

SUPERO[®]

SUPER X5DPA-TGM
SUPER X5DPA-TGM+

USER'S MANUAL

Revision 1.1a

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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 X5DPA-TGM/X5DPA-TGM+ mainboard. The SUPER X5DPA-TGM/X5DPA-TGM+ supports single or dual Intel® 604 and 603-pin Xeon™ processors at a 533/400 MHz front side bus. Please refer to the support section of our web site (<http://www.supermicro.com/TechSupport.htm>) for a complete listing of supported processors. This product is intended to be professionally installed.

Manual Organization

Chapter 1 begins with a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and DIMM memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, SCSI drives, the IDE interfaces, the parallel and serial ports, the keyboard and mouse, the power supply and various control panel buttons and indicators.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ [Frequently Asked Questions] section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site (at www.supermicro.com/techsupport.htm) for more detailed information.

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

Appendix A gives information on BIOS POST messages.

Appendix B provides BIOS POST codes.

Appendix C Software Installation Instructions for the X5DPA-TGM.

Appendix D Software Installation Instructions for the X5DPA-TGM+.

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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.

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

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices

One (1) floppy ribbon cable

One (1) one head USB cable with bracket (For retail only)

One (1) one COM Port cable with bracket (For retail only)

One (1) 9-pin Serial Port DKT cable

One (1) I/O backpanel shield

Two (2) SATA cables (For retail only)

One (1) Supermicro CD

One (1) User's/BIOS Manual

Two (2) CPU/Heatsink Plates (SKT-120-P) and two (2) heatsink retention clips (SKT-095-604 E)

Contacting Supermicro

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Web Site: www.supermicro.com.tw

Technical Support:

Email: support@supermicro.com.tw

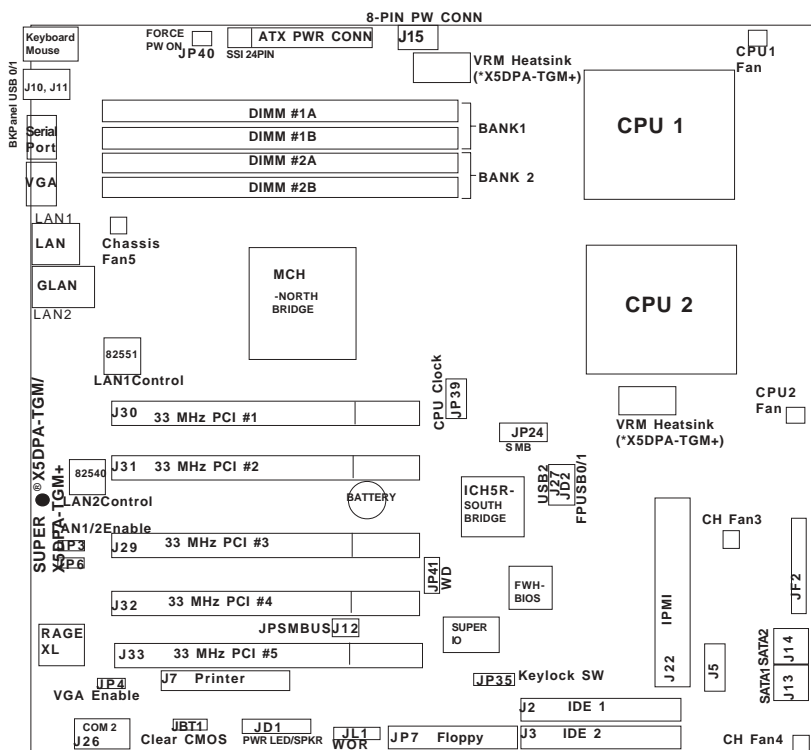
Tel: 886-2-8228-1366, ext.132 or 139

Figure 1-1. SUPER X5DPA-TGM Image



(Notes: There are two VRM Heatsinks on the X5DPA-TGM+ motherboard and there is no VRM Heatsink on the X5DPA-TGM motherboard. The X5DPA-TGM+ uses Intel's 82541 GLAN controller. The X5DPA-TGM uses Intel's 82540 GLAN controller.)

Figure 1-2. SUPER X5DPA-TGM/X5DPA-TGM+ Layout*
(not drawn to scale)



Notes:

1. The CPU sockets are designed for the 604-Pin Xeon Processors; however, the 603-Pin CPUs are also supported. When one CPU is used, please install it in CPU Socket #1.
2. DIMM memory modules have to be used in pairs. When one pair of DIMMs are used, please install them in Bank #1.
3. There are two VRM Heatsinks on the X5DPA-TGM+ motherboard and there is no VRM Heatsink on the X5DPA-TGM motherboard.

X5DPA-TGM/X5DPA-TGM+ Quick Reference

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

<u>Connector</u>	<u>Description</u>
ATX PWR CONN	Primary ATX Power Connector
DIMM#1A-DIMM#2B	Memory (RAM) Slots
CPU/CHASSIS FANS	CPU/Chassis Fan Headers
LAN1	LAN (100/10 Mbps Fast Ethernet Port-82551)
LAN2	GLAN (Gigabit Ethernet Port-82540 for the X5DPA-TGM, 82541 for the X5DPA-TGM+)
J2/J3	IDE#1(J2), IDE#2(J3) HDD Connectors
J4	VGA Connector
J5	SATA LED Header
J7	Printer Connector
J8, J26	COM1(SerialPort1-J8),COM2(SerialPort2-J26)
J10,J11	Back Panel USB 0/1 Ports(J10:USB 0,J11: USB 1)
J13/J14	SATA0Connector(J13) ,SATA1Connector(J14)
J15	Secondary ATX Power (8-Pin) Connector
J22	IPMI Connector
J27, JD2	Front Panel USB(JD2: USB2/3,J27:USB4)
J28	PS/2 Keyboard & PS/2 Mouse
J29-J33	33 MHz PCI slots
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JP7	Floppy Disk Drive Connector
JP24	SMBus Connector
JP35	Keylock Switch Connector
WOR	Wake-on-Ring Header

Motherboard Features

CPU

- Single or dual Intel® 604-Pin Xeon™ processors at a 533/400 MHz front side (system) bus speed. (603-Pin Xeon supported)**Note:** Please refer to the support section of our web site for a complete listing of supported processors (<http://www.supermicro.com/TechSupport.htm>).

(*For CPU speeds, please refer to our website at www.Supermicro.com)

Memory

- Four 184-pin DIMM sockets supporting up to 8 GB of registered ECC DDR-266/200 SDRAM
- Note:** Interleaved memory; requires memory modules to be installed in pairs. DDR-266 memory must be used with 533 MHz FSB speed processors. See Section 2-3 for details.

Chipset

- Intel E7501 chipset

Expansion Slots

- Five 32-bit, 33 MHz PCI

BIOS

- 4 Mb AMI 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 3.3V standby
- Fan status monitor with firmware/software on/off control
- CPU/chassis temperature monitors
- Environmental temperature monitor and control
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- CPU overheat LED header
- 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

ACPI Features (optional)

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- Main switch override mechanism

Onboard I/O

- Integrated ATI Rage XL graphics controller
- Intel Gigabit LAN Ethernet (82541 for the X5DPA-TGM+/82540 for the X5DPA-TGM), and an additional 82551 100/10Mbps Fast Ethernet LAN 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
- Up to 5 USB (Universal Serial Bus) ports

Other

- Internal/external modem ring-on
- Wake-on-LAN (WOL)
- Console redirection
- IPMI

CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

Dimensions

- ATX: 12" x 10" (304.8 x 254 mm)

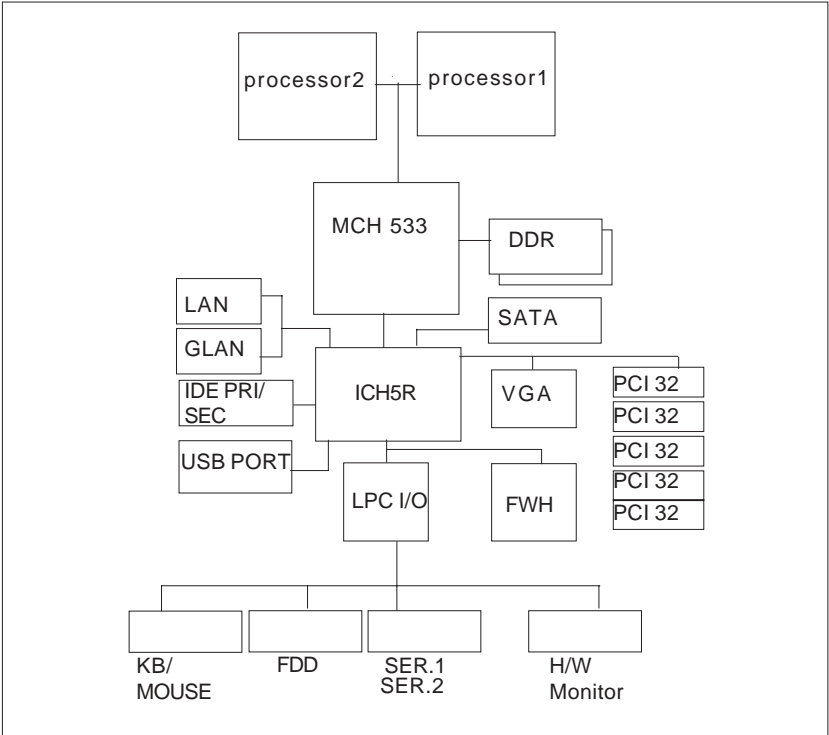


Figure 1-5. X5DPA: Block Diagram

Note: This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of each motherboard.

1-2 Chipset Overview

The Intel E7501 chipset is a high-performance chipset with a performance and feature-set designed for mid-range, dual processor servers. The E7501 chipset consists of three major components: the Memory Controller Hub (MCH), the I/O Controller Hub (ICH5R), and the FW82801CA FIRMWARE Controller.

The MCH employs a 144-bit wide memory bus for a DDR-266 memory interface, which provides a total bandwidth of 3.2 GB/s (at 400 MHz FSB), 4.2 GB/s (at 533 MHz FSB). The ICH5R interface is a 266 MB/sec point-to-point connection using an 8-bit wide, 66 MHz base clock at a 4x data transfer rate. Maximum system memory supports up to 8 GB for Dual -Channel.

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

1-3 Special Features

ATI Graphics Controller

The X5DPA-TGM/X5DPA-TGM+ has an integrated ATI video controller based on the Rage XL graphics chip. The Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

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 AMI BIOS Utility to change this setting.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER X5DPA-TGM/X5DPA-TGM+. All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, +3.3V, +5V, +12V, -12V and +3.3V 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/Software On/Off Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 3-pin CPU and chassis fans are controlled by the power management functions.

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, the Overheat buzzer and the LED will be automatically activated. 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 buzzer 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 1.4V to 3.5V. 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 both Windows 2000 and Windows NT 5.0.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

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. Depressing 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 depress and hold the power button for 4 seconds. This option can be set in the "BIOS features" under the "Advanced Menu."

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, updates 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.

