SUPER®

SUPER S2QR6
SUPER S2QE6

USER'S MANUAL

1.0

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Printed in the United States of America.

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SUPER S2QR6/S2QE6 system boards. The SUPER S2QR6/S2QE6 supports Xeon Pentium III/II processors in one, two, three or four way configurations. Please refer to the support section of our web site (http://www.supermicro.com/TechSupport.htm) for a complete listing of supported processors.

Manual Organization

Chapter 1 provides a checklist of the components that should be included in the box your system board came in and describes the features, specifications and performance of the SUPER S2QR6/S2QE6.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and system memory and when mounting the S2QR6/S2QE6 in a chassis. Also refer to this chapter to connect the floppy and hard disk drives, the SCSI drives, the IDE interfaces, the parallel and serial ports and the twisted wires for the power supply, the reset button, the keylock/power LED, the speaker and the keyboard.

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

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

Appendix A offers information on BIOS error beep codes and messages.

Appendix B provides post diagnostic error messages.

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Chapter 1: Introduction

Chapter 2: Installation

Chapter 3: Troubleshooting

Chapter 4: BIOS/Setup

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Chapter 1
Introduction

1-1 Overview

Checklist

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

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

One (1) Supermicro Mainboard

One (1) ribbon cable for floppy drives

One (1) 40-pin IDE ribbon cable.

One (1) serial COM 2 cable (for S2QE6 only)

One (1) I/O backpanel shield

Two (2) Slot 2 CPU termination cards.

SCSI Accessories

- One (1) 50-pin Ultra SCSI cable
- One (1) 68-pin LVD SCSI cable
- One (1) set of SCSI driver diskettes
- One (1) SCSI manual

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

Two (2) DRMs (Dual Retention Mechanisms for the CPU - preinstalled)

One (1) User's Manual

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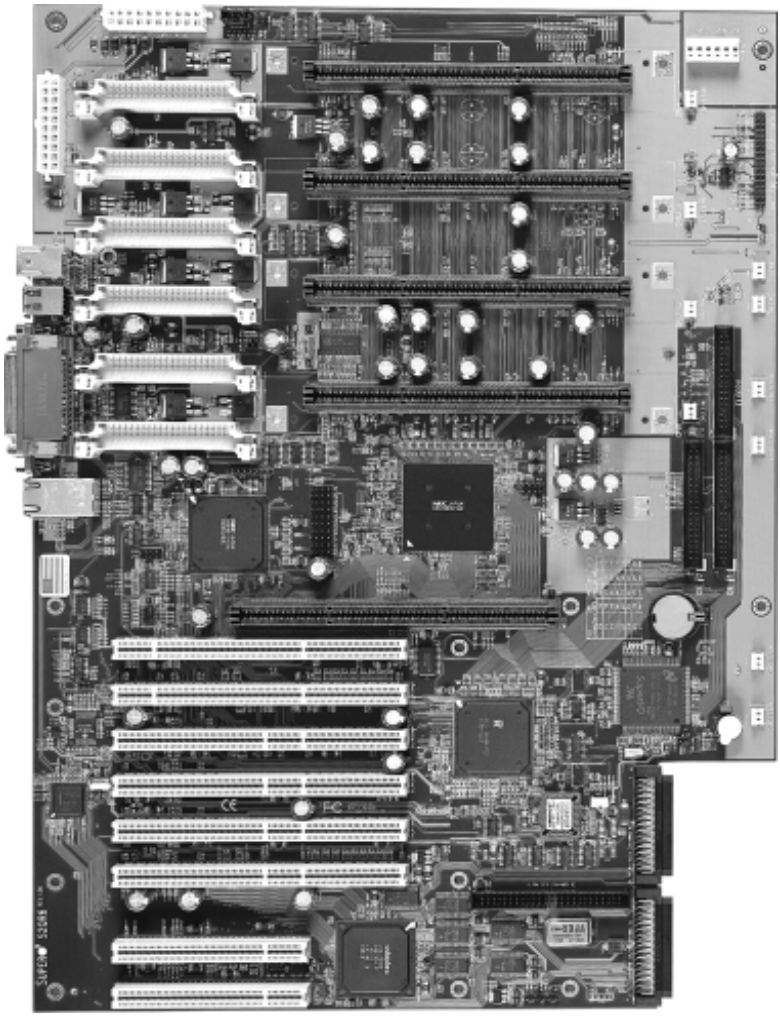
Notes

SUPER S2QR6

Figure 1-1. SUPER S2QR6 Image



SUPER S2QE6

Figure 1-2. SUPER S2QE6 Image

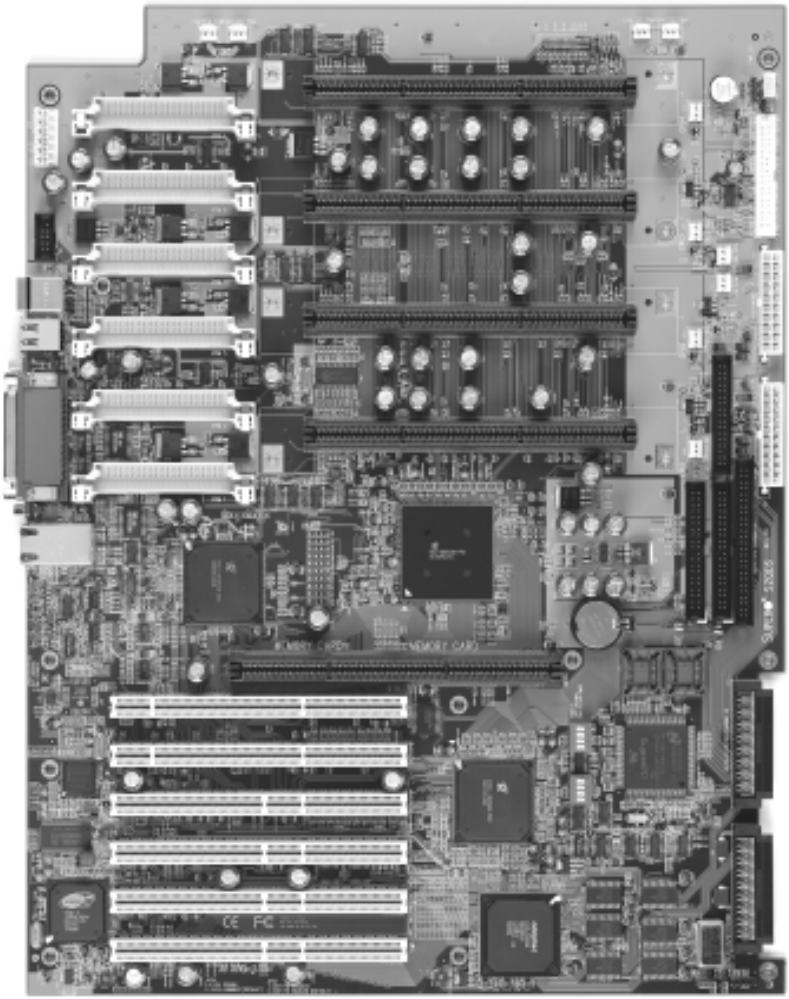
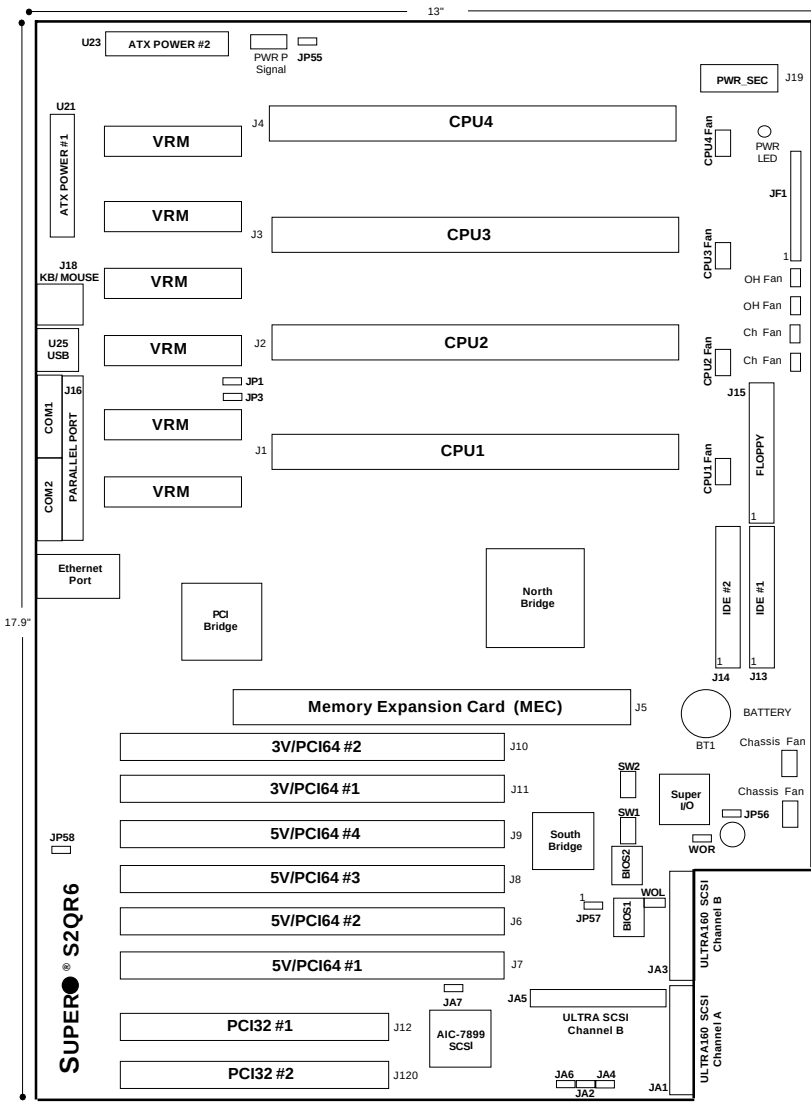


Figure 1-3. SUPER S2QR6 Layout
(not drawn to scale)



Also see the figure on page 2-9 for the locations of the Front Control Panel (JF1) Connectors and 2-10 for the locations of the I/O ports.

