

SUPER[®]

SUPER[®] X7DCA-L

USER'S MANUAL

Revision 1.0a

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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** X7DCA-L motherboard. The **SUPER** X7DCA-L supports dual Intel Xeon Quad-Core/Dual-Core 5400/5300/5200/5100 Series processors (w/771 LGA) with a front side bus speed of up to 1.333 GHz or 1.066 GHz. With dual 64-bit Xeon Quad-Core/Dual-Core 5400/5300/5200/5100 Series processors built-in, the X7DCA-L offers substantial functionality enhancements to the motherboards based on the Intel Core microarchitecture while remaining compatible with the IA-32 software. The features supported include Intel Virtualization Technology and Enhanced Intel SpeedStep technology. These features allow the motherboard to operate at much higher speeds with better power management in much safer thermal environments than the traditional motherboards. The X7DCA-L is ideal for intense computing environments, complex business applications and high-end workstations. Please refer to the motherboard specifications pages on our web site (<http://www.supermicro.com/products/motherboard/>) for updates. This product is intended to be professionally installed.

Manual Organization

Chapter 1 describes the features, specifications and performance of the mainboard and provides detailed information about the chipset.

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

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

Appendix A and **Appendix B** provide BIOS POST Messages and POST Codes. **Appendix C** and Appendix D list Windows OS and Other Software Installation Instructions.

Conventions Used in the Manual

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



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



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



Note: Additional Information given to differentiate various models or to ensure correct system setup.

Notes

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Chapter 1

Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

All the following items are included in the retail box only:

- One (1) Supermicro Mainboard
- One (1) floppy ribbon cable (CBL-0022L)
- Six (6) SATA cables (CBL-0044L)
- One (1) I/O add-on card backplate (MCP-260-74301-ON)
- One (1) CPU retention backplate (SKT-0159L)
- One (1) Supermicro CD containing drivers and utilities
- One (1) User's/BIOS Manual

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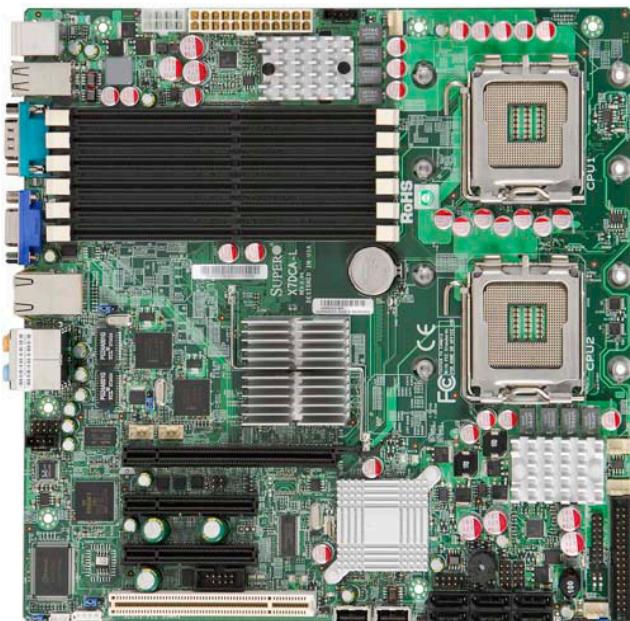
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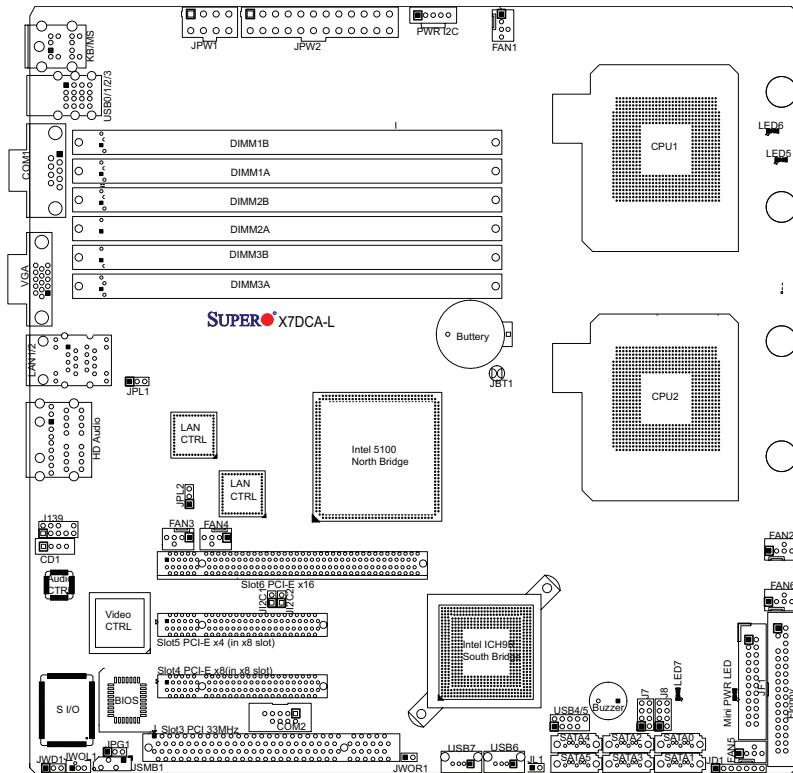
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139

SUPER[®] X7DCA-L Image

Note: The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.

SUPER[®] X7DCA-L Motherboard Layout

(not drawn to scale)

**Notes:**

1. Jumpers not indicated are for test purposes only.
2. See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections.
3. "■" indicates the location of Pin 1.
4. For RAID configuration and OS installation instructions, please refer to the user guides posted on our web site at www.supermicro.com.

X7DCA-L Quick Reference

	Description	Default Setting
Jumper		
JB1	CMOS Clear	(See Section 5-10)
JI ² C1/JI ² C2	I ² C to PCI/PCI-X/E Slots	Open (Disabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1/JPL2	LAN1/2 Enable/Disable	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)
Connector	Description	
Audio/J139/CD1	HD Audio, Microphone, Line-In/Line-Out/CD-In	
COM1/COM2	COM1/COM2 Serial Port/Header	
FAN 1-6	Chassis/CPU Fan Headers	
Floppy	Floppy Drive Connector (JFDD1)	
I-SATA0 ~ I-SATA5	SATA Ports	
JD1	Onboard Speaker/Power LED	
JF1	Front Panel Control Connector	
JL1	Chassis Intrusion Header	
JPW1	8-pin Power Connector	
JPW2	24-pin Power Connector	
JSMB1	Power System Management (I ² C)	
JWOL1	Wake-On-LAN Header	
JWOR1	Wake-On-Ring Header	
KB/MS	PS2 Keyboard/Mouse Connectors	
LAN1/2	Gigabit Ethernet (RJ45) Ports	
PWR I ² C	Power Supply SMBus I ² C Header (JP I ² C1)	
J7, J8	Serial General Purpose Input/Output Headers	
USB0~3,USB4~5,6,7	Universal Serial Bus (USB) Ports, Headers	
VGA	VGA Connector	
LED Indicator	Description	
Mini Power LED	Mini Power LED	
LED5	CPU1 VRM Overheat LED	
LED6	CPU2 VRM Overheat LED	
LED7	Onboard Standby Power LED	

Motherboard Features

CPU

- Dual Intel® 64-bit Xeon LGA 771 Quad-Core/Dual-Core 5400/5300/5200/5100 Series processors at a front side bus speed of 1333 MHz/1066 MHz

Memory

- Six 240-pin DIMM sockets with support up to 48 GB ECC Buffered (Registered) DDR2 667/533 Memory (*See Section 2-3 in Chapter 2 for DIMM Slot Population.)

Chipset

- Intel 5100 chipset, including: the 5100 Memory Control Hub (MCH) and the ICH9R South Bridge

Expansion Slots

- One PCI-Exp. x16
- One PCI-Exp. x8 (in x8 slot)
- One PCI-Exp. x4 (in x8) slot
- One 32-bit PCI 33 MHz slot

BIOS

- 16 Mb Phoenix® Flash ROM
- DMI 2.3, PCI 2.2, ACPI 1.0/2.0, Plug and Play (PnP), USB Keyboard support, Hardware BIOS Virus Protection, and Real Time Clock Wake-up

PC Health Monitoring

- Onboard voltage monitors for CPU core voltage, Memory voltage, Chipset, +3.3V, +5V, +12V, -12V, +3.3V standby, +5V standby and VBAT)
- Fan status monitor with firmware control
- CPU/chassis temperature monitors
- Low noise fan speed control
- CPU fan auto-off in sleep mode
- Pulse Width Modulation (PWM) fan control
- I²C temperature sensing logic
- Thermal Monitor 2 (TM2) support
- CPU slow-down on temperature overheat
- CPU thermal trip support for processor protection
- Power-up mode control for recovery from AC power loss
- Chassis intrusion detection
- System resource alert via Supero Doctor III

ACPI Features

- Slow blinking LED for suspend state indicator
- Main switch override mechanism
- ACPI Power Management
- Power-on mode for power recovery

Onboard I/O

- Six SATA ports (supporting RAID0, 1,10 and 5 in the Windows OS environment)
(*Note below)
- Dual Intel 82573L LAN chips support two Giga-bit LAN ports
- One floppy port interface
- Two COM ports(1 header, 1 port)
- Up to eight USB 2.0 (Universal Serial Bus) (four ports, four headers)
- 7.1 High-Definition (HD) Audio
- Super I/O: Winbond W83627DHG