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 X5DPA-TGM/X5DPA-TGM+ accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 350W of power and includes the additional +12V, 8-pin power connector - an even higher wattage power supply is recommended for high-load configurations. Also your power supply must supply 1.5A for LAN1 and LAN2.

(*NOTES:

Auxiliary 12V power (J15) is necessary to support Intel Xeon CPUs. Failure to provide this extra power will result in the CPUs becoming unstable after only a few minutes of operation. See Section 2-5 for details on connecting the power supply cables.

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.

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 generator, drive interface control logic and interrupt and DMA logic. 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), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system.

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.

The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Chapter 2 Installation

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 anti-static 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.

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.

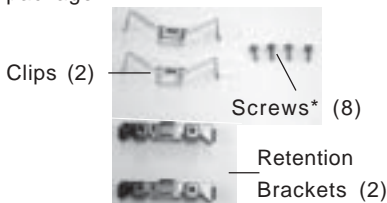
2-2 PGA Processor and Heatsink Installation



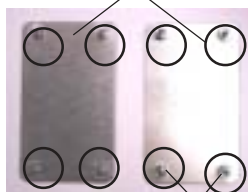
When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

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 heat sink.

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



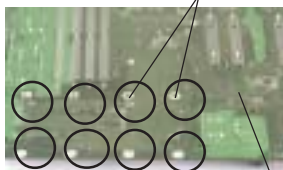
CPU Socket Retention Plates (2)



Retention Plate Standoffs

2. On the back side of the motherboard, locate the four CPU Retention Plate mounting holes. Also, locate the four standoffs on each of the Retention Plates (shown on the pictures on the right).

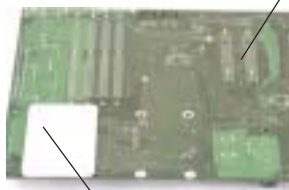
Retention Plate Mounting Holes



3. Make sure that the small sheet of Mylar is attached on the surface of the Retention Plate. Align the standoffs of the Retention Plate with the four mounting holes on the motherboard.

The Back Side of the Motherboard

4. Place the Retention Plate on the back side of the motherboard and lock it into the proper position by inserting the standoffs on the Retention Plate into the mounting holes on the motherboard (with the Mylar sheet in between).



5. On the front side of the motherboard, place a Retention Bracket on top of the CPU socket. Make sure to

Place the Retention Plate on the back of the motherboard with its standoffs inside the mounting holes.

line up the mounting holes on the bracket against the mounting holes on the motherboard. Secure the Retention Bracket (on the front) and the Retention Plate (on the back) by putting screws through the mounting holes. Repeat this step for the second Retention Bracket.

Retention Plate with screws



Mounting Holes

6. Repeat Steps 2-5 to install the additional CPU Retention Plate and the Retention Brackets.

7. Lift the lever on the CPU socket: *lift the lever completely or you will damage the CPU socket when power is applied. (Install CPU1 first.)*

CPU Socket

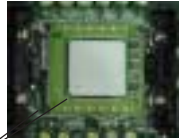


8. Install the CPU in the socket. Make sure that pin 1 of the CPU is seated on pin 1 of the socket (both corners are marked). When using only one CPU, install it into CPU socket #1 (CPU socket #2 is automatically disabled if only one CPU is used).

Socket lever



Pin 1



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

Heatsink

Fan



10. Apply the proper amount of thermal glue to the CPU die and place the heatsink and fan on top of the CPU.

11. Secure the heatsink by locking the retention clips into their proper position.

Retention clip



12. Connect the three wires of the CPU fan to the respective CPU fan connector.

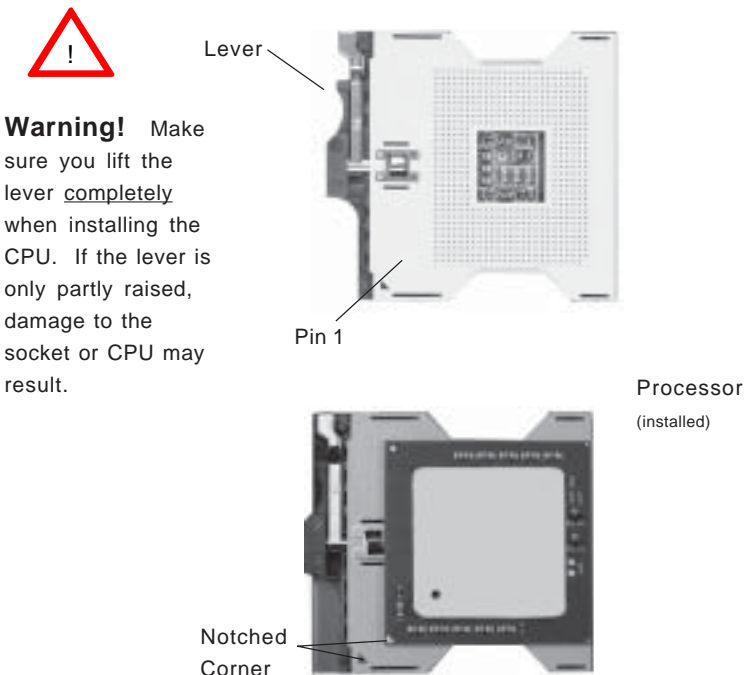
CPU fan

wires

CPU fan connector



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 the location 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.

2-3 Installing DIMMs

Note: Check the Supermicro web site for recommended memory modules:
http://www.supermicro.com/TECHSUPPORT/FAQs/Memory_vendors.htm

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figure 2-2)

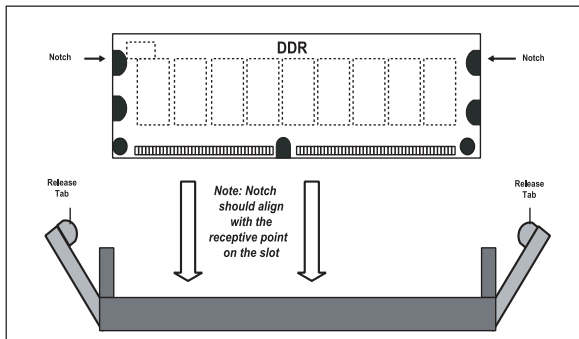
1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module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

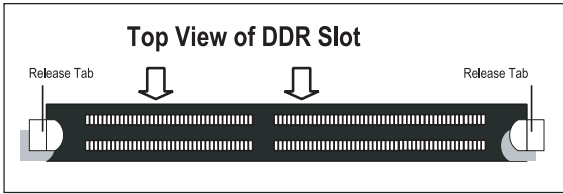
Memory Support

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

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.

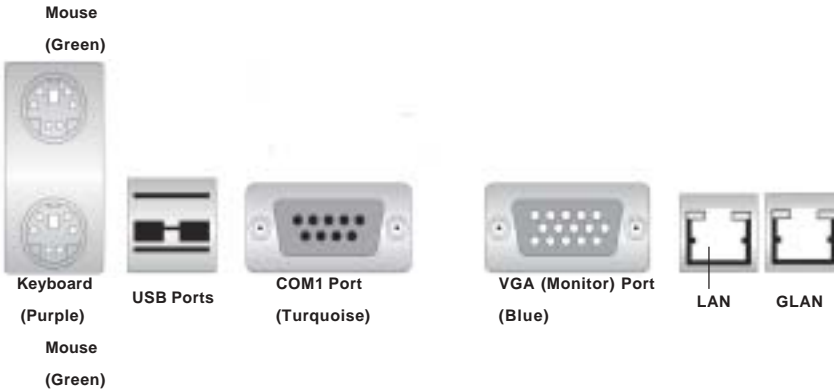


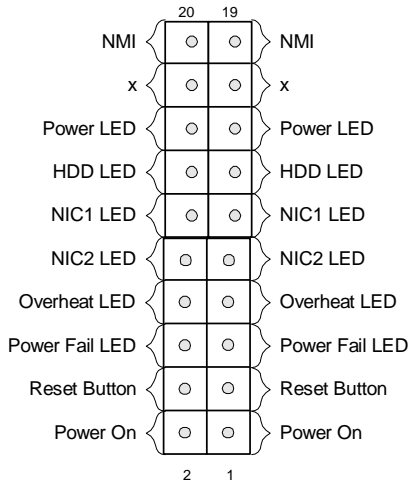
Figure 2-3. I/O Port Locations and Definitions

Notes: COM2 is a header located on the motherboard - see the motherboard layout pages in Chapter 1 for location.

Front Control Panel

JF2 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. JF2 Header Pins



2-5 Connecting Cables

ATX Power Connection

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

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

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

PWR_SEC Connection

In addition to the Primary ATX power connector (above), the Secondary 12v 8-pin J15 connector must also be connected to your power supply.

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

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

Power LED

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

**PWR_LED Pin Definitions
(JF2)**

Pin Number	Definition
15	Vcc
16	Control

NMI Button

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

**NMI Button Pin
Definitions (JF2)**

Pin Number	Definition
19	Control
20	Ground

HDD LED

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

**HDD LED Pin
Definitions
(JF2)**

Pin Number	Definition
13	Vcc
14	HD Active

NIC1/NIC2 LEDs

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF2. The NIC2 LED connection is located on pins 9 and 10 of JF2. Attach the NIC1/NIC2 LED cables to display network activity. Refer to the table on the right for pin definitions.

**NIC1 LED Pin
Definitions
(JF2)**

Pin Number	Definition
11	Vcc
12	Active

**NIC2 LED Pin
Definitions
(JF2)**

Pin Number	Definition
9	Vcc
10	Active

Overheat LED (OH)

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

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

Pin Number	Definition
7	Vcc
8	GND

Power Fail LED

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

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

Pin Number	Definition
5	Vcc
6	GND

Reset Button

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

**Reset Pin
Definitions
(JF2)**

Pin Number	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF2. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

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

Pin Number	Definition
1	PW_ON
2	Ground

Chassis Intrusion

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

Back Panel Universal Serial Bus (USB0/1)

Two Universal Serial Bus ports (J10, J11) are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

**Back Panel Universal Serial Bus Pin
Definitions (J10, J11)**

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

Front Panel USB 0/1 & USB 2

Three Front Panel USB Headers (JD2, J27) can be used for front side USB access. These USB headers are located next to the Floppy Disk Connector. You will need a USB cable (one included) to use either connection. Refer to the tables on the right for pin definitions.

Front Panel Universal Serial Bus Pin Definitions
USB0/1(JD2) USB2(J27)

Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	Key	5	N/A

Serial Ports

The COM1(J8) serial port is located next to the USB 0/1 ports. COM 2 is located at the corner near PCI-33 Slots. (See MB layouts in Chapter 1). See the table on the right for pin definitions. The COM2(J26) connector is a header on the motherboard (see pp. 1-6, 1-8 for location).

Serial Port Pin Definitions
(COM1, COM2)

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

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

Ethernet Ports-GLAN/LAN

An Ethernet port is located beside the VGA port on the IO backplane. An additional GLAN port is also located next to the LAN port on the X5DPA-TGM/TGM+. These ports accept RJ45 type cables.



Fan Headers

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

Fan Header Pin Definitions

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

Caution: These fan headers are DC power.

