMI Connector |
| J27, JD2 | Front Panel USB2/3, USB4 |
| J28 | PS/2 Keyboard Mouse |
| JF2 | Front Control Panel Connector |
| JL1 | Chassis Intrusion Header |
| JP7 | Floppy Disk Connector |
| JP24 | SMBus Connector |
| JP35 | Keylock Switch Connector |
| WOR | Wake-on-Ring Header |

# 5-9 Connector Definitions

## ATX Power Connection

The X5DPA-TGM+ power supply connector meets the SSI (Superset ATX) 24-pin specification, however it also supports a 20-pin power supply connector. Make sure that the orientation of the PS connector is correct. See the table on the right for pin definitions.

**ATX Power Supply 24-pin Connector Pin Definitions**

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

## PWR_SEC Connection

In addition to the Primary ATX power connector (above), the secondary 12v 8-pin connector labeled J15 must also be connected to your power supply. See the table on the right for pin definitions.

**8-Pin +12v Power Supply Connector (J15)**

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

## Power LED

The Power LED connection is located on pins 15 and 16 of JF2. Refer to the table on the right for pin definitions.

**PWR_LED Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 15 | Vcc |
| 16 | Control |

## NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF2. Refer to the table on the right for pin definitions.

**NMI Button Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 19 | Control |
| 20 | Ground |

### HDD LED

The HDD LED (for IDE and Serial ATA disk drives) connection is located on pins 13 and 14 of JF2. Attach the IDE hard drive LED cable to these pins to display disk activity. Refer to the table on the right for pin definitions.

**HDD LED Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 13 | Vcc |
| 14 | HD Active |

### NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF2. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

**NIC1 LED Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 11 | Vcc |
| 12 | GND |

### NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF2. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

**NIC2 LED Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 9 | Vcc |
| 10 | GND |

### Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF2 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

**Overheat (OH) LED Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 7 | Vcc |
| 8 | GND |

### Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF2. Refer to the table on the right for pin definitions.

**Power Fail LED Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 5 | Vcc |
| 6 | GND |

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF2. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

**Reset Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 3 | Reset |
| 4 | Ground |

### Power Button

The Power Button connection is located on pins 1 and 2 of JF2. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least four seconds. Refer to the table on the right for pin definitions.

**Power Button Connector Pin Definitions (JF2)**

| Pin Number | Definition |
|---|---|
| 1 | PW_ON |
| 2 | Ground |

### Chassis Intrusion

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

**Chassis Intrusion Pin Definitions (JL1)**

| Pin Number | Definition |
|---|---|
| 1 | Signal |
| 2 | Ground |

### Universal Serial Bus (USB0/1)

Two Universal Serial Bus ports are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

**USB 0/1 Pin Definitions**

| USB0 | | USB1 | |
|---|---|---|---|
| Pin Number | Definition | Pin Number | Definition |
| 1 | +5V | 1 | +5V |
| 2 | P0- | 2 | P0- |
| 3 | P0+ | 3 | P0+ |
| 4 | Ground | 4 | Ground |

## Front Side USB

Three additional USB headers (at JD2 and J27) can be used for front side USB access (see the motherboard layout for locations). You will need a USB cable (not included) to use either connection. Refer to the table on the right for pin definitions.

**Front Side USB Pin Definitions**

| USB0/1 (JD2) | | USB2 (J27) | |
|---|---|---|---|
| Pin Number | Definition | Pin Number | Definition |
| 1 | +5V | 1 | +5V |
| 2 | P0- | 2 | P0- |
| 3 | P0+ | 3 | P0+ |
| 4 | Ground | 4 | Ground |
| 5 | Key | 5 | N/A |

## Serial Ports

The COM1 serial port is located next to the USB 0/1 ports. COM 2 is located at the corner of the board near the PCI #5 slot (see motherboard layout). See the table on the right for pin definitions. The COM2(J26) connector is a header on the motherboard (see motherboard layout).

**Serial Port Pin Definitions (COM1, COM2)**

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

**Note:** Pin 10 is included on the header but not on the port.

## Ethernet Ports

Two Ethernet ports (one Gb LAN port and one Mb LAN port) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.

## Fan Headers

The X5DPA-TGM+ has five CPU and chassis fan headers designated CPU Fan1, CPU Fan2, Chassis Fan 3, Chassis Fan4 and Chassis Fan 5. See the table on the right for pin definitions.

**Fan Header Pin Definitions**

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

Caution: These fan headers are DC power.

## Power LED/Speaker

On the JD1 header, pins 1-3 are for a Power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

**Speaker Connector Pin Definitions (JD1)**

| Pin Number | Function | Definition |
|---|---|---|
| 4 | + | Red wire, Speaker data |
| 5 | Key | No connection |
| 6 | | Key |
| 7 | | Speaker data |

## ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located on J28 on the X5DPA-TGM+. See the table at right for pin definitions. (See Figure 5-2 for the locations of each.)

**PS/2 Keyboard and Mouse Port Pin Definitions (J28)**

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

### SMBus Header

The SMBus header is located on J12. Close pins 1-2 and 3-4 to support the PCI/SMBus (this is the default setting).

### Wake-On-Ring

The Wake-On-Ring header is designated JWOR1. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

**Wake-on-Ring Pin Definitions (JWOR1)**

| Pin Number | Definition |
|---|---|
| 1 | Ground |
| 2 | Wake-up |

### Keylock

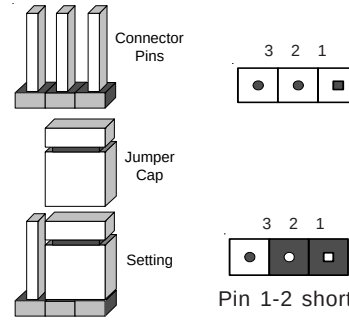
The keyboard lock connection is located on JP35. Utilizing this header allows you to inhibit any actions made on the keyboard, effectively "locking" it.

## 5-10 Jumper Settings

### Explanation of Jumpers

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

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




### CMOS Clear

JBT1 is used to clear CMOS (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, first power down the system, then

1) 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*.

### Front Side Bus Speed

JP39 (see motherboard layout ) is used to set the system (front side) bus speed for the processors. It is best to keep this jumper set to Auto. This jumper is used together with the CPU Clock setting in BIOS. See the table on the right for jumper settings.

**Front Side Bus Speed Jumper Settings (JP39)**

| Jumper Position | Definition |
|---|---|
| Pins 1-2 | Auto |
| Pins 2-3 | 400 MHz |
| Open | 533 MHz |

### GLAN/LAN Enable/Disable

Change the setting of JP3 to enable or disable the onboard GLAN. Change the setting of JP6 to enable or disable the onboard LAN. See the table on the right for jumper settings. The default setting for both is enabled.

**GLAN/LAN Enable/Disable Jumper Settings (JP3: GLAN, JP6: LAN )**

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

### VGA Enable/Disable

JP4 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 (JP4)**

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

### Watch Dog Enable/Disable

JP41 allows you to enable or disable the Watch Dog function. See the table on the right for jumper settings. Close pins 1-2 to reset the system or close pins 2-3 to generate an NMI (Non Maskable Interrupt) when an application freezes the system.

**Watch Dog Enable/ Disable Jumper Settings (JP41)**

| Jumper Position | Definition |
|---|---|
| 1-2 | Reset |
| 2-3 | NMI |

## 5-11 Onboard Indicators

### GLAN/LAN LEDs

Each Ethernet port has two LEDs. On each LAN port, the yellow LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table on the right for the functions associated with these LEDs.

**GLAN Right LED Indicator**

| LED Color | Definition |
|---|---|
| Off | No Connection |
| Green | 100 MHz |
| Orange | 1 GHz |

## 5-12 Parallel Port, Floppy and Hard Drive Connections

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

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

### Parallel Port Connector

The parallel port is located on J7. See the table on the right for pin definitions.

**Parallel (Printer) Port Pin Definitions (J7)**

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

## Floppy Connector

The floppy connector is located on JP7. See the table on the right for pin definitions.

**Floppy Connector Pin Definitions (JP7)**

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

## IDE Connectors

There are no jumpers to configure the onboard IDE interfaces J2 (IDE#1) and J3 (IDE#2). See the table on the right for pin definitions.

**IDE Connector Pin Definitions (J2, J3)**

| Pin Number | Function | Pin Number | Function |
|---|---|---|---|
| 1 | Reset IDE | 2 | GND |
| 3 | Host Data 7 | 4 | Host Data 8 |
| 5 | Host Data 6 | 6 | Host Data 9 |
| 7 | Host Data 5 | 8 | Host Data 10 |
| 9 | Host Data 4 | 10 | Host Data 11 |
| 11 | Host Data 3 | 12 | Host Data 12 |
| 13 | Host Data 2 | 14 | Host Data 13 |
| 15 | Host Data 1 | 16 | Host Data 14 |
| 17 | Host Data 0 | 18 | Host Data 15 |
| 19 | GND | 20 | Key |
| 21 | DRQ3 | 22 | GND |
| 23 | I/O Write- | 24 | GND |
| 25 | I/O Read- | 26 | GND |
| 27 | IOCHRDY | 28 | BALE |
| 29 | DACK3- | 30 | GND |
| 31 | IRQ14 | 32 | IOCS16- |
| 33 | Addr 1 | 34 | GND |
| 35 | Addr 0 | 36 | Addr 2 |
| 37 | Chip Select 0 | 38 | Chip Select 1- |
| 39 | Activity | 40 | GND |

# Chapter 6
# Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC811T-350 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

### Tools Required

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

## 6-1 Static-Sensitive Devices

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

### Precautions

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

### Unpacking

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

**Figure 6-1. Chassis Front View**

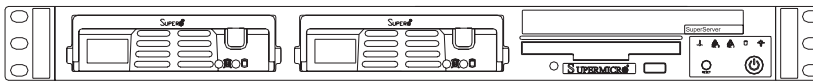
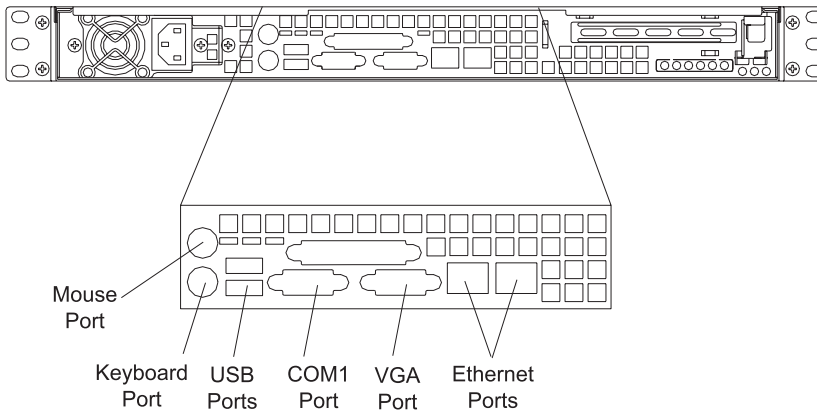


**Figure 6-2. Chassis Rear View**




## 6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF2 connector on the motherboard to provide you with system control buttons and status indicators. These wires have been bundled together in a ribbon cable to simplify the connection. Connect the cable from JF2 on the motherboard to JP4 on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both JF2 and JP4. Pull all excess

cabling out of the airflow path. The LEDs inform you of system status. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF2 can be found in Chapter 5.

## 6-3 System Fans

Two 10-cm blower fans provides all the cooling needed for the SuperServer 6013A-T. Air seals are included under the blower fans and at the chassis cross section, which separates the drive bay area from the motherboard area of the chassis to promote better airflow. It is highly important that the air seals are properly installed and making a good seal in order for the cooling air to circulate properly through the chassis.