Other

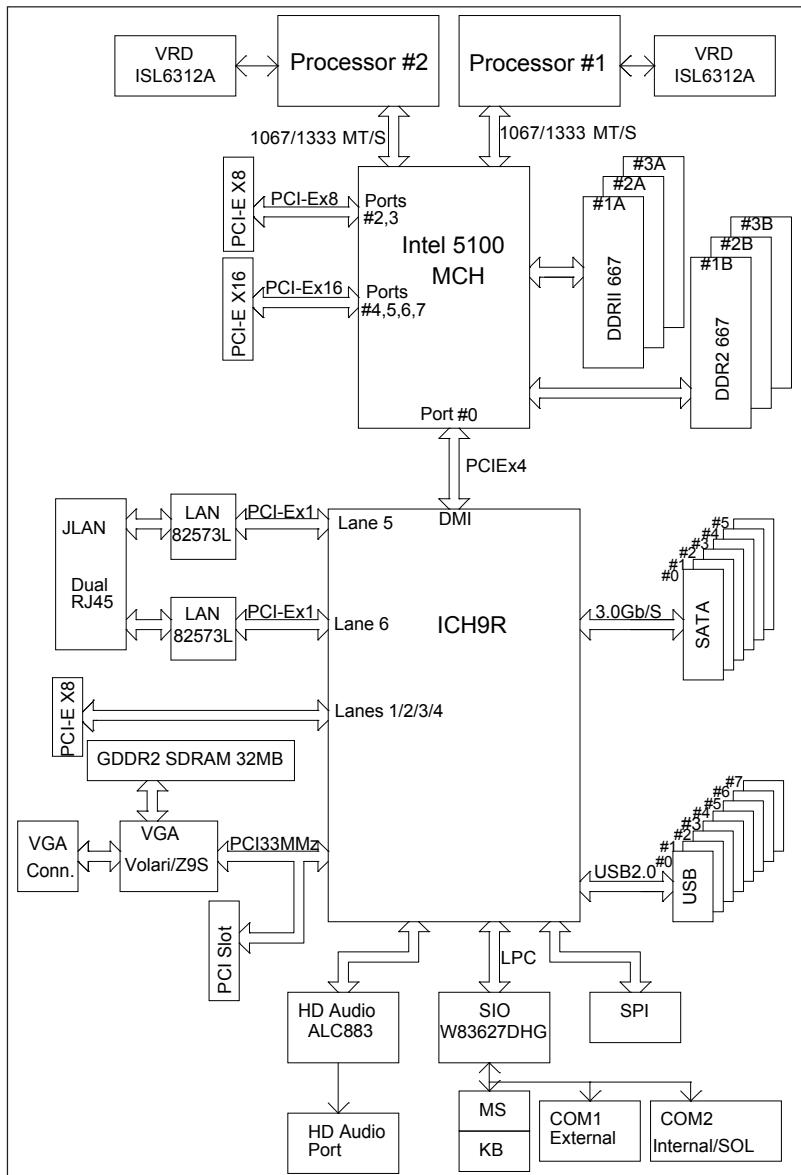
- External modem ring-on
- Wake-on-LAN (WOL1)
- Wake-on-Ring (WOR1)
- Console redirection
- Onboard Fan Speed Control by Thermal Management via BIOS
- **CD/Diskette Utilities**
- BIOS flash upgrade utility and device drivers

Dimensions

- Micro ATX 10.00" (L) x 10.00" (W) (254.00 mm x 254.00 mm)



Note: For RAID configuration and Linux OS installation instructions, please refer to the user guides posted on our web site at www.supermicro.com/support/manuals.



System 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 and Processor Features Overview

Built upon the functionality and the capability of the Intel 5100 chipset, the X7DCA-L motherboard provides the performance and feature set required for dual processor-based high-end computer systems with configuration options optimized for intensive computing, high energy-efficiency and complex business applications. The 5100 chipset supports single or dual Intel Xeon 64-bit Quad-Core/Dual-Core 5400/5300/5200/5100 Series processors with front side bus speeds of up to 1.333 GHz. The chipset consists of the 5100 Memory Controller Hub (MCH), Intel I/O Controller Hub (ICH9R) and the I/O subsystem.

The 5100 Memory Controller Hub (MCH)

The Intel 5100 MCH chip is designed for symmetric multiprocessing across two independent front side bus interfaces. Each front side bus uses a 64-bit wide, 1066/1333 MTS data bus capable of transferring data at 8.5/10.6 GB/s for a total bandwidth of 17/21.3 GB/s. The MCH supports a 36-bit wide address bus and up to six DDR2 667 MHz/533 MHz DIMM modules, providing a total memory capacity of up to 48 GB.

The 5100 MCH also provides six x4 PCI-Express interfaces and one x4 DMI Interface to the ICH9R. Each PCI Express port on the MCH provides 4 GB/s bi-directional bandwidth if configured as a x8 port, or 2 GB/s bi-directional bandwidth if configured as a x4 port.

The Ninth Generation I/O Controller Hub (ICH9)

The I/O Controller ICH9R provides the data buffering and interface arbitration required for the system to operate efficiently. It also provides the bandwidth needed for the system to maintain its peak performance. The Direct Media Interface (DMI) provides the connection between the MCH and the ICH9R. The ICH9R supports up to six PCI-Express x1 slots, six Serial ATA ports and eight USB 2.0 ports. In addition, the ICH9R offers the Intel Matrix Storage Technology which provides various RAID options for data protection and rapid data access. It also supports the next generation of client management through the use of PROActive technology in conjunction with Intel's next generation Gigabit Ethernet controllers.

The Xeon Quad-Core/Dual-Core 5400/5300/5200/5100 Series Processor Features

In addition, the Intel Xeon Quad-Core/Dual-Core 5400/5300/5200/5100 Series Processor-based platforms offer a wide range of RAS (Reliability, Availability, and Serviceability) features, including memory interface ECC, x4 Single Device Data Correction, parity protection, and out-of-band register access via SMBus.

1-3 Special Features

Recovery from AC Power Loss

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

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the X7DCA-L. All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitoring

An onboard voltage monitor will scan the following voltages continuously: CPU core voltage, Memory voltage, Chipset, +3.3V, +5V, +12V, -12V, +3.3V standby, +5V standby and VBAT. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

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

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. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU 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 the CPU temperature reaches the pre-defined overheat threshold, both the overheat fan and the warning LED are triggered.

System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. Supero Doctor is used to notify the user of certain system events. For example, if the system is running low on virtual memory and there is insufficient hard drive space for saving the data, you can be alerted of the potential problem. You can also configure Supero Doctor to provide you with warnings when the system temperature goes beyond a pre-defined range.

1-5 ACPI Features

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

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with Windows 2000, Windows XP and Windows 2003 Servers.

Slow Blinking LED for Suspend-State Indicator

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

Main Switch Override Mechanism

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

External Modem Ring-On

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

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboard has a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. In addition, an onboard LAN controller can also support WOL without any connection to the WOL header. The 3-pin WOL header is to be used with a LAN add-on card only.

Note: Wake-On-LAN requires an ATX 2.01 (or above) compliant power supply.

1-6 Power Supply

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

The X7DCA-L can only accommodate 24-pin ATX power supply. Although most power supplies generally meet the specifications required by the motherboard, some are inadequate. You should use one that will supply at least 400W of power. In addition, the 12V 8-pin is also required for adequate power supply to the CPU. Also your power supply must supply 1.5A for the Ethernet ports.

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). 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 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.

Notes

Chapter 2

Installation

2-1 Static-Sensitive Devices

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

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

Unpacking

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

2-2 Processor and Heatsink Installation



Warning: When handling the processor package, avoid placing direct pressure on the label area of the fan.

Notes:

1. Always connect the power cord last and always remove it before adding, removing or changing any components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
2. Intel's boxed Xeon CPU package contains the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel-certified multi-directional heatsink and fan.
3. Make sure to install the motherboard into the chassis before you install the CPU heatsink and fan.
4. When purchasing a motherboard with an LGA 771 CPU Socket, make sure that the CPU plastic cap is in place, and none of the CPU Socket pins are bent; otherwise, contact the retailer immediately.
5. Refer to the Chipset/MB Features Section for more details on CPU support.

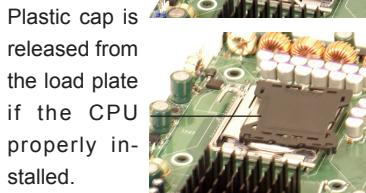
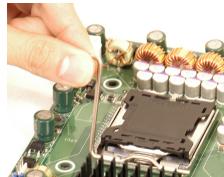
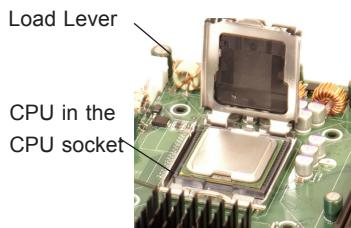
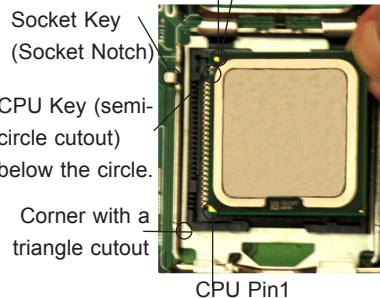
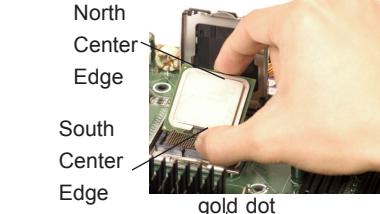
Installing the LGA771 Processor

1. Press the load lever to release the load plate, which covers the CPU socket, from its locking position.
2. Gently lift the load lever to open the load plate.
3. Use your thumb and your index finger to hold the CPU at the North Center Edge and the South Center Edge of the CPU.



Loading the Processor into the Socket

1. Align CPU Pin1 (the CPU corner marked with a triangle) against the socket corner that is marked with a triangle cutout.
2. Align the CPU key that is the semi-circle cutout below a gold dot against the socket key, the notch on the same side of the triangle cutout on the socket.
3. Once aligned, carefully lower the CPU straight down to the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damage to the CPU or the socket.)
4. With the CPU installed in the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed. Then, close the load plate.
5. Use your thumb to gently push the load lever down to lock it.
6. If the CPU is properly installed into the socket, the plastic cap will be automatically released from the load plate when the clip is pushed in the clip lock. Remove the plastic cap from the motherboard.