Power LED/Speaker

On the JD1 header, pins 1-3 are for a Power LED, pins 4-7 are for the speaker. See the table on the right for speaker pin definitions.

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

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

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located on J28 on the X5DPA-TGM/X5DPA-TGM+. See the table at right for pin definitions. (See Figure 2-3 for the locations of each.)

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

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

PCI SMBus Enable

The PCI SMBus header is located on J12. Close Pins 1-2, 3-4 to support PCI/SMBus (*default).

Wake-On-Ring

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

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

Pin Number	Definition
1	Ground
2	Wake-up

Keylock

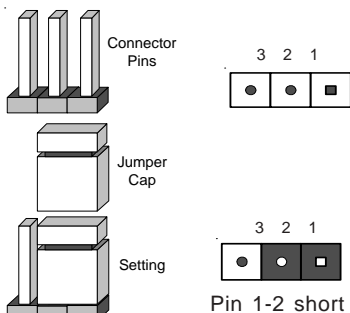
The keyboard lock connection is located on JP35. Utilizing this header allows you to inhibit any actions made on the keyboard, effectively "locking" it.

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 not literally a jumper but consists of two contact pads. To clear the contents of CMOS, short these pads together by touching them both with a metal conductor such as the head of a small screwdriver. For ATX power supplies, you must completely shut down the system and remove the AC power cord before clearing CMOS.

GLAN/LAN Enable/Disable

Change the setting of JP3 to enable or disable the onboard GLAN. Change the setting of JP6 to enable or disable the onboard LAN for the X5DPA-TGM/TGM+. See the table on the right for jumper settings. The default setting is enabled

**LAN
Enable/Disable
Jumper Settings
(JP3: LAN 1, JP6: LAN2)**

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

VGA Enable/Disable

JP4 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

**VGA Enable/Disable
Jumper Settings
(JP4)**

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

Front Side Bus Speed

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

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

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

Watch Dog Enable/Disable

JP41 allows you to enable or disable the functions of Watch Dog. See the table on the right for jumper settings. Close Pins 1-2 for reset(*default). Close Pins 2-3 to activate the function of NMI (Non Maskable Interrupt).

**Watch Dog Enable/
Disable Jumper Settings
(JP37)**

Jumper Position	Definition
1-2	Reset
2-3	NMI

2-7 Onboard Indicators

GLAN/LAN LEDs

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

**GLAN Right LED
Indicator**

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

2-8 Floppy/Hard Disk Drive, Parallel Port, and IPMI 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 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Parallel Port Connector

J7 is designated as the parallel (printer) port connector for the X5DPA-TGM/X5DPA-TGM+ motherboard. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions
(J7)

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

IPMI

J22 is designated as the IPMI Socket for the X5DPA-TGM/X5DPA-TGM+ Motherboard.

Floppy Connector

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

Floppy Connector Pin Definitions (JP7)

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

IDE Connectors

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

**IDE Connector Pin Definitions
(IDE#1, IDE#2)**

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

(*Note: For software installation, please refer to Appendix C.)

Chapter 3

Troubleshooting

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 (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)

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.

No Video

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

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure 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 registered ECC, DDR-266 or DDR-200 SDRAM. If using 533 MHz processors, you must use DDR-266 memory. (If a 400 MHz FSB CPU is used, DDR-266 will run at 200MHz.)
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 at a time, beginning with Bank 1, then Bank 2, and so on (see Section 2-3).
6. Check the power supply voltage 115V/230V switch.

Losing the System's Setup Configuration

1. Ensure 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/TECHSUPPORT/techsupport.htm>) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our web site at <http://www.supermicro.com/techsupport/download.htm>.

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 configurationAn example of a Technical Support form is on our web site at http://www.supermicro.com/techsupport/contact_support.htm.
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 or by fax at: (408) 503-8000, option 2.

3-3 Frequently Asked Questions

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

Answer: The X5DPA-TGM/X5DPA-TGM+ has four DIMM slots that support 184-pin, registered ECC DDR-266 or DDR-200 SDRAM DIMM modules. If using 533 MHz processors, you must use DDR-266 memory (DDR-200 is not supported at a 533 MHz front side bus speed. If a 400 MHz FSB CPU is used, DDR-266 will run at 200MHz.) It is strongly recommended that you do not mix memory modules of different speeds and sizes. Unbuffered SDRAM, non-ECC memory and PC100/133 SDRAM modules are not supported.

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 info 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.

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.

Question: Why can't I turn off the power using the momentary power on/off switch?

Answer: The instant power off function is controlled in BIOS by the Power Button Mode setting. When the On/Off feature is enabled, the motherboard will have instant off capabilities as long as the BIOS has control of the system. When the Standby or Suspend feature is enabled or when the BIOS is not in control such as during memory count (the first screen that appears when the system is turned on), the momentary on/off switch must be held for more than four seconds to shut down the system. This feature is required to implement the ACPI features on the motherboard.

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 alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4

AMIBIOS

4-1 Introduction

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

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, hit the <Delete> key while the system is booting-up.

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

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

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

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

4-2 Main Setup

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

BIOS SETUP UTILITY	
Main AdvancedBoot SecurityExit	
System Overview AMI BIOS Version : 08.00.10 Build Date: 08/06/04 System Time [21:16:41] System Date [Wed. 10/13/04] Floppy A [1.44MB 3 1/2"] Floppy B [Disabled] System Memory Size : 1024MB	Use [ENTER], [TAB] or [SHIFT-TAB] to select a field. Use [+] or [-] to configure system time. ↔ Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
VOZ-53 (C) Copyright 1985-2002, American Megatrends, Inc.	

System Time/System Date

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

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

Floppy A/Floppy B

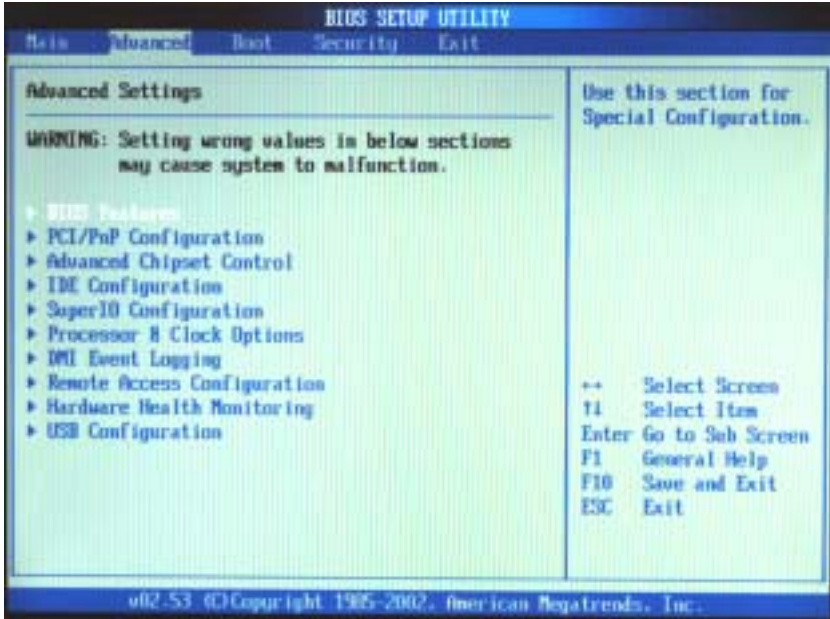
Move the cursor to these fields via up and down <arrow> keys. Select the floppy type. The options are "Disabled", "360 KB 5 1/4", "1.2 MB 5 1/4", "720 KB 3 1/2", "1.44 MB 3 1/2", and "2.88 MB 3 1/2". The default setting for Floppy A is "1.44 MB 3 1/2", and the default setting for Floppy B is "Disabled."

System Memory

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

4-3 Advanced BIOS Setup

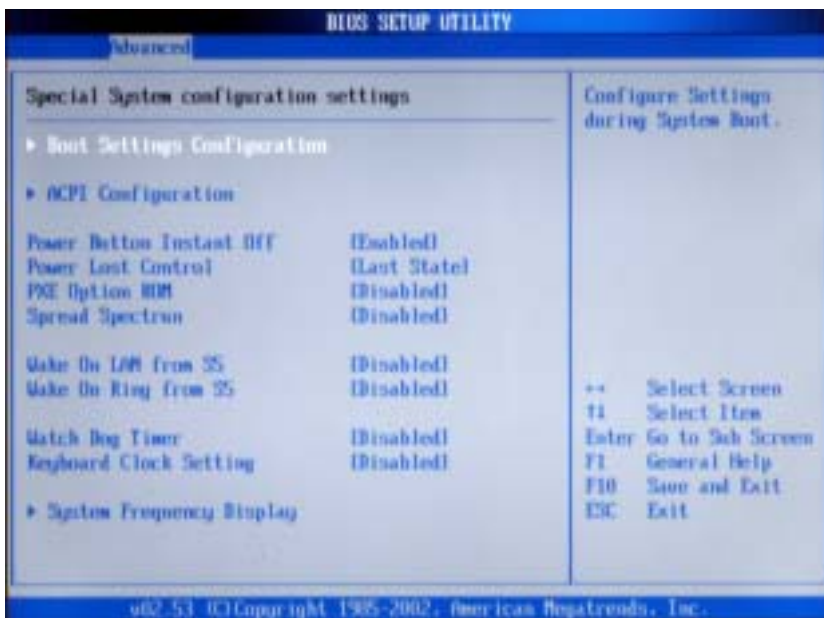
The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



► BIOS Features

► Boot Settings Configuration

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



Quick Boot

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

Quiet Boot

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

Add-On ROM Display Mode

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

Boot up Num-Lock

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

PS/2 Mouse Support

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

Wait for 'F1' If Error

Select Enable to activate the function of Wait for "F1" if Error. The options are "Enabled" and "Disabled".

Hit 'DEL' Message Display

Select "Enabled" to display Setup Message when the user hits the DEL key. The options are "Enabled" and "Disabled".

Interrupt 19 Capture

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

▶ APCI Configuration

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

ACPI Aware O/S

Select "Yes" if the operating system supports ACPI. Select "No" if the operating system does not support ACPI. The options are "No" and "Yes."

▶ Advanced APCI Configuration

ACPI 2.0 Features

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

ACPI APIC Support

Select "Enabled" to allow the ACPI APIC Table Pointer to be included in the RSDP pointer list. The options are "**Enabled**", and "Disabled".

APIC ACPI SCSI IRQ

Select "Enabled" to enable the function of APIC ACPI SCSI IRQ. The options are "Enabled" and "**Disabled**".

BIOS-AML ACPI Table

Select "Enabled" to allow the OEMB Table Pointer to be included in the R(x)SDT pointer lists. The options are "**Enabled**", and "Disabled".

Headless Mode

Select "Enabled" to activate the Headless Operation Mode through ACPI. The options are "Enabled", and "**Disabled**".

Power Button Instant Off

Select "Enabled" to activate the function of "Power Button Instant off". The options are "**Enabled**", and "Disabled".