### System Fan Failure

The blower fans run at a full 100% rpm. If a fan fails, the ambient air temperature in the chassis will rise and activate the overheat LED on the control panel. You will need to power down the system to replace this fan.

### Replacing System Cooling Fans

**1. Removing a blower fan**

After turning off the power to the system, first remove the chassis cover and unplug the fan cable from the motherboard. Unscrew the failed blower fan from the chassis and pull it completely out from the motherboard.

**2. Installing a new blower fan**

Replace the failed fan with an identical 10-cm, 12 volt fan (available from Supermicro, FAN-038). Position the new fan in its proper place and secure it to the chassis with the screws you removed previously. After the new fan has been installed, plug the fan cable back into the same chassis fan header on the motherboard you removed it from. Make sure the air seal under the fan is properly installed and creating a good seal. Power up the system and check that the fan is working properly and that the overheat LED on the control panel has turned off. Finish by replacing the top panel of the chassis.

# 6-4 Drive Bay Installation/Removal

## Accessing the Drive Bays

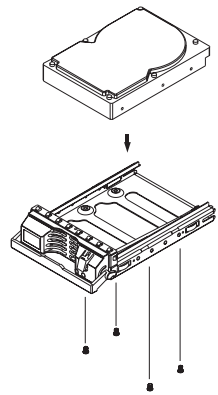
Serial ATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace Serial ATA drives. Proceed to the next step for instructions.

CD-ROM/Floppy Disk Drives: For installing/removing a CD-ROM or floppy disk drive, you will need to gain access to the inside of the 6013A-T by removing the top cover of the chassis. Proceed to the "CD-ROM and Floppy Drive Installation" section later in this chapter for instructions.
**Note: Only a "slim" CD-ROM drive will fit into the 6013A-T.**

## Serial ATA Drive Installation

**1. Mounting a Serial ATA drive in a drive carrier**
The Serial ATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the Serial ATA drive bays. For this reason, even empty carriers without Serial ATA drives installed must remain in the chassis. To add a new Serial ATA drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

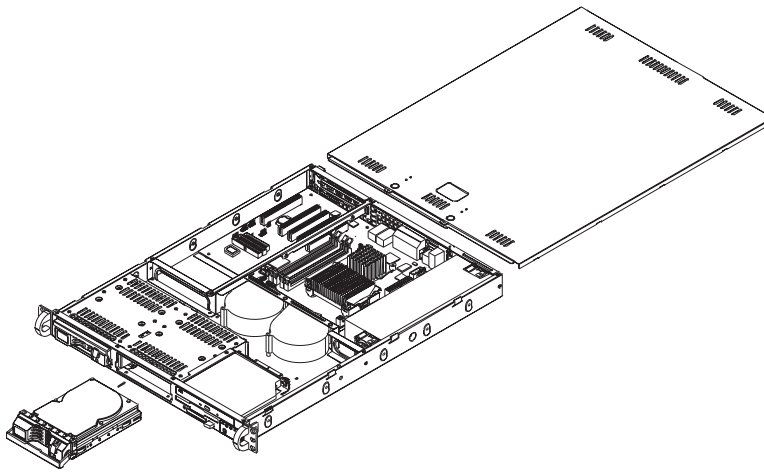
**Figure 6-3. Mounting a Drive in a Carrier**



**2. Installing/removing hot-swap Serial ATA drives**

Two Serial ATA drive bays are located in the front of the chassis, making them easily accessible for installation and removal. These drives are hot-swappable, meaning they can be installed and removed without powering down the system. To remove, first push the release button located beside the drive LEDs, then swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-4).

**Figure 6-4. Removing/Installing Serial ATA Drives**



**Use caution when working around the Serial ATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.**

**<u>Important:</u> Regardless of how many Serial ATA hard drives are installed, both drive carriers must remain in the drive bays to maintain proper airflow.**

### Serial ATA Power Cables

Serial ATA power cables should be routed so that they do not block the airflow through the chassis. See the motherboard layout diagram for the location of the cable connections.

### Serial ATA Backplane

The Serial ATA drives plug into a backplane that provides power, drive ID and bus termination. A RAID controller can be used with the backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the Serial ATA drives. The backplane is already preconfigured, so there are no jumpers or switches present on it.

## CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM and floppy drive bays. The CD-ROM drive must have a "slim" profile to fit into the 6013A-T.

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. You must power down the system before installing or removing a CD-ROM or floppy drive.

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

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

## 6-5 Power Supply

The SuperServer 6013A-T has a single 350 watt power supply. This power supply has an auto-switching capability, which enables it to automatically sense and operate at 100 to 240 input volts. Depress the main power button 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 (see contact infomation in Chapter 1).

### Replacing the Power Supply

**1. Accessing the inside of the SuperServer 6013A-T**

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

**2. Removing the power supply**

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

**3. Installing a new power supply**

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

## Notes

# Chapter 7
# AMIBIOS

## 7-1 Introduction

This chapter describes the AMIBIOS for the X5DPA-TGM+. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily upgraded using a floppy disk-based program. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

### Starting the BIOS Setup Utility

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

Each main BIOS menu option is described in this user's guide. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

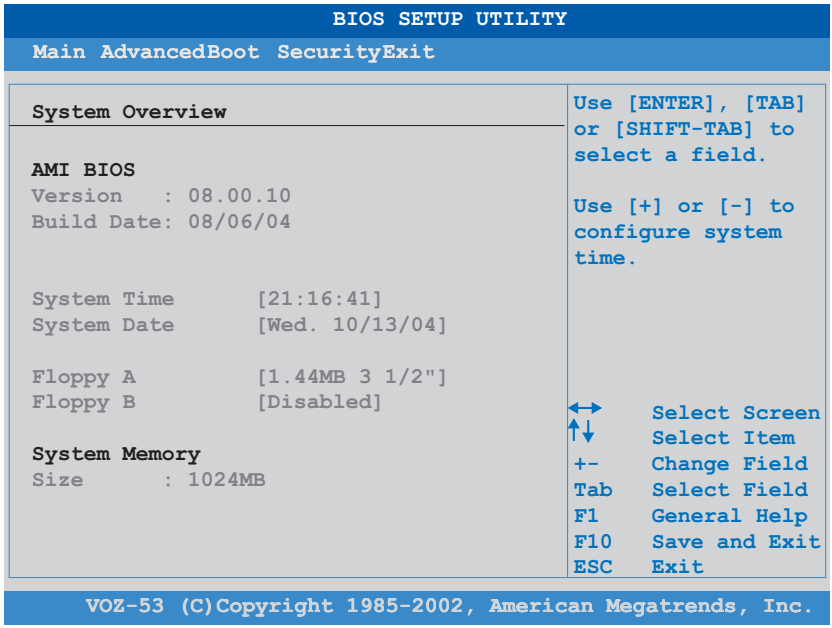
(AMIBIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.

*Note: Options printed in **Bold** are default settings.

## 7-2 Main Setup

When you first enter the BIOS Setup Utility, the Main setup screen will be displayed. You can always return to the Main setup screen by selecting the ***Main*** tab on the top of the screen. The Main BIOS Setup screen is shown below.




### System Time/System Date

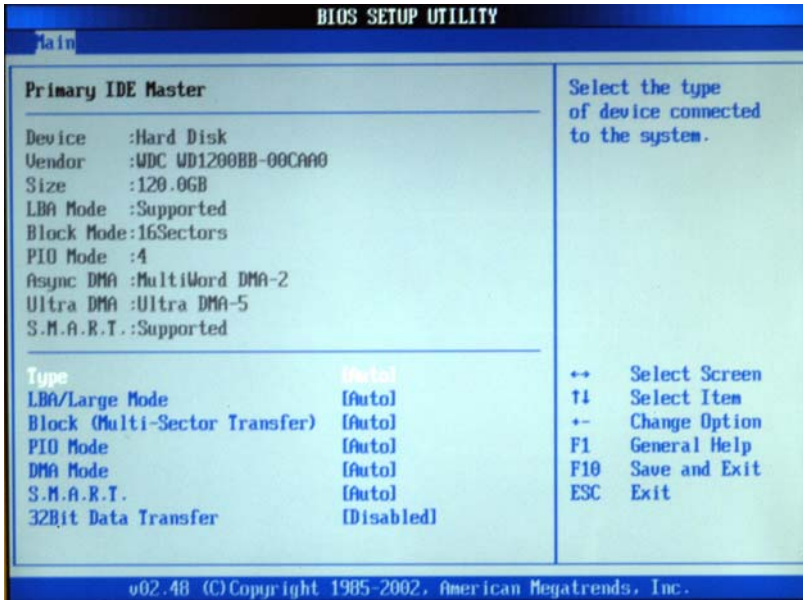
Use this option to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

**Note:** The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30P.M. as 17:30:00.

### Floppy Diskette Device

Move the cursor to these fields via the up and down <arrow> keys. Select the floppy type. The options are "Disabled", "360 KB 51/4", "1.2 MB 51/4"," 720 KB 31/2", "1.44 MB 3½" and "**2.88 MB 3½**".

## ▶Primary IDE Master/Slave, Secondary IDE Master/Slave Sub Menu




### ▶Primary and Secondary IDE Master and Slave Settings

From the Main Setup screen, press <Enter> to access the submenu for the primary and secondary IDE master and slave drives. Use this screen to select options for the Primary and Secondary IDE drives. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen for the Primary IDE Master is shown above.

### Type

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

### LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB. For drives of over 137 GB, your system must be equipped with 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. Options are "Disabled" or "**Auto**".

### Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select "Disabled" to allow the data to be transferred from and to the device one sector at a time. Select "Auto" to allow the data transfer to and from the device to take place multiple sectors at a time if the device supports it. The options are "**Auto**" and "Disabled".

### PIO Mode

IDE PIO (Programmable I/O) mode programs the timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are "**Auto**", "0", "1", "2", "3", and "4". Select Auto to allow the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow the BIOS to use PIO mode 0 (for a data transfer rate of 3.3 MBs). Select 1 to allow the BIOS to use PIO mode 1 (for a data transfer rate of 5.2 MBs). Select 2 to allow the BIOS to use PIO mode 2 (for a data transfer rate of 8.3 MBs). Select 3 to allow the BIOS to use PIO mode 3 (for a data transfer rate of 11.1 MBs). Select 4 to allow the BIOS to use PIO mode 4 (for a data transfer rate of 16.6 MBs). This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

### DMA Mode

Select Auto to allow the BIOS to auto detect the DMA mode. Use this value if the IDE disk drive support cannot be determined. Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0, which has a data transfer rate of 2.1 MBs. Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1, which has a data transfer rate of 4.2 MBs. Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2, which has a data transfer rate of 8.3 MBs. Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0, which has a data transfer rate of 4.2 MBs. Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1, which has a data transfer rate of 13.3 MBs. Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2, which has a data transfer rate of 16.6 MBs. Select UDMA0 to allow the BIOS to use Ultra DMA mode 0, which has a data transfer rate of 16.6 MBs. This is the same transfer rate as PIO mode 4 and Multi Word DMA mode 2. Select UDMA1 to allow the BIOS to use Ultra DMA mode 1, which has a data

transfer rate of 25 MBs. Select UDMA2 to allow the BIOS to use Ultra DMA mode 2,which has a data transfer rate of 33.3 MBs. The Options are "**Auto**", "SWDMA0", "SWDMA1", "SWDMA2", "MWDMA0", "MWDMA1", "MWDMA2","UDMA0", "UDMA1", and "UDMA2".

### S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select **"Auto"** to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent the BIOS from using S.M.A.R.T. Select "Enabled" to allow the BIOS to use S.M.A.R.T. to support hard drive disk.