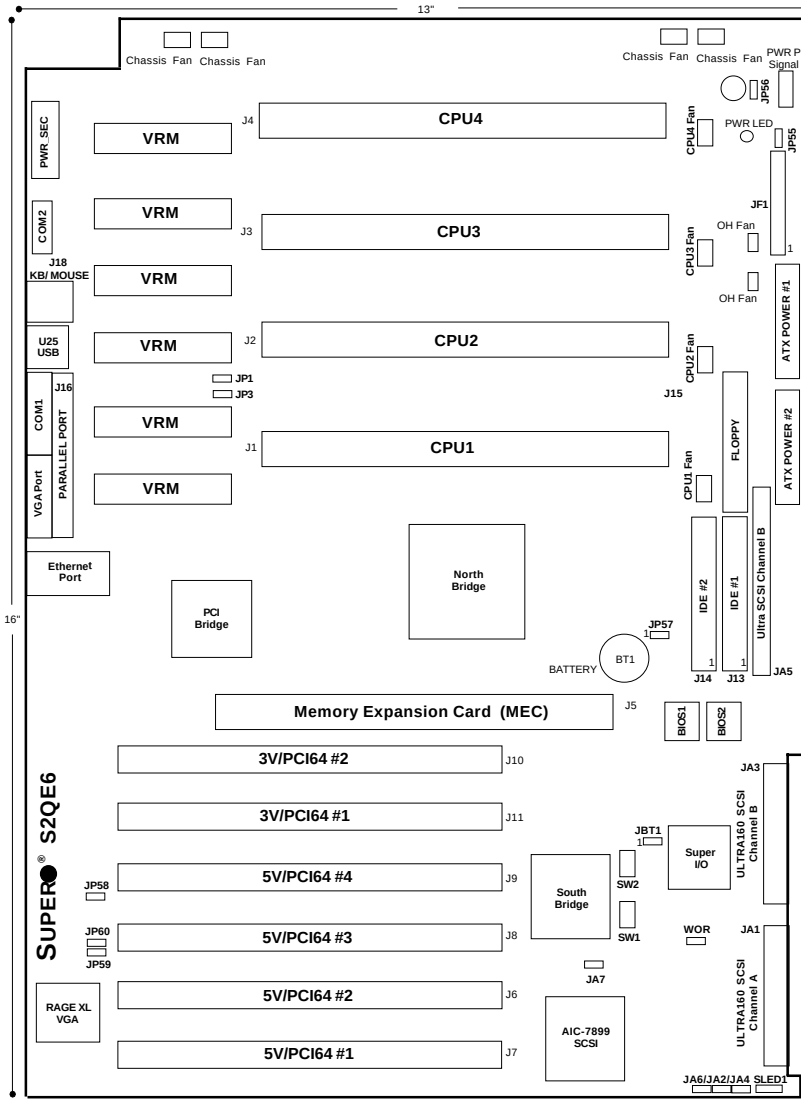
Jumper	Description	Default Setting
JA2	LVD SCSI Ch A Term. (p. 2-20)	Open (Enabled)
JA4	LVD SCSI Ch B Term. (p. 2-20)	Open (Enabled)
JA6	50pin SCSI Ch B Term. (p. 2-20)	Open (Enabled)
JA7	Onboard SCSI Enable (p. 2-20)	Open (Enabled)
JP1	Front Side Bus Speed (p. 2-18)	Closed (100 MHz)
JP3	Spread Spectrum Enable	Closed (Enabled)
JP55	3rd P/S Failure Alarm (p. 2-18)	Open (Disabled)
JP56	Buzzer Alarm (p. 2-19)	Closed (Enabled)
JP57	BIOS Select (p. 2-19)	Pin 1-2 (Pri. BIOS)
JP58	Onboard LAN (p. 2-19)	Open (Enabled)

DIP Switch	Description (p. 2-17)	Default Setting
Switch 1	(1-4) CPU/Core Bus Ratio	Only 4 ON (5.5x)
Switch 2	Manufacturer's Setting	All OFF

Connector	Description
ATX Power#1	Primary ATX Power Connector #1 (p. 2-11)
ATX Power#2	Primary ATX Power Connector #2 (p. 2-11)
CHASSIS FAN	Chassis Fan Header (4 total) (p. 2-15)
COM1/2	COM1/2 Serial Port Connector (p. 2-15)
CPU1/2/3/4 FAN	CPU 1/2/3/4 Fan Header (p. 2-15)
Ethernet Port	Ethernet Port (p. 2-16)
J1-J4	CPU Slots 1 through 4 (p. 2-2)
J13, J14	IDE Hard Disk Drive Connectors (p. 2-22)
J15	Floppy Disk Drive Connector (p. 2-21)
J16	Parallel Printer Port (p. 2-21)
J18	PS/2 Keyboard/Mouse (p. 2-15)
JA1	Ultra160 SCSI Connector (Ch A) (p. 2-23)
JA3	Ultra160 SCSI Connector (Ch B) (p. 2-23)
JA5	50-pin SCSI Connector (Ch B) (p. 2-22)
JF1	Front Control Panel (p. 2-9)
MEC	Memory Expansion Card Slot (p. 2-4)
OH FAN	Overheat Fan Header (2 total) (p. 2-15)
PWR P	Power Supply Fail Signal (p. 2-16)
PWR_SEC	Secondary ATX Power Connector (p. 2-11)
SLED	SCSI LED Indicator (p. 2-17)
U25	Universal Serial Bus Ports (p. 2-16)
WOR	Wake-on-Ring Header (p. 2-16)

Jumpers not indicated are for test purposes only.

Figure 1-4. SUPER S2QE6 Layout
(not drawn to scale)



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JA6	50pin SCSI Ch B Term. (p. 2-20)	Open (Enabled)
JA7	Onboard SCSI Enable (p. 2-20)	Open (Enabled)
JBT1	CMOS Clear (p. 2-19)	Pin 1-2 (Normal)
JP1	Front Side Bus Speed (p. 2-18)	Closed (100 MHz)
JP3	Spread Spectrum Enable	Closed (Enabled)
JP55	3rd P/S Failure Alarm (p. 2-18)	Open (Disabled)
JP56	Buzzer Alarm (p. 2-19)	Closed (Enabled)
JP57	BIOS Select (p. 5-22)	Pin 1-2 (BIOS 1)
JP58	Onboard LAN (p. 2-19)	Open (Enabled)
JP59	Onboard VGA Enable	Pin 2-3 (Enabled)
JP60	Onboard VGA Interrupt Enable	Pin 2-3 (Enabled)

DIP Switch	Description (p. 2-17)	Default Setting
Switch 1	(1-4) CPU/Core Bus Ratio	Only 4 ON (5.5x)
Switch 2	Manufacturer's Setting	All OFF

Connector	Description
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Ethernet Port	Ethernet Port (p. 2-16)
J1-J4	CPU Slots 1 through 4 (p. 2-2)
J13, J14	IDE Hard Disk Drive Connectors (p. 2-22)
J15	Floppy Disk Drive Connector (p. 2-21)
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PWR_SEC	Secondary ATX Power Connector (p. 2-11)
SLED	SCSI LED Indicator (p. 2-17)
U25	Universal Serial Bus Ports (p. 2-16)
VGA	Graphics (monitor) Port
WOR	Wake-on-Ring Header (p. 2-16)

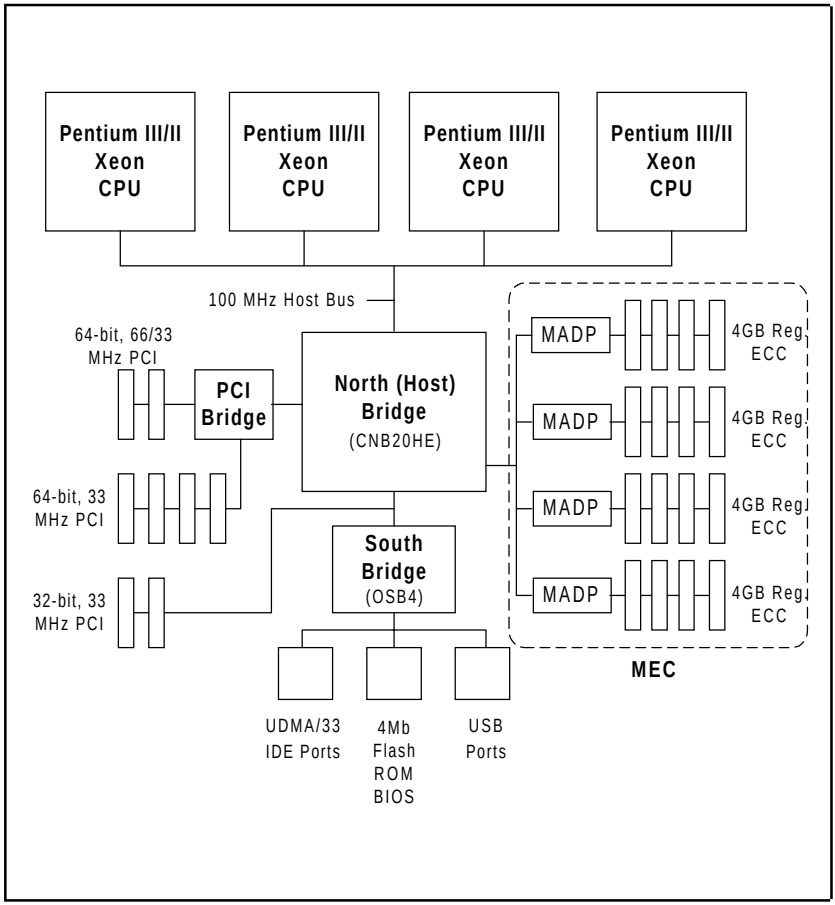


Figure 1-5. ServerWorks HE Classic Chipset: System Block Diagram

NOTE: The 32-bit PCI slots are included only on the S2QR6. See the following page for the actual specifications of each motherboard.

Features of the S2QR6/S2QE6

CPU

- Up to four Pentium III Xeon 400-700 MHz processors at 100 MHz bus speed and Cascades 5V/12V processors

  Note: Please refer to the support section of our web site for a complete listing of supported processors. (http://www.supermicro.com/TechSupport.htm)

Memory

- One MEC (Memory Expansion Card) having 16 168-pin DIMM sockets to support up to 16 GB registered ECC DIMMs (no unbuffered or non-ECC memory)

Chipset

- ServerWorks Enterprise ServerSet III HE chipset (see page 1-13 for details)

Expansion Slots

- Two 64-bit, 66/33 MHz PCI slots
- Four 32-bit, 33 MHz PCI slots
- Two 32-bit, 33 MHz PCI slots (S2QR6 only)

BIOS (Dual BIOS is optional)

- One (or two) 4 Mb Flash ROM BIOS chips
- APM 1.2, DMI 2.3, PCI 2.2 with PME support, ACPI 1.0, Plug and Play (PnP) 1.0A

PC Health Monitoring

- Eight onboard voltage monitors for CPU core, chipset voltage, +2.5V, +3.3V, +5V and +12V
- Four-fan status monitor with firmware/software on/off control
- Environmental temperature monitor and control
- Chassis intrusion header
- Power-up mode control for recovery from AC power loss
- System overheat LED and control
- System resource alert
- Hardware BIOS virus protection
- Auto-switching voltage regulator for the CPU cores

ACPI/PC 98 Features

- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Main switch override mechanism
- External modem ring-on
- CPU fan auto-off in sleep mode

Onboard I/O

- Dual channel Ultra160 SCSI
- 2 EIDE bus master interfaces support Ultra DMA/33
- Integrated ATI Graphics Controller (S2QE6 only)
- 1 floppy port interface (up to 2.88 MB)
- 2 Fast UART 16550A compatible serial ports
- 1 EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) supported parallel port
- PS/2 mouse and PS/2 keyboard ports
- 2 USB (Universal Serial Bus) ports

Other

- AOL2 (optional, see page 1-13)
- Internal/external modem ring-on
- Recovery from AC power loss control
- Wake-on-LAN (WOL)
- Multiple FSB clock frequency selections (set in BIOS)

CD Utilities

- BIOS flash upgrade utility
- Drivers for chipset utilities

Dimensions

- SUPER S2QR6 - SWTX: 17.9" x 13" (455 x 330 mm)
- SUPER S2QE6 - SWTX: 16" x 13" (406 x 330 mm)

1-2 Chipset Overview

The ServerWorks ServerSet™ III HE Classic is a high-performance core logic chipset that consists of a North Bridge and a South Bridge.

The North Bridge includes an integrated main memory subsystem and a dual channel PCI bus that bridges the processor bus to a 64-bit PCI bus and a 32-bit PCI bus. The North Bridge also packs and unpacks data for PCI accesses, which reserves more processor bandwidth for multiprocessor motherboards.

The South Bridge provides various integrated functions, including the PCI to ISA bridge and support for UDMA33, security (passwords and system protection), Plug & Play, USBs, power management, interrupt controllers and the SMBus.