Power Lost Control

Select "Stay Off" if you want the system to remain off when the power recovers from an outage. Select "Power On" if you want the system to be automatically turned on when the power recovers from an outage. Select "Last State" if you want to system to resume its last state when the power recovers from an outage. The options are "Stay Off", " Power On" and "**Last State**".

PXE Option ROM

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

Spread Spectrum

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

Wake On LAN from S5

Select "Enabled" to allow the BIOS to Wake Up LAN from S5. The options are "**Enabled**", and "Disabled".

Wake On Ring from S5

Select "Enabled" to activate the function of "Wake On Ring from S5". The options are "**Enabled**", and "Disabled".

Watch Dog Timer

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

Set Watch Dog Timer

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

Keyboard Clock Setting

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

► System Frequency Display

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

FSB/DDR Memory

This option allows the BIOS to display the status of FSB/DDR Memory.

► PCI/PnP Configuration

Plug & Play O/S

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

PCI Latency Timer

This option sets the latency of all PCI devices on the PCI bus. The default setting is "32." Select "32" to set the PCI latency to 32 PCI clock cycles. Select "64" to set the PCI latency to 64 PCI clock cycles. Select "96" to set the PCI latency to 96 PCI clock cycles. Select "128" to set the PCI latency to 128 PCI clock cycles. Select "160" to set the PCI latency to 160 PCI clock cycles. Select "192" to set the PCI latency to 192 PCI clock cycles. Select "224" to set the PCI latency to 224 PCI clock cycles. Select "248" to set the PCI latency to 248 PCI clock cycles.

Allocate IRQ to PCI VGA

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

Palette Snooping

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

PCI IDE BusMaster

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

OffBoard PCI/ISA IDE Card

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

IRQ

Set this value to allow the IRQ settings to be modified. The default setting is "**Available**". Select "Available" to allow the specified IRQ to be used by a PCI/PnP device. The options are "**Available**" and "Reserved" for the following IRQs. Select "Reserved" to allow the specified IRQ to be used by a legacy ISA device.

IRQ3

IRQ4

IRQ5

IRQ7

IRQ9

IRQ10

IRQ11

IRQ14

IRQ15

DMA

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

DMA Channel 0

DMA Channel 1

DMA Channel 3

DMA Channel 5

DMA Channel 6

DMA Channel 7

Reserved Memory Size

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

► Advanced Chipset Control

► Intel E7500/7501 NorthBridge Configuration

This feature allows the user to configure the settings for Intel E7500/E7501 NorthBridge chipset.

Chipset Memory Remap Feature

Select "Enabled" to allow remapping of overlapped PCI memory above the total physical memory. The options are "**Enabled**" and "Disabled."

Memory Hole

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

► Intel ICH5 SouthBridge Configuration

This feature allows the user to configure the settings for Intel ICH5 SouthBridge chipset.

MPS Revision

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

► IDE Configuration

This feature allows the user to configure IDE settings.

Onboard PCI IDE Operate Mode

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

S-ATAConfigure

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

Combined Mode Operation

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

S-ATA Keep Enabled

Select "Yes" to enable the function of S-ATA at all time. The options are "Yes" and "No."

P-ATA Keep Enabled

Select "Yes" to enable the function of P-ATA at all time. The options are "Yes" and "No."

P-ATA Channel Selection

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

S-ATA Ports Definition

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

Configure S-ATA as RAID

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

► Primary, Secondary, Third and Fourth IDE Master and Slave Settings

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

Type

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

LBA/Large Mode

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

Block (Multi-Sector Transfer)

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

PIO Mode

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

DMA Mode

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

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

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

32Bit Data Transfer

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

► Super IO Configuration

OnBoard Floppy Controller

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

Serial Port1 Address

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

Serial Port2 Address

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

Serial Port2 Mode

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

Parallel Port Address

This option specifies the I/O address used by the parallel port. Select "Disabled" to prevent the parallel port from accessing any system resources. When the value of this option is set to "Disabled", the printer port becomes unavailable. Select "**378**" to allow the parallel port to use 378 as its I/O port address. The majority of parallel ports on computer systems use IRQ7 and I/O Port 378H as the standard setting. Select "278" to allow the parallel port to use 278 as its I/O port address. Select "3BC" to allow the parallel port to use 3BC as its I/O port address. The default setting is "**Disabled**."

Parallel Port Mode

Specify the parallel port mode. The options are **Normal**, Bi-directional, EPP and ECP.

Parallel Port IRQ

Select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

► Processor & Clock Options

HyperThreading

Select "Enabled" to enable the function of HyperThreading for HT supported processor(s). The Options are "**Enabled**" or "Disabled."

Ratio CMOS Setting

This feature allows the user to set the ratio between CPU Core Clock and the FSB Frequency. Enter the desired setting by typing a number between 12 and 23 or use the +, - and arrow keys to select the desired setting.

Spread Spectrum

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

► DMI Event Logging

View Event Log

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

Mark All Events as Read

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

Clear Event Logs

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

Event Log Statistics

This setting allows you to view Event Log Statistics.

► Remote Access Configuration

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

Remote Access

This feature allows the user to disable the function of Remote Access. If "Disabled" is not selected, then you can select a Remote Access type. The options are "**Disabled**" or "Serial". If the option is set to Serial, the following items will display:

Serial Port Number

This option allows the user to select Serial Port Number for Console Redirection. The options are **Com1** and COM2.

Serial Port Mode

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

Flow Control

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

Terminal Type

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

Send Carriage Return

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

Redirection after BIOS POST

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

►Hardware Health Monitoring

H/W Health Function

Select "Enabled" to enable the function of Hardware Health Monitoring Device. The Options are "**Enabled**" and "Disabled".

Overheat Temperature Trips

The feature allows the user to set the CPU temperature threshold. The options are "72°C": **78°C** and "85°C".

Hardware Health Event Monitoring

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

► USB Configuration

This feature allows the user to configure USB settings.

USB Functions

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

Legacy USB Support

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

USB 2.0 Controller

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

USB 2.0 Controller Mode

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

Stop EHCI HC in OHCI Handover

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

► USB Mass Storage Device Configuration

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

USB Mass Storage Reset Delay

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

Emulation Type

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

4-4 Boot Settings

Boot Settings Configuration

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



▶ Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device.

The settings are "1st Floppy Drive", "CD ROM", "ATAPI CDROM", and "Disabled." The default settings are:

- 1st boot device – 1st Floppy Drive
- 2nd boot device – CD ROM
- 3rd boot device – ATAPI CDROM
- 4th boot device – IDE Drive

▶ Hard Disk Drives

This feature allows the user to specify the Boot sequence from available Hard Drives.

1st Drive

Specify the boot sequence for 1st Hard Drive. The Options are "**PM-ST3120023AS**" and "Disabled".

2nd Drive

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

3rd Drive

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

► Removable Drives

This feature allows the user to specify the Boot sequence from available Removable Drives.

1st Drive

Specify the boot sequence for 1st Removable Drive. The Options are "**1st Floppy Drive**" and "Disabled".

► ATAPI Drives

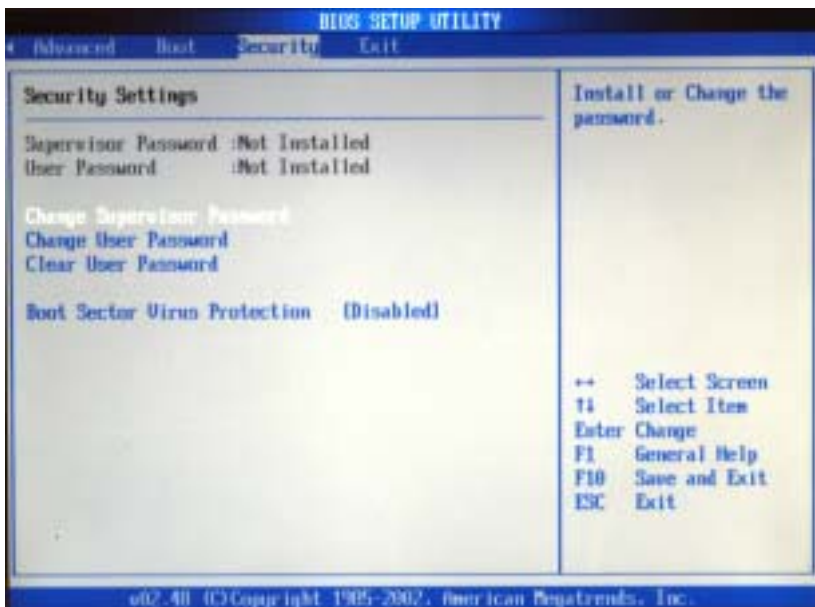
This feature allows the user to specify the boot sequence from available ATAPI CDROM Drives.

1st Drive

Specify the boot sequence for 1st Hard Drive. The Options are "**CD ROM**" and "Disabled".

4-5 Security Settings

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



Change Supervisor Password

Select this option and press <Enter> to access the sub menu, and then, type in the password.

Change User Password

Select this option and press <Enter> to access the sub menu, and then, type in the password.

Clear User Password

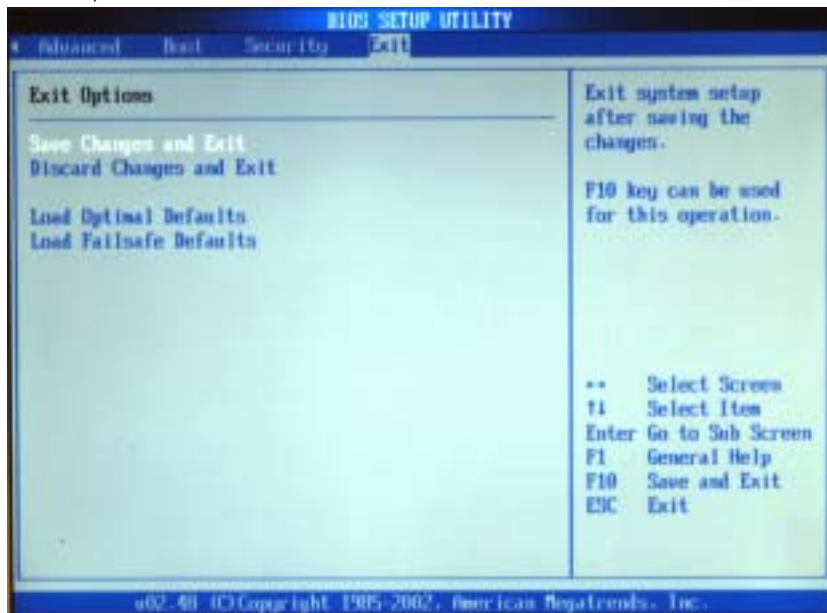
Select this option and press <Enter> to access the sub menu. You can use the sub menu to clear the user password.

Boot Sector Virus Protection

This option is near the bottom of the Security Setup screen. Select "Disabled" to deactivate the Boot Sector Virus Protection. Select "Enabled" to enable boot sector protection. When "Enabled", AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are "Enabled" and "Disabled".

