Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER® X6DHR-3G2/X6DHR-EG2 motherboard. The SUPER® X6DHR-3G2/X6DHR-EG2 supports single or dual Intel® Xeon 64-bit processors at a 800 MHz front side bus. Based upon the Intel Xeon EM64T processor, the X6DHR-3G2/X6DHR-EG2 supports Intel's Hyper-Threading Technology and the EM64T Technology and is ideal for high performance server or sever security environments. Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product) for updates or visit Intel's web site for processor support. This product is intended to be professionally installed.

Manual Organization

Chapter 1 describes the features, specifications and performance of the X6DHR-3G2/X6DHR-EG2 mainboard and provides detailed information about the chipset.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see Chapter 3, which describes troubleshooting procedures for the video, the memory and the system setup.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS POST Messages.

Appendix B lists BIOS POST Codes.

Appendix C lists Software Installation Instructions.

Conventions Used in this Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself:

Danger/Caution: Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury.

Warning: Important information given to ensure proper system installation or to prevent damage to the components.

(*Note): Note: Additional Information given to differentiate various models or to ensure correct system setup.
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Chapter 1
Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

One (1) Supermicro Mainboard

One (1) Supermicro CD or diskettes containing drivers and utilities

One (1) User's/BIOS Manual
Contacting Supermicro

**Headquarters**
Address: SuperMicro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)
Web Site: www.supermicro.com

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support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

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Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139
Figure 1-1. SUPER® X6DHR-3G2/X6DHR-EG2 Image

*Note: All images and graphics shown in this manual were based upon the latest PCB revision available at the time of publishing of this manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.
1. Jumpers not indicated are for test purposes only.

2. "■" indicates Pin 1.

3. The graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of this manual. The motherboard you’ve received may or may not look exactly the same as the graphics shown in this manual.

4. JP17 is to be used with JWF1 and JP18 is to be used with JWF2.

5. PCI-X 133 MHz Slot 6 is the same as PCI-X Slot 1 shown in the BIOS, and PCI-X 100 MHz Slot 7 is the same as PCI-X Slot 2 shown in the BIOS.

6. All SAS components: SAS Controller, SAS 0-3, SAS 4-7 Connections, SAS LEDs: DS 1-8, JS10 and JPS1 are available on the X6DHR-3G2 only.
### Quick Reference (X6DHR-3G2/X6DHR-EG2)

(*Please refer to Chapter 2 for pin definitions and detailed information.)*

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Description</th>
<th>Default Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>J3P</td>
<td>3rd PWR Supply Fail Detect</td>
<td>Open (Disabled)</td>
</tr>
<tr>
<td>JBT1</td>
<td>CMOS Clear</td>
<td>See Chapter 2</td>
</tr>
<tr>
<td>JPG1</td>
<td>VGA Enable/Disable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JP17/JP18</td>
<td>Compact Flash Master/Slave Select</td>
<td>Closed (Master)(*Note2)</td>
</tr>
<tr>
<td>JPL1</td>
<td>GLAN Enable/Disable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPS1(*Note3)</td>
<td>SAS Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JWD</td>
<td>Watch Dog</td>
<td>Pins 1-2 (Reset)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATX PWR (J43)</td>
<td>Primary ATX 20-Pin Power Connector</td>
</tr>
<tr>
<td>12-V PWR (J38)</td>
<td>4-Pin Power Connector (*Required)</td>
</tr>
<tr>
<td>CPU PWR (J1D1)</td>
<td>8-Pin CPU Power Connector (*Required)</td>
</tr>
<tr>
<td>COM(J14)/COM2(J15)</td>
<td>COM1/COM2 Serial Port Connectors</td>
</tr>
<tr>
<td>DIMM#1A-DIMM#4B</td>
<td>Memory (RAM) Slots</td>
</tr>
<tr>
<td>DS 1-8</td>
<td>SAS LED Indicators (*See Chapter 2). (*Note3)</td>
</tr>
<tr>
<td>FAN#1-5</td>
<td>Onboard CPU Fan/Chassis Fan Headers</td>
</tr>
<tr>
<td>Floppy Drive(J12)</td>
<td>Floppy Drive Connector</td>
</tr>
<tr>
<td>GLAN1/2</td>
<td>G-bit Ethernet Ports</td>
</tr>
<tr>
<td>IPMI (J9)</td>
<td>IPMI 2.0 Socket</td>
</tr>
<tr>
<td>IDE1/2 (J5/J6)</td>
<td>IDE1/2 Hard Disk Drive Connectors (*Note 1)</td>
</tr>
<tr>
<td>KB/Mouse (J33, J34)</td>
<td>PS/2 Keyboard (J34)/Mouse (J33)</td>
</tr>
<tr>
<td>Power SMB (J32)</td>
<td>Power System Management Bus (See Chapter 2)</td>
</tr>
<tr>
<td>PW Fail (JP9)</td>
<td>PWR Fail</td>
</tr>
<tr>
<td>SMB (J11)</td>
<td>System Management Bus Header</td>
</tr>
<tr>
<td>JWF1/JWF2</td>
<td>Compact Flash Card PWR (*Note 2)</td>
</tr>
<tr>
<td>JAR</td>
<td>Alarm Rest Header (Defult: On)</td>
</tr>
<tr>
<td>JD1</td>
<td>PWR LED (Pins1-3), Speaker (Pins4-7) Header</td>
</tr>
<tr>
<td>JF1</td>
<td>Front Control Panel Connector</td>
</tr>
<tr>
<td>JL1</td>
<td>Chassis Intrusion Header</td>
</tr>
<tr>
<td>JOH1</td>
<td>Overheat LED Header</td>
</tr>
<tr>
<td>JS10</td>
<td>SAS I²C (*Note3)</td>
</tr>
<tr>
<td>JSM1/JSM2 (*Note3)</td>
<td>SAS connectors (JSM1: SAS 0-3)/(JSM2: SAS 4-7)</td>
</tr>
<tr>
<td>JWOL</td>
<td>Wake-on-LAN Header</td>
</tr>
<tr>
<td>JWOR</td>
<td>Wake-on-Ring Header</td>
</tr>
<tr>
<td>VGA(J7)</td>
<td>Video Connector</td>
</tr>
<tr>
<td>USB0/1(J16)</td>
<td>Universal Serial Bus Ports</td>
</tr>
<tr>
<td>USB2/3(JD2)</td>
<td>Front Panel USB2/3 Headers</td>
</tr>
</tbody>
</table>

(*Note 1: Both IDE connectors support Compact Flash. Note 2: JP17 is to be used with JWF1, JP18 with JWF2. Note 3: For the X6DHR-3G2 only.*)
Motherboard Features

**CPU**
- Single or dual Intel® Xeon™ 64-bit processors at 800 MHz front side (system) bus speed, with support of Hyper-Threading (HT), EM64T and Enhanced Intel SpeedStep (EIST)

**Using the EM64T Feature**
- Install a 64-bit OS (Windows XP Professional x64 Ed, Server 2003x64 Ed.)
- Install a 64-bit OS (Windows XP Professional x64 Ed, Server 2003x64 Ed.)
- Install the 64-bit drivers for all MB components, devices and add-on cards

**Using the Hyper-Threading (HT) Technology**
- Use a CPU that supports the EM64T
- Install an OS that supports HT, including Windows XP/2003 Server and Linux 2.4.x. (Under Linux, use the HT compiler to compile the code. For other operating systems, be sure to disable the HT feature in the BIOS.)
- Enable the HT feature in the BIOS (under "Advanced" Setting) before installing a supported OS. (*Note: visit www.Intel.com for CPU support and driver updates.)