The North and South Bridges communicate over a serial bus that uses the PCI clock as a timing reference. This serial bus uses a single pin on both bridges to send a 4-bit word for transmitting commands back and forth.

1-3 Special Features

Alert on LAN 2 (optional)

AOL2 ASIC brings an advanced level of management interface between a remote management console/server and the client system. It provides interfaces to the 82559 Ethernet controller chip and to system monitoring devices. AOL2 can send "Alert" messages to the mangagement console to notify administrators of important events or problems such as high temperatures, chassis intrusion and voltages exceeding safe margins.

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 BIOS on page 4-11 of this manual to change this setting. The default setting is Always OFF.

ATI Graphics Controller (S2QE6 only)

The S2QE6 has an integrated ATI video controller based on the Rage XL graphics chip. The Rage XL is the first accelerator in the world to provide integrated support for digital flat panel monitors. It contains 8 MB VGA memory and fully supports sideband addressing. Working with system memory, this onboard graphics package can provide a bandwidth of up to 1 GB/sec over a 64-bit interface.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER S2QR6/S2QE6. The board has an onboard System Hardware Monitor chip that supports PC health monitoring.

Eight Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, +2.5V, +3.3V, +5V and +12V

The onboard voltage monitor will scan these eight voltages continuously. Once a voltage becomes unstable, it will give a warning or send an error message to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Four-Fan Status Monitor with Firmware/Software On/Off Control

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

Environmental Temperature Control

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

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It can be turned off when the CPU is in sleep mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS (see page 4-17). This allows the user to define an overheat temperature. When this temperature is exceeded, both the overheat fan and the warning LED are triggered.

System Resource Alert

This feature is available when used with Intel's LANDesk Client Manager (optional). It 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.

Hardware BIOS Virus Protection

The system BIOS is protected by hardware so that no virus can infect the BIOS area. The user can only change the BIOS content through the flash utility provided by SUPERMICRO. This feature can prevent viruses from infecting the BIOS area and destroying valuable data.

Auto-Switching Voltage Regulator for the CPU Core

The auto-switching voltage regulator for the CPU core can support up to 20A current and auto-sense voltage IDs ranging from 1.3V to 3.5V. This will allow the regulator to run cooler and thus make the system more stable.

1-5 ACPI/PC 98 Features

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

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 98 and Windows NT 5.0. **Note:** To utilize ACPI, you must reinstall Windows 98. To reinstall Windows 98 with ACPI, enter DOS and type "setup /p J" at the CDROM prompt (usually D:\) with the Windows 98 CD loaded. (Make sure you include the spaces after "setup" and "p".) Then hit <Enter>. You can check to see if ACPI has been properly installed by looking for it in the Device Manager, which is located in the Control Panel in Windows.

Microsoft OnNow

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

Slow Blinking LED for Suspend-State Indicator

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

BIOS Support for USB Keyboard

If the USB keyboard is the only keyboard in the system, the USB keyboard will work like a normal keyboard during system boot-up.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button. When the user depresses the power button, the system will enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. The power will turn off and no power will be provided to the motherboard.

External Modem Ring-On

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

Wake-On-LAN (WOL)

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

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. The SUPER S2QR6/S2QE6 accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate.

From a system board point of view, the major power-consuming components are the processors and certain add-on cards. The system integrator should select an appropriate power supply after considering the power consumption and requirements of the major power-consuming components in the system. Generally speaking, one (1) Pentium III Xeon Cascades 2.8V

processor consumes a minimum of 17 amps from 2.8V.
Example: The 2.8V is converted from the supplied +5V and is considered to be 80% efficient for a 700 MHz processor.

17 amps / 0.8 / 5 x 2.8 = 11.9 amps consumed from the +5V supply

For a system with quad Pentium III Xeon 2.8V processors:

11.9 x 4 = 47.6 amps (for +5V); 47.6 + system components (eg. 10.0 amps) + add-on cards + drives + other devices = xamps (for +5V power supplies).

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. The power supply you choose should provide two (2) 10-pin power connectors, which should both be connected to the S2QR6/S2QE6. Also, 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 four 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.

It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

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

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

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

Notes

Chapter 2
Installation

Tools Required

The only tools you will need to install the S2QR6/S2QE6 into a chassis are a long and a short Philips screwdriver.

2-1 Handling the S2QR6/S2QE6 Motherboard

Static electrical discharge can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. Also note that the size and weight of the S2QR6/S2QE6 motherboard system board can cause it to bend if handled improperly, which may result in damage. To prevent the S2QR6/S2QE6 motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

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

Unpacking

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

2-2 Motherboard Installation

This section explains how to physically mount the S2QR6/S2QE6 into a chassis. To remove the motherboard, follow the procedure in reverse order. Following the steps in the order given will eliminate the most common problems encountered in such an installation.

1. **Installing metal standoffs:**
Check that the location of all the mounting holes on both the motherboard and the motherboard tray match. All motherboards have standard mounting holes to fit different types of chassis. Chassis may include a variety of mounting fasteners made of metal or plastic. Although a chassis may have both types, metal fasteners are the most highly recommended because they ground the motherboard to the chassis. For this reason, it is best to use as many metal fasteners as possible.

2. **Check compatibility of motherboard ports and I/O shield:**
The S2QR6/S2QE6 requires a chassis big enough to support a 13" x 18" motherboard, such as the Supermicro SC850 and SC840. Make sure that the I/O ports on the motherboard properly align with their respective holes in the I/O shield at the back of the chassis.

3. **Mounting the motherboard onto the motherboard tray:**
Carefully mount the motherboard to the motherboard tray by aligning the board holes with the metal standoffs you just installed. Insert screws into all the mounting holes provided and tighten until snug.

2-3 Installing Processors and DRMs

Before installing the Pentium III/II Xeon processors, both DRMs (Dual Retention Modules) must be bolted through the motherboard and into the chassis to protect the processors from shock and vibration.

1. Mounting fans to the DRMs (optional):

If your chassis provides good cooling, adding DRM fans is not necessary (Supermicro DRMs are aerodynamically designed to make the airflow generated by the system fans sufficient for system cooling). If you want to add fans, mount them *before* attaching the DRMs to the motherboard. Add two or four to each DRM - two should be enough in most cases.

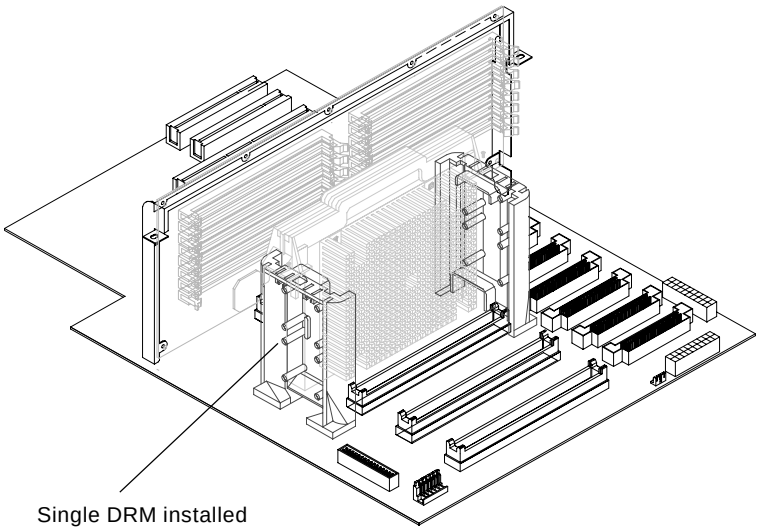
2. Installing DRMs (Dual Retention Modules):
Regardless of how many processors you will be using, both DRMs must be installed. Position the DRMs as indicated in Figure 2-1, using the pegs on their bases to help align the mounting holes to those on the motherboard. Then insert the DRM mounting screws through the motherboard and into the motherboard tray, where they should be secured to the standoffs.

3. Installing handlebar caps on the Xeon processors:
When attaching the caps (top cross pieces) to function as handlebars for the Xeon processors, make sure the two mounting screw holes on the top of each cap face inward. You should test the configuration of the units before mounting the caps.

4. Securing the processors:
Beginning with the CPU1 slot, slide the processor(s) into the DRMs and let it rest in the Slot 2 socket. Then insert the four DRM screws to the base of each DRM and secure the units by screwing them in firmly.

5. Empty processor slots:
Terminator cards (Supermicro p/n TMR-008) must be installed in the processor slot(s) left empty in 1, 2 and 3-way configurations.

Figure 2-1. Installing the DRMs



Removing the Pentium II/III Xeon Processors

To remove the Xeon processors from the motherboard, follow the installation process in reverse order.

When removing a Pentium II/III Xeon processor, avoid pressing down on the motherboard or any of its components.

2-4 Installing Memory in the MEC

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. The MEC must be populated in the manner described in Step 2 below.

Memory Support: The S2QR6/S2QE6 supports 128MB/256MB/ 512MB/ and 1 GB registered ECC DIMM memory modules. Non-ECC or unbuffered SDRAM memory are not supported.

1. Removing the MEC (Memory Expansion Card):
You should remove the MEC whenever installing or removing DIMMs. The MEC is attached to a retention plate with seven screws. Do not remove these. Instead, remove only the two screws that secure the MEC retention plate to the chassis. After removing the board, place it on an antistatic bag before inserting the DIMMs.

2. Populating the MEC:
Important: Because memory is accessed by a four-way interleaving scheme, you must install modules four at a time and in the order shown in Figure 2-2 and described here: If four DIMMs are to be installed, you must populate the four Bank0 slots. If eight are to be installed, you must populate the four Bank0 and the four Bank1 slots, and so on. All four DIMMs installed in a single bank must be the same brand, type, size and speed.

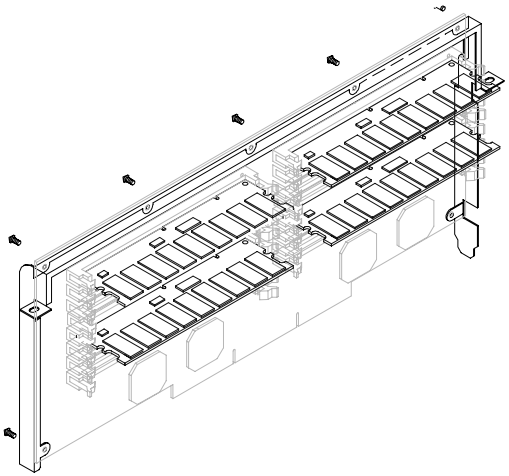
3. Inserting DIMMs:
Insert each DIMM module vertically into its slot. Pay attention to the two notches along the bottom of the module to prevent inserting the DIMM module incorrectly. Gently press down on the DIMM module until it snaps into place in the slot (see Figure 2-3). If you use too much pressure

when inserting the DIMMs you may bend and damage the MEC.

4. Installing the MEC:

After populating the MEC, carefully install it back into its slot on the motherboard, making sure it is fully seated. Finish by tightening the two screws that secure the retention plate to the chassis.