4-6 Exit Options

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



Save Changes and Exit

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

Discard Changes and Exit

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

Load Optimal Defaults

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

Load Fail-Safe Defaults

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

Appendix A

BIOS Error Beep Codes

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

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

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

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

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

A-1 AMIBIOS Error Beep Codes

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

Notes

Appendix B

BIOS POST Checkpoint Codes

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

B-1 Uncompressed Initialization Codes

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

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

B-2 Bootblock Recovery Codes

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

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

B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution.

These codes are uncompressed in F0000h shadow RAM.

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

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

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

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

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

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

Notes

Appendix C

Installing Software Programs and Drivers for the X5DPA-TGM Motherboard

(Please refer to Appendix D for software installation for the X5DPA-TGM+.)

(*Notes: if you do not wish to configure onboard SATA RAID functions, please go directly to Section C-4 on Page C-18 for Operating System & Other Software Installation.)

After all the hardware has been installed, you must first configure Intel's ICH5R SATA RAID (*Note) before you install the Windows operating system, and other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

C-1 Installing Intel ICH5R SATA RAID Utility

To configure SATARAID functions, you must first install Intel ICH5R SATA RAID Utility program before you install the Windows XP operating system, and other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard. (*Note: the current version of ICH5R SATA RAID Utility can only support Windows XP Operating System.)

Serial ATA (SATA)

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

Introduction to Intel ICH5R SerialRAID

Located in the South Bridge of the 875 Chipset, the I/O Controller Hub (ICH5R) provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE controller (PATA) and two Serial ATA (SATA) Host Controllers, which support up to two Serial ATA ports and up to two RAID drives. The ICH5R supports the following Parallel ATA (PATA) and Serial (SATA) device configurations:

ATA Operation Modes

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

Legacy Mode:

In this mode, system BIOS assigns the traditional 14 and 15 IRQs for the use of HDD. Up to 4 ATA devices are support by this mode.

Within Legacy Mode, the following three modes are supported:

*Non-Combined Mode: Parallel ATA only with the maximum of 4 devices supported;

*Non-Combined Mode: Serial ATA only with the maximum of 2 devices supported;

*Combined Mode: SATA devices and PATA with the support of 2 devices each (total: 4 devices maximum). (For IDE/SATA configurations, please refer to the table below.)

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

Native Mode:

In this mode, system BIOS will automatically search all available IRQs for the use of HDD. For newer Operating Systems that support switching to Native Mode, such as Windows XP, Windows 2003, you can set SATA and PATA to Native Mode. These newer Operating Systems can accommodate both Legacy and Native modes and support up to 6 ATA devices. (*To select Legacy or Native Mode, please go to the "BIOS Setup" section in System BIOS).

Configuring BIOS settings for SATA RAID Functions (Native Mode)

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

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

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

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

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

5. Select the item- "Serial ATA Configurations". (*Make sure that it is in the " Native Mode."

6. Scroll down to the item- "Configure SATA as RAID" and press the <Enter> Key to select this option. Then, select "Yes" to confirm the selection.

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

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

Using Intel ICH5R SATA RAID Utility Program

1. Creating, Deleting and Reseting RAID Volumes:

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

```

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

RAID Volumes:
None defined.

Non-RAID Disks:

```

Port	Drive Model	Serial #	Size	Status	Bootable
0	ST3120023AS	3EACJ1EJ	111.7GB	Normal	Yes
1	ST3120023AS	3EACJHMC	111.7GB	Normal	Yes

```

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

```

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

```

Intel(R) RAID for Serial ATA - RAID Configuration Utility
Copyright(C) 2003 Intel Corporation. All Rights Reserved. v3.0.0.2307
-----[ MAIN MENU ]-----
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit

-----[ DISK/VOLUME INFORMATION ]-----
RAID Volumes:
None defined.

Non-RAID Disks:

```

Port	Drive Model	Serial #	Size	Status	Bootable
0	ST3120023AS	3EACJ1EJ	111.7GB	Normal	Yes
1	ST3120023AS	3EACJHMC	111.7GB	Normal	Yes

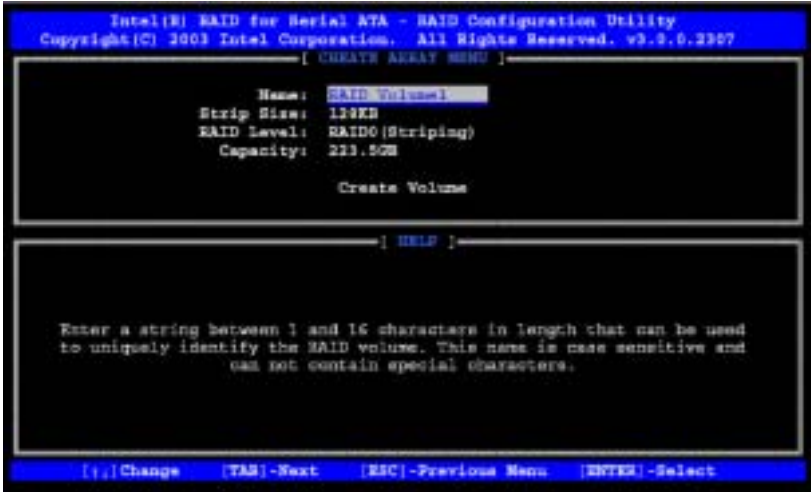
```

[.] - Select      [ESC] - Exit      [ENTER] - Select Menu

```

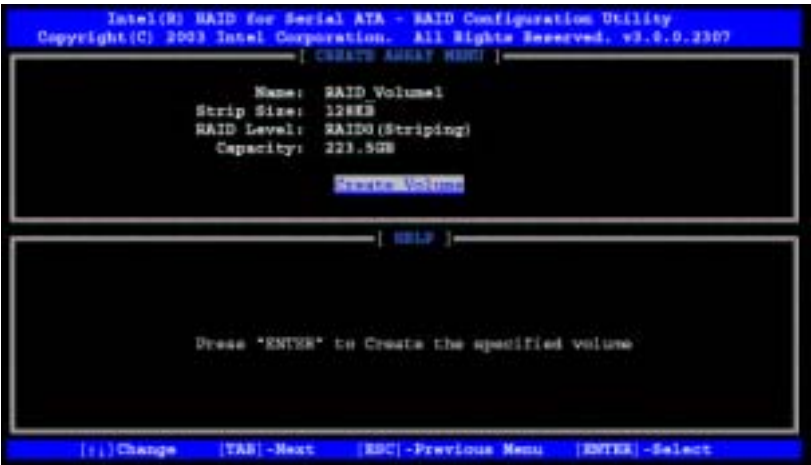
Creating RAID Volume:

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

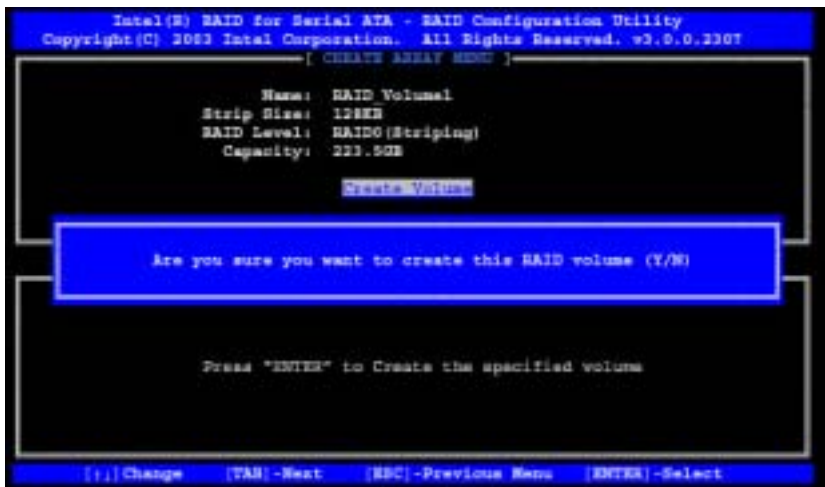


b. Specify a RAID Volume Name and press the <Tab> key or the <Enter> key to go to the next field. (*Note: You can use the <Esc> key to select the previous menu.)

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



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



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



f. Once the above screen appears, use the <Down Arrow> key to select item#4-"Exit" and press the <Enter> key. The following screen will appear:

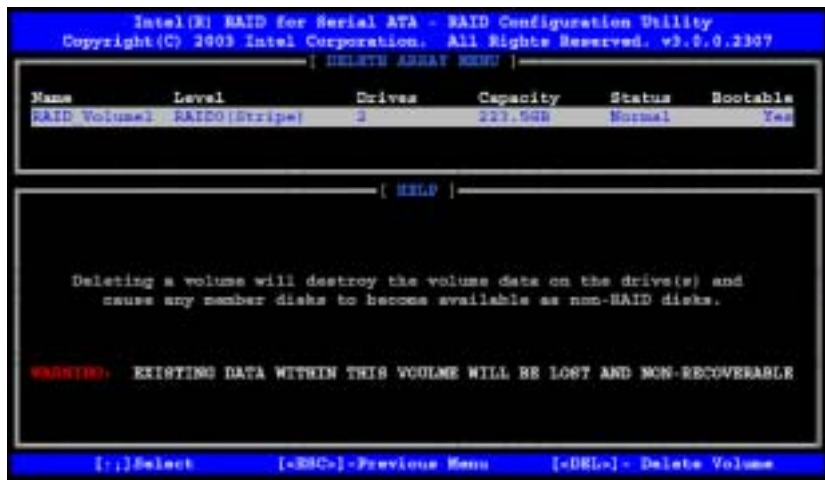


g. When asked "Are you sure you want to exit? (Y/N): ", type "Y" to confirm the selections and exit the "Create RAID Volume" menu. Press the <Enter> key to return to the main menu.

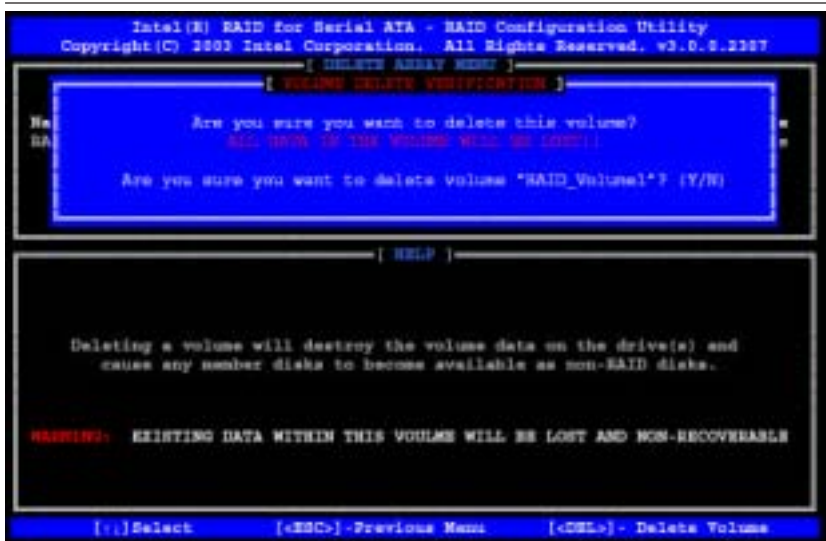
Deleting RAID Volume:

a. When you are in the main menu, use the <Down Arrow> and the <Upper Arrow> keys to select item#2-"Delete RAID Volume" in the main menu.

b. When the item# 2 is highlighted, press the <Enter> key to select the item: "Delete RAIDVolume". The following screen will appear:



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



d. When asked "Are you sure you want to delete this volume?", type "Y" to confirm the deletion of the RAID Volume, and press the <Enter> key to return to the main menu. (*Note: the <Esc> key is used to select the previous menu.)