**Memory**
- Eight 240-pin DIMM sockets supporting up to 16 GB Registered ECC DDRII-400 in 8 DIMMs

**Chipset**
- Intel E7520 (Lindenhurst) chipset
- Intel ICH5R
- Intel PXH

**Expansion Slots**
- Two PCI-Express slots (x8)
- One 64-bit PCI-X 133 MHz (Slot 6)
- One 64-bit PCI-X 100 MHz (Slot 7)

**BIOS**
- 8 Mb Phoenix® Flash ROM
- APM 1.2, DMI 2.1, PCI 2.2, ACPI 1.0, Plug and Play (PnP), SMBIOS 2.3

**PC Health Monitoring**
- Onboard voltage monitors for CPU cores, +3.3V, +5V, +12V, -12V, and 5V standby
- Fan status monitor with firmware control
- CPU/chassis temperature monitors
• Environmental temperature monitor and control
• CPU fan auto-off in sleep mode
• CPU slow-down on temperature overheat
• CPU thermal trip support for processor protection, +5V standby alert LED
• Power-up mode control for recovery from AC power loss
• Auto-switching voltage regulator for CPU core
• System overheat LED and control
• Chassis intrusion detection
• System resource alert (via Supero Doctor III)

ACPI Features
• Slow blinking LED for suspend state indicator
• Main switch override mechanism

Onboard I/O
• One IPMI 2.0 Socket
• Intel 82546GB Gigabit Ethernet dual-port controller
• 2 EIDE Ultra DMA/100 bus master interfaces
• 1 floppy port interface (up to 2.88 MB)
• 2 Fast UART 16550A compatible serial ports
• PS/2 mouse and PS/2 keyboard ports
• Winbond Super I/O (W83627 HF) and Hardware Monitoring (W83792D)
• Up to 4 USB 2.0 (Universal Serial Bus) ports/headers
• SAS (4 internal + 4 external) (*For the X6DHR-3G2 only)
• All-in-One ZCR AOC-SOZCR1 supported (*For the X6DHR-3G2 only)

Other
• Internal/external modem ring-on (WOR)
• Wake-on-LAN (WOL)
• Console redirection

CD/Diskette Utilities
• BIOS flash upgrade utility and device drivers

Dimensions
• ATX Ext. 12" x 13.05" (304.8 x 331.5 mm)
Figure 1-9. Block Diagram of the E7520 Chipset

Note: This is a general block diagram. Please refer to the Motherboard Features for details.
1-2 Chipset Overview

Built upon the functionality and the capability of the Intel E7520 (Lindenhurst) chipset, the X6DHR-3G2/X6DHR-EG2 motherboard provides the performance and feature set required for dual processor-based servers, with configuration options optimized for communications, presentation, storage, computation or database applications. The Intel E7520 (Lindenhurst) chipset consists of the following components: the E7520 (Lindenhurst) Memory Controller Hub (MCH), the ICH5R Controller Hub (ICH), the Intel PCI-X Hub (PXH).

The E7520 MCH supports single or dual Xeon processors with Front Side Bus speeds of 800 MHz. Its memory controller provides direct connection to two channels of registered DDRII with a marched system bus address and data bandwidths of up to 6.4GB/s. The E7520 also supports the new PCI-Express high speed serial I/O interface for superior I/O bandwidth. The MCH provides three configurable x8 PCI Express interfaces which may alternatively be configured as two independent x4 PCI Express interfaces. These interfaces support connection of the MCH to a variety of other bridges that are compliant with the PCI Express Interface Specification, Rev. 1.0a. The MCH interfaces with the ICH5R I/O Controller Hub (ICH5) via a dedicated Hub Interface supporting a peak bandwidth of 266 MB/s using a x4 base clock of 66 MHz. The PXH provides connection between a PCI Express interface and two independent PCI bus interfaces that can be configured for standard PCI-X 1.0 protocol.

ICH5R System Features

In addition to providing the I/O subsystem with access to the rest of the system, the ICH5R I/O Controller Hub integrates many I/O functions.

The ICH5R I/O Controller Hub integrates: 2-channel Ultra ATA/100 Bus Master IDE Controller, two Serial ATA (SATA) Host w/RAID0, RAID1 support, SMBus 2.0 Controller, LPC/Flash BIOS Interface, PCI 2.2 Interface and System Management Controller.
1-3 Special Features

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced Setup section (Boot Features) to change this setting. The default setting is Last State.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the X6DHR-3G2/X6DHR-EG2. It has an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Memory Voltage, +3.3V, +5V, +12V, -12V, and +5V Standby

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by the Thermal Management via BIOS (by selecting 'Hardware Monitoring' in the Advanced Settings.)

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. It can continue to monitor for overheat conditions even when the CPU is in sleep mode. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal control fan to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.
CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, both the overheat fan and the warning LED are triggered.

Auto-Switching Voltage Regulator for the CPU Core

The auto-switching voltage regulator for the CPU core can support up to 20A current and auto-sense voltage IDs ranging from 0.83V to 1.63V. This will allow the regulator to run cooler and thus make the system more stable.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with Windows Operating Systems.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.
External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboard has a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-LAN can only be used with an ATX 2.01 (or above) compliant power supply.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The SUPER X6DHR-3G2/X6DHR-EG2 accommodates ATX power 20-pin supplies. Although most power supplies generally meet the specifications required by the system, some are inadequate. You should use one that will supply at least 420W of power.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges. (*Please refer to the next page for additional information.)

NOTES: 1. A 12V 8-pin power (JID1) is required to support Intel Xeon CPUs. In addition, a 12V 4-pin PWR connection is also required. See Section 2-5 for details on connecting the power supply cables.

2. Be sure to use the correct type of onboard CMOS battery as specified by the Manufacturer. Do not install the CMOS battery up-side down to avoid possible explosion.

1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock genera-
The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP), Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.
2-1 Static-Sensitive Devices

Electric-Static-Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the 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 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.

Warning: Please use the correct type of onboard CMOS battery (CR2032) as specified by the Manufacturer. Do not install the CMOS battery upside down to avoid possible explosion.

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.
2-2 Processor and Heatsink Installation

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

IMPORTANT: Always connect the power cord last and 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 CPU heatsink.

CPU Installation

1. Lift the lever on the CPU socket: lift the lever completely as shown on the picture on the right; otherwise, you will damage the CPU socket when power is applied. (Install CPU1 first.)

2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1 (socket #2 is automatically disabled if only one CPU is used).

3. Press the lever down until you hear the click, so you can be sure that the CPU is securely installed in the CPU socket.
Heatsink Installation

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

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

3. Screw in two diagonal screws (ie the #1 and the #2 screws) until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)

4. Finish the installation by fully tightening all four screws.

To Un-Install Heatsink

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as show in the second picture on the right.

2. Hold the heatsink as show in the picture on the right and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the CPU is loosened from the heatsink, remove the heatsink from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the CPU and the heatsink.
Warning! Make sure that you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may occur.

Figure 2-1. PGA604 Socket: Empty and with Processor Installed

Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray. (*Note: some components are very close to the mounting holes. Please take precautionary measures to prevent damage done to these components when you install the motherboard to the chassis.*)
2-3 Installing DIMMs

Memory Module Installation (See Figure 2-2)

Exercise extreme care when installing or removing memory modules to prevent any possible damage.

1. Insert each DDR 2 memory module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly. (See support information below.)

2. Gently press down on the memory module until it snaps into place.

Support

The X6DHR-3G2/X6DHR-EG2 supports dual channel ECC Registered DDR II 400 SDRAM. This motherboard only supports Interleaved memory. Populating DIMM#1A, DIMM#1B, and/or DIMM#2A, DIMM#2B with a pair (or pairs) of memory modules that are of the same size and of the same type will result in dual channel, two-way interleaved memory. When ECC memory is used, it may take 25-40 seconds for the VGA to display.

Figure 2-2. Installing and Removing DIMMs

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.
To Remove:
Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.

2-4 I/O Ports/Control Panel Connectors

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 2-3 below for the colors and locations of the various I/O ports.