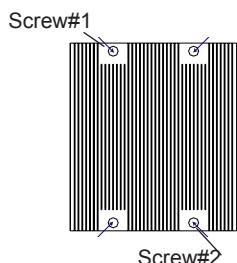
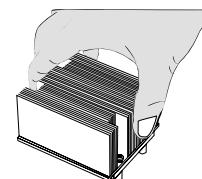
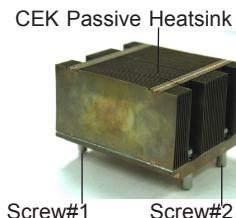


Warning: Please save the plastic PnP cap. The motherboard must be shipped with the PnP cap properly installed to protect the CPU socket pins. Shipment without the PnP cap properly installed will cause damage to the socket pins.

Installing the Heatsink

CEK Heatsink Installation

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
3. Screw in two diagonal screws (ie the #1 and the #2 screws) until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)
4. Finish the installation by fully tightening all four screws.

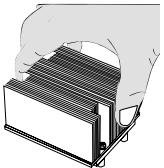
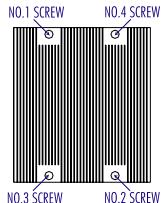


To Un-install the Heatsink



Warning: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions on the next page to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.

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



Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Make sure that the metal standoffs click in or are screwed in tightly. Then, use a screwdriver to secure the motherboard onto the motherboard tray.



Note: some components are very close to the mounting holes. Please take precautionary measures to prevent damage done to these components when you install the motherboard into the chassis.



Caution: To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation.

2-3 Installing DIMMs



Note: Check the Supermicro web site for recommended memory modules.

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)

- Insert the desired number of DIMMs into the memory slots, starting with DIMM #1A. The memory scheme is interleaved, so you must install two modules at a time, beginning with DIMM 1A, DIMM 1B, then DIMM 2A, DIMM 2B, and DIMM 3A, DIMM 3B.
- 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.
- 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 X7DCA-L supports up to 48 GB Buffered (Registered) ECC DDR2 667/533 in 6 DIMMs. Populating memory slots of the same bank with a pair of memory modules of the same size and same type **will result in two-way Interleaved Memory** which will improve memory performance.

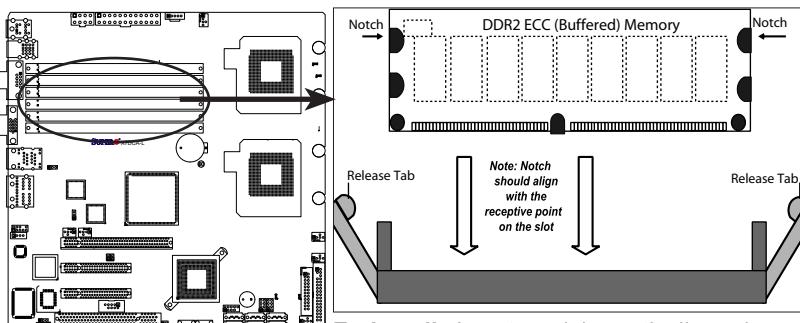


Notes:

- 1: Due to OS limitations, some operating systems may not show more than 4 GB of memory.
- 2: Due to memory allocation to system devices, memory remaining available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (Refer to the following Memory Availability Table for details. For Microsoft Windows users: Microsoft implemented a design change in Windows XP with Service Pack 2 (SP2) and Windows Vista. This change is specific to the Physical Address Extension (PAE) mode behavior which improves driver compatibility. For more information, please read the following article at Microsoft's Knowledge Base website at: <http://support.microsoft.com/kb/888137>.

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

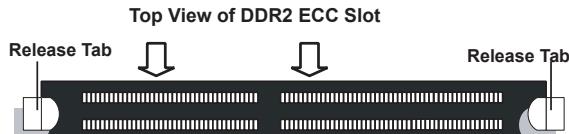
Installing and Removing DIMMs



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:

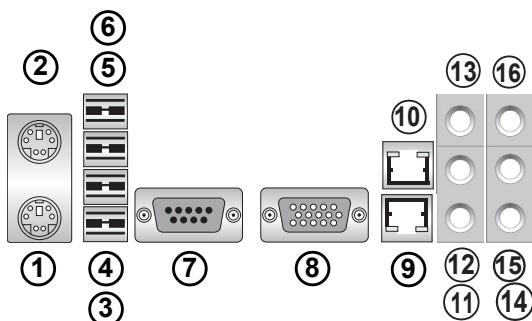
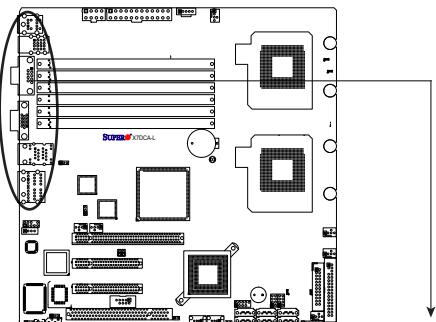
Use your thumbs to gently push the release tabs near both ends of the module to release it from the slot.



2-4 Control Panel Connectors/IO Ports

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.

Back Panel Connectors/IO Ports



Back Panel I/O Port Locations and Definitions

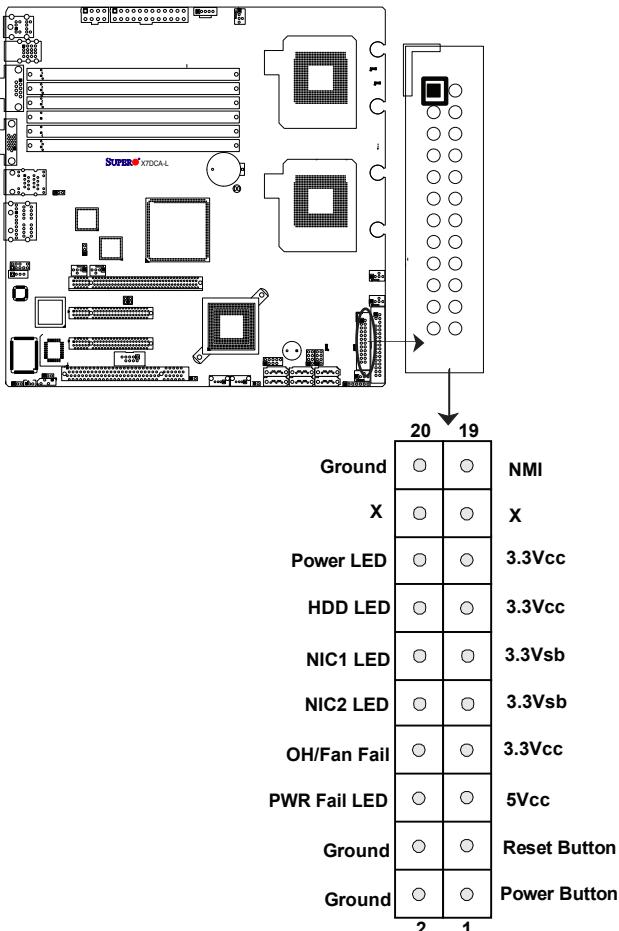
Back Panel Connectors			
1	Keyboard (Purple)	9	LAN 1
2	PS/2Mouse (Green)	10	LAN 2
3	USB 0	11	Side_Surround (Grey)
4	USB 1	12	Back_Surround (Black)
5	USB 2	13	CEN/LFE (Orange)
6	USB 3	14	Microphone-In (Pink)
7	COM 1 (Turquoise)	15	Front (Green)
8	VGA (Blue)	16	Line-In (Blue)

(See Section 2-5 for details.)

Front Control Panel

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

Front Control Panel Header (JF1) Pins



Front Control Panel Pin Definitions

NMI Button

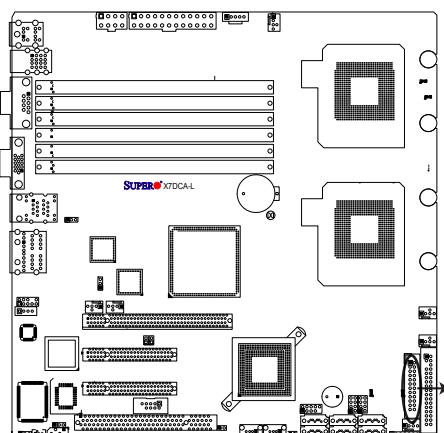
The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Power LED

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

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+5V
16	Ground



A. NMI

B. PWR LED

	20	19	
Ground	○	○	NMI A
X	○	○	X
Power LED	○	○	3.3Vcc
HDD LED	○	○	3.3Vcc
NIC1 LED	○	○	3.3Vsb
NIC2 LED	○	○	3.3Vsb
OH/Fan Fail	○	○	3.3Vcc
PWR Fail LED	○	○	5Vcc
Ground	○	○	5Vcc
Ground	○	○	Reset Button
	2	1	Power Button

HDD LED

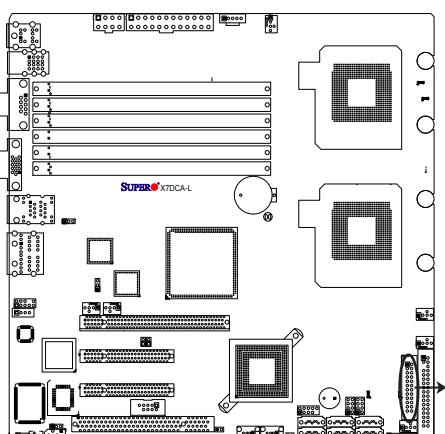
The HDD LED connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable here to display disk activity (for any hard drives on the system, including SAS, Serial ATA and IDE). See the table on the right for pin definitions.