Reset Disks to Non-RAID:

a. When you are in the main menu, use the <Down Arrow> and the <Upper Arrow> keys to select item#3-"Reset Disks to Non-RAID" in the main menu.

b. When the item# 3 is highlighted, press the <Enter> key to select the item- "Reset Disks to Non-RAID". The following screen will appear:



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

2. Exiting the ICH5R SATA RIAD Configuration Utility Program:

a. When you are in the main menu, use the <Down Arrow> and the <Upper Arrow> keys to select item#4-"Exit" in the main menu.

b. When the item# 4 "Exit" is highlighted, press the <Enter> key.

c. When asked "Are you sure you want to exit? (Y/N):" Type "Y" to confirm the selection, and press the <Enter> key to exit the ICH5R SATA RIAD Configuration Utility Program. The system will start to re-boot.

C-2 Installing the Windows XP for systems with RAID Functions

New Operating System-Windows XP Installation

a. Insert Microsoft Windows XP Setup CD in the CD Driver, and the system will start booting up from CD.

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

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

d. Insert the driver diskette-"Intel AA RAID XP Driver for ICH5R into Drive A: and press the <Enter> key.

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

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

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

(*Note: the current version of the ICH5R SATA RAID Utility can only support Windows XP Operating System.)

- h. After Windows XP Installation is completed, the system will automatically reboot.
- i. Insert Supermicro CD that came with the package into the CD Drive during system reboot, and the following screen will appear:

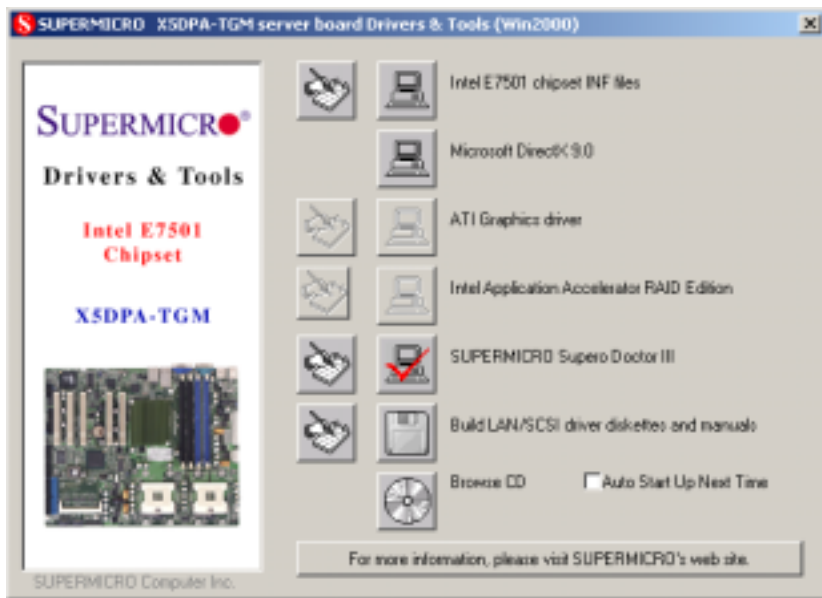


Figure 2-6. Driver/Tool Installation Display Screen

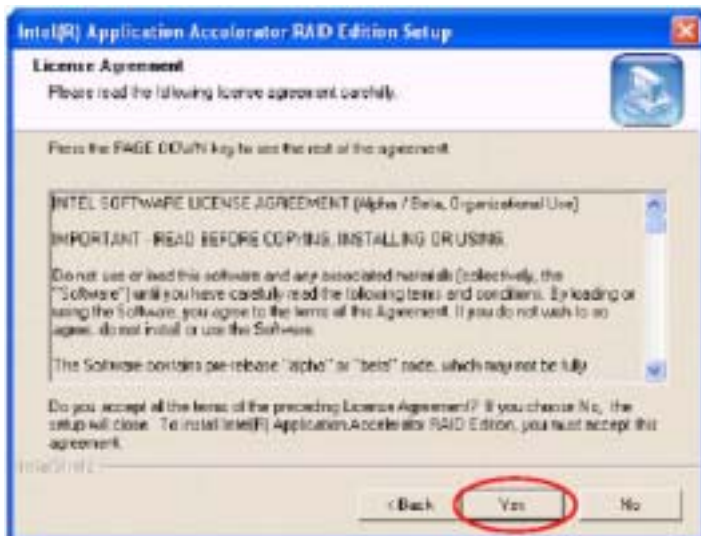
(*Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item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

Installing Intel Application Accelerator Utility

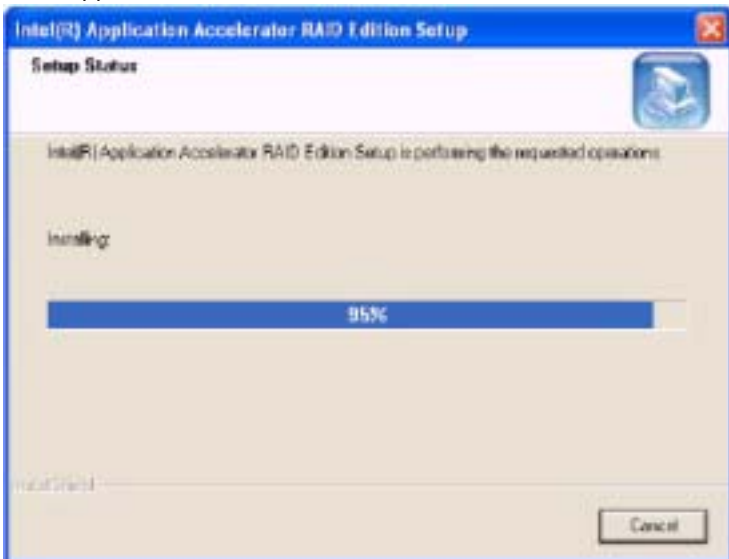
- a. When the above screen appears, click on the icon marked "Application Accelerator RAID Edition" on the screen, and the following screen will appear:



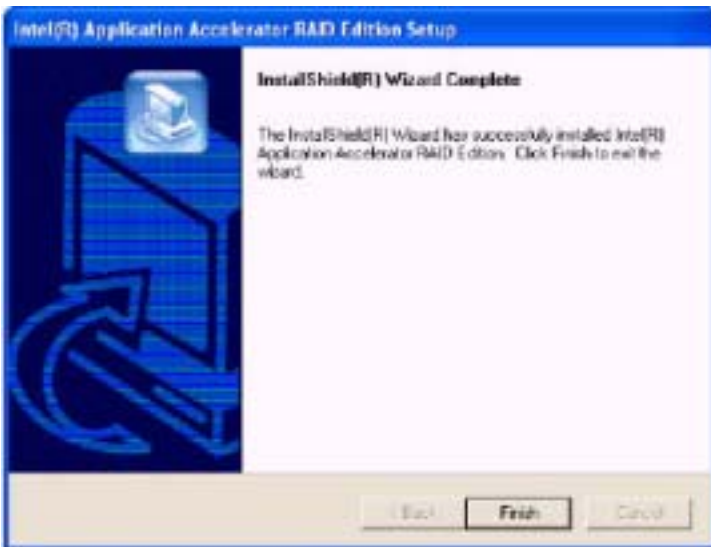
- b. When the above screen appears, click on the icon marked "Next" on the screen, and the following screen will appear:



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



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



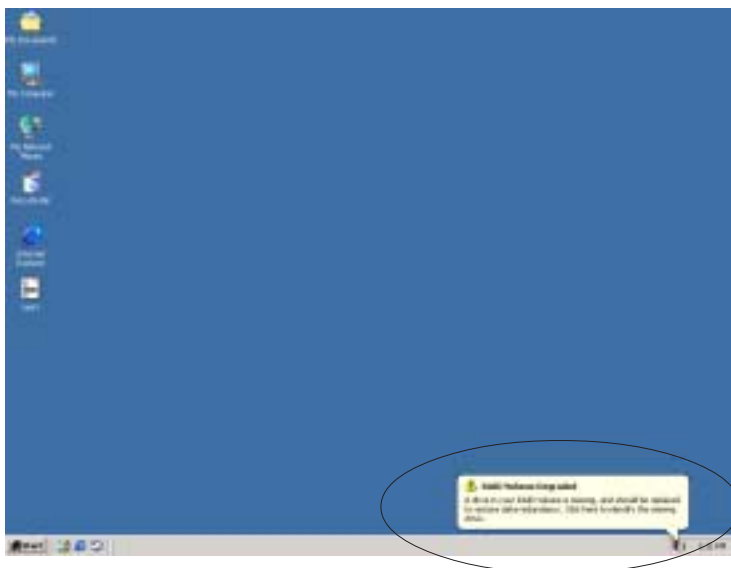
(*Note: Once the XP Operating System is installed, please read the "Readme text files" for the instructions to use the SATA RAID Utility in the Windows XP OS environment.)

C-3 Rebuilding SATA RAID1

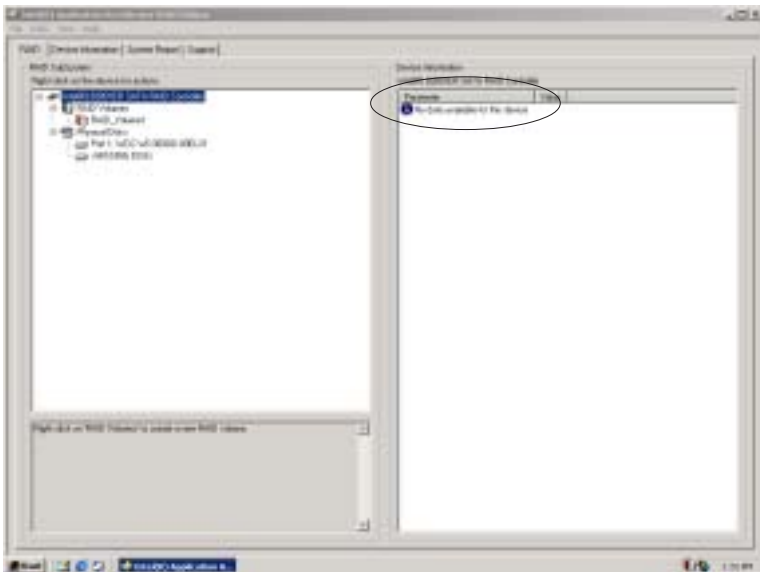
Procedures to Rebuild RAID1

(*If necessary, please download documentation from Intel's website at: [Intel® Application Accelerator RAID Edition. Intel will release the SATA RAID Driver on July 18, 2003.](#))