### 32-Bit Data Transfer

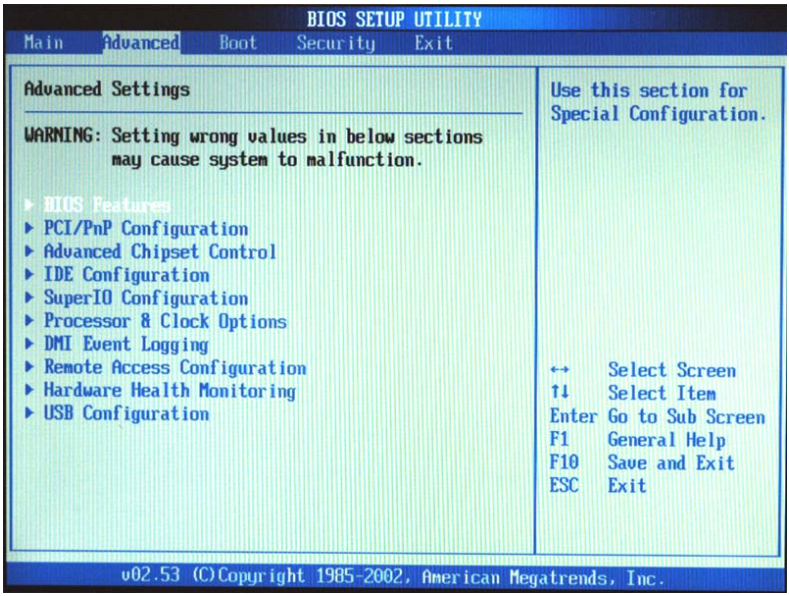
Select "Enabled" to activate the 32-Bit data transfer function. Select "**Disabled**" to deactivate the function.

### System Memory

When AMI BIOS auto detects the System Memory, it will automatically display the size of the memory.

## 7-3 Advanced BIOS Setup

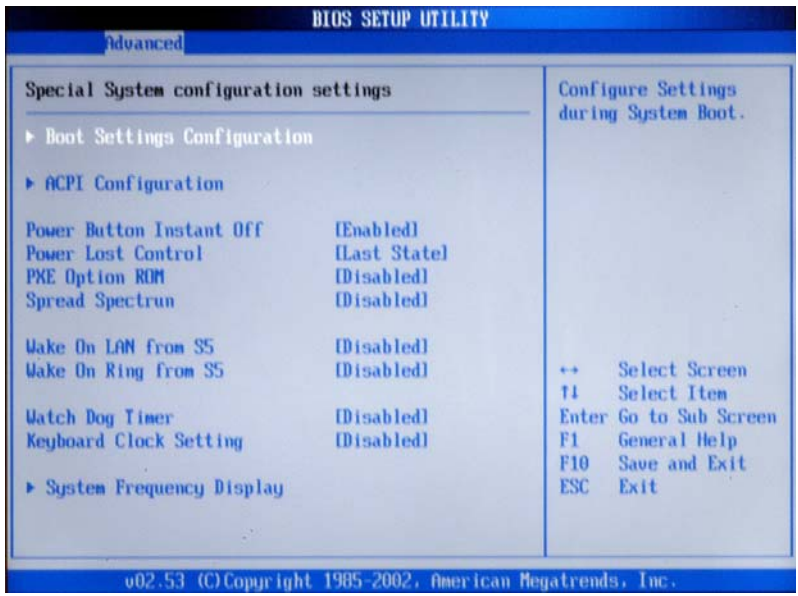
The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.




## ▶BIOS Features

## ▶Boot Settings Configuration

This item allows the user to configure the system's boot settings.



### Quick Boot

Select "Disabled" to allow the BIOS to perform all POST tests. Select "**Enabled**" to have the BIOS to skip certain POST tests to reduce the time needed for the system to boot up.

### Quiet Boot

Set this value to allow the boot up screen options to be modified between POST messages or OEM logo. Select "Disabled" to allow the computer system to display the POST messages. Select "**Enabled**" to allow the computer system to display the OEM logo.

### Add-On ROM Display Mode

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

### Boot up Num-Lock

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

### PS/2 Mouse Support

Set this value to allow the PS/2 mouse support to be modified. The options are "**Enabled**" and "Disabled".

### Wait for 'F1' If Error

Select "**Enabled**" to activate the function of Wait for "F1" if Error. T

### Hit 'DEL' Message Display

Select "**Enabled**" to display Setup Message when the user hits the DEL key.

### Interrupt 19 Capture

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

## ▶APCI Configuration

This item allows the user to enable or disable ACPI support for the operating system.

### ACPI Aware O/S

Select "**Yes**" if the operating system supports ACPI. Select "No" if the operating system does not support ACPI.

## ▶Advanced APCI Configuration

### ACPI 2.0 Features

Select "Yes" to allow RSDP pointers to point to the 64-bit Fixed System Description Tables. Select "**No**" to deactivate this function.

#### ACPI APIC Support

Select "**Enabled**" to allow the ACPI APIC Table Pointer to be included in the RSDP pointer list.

#### AMI OEMB Table

Select "**Enabled**" to allow the OEMB Table Pointer to be included in the R(x)SDT pointer lists.

#### Headless Mode

Select "Enabled" to activate the Headless Operation Mode through ACPI. The default setting is "**Disabled**".

### Power Button Instant Off

Select "**Enabled**" to activate the "Power Button Instant Off" function.

### Power Lost Control

Select "Stay Off" if you want the system to remain off when power is resatored following from a power outage. Select "Power On" if you want the system to automatically turn on when power is resatored following from a power outage. Select "**Last State**" if you want to system to resume its last state when power is resatored following from a power outage.

### PXE Option ROM

Select "Enabled" to enable the Boot from LAN function. The options are "Enabled", and "**Disabled**".

### Spread Spectrum

Select "**Enabled**" to activate Spread Spectrum, which is used to reduce electromagnetic interference. The options are "Enabled", and "**Disabled**".

### Wake On LAN from S5

Select "**Enabled**" to allow the BIOS to Wake Up the system from an S5 state via the LAN.

### Wake On Ring from S5

Select "**Enabled**" to activate the Wake On Ring from S5" function.

### Watch Dog Timer

Select "Enabled" to activate Watch Dog Timer. The options are "Enabled" or "**Disabled**".

#### Set Watch Dog Timer

Allows the user to set the value of Watch Dog Timer. The options are "2 Minutes", "**5 Minutes**", "10 Minutes" and "15 Minutes".

### Keyboard Clock Setting

Select "Enabled" to allow the user to configure the keyboard clock settings. The options are "**Enabled**" or "Disabled".

### ▶System Frequency Display

This feature allows the BIOS to display the status, and the frequency of Front Side Bus, Memory and PCI slots.

#### FSB/DDR Memory

This option allows the BIOS to display the status of the FSB and DDR memory".

## ▶PCI/PnP Configuration

### Plug & Play O/S

Select "Yes" to allow the operating system to configure Plug & Play devices that are not required when booting up the system, if Plug & Play is supported by the OS. Select "**No**" to allow the BIOS to configure Plug & Play devices when the system is booting up.

### PCI Latency Timer

This option sets the latency of all PCI devices on the PCI bus. Select a number listed to set the PCI latency to that many PCI clock cycles. The settings are "32, "**64**", "96", "128", "160", "192", "224" and "248".

### Allocate IRQ to PCI VGA

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

### Palette Snooping

Set this value to allow the system to modify the Palette Snooping settings. This setting should not be changed unless the VGA card manufacturer indicates otherwise. Select "Enabled" to inform the PCI devices that an ISA based graphics device is installed in the system so that the card will function correctly. Always check with your adapter card's manuals first before modifying the default settings in the BIOS. The options are "Enabled" and "**Disabled**."

### PCI IDE BusMaster

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

### OffBoard PCI/ISA IDE Card

Set this value to allow the OffBoard PCI/ISA IDE Card to be selected. Select "**Auto**" to allow the BIOS to automatically select the location of an OffBoard PCI IDE adapter card. Select "PCI Slot1" only when there is an IDE adapter card installed in PCI Slot 1. Select "PCI Slot2" only when there is an IDE adapter card installed in PCI Slot 2. Select "PCI Slot 3" only when there is an IDE adapter card installed in PCI Slot 3. Select "PCI Slot 4" only if there is an IDE adapter card installed in PCI Slot 4.

### IRQ

Set this value to allow the IRQ settings to be modified. Select "**Available**" to allow the specified IRQ to be used by a PCI/PnP device. The options are "**Available**" and "Reserved" for the following IRQs: IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ14, IRQ15. Select "Reserved" to allow the specified IRQ to be used by a legacy ISA device.

### DMA

Select "**Available**" to allow the specified DMA to be used by a PCI/PnP device. Select "Reserved" to allow the specified DMA to be used by a legacy ISA device. The Reserved setting allows the specified DMA to be used by a legacy ISA device.

### Reserved Memory Size

This item allows the system to reserve memory that is used by ISA devices. Select "**Disabled**" to prevent BIOS from reserving memory for ISA devices. Select "16K" to allow the system to reserve 16K of the system memory for ISA devices. Select "32K" to allow the system to reserve 32K of the system memory for ISA devices. Select "64K" to allow the system for reserve 64K of the system memory for ISA devices.

## ▶Advanced Chipset Control

### ▶Intel E7500/7501 NorthBridge Configuration

This feature allows the user to configure the settings for the MCH NorthBridge portion of the chipset.

### Chipset Memory Remap Feature

Select "**Enabled**" to allow remapping of overlapped PCI memory above the total physical memory.

### Memory Hole

Select "Enabled" to allow the memory hole to be set from 15M to 16M. The options are "**Disabled**" and "enabled."

### ▶Intel ICH5R SouthBridge Configuration

This feature allows the user to configure the settings for the Intel ICH5R SouthBridge portion of the chipset.

### MPS Revision

This feature allows the BIOS to display the current MPS revision level. The current revision is [1.4].

### ▶IDE Configuration

This feature allows the user to configure the IDE settings.

### Onboard PCI IDE Operate Mode

This feature allows the user to set the Onboard PCI IDE Operation mode. The options are "**Legacy Mode**" and "Native Mode." (Note: Native Mode is available for motherboards that run on WindowsXP or Windows 2000 OS.)

### S-ATA Configure

This feature allows the user to set the S-ATA Mode. The options are: "**Native**" and "Legacy."

#### Combined Mode Operation

This feature allows the user to select the operation mode for the IDE drives. The options are "**S-ATA 1st Channel**" and "P-ATA 1st Channel."

#### S-ATA Keep Enabled

Select "Yes" to enable S-ATA at all times. The options are "**Yes**" and "No."

#### P-ATA Keep Enabled

Select "Yes" to enable P-ATA at all times. The options are "**Yes**" and "No."

#### P-ATA Channel Selection

This feature allows the users to select P-ATA channels. The options are "**Both**", "Primary" and "Secondary."

#### S-ATA Ports Definition

This feature allows the users to define the location of the S-ATA ports. The options are "**P0-3rd/P1-4th**" and "P0-4th/PI-3rd."

### Configure S-ATA as RAID

Select "Yes" if you wish to configure S-ATA as RAID. The options are "Yes" and "**No**".

### ▶Primary, Secondary, Third and Fourth Master and Slave Settings

From the Main Setup screen, press <Enter> to access the sub menu for the primary and secondary IDE master and slave drives. Use this screen to select options for the Primary and Secondary IDE drives. Use the <up> and <down> arrow keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.

### Type

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

### LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB. For drive capacities of over 137 GB, your system must be equipped with 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are "Disabled" and "**Auto**".

### Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select "Disabled" to allow the data to be transferred from and to the device one sector at a time. Select "Auto" to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are "**Auto**" and "Disabled".