HDD/UID LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

NIC1/NIC2 LED Indicators

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

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground



A. HDD LED

B. NIC1 LED

C. NIC2 LED

	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	3.3Vcc
A HDD LED	○	○	3.3Vcc
B NIC1 LED	○	○	3.3Vsb
C NIC2 LED	○	○	3.3Vsb
OH/Fan Fail	○	○	3.3Vcc
PWR Fail LED	○	○	5Vcc
Ground	○	○	Reset Button
Ground	○	○	Power Button
	2	1	

Overheat/Fan Fail LED (OH)

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

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

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

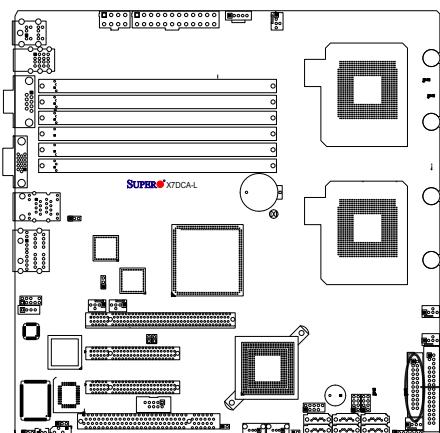
Power Fail LED

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

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

A. OH/Fan Fail LED

B. PWR Supply Fail



	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	3.3Vcc
HDD LED	○	○	3.3Vcc
NIC1 LED	○	○	3.3Vsb
NIC2 LED	○	○	3.3Vsb
A OH/Fan Fail	○	○	3.3Vcc
B PWR Fail LED	○	○	5Vcc
Ground	○	○	Reset Button
Ground	○	○	Power Button
	2	1	

Reset Button

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

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

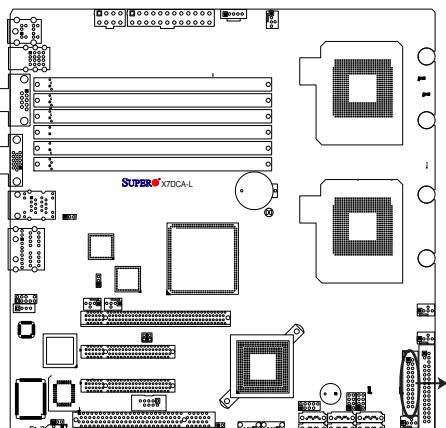
Power Button

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

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	+3V Standby

A. Reset Button

B. PWR Button



	20	19	
Ground	○	○	NMI
X	○	○	X
Power LED	○	○	3.3Vcc
HDD LED	○	○	3.3Vcc
NIC1 LED	○	○	3.3Vsb
NIC2 LED	○	○	3.3Vsb
OH/Fan Fail	○	○	3.3Vcc
PWR Fail LED	○	○	5Vcc
Ground	○	○	Reset Button A
Ground	○	○	Power Button B
	2	1	

2-5 Connecting Cables

ATX Power Connector

A 24-pin main power supply connector is located at JPW2 on the motherboard. This power connector meets the SSI EPS 12V specification. See the table on the right for pin definitions. For the 8-pin CPU Power connector (JPW21), refer to the item below.

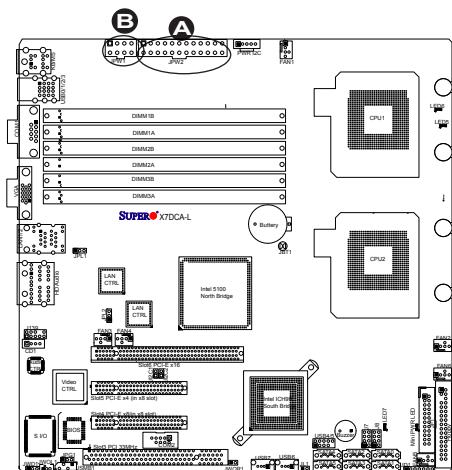
ATX Power 24-pin Connector Pin Definitions			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connector

In addition to the Primary ATX power connector, the 12V 8-pin CPU PWR connector at JPW1 must also be connected to provide adequate power to your processors. See the table on the right for pin definitions.

12V 8-pin CPU PWR Pin Definitions	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

Required Connections



A. 24-pin ATX PWR

B. 8-pin Processor PWR

Universal Serial Bus (USB)

There are eight USB 2.0 (Universal Serial Bus) ports/headers on the motherboard. Four of them are Back Panel USB ports: USB 0~3 (JPUSB1). The other four are Front Panel USB connectors: USB 4~5 (JUSB3), USB 6 (JUSB4), and USB 7 (JUSB5). See the tables on the right for pin definitions.

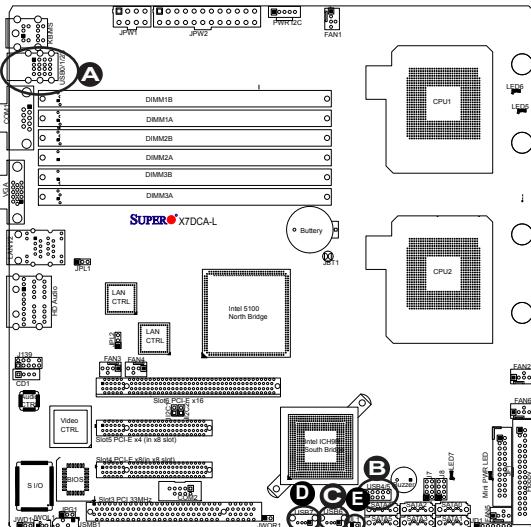
Back Panel USB (USB 0~3)	
Pin#	Definitions
1	+5V
2	PO-
3	PO+
4	Ground
5	N/A

Front Panel USB (USB 4~7)			
USB 4/6/7	USB 5		
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	No connection

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground



A. Backpanel USB 0~3

B. Front Panel USB 4~5

C. Front Panel USB 6

D. Front Panel USB 7

E. Chassis Intrusion

Fan Headers

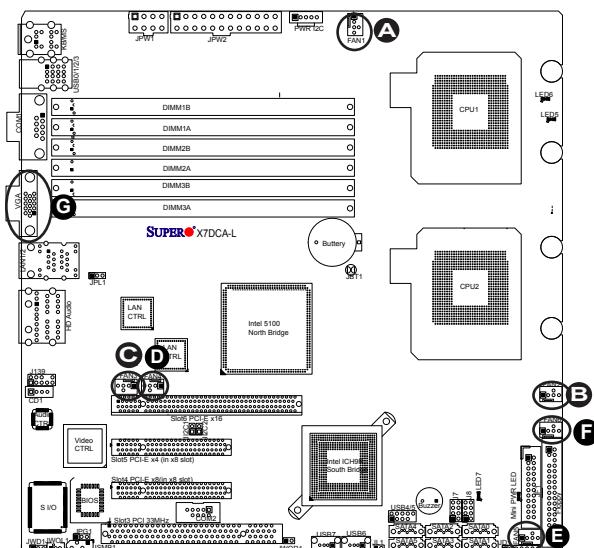
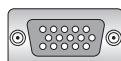
The X7DCA-L has six CPU/system fan headers (Fans 1~Fan 6). All these fans are 4-pin fans. See the table on the right for pin definitions.

Note: The onboard fan speeds are controlled by Thermal Management via BIOS Hardware Monitoring in the Advanced Setting. (The default setting is **Disabled**.)

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWM

VGA Connector

A VGA connector is located next to the COM1 port on the IO backplane. Refer to the board layout below for the location.



- A. Fan 1
- B. Fan 2
- C. Fan 3
- D. Fan 4
- E. Fan 5
- F. Fan 6
- G. VGA

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on the IO Backpanel. See the table on the right for pin definitions. (The mouse port is above the keyboard port.) See the table on the right for pin definitions.

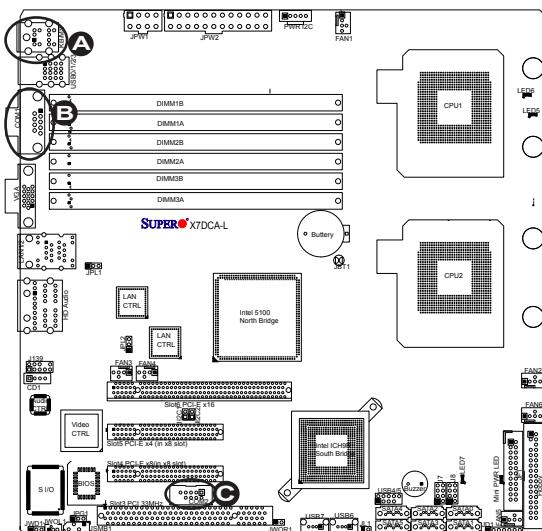
PS/2 Keyboard and Mouse Port Pin Definitions	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Serial Ports

COM1 is the serial port located at JCOM1 on the IO Backpanel. COM2 is a header located at JCOM2. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

(Pin 10 is available on COM2 only. NC: No Connection.)



A. Keyboard/Mouse

B. COM1

C. COM2

Wake-On-Ring

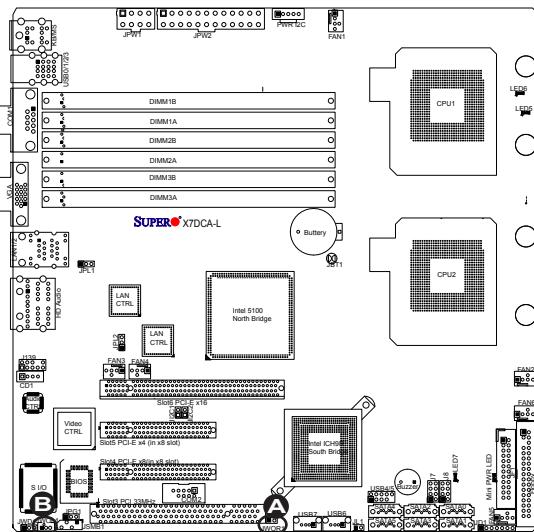
The Wake-On-Ring header is located at JWOR1. This feature allows your computer to be "awakened" by an incoming call to the modem when the system is in the suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions	
Pin#	Definition
1	Ground
2	Wake-up

Wake-On-LAN

The Wake-On-LAN header is located at JWOL1 on the motherboard. See the table on the right for pin definitions. (You must have a LAN card with a Wake-On-LAN connector, and cable to use this feature.)