Figure 2-3. I/O Port Locations and Definitions
Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See Figure 2-4 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

Figure 2-4. JF1 Header Pins
2-5 Connecting Cables

ATX Power Connector

The primary power supply connector (J43) on the X6DHR-3G2/X6DHR-EG2 meets the SSI (Superset ATX) 20-pin specification. To provide adequate power supply to your system, you must also connect the 4-pin (J38) power connector and

Processor Power Connectors

In addition to the Primary ATX power connector (above), there is a 12V 8-pin processor power connector. The 12V 8-pin connector at J1D1 must also be connected to your power supply for CPU consumption. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>+3.3V</td>
<td>1</td>
<td>+3.3V</td>
</tr>
<tr>
<td>12</td>
<td>-12V</td>
<td>2</td>
<td>+3.3V</td>
</tr>
<tr>
<td>13</td>
<td>COM</td>
<td>3</td>
<td>COM</td>
</tr>
<tr>
<td>14</td>
<td>PS_ON</td>
<td>4</td>
<td>+5V</td>
</tr>
<tr>
<td>15</td>
<td>COM</td>
<td>5</td>
<td>COM</td>
</tr>
<tr>
<td>16</td>
<td>COM</td>
<td>6</td>
<td>+5V</td>
</tr>
<tr>
<td>17</td>
<td>COM</td>
<td>7</td>
<td>COM</td>
</tr>
<tr>
<td>18</td>
<td>-5V</td>
<td>8</td>
<td>PWR_OK</td>
</tr>
<tr>
<td>19</td>
<td>+5V</td>
<td>9</td>
<td>5V Standby</td>
</tr>
<tr>
<td>20</td>
<td>+5V</td>
<td>10</td>
<td>+12V</td>
</tr>
</tbody>
</table>

Required Connection

12V 4-pin Power Connector Pin Definitions

<table>
<thead>
<tr>
<th>Pins</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>Ground</td>
</tr>
<tr>
<td>3 and 3</td>
<td>+12V</td>
</tr>
</tbody>
</table>

Required Connection

12V 8-pin Power Connector Pin Definitions

<table>
<thead>
<tr>
<th>Pins</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 through 4</td>
<td>Ground</td>
</tr>
<tr>
<td>5 through 8</td>
<td>+12V</td>
</tr>
</tbody>
</table>
NMI Button

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Control</td>
</tr>
<tr>
<td>20</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>+5V</td>
</tr>
<tr>
<td>16</td>
<td>Ground</td>
</tr>
</tbody>
</table>
HDD LED

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

<table>
<thead>
<tr>
<th>HDD LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for GLAN port1 is located on pins 11 and 12 of JF1 and the LED connection for GLAN Port2 is on Pins 9 and 10. Attach the NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>GLAN1/2 LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>9/11</td>
</tr>
<tr>
<td>11/12</td>
</tr>
</tbody>
</table>
Overheat/Fan Fail LED (OH)

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide advanced warnings of chassis overheating or fan failure. Refer to the table on the right for pin definitions.

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.
Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Reset</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in BIOS - see Chapter 4). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Signal</td>
</tr>
<tr>
<td>2</td>
<td>+3V Standby</td>
</tr>
</tbody>
</table>

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.
Universal Serial Bus

Two USB 2.0 ports (J16) are located on the IO Backpanel. USB0 is the bottom connector and USB1 is the top connector. An Extra USB header (JD2 for USB2/USB3) can be used for front side USB access. You will need a USB cable to use the connections. Refer to the tables on the right for pin definitions.

Chassis Intrusion

A Chassis Intrusion header (JL1) is located on the motherboard. Attach the appropriate cable to inform you of a chassis intrusion.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intrusion Input</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
<th>(FP)</th>
<th>USB 2/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>PO-</td>
<td>2</td>
<td>PO-</td>
</tr>
<tr>
<td>3</td>
<td>PO+</td>
<td>3</td>
<td>PO+</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td>5</td>
<td>Key</td>
</tr>
</tbody>
</table>
GLAN1/GLAN2 (Gigabit-Ethernet Ports)

A G-bit Ethernet ports (designated JLAN1/JLAN2) are located on the IO backplane. This port accepts RJ45 type cables.

Fan Headers

There are five fan headers (Fan 1 to Fan 5) on the X6DHR-3G2/X6DHR-EG2. See the table on the right for pin definitions. (*The onboard fan speeds are controlled by Thermal Management via BIOS—Hardware Monitor in the Advanced Setting. The default setting is disabled.

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

COM Port 1 (J14) is located on the IO Backpanel, and COM Port 2 is located close to the Battery. See the table on the right for pin definitions.

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

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

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 Keyboard (J34) and PS/2 Mouse (J33) are located on the backpanel. See the table at right for pin definitions. (See Figure 2-3 for the locations of each.)

Keyboard

Mouse

PS/2 Keyboard and Mouse Port Pin Definitions

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data</td>
</tr>
<tr>
<td>2</td>
<td>NC</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>VCC</td>
</tr>
<tr>
<td>5</td>
<td>Clock</td>
</tr>
<tr>
<td>6</td>
<td>NC</td>
</tr>
</tbody>
</table>
**SMB**

A System Management Bus header is located at J11. Connect the appropriate cable here to utilize SMB on your system.

<table>
<thead>
<tr>
<th>SMB Header Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Speaker Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin Setting</td>
</tr>
<tr>
<td>Pins 6-7</td>
</tr>
<tr>
<td>Pins 4-7</td>
</tr>
</tbody>
</table>
Wake-On-LAN

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

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and be "woken-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.
Power Supply Failure LED

Connect a cable from your power supply to the Power Supply Failure LED header (JP9) to provide a warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate of a power failure on the chassis. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PWR 1: Fail</td>
</tr>
<tr>
<td>2</td>
<td>PWR 2: Fail</td>
</tr>
<tr>
<td>3</td>
<td>PWR 3: Fail</td>
</tr>
<tr>
<td>4</td>
<td>Signal: Alarm Reset</td>
</tr>
</tbody>
</table>

Overheat LED (JOH1)

Connect an LED to the JOH1 header to provide a warning of chassis overheating. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5vDC</td>
</tr>
<tr>
<td>2</td>
<td>OH Active</td>
</tr>
</tbody>
</table>
Power SMB (I²C) Connector

Power SMB (I²C) Connector (J32) monitors the status of PWR Supply, Fan and temperature. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clock</td>
</tr>
<tr>
<td>2</td>
<td>Data</td>
</tr>
<tr>
<td>3</td>
<td>PWR Fail</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>+3.3V</td>
</tr>
</tbody>
</table>

SAS SMB Power (I²C) Connector (*For the X6DHR-3G2 only)


<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TWSI_SDA</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>TWSI_SCK</td>
</tr>
</tbody>
</table>
2-6 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. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS. Refer to the graphics below for the location of JBT1. Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS. Do not use the PW ON connector to clear CMOS.
GLAN Enable/Disable

JPL1 enables or disables the GLAN ports on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-2</td>
<td>Enabled</td>
</tr>
<tr>
<td>Pins 2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

VGA Enable/Disable

JPG1 enables or disables the VGA Connector on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 1-2</td>
<td>Enabled</td>
</tr>
<tr>
<td>Pins 2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>
Watch Dog

JWD controls Watch Dog, a system monitor that takes action when a software application hangs. Pins 1-2 will have WD reset the system if a program hangs. Pins 2-3 will generate a non-maskable interrupt for the program that hangs (requires software implementation). Watch Dog must also be enabled in BIOS.

SAS Enable (*For the X6DHR-3G2 only)

Jumper JPS1 allows you to enable or disable the SAS headers. The default setting is pins 1-2 to enable the SAS controller. See the table on the right for jumper settings.
**Alarm Reset (JAR)**

The system will notify you in the event of a power supply failure. This feature assumes that Supermicro redundant power supply units are installed in the chassis. If you only have a single power supply installed, you should not connect anything to this jumper to prevent false alarms. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+5V</td>
</tr>
<tr>
<td>1</td>
<td>Ground</td>
</tr>
</tbody>
</table>

**3rd PWR Supply PWR Fault Detect (J3P)**

The system can notify you in the event of a power supply failure. This feature assumes that three power supply units are installed in the chassis, with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with J3P to prevent false alarms.

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed</td>
<td>Enabled</td>
</tr>
<tr>
<td>Open</td>
<td>Disabled (*Default)</td>
</tr>
</tbody>
</table>
2-7 Onboard Indicators

GLAN LEDs

Each of the Gigabit Ethernet LAN ports has two LEDs. The amber LED indicates activity while the other LED may be green, orange or off to indicate the speed of the connection. See the table at right for the functions associated with the second LED.

<table>
<thead>
<tr>
<th>GLAN Left LED Connection Speed Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Color</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>Green</td>
</tr>
<tr>
<td>Amber</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GLAN Right LED Activity Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Color</td>
</tr>
<tr>
<td>Amber</td>
</tr>
</tbody>
</table>
SAS Activity LED Indicators
(*For the X6DHR-3G2 only)

SAS Activity LED Indicators (DS1-DS4) indicate the activity status of SAS ports 0-3 (JSM1), DS5-DS8 indicate the activity status of SAS ports 4-7 (JSM2). See the table on the right for pin definitions.
2-8 Floppy, IPMI and Hard Disk Drive Connections

Note the following when connecting the floppy and hard disk drive cables:
• The floppy disk drive cable has seven twisted wires.
• A red mark on a wire typically designates the location of pin 1.
• A single floppy disk drive ribbon cable has 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.