### PIO Mode

IDE PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are "**Auto**", "0", "1", "2", "3", and "4". Select Auto to allow the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow the BIOS to use PIO mode 0, which has a data transfer rate of 3.3 MBs. Select 1 to

allow the BIOS to use PIO mode 1, which has a data transfer rate of 5.2 MBs. Select 2 to allow the BIOS to use PIO mode 2, which has a data transfer rate of 8.3 MBs. Select 3 to allow the BIOS to use PIO mode 3, which has a data transfer rate of 11.1 MBs. Select 4 to allow the BIOS to use PIO mode 4, which has a data transfer rate of 16.6 MBs. This setting

### DMA Mode

Select Auto to allow the BIOS to auto-detect the DMA mode. Use this value if the IDE disk drive support cannot be determined. Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0, which has a data transfer rate of 2.1 MBs. Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1, which has a data transfer rate of 4.2 MBs. Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2, which has a data transfer rate of 8.3 MBs. Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0, which has a data transfer rate of 4.2 MBs. Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1, which has a data transfer rate of 13.3 MBs. Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2, which has a data transfer rate of 16.6 MBs. Select UDMA0 to allow the BIOS to use Ultra DMA mode 0, which has a data transfer rate of 16.6 MBs (the same transfer rate as PIO mode 4 and Multi Word DMA mode 2. Select UDMA1 to allow the BIOS to use Ultra DMA mode 1, which has a data transfer rate of 25 MBs. Select UDMA2 to allow the BIOS to use Ultra DMA mode 2, which has a data transfer rate of 33.3 MBs. Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. Options are "**Auto**", "SWDMA0", "SWDMA1", "SWDMA2", "MWDMA0", "MWDMA1", "MWDMA2", "UDMA0", "UDMA1", "UDMA2", "UDMA3", "UDMA4", "UDMA5" and "UDMA6".

### S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "Auto" to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent the BIOS from using the S.M.A.R.T. Select "Enabled" to allow the BIOS to use the S.M.A.R.T. to support hard drive disk. The options are "Disabled", "Enabled" and "**Auto**."

### 32-Bit Data Transfer

Select "Enabled" to activate 32-bit data transfer. Select "Disabled" to deactivate the function. The options are "Enabled" and "**Disabled**".

## ▶Super IO Configuration

### OnBoard Floppy Controller

Select "**Enabled**" to enable the Onboard Floppy Controller. The options are "Disabled", and "Enabled."

### Serial Port1 Address

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

### Serial Port2 Address

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

### Serial Port2 Mode

This feature sets the Serial Port2 Mode. The options are "**Normal**", IrDA", and "ASK IR".

### Parallel Port Address

This option specifies the I/O address used by the parallel port. Select Disabled to prevent the parallel port from accessing any system resources and to render the printer port unavailable. The majority of parallel ports on computer systems use IRQ7 and I/O port 378H as the standard setting. The options are"**Disabled**", 278" and "3BC"

## ▶Processor and Clock Options

### HyperThreading

Select "Enabled" to enable HyperThreading for HT supported processor(s). The options are "**Enabled**" and "Disabled."

### Ratio CMOS Setting

This feature allows the user to set the ratio between CPU Core Clock and the FSB Frequency. The default setting is "255".

### Spread Spectrum

Select "Enabled" to activate the function of "Spread Spectrum" in order to reduce the possibility of Electromagnetic Interference. The options are "Enabled" and "**Disabled**."

### ▶ DMI Event Logging

### View Event Log

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

### Mark All Events as Read

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

### Clear Event Logs

This setting will clear the event log when set to "OK". Options are "OK" and **"Cancel"**.

### Event Log Statistics

This setting allows you to view the Event Log Statistics.

## ▶Remote Access Configuration

You can use this screen to select options for the Remote Access Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

### Serial Port Number

This option allows the user to select the Serial Port Number for console redirection. The options are **"Com1"** and "COM2".

### Serial Port Mode

This option allows the user to set the Serial Port Mode. The options are **"115200 8, n, 1",** "57600 8, n, 1", "38400 8, n, 1", "19200 8, n, 1", "9600 8, n, 1", "4800 8, n, 1" and "2400 8, n, 1".

### Flow Control

This option allows the user to determine how the system controls the flow of signal transmission for console redirection. The options are **"None"** and "Hardware".

### Terminal Type

This option allows the user to select the target terminal type for Console Redirection. The options are "VT100" and **"ANSI"**.

### Send Carriage Returen

Enable this feature if the target terminal has more than 80 columns. Disable this function if you do not wish the text to wrap lines even if the text exceeds the terminal width. The options are "Enabled" and **"Disabled"**.

### Redirection after BIOS POST

Select "Disabled" to turn off Console Redirection. Select **"Boot Loader"** to turn off Console Redirection when Boot Loader has completed its operation. Select "Always" to keep Console Redirection active even in the OS environment. (This function is not available for an OS in the graphics mode.

## ▶Hardware Health Monitoring

### H/W Health Function

Select "**Enabled**" to enable the Hardware Health Monitoring function.

### Overheat Temperature Trips

This feature allows the user to set the CPU temperature threshold. The options are "72ºC", "**78ºC**" and "85ºC".

### Hardware Health Event Monitoring

This feature allows the BIOS to display Hardware Health Event Monitoring Results. The user cannot modify the results. The results are for display only.

### ▶USB Configuration

This feature allows the user to configure USB settings.

### USB Functions

This feature allows the user to set USB functions. The options are "Disabled", "2 USB Ports", "4 USB Ports", **"6 USB Ports"** "8 USB Ports".

### Legacy USB Support

Select "Enabled" to enable the support for USB Legacy. The options are "Disabled" and "**Enabled**."

### USB 2.0 Controller

Select "Enabled" to activate the USB 2.0 Controller. The options are "Disabled" and "**Enabled**."

### USB 2.0 Controller Mode

This feature allows the user to select the USB 2.0 Controller Mode. The options are "Full Speed", and "**Hi Speed**."

### Stop EHCI HC in OHCI Handover

This feature allows the BIOS to disable the EHCI Host Controller during OHCI OS Handover Call. This is needed for the operating system that does not support EHCI Host Controller. The options are **"Enabled"** and "Disabled".

### ▶USB Mass Storage Device Configuration

This feature allows the user to configure USB Mass Storage Device settings.

### USB Mass Storage Reset Delay

This feature allows the user to set the reset delay for USB Mass Storage. The options are "10 Sec", "**20 Sec**", "30 Sec" and "40 Sec".

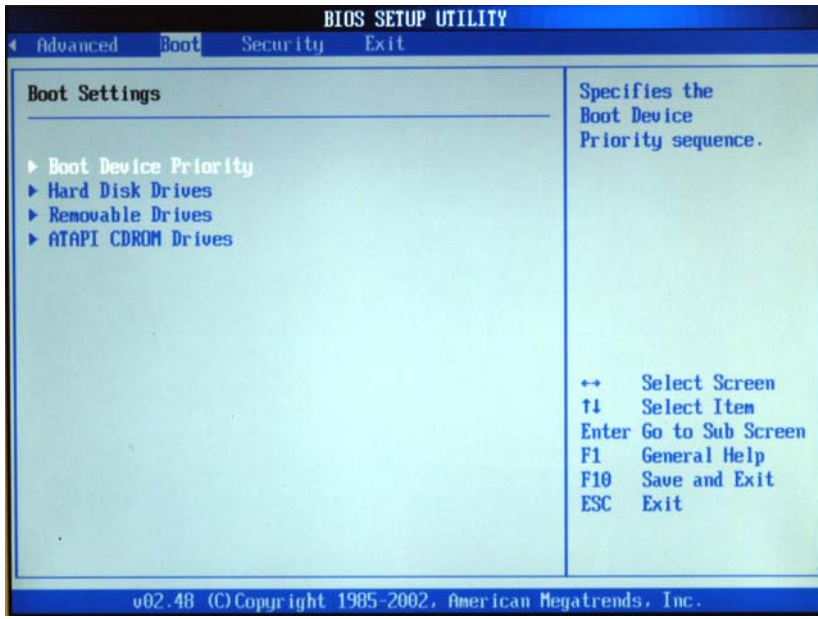
### Emulation Type

If this feature is set to Auto, USB devices that are less than 530MB will be emulated as Floppy. The option of Forced FDD can be used to force a Hard Drive Disk to be formatted and booted as FDD. The options are Floppy, Forced FDD, Hard Disk, CD ROM and **Auto**.

## 7-4 Boot Settings

### Boot Settings Configuration

Use this screen to select options for the Boot Settings Configuration. The settings are described on the following pages. The screen is shown below.




### ▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are "1st Floppy Drive", "CDROM", "ATAPI CDROM" and "Disabled." The default settings are:

· 1st boot device –1st Floppy Drive

· 2nd boot device – CD ROM

· 3rd boot device – ATAPI CDROM

· 4th boot device – IDE Drive

### ▶Hard Disk Drives

This feature allows the user to specify the boot sequence from the available hard drives.

#### 1st Drive

Specify the boot sequence for 1st Hard Drive. The options are "**PM-ST340016A**" and "Disabled".

#### 2nd Drive

Specify the boot sequence for 2nd Hard Drive. The options are "**SM-ST3120023AS**" and "Disabled".

#### 3rd Drive

Specify the boot sequence for 3rd Hard Drive. The options are "**SM-IC35L080AUUA07**" and "Disabled".

### ▶Removable Drives

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

#### 1st Drive

Specify the boot sequence for the 1st removable drive. The options are "**1st Floppy Drive**" and "Disabled".

### ▶ATAPI Drives

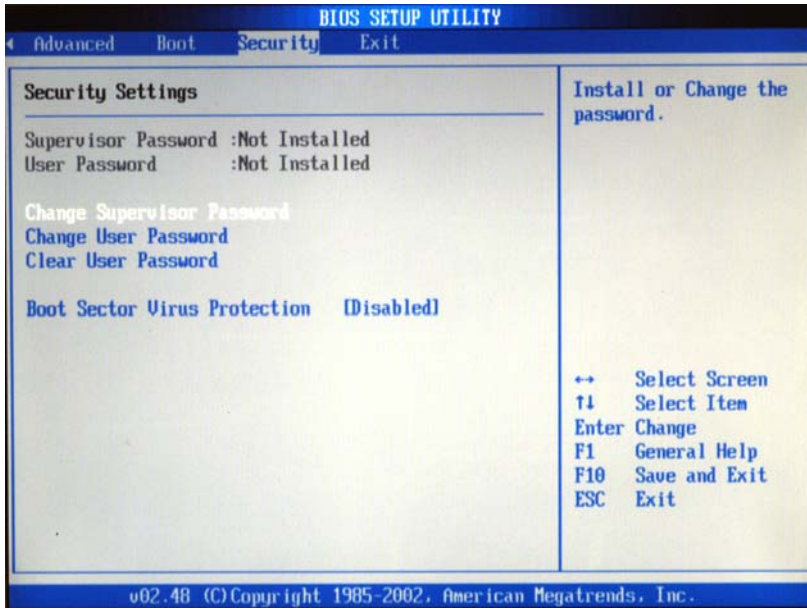
This feature allows the user to specify the boot sequence from the available ATAPI CDROM Drives.

#### 1st Drive

Specify the boot sequence for the 1st hard drive. The options are "**CD-ROM**" and "Disabled".

## 7-5 Security Settings

AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.




### Change Supervisor Password

Highlight this and press <Enter> to access the submenu, then type in the password.

### Change User Password

Highlight this and press <Enter> to access the submenu, then type in the password.