Figure 2-2. Populating the MEC
(Four DIMM installation shown)



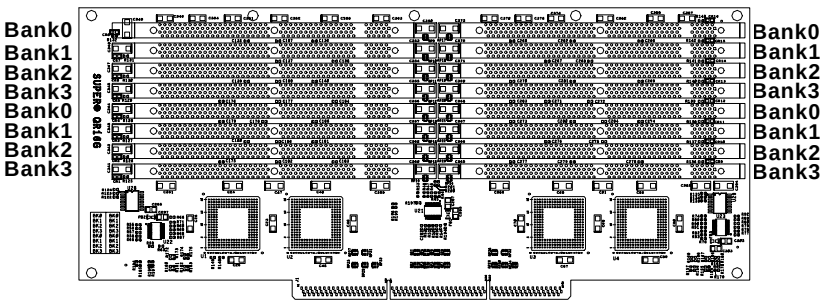
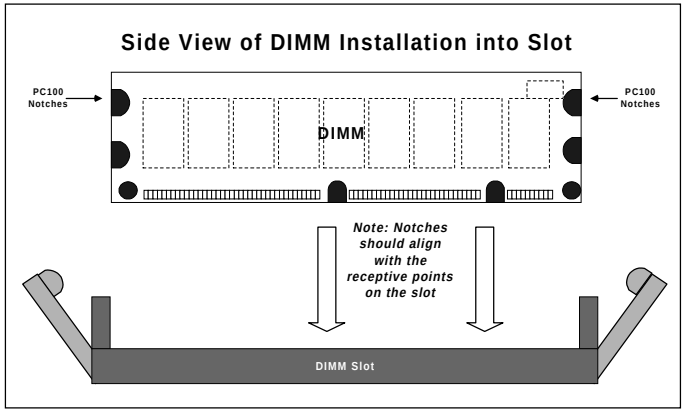
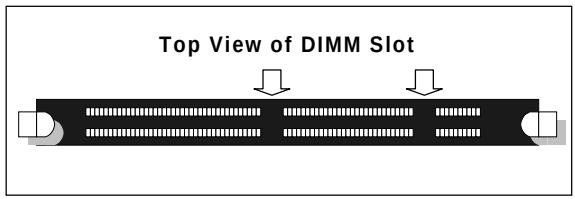


Figure 2-3. DIMM Installation into Socket



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the two notches.



To Remove:
Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.

2-5 Adding PCI Cards

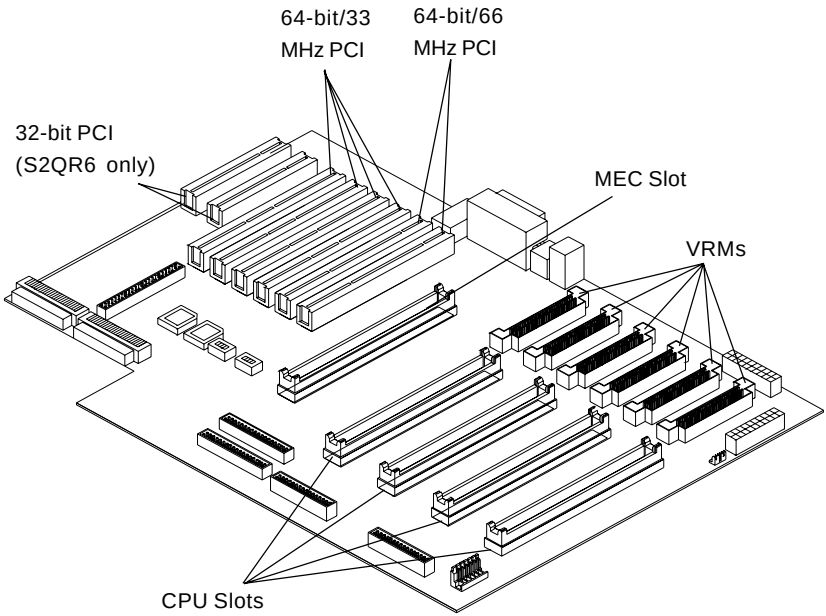
1. 64-bit PCI slots:

The S2QR6/S2QE6 has six 64-bit PCI slots. Two of these are 66 MHz slots that are keyed to only accept 66 MHz, 3V PCI cards. The other four 64-bit slots run at 33 MHz and are backward compatible with 32-bit cards. The S2QR6 also has two 32-bit PCI slots.

2. PCI card installation:

You are now ready to install your PCI add-on cards. Make sure you choose the correct slot for the type of card you are installing (see step 1). First, remove the I/O shield for the proper slot. Then fully seat the card into the slot, pushing down with your thumbs on both sides of the card. Finish by using a screw to secure the top of the card shield to the chassis. The I/O shields protect the motherboard and its components from EMI and aid in proper ventilation, so make sure all the PCI slots have a shield in place.

Figure 2-4. Adding PCI Cards



2-6 Connecting Cables

Now that the motherboard, memory and add-on cards are installed, the next step is to connect the cables to the S2QR6/S2QE6. These include the data (ribbon) cables for the peripherals and front control panel, the power fail signal (PWR P) cable and the power cables.

Connecting Data Cables

Most of the ribbon cables used to transfer data should be routed from the motherboard to the drive bay side of the chassis. Connect these to the motherboard first (make sure the red wires connect to the pin 1 locations) and then route them through to the drive bay side of the chassis. Pull any excess cabling through to the drive bay side to provide an unobstructed airflow to the motherboard and processors. The following data cables (with their locations noted) should be connected. (See the layouts on page 1-6,8 for connector locations.)

- IDE Device Cables (J13 and J14)
- Floppy Drive Cable (J15)
- SCSI Device Cables (JA1, JA3 and JA5)
- Front Control Panel Cable (JF1, see next page)
- Power Fail Signal Cable (PWR P)

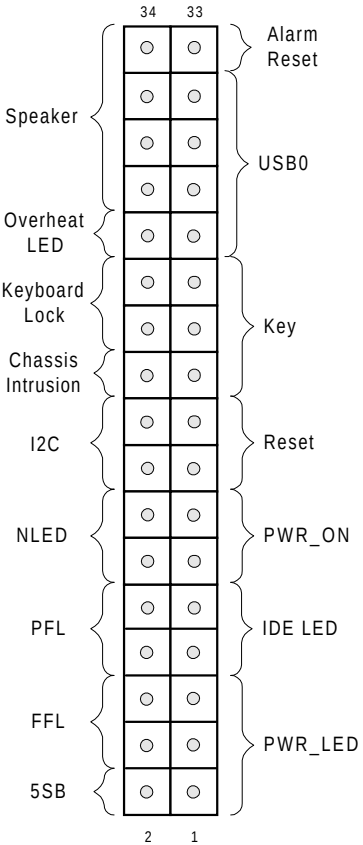
Connecting Power Cables

The S2QR6/S2QE6 has two primary power supply connectors: ATX Power #1 and ATX Power #2. You must connect both the primary *and* the secondary ATX power connectors to your power supply. A third power connector (PWR_SEC) is included for extremely power hungry system configurations. It requires a 6-pin power connector. See the layouts on page 1-6,8 for connector locations.

Front Control Panel Connections

The JF1 header on the S2QR6/S2QE6 contains header pins for various front control panel connectors. See Figure 2-5 for the specific locations of the speaker, overheat LED, keyboard lock, chassis intrusion, I2C, network activity LED, power fail, fan fail, 5v standby, power LED, IDE drive activity LED, power on LED, reset switch, USB0 and alarm reset headers. Note that even and odd numbered pins are on opposite sides of the connector. See pages 2-11 to 2-14 for details and pin descriptions.

Figure 2-5. Front Control Panel Connectors

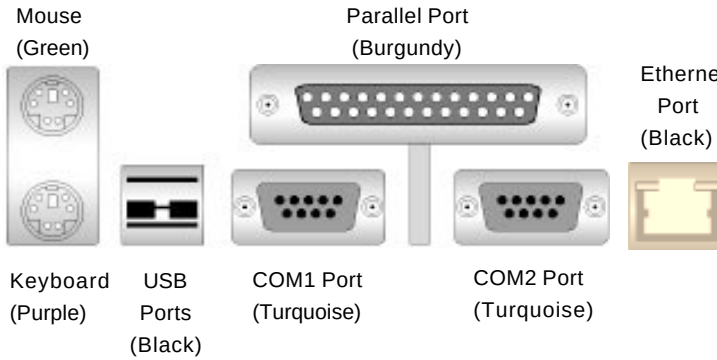


JF1

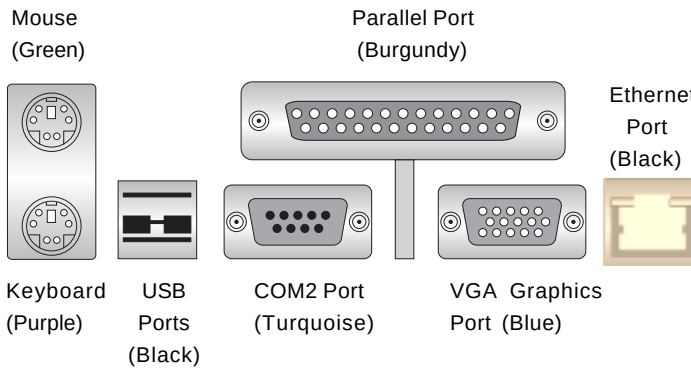
I/O Port Connector Locations

The I/O ports on the S2QR6/S2QE6 are color coded in conformance with the PC 99 specification. See Figure 2-6 below for the colors and locations of the various I/O ports.

Figure 2-6. I/O Port Locations and Definitions



S2QR6 Ports



S2QE6 Ports

2-7 Connector Definitions

Power Supply Connectors

The S2QR6/S2QE6 has two primary power supply connectors: at U21 and U23. You should connect power to both of these two primary connectors. Each 20-pin power connector can handle up to 9 amps maximum. See Table 2-1 for pin definitions.

Table 2-1
ATX Power Supply Connector
Pin Definitions (U21, U23)

Pin Number	Definition	Pin Number	Definition
1	3.3V	11	3.3V
2	3.3V3	12	-12V
3	Ground	13	Ground
4	5V	14	PS-ON
5	Ground	15	Ground
6	5V	16	Ground
7	Ground	17	Ground
8	PW-OK	18	-5V
9	5VSB	19	5V
10	12V	20	5V

Secondary Power Connector

Use of the secondary power connector (PWR_SEC) is recommended when a heavy load of peripherals has been added to the motherboard. This connector can handle up to 5 amps maximum. See Table 2-2 for pin definitions. ***Note: Be sure to use a 6-pin connector and check the power supply layout before attaching it.***

Table 2-2
Secondary Power Connector
(PWR_SEC)

Pin Number	Definition
1	Ground
2	Ground
3	Ground
4	+3.3V
5	+3.3V
6	+5V (keyed)

Power LED

The Power LED connection is located on pins 1, 3 and 5 of JF1. See Table 2-3 for pin definitions and Figure 2-5 for pin locations.

Table 2-3
PWR_LED Pin
Definitions (JF1)

Pin Number	Definition
1	+5V
3	Key
5	GND

Fan Fail LED (FFL)

The Fan Fail LED connection is located on pins 2 and 4 of JF1. See Table 2-4 for pin definitions and Figure 2-5 for pin locations.

Table 2-4
Fan Fail LED
Pin Definitions
(JF1)

Pin Number	Definition
4	+5V
6	Ground

IDE LED

The IDE Drive LED connection is located on pins 7 and 9 of JF1. This will send an indication of IDE disk activity to the front control panel. See Table 2-5 for pin definitions and Figure 2-5 for pin locations.

Table 2-5
IDE_LED Pin Definitions (JF1)

Pin Number	Definition
7	+5V
9	HD Active

Power Fail LED (PFL)

The Power Fail LED connection is located on pins 8 and 10 of JF1. See Table 2-6 for pin definitions and Figure 2-5 for pin locations.

Table 2-6
Power Fail LED Pin Definitions (JF1)

Pin Number	Definition
8	+5V
10	Ground

PWR_ON

The PWR_ON connection is located on pins 11 and 13 of JF1. Momentarily contacting both pins will power on/off the system (based on the power management scheme of your operating system). See Table 2-7 for pin definitions and Figure 2-5 for pin locations.