Floppy Connector

The floppy connector (J12) is located next to the IDE connectors. See the table below for pin definitions.

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

IPMI 2.0 Socket

J9 is designated as the IPMI 2.0 Socket for the Motherboard. Refer to the layout below for the location.

IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors (at J5 and J6, respectively). Both IDE connectors support Compact Flash. See the table on the right for pin definitions.

---

### IDE Drive Connectors

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

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the ‘Technical Support Procedures’ and/or ‘Returning Merchandise for Service’ section(s) in this chapter.

Note: Always disconnect the power cord before adding, changing or installing any hardware components.

**Before Power On**

1. Make sure no short circuits exist between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install one CPU first (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)
5. Use only the correct type of onboard CMOS battery as recommended by the Manufacturer. Do not install the battery upside down to avoid possible explosion.

**No Power**

1. Make sure no short circuits exist between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
6. Use only the correct type of onboard CMOS battery as recommended by the Manufacturer. Do not install the battery upside down to avoid possible explosion.

**No Video**

1. If the power is on but you have no video, remove all the add-on cards, cables and memory.
2. Use the speaker to determine if any beep codes exist. By default, the onboard speaker is enabled. Refer to the Appendix for details on beep codes.
Memory Errors

1. Make sure that the DIMM modules are properly and fully installed.
2. Determine if different speeds of DIMMs have been installed and verify that the BIOS setup is configured for the fastest speed of RAM used. It is recommended to use the same RAM speed for all DIMMs in the system.
3. Make sure you are using the correct type of Reg. ECC DDRII 400 (PC3200) Memory (*recommended by the manufacturer.)
4. Check for bad DIMM modules or slots by swapping a single module between two slots and noting the results.
5. Make sure all memory modules are fully seated in their slots. As an interleaved memory scheme is used, you must install two modules of the same type at a time, beginning with Bank 1, then Bank 2, and so on (see Section 2-3).
6. Check the position of the 115V/230V switch on the power supply.

Losing the System’s Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, Super Micro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the ‘Troubleshooting Procedures’ and ‘Frequently Asked Question’ (FAQ) sections in this chapter or see the FAQs on our web site (http://www.supermicro.com/support/faqs/) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our web site at
Chapter 3: Troubleshooting

(www.supermicro.com/support/bios/).

Note: Not all BIOS can be flashed depending on the modifications to the boot block code.

3. If you still cannot resolve the problem, include the following information when contacting Super Micro for technical support:
   • Motherboard model and PCB revision number
   • BIOS release date/version (this can be seen on the initial display when your system first boots up)
   • System configuration

An example of a Technical Support form is on our web site at (www.supermicro.com/support/contact.cfm).

4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com, by phone at: (408) 503-8000, option 2, or by fax at (408)503-8019.

3-3 Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The X6DHR-3G2/X6DHR-EG2 has eight 240-pin DIMM slots that support registered ECC DDRII-400 (PC3200) SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes.

Question: How do I update my BIOS?

Answer: It is recommended that you do not upgrade your BIOS if you are experiencing no problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your BIOS before downloading. Select your motherboard model and download the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the phlash16.exe (BIOS flash utility), the Chkflash.com, Flash.bat (platform files) and the BIOS image (xxxxxx.rom) files. Copy these files onto a bootable floppy and reboot your system. Then, follow the direction given in Readme.txt to complete the BIOS update.

("Warning: Do not shut down or reset the system while updating BIOS to prevent possible system boot failure!")
Question: After flashing the BIOS my system does not have video. How can I correct this?

Answer: If the system does not have video after flashing your new BIOS, it indicates that the flashing procedure failed. To remedy this, first clear CMOS per the instructions in this manual and if it still does not work, contact Support at Supermicro.

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for Windows and security and audio drivers.

3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.
4-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X6DHR-3G2/ X6DHR-EG2. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

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

System BIOS

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

How To Change the Configuration Data

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

Starting the Setup Utility

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

Warning: Do not shut down or reset the system while updating BIOS to prevent possible boot failure.
4-2 Running Setup

*Default settings are in bold text unless otherwise noted.*

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

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

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

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

   Press the <Delete> key to enter Setup

4-3 Main BIOS Setup

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

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

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

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

### Main Setup Features

#### System Time

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

#### System Date

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

#### BIOS Date

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

#### Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in, and 2.88MB 3.5 in.

#### Parallel ATA

This setting allows the user to enable or disable the function of Parallel ATA. The options are Disabled, Channel 0, Channel 1, and **Both**.
Serial ATA

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

Serial ATA RAID Enable

Select Enable to enable Serial ATA RAID Functions. (*For the Windows OS environment, use the RAID driver if this feature is set to Enabled. If set to Disabled, use the Non-RAID driver.)

Native Mode Operation

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

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

These settings allow the user to set the parameters of IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

<table>
<thead>
<tr>
<th>Type</th>
<th>Item Specific Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinders:</td>
<td>User = you enter parameters of hard-disk drive installed at this connection.</td>
</tr>
<tr>
<td>Heads:</td>
<td>Auto = autotypes hard-disk drive installed here.</td>
</tr>
<tr>
<td>Maximum Capacity:</td>
<td>CD-ROM = a CD-ROM drive is installed here.</td>
</tr>
<tr>
<td>LBA Format</td>
<td>ATAPI Removable = removable disk drive is installed here.</td>
</tr>
<tr>
<td>Total Sectors:</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4: BIOS

Type

Selects the type of IDE hard drive. The options are Auto, (which allows the BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CDROM and ATAPI Removable. The option "User" will allow the user to enter the parameters of the HDD installed at this connection. The option "Auto" will allow the BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option 1-39 to select a predetermined HDD type. Select CDROM if a CDROM drive is installed. Select ATAPI if a removable disk drive is installed.

CHS Format

The following items will be displayed by the BIOS:

TYPE: This item displays the type of CPU.

Cylinders: This item indicates the status of Cylinders.

Headers: This item indicates the number of headers.

Sectors: This item displays the number of sectors.

Maximum Capacity: This item displays the maximum storage capacity of the system.

LBA Format

The following items will be displayed by the BIOS:

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

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

Multi-Sector Transfer

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

LBA Mode Control

This item determines whether the Phoenix BIOS will access the IDE Channel 0 Master Device via the LBA mode. The options are Enabled and Disabled.

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and Disabled.
Transfer Mode
Selects the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1, and FPIO4/DMA2.

Ultra DMA Mode
Selects Ultra DMA Mode. The options are Disabled, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

System Memory
This display informs you how much system memory is detected in the system.

Extended Memory
This display informs you how much extended memory is detected in the system.

4-4 Advanced Setup
Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.
Boot Features

Access the submenu to make changes to the following settings.

Quick Boot Mode

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

Quiet Boot

This setting allows you to Enable or Disable the diagnostic screen during boot-up.

ACPI Mode

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

Power Button Behavior

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

Resume On Modem Ring

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

Power Loss Control

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

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and Disabled.

Summary Screen

This setting allows you to Enable or Disable the summary screen which displays the system configuration during bootup.
Memory Cache

**Cache System BIOS Area**

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

**Cache Video BIOS Area**

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

**Cache Base 0-512K**

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

**Cache Base 512K-640K**

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and Write Back.

**Cache Extended Memory**

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations.
Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and Write Back.

**Discrete MTRR Allocation**

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

**PCI Configuration**

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

**Onboard GLAN (Gigabit-LAN) OPROM Configure**

Enabling this option provides the capability to boot from GLAN. The options are Disabled and Enabled.

**Default Primary Video Adapter**

This item allows the user to select the Primary Video Adapter between two adapters instead of selecting among three or more adapters. The options are Other and Onboard Video.

**PCI Parity Error Forwarding**

Enable this item to forward the PCI errors occurring behind P2P bridges to the South Bridge, so NMI can be asserted. The options are Enabled and Disabled.

**ROM Scan Ordering**

This feature allows the user to decide which Option ROM to be activated first. The options are Onboard Option ROM first and Add-On first.

**Reset Configuration Data**

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and No.
Frequency for Slot#1/GLAN

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are Auto, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, and PCI-X 100 MHz.