### Clear User Password

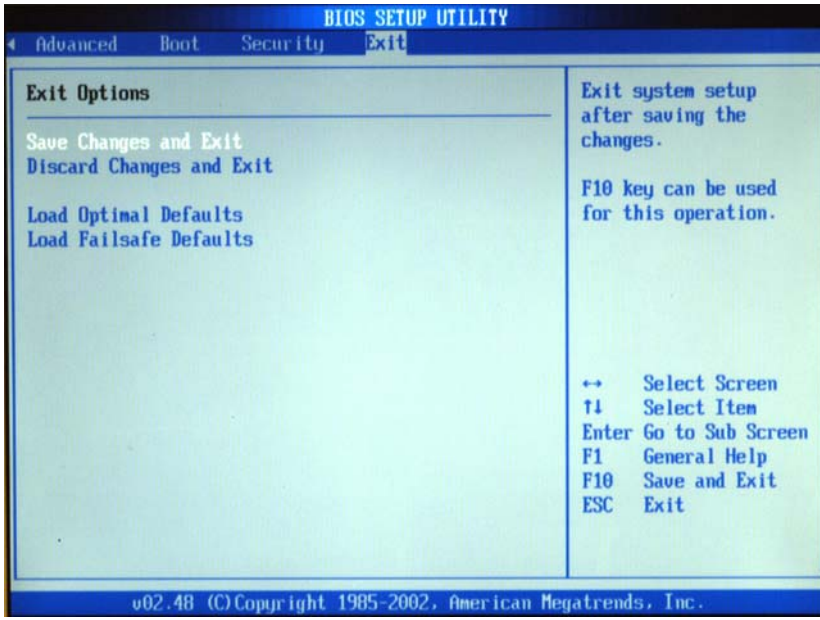
Highlight this and press <Enter> to access the sub menu. You can use the sub menu to clear the user password.

### Boot Sector Virus Protection

Select "Disabled" to deactivate and "Enabled" to activate boot sector protection. When "Enabled", AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive.

## 7-6 Exit Options

Select the Exit tab from the BIOS Setup Utility screen to enter the Exit BIOS Setup screen.




### Save Changes and Exit

When you have completed the system configuration changes, select this option to leave BIOS Setup and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

### Discard Changes and Exit

Select this option to quit BIOS Setup without making any permanent changes to the BIOS settings and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

### Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then Select "OK" to allow BIOS to automatically load the optimal defaults for all BIOS settings. The optimal settings are designed for maximum system performance, but may not work best for all computer applications.

### Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but may not provide maximum performance.

## Notes

# Appendix A
# BIOS Error Beep Codes

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

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

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

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

POST codes may be read on the debug LEDs located beside the LAN port on the motherboard backplane. See the description of the Debug LEDs (LED1 and LED2) in Section 2-6.

## A-1 AMIBIOS Error Beep Codes

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

## Notes

# Appendix B
# BIOS POST Checkpoint Codes

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

## B-1 Uncompressed Initialization Codes

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

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

## B-2 Bootblock Recovery Codes

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

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

## B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution. These codes are uncompressed in F0000h shadow RAM.

| Checkpoint | Code Description |
|---|---|
| 03h | The NMI is disabled. Next, checking for a soft reset or a power on condition. |
| 05h | The BIOS stack has been built. Next, disabling cache memory. |
| 06h | Uncompressing the POST code next. |
| 07h | Next, initializing the CPU and the CPU data area. |
| 08h | The CMOS checksum calculation is done next. |
| 0Ah | The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next. |
| 0Bh | The CMOS status register is initialized. Next, performing any required |

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

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

| Checkpoint | Code Description |
|---|---|
| 48h | Patterns written in base memory. Determining the amount of memory below 1 MB next. |
| 49h | The amount of memory below 1 MB has been found and verified. Determining the amount of memory above 1 MB memory next. |
| 4Bh | The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next. |
| 4Ch | The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next. |
| 4Dh | The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next. |
| 4Eh | The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next. |
| 4Fh | The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next. |
| 50h | The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next. |
| 51h | The memory size display was adjusted for relocation and shadowing. Testing the memory above 1 MB next. |
| 52h | The memory above 1 MB has been tested and initialized. Saving the memory size information next. |
| 53h | The memory size information and the CPU registers are saved. Entering real mode next. |
| 54h | Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next. |
| 57h | The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next. |
| 58h | The memory size was adjusted for relocation and shadowing. Clearing the *Hit <DEL>* message next. |
| 59h | The *Hit <DEL>* message is cleared. The *<WAIT...>* message is displayed. Starting the DMA and interrupt controller test next. |

| Checkpoint | Code Description |
|---|---|
| 60h | The DMA page register test passed. Performing the DMA Controller 1 base register test next. |
| 62h | The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next. |
| 65h | The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next. |
| 66h | Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next. |
| 67h | Completed 8259 interrupt controller initialization. |
| 7Fh | Extended NMI source enabling is in progress. |
| 80h | The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next. |
| 81h | A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next. |
| 82h | The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next. |
| 83h | The command byte was written and global data initialization has completed. Checking for a locked key next. |
| 84h | Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next. |
| 85h | The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next. |
| 86h | The password was checked. Performing any required programming before WINBIOS Setup next. |
| 87h | The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next. |
| 88h | Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next. |
| 89h | The programming after WINBIOS Setup has completed. Displaying the power on screen message next. |
| 8Bh | The first screen message has been displayed. The <*WAIT...*> message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check next. |
| 8Ch | Programming the WINBIOS Setup options next. |
| 8Dh | The WINBIOS Setup options are programmed. Resetting the hard disk controller next. |
| 8Fh | The hard disk controller has been reset. Configuring the floppy drive controller next. |
| 91h | The floppy drive controller has been configured. Configuring the hard disk drive controller next. |

| Checkpoint | Code Description |
|---|---|
| 95h | Initializing the bus option ROMs from C800 next. See the last page of this chapter for additional information. |
| 96h | Initializing before passing control to the adaptor ROM at C800. |
| 97h | Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next. |
| 98h | The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control. |
| 99h | Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next. |
| 9Ah | Set the timer and printer base addresses. Setting the RS-232 base address next. |
| 9Bh | Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next. |
| 9Ch | Required initialization before the Coprocessor test is over. Initializing the Coprocessor next. |
| 9Dh | Coprocessor initialized. Performing any required initialization after the Coprocessor test next. |
| 9Eh | Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next. |
| A2h | Displaying any soft errors next. |
| A3h | The soft error display has completed. Setting the keyboard typematic rate next. |
| A4h | The keyboard typematic rate is set. Programming the memory wait states next. |
| A5h | Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next. |
| A7h | NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next. |
| A8h | Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next. |
| A9h | Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next. |
| Aah | Initialization after E000 option ROM control has completed. Displaying the system configuration next. |
| Abh | Uncompressing the DMI data and executing DMI POST initialization next. |
| B0h | The system configuration is displayed. |
| B1h | Copying any code to specific areas. |
| 00h | Code copying to specific areas is done. Passing control to INT 19h boot loader next. |

## Notes

# Appendix C
# Software Installation

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID Driver before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard.

**Note:** the following section provides information on Adaptec's SATA RAID Driver based on the SATA controller in Intel's ICH5R South Bridge.

## C-1 Introduction

### Serial ATA (SATA)

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

### ICH5R I/O Controller Hub

Located in the South Bridge of the Intel E7501 chipset, the ICH5R I/O Controller Hub (ICH) provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE controller (PATA) and two Serial ATA (SATA) Host Controllers, which support up to two Serial ATA ports and up to two RAID drives. The ICH5R supports the following Parallel ATA (PATA) and Serial (SATA) device configurations:

#### Combined Mode

In this mode, system BIOS assigns the traditional IRQ 14 and IRQ 15 for the use of HDD. Up to four ATA devices are supported by this mode.

Within the Combined Mode, the following three modes are supported:

Non-Combined Mode: Parallel ATA only, with a maximum of four devices supported.

Non-Combined Mode: Serial ATA only, with a maximum of two devices supported

Combined Mode: SATA devices and PATA, with support for two devices each (for a maximum of four total devices). For IDE/SATA configurations, please refer to the table below.

| | | | | | | |
|---|---|---|---|---|---|---|
| Primary Master(=PM) | Yes | Yes | No | No | No | No |
| Primary Slave(=PS) | Yes | No | Yes | No | No | No |
| Secondary Master(=SM) | Yes | No | No | Yes | No | No |
| Secondary Slave(=SS) | Yes | No | No | No | Yes | No |
| SATA Port0 | No | SM | SM | PM | PM | PM |
| SATA Port1 | No | SS | SS | PS | PS | PS |
| *Note: (No=Not Present, Yes=Present) Also, if Logical Primary is selected, the IDE channels are no longer available. | | | | | | |

**Enhanced Mode**

In this mode, system BIOS will automatically search for all available IRQs for the use of HDD. For newer operating systems that support the Enhanced Mode (such as Windows XP, Windows 2000 and Windows 2003), you can set SATA and PATA to the Enhanced Mode. (The newer operating systems can accommodate both Enhanced Mode and Combined Mode and support up to six ATA devices.)

Please refer to the "Advanced Chipset Control" under "Advanced" setup in BIOS to select Combined Mode or Enhanced Mode.

## Configuring BIOS Settings for Enhanced Mode

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

**Note:** If it is your first time to power on the system, we recommend that you load the Optimized Default settings. If you have already done so, please skip to Step 3.

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

3. Use the arrow keys to select the "Advanced" Menu.

4. Scroll down to "IDE Configurations" and press the <Enter> key to select this option.

5. Scroll up to "SATA Mode" and select "Configure SATA as RAID". Press the <Enter> key to select this option.

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

7. Once you've exited the BIOS setup utility, the system will reboot.

8. During the system startup, press the <Ctrl> and the <A> keys simultaneously to run the Adaptec RAID Configuration Utility when prompted by the following message:

*Press <Ctrl><A> for Adaptec RAID Configuration Utility*

## Adaptec Embedded SATA with HostRAID Controller Driver

Adaptec's Embedded Serial ATA with HostRAID controller adds RAID functionality to the Serial ATA I/O controller by supporting RAID 0 (Striping) or RAID 1 (Mirroring) to enhance the industry's pioneer PCI-to-e host controller products. RAID striping (RAID 0) can greatly improve hard disk I/O performance because of its capability in striping data across multiple drives. RAID mirroring (RAID 1) allows data to be simultaneously written to two drives, so critical data is always available even if a single hard disk fails. Due to this built-in functionality, the X5DPA-TGM+ is specially designed to keep pace with the increasing performance demands of computer systems by improving disk I/O throughput and providing data accessibility regardless of a single disk failure. By incorporating Adaptec Embedded Serial ATA into the motherboard design, Supermicro's X5DPA-TGM+ offers the user with the benefits of SATA RAID without the high costs associated with hardware RAID applications.

**Note:** For Adaptec's RAID Driver Installation Instructions, please refer to the Adaptec RAID Controller User's Guide (Emb_SA_RAID_UG.pdf) in the CD that came with this server. You can also download a copy of Adaptec's User's Guide from our web site at www.supermicro.com.

## Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, which includes:

Array Configuration Utility: Use this utility when you want to create, configure and manage arrays.