Table 2-7
PWR_ON Connector Pin Definitions (JF1)

Pin Number	Definition
11	PW_ON
13	Ground

NIC_LED

The Network Interface Controller LED connection is located on pins 12 and 14 of JF1. This header is used to display network activity. See Table 2-8 for pin definitions and Figure 2-5 for pin locations.

Table 2-8
NIC_LED Pin Definitions (JF1)

Pin Number	Definition
12	+5V
14	GND

Reset

The Reset connection is located on pins 15 and 17 of JF1. This connector attaches to the hardware reset switch on the computer chassis. See Table 2-9 for pin definitions and Figure 2-5 for pin locations.

Table 2-9
Reset Pin Definitions (JF1)

Pin Number	Definition
15	Reset
17	Ground

Chassis Intrusion (CI)

A Chassis Intrusion connection is located on pin 20 of JF1. If a chassis intrusion condition has been detected, a message will be sent to notify the system administrator. See Table 2-10 for pin definitions and Figure 2-5 for pin locations.

Table 2-10
Chassis Intrusion (CI) Pin Definitions (JF1)

Pin Number	Definition
20	Intrusion Input

Keyboard Lock

The Keyboard Lock connection is located on pins 22 and 24 of JF1. See Table 2-11 for pin definitions and Figure 2-5 for pin locations.

Table 2-11
Keyboard Lock Pin Definitions (JF1)

Pin Number	Definition
22	Kybd Inhibit
24	GND

Extra Universal Serial Bus Connection (USB0)

An additional connection for USB0 is included on pins 25, 27, 29 and 31 of JF1 for front side USB access. You cannot have devices connected to both this and the upper port on U25. See Table 2-12 for pin definitions and Figure 2-5 for pin locations.

Note: You will need a USB cable (not included) to use this connection.

Table 2-12
USB0 Pin Definitions (JF1)

Pin Number	Definition
25	+5V
27	PO-
29	PO+
31	Ground

Overheat LED (OH)

Connect an LED to the OH connection on pin 26 of JF1 to provide advanced warning of chassis overheating. Refer to Table 2-13 for pin definitions and Figure 2-5 for pin locations.

Table 2-13
Overheat LED (OH)
Pin Definitions (JF1)

Pin Number	Definition
26	OH Input

Speaker

The speaker connection is located on pins 28, 30, 32 and 34 of JF1. See Table 2-14 for pin definitions and Figure 2-5 for pin locations.

Table 2-14
Speaker Connector
Pin Definitions (JF1)

Pin Number	Definition
28	Power
30	NC
32	NC
34	Data

Alarm Reset

Pin 33 of JF1 provides a connection for a switch to disable the system's audible alarm, which indicates either a chassis overheat condition, a power supply failure or a fan failure. The alarm reset switch will only disable the audible alarm; the alarm LED corresponding to the alarm will remain illuminated until corrective actions have been taken. See Table 2-15 for pin definitions and Figure 2-5 for pin locations.

Table 2-15
Alarm Reset Switch
Pin Definitions (JF1)

Pin Number	Definition
33	Alarm Input

Fan Headers*

There are several fan headers on the S2QR6/S2QE6 to provide cooling for various components. In addition to one fan header for each processor, there are two overheat and four chassis fan headers. See the motherboard layout on page 1-6,8 for locations. Refer to Table 2-16 for pin definitions. **Note: The maximum current limitation for the onboard fans is 0.35 amps for each, not to exceed 1.2 amps for any group of four fans (i.e. the four CPU fans or the four chassis fans).**

Table 2-16
Fan Header Pin Definitions
(CPU, CHASSIS and OH FANs)

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

* Caution: These fan headers are DC power.

Serial Ports

There are two serial connectors on the motherboard. COM1 is located below the parallel port. COM2 is located below the parallel port on the S2QR6 (see Figure 2-8) and is included as a header beside the mouse port on the S2QE6 (see page 1-8). See Table 2-17 for pin definitions.

Table 2-17
Serial Port Pin Definitions
(COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	Ground
5	Serial Out	10	NC

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J18. See Table 2-18 for pin definitions. (The mouse port is above the keyboard port. See Figure 2-8.)

Table 2-18
PS/2 Keyboard and Mouse Port Pin Definitions
(J18)

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

Universal Serial Bus (USB)

Two USB connectors are located on U25; USB0 is on the bottom and USB1 is on the top. **Note: USB0 is shared with pins 25, 27, 29 and 31 of JF1 (see page 2-9). Only one of these two connections may be used at one time.**

USB0/USB1 Ports

Ethernet Port

An Ethernet port is located beside the COM2/VGA port on the I/O backplane. This port accepts an RJ45 cable.

RJ45 Ethernet Port

Wake-On-Ring

Wake-on-Ring allows your computer to be "woken up" by an incoming call when in the suspend state. Refer to Table 2-19 for pin definitions. The S2QR6/S2QE6 meets the PCI 2.2 standard, which provides the PME function to support WOR and WOL. **Note: You must also have a WOR card and cable to use WOR.**

Table 2-19
Wake-on-Ring Pin Definitions (WOR)

Pin Number	Definition
1	Ground
2	Wake-up

PWR P Header

Connect a four-pin connector from the power supply to the PWR P header on the motherboard to provide notification of a system power supply failure. If your system does not have three power supply units, you should disable this with JP55 to prevent false alarms. **See Table 2-20 for the pin definitions of the PWR P header. (The power supplies are numbered from top to bottom.)**

Table 2-20
PWR P Header Pin Definitions

Pin Number	Definition
1	P/S1 signal
2	P/S2 signal
3	P/S3 signal
4	Reset

SLED (SCSI LED) Indicator

The SLED connector is used to provide an LED indication of SCSI activity. Refer to Table 2-21 for connecting the SCSI LED.

Table 2-21
SLED (SCSI LED) Pin Definitions

Pin Number	Definition
1	Positive
2	Negative
3	Negative
4	Positive

2-8 DIP Switch Settings

DIP Switch 1: Core/Bus Ratio

Two DIP switches labeled SW1 and SW2 are located on the S2QR6/S2QE6. Each has four individual switches. The four on Dip Switch 1 are used to set the core/bus ratio.

The example on the right will show you which CPU Core/Bus Ratio to use. The general rule is to divide the CPU speed by the bus speed (100 MHz only). If you have a 550 MHz CPU, dividing it by a 100 Mhz front side bus will give you a CPU Core/BUS Ratio of 5.5. After determining the CPU Core/Bus Ratio, refer to Table 2-22 for the correct settings of DIP switch 1.

Note: Most Intel processors have a fixed Core/Bus ratio that will overwrite the setting of DIP Switch 1.

Table 2-22
CPU Core/Bus Ratio Selection (DIP Switch1)

CPU Core/ Bus Ratio	SW1 #4	SW1 #3	SW1 #2	SW1 #1
2.0	ON	ON	ON	ON
3.0	ON	ON	OFF	ON
4.0	ON	OFF	ON	ON
4.5	ON	OFF	ON	OFF
5.0	ON	OFF	OFF	ON
5.5	ON	OFF	OFF	OFF
6.0	OFF	ON	ON	ON
6.5	OFF	ON	ON	OFF
7.0	OFF	ON	OFF	ON
7.5	OFF	ON	OFF	OFF
8.0	OFF	OFF	ON	ON

550 (MHz) / 100 (MHz) = 5.5

CPU Speed / Bus Freq. = Ratio

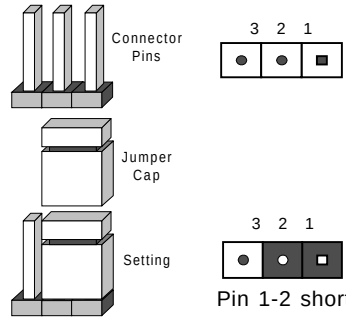
DIP Switch 2

Only DIP switch 1 is functional at this time. DIP switch 2 should be left as set by the manufacturer.

2-9 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.



Front Side Bus Speed

JP1 sets the FSB speed. Since the S2QR6/S2QE6 only runs at a 100 MHz front side bus speed, you do not need to change this setting. Table 2-23 describes the jumper settings.

Table 2-23
Front Side Bus Speed
Jumper Settings (JP1)

Jumper Position	Definition
OFF	Auto
ON	100 MHz

* Note: The Auto setting allows the CPU to set the speed.

Power Supply Failure Alarm Enable/Disable

The system will notify you in the event of a power supply failure. This feature assumes that three power supply units are installed in the chassis, with one acting as a backup. If you only have one or two power supply units installed, you will want to disable this with JP55 to prevent false alarms. You must connect the PWR P cable for this feature (see page 2-16). The default setting is enabled. See Table 2-24 for jumper settings.

Table 2-24
Power Supply Failure Alarm Enable/Disable Jumper Settings (JP55)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

Overheat Buzzer Alarm Enable/Disable

JP56 gives you the option of disabling the audio alarm signal that notifies you of power failure, fan failure and overheat conditions. If disabled, you will still be notified of such conditions by the LED corresponding to the fault. The default setting is enabled. See Table 2-25 for jumper settings.

Table 2-25
Overheat Alarm Enable/Disable Jumper Settings (JP56)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

CMOS Clear (S2QE6 only)

Refer to Table 2-26 for setting JBT1 to clear CMOS. Always remove the AC power cord from the system before clearing CMOS.

Table 2-26
CMOS Clear Jumper Settings (JBT1)

Jumper Position	Definition
1-2	Normal
2-3	CMOS Clear

BIOS Select (Dual BIOS is optional)

The S2QR6/S2QE6 has two BIOS chip sockets to provide a backup (backup chip optional) if the BIOS becomes corrupted. Switching from one BIOS chip to the other is done manually with jumper JP57. BIOS chip #1 is the default setting. See Table 2-27 for jumper settings.

Table 2-27
BIOS Select Jumper Settings (JP57)

Jumper Position	Definition
1-2	BIOS 1
2-3	BIOS 2

Onboard LAN/NIC Enable/Disable

Change the setting of jumper JP58 to enable or disable the onboard LAN or NIC (Network Interface Card) on your motherboard. See Table 2-28 for jumper settings.

Table 2-28
Onboard LAN/NIC Enable/Disable Jumper Settings (JP58)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LVD Channel A SCSI Termination Enable/ Disable

Jumper JA2 allows you to enable or disable termination for the LVD Channel A SCSI connector. The normal (default) position is open to enable SCSI termination. See Table 2-29 for jumper settings.

Table 2-29
LVD CH A SCSI Termination Jumper Settings (JA2)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LVD Channel B SCSI Termination Enable/ Disable

Jumper JA4 allows you to enable or disable termination for the LVD Channel B SCSI connector. The normal (default) position is open to enable SCSI termination. See Table 2-30 for jumper settings.

Table 2-30
LVD CH B SCSI Termination Jumper Settings (JA4)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

50-pin Legacy Channel B SCSI Termination Enable/ Disable

Jumper JA6 allows you to enable or disable termination for the 50-pin Channel B SCSI connector. The normal (default) position is open to enable SCSI termination. See Table 2-31 for jumper settings.

Table 2-31
50-pin Legacy CH B SCSI Termination Jumper Settings (JA6)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

SCSI Enable/Disable

Jumper JA7 allows you to enable or disable all onboard SCSI. The normal (default) position is open to enable SCSI operation. See Table 2-32 for jumper settings.