Wake-On-LAN Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up



GLAN 1/2 (Giga-bit Ethernet Ports)

Two G-bit Ethernet ports are located at JLAN3 on the I/O backplane. These ports accept RJ45 type cables.



GLAN1/2

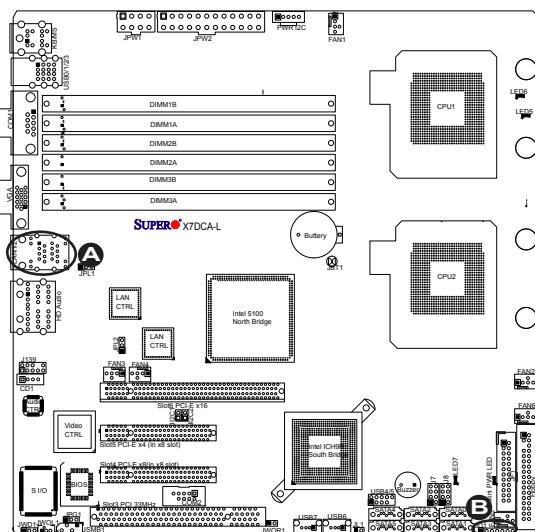
Power LED/Speaker

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



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

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 6-7	Internal Speaker
Pins 4-7	External Speaker



A. GLAN1/2

B. PWR LED/Speaker

T-GPIO Headers

Two GPIO (Serial-Link General Purpose Input/Output) headers are located at J7 and J8 on the motherboard. These headers are used to communicate with the Serial-Link System Monitoring chip on the backplane. See the table on the right for pin definitions. Refer to the board layout below for the locations of the headers.

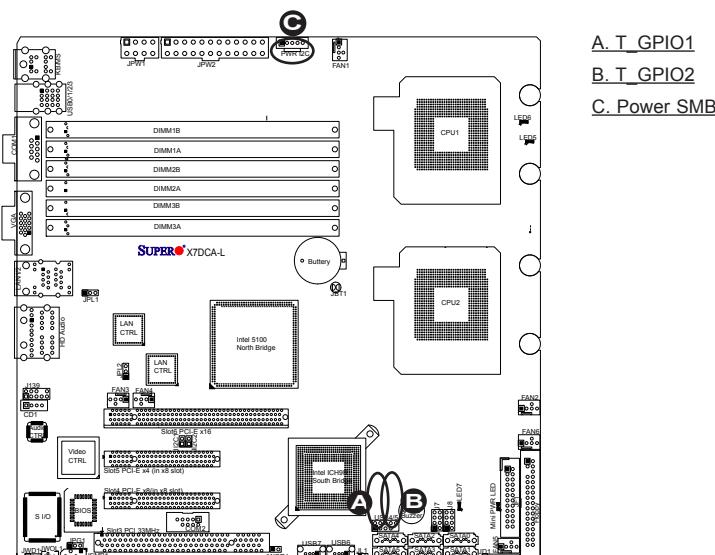
T-GPIO1/2 Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

Note: NC= No Connections

Power SMB (I²C) Connector

Power SMB (I²C) Connector (JPI²C1) monitors the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

PWR SMB Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V



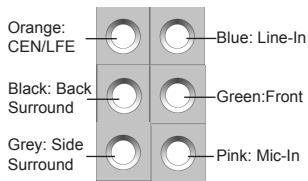
A. T_GPI01

B. T_GPI02

C. Power SMB

High Definition Audio (HDA)

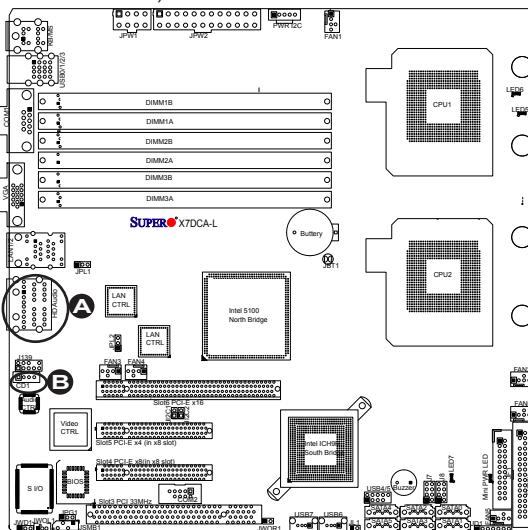
This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels, simultaneously supporting 7.1 sound playback, and two channels of independent stereo sound output (multiple streaming) through the front panel stereo out for the front L&R, rear L&R, center and subwoofer speakers. Use the Advanced software included in the CD-ROM that came with your motherboard to enable HD Audio. Once enabled, sound is then output through the Line In, Line Out and MIC jacks (See at the picture at right.)



CD and Auxiliary (FP) Audio Headers

A 4-pin CD header is located at CD1, and an Auxiliary Front Panel header* is located at J139 on the motherboard. These headers allow you to use the onboard sound for audio CD playback. Connect an audio cable from your CD drive to the header that fits your cable's connector. Only one CD header can be used at any one time. See the tables at right for pin definitions. (Auxiliary Audio: see the next item.)

CD1 Pin Definitions	
Pin#	Definition
1	Left Stereo Signal
2	Ground
3	Ground
4	Right Stereo Signal



A. H.D Audio

B. CD1

Auxiliary Front Panel Audio Control

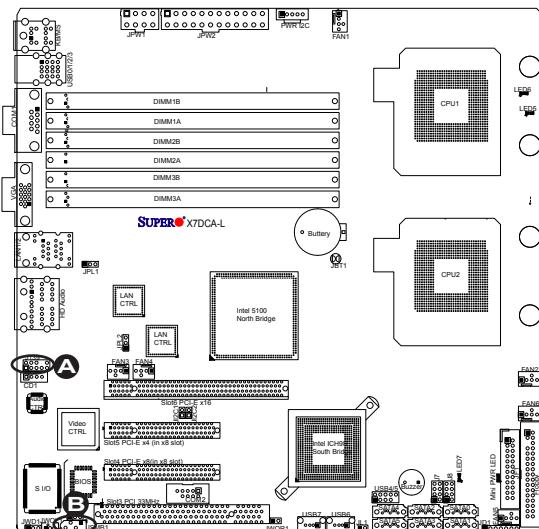
When the front panel headphones are plugged in, the back panel audio output is disabled. This is done through the FP Audio header (J139). If the front panel interface card is not connected to the front panel audio header, jumpers should be installed on the header (J139) pin pairs 1-2, 5-6, and 9-10. If these jumpers are not installed, the back panel line-out connector will be disabled, and microphone input Pin 1 will be left floating, which can lead to excessive back panel microphone noise and cross-talk. See the table at right for pin definitions.

HD Front Panel Audio Pin Definitions	
Pin#	Signal
1	MIC_L
2	AUD_GND
3	MIC_R
4	FP_Audio-Detect
5	Line_2_R
6	Ground
7	FP_Jack-Detect
8	Key
9	Line_2_L
10	Ground

SMB

A System Management Bus header is located at JSMB1. Connect an appropriate cable here to utilize SMB on your system.

SMB Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection



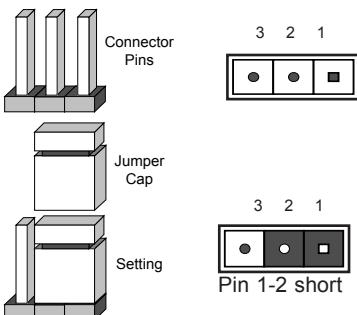
A. FP Audio

B. SMB

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.



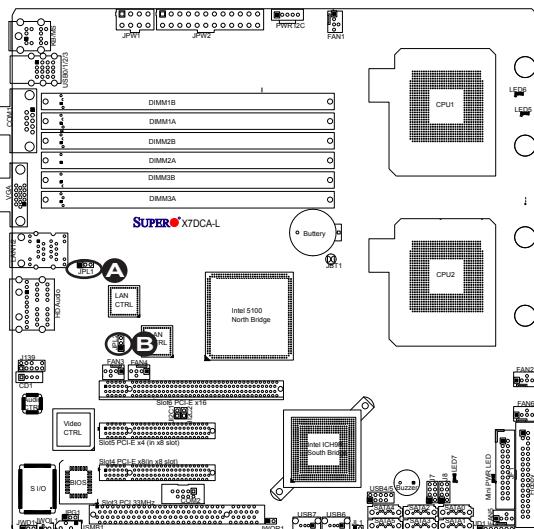
Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

GLAN Enable/Disable

JPL1/JPL2 enable or disable GLAN Port1/GLAN Port2 on the motherboard. See the table on the right for jumper settings. The default setting is **Enabled**.

GLAN Enable

Pin#	Definition
1-2	Enabled (default)
2-3	Disabled



A. GLAN Port1 Enable

B. GLAN Port2 Enable

CMOS Clear

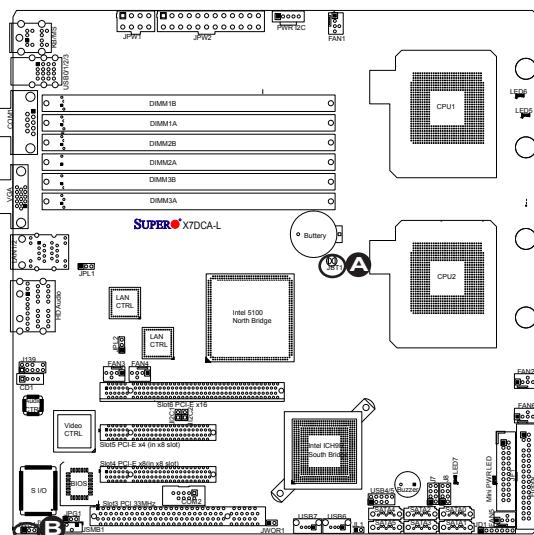
JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS. **Note:** For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS.