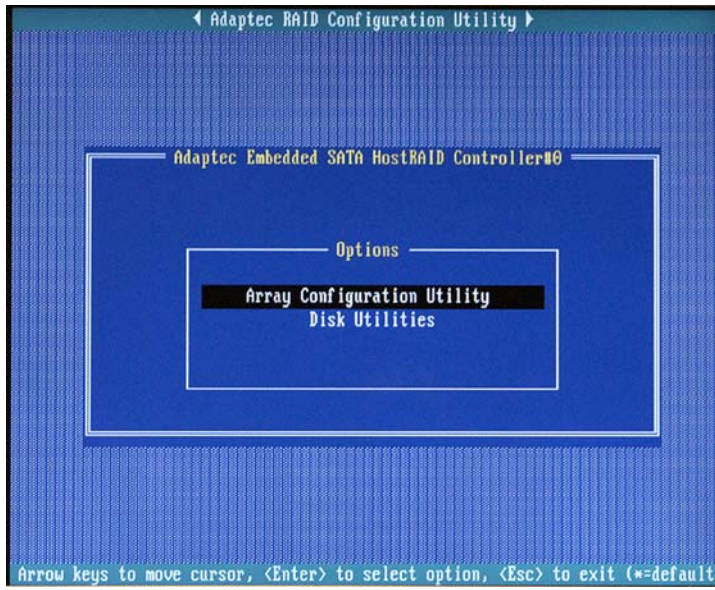
Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will first need to enable the RAID function in the system BIOS (refer to Chapter 7) and then press the <Ctrl> and <A> keys simultaneously when prompted to do so during the system startup. (Refer to the previous page for detailed instructions.)

**Note:** To select an option, use the arrow keys to highlight the item and then press the <Enter> key to select it. To return to a previous menu, press the <ESC> key.

### Using the Array Configuration Utility (ACU)

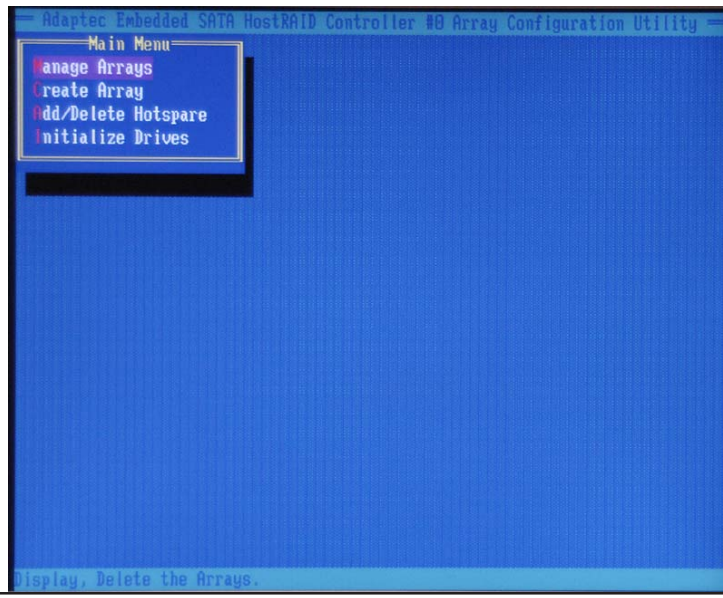
The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives and initialize drives. During the system startup, press the <Ctrl> and <A> keys simultaneously and the main menu will appear.




## Managing Arrays

Select this option to view array properties and to delete arrays. The following sections describe the operations of "Managing Arrays".

To select this option, use the arrow keys and the <Enter> key to select "Managing Arrays" from the main menu (as shown below).



### Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press <Ctrl+A>.

2. From the ARC menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays** (as shown on the previous screen.)

4. From the List of Arrays dialog box, select the array you want to view and press <Enter>.

The Array Properties dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.

5. Press <Esc> to return to the previous menu.

### Deleting Arrays

***Warning: Backup the data on an array before you delete it to prevent any loss of data. Deleted arrays cannot be restored.***

To delete an existing array:

1. Turn on your computer and press <Ctrl+A> when prompted to access the ARC utility.

2. From the ARC main menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays**.

4. Select the array you wish to delete and press <Delete>.

5. In the Array Properties dialog box, select <Delete> and press <Enter>. The following prompt is displayed:

> *Warning!! Deleting the array will render array unusable. Do you want to delete the array? (Yes/No):*
>
> ***RAID 1 only*—the following prompt is also displayed:**
>
> *Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):*

6. Select **Yes** to delete the array or partition or **No** to return to the previous menu.

7. Press <Esc> to return to the previous menu.

## Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space or disks that are not initialized are shown in gray and cannot be used. See *Initializing Disk Drives*.

**To create an array:**

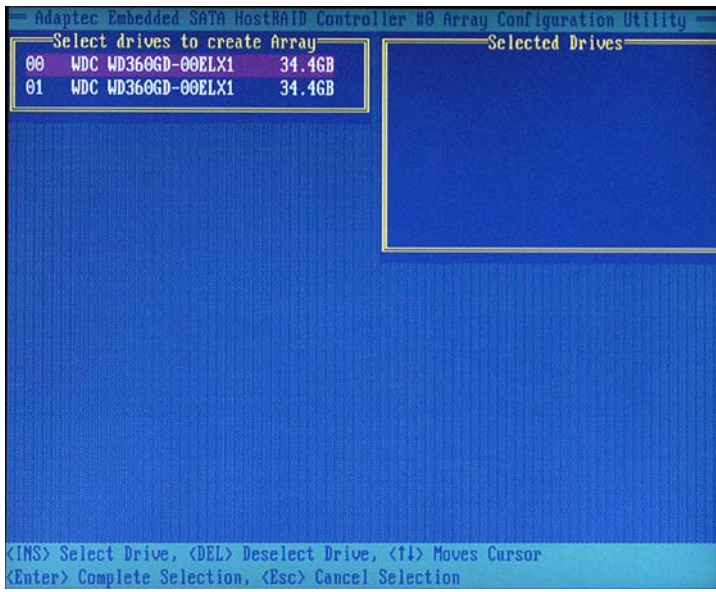
1. Turn on the computer and press <Ctrl+A> when prompted to access the ARC utility.

2. From the ARC menu, select the **Array Configuration Utility Main Menu (ACU)** (as shown on the first screen on page C-5).

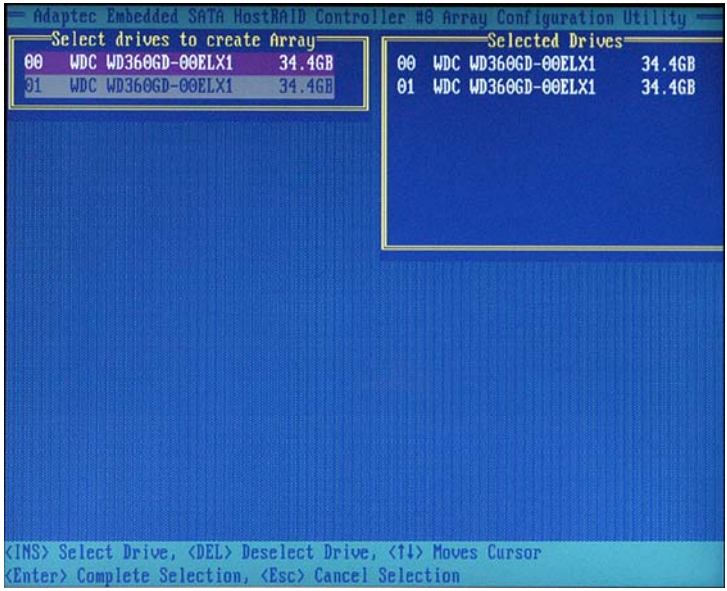
3. From the ACU menu, select **Create Array**.

4. Select the disks for the new array and press <Insert> (as shown on the screen shown below).

**Note:** To deselect any disk, highlight the disk and press <Delete>.




5. Press <Enter> when both disks for the new array are selected. The Array Properties menu is then displayed (as shown on the next page).




### Assigning Array Properties

Once you've created a new array, you are ready to assign properties to it.

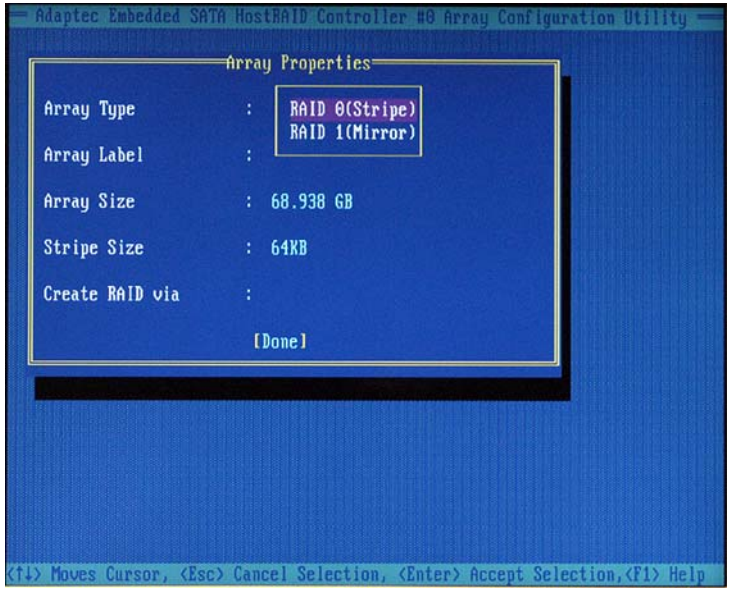
**Caution:** Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. You will need to use the Adaptec Storage Manager - Browser Edition (refer to Adaptec's User's Guide in the enclosed CD).

**To assign properties to the new array:**

1. In the Array Properties menu, select an array type and press <Enter>. Note that only the available array types (RAID 0 and RAID1) are displayed on the screen. (RAID 0 and RAID 1 require two drives.)

2. Under "**Arrays Label**", type in a label and press <Enter>. The label cannot be more than 15 characters long.

3. For RAID 0, select the desired stripe size. Available stripe sizes are 16, 32, and the default of 64 KB. It is recommended that you *do not* change the default setting.



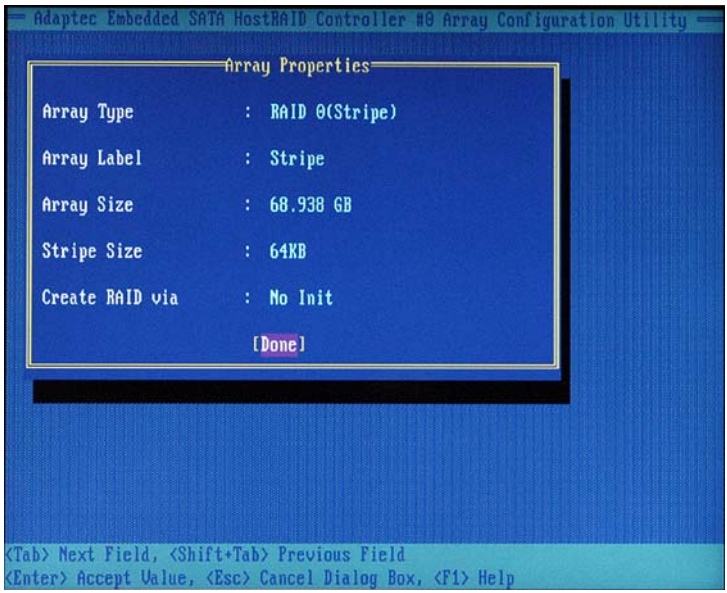

4. The item **"Create RAID via"** allows you to select between the different methods for creating RAID 0 and RAID 1.

The following table gives examples of when each method is appropriate.

| Raid Level | Create Via | When Appropriate |
|---|---|---|
| RAID 0 | No Init | Creating a RAID 0 on new drives |
| RAID 0 | Migrate (*Note) | Creating a RAID 0 from one new drive and one drive with data you wish to preserve |
| RAID 1 | Build1 | Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve |
| RAID 1 | Clear | Creating a RAID 1 on new drives, or when you want to ensure that the array contains no data after creation. |
| RAID 1 | Quick | Fastest way to create a RAID 1. Appropriate when using new drives |
| RAID 1 | Init | |

**Note:** If you select "Migrate" for RAID 0 or "Build" for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved, however the data on the new drive will be lost.