Table 2-32
SCSI Enable/Disable Jumper Settings (JA7)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

2-10 Parallel Port, Floppy/Hard Disk Drive and SCSI Connections

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

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

Parallel Port Connector

The parallel port is located on J16 and requires a 26-pin ribbon cable for operation. See Table 2-33 for pin definitions.

Table 2-33
Parallel (Printer) Port Pin Definitions
(J16)

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

Floppy Connector

The floppy connector is located on J15 and requires a 34-pin ribbon cable for operation. See Table 2-34 for pin definitions.

Table 2-34
Floppy Connector Pin Definitions (J15)

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

IDE Connectors

There are no jumpers to configure the onboard IDE connectors J13 and J14. Refer to Table 2-35 for pin definitions.

Table 2-35
IDE Connector Pin Definitions
(J13, J14)

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

50-pin Legacy SCSI Connector

Refer to Table 2-36 for pin definitions of the 50-pin Legacy SCSI connector located at JA5.

Table 2-36
50-pin Legacy SCSI Connector Pin Definitions
(JA5)

Pin Number	Function	Pin Number	Function
1	GND	26	-DB (0)
2	GND	27	-DB (1)
3	GND	28	-DB (2)
4	GND	29	-DB (3)
5	GND	30	-DB (4)
6	GND	31	-DB (5)
7	GND	32	-DB (6)
8	GND	33	-DB (7)
9	GND	34	-DB (P)
10	GND	35	GND
11	GND	36	GND
12	Reserved	37	Reserved
13	Open	38	Termpwr
14	Reserved	39	Reserved
15	GND	40	GND
16	GND	41	-ATN
17	GND	42	GND
18	GND	43	-BSY
19	GND	44	-ACK
20	GND	45	-RST
21	GND	46	-MSG
22	GND	47	-SEL
23	GND	48	-C/D
24	GND	49	-REQ
25	GND	50	-I/O

Ultra160 SCSI Connectors

Refer to Table 2-37 for pin definitions for the Ultra160 SCSI connectors located at JA1 and JA3.

Table 2-37
68-pin Ultra160 SCSI Connectors (JA1, JA3)

Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

2-11 IRQs

Some PCI bus mastering devices share IRQs (Interrupt Requests) without performance penalties. See Table 2-38 for details on shared IRQs.

Table 2-38. IRQs

32-bit PCI#1 (J12) and 32-bit PCI#2 (J120) share IRQs 10 and 11 (S2QR6).
64-bit/33 MHz PCI#1 (J7) shares IRQ0 with the onboard SCSI.
64-bit/33 MHz PCI#2 (J6) has a dedicated IRQ.
64-bit/33 MHz PCI#3 (J8) has a dedicated IRQ.
64-bit/33 MHz PCI#4 (J9) has a dedicated IRQ.
64-bit/66 MHz PCI#1 (J11) has a dedicated IRQ.
64-bit/66 MHz PCI#2 (J10) has a dedicated IRQ.
The onboard LAN has a dedicated IRQ.

2-12 Installing Software Drivers

After all the hardware has been installed you must install the software drivers. The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard. After inserting this CD into your CDROM drive, a driver display screen should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CDROM drive. Finally, double click on the S "Setup" icon.)

Click the icons showing a hand writing on paper to view the readme files for each item. Click the tabs to the right of these *in order from top to bottom* to install each item one at a time. **After installing each item marked "Reboot System", you must reboot the system before moving on to the next item on the list.** You should install everything here except for the Security Drivers and the Super Doctor utility, which are optional. The Security Drivers support multiple languages. Click the arrow to pull down a menu of choices. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Chapter 3
Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. **Note: Always disconnect the power cord before adding, changing or installing any hardware components.**

Before Power On

1. Make sure no short circuits exist between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install a CPU (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)

No Power

1. Make sure no short circuits exist between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

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

NOTE

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

Memory Errors

1. Make sure the DIMM modules are properly and fully installed into the MEC. Interleaved memory requires that modules must be installed in groups of four (four slots at a time and in specific banks. See Chapter 2, Section 4).
2. Determine if DIMM modules of different speeds have been installed and verify that the BIOS setup is configured for the fastest speed of RAM used. It is recommended that all DIMM modules in the system be the same speed.
3. Make sure you are using PC133 or PC100 compliant, unbuffered SDRAM. EDO SDRAM is not supported.
4. Check for bad DIMM modules or slots by swapping a single module between both slots and noting the results.
5. Make sure all memory modules are fully seated in their slots.
6. Check the power supply voltage 115V/230V switch.

Losing the System's Setup Configuration

1. Check the setting of jumper JBT1. Ensure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Chapter 1, Section 5 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

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

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

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

3. If you still cannot resolve the problem, include the following information when contacting Super Micro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version
   (this can be seen on the initial display when your system first boots up)
   - System configuration
   An example of a Technical Support form is on our web site at http://www.supermicro.com/techsupport/contact_support.htm.
4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com or by fax at (408) 895-2012.

3-3 Frequently Asked Questions

Question: What are the various types of memory that the S2QR6/ S2QE6 motherboard can support?

Answer: The S2QR6/S2QE6 requires the use of an MEC (Memory Expansion Card). The MEC has 16 DIMM slots that support 168-pin, unbuffered 3.3V SDRAM and ECC (Error-Correcting Code) memory. (Check the Memory ECC Mode in BIOS to enable the use of ECC.) Modules of 128MB/256MB/ 512MB and 1 GB can be installed in the MEC, meaning that you can populate it with up to a full 16 GB of SDRAM. Note that while both PC133 and PC100 memory are supported, they will offer the same performance since the chipset has a 100 MHz memory bus. Modules must be installed in groups of four (four slots at a time and in specific slots) because interleaved memory technology is used. See Chapter 2 Section 4 for details on properly populating the MEC.

Question: How do I update my BIOS?

Answer: It is recommended that you **do not** upgrade your BIOS if you are experiencing no problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com. Please check our BIOS warning message and the info on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your BIOS before downloading. Select your motherboard model and download the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the fwhflash.com (BIOS flash utility) and the BIOS image (xxxxxx.rom) files. Copy these files onto a bootable floppy and reboot your system. It is not necessary to set BIOS boot block protection jumpers on the motherboard. At the DOS prompt, enter the command "fwhflash." This will start the flash utility and give you an opportunity to save your current BIOS image. Flash the boot block and enter the name of the update BIOS image file.

Note: It is important to save your current BIOS and **rename it "super.rom"** in case you need to recover from a failed BIOS update. Select flash boot block, then enter the update BIOS image. Select "Y" to start the BIOS flash procedure and do not disturb your system until the flash utility displays that the procedure is complete. After updating your BIOS, please clear the CMOS then load Optimal Values in the BIOS.

Question: After flashing the BIOS my system does not have video. How can I correct this?

Answer: If the system does not have video after flashing your new BIOS, it indicates that the flashing procedure failed. To remedy this, first clear CMOS per the instructions in this manual and retry the BIOS flashing procedure. If you still do not have video, please use the following **BIOS Recovery Procedure**. First, make sure jumper JP6 is disabled. Then, turn your system off and place the floppy disk with the saved BIOS image file (see above FAQ) in drive A. Press and hold <CTRL> and <Home> at the same time, then turn on the power with these keys pressed until your floppy drive starts reading. Your screen will remain blank until the BIOS program is done. If the system reboots correctly, then the recovery was successful. The **BIOS Recovery Procedure** will not update the boot block in your BIOS.

Question: Do I need the CD that came with your motherboard?

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

chipset drivers for Windows and security and audio drivers.

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

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

Question: I see some of my PCI devices sharing IRQs, but the system seems to be fine. Is this correct or not?

Answer: Some PCI Bus Mastering devices can share IRQs without performance penalties. These devices are designed to work correctly while sharing IRQs. See Table 3-1 below for details on shared IRQs.

Table 3-1. Shared IRQs

32-bit PCI#1 (J12) and 32-bit PCI#2 (J120) share IRQs 10 and 11 (S2QR6).
64-bit/33 MHz PCI#1 (J7) shares IRQ0 with the onboard SCSI.
64-bit/33 MHz PCI#2 (J6) has a dedicated IRQ.
64-bit/33 MHz PCI#3 (J8) has a dedicated IRQ.
64-bit/33 MHz PCI#4 (J9) has a dedicated IRQ.
64-bit/66 MHz PCI#1 (J11) has a dedicated IRQ.
64-bit/66 MHz PCI#2 (J10) has a dedicated IRQ.
The onboard LAN has a dedicated IRQ.

3-4 Returning Merchandise for Service

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

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

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

Chapter 4
BIOS

4-1 Introduction

This chapter describes the AMIBIOS for the Super S2QR6/S2QE6 system board. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Refer to the Manual Download area of our web site for any changes to BIOS that are not reflected in this manual.

Configuration Data

The original IBM AT had 64 kbytes of non-volatile memory storage in CMOS RAM. All AT-compatible systems have at least 64 kbytes of CMOS RAM, which is usually part of the Real Time Clock.

How Data Is Configured

AMIBIOS provides a Setup utility in ROM that is accessed by pressing <Del> at the appropriate time during system boot. Setup configures data in CMOS RAM.

POST Memory Test

Normally, the only visible POST routine is the memory test. The screen that appears when the system is powered on is shown on the next page.

A BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

4-2 BIOS Features

- Supports Plug and Play V1.0A and DMI 2.3
- Supports Intel PCI 2.2 (Peripheral Component Interconnect) local bus specification
- Supports Advanced Power Management (APM) specification v 1.1
- Supports ACPI
- Supports Flash ROM

AMIBIOS supports the LS120/zip drive:

- Can be used as a boot device
- Is accessible as the next available floppy drive

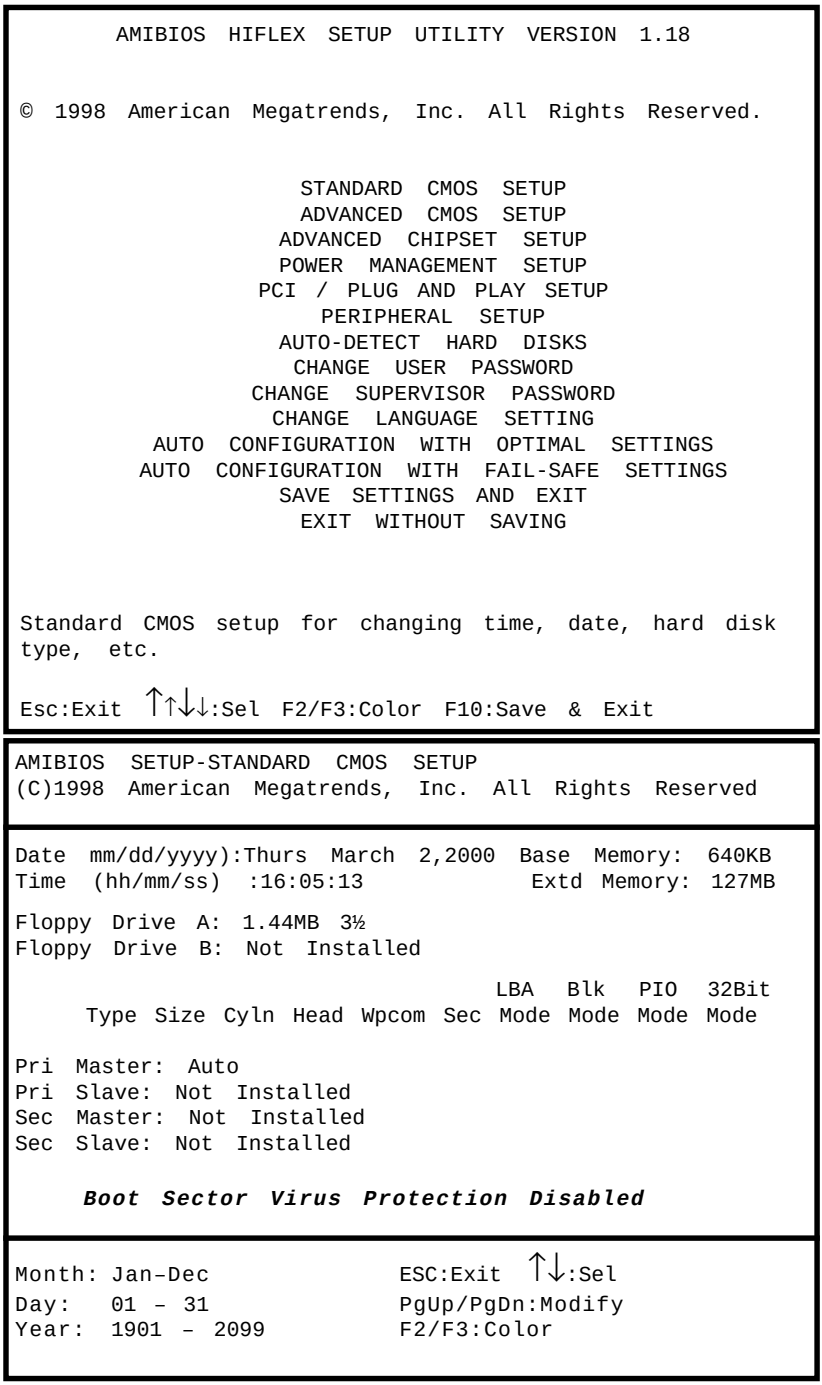
AMIBIOS supports PC Health Monitoring chips. When a failure occurs in a monitored activity, AMIBIOS can sound an alarm and display a message. The PC Health Monitoring chips monitor:

- Four CPU temperatures
- System Overheat
- Chassis intrusion
- Four positive voltage inputs
- Four fan-speed monitor inputs

4-3 Running Setup

Optimal 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 Standard Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).


AMIBIOS HIFLEX SETUP UTILITY VERSION 1.18
© 1998 American Megatrends, Inc. All Rights Reserved.
STANDARD CMOS SETUP
ADVANCED CMOS SETUP
ADVANCED CHIPSET SETUP
POWER MANAGEMENT SETUP
PCI / PLUG AND PLAY SETUP
PERIPHERAL SETUP
AUTO-DETECT HARD DISKS
CHANGE USER PASSWORD
CHANGE SUPERVISOR PASSWORD
CHANGE LANGUAGE SETTING
AUTO CONFIGURATION WITH OPTIMAL SETTINGS
AUTO CONFIGURATION WITH FAIL-SAFE SETTINGS
SAVE SETTINGS AND EXIT
EXIT WITHOUT SAVING
Standard CMOS setup for changing time, date, hard disk type, etc.
Esc:Exit ↑↑↓↓:Sel F2/F3:Color F10:Save & Exit
AMIBIOS SETUP-STANDARD CMOS SETUP
(C)1998 American Megatrends, Inc. All Rights Reserved
Date mm/dd/yyyy):Thurs March 2,2000 Base Memory: 640KB
Time (hh/mm/ss) :16:05:13 Extd Memory: 127MB
Floppy Drive A: 1.44MB 3½
Floppy Drive B: Not Installed
LBA Blk PIO 32Bit
Type Size Cyln Head Wpcom Sec Mode Mode Mode Mode
Pri Master: Auto
Pri Slave: Not Installed
Sec Master: Not Installed
Sec Slave: Not Installed
Boot Sector Virus Protection Disabled
Month: Jan–Dec
Day: 01 – 31
Year: 1901 – 2099
ESC:Exit ↑↓:Sel
PgUp/PgDn:Modify
F2/F3:Color

Standard CMOS Setup

Date and Time Configuration
Select the Standard option. Select the *Date/Time* icon. The current values for each category are displayed. Enter new values through the keyboard.

Floppy A
Floppy B
Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *Not Installed, 360 KB 5¼ inch*, *1.2 MB 5¼ inch*, *720 KB 3½ inch*,*1.44 MB 3½ inch or 2.88 MB 3½ inch*. ***Note: The Optimal and Fail-Safe settings for Floppy Drive A are 1.44 MB 3 1/2 inch and for Floppy Drive B are Not Installed***.

Pri Master
Pri Slave
Sec Master
Sec Slave

Type	How to Configure
Type	Select *Type*. The options are *1-46, User, Auto, CDROM, ARMD. 1-46* indicates the prefined type of the parameters. Select *Enter* to enter the parameter type manually. If *Auto* is selected, the parameter type will be set automatically on each boot. Select *CDROM* when ATAPI CDROM drives are used. Select *ARMD* if LS120, MO, Iomega Zip drives are used, or Press *enter* to let the BIOS autodetect the parameter type.

Entering Drive Parameters

You can also enter the hard disk drive parameters. The drive parameters are:

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
WPCOM	The size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. WPCOM circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number where WPCOM begins.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drive may have even more sectors per track.

Boot Sector Virus Protection

This setting allows you to prevent any data from being written the boot sector of the hard drive. While this may prevent viruses from infecting your system, you may need to change information here when installing new programs. The options for this setting are *Enabled* or ***Disabled***.

Advanced CMOS Setup

Quick Boot

The Settings are ***Disabled*** or *Enabled*. Set to *Enabled* to permit AMIBIOS to boot quickly when the computer is powered on. This option replaces the old Above 1 MB Memory Test Advanced Setup option. The settings are:

Setting	Description
Disabled	AMIBIOS tests all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hard disk drive. AMIBIOS waits for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a <Del> key press and runs AMIBIOS setup if the key has been pressed.

Enabled AMIBIOS does not test system memory above 1 MB. AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. In *Enabled,* the keyboard will be bypassed.

Note: The AMIBIOS Setup can be run at system boot but no display is given.

Pri Master ARMD Emulated as
Pri Slave ARMD Emulated as
Sec Master ARMD Emulated as
Sec Slave ARMD Emulated as
The settings for these options are ***Auto***, *Floppy* or *Hard disk*. If set to Auto, the default emulation type depends on the ARMD drive. The default emulation type is floppy for LS120, Hard Disk for MO and Hard Disk for Iomega Zip.

1st Boot Device
2nd Boot Device
3rd Boot Device
The options for the 1st Boot Device are *Disabled, 1st IDE-HDD, 2nd IDE-HDD, 3rd IDE-HDD, 4th IDE-HDD,* ***Floppy****, ARMD-FDD, ARMD-HDD, ATAPI CDROM, SCSI, Network* or *I$_2$0*. The options for the 2nd Boot Device are *Disabled,* ***1st IDE-HDD****, 2nd IDE-HDD, 3rd IDE-HDD, 4th IDE-HDD, Floppy, ARMD-FDD, ARMD-HDD, ATAPI CDROM or SCSI*. The options for the 3rd Boot Device are *Disabled, 1st IDE-HDD, 2nd IDE-HDD, 3rd IDE-HDD, 4th IDE-HDD, Floppy, ARMD-FDD, ARMD-HDD or* ***ATAPI CDROM***.

1st IDE-HDD, 2nd IDE-HDD, 3rd IDE-HDD and 4th IDE-HDD are the four hard disks that can be installed by the BIOS. 1st IDE-HDD is the first hard disk installed by the BIOS, 2nd IDE-HDD is the second hard disk, and so on. For example, if the system has a hard disk connected to Primary Slave and another hard disk to Secondary Master, then 1st IDE-HDD will be referred to as the hard disk connected to Primary Slave and 2nd IDE-HDD will be referred to as the hard disk connected to the Secondary Master. 3rd IDE-HDD and 4th IDE-HDD are not present. Note that the order of the initialization of the devices connected to the primary and secondary channels are Primary Master first, Primary Slave second, Secondary Master third, and Secondary Slave fourth.

The BIOS will attempt to read the boot record from 1st, 2nd, 3rd and 4th boot device in the selected order until it is successful in reading the booting record. The BIOS will not attempt to boot from any device which is not selected as the boot device.

Try Other Boot Devices

This option controls the action of the BIOS if all the selected boot devices failed to boot. The settings for this option are ***Yes*** or *No*. If *Yes* is selected, the BIOS will try to boot from the other boot devices that are present in the setup but not selected if all selected Boot Devices failed to boot. If *No* is selected, the BIOS will not try to boot from the other boot devices when all selected boot devices failed to boot.

Initialize I2O Devices

The settings for this option are ***Yes*** or *No*. If *Yes* is selected, the BIOS will initialize I2O processor(s), I2O storage devices and provide INT13 support for I2O storage devices. If *No is* selected, the BIOS will not initialize I2O processor(s) and I2O storage devices.

Initial Display Mode

This option determines the display screen with which the POST is going to start the display. The settings for this option are *BIOS* or ***Silent***. If selected as *BIOS,* the POST will start with the normal sign-on message screen. If *Silent* is selected, the POST will start with the Supermicro screen.

Display Mode at Add-On ROM Init

The settings for this option are ***Force BIOS*** or *Keep Current*. If *Force Bios* is selected, the Add-on ROM will take control of the POST screen.

Floppy Access Control

The settings for this option are ***Read-Write*** or *Read-Only*. This option will be effective only if the device is accessed through BIOS.

Hard Disk Access Control

The settings for this option are ***Read-Write*** or *Read-Only*. This option will be effective only if the device is accessed through BIOS.

S.M.A.R.T. for Hard Disks

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a technology developed to manage the reliability of the hard disk by predicting future device failures. The hard disk needs to be S.M.A.R.T. capable. The settings for this option are ***Disabled*** or *Enabled*. Note: **S.M.A.R.T. cannot predict all future device failures. S.M.A.R.T.** should

be used as a warning tool, not as a tool to predict the device reliability.

Boot Up Num-Lock

Settings for this option are ***On*** or *Off*. When this option is set to *On*, the BIOS turns off the Num Lock key when the system is powered on. This will enable the end user to use the arrow keys on both the numeric keypad and the keyboard.

PS/2 Mouse Support

Settings for this option are ***Enabled*** or *Disabled*. When this option is set to *Enabled*, AMIBIOS supports a PS/2-type mouse.

Primary Display

The settings for this option are *Absent, **VGA/EGA**, CGA 40x25, CGA 80x25* or *Mono*.

Password Check

This option enables the password check option every time the system boots or the end user runs WinBIOS Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If ***Setup*** is chosen, the password prompt appears if WinBIOS Setup is executed.

Boot to OS/2

If DRAM size is over 64 MB, set this option to *Yes* to permit AMIBIOS to run with IBM OS/2. The settings are ***No*** or *Yes*.

Processor Serial Number

Intel included a serial number in their Pentium III/Pentium III Xeon Processors as a unique system identifier. Select *Enabled* to allow Processor's Serial Number to be detected by the application software programs. For privacy reasons, you can disable this setting to prevent the release of this identifier. The settings for this option are *Enabled* or ***Disabled***.

CPU Microcode Updation

This option allows the BIOS to update the CPU Microcode. The settings for this option are *Disabled and **Enabled***.

Internal Cache (L1 Cache)

This option is for enabling or disabling the internal cache memory. The settings for this option are *Disabled, WriteThru* or ***WriteBack***.

External Cache (L2 Cache)

This option is for enabling or disabling the external cache memory. The settings for this option are *Disabled, WriteThru* or ***WriteBack***.