Watch Dog Enable/Disable

Watch Dog is a system monitor that can reboot the system when a software application hangs. Close pins 1-2 to reset the system if an application hangs. Close pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

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



A. Clear CMOS

B. Watch Dog Enable

I^2C Bus to PCI Slots

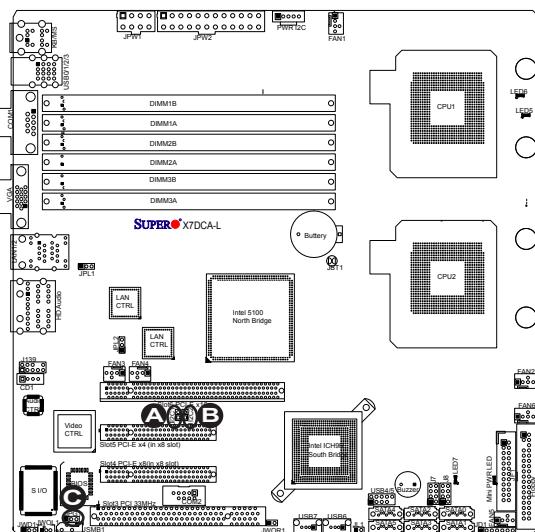
Jumpers J1²C1 and J1²C2 allow you to connect the System Management Bus (I^2C) to PCI-E and PCI slots. The default setting is set to **Disabled**. See the table on the right for jumper settings.

I^2C to PCI-Slots Jumper Settings	
Jumper	Definition
1-2	Enabled
2-3	Disabled (Default)

VGA Enable/Disable

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

VGA Enable/Disable Jumper Settings (JPG1)	
Both Jumpers	Definition
*Pins 1-2	Enabled
Pins 2-3	Disabled

A. I^2C1 B. I^2C2

C. VGA Enabled

2-7 Onboard Indicators

GLAN LEDs

There are two GLAN ports on the motherboard. Each Gigabit Ethernet LAN port has two LEDs. The green LED indicates activity, while the Link LED may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.



Rear View

(when viewing from the back of the chassis.)

**GLAN Activity Indicator
LED Setting**

Color	Status	Definition
Green	Flashing	LAN Active

**GLAN Link Indicator
LED Settings**

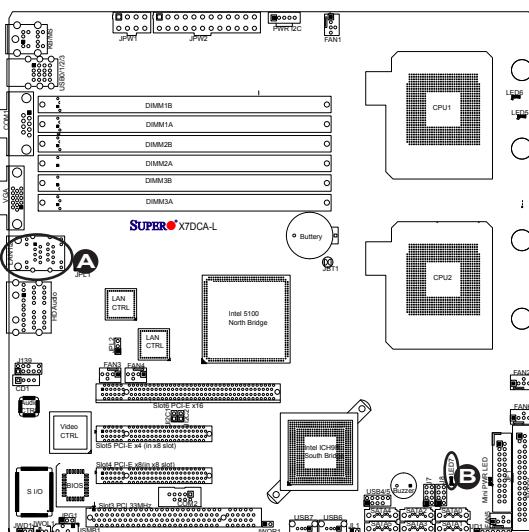
LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

Onboard Power LED

An Onboard Power LED is located at LED7 on the motherboard. When this LED is lit, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the layout below for the LED location.

**Onboard PWR LED Indicator (LED7)
Pin Definitions**

LED Color	Definition
Off	System Off
On	Standby Power On
Green	System On



A. GLAN Port1/Port2 LEDs

B. Onboard PWR LED

CPU_VRM Overheating LED Indicators (LED5/LED6)

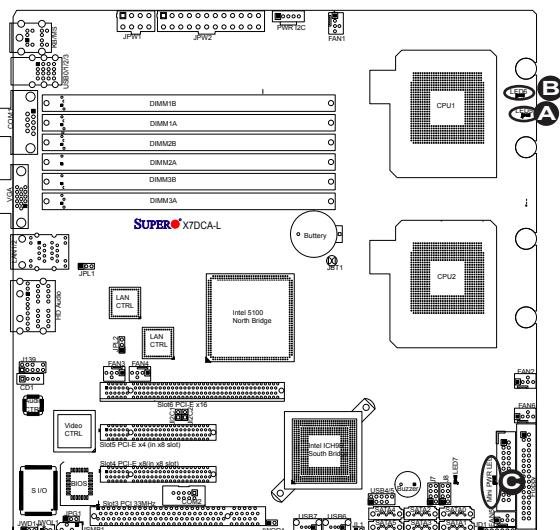
Two CPU VRM Overheat LED Indicators are located at LED5 and LED6 on the motherboard. These LEDs provide indications for CPU VRM Overheating. Refer to the table on the right for LED5 and LED6 settings. See the layout below for the LED locations.

CPU_VRM Overheat LED Indicators

LED#	Description
LED5: On	CPU1_VRM Overheating
LED6: On	CPU2_VRM Overheating

Mini Power LED Indicator

The Mini Power LED Indicator is located at DP1 on the motherboard. See the layout below for the LED locations.



A. LED5: CPU1VRM OH

B. LED6: CPU1VRM OH

C. Mini Power LED

2-8 Floppy Drive Connection

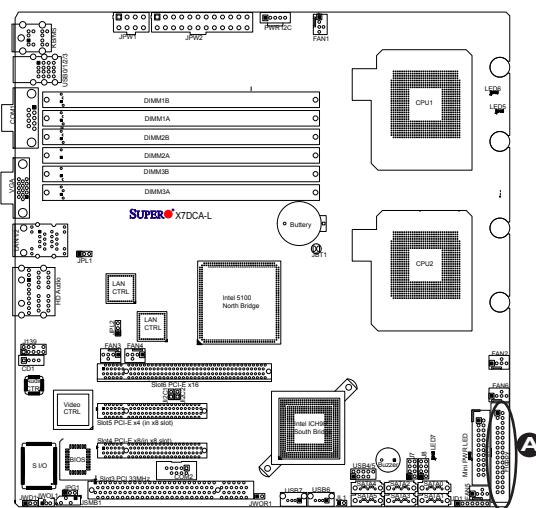
Note the following when connecting the floppy and hard disk drive cables:

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.

Floppy Connector

The floppy connector is located at JFDD1. See the table below for pin definitions.

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



A. Floppy Disk Drive

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 that there are no short circuits between the motherboard and the chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse. Remove all add-on cards.
3. Install a CPU in CPU Socket and connect the chassis speaker and the power LED to the motherboard. (Make sure that the CPU is properly seated. Be sure to check all jumper settings as well.)

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that all jumpers are set to their default positions.
3. Make sure that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system. 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.

Losing the System's Setup Configuration

3. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
4. 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.
5. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

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. Check if DIMMs of different speeds or types have been installed. Also make sure that the BIOS setup is configured for the fastest speed of RAM used.
2. It is recommended to use the same RAM speed for all DIMMs in the system. Make sure you are using the correct type of DDR2 Buffered (Registered) ECC 667/533 SDRAM (*recommended by the manufacturer.)
3. Check for bad DIMM modules or slots by swapping a single module between four slots and noting the results. 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 DIMM 1A, DIMM 1B, DIMM 2A, DIMM 2B, then DIMM 3A, and DIMM 3B (see Section 2-3). Check the position of the 115V/230V switch on the power supply.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, Supermicro 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.

4. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our web site (<http://www.supermicro.com/support/faqs/>) before contacting Technical Support.
5. BIOS upgrades can be downloaded from our web site at <http://www.supermicro.com/support/bios/>.
6. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
 - Motherboard model and PCB revision number
 - BIOS release date/version (this can be seen on the initial display when your system first boots up)
 - System configuration
 - An example of a Technical Support form is on our web site at <http://www.supermicro.com/support/contact.cfm>.

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 X7DCA-L has six 240-pin DIMM slots that support DDR2 Registered ECC 667/533 SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes. (See Chapter 2 for detailed Information.)

Question: Why does Microsoft Windows XP (SP2) and Windows Vista show less memory than what is physically installed?

Answer: Microsoft implemented a design change in Windows XP with Service Pack 2 (SP2) and Windows Vista. This change is specific to the Physical Address Extension (PAE) mode behavior which improves driver compatibility. For more information, please read the following article at Microsoft's Knowledge Base website at: <http://support.microsoft.com/kb/888137>.

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/support/bios/>. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Also, check the current BIOS revision, and make sure that it is newer than your BIOS before downloading. Select your motherboard model and download the BIOS file to your computer. Unzip the BIOS files onto a bootable floppy and reboot your system. Follow the Readme.txt to continue flashing the BIOS.



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

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 the Windows OS, and security and audio drivers.

3-4 Returning Merchandise for Service

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

This warranty only covers normal consumer use and does not cover damage incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products. For faster service, RMA authorizations may be requested online (<http://www.supermicro.com/support/rma/>).

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

Chapter 4

BIOS

4-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X7DCA-L. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.



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

System BIOS

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

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 4-3, detailed descriptions are given for each parameter setting in the Setup utility.



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

4-2 Running Setup

Default settings are in bold text unless otherwise noted.

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

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

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

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

Press the <Delete> key to enter Setup

4-3 Main BIOS Setup

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

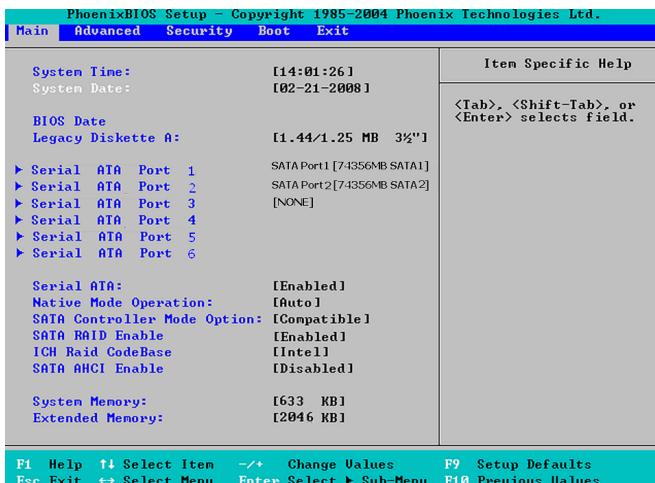
Use the Up/Down arrow keys to move among the different settings in each menu.