Frequency for Slot#2/MASS/ZCR (*MASS: Mass Storage Devices=SATA/SAS/SCSI Devices. SAS: for the X6DHR-3G2 only)

This option allows the user to change the bus frequency of the devices installed in the slot indicated. The options are Auto, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

PCI-X 133MHz Slot#1, PCI-X 100MHz Slot#2, PCI-Exp x8 Slot#1, CI-Exp x8 Slot#2

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

Option ROM Scan

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

Enable Master

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

Latency Timer

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

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are DOS or Other (for Unix, Novelle NetWare and other operating systems).
Advanced Chipset Control

Access the submenu to make changes to the following settings.

**Force Compliance Mode**

This feature allows you to enable the PCI-Express Compliance Mode. The options are **Disabled** or **Enabled**.

**Memory RAS Feature Control**

Select this option in order to enable the special feature of DIMM sparing or memory mirroring. The options are Mirroring, Sparing, and **Standard**.

**Clock Spectrum Feature**

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

**Memory Remap Function Control**

PCI memory resources will overlap with the physical memory if 4GB of memory or above is installed on the motherboard. When this occurs, **enable** this function to reallocate the overlapped physical memory to a location above 4GB to resolve the memory overlapping situation.

**DRAM Data Integrity Mode**

If enabled, this feature allows the data stored in the DRAM memory to be integrated for faster data processing. The options are 72-bit **ECC**, 144-bit **ECC**, **Auto** and **Disabled**.

**ECC Error Type**

This setting lets you select which type of interrupt to be activated as a result of an ECC error. The options are None, NMI (Non-Maskable Interrupt), **SMI** (System Management Interrupt), and SCI (System Control Interrupt).
SERR Signal Condition

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

Enabling Multi-Media Timer

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

USB Function

Select Enabled to enable the function of USB devices specified. The settings are Enabled and Disabled.

Legacy USB Support

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

Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

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

Hyper-threading (*Available when supported by the CPU.)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled or Enabled.

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

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

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

Set to Enabled to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are Enabled and Disabled. (*Note: please refer to Intel's web site for detailed information.)
No Execute Mode Memory Protection (*Available when supported by the CPU and the OS.)

Set to Enabled to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack.

(*Note: this feature is available when your OS and your CPU support the function of Execute Disable Bit.) The options are Disabled and Enabled. (Note: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.)

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

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

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

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

Processor Power Management (*Available when supported by the CPU.)

This feature allows the user to determine the processor power management mode. The options are Disabled and C States Only. If set to Disabled, C States and GV1/GV3 are disabled. If set to C States only, the processor power will be controlled through CPU power states in the APCI setting.
I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for KBC. The options are 6MHz, 8MHz, 12MHz, and 16MHz.

Onboard COM 1

This setting allows you to assign control of serial port A. The options are Enabled (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

Select the base I/O address for serial port A. The options are 3F8, 2F8, 3E8, and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port A. The options are IRQ3 and IRQ4.

Onboard COM 2

This setting allows you to assign control of serial port B. The options are Enabled (user defined), Disabled, Auto (BIOS controlled), and OS Controlled.

Mode

Specify the type of device that will be connected to serial port B. The options are Normal, and IR (for an infrared device).

Base I/O Address

Select the base I/O address for serial port B. The options are 3F8, 2F8, 3E8, and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port B. The options are IRQ3 and IRQ4.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are Enabled (user defined), Disabled, and Auto (BIOS and OS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are Primary and Secondary.
DMI Event Logging

Access the submenu to make changes to the following settings.

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

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

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

Event Logging
This setting allows you to Enable or Disable event logging.

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

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

Clear All DMI Event Logs
Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and No.
Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify to redirect the console to Onboard COM A or Onboard COM B. This setting can also be Disabled.

BAUD Rate

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

Console Type

This item allows you to choose from the available options to select the console type for console redirection. The options are VT100, VT100, 8bit, PC-ANSI, 7bit, PC ANSI, VT100+, and VT-UTF8.

Flow Control

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

Console Connection

This item allows you to choose select the console connection: either Direct or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and Off.
Hardware Monitor Logic

CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 70°C, 75°C, 80°C and 85°C.

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

CPU1 Temperature: This item displays CPU1 Temperature.

CPU2 Temperature: This item displays CPU2 Temperature.

System Temperature: This item displays the System Temperature.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. The Options are: 1. Full Speed at 12V. 2. Optimized for Server with 3-pin Fans.

Fan 1-Fan5: If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of the fans indicated in this item.

Vcore A/Vcore B: These items display the Voltage status of CPU 1 and CPU 2.

P3V3: This item displays the +3.3V voltage status.

P5V: This item displays the +5V voltage status.

N12V: This item displays the -12V voltage status.

P12V: This item displays the +12V voltage status.

VDD: This item displays the VDD status.

P5Vsb: This item displays the voltage status of +5V Standby power.
4-5 Security

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

Supervisor Password Is:

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

Set User Password

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

**Fixed Disk Boot Sector**

This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is Normal.

**Password on Boot**

This setting allows you to require a password to be entered when the system boots up. The options are Enabled (password required) and Disabled (password not required).
4-6  Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

+Removable Devices
Highlight and press <Enter> to expand the field. See details on how to change the order and specs of devices in the Item Specific Help window.

CDROM Drive
See details on how to change the order and specs of the CDROM drive in the Item Specific Help window.

+Hard Drive
Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.
4-7 Exit

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

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

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

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

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

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

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

**Failure Fixed Disk**
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

**Stuck key**
Stuck key on keyboard.

**Keyboard error**
Keyboard not working.

**Keyboard Controller Failed**
Keyboard controller failed test. May require replacing keyboard controller.

**Keyboard locked - Unlock key switch**
Unlock the system to proceed.

**Monitor type does not match CMOS - Run SETUP**
Monitor type not correctly identified in Setup

**Shadow Ram Failed at offset: nnnn**
Shadow RAM failed at offset nnnn of the 64k block at which the error was detected.

**System RAM Failed at offset: nnnn**
System RAM failed at offset nnnn of in the 64k block at which the error was detected.

**Extended RAM Failed at offset: nnnn** Extended memory not working or not configured properly at offset nnnn.

**System battery is dead - Replace and run SETUP**
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.
System CMOS checksum bad - Default configuration used
System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error
The timer test failed. Requires repair of system board.

Real time clock error
Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings
BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used
Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of wait states, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS
Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error
Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP
Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP
Type of floppy drive B: not correctly identified in Setup.
System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:
CPU socket number for Multi-Processor error.

EISA CMOS not writeable
ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed
ServerBIOS2 test error: Cannot write to extended DMA (Direct Memory Access) registers.

Software NMI Failed
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed
ServerBIOS2 test error: Fail-Safe Timer takes too long.

device Address Conflict
Address conflict for specified device.

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified device.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

Failing Bits: nnnn
The hex number nnnn is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.
Fixed Disk n
Fixed disk n (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where nnnn is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where nnnn is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where nnnn is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed
Where nnnn is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.
Parity Check 2 nnnn
Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.

Press <F1> to resume, <F2> to Setup, <F3> for previous
Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an Option ROM, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup
Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:
PS/2 mouse identified.

Run the I2O Configuration Utility
One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed
System BIOS copied to shadow RAM.

UMB upper limit segment address: nnnn
Displays the address nnnn of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed
Video BIOS successfully copied to shadow RAM.
Appendix B
BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the Phoenix BIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

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

1 long and two short beeps - video configuration error
1 continuous long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