1. Once a hard drive disk has failed, a pop- up message will appear to alert you that the RAID Volume has been degraded and the following screen will appear:

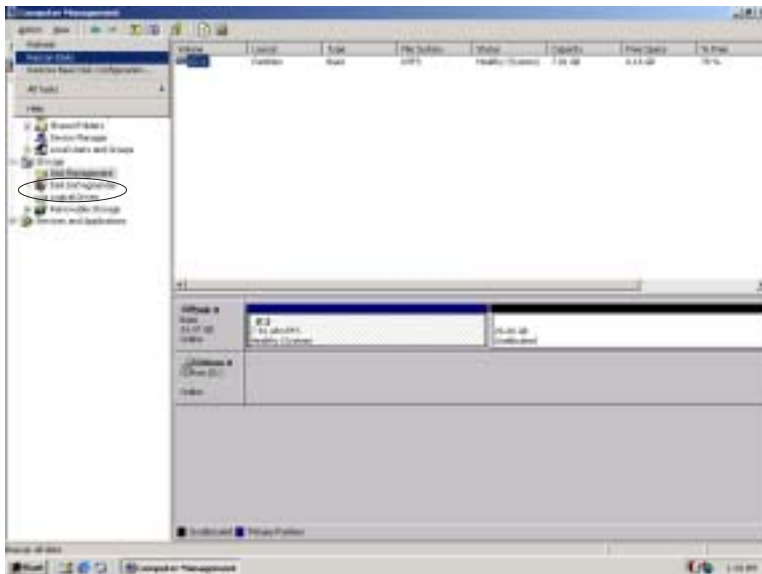


2. Then, you can double click the Intel AARE (SATA RAID Controller) menu, and it will show you what is missing or not working as the screen shown below:



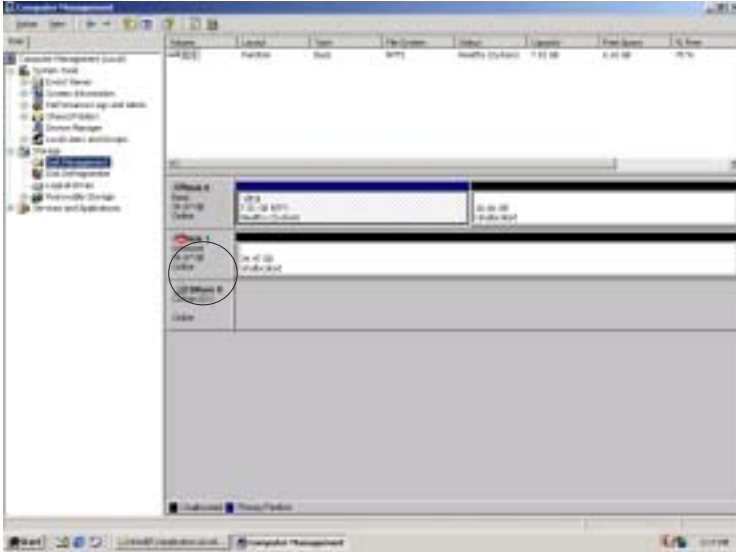
3. Unplug the bad HDD and replace it with a new one.

4. After you have replaced the bad HDD with a good one, go to "Disk Management" of your system. The following screen will appear:

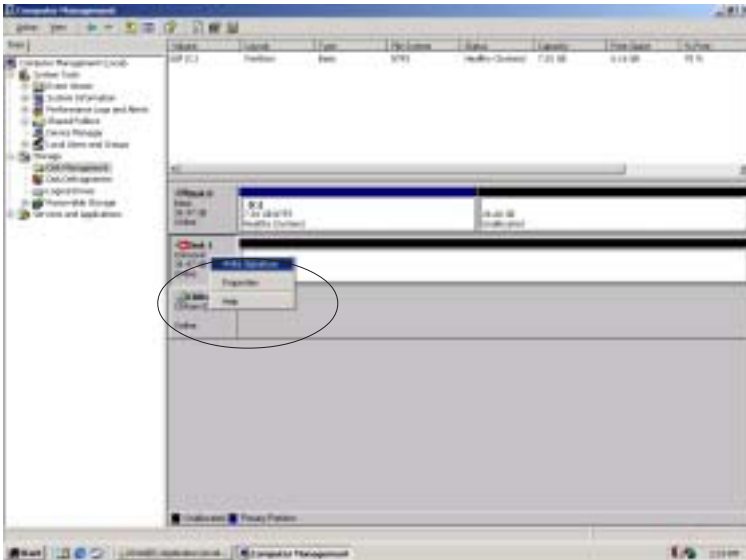


5) Then click "Action" to scan disks.

- 6) Once the disk manager detects the new disk that you've installed. It will show an "Unknown" disk as indicated in the following screen:



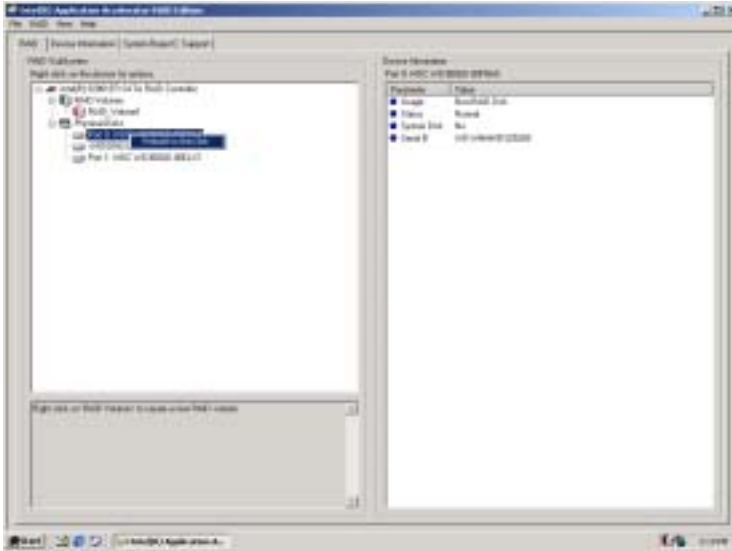
7. Once the above screen appears, right click on the new disk and It will bring up a manual for the new disk. Select the item-"Write Signature" to the new disk and the following screen will appear:



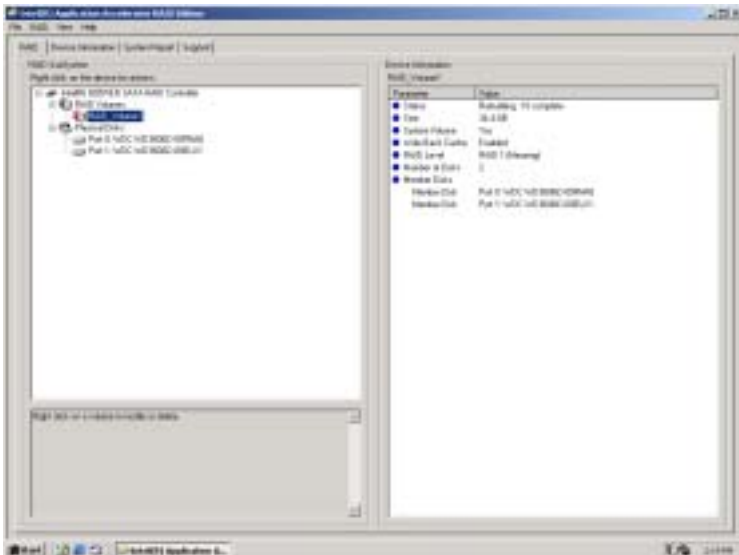
8. After you finished writing the signature to the new disk, Open the Intel AARE application again. (***Note: Do not reboot the system as prompted to avoid losing data!!**)

9. This time it should detect that you have a new disk available.

10. Right click on the new disk and select “Rebuild to disk” and the following screen will appear:

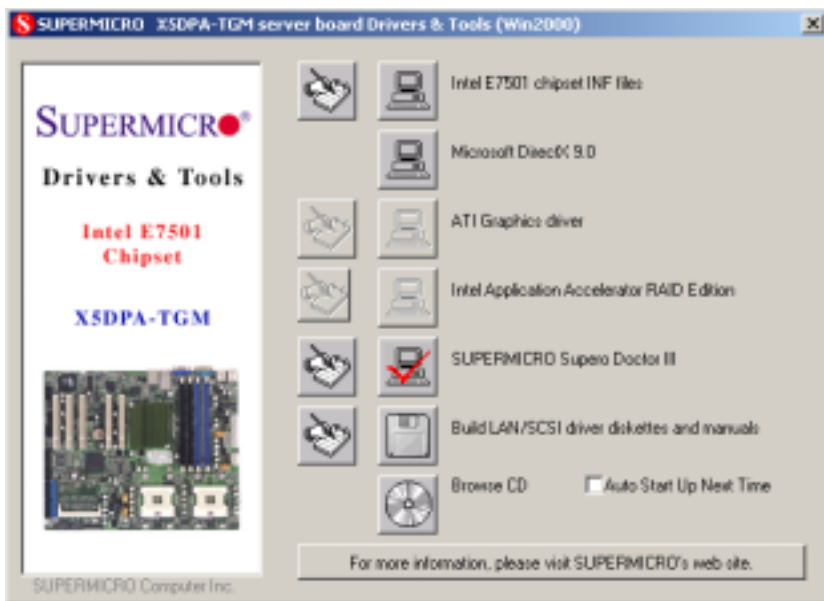


11. Once you've made your selection, you can go up to the setting of “RAID Volume” to see the process of rebuilding RAID1 in progress. The following screen will appear:



C-4 Installing the Operating System and other Software Programs

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



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.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.)

Supero Doctor III

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

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



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



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

Appendix D

Installing Software Drivers and Windows Operating System for the X5DPA-TGM+ motherboard

(Please refer to Appendix C for the software installation for the X5DPA-TGM motherboard.)

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID Driver before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard. (**The following section provides information on Adaptec's SATA RAID Driver based on the Intel ICH 5R Controller.*)

D-1 Introduction to the Adaptec Embedded Serial ATA RAID Controller Driver

Serial ATA (SATA)

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

Introduction to the Intel ICH5R I/O Controller Hub

Located in the South Bridge of the Intel E7525 (Tumwater) Chipset, the ICH5R I/O Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE controller (PATA) and two Serial ATA (SATA) Host Controllers, which support up to two Serial ATA ports and up to two RAID drives. The ICH5R I/O Controller Hub supports the following Parallel ATA (PATA) and Serial (SATA) device configurations:

ATA Operate Mode

You can select from the following two modes: Combined Mode and Enhanced Mode.

Combined Mode:

In this mode, system BIOS assigns the traditional IRQ 14 and IRQ 15 for the use of HDD. Up to 4 ATA devices are supported by this mode.

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

*Non-Combined Mode: Parallel ATA only:with the maximum of 4 devices supported;

*Non-Combined Mode: Serial ATA only:with the maximum of 2 devices supported;

*Combined Mode: SATA devices and PATA: with the support of 2 devices each (total: 4 devices maximum). (For IDE/SATA configurations, please refer to the table below.)