Use the Left/Right arrow keys to change the options for each setting.

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

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

Main BIOS Setup Menu



Main Setup Features

System Time

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

System Date

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

BIOS Date

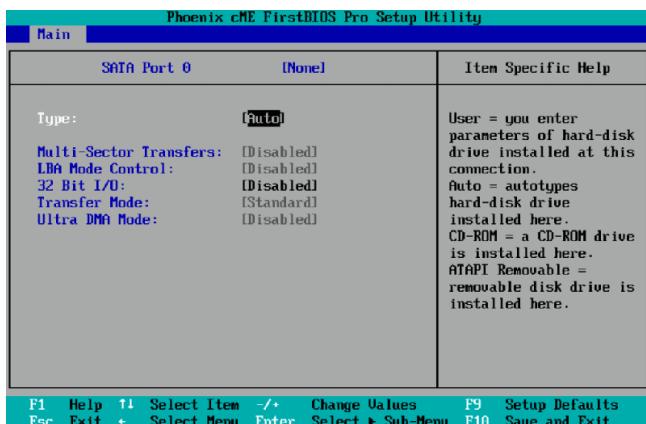
This field displays the date when this version of BIOS was built.

Legacy Diskette A

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

►SATA Port 0,SATA Port 1, SATA Port 2, SATA Port 3, SATA Port 5 and SATA Port 6

These settings allow the user to set the parameters of SATA Port 1, SATA Port 2, SATA Port 3, SATA Port 4, SATA Port 5, and SATA Port 6 slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:



Type

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

Multi-Sector Transfers

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

LBA Mode Control

This item determines whether the Phoenix BIOS will access the device installed in the slot specified in the LBA mode. The options are Enabled and **Disabled**.

32 Bit I/O

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

Transfer Mode

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

Ultra DMA Mode

This option allows the user to select Ultra DMA Mode for the slot specified. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

Serial ATA

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

Native Mode Operation

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

SATA Controller Mode Option

Select **Compatible** to allow the SATA and PATA drives to be automatically-detected and be placed in the Legacy Mode by the BIOS. Select Enhanced to allow the SATA and PATA drives to be automatically-detected and be placed in the Native IDE Mode. (**Note: The Enhanced mode is supported by the Windows 2000 OS or a later version.**)

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

Serial ATA (SATA) RAID Enable

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

ICH RAID Code Base

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

SATA AHCI Enable

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

System Memory

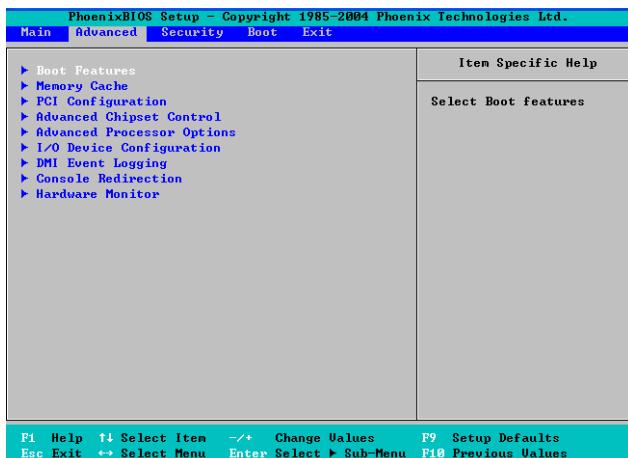
This display informs you how much system memory is detected by the BIOS.

Extended Memory

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

4-4 Advanced Setup

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



► Boot Features

Access the submenu to make changes to the following settings.

QuickBoot Mode

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

QuietBoot Mode

This setting allows you to **Enable** or **Disable** the graphic logo screen during boot-up.

POST Errors

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

ACPI Mode

This feature allows you to decide which ACPI (Advanced Configuration and Power Interface) power management mode to use when in the sleep mode. The options are **Yes** and **No**.

Power Button Behavior

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

Resume On Modem Ring

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

Keyboard On Now Function

This feature allows the user to determine how to use the keyboard to power on the system from S3~S5 States. Select **Space** to allow the user to power on the system by pressing the space bar. Select **Password** to allow the user to enter the password to power on the system. Select **Disabled** to disable this function.

Power Loss Control

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

Watch Dog

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

Summary Screen

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

►Memory Cache

Cache System BIOS Area

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

Cache Video BIOS Area

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

Cache Base 0-512K

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

Cache Base 512K-640K

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

Cache Extended Memory Area

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

Discrete MTRR Allocation

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

►PCI Configuration

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

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

Select Enabled to allow the system to boot from the GLAN1 connection or the GLAN 2 connection. The options are Enabled and **Disabled**.

Default Primary Video Adapter

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

Reset Configuration Data

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

►Slot3 PCI 33 MHz, Slot4 PCI-Exp x8, Slot5 PCI-Exp x8, and Slot6 PCI-Exp x16

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

Option ROM Scan

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

Enable Master

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

Latency Timer

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

Large Disk Access Mode

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

►Advanced Chipset Control

Access the submenu to make changes to the following settings.



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

Accelerate MRC

If Enabled, the BIOS will ignore the Memory Reference Code (MRC) when there is no change to DIMM population in order to speed up system boot. The options are **Enabled** and **Disabled**.

Clock Spectrum Feature

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

Crystal Beach Features

Select Enabled to use the Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. (**Note:** A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card. For this motherboard, the TOE device is built inside the ESB 2 South Bridge chip.) The options are **Enabled** and **Disabled**.

SERR Signal Condition

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

4GB PCI Hole Granularity

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

Channel 0 Rank Sparing/Channel 1 Rank Sparing

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

Enhanced x8 Detection

Select **Enabled** to enable Enhanced x8 DRAM UC Error Detection. The options are Disabled and **Enabled**.

Demand Scrubbing

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

Patrol Scrubbing

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

Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are **PCI** and **LPC**.

Enable Multi-Media Timer

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

USB Host Controller

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

Legacy USB Support

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

Azalia Audio

When set to **Auto**, Azalia Audio will be automatically turned on when detected by the BIOS. The settings are **Auto** and **Disabled**.

►Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

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

Frequency Ratio (Available when supported by the CPU.)

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

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

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

Machine Checking (Available when supported by the CPU.)

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

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

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

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

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

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

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

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

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

Hardware Prefetcher (Available when supported by the CPU.)

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

Echo TPR

Set to Enabled to prevent xTPR messages from being sent to the system. The options are **Disabled** and Enabled.

Intel ® Virtualization Technology (Available when supported by the CPU.)

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

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

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

►CPU Cache Control

DCU Prefetcher (Available when supported by the CPU.)

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

IP Prefetcher (Available when supported by the CPU.)

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

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

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

DCA Delay Clocks (Available when supported by the CPU.)

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

►I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

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

Serial Port A

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

Base I/O Address

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

Interrupt

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

Serial Port B

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

Mode

This setting allows you to set the type of device that will be connected to serial port B. The options are **Normal** and IR (for an infrared device).

Base I/O Address

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

Interrupt

This setting allows you to select the IRQ (interrupt request) for serial port B. The options are **IRQ3** and IRQ4.

Floppy Disk Controller

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

Base I/O Address

This setting allows you to select the base I/O address for the Floppy port. The options are **Primary** and Secondary.

►DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

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

Event Log Capacity

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

View DMI Event Log

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

Event Logging

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

ECC Event Logging

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

Mark DMI Events as Read

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

Clear All DMI Event Logs

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

►Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

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

Console Type

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

Flow Control

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

Console Connection

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

Continue CR after POST

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

►Hardware Monitor

Highlight an item and hit <Enter> to see the status of each of the following items:

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat. Refer to the next item, CPU Temperature for more information regarding PECL, DTS and other thermal features of this motherboard.

 **Warning:** Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

The options are:

The Default Alarm Setting: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about +5 PECL counts above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling.

The Early Alarm Setting: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

CPU1 Temperature/CPU2 Temperature

The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the ‘normal’ operating state. The CPU temperature is well below the CPU ‘Temperature Tolerance’. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

Medium – The processor is running warmer. This is a ‘precautionary’ level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU ‘Temperature Tolerance’. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a ‘caution’ level since the CPU’s ‘Temperature Tolerance’ has been reached (or has been exceeded) and may activate an overheat alarm:

The Default Alarm – the Overheat LED and system buzzer will activate if the High condition continues for some time after it is reached. The CPU fan will run at full speed to bring the CPU temperature down. If the CPU temperature still increases even with the CPU fan running at full speed, the system buzzer will activate and the Overheat LED will turn on.

The Early Alarm – the Overheat LED and system buzzer will be activated exactly when the High level is reached. The CPU fan will run at full speed to bring the CPU temperature down.

Note: In both the alarms above, please take immediate action as shown below. See CPU Overheat Alarm to modify the above alarm settings.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems. Note: the system may shut down if it continues for a long period to prevent damage to the CPU.

 **Notes:** The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25°C).

The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

System Temperature1

This feature displays the system's absolute temperature reading (i.e., 29°C).

Fan1-Fan6:

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

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select “Disable” to disable the fan speed control function and allow the onboard fans to constantly run at the full speed (12V). The Options are: 1. **Disabled (Full Speed @12V)**, 2. 4-pin (Quiet), 3. 4-pin (Super Quiet), 4. Optimized Server w/4-pin, and 5. Optimized Workstation w/4-pin.