<table>
<thead>
<tr>
<th>POST Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>02h</td>
<td>Verify Real Mode</td>
</tr>
<tr>
<td>03h</td>
<td>Disable Non-Maskable Interrupt (NMI)</td>
</tr>
<tr>
<td>04h</td>
<td>Get CPU type</td>
</tr>
<tr>
<td>06h</td>
<td>Initialize system hardware</td>
</tr>
<tr>
<td>07h</td>
<td>Disable shadow and execute code from the ROM.</td>
</tr>
<tr>
<td>08h</td>
<td>Initialize chipset with initial POST values</td>
</tr>
<tr>
<td>09h</td>
<td>Set IN POST flag</td>
</tr>
<tr>
<td>0Ah</td>
<td>Initialize CPU registers</td>
</tr>
<tr>
<td>0Bh</td>
<td>Enable CPU cache</td>
</tr>
<tr>
<td>0Ch</td>
<td>Initialize caches to initial POST values</td>
</tr>
<tr>
<td>0Eh</td>
<td>Initialize I/O component</td>
</tr>
<tr>
<td>0Fh</td>
<td>Initialize the local bus IDE</td>
</tr>
<tr>
<td>10h</td>
<td>Initialize Power Management</td>
</tr>
<tr>
<td>11h</td>
<td>Load alternate registers with initial POST values</td>
</tr>
<tr>
<td>12h</td>
<td>Restore CPU control word during warm boot</td>
</tr>
<tr>
<td>13h</td>
<td>Initialize PCI Bus Mastering devices</td>
</tr>
<tr>
<td>14h</td>
<td>Initialize keyboard controller</td>
</tr>
<tr>
<td>16h</td>
<td>1-2-2-3 BIOS ROM checksum</td>
</tr>
<tr>
<td>17h</td>
<td>Initialize cache before memory Auto size</td>
</tr>
<tr>
<td>POST Code</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>18h</td>
<td>8254 timer initialization</td>
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<tr>
<td>1Ah</td>
<td>8237 DMA controller initialization</td>
</tr>
<tr>
<td>1Ch</td>
<td>Reset Programmable Interrupt Controller</td>
</tr>
<tr>
<td>20h</td>
<td>1-3-1-1 Test DRAM refresh</td>
</tr>
<tr>
<td>22h</td>
<td>1-3-1-3 Test 8742 Keyboard Controller</td>
</tr>
<tr>
<td>24h</td>
<td>Set ES segment register to 4 GB</td>
</tr>
<tr>
<td>28h</td>
<td>Auto size DRAM</td>
</tr>
<tr>
<td>29h</td>
<td>Initialize POST Memory Manager</td>
</tr>
<tr>
<td>2Ah</td>
<td>Clear 512 kB base RAM</td>
</tr>
<tr>
<td>2Ch</td>
<td>1-3-4-1 RAM failure on address line \textit{xxxx}^*</td>
</tr>
<tr>
<td>2Eh</td>
<td>1-3-4-3 RAM failure on data bits \textit{xxxx}^* of low byte of memory bus</td>
</tr>
<tr>
<td>2Fh</td>
<td>Enable cache before system BIOS shadow</td>
</tr>
<tr>
<td>32h</td>
<td>Test CPU bus-clock frequency</td>
</tr>
<tr>
<td>33h</td>
<td>Initialize Phoenix Dispatch Manager</td>
</tr>
<tr>
<td>36h</td>
<td>Warm start shut down</td>
</tr>
<tr>
<td>38h</td>
<td>Shadow system BIOS ROM</td>
</tr>
<tr>
<td>3Ah</td>
<td>Auto size cache</td>
</tr>
<tr>
<td>3Ch</td>
<td>Advanced configuration of chipset registers</td>
</tr>
<tr>
<td>3Dh</td>
<td>Load alternate registers with CMOS values</td>
</tr>
<tr>
<td>41h</td>
<td>Initialize extended memory for RomPilot</td>
</tr>
<tr>
<td>42h</td>
<td>Initialize interrupt vectors</td>
</tr>
<tr>
<td>45h</td>
<td>POST device initialization</td>
</tr>
<tr>
<td>46h</td>
<td>2-1-2-3 Check ROM copyright notice</td>
</tr>
<tr>
<td>47h</td>
<td>Initialize I20 support</td>
</tr>
<tr>
<td>48h</td>
<td>Check video configuration against CMOS</td>
</tr>
<tr>
<td>49h</td>
<td>Initialize PCI bus and devices</td>
</tr>
<tr>
<td>4Ah</td>
<td>Initialize all video adapters in system</td>
</tr>
<tr>
<td>4Bh</td>
<td>QuietBoot start (optional)</td>
</tr>
<tr>
<td>4Ch</td>
<td>Shadow video BIOS ROM</td>
</tr>
<tr>
<td>4Eh</td>
<td>Display BIOS copyright notice</td>
</tr>
<tr>
<td>4Fh</td>
<td>Initialize MultiBoot</td>
</tr>
<tr>
<td>50h</td>
<td>Display CPU type and speed</td>
</tr>
<tr>
<td>51h</td>
<td>Initialize EISA board</td>
</tr>
<tr>
<td>52h</td>
<td>Test keyboard</td>
</tr>
<tr>
<td>54h</td>
<td>Set key click if enabled</td>
</tr>
<tr>
<td>55h</td>
<td>Enable USB devices</td>
</tr>
<tr>
<td>58h</td>
<td>2-2-3-1 Test for unexpected interrupts</td>
</tr>
<tr>
<td>59h</td>
<td>Initialize POST display service</td>
</tr>
<tr>
<td>5Ah</td>
<td>Display prompt “Press F2 to enter SETUP”</td>
</tr>
<tr>
<td>5Bh</td>
<td>Disable CPU cache</td>
</tr>
<tr>
<td>POST Code</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>5Ch</td>
<td>Test RAM between 512 and 640 kB</td>
</tr>
<tr>
<td>60h</td>
<td>Test extended memory</td>
</tr>
<tr>
<td>62h</td>
<td>Test extended memory address lines</td>
</tr>
<tr>
<td>64h</td>
<td>Jump to UserPatch1</td>
</tr>
<tr>
<td>66h</td>
<td>Configure advanced cache registers</td>
</tr>
<tr>
<td>67h</td>
<td>Initialize Multi Processor APIC</td>
</tr>
<tr>
<td>68h</td>
<td>Enable external and CPU caches</td>
</tr>
<tr>
<td>69h</td>
<td>Setup System Management Mode (SMM) area</td>
</tr>
<tr>
<td>6Ah</td>
<td>Display external L2 cache size</td>
</tr>
<tr>
<td>6Bh</td>
<td>Load custom defaults (optional)</td>
</tr>
<tr>
<td>6Ch</td>
<td>Display shadow-area message</td>
</tr>
<tr>
<td>6Eh</td>
<td>Display possible high address for UMB recovery</td>
</tr>
<tr>
<td>70h</td>
<td>Display error messages</td>
</tr>
<tr>
<td>72h</td>
<td>Check for configuration errors</td>
</tr>
<tr>
<td>76h</td>
<td>Check for keyboard errors</td>
</tr>
<tr>
<td>7Ch</td>
<td>Set up hardware interrupt vectors</td>
</tr>
<tr>
<td>7Dh</td>
<td>Initialize Intelligent System Monitoring</td>
</tr>
<tr>
<td>7Eh</td>
<td>Initialize coprocessor if present</td>
</tr>
<tr>
<td>80h</td>
<td>Disable onboard Super I/O ports and IRQs</td>
</tr>
<tr>
<td>81h</td>
<td>Late POST device initialization</td>
</tr>
<tr>
<td>82h</td>
<td>Detect and install external RS232 ports</td>
</tr>
<tr>
<td>83h</td>
<td>Configure non-MCD IDE controllers</td>
</tr>
<tr>
<td>84h</td>
<td>Detect and install external parallel ports</td>
</tr>
<tr>
<td>85h</td>
<td>Initialize PC-compatible PnP ISA devices</td>
</tr>
<tr>
<td>86h</td>
<td>Re-initialize onboard I/O ports.</td>
</tr>
<tr>
<td>87h</td>
<td>Configure Motherboard Configurable Devices (optional)</td>
</tr>
<tr>
<td>88h</td>
<td>Initialize BIOS Data Area</td>
</tr>
<tr>
<td>89h</td>
<td>Enable Non-Maskable Interrupts (NMIs)</td>
</tr>
<tr>
<td>8Ah</td>
<td>Initialize Extended BIOS Data Area</td>
</tr>
<tr>
<td>8Bh</td>
<td>Test and initialize PS/2 mouse</td>
</tr>
<tr>
<td>8Ch</td>
<td>Initialize floppy controller</td>
</tr>
<tr>
<td>8Fh</td>
<td>Determine number of ATA drives (optional)</td>
</tr>
<tr>
<td>90h</td>
<td>Initialize hard-disk controllers</td>
</tr>
<tr>
<td>91h</td>
<td>Initialize local-bus hard-disk controllers</td>
</tr>
<tr>
<td>92h</td>
<td>Jump to UserPatch2</td>
</tr>
<tr>
<td>93h</td>
<td>Build MPTABLE for multi-processor boards</td>
</tr>
<tr>
<td>95h</td>
<td>Install CD ROM for boot</td>
</tr>
<tr>
<td>96h</td>
<td>Clear huge ES segment register</td>
</tr>
<tr>
<td>97h</td>
<td>Fix up Multi Processor table</td>
</tr>
<tr>
<td>98h</td>
<td>1-2 Search for option ROMs. One long, two short beeps on checksum failure</td>
</tr>
<tr>
<td>POST Code</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>99h</td>
<td>Check for SMART Drive (optional)</td>
</tr>
<tr>
<td>9Ah</td>
<td>Shadow option ROMs</td>
</tr>
<tr>
<td>9Ch</td>
<td>Set up Power Management</td>
</tr>
<tr>
<td>9Dh</td>
<td>Initialize security engine (optional)</td>
</tr>
<tr>
<td>9Eh</td>
<td>Enable hardware interrupts</td>
</tr>
<tr>
<td>9Fh</td>
<td>Determine number of ATA and SCSI drives</td>
</tr>
<tr>
<td>A0h</td>
<td>Set time of day</td>
</tr>
<tr>
<td>A2h</td>
<td>Check key lock</td>
</tr>
<tr>
<td>A4h</td>
<td>Initialize typematic rate</td>
</tr>
<tr>
<td>A8h</td>
<td>Erase F2 prompt</td>
</tr>
<tr>
<td>AAh</td>
<td>Scan for F2 key stroke</td>
</tr>
<tr>
<td>ACh</td>
<td>Enter SETUP</td>
</tr>
<tr>
<td>AEh</td>
<td>Clear Boot flag</td>
</tr>
<tr>
<td>B0h</td>
<td>Check for errors</td>
</tr>
<tr>
<td>B1h</td>
<td>Inform RomPilot about the end of POST.</td>
</tr>
<tr>
<td>B2h</td>
<td>POST done - prepare to boot operating system</td>
</tr>
<tr>
<td>B4h</td>
<td>1 One short beep before boot</td>
</tr>
<tr>
<td>B5h</td>
<td>Terminate QuietBoot (optional)</td>
</tr>
<tr>
<td>B6h</td>
<td>Check password (optional)</td>
</tr>
<tr>
<td>B7h</td>
<td>Initialize ACPI BIOS</td>
</tr>
<tr>
<td>B9h</td>
<td>Prepare Boot</td>
</tr>
<tr>
<td>BAh</td>
<td>Initialize SMBIOS</td>
</tr>
<tr>
<td>BBh</td>
<td>Initialize PnP Option ROMs</td>
</tr>
<tr>
<td>BCh</td>
<td>Clear parity checkers</td>
</tr>
<tr>
<td>BDh</td>
<td>Display MultiBoot menu</td>
</tr>
<tr>
<td>BEh</td>
<td>Clear screen (optional)</td>
</tr>
<tr>
<td>BFh</td>
<td>Check virus and backup reminders</td>
</tr>
<tr>
<td>C0h</td>
<td>Try to boot with INT 19</td>
</tr>
<tr>
<td>C1h</td>
<td>Initialize POST Error Manager (PEM)</td>
</tr>
<tr>
<td>C2h</td>
<td>Initialize error logging</td>
</tr>
<tr>
<td>C3h</td>
<td>Initialize error display function</td>
</tr>
<tr>
<td>C4h</td>
<td>Initialize system error handler</td>
</tr>
<tr>
<td>C5h</td>
<td>PnPnd dual CMOS (optional)</td>
</tr>
<tr>
<td>C6h</td>
<td>Initialize note dock (optional)</td>
</tr>
<tr>
<td>C7h</td>
<td>Initialize note dock late</td>
</tr>
<tr>
<td>C8h</td>
<td>Force check (optional)</td>
</tr>
<tr>
<td>C9h</td>
<td>Extended checksum (optional)</td>
</tr>
<tr>
<td>CAh</td>
<td>Redirect Int 15h to enable remote keyboard</td>
</tr>
<tr>
<td>CBh</td>
<td>Redirect Int 13h to Memory Technologies</td>
</tr>
<tr>
<td></td>
<td>Devices such as ROM, RAM, PCMCIA, and serial disk</td>
</tr>
<tr>
<td>CCh</td>
<td>Redirect Int 10h to enable remote serial video</td>
</tr>
<tr>
<td>POST Code</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>CDh</td>
<td>Re-map I/O and memory for PCMCIA</td>
</tr>
<tr>
<td>CEh</td>
<td>Initialize digitizer and display message</td>
</tr>
<tr>
<td>D2h</td>
<td>Unknown interrupt</td>
</tr>
</tbody>
</table>