5. When you are finished, press **Done** (as shown on the next screen).




**Notes**

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

2. If you stop the Build or Clear process on a RAID 1 from ACU, you can restart it by pressing Ctrl+R.

3. A RAID 1 disk created using the Quick Init option may return some data miscompares if you later run a consistency check. This is normal and is not a cause for concern.

4. The ACU allows you to use drives of different sizes in a RAID. However during a build operation, only the smaller drive can be selected as the source or first drive.

5. When migrating from a single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

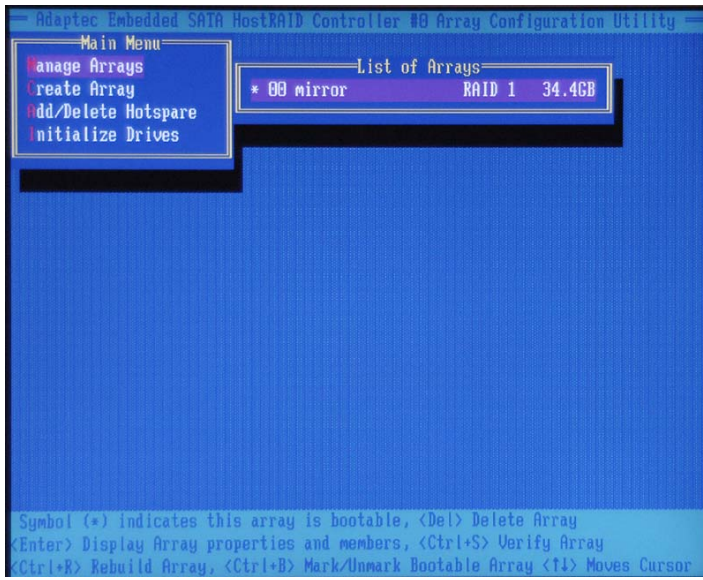
**Warning**: Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, you will not be able to restart or recover the data that was on the source drive.

**Adding a Bootable Array**

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the array you want to make bootable, and press <Ctrl+B>.

3. Enter **Y** to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" A bootable array will then be created and an asterisk will appear next to the new bootable array as shown on the screen below.




**Deleting a Bootable Array**

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the bootable array (*) you want to delete and press <Ctrl+B>. A bootable array is an array marked with an asterisk, as shown in the screen above.

3. Enter **Y** to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" The bootable array will then be deleted and the asterisk will disappear.

**Note: Do not use the delete key to delete a bootable array.**

**Adding/Deleting Hotspares**

**Note:** In order to rebuild a RAID (RAID 0 or RAID 1) drive, you first need to add a new hard disk drive as a hotspare.

1. Turn on your computer and press <Ctrl+A> when prompted to access the ARC Utility.

2. From the ARC menu, select the **Array Configuration Utility** (ACU).

3. From the ACU menu, select **Add/Delete Hotspares**.

4. Use the up and down arrow keys to highlight and select the disk you want to designate as a hotspare, and press <Insert> and then <Enter>.

5. Select **Yes** when the following prompt is displayed: "Do you want to create spare? (Yes/No?)"

The spare you have selected will appear in the Select Drive Menu.

## Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

**Caution:** Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.

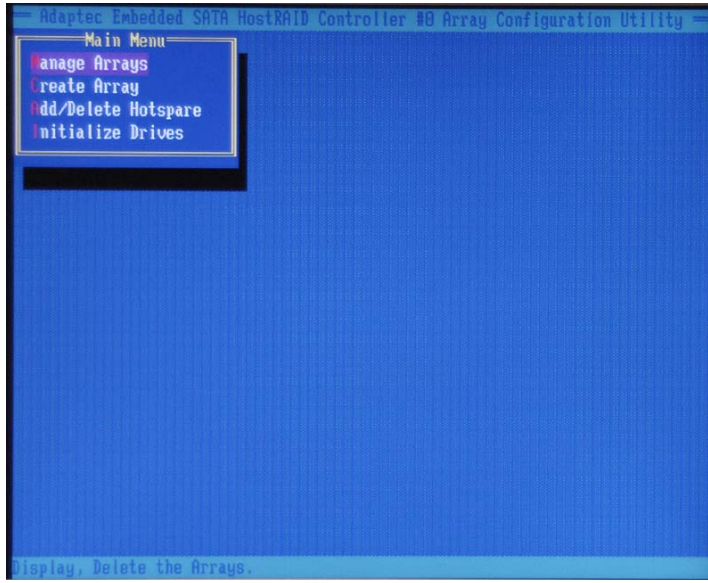
***Do not*** initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to *Viewing Array Properties.*

**To initialize drives:**

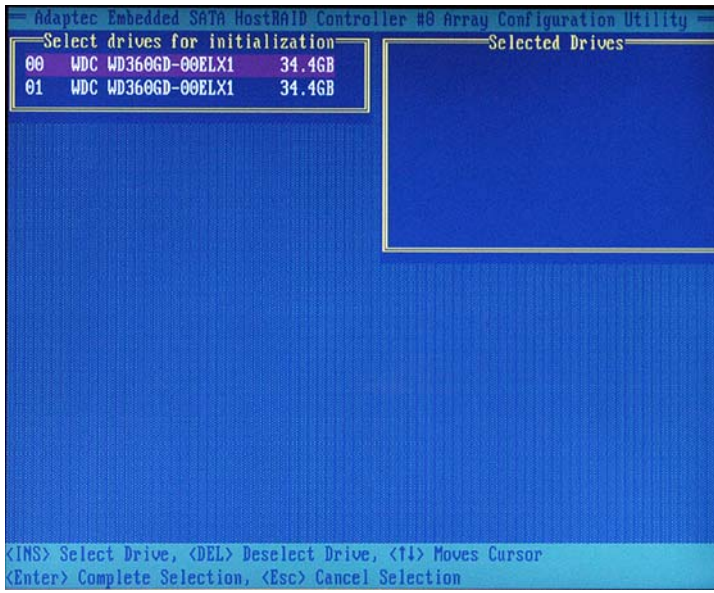
1. Turn on your computer and press <Ctrl+A> when prompted to access the ARC utility.

2. From the ARC menu, select **Array Configuration Utility (ACU)**.

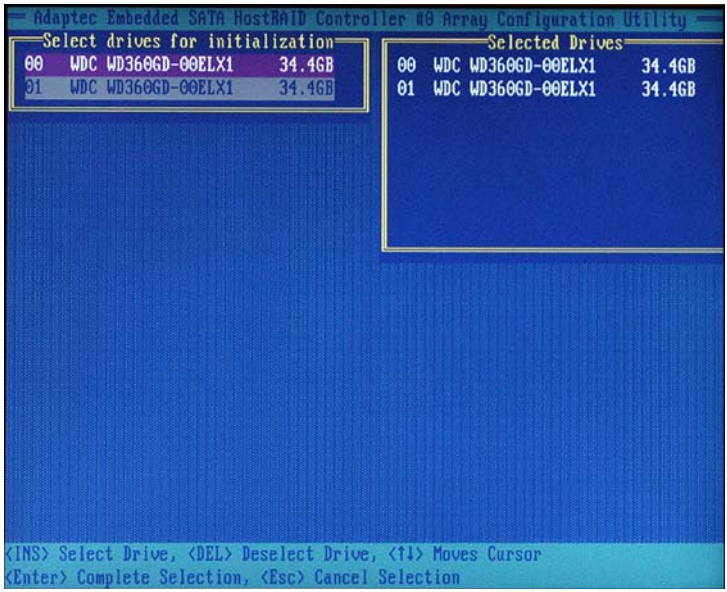
3. From the Main menu, select **Initialize Drives** (as shown on the next screen).



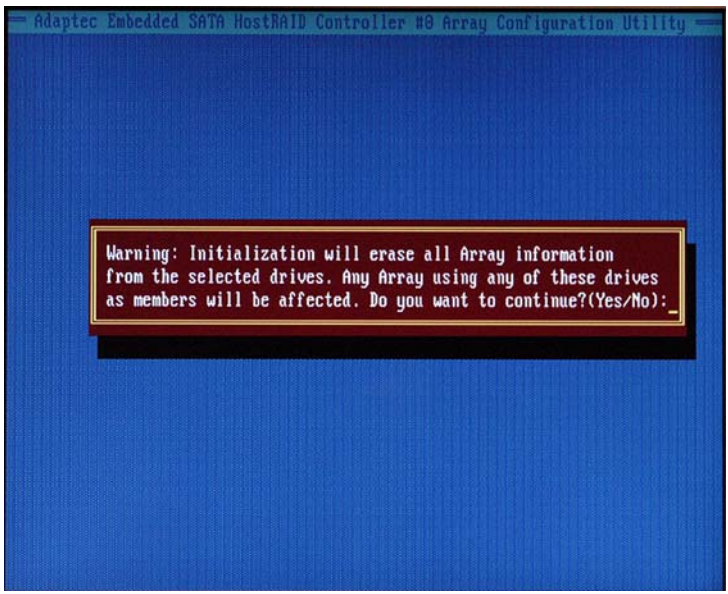

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press <Insert> (as shown below).



5. Repeat Step 4 to select both drives (as shown below).




6. Press <Enter>.
7. Read the warning message that appears (below).




8. Make sure that you have selected the correct disk drives to initialize. If correct, type Y to continue.

### Rebuilding Arrays

**Note:** Rebuilding applies to Fault Tolerant arrays (RAID 1) only.

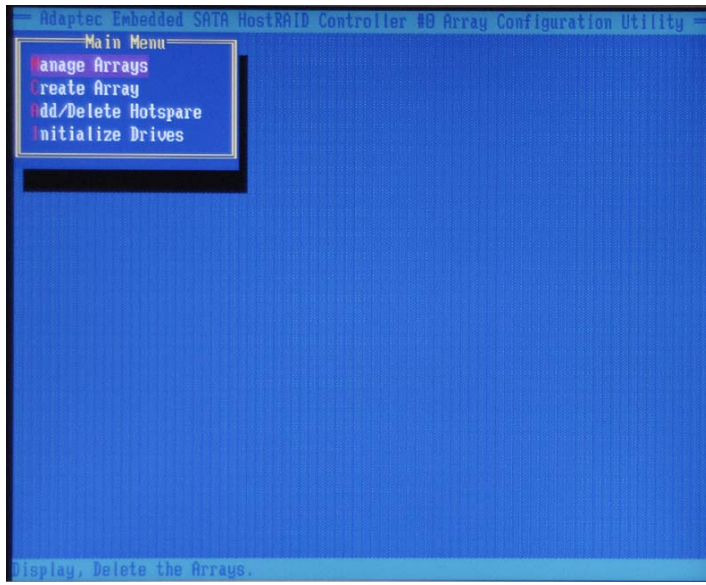
If an array Build process (or initialization) is interrupted or critical with one member missing, you must perform a Rebuild to optimized its functionality. For a critical array Rebuild operation, the optimal drive is the source drive.

**Note:** If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

**To rebuild an array:**

1. From the Main Menu, select **Manage Arrays** (as shown on the screen below). From the List of Arrays, select the array you want to Rebuild.