Voltage Monitoring

The following items will be monitored and displayed:

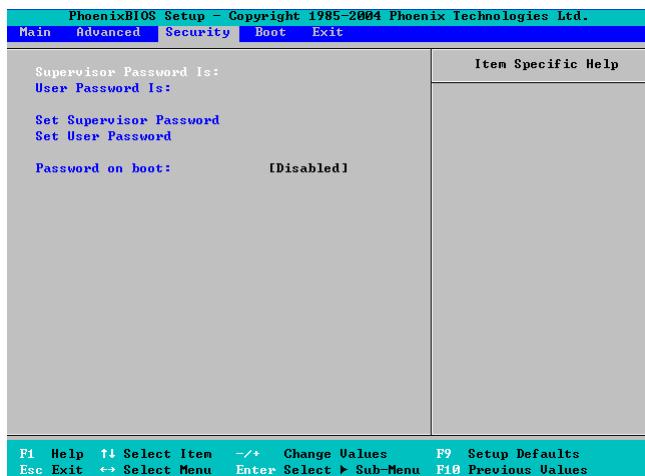
VcoreA/VcoreB, 12V, 1.8V, 5V, 3.3V, 3.3Vsb, Vbat



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

4-5 Security

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



Supervisor Password Is:

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

User Password Is:

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

Set Supervisor Password

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

Set User Password

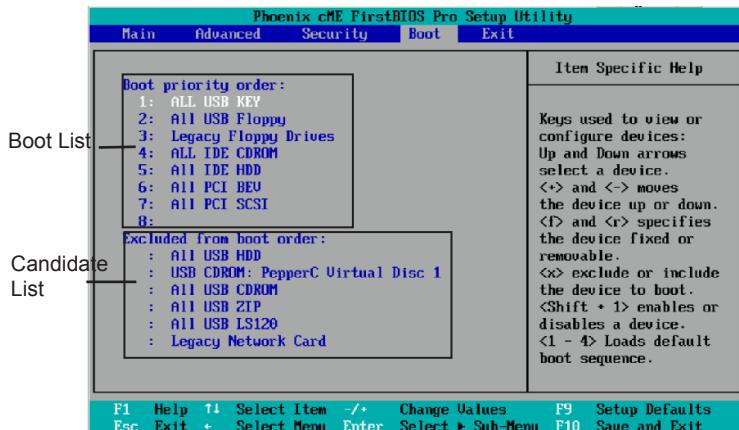
When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Password on Boot

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

4-6 Boot

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

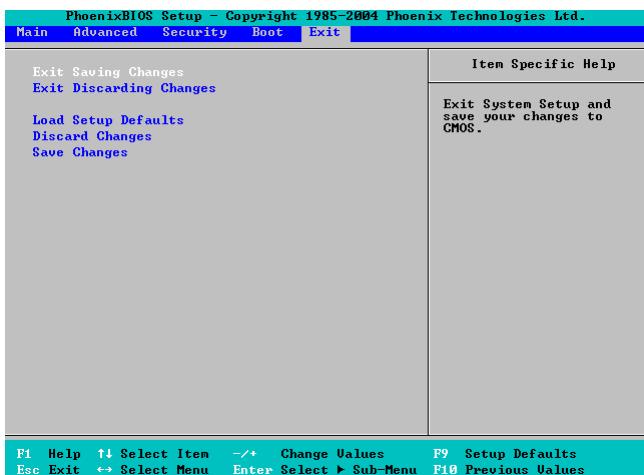


Boot Priority Order/Excluded from Boot Orders

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

4-7 Exit

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



Exit Saving Changes

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

Exit Discarding Changes

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

Load Setup Defaults

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

Discard Changes

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

Save Changes

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

Appendix

BIOS POST Messages

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

Failure Fixed Disk

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

Stuck key

Stuck key on keyboard.

Keyboard error

Keyboard not working.

Keyboard Controller Failed

Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch

Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP

Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn

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

System RAM Failed at offset: nnnn

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

Extended RAM Failed at offset: nnnn

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

System battery is dead - Replace and run SETUP

The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error

The timer test failed. Requires repair of system board.

Real time clock error

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

Check date and time settings

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

Previous boot incomplete - Default configuration used

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

Memory Size found by POST differed from CMOS

Memory size found by POST differed from CMOS.

Diskette drive A error

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

Incorrect Drive A type - run SETUP

Type of floppy drive A: not correctly identified in Setup.

System cache error - Cache disabled

RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:

CPU socket number for Multi-Processor error.

EISA CMOS not writeable

ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed

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

Software NMI Failed

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

Fail-Safe Timer NMI Failed

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

device Address Conflict

Address conflict for specified **device**.

Allocation Error for: device

Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive

CD ROM Drive identified.

Entering SETUP ...

Starting Setup program

Failing Bits: nnnn

The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n

Fixed disk **n** (0-3) identified.

Invalid System Configuration Data

Problem with NVRAM (CMOS) data.

I/O device IRQ conflict

I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:

PS/2 Mouse installed.

nnnn kB Extended RAM Passed

Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed

Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed

Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed

Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu

There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found

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

Parity Check 1 nnnn

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

Parity Check 2 nnnn

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????**.

Press <F1> to resume, <F2> to Setup, <F3> for previous

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

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

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

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*

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

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Appendix B

BIOS POST Codes

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

Recoverable POST Errors

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

- 1 long and two short beeps - video configuration error
- 1 repetitive long beep - no memory detected
- 1 long continuous beep with Overheat LED on - system overheat

Terminal POST Errors

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

POST Code Description

01h	IPMI Initialization
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE

POST Code Description

10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Reset PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line xxxx
2Eh	1-3-4-3 RAM failure on data bits xxxx of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot (optional)
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
48h	Check video configuration against CMOS

POST Code Description

49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board (optional)
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press <ESC> to enter SETUP"
5Bh	Disable CPU cache
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring (optional)
7Eh	Initialize coprocessor if present

POST Code Description

80h	Disable onboard Super I/O ports and IRQs (optional)
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs and shadow if successful. One long, two short beeps on checksum failure
99h	Check for SMART Drive (optional)
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate

POST Code Description

A8h	Erase <ESC> prompt
AAh	Scan for <ESC> key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST (optional)
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS and PPM Structures
B9h	Prepare Boot
BAh	Initialize SMBIOS
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error flags
C6h	Console redirection init.
C7h	Unhook INT 10h if console redirection enabled
C8h	Force check (optional)
C9h	Extended ROM checksum (optional)
CDh	Reclaim console redirection vector
D2h	Unknown interrupt
D4h	Check Intel Branding string
D8h	Alert Standard Format initialization
D9h	Late init for IPMI
DEh	Log error if micro-code not updated properly

The following are for boot block in Flash ROM

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

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

Appendix C

Installing the Windows OS

After all the hardware has been installed, you must first configure Intel South Bridge RAID settings before you install the OS and other software drivers. To install the Linux OS or to configure RAID settings, please refer to the OS Installation or RAID Configuration User Guides posted on our web site at www.supermicro.com/support/manuals.

C-1 Installing the Windows XP/2000/2003 OS for systems with RAID Functions

1. Insert Microsoft's Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.
2. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.
3. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).
4. Insert the driver diskette-"ITE RAID XP/2000/2003 Driver for IDE" into Drive A: and press the <Enter> key.
5. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).
6. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH9R" into Drive A: and press the <Enter> key.
7. Select the Intel(R)82801GR/GH SATA RAID Controller from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.
8. 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.
9. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

1. After the Windows XP/2000/2003 Installation is completed, the system will automatically reboot.
2. Insert the Supermicro Setup CD that came with the package into the CD Drive during system reboot, and the main screen will appear.

C-2 Installing the Windows XP/2000/2003 OS to Systems without RAID Functions

1. Insert Microsoft's Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.
2. Press the <F6> key when the message—"Press F6 if you need to install a third party SCSI or RAID driver" displays.
3. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).
4. Insert the driver diskette—"ITE RAID XP/2000/2003 Driver for IDE" into Drive A: and press the <Enter> key.
5. 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.
6. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.
7. After the Windows XP/2000/2003 OS Installation is completed, the system will automatically reboot.

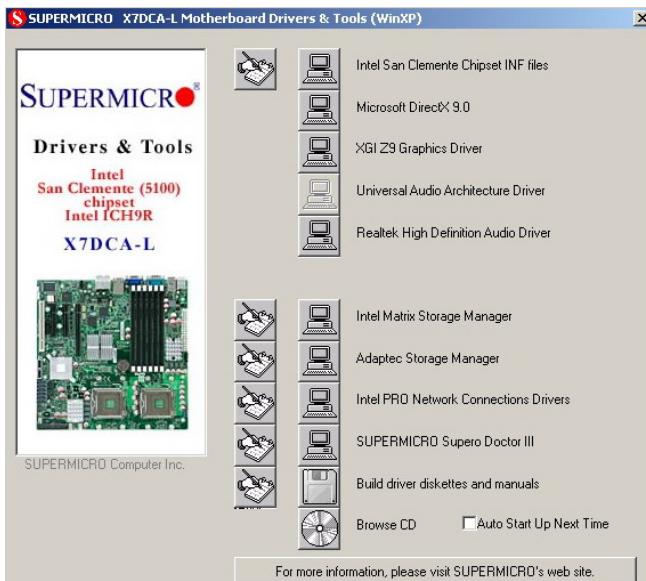
Appendix D

Installing Other Software and Drivers

D-1 Installing Other Drivers

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

Driver/Tool Installation Display Screen



Notes:

1. Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon on the right of an item to install an item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before proceeding with the next item on the list.**
2. To install the Linux OS or to configure RAID settings, please refer to the OS Installation or RAID Configuration User Guides posted on our web site at www.supermicro.com/support/manuals.

D-2 Configuring Supero Doctor III

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



Note 1: Both default username and password are **ADMIN**.

Note 2: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

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



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



Note: SD III Software 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 the Linux OS, we will still recommend that you use Supero Doctor II.

Notes

(Disclaimer)

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