**The following are for boot block in Flash ROM**

<table>
<thead>
<tr>
<th>POST Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0h</td>
<td>Initialize the chipset</td>
</tr>
<tr>
<td>E1h</td>
<td>Initialize the bridge</td>
</tr>
<tr>
<td>E2h</td>
<td>Initialize the CPU</td>
</tr>
<tr>
<td>E3h</td>
<td>Initialize system timer</td>
</tr>
<tr>
<td>E4h</td>
<td>Initialize system I/O</td>
</tr>
<tr>
<td>E5h</td>
<td>Check force recovery boot</td>
</tr>
<tr>
<td>E6h</td>
<td>Checksum BIOS ROM</td>
</tr>
<tr>
<td>E7h</td>
<td>Go to BIOS</td>
</tr>
<tr>
<td>E8h</td>
<td>Set Huge Segment</td>
</tr>
<tr>
<td>E9h</td>
<td>Initialize Multi Processor</td>
</tr>
<tr>
<td>EAh</td>
<td>Initialize OEM special code</td>
</tr>
<tr>
<td>EBh</td>
<td>Initialize PIC and DMA</td>
</tr>
<tr>
<td>ECh</td>
<td>Initialize Memory type</td>
</tr>
<tr>
<td>EDh</td>
<td>Initialize Memory size</td>
</tr>
<tr>
<td>EEh</td>
<td>Shadow Boot Block</td>
</tr>
<tr>
<td>EFh</td>
<td>System memory test</td>
</tr>
<tr>
<td>F0h</td>
<td>Initialize interrupt vectors</td>
</tr>
<tr>
<td>F1h</td>
<td>Initialize Run Time Clock</td>
</tr>
<tr>
<td>F2h</td>
<td>Initialize video</td>
</tr>
<tr>
<td>F3h</td>
<td>Initialize System Management Manager</td>
</tr>
<tr>
<td>F4h</td>
<td>Output one beep</td>
</tr>
<tr>
<td>F5h</td>
<td>Clear Huge Segment</td>
</tr>
<tr>
<td>F6h</td>
<td>Boot to Mini DOS</td>
</tr>
<tr>
<td>F7h</td>
<td>Boot to Full DOS</td>
</tr>
</tbody>
</table>

*If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020” means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.*
Notes
Appendix C

Installing Software Drivers and the Windows Operating System

C-1 The Adaptec Embedded SAS/SATA with HostRAID Controller Driver (*Note: SAS is for the X6DHR-3G2 only.)

Introduction to SATA (Serial ATA) and SAS (Serial Attached SCSI)

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. It is a serial link which supports SATA transfer rates up to 150Mbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems provide more efficient system cooling, faster data transfer and better functionality than Parallel ATA. In addition to SATA, the X6DHR-3G2 has an SAS (Serial Attached SCSI) Controller built-in. SAS supports serial link data transfer rates up to 3Gbps. With the functionality provided by the SAS controller, the X6DHR-3G2 offers unprecedented I/O throughput, reliability and scalability to the IT industry. Furthermore, with the dynamic SAS infrastructure built-in, the X6DHR-3G2 supports both SATA and SAS without any bridging, providing the user with unparalleled data storage expansion and inter-connectivity capability. (*Note: The onboard SAS Controller supports both SATA and SAS RAID configuration; however, "mixing-and-matching" SATA and SAS in the configuration is not recommended.)

Using the Adaptec RAID Configuration Utility (ARC)

(*Note: You can also follow the instructions listed below to configure SATA RAID settings.)

The onboard SAS Controller is enabled by default. To disable it, please set Jumper JPS1 to Pins 2-3 (See Page 2-19 in Chapter 2 for details.)

* Upon detecting the SAS Controller BIOS, please make sure that the Adapter WWN address is listed. This is a 16-digit number. If this number is not shown, you will not be able to use the controller.

* Once the WWN address is listed, press the <Ctrl> and <A> simultaneously when prompted to access the Adaptec SAS RAID BIOS. (*Note: To select an option, use the arrow keys to highlight the item and then press <Enter> to select it. To return to the previous menu, press <ESC>.)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, including:

* Array Configuration Utility: Use this utility to create, configure and manage arrays.