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

Enhanced Mode:

In this mode, system BIOS will automatically search for all available IRQs for the use of HDD. For newer Operating Systems that support the Enhanced Mode, such as Windows XP, Windows 2000, and Windows 2003, you can set SATA and PATA to the Enhanced Mode. (*The newer Operating Systems can accommodate both Enhanced Mode and Combined Mode and support up to 6 ATA devices.)

(*Please refer to the "Advanced Chipset Control" under the "Advanced" Setup in the BIOS for the selection of Combined Mode or Enhanced Mode.)

Configuring BIOS settings for the SATA RAID Functions (Enhanced Mode)

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

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

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

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

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

5. Scroll up to the item-"SATA Mode" and select the "Configure SATA as RAID" and press the <Enter> Key to select this option.

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

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

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

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

The Adaptec Embedded Serial ATA with HostRAID Controller Driver

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

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

Using the Adaptec RAID Configuration Utility (ARC)

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

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

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

To run the Adaptec RAID Configuration Utility, you will need to enable the RAID function in the system BIOS (refer to Chapter 4 for System BIOS Configurations), and then, press the <Ctrl> and <A> keys simultaneously when prompted to do so during the system startup. (Refer to the previous page for detailed instructions.)

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

A. Using the Array Configuration Utility (ACU)

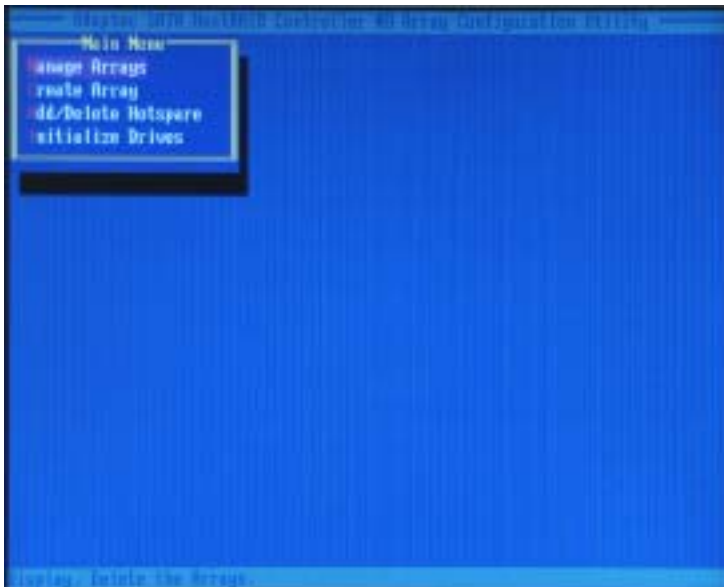
The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives, and initialize drives. During the system startup, press <Ctrl> and <A> key simultaneously, and the main menu will appear.



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 ARC menu, select **Array Configuration Utility (ACU)**.
3. From the ACU menu, select **Manage Arrays** (as shown on the previous screen.)
4. From the List of Arrays dialog box, select the array you want to view and press **Enter**.

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

5. Press **Esc** to return to the previous menu.

Deleting Arrays

**Warning: 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 ARC utility.
2. From the ARC main menu, select **Array Configuration Utility (ACU)**.
3. From the ACU menu, select **Manage Arrays**.
4. Select the array you wish to delete and press **Delete**.
5. In the Array Properties dialog box, select **Delete** and press **Enter**. The following prompt is displayed:

**Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):*

RAID 1 only—the following prompt is also displayed:

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

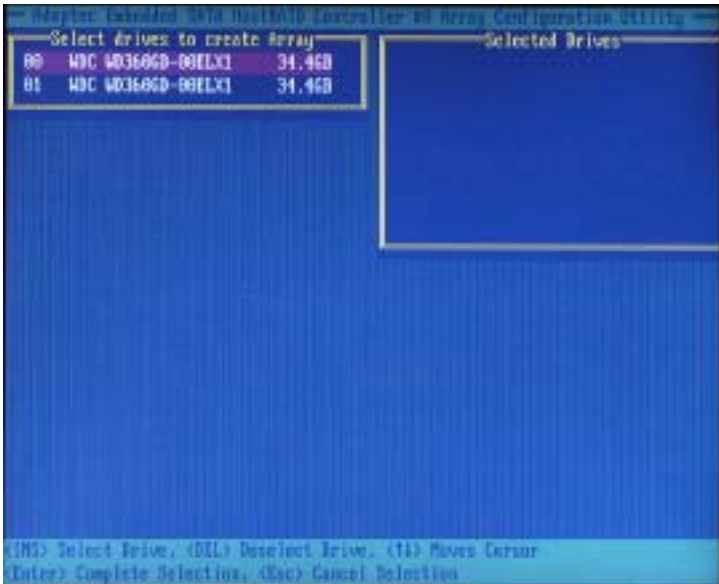
6. Press **Yes** to delete the array or partition or **No** to return to the previous menu.
7. Press **Esc** to return to the previous menu.

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 un-initialized are shown in gray and cannot be used. See [Initializing Disk Drives](#).

To create an array:

- 1 Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.
 - 2 From the ARC menu, select **Array Configuration Utility Main Menu (ACU)** (as shown on the first screen on page C-5).
 - 3 From the ACU menu, select **Create Array**.
 - 4 Select the disks for the new array and press Insert (as the screen shown below).
- (*Note: To deselect any disk, highlight the disk and press **Delete**.)



- 5 Press **Enter** when both disks for the new array are selected. The Array Properties menu displays (as the screen shown on the next page).



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 ACU. You will need to use the Adaptec Storage Manager - Browser Edition. (Refer to Adaptec's User's Guide in the enclosed CD.)

To assign properties to the new array:

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

Note that only the available array types: RAID 0, and RAID1, are displayed on the screen. (*RAID 0 or RAID 1 requires two drives.)



2. Under the item "**Arrays Label**", type in an 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 KB-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.

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

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

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



Notes:

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.
2. If you stop the Build or Clear process on a RAID 1 from ACU, you can restart it by pressing Ctrl+R.
3. A RAID 1 created using the Quick Init option may return some data mismatches if you later run a consistency check. This is normal and is not a cause for concern.
4. The ACU allows you to use drives of different sizes in a RAID . However, during a build operation, only the smaller drive can be selected as the source or first drive.
5. When migrating from 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 **Manage Arrays**.
2. From the List of Arrays, select the array you want to make bootable, and press **Ctrl+B**.
3. Enter Y to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" Then, a bootable array will be created. An asterisk will appear next to the bootable array (as shown in the picture below:)



Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select **Manage Arrays**.
2. From the List of Arrays, select the bootable array (*) you want to delete, and press **Ctrl+B**. (* a bootable array is the array marked with an asterisk (as shown in the picture above.)
3. Enter Y to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" Then, the bootable array will be deleted and the asterisk will disappear.

(*Note: do not use the delete key to delete the bootable array.)

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 (ACU).
3. From the ACU menu, select Add/Delete Hotspares.
4. Use the up and down arrow keys to highlight and select the disk you want to designate as a hotspare, and press <Insert>, and then, 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.

Initializing Disk Drives

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

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

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

To initialize drives:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.
2. From the ARC menu, select **Array Configuration Utility (ACU)** (as shown in the screen below).



3. Select **Initialize Drives** (as shown in the screen below).



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



5. Repeat [Step 4](#) so that both drives to be initialized are selected (as shown in the screen below).



6. Press **Enter**.
7. Read the warning message as shown in the screen.



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

Rebuilding Arrays

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

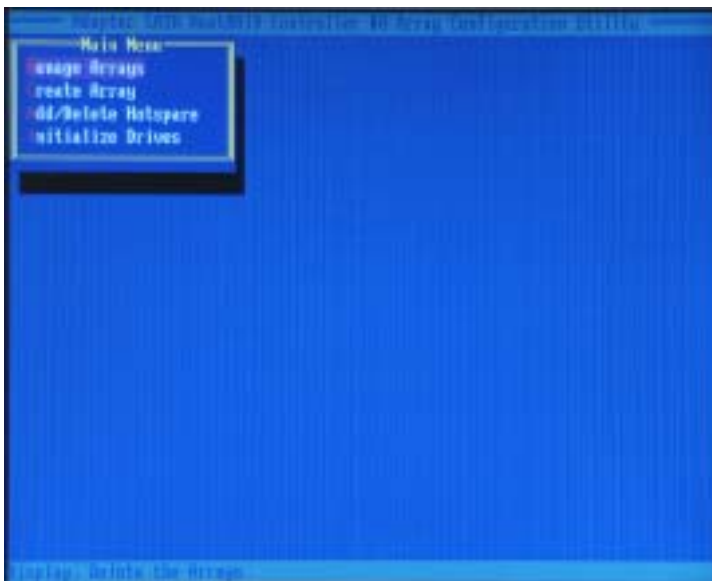
If an array Build process (or initialization) is interrupted or critical with one member missing, you must perform a Rebuild to optimized its functionality. For a critical array Rebuild operation, the optimal drive is the source drive.

***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 Disk Utilities

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

To access the disk utilities:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility (as shown in the screen below.)



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



3 Select the desired disk and press **Enter** (as shown in the screen below.)



You can choose from the following options:

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

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

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.)**

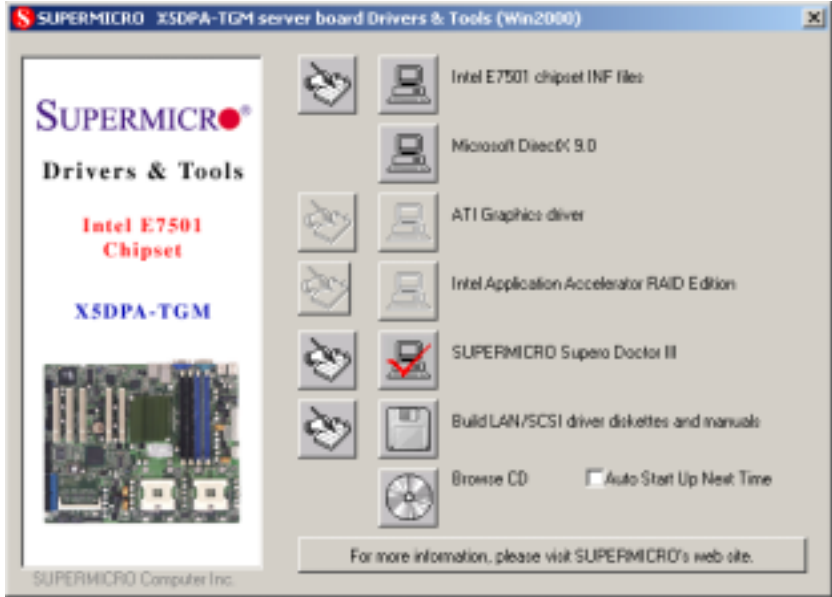
D-2 Installing Intel's ICH5R Driver by Adaptec and the OS

- 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. Choose from the list the item: "Intel ICH5R Driver by 3rd Party (Adaptec)" 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.

D-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.** You should install everything here except for the SUPER Doctor utility, Intel LDCM and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.)

(*Please refer to 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.

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



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



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

Notes