2. Press <Ctrl+R> to Rebuild.



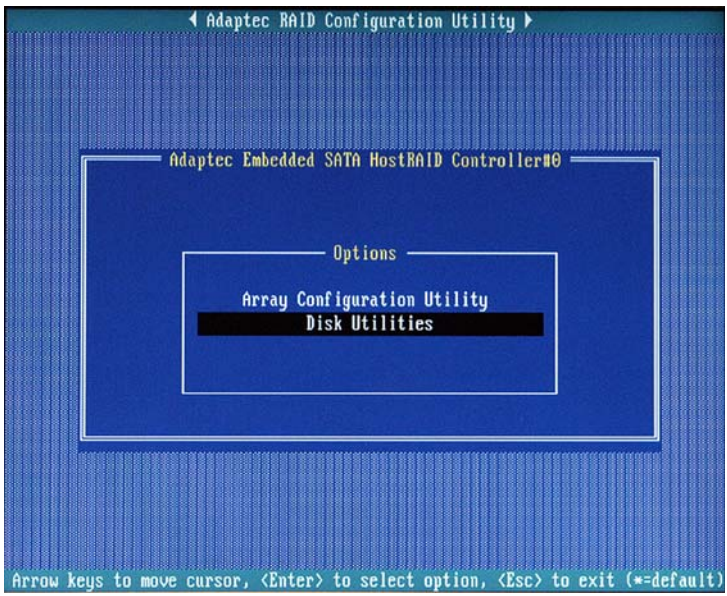
## Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

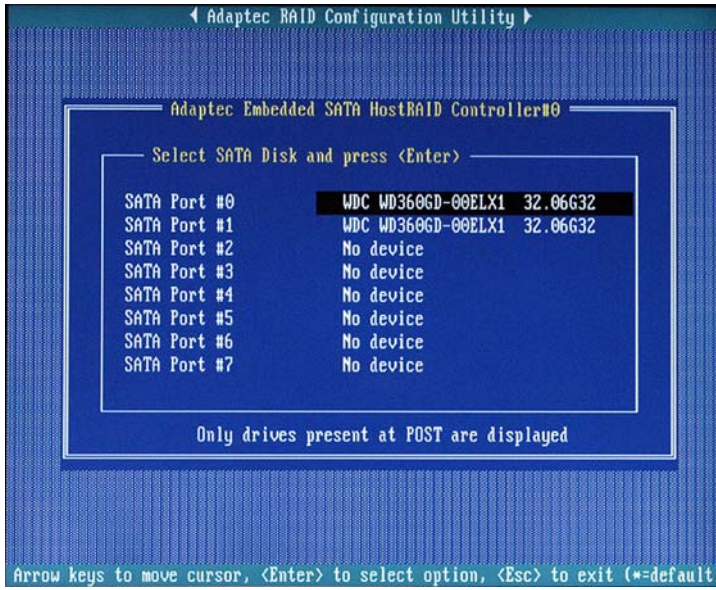
**To access the disk utilities:**

1. Turn on your computer and press <Ctrl+A> when prompted to access the ARC utility.

2. From the ARC menu, select **Disk Utilities** as shown on the screen below.




3. Select the desired disk and press <Enter> (as shown on the next screen.)




**You can choose from the following options:**

**Format Disk**: Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

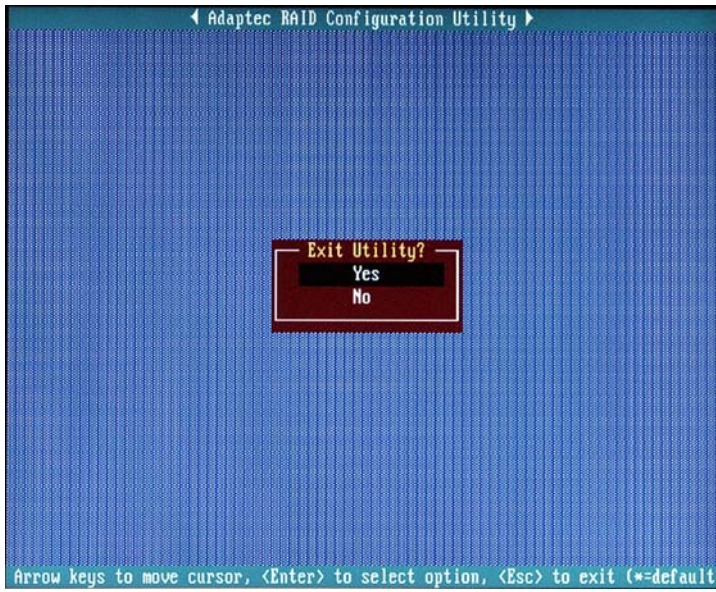
**Caution:** Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.)

**Verify Disk Media:** Scans the media of a disk drive for defects.

### To Exit the Adaptec RAID Configuration Utility

1. Once you have completed all RAID array configurations, press <ESC> to exit. The screen below will appear.

2. Select **Yes** to exit the Utility.




**For more information regarding the Adaptec RAID Utility, please refer to Adaptec's User's Guide in the CD included with your system. You can also download a copy of Adaptec User's Guide from our web site at www. supermicro.com.**

## C-2 Installing the ICH5 Driver

1. Insert Supermicro's bootable CD that came with the system into the CD-ROM drive during system reboot, and the "Super Micro Driver Diskette Maker" screen will appear.

2. From the list, choose "Intel ICH5R Driver by 3rd Party (Adaptec)" and press <Enter>.

3. From the next screen displayed, choose the OS driver you want to install and press <Enter>.

4. Insert a formatted diskette into drive A and press <Enter> as prompted.

5. Exit the program after the process is complete.

6. Insert the Microsoft Windows OS Setup CD in the CD-ROM drive and reboot the system. The system will start to boot up from the CD.

7. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" is displayed.

8. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

9. Insert the "Adaptec Embedded Serial ATA Raid Controller Driver" diskette into Drive A and press the <Enter> key.

10. Choose "Adaptec Embedded Host Serial ATA Raid Controller" from the list and press the <Enter> key.

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

12. From the Windows OS Setup screen, press the <Enter> key. The OS Setup will automatically load all device files and then continue installing the Windows OS.

13. After the Windows OS installation is complete, the system will automatically reboot.

# C-3 Installing Other Drivers

## Installing Additional Drivers

After you've installed the Windows Operating System, a screen as shown in Figure C-1 will appear. You are now ready to install additional software programs and drivers.

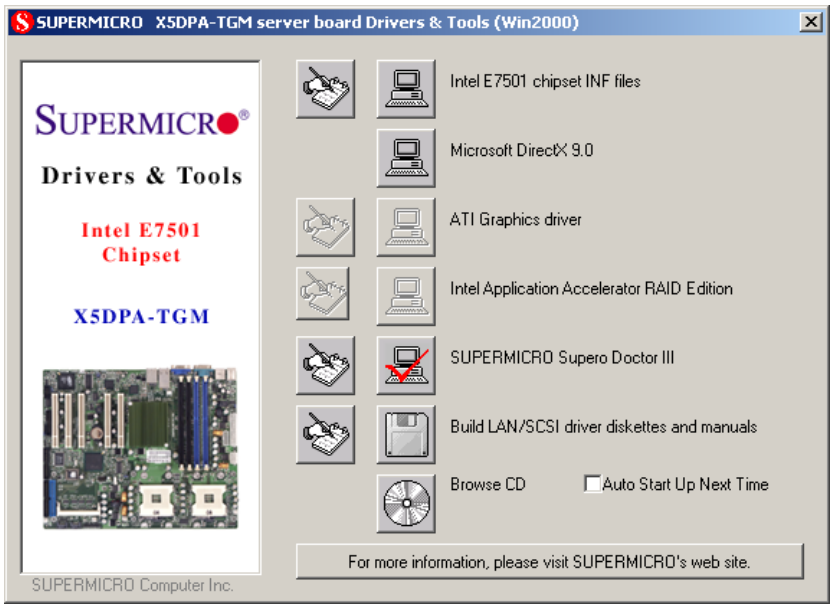



**Figure C-1. Driver/Tool Installation Display Screen**

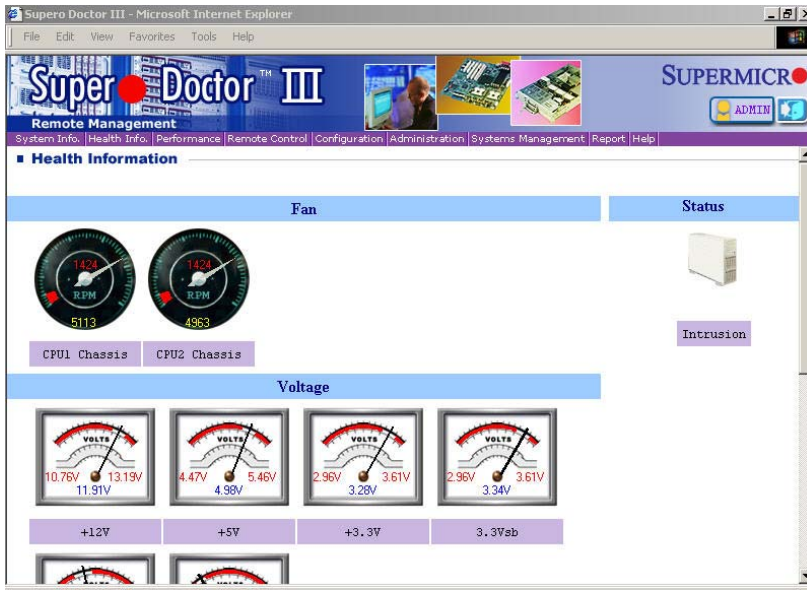
Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.**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

Please refer to Adaptec User's Guide to install the Adaptec Serial ATA RAID Controller Driver (included in the CD). You can also download a copy of the user's guide from our web site.

### Supero Doctor III

The Supero Doctor III program is a web-based management tool that supports remote management capabilities. It includes both remote and local management tools. The local management tool is called SD III Client. The Supero Doctor III program included on the CD-ROM that came with your system 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 Figure C-2 for an example of the Supero Doctor III interface.

**Figure C-2. Supero Doctor III Interface**




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

## Notes

# Appendix D
# System Specifications

### Processors
Single or dual Intel® Xeon™ 604/603-pin processors to 3.20 GHz with hyper-threading technology and a 1 MB cache at a 533/400 MHz front side bus speed

**Note: Please refer to our web site for a complete listing of supported processors. (http://www.supermicro.com)**

### Chipset
Intel E7501

### Memory Capacity
Four (4) 184-pin DIMM slots to support a maximum of 8 GB of registered ECC DDR-266/200 (PC2100/1600) low-profile SDRAM

### Serial ATA Controller
Adaptec Embedded SATA RAID Controller Driver / Intel ICH5R I/O Hub, incorporated into chipset (RAID 0 and RAID 1 supported)

### Main Drive Bays
Two (2) drive bays to house two (2) standard SATA drives

### Peripheral Bays
One (1) 3.5" floppy drive
One (1) slim CD-ROM drive

### Expansion Slots
One (1) 32-bit 33 MHz (5V) PCI slot (bundled with a 32-bit, 33 MHz 5V riser card)

### Motherboard
Model: X5DPA-TGM+ (ATX form factor)
Dimensions: 12 x 10 in (305 x 254 mm)

### Chassis
Model: SC811T-350 (1U Rackmount)
Dimensions: (WxHxD) 16.7 x 1.7 x 22.6 in. (424 x 43 x 574 mm)

### Weight
Net (Gross): 38 lbs. (17.3 kg.)

### System Cooling
Two (2) 10-cm ball bearing blower fans

### System Input Requirements
AC Input Voltage: 100-240 VAC
Rated Input Current: 6A (115V) to 3A (230V)
Rated Input Frequency: 50 to 60 Hz

### Power Supply
Rated Output Power: 350W (Model# FSP350-601U, Part# PWS-0042-24)
Rated Output Voltages: +3.3V (20A), +5V (25A), +12V (25A), -5 (0.3A), -12V (0.8A), +5Vsb (2A)

### BTU Rating
1841 BTUs/hr (for rated output power of 350W)

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

### Regulatory Compliance
Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B
Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)