* SerialSelect Utility: Use this option to configure SAS/SATA RAID drives.

* Disk Utilities: Use this option to format or verify disks.
A. Using the Array Configuration Utility

The Array Configuration Utility 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 <Ctrl> and <A> simultaneously to display the main menu.

**Managing Arrays**

Select this option to view array properties, and 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 above).
### Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press **Ctrl+A**.
2. From the Adaptec RAID Configuration Utility menu, select **Array Configuration Utility**.
3. From the Array Configuration Utility 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: Back up the data on an array before you delete it to prevent the 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 Adaptec RAID Configuration Utility.
2. From the Adaptec RAID Configuration Utility main menu, select **Array Configuration Utility**.
3. From the Array Configuration Utility 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. Press **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 uninitialized are shown in gray and cannot be used. Refer to the section: Initializing Disk Drives.

To create an array:

1. Turn on your computer and press Ctrl+A when prompted to access the Adaptec RAID Configuration Utility.
2. From the Adaptec RAID Configuration Utility menu, select Array Configuration Utility Main Menu.
3. From the Array Configuration Utility menu, select Create Array.
4. Select the disks for the new array and press Insert (as the screen shown below).

(*Note: To deselect any disk, highlight the disk and press Delete.)

5. After both disks for the new array are selected, press Enter. The Array Properties menu displays (as the screen shown below).
Assigning Array Properties

Once you’ve create a new array, you are ready to assign the properties to the array.

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

To assign properties to the new array:

1. In the Array Properties menu (as shown in the screen below), select an array type and press Enter.

   Note that only the available array types: RAID 0, and RAID 1, are displayed on the screen. (*RAID 0 or RAID 1 requires two drives.)

2. Under the item "Arrays Label", type in a label and press Enter. (*Note: The label shall not be more than 15 characters.)

3. For RAID 0, select the desired stripe size. (*Note: Available stripe sizes are 16, 32, and 64 KC-default. It is recommended that you do not change the default setting.)

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

   The following table gives examples of when each is appropriate.
5. When you are finished, press **Done (as shown in the previous 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 Array Configuration Utility, you can restart it by pressing Ctrl+R.

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

4. The Array Configuration Utility 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 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 to recover the data that was on the source drive.
Adding a Bootable Array

To make an array bootable:

1. From the Main menu, select **Configure Boot Unit** and press Enter. The following screen displays.

2. From the "Select Drive to Create Boot Unit" list, select the drive you wish to **Configure Boot Unit** and press Insert. The Drive you have selected appears in the right window as shown in the screen below:

3. Select the disk drive you wish to configure as a bootable drive from the "Selected Drives" List (in the right window) and press Enter. The next screen appears.
Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select **Configure Boot Unit** and press Enter.

2. From the "Select the Boot Unit" list (in the right window), select the bootable drive you wish to delete and press Delete. The following screen appears:

3. When the screen shown above appears, select Delete and press Enter.

4. Enter Y to delete a bootable array when the following message is displayed: "Do you want to delete the Bootable Unit? (Yes/No):" Then, the bootable array will be deleted.
Adding/Deleting Hotspares

("Note: In order to rebuild a RAID (RAID 0 or RAID 1), you would need to add a new HDD as a hotspare.)

1. Turn on your computer and press Ctrl+A as prompted to access the ARC Utility.
2. From the ARC menu, select Array Configuration Utility.
3. From the ACU menu, select Add/Delete Hotspares and press <Enter>. The following screen appears:

   ![Add/Delete Hotspares Screen]

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, press <Enter>.
5. Press 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.

To Delete a Hotspare Drive

4. From the List of "Assigned Hotspare Drives" (in the right window), select the hotspare drive you want to delete, and press <Delete> and <Enter>.
5. Press yes when the following prompt is displayed: "Do you want to Delete the Hotspare?" (Yes/No?)

   The hotspare drive you have selected will be deleted.
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 Adaptec RAID Configuration utility.
2. From the Adaptec RAID Configuration Utility menu, select **Array Configuration Utility** (as shown in the screen below).
3. From the screen below, select **Initialize Drives** and press <Enter>.

![Initialize Drives Screen]

4. From the "Select drives for initialization" list (on the left screen), select the disk you wish to initialize and press Insert. The drive you've selected will appear on the "Selected Drives" list as shown below:

![Selected Drives List]

5. Repeat Step 4 so that both drives to be initialized are selected and press <Enter>.

6. When the following message appears, make sure that you have selected the correct drive for initialization and press <Y> to initialize the drive or press <N> to quit.

Warning: Initialization will configure the drive(s) as simple volume disk(s). Do you want to continue? (Yes/No):
Rebuilding Arrays

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

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

*Note 2: 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 in the screen below). From the List of Arrays, select the array you want to Rebuild.

2 Press Ctrl+R to Rebuild.
Using the SerialSelect Utility to Configure SAS Settings

The SerialSelect Utility enables you to configure SAS disk drive settings.

**To access the SAS utilities:** (*Note: SAS is for the X6DHR-3G2 only.)*

1. Turn on your computer and press Ctrl+A when prompted to access the Adaptec RAID Configuration Utility (as shown in the screen below).

2. Use the arrow keys to select "SerialSelect Utility" and press <Enter> to access the Controller Configuration submenu:
To Set Controller Configuration:

3. Select "Controller Configuration" and press <Enter> to access the submenu as shown below:

4. Use the arrow keys to select an item. Then, press <Enter> and the arrow keys to configure the setting for the item selected.

5. To load the default settings, press <F6>.

(*Note: The default setting for each item is listed below:
Runtime BIOS: Enabled,
BBS Support: Device,
POST Banner Display: Enabled,
CTRL-A Message Display: Enabled,
Physical Drives Display during POST: Enabled,)

6. Press <Esc> to return to the previous menu and to exit the utility.
To Set Physical Configuration:

1. Turn on your computer and press **Ctrl+A** when prompted to access the Adaptec RAID Configuration Utility.

2. Use the arrow keys to select "SerialSelect Utility" and press <Enter> to access the Physical Configuration submenu as shown below:

3. Select "Physical Configuration" and press <Enter> to access SAS Device Configuration submenu as shown below:

4. Use the arrow keys to select an item. Then, press <Enter> and the arrow keys to configure the item selected.

5. To load default settings, press <F6>.

6. Press <Esc> to return to the previous menu and to exit the utility.
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 Adaptec RAID Configuration Utility (as shown in the screen below.)

2. From the Adaptec RAID Configuration Utility menu, select Disk Utilities from the screen as shown above and press Enter.

3. When the submenu appears, select the desired disk and press Enter.

The following options are available:

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

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

2. Verify Disk Media—Scans the media of a disk drive for defects.
To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press ESC to exit. The following screen will appear.

2. Press Yes to exit the Utility.

("For more information regarding Adaptec RAID Utility, please refer to Adaptec's User's Guide in the CD included in your shipping package. You can also download a copy of Adaptec User's Guide from our web site at: www.supermicro.com.)
C-2 Installing the ICH5R/SAS Driver and the OS (*Note: SAS is for the X6DHR-3G2 only)

a. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot, and the screen:"Super Micro Driver Diskette Maker" will appear.

b. From the list displayed on the screen, choose the item: "Intel 6300 ESB/ICH5R Driver by 3rd Party (Adaptec)" or "SAS" and press <ENTER>.

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

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

e. Exit the program after the process is completed. Then, reboot the system.

f. Insert Microsoft Windows OS Setup CD in the CD Driver, and the system will start to boot up from CD.

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

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

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

j. Choose Adaptec Embedded Host Serial ATA Raid Controller from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

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

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

m. After Windows OS Installation is completed, the system will automatically reboot.
C-3 Installing Other Software Programs and Drivers

A. Installing Drivers other than Adaptec Embedded Serial ATA RAID Controller Driver

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

Driver/Tool Installation Display Screen

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

(*Please refer to the Adaptec User’s Guide for the installation of Adaptec’s Serial ATA RAID Controller Driver. Adaptec’s User’s Guide is 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 base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

(*Note: The default user name and password are ADMIN,)

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

Graceful power control

Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.

Requirements

Keep Supero SD3 Service Daemon running at all times on this system.
Provide TCP/IP connectivity.

Power control

(*Notes: 1. SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SD III User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend Supero Doctor II. 2. For detailed information on Adaptec's SCSI SATA RAID Utility, please refer to the CDs that came with your motherboard.)