System BIOS Cacheable

When set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to cache memory. The contents of this memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are ***Enabled*** or *Disabled*. ***Note: The Optimal default setting is Enabled and the Fail-Safe default setting is Disabled. Set this option to Enabled to permit the contents of F0000h RAM memory segment to be written to and read from cache memory.***

C000 Shadow (16K) (Cached)
C400 Shadow (16K) (Cached)
C800 Shadow (16K) (Cached)
CC00 Shadow (16K) (Cached)
D000 Shadow (16K)
D400 Shadow (16K)
D800 Shadow (16K)
DC00 Shadow (16K)

These options specify how the 16 KB of video ROM at C0000h (or D0000h) is treated. The settings are: *Disabled*, *Enabled or Cached*. The default is *Disabled* for all settings except C000, C400, C8000, CC00 which are *Cached* for default. When set to *Disabled,* the contents of the video ROM are not copied to RAM. When set to *Enabled,* the contents of the video ROM area from C0000h-CFFFFh (or D0000h-D7FFFh) are copied (shadowed) from ROM to RAM for faster execution. When set to *Cached*, the contents of the video ROM area from C0000h-C7FFFh (or D0000h-D7FFFh) are copied from ROM to RAM, and can be written to or read from cache memory.

Advanced Chipset Setup

USB Function

The settings for this option are ***Enabled*** or *Disabled*. Set this option to *Enabled* to enable the USB (Universal Serial Bus) functions.

USB KB/Mouse Legacy Support

The settings for this option are *Keyboard, Auto, Keyboard+Mouse* or ***Disabled***.

Port 64/60 Emulation:

The settings for this option are ***Enabled*** or *Disabled*.

Write Combining for P6-to-PCI:
The settings for this option are ***Enabled*** or *disabled.* This bit enables or disables the combining (bursting) of accesses within the PCI memory regions. The BWCR register provides the write combining enable/disable bit for each region. This bit acts as a master bit to enable the write combining for all the regions.

The main memory system of the CNB30 supports various clock speeds and memory speeds. The MTCR (Memory Timing Control Register) dictates the memory controller to generate the DRAM timing accordingly.

Act to Deact
The settings for this option are ***6CLKS*** or *5CLKS*.

Act to Read/Write
The settings for this option are ***3CLKS*** or *2CLKS*.

RAS Precharge Time
This option defines the RAS Precharge Time. The settings are ***3 CLKS***, *and 2 CLKS.*

RAS Cycle Time
This option defines the RA Cycle Time. The settings are *10CLKS, 9CLKS,* ***8CLKS****, 7CLKS.*

Write to DeAct
The settings for this option are ***3CLKS*** and *2CLKS*.

SDRAM CAS Latency
The settings for this option are ***CAS Latency3*** and *CAS Latency2*.

Memory Auto Precharge
The settings for this option are ***Enabled*** and *Disabled*.

SDRAM Fast Timing
The settings for this option are ***10-1-1-1*** and *11-1-1-1*. When the value set to 10-1-1-1, the CNB30 drives the CAS# signal one clock earlier and reduces the lead time of a page hit read by one clock.

Memory Write Posting
The settings for this option are ***Enabled*** and *disabled*.

ISA IO Cycle Delay
Settings include *Full Delay*, ***1.5 BCLK,*** 2.5 BCLK and 3.5 BCLK.

Scrubbing Enable
The settings for this option are *Disabled* or ***Enabled***. Set "Enabled" to allow the CNB30 to perform "scrubbing"(--i.e. writing the ECC corrected memory data back to the DRAM).

MPS Support
The settings for this option are ***Enabled*** and *Disabled*. Select "Enabled" to activate Multi-Processor System Support.

Power Management

ACPI Aware O/S
The settings for this option are *No* or ***Yes***. Available with ACPI only. The operating system has the built-in ACPI features. Select "Yes" to permit the OS to detect the ACPI functions in the system.

Power Management/APM
The settings for this option are *Enabled* and ***Disabled***. If "enabled" is selected, the Power Management/Advanced Power Management mode will be activated.

Video Power Down Mode
When in the AMP mode, this option specifies the power conserving state that the VGA video subsystem enters after the specified period of display inactivity has expired. The settings are ***Disabled*** and *Suspend*. ***Note: The Optimal default setting for this option is Suspend and the Fail-Safe default setting is Disabled***.

Hard Disk Power Down Mode
When in the AMP mode, this option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings are *Disabled* and ***Suspend***. ***Note: The Optimal default setting for this option is Suspend and the Fail-Safe default setting is Disabled***.

Hard Disk Time Out (Minutes)
When in the AMP mode, this option specifies the length of a period of hard disk drive inactivity. When this length of time expires, the computer enters the power-conserving state specified in the Hard Disk Power Down Mode option. The settings are ***Disabled*** and *1 Min* through *14 Min* in 1 minute increments.

Suspend Time Out

When in the AMP mode, this option specifies the length of a period of system inactivity while in the suspend state. When this length of time expires, the computer enters a suspend power. The settings are Disabled and *1 Min* through *14 Min* in 1 minute increments. The default setting is **5**.

Power Button Enable

When in the AMP mode, this in the AMP mode, this option specifies how the power button mounted externally on the computer chassis is used. The settings are: *Suspend, PowerOn* and ***PowerOff***. When set to *PowerOn or PowerOff*, pushing the power button turns the computer on or off. The *Suspend* setting places the computer in Suspend mode or Full On power mode.

The BIOS has the capability to detect the IRQ events. When the BIOS detects an IRQ trigger event being activated, then, the system will "wake up" and resumes its activities.

IRQ1:

The settings are: *Ignore,* and ***Monitor***.

IRQ3:

The settings are: ***Ignore***, and *Monitor*.

IRQ4:

The settings are: ***Ignore***, and *Monitor*.

IRQ5:

The settings are: ***Ignore***, and *Monitor*.

IRQ6:

The settings are: ***Ignore***, and *Monitor*.

IRQ7:

The settings are: ***Ignore***, and *Monitor*.

IRQ9:

The settings are: ***Ignore***, and *Monitor*.

IRQ10:

The settings are: ***Ignore***, and *Monitor*.

IRQ11:

The settings are: ***Ignore***, and *Monitor*.

IRQ12:
The settings are: *Ignore,* and ***Monitor***.

IRQ14:
The settings are: ***Ignore***, and *Monitor*.

IRQ15:
The settings are: ***Ignore***, and *Monitor*.

USB Resume
When in the AMP mode, this option allows you to wake up the system from a USB device. The settings for this option are *Enabled* and ***Disabled***.

PME Resume
When in the AMP mode, this option allows you to wake up the system from a PME device. The settings for this option are *Enabled* and ***Disabled***.

R1 Resume
When in the AMP mode, this option allows you to wake up the system from a R1 device. The settings for this option are *Enabled* and ***Disabled***.

PCI/Plug and Play Setup

Plug and Play-Aware OS
The settings for this option are ***No*** or *Yes*. Set this option to *Yes* to allow the operating system to detect ISA Plug and Play devices. (Since the S2QR6 has no ISA slots, this should always be set to ***No***.

PCI Latency Timer (PCI Clocks)
This option specifies the latency timings in PCI clocks for all PCI devices. The settings are *32*, ***64***, *96*, *128*, *160*, *192*, *224*, or *248*.

PCI VGA Palette Snoop
The settings for this option are ***Disabled*** or *Enabled.* When set to *Enabled,* multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example: if there are two VGA devices in the computer (one PCI and one ISA) and this option is disabled, data read and written by the CPU is only directed to the PCI VGA device's palette registers. If enabled, data read and written by the

CPU is directed to both the PCI VGA device's palette registers and the ISA VGA palette registers. This will permit the palette registers of both devices to be identical. This option must be set to *Enabled* if any ISA adapter card installed in the system requires VGA palette snooping.

PCI IDE Busmaster

The settings for this option are ***Disabled*** or *Enabled*. Set to *Enabled* to specify the IDE Controller on the PCI bus has bus mastering capabilities. Under Windows 95, you should set this option to *Disabled* and install the Bus Mastering driver.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is installed in the computer. The PCI expansion slot on the motherboard where the offboard PCI IDE controller is installed must be specified. If an offboard PCI IDE controller is used, the onboard IDE controller is automatically disabled. The settings are ***Auto*** (AMIBIOS automatically determines where the offboard PCI IDE controller adapter card is installed), *Slot 1*, *Slot 2*, *Slot 3*, *Slot 4, Slot 5* and *Slot 6*.

This option forces IRQ14 and IRQ15 to a PCI slot on the PCI local bus. This is necessary to support non-compliant ISA IDE controller adapter cards. If an offboard PCI IDE controller adapter card is installed in the computer, you must also set the Offboard PCI IDE Primary IRQ and Offboard PCI IDE Secondary IRQ options.

Offboard PCI IDE Primary IRQ

Offboard PCI IDE Secondary IRQ

These options specify the PCI interrupt used by the primary (or secondary) IDE channel on the offboard PCI IDE controller. The settings are ***Disabled***, *Hardwired*, *INTA*, *INTB*, *INTC*, and *INTD*.

Onboard USB IRQ

Use these options to specify the IRQ priority for Onboard USB devices installed in the PCI expansion slots. The settings are ***Auto***, *(IRQ) 3, 4, 5, 7, 9, 10,* and *11,* in priority order**.**

PCI Slot 1 and Slot 2 IRQ

Use these options to specify the IRQ priority for PCI devices installed in the PCI expansion slots. The settings are ***Auto***, *(IRQ) 3, 4, 5, 7, 9, 10,* and *11* in priority order**.**

Onboard LAN IRQ
Use these options to specify the IRQ priority for Onboard LAN devices installed in the PCI expansion slots. The settings are ***Auto***, *(IRQ) 3, 4, 5, 7, 9, 10,* and *11* in priority order**.**

PCI Slot 3 and Onboard SCSI IRQ
Use these options to specify the IRQ priority for PCI Slot 3 and Onboard SCSI devices installed in the PCI expansion slots. The settings are ***Auto***, *(IRQ) 3, 4, 5, 7, 9, 10,* and *11* in priority order**.**

PCI Slot 4 IRQ
PCI Slot 5 IRQ
PCI Slot 6 IRQ
PCI Slot 7 IRQ
PCI Slot 8 IRQ
Use these options to specify the IRQ priority for PCI devices installed in the PCI expansion slots. The settings are ***Auto***, *(IRQ) 3, 4, 5, 7, 9, 10,* and *11* in priority order**.**

DMA Channel 0
DMA Channel 1
DMA Channel 3
DMA Channel 5
DMA Channel 6
DMA Channel 7
These DMA channels control the data transfers between the I/O devices and the system memory. The chipset allows the BIOS to choose which channels to do the job. The settings are ***PnP*** or *ISA/EISA.*

IRQ3
IRQ4
IRQ5
IRQ7
IRQ9
IRQ10
IRQ11
IRQ14
IRQ15
These options specify which bus the specified IRQ line is used on and allow you to reserve IRQs for legacy ISA adapter cards. If more IRQs must be removed from the pool, the end user can use these options to

reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as PCI/PnP.

IRQ14 and 15 will not be available if the onboard PCI IDE is enabled. If all IRQs are set to *ISA/EISA* and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices. This is because at least one IRQ must be available for PCI and PnP devices. The settings are ***PCI/PnP*** or *ISA/EISA.* (See page 3-5 for information on shared IRQs.)

Reserved Memory Size
This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are ***Disabled***, *16K*, *32K* or *64K*.

Reserved Memory Address
This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards. The settings are *C0000*, *C4000*, ***C8000***, *CC000*, *D0000*, *D4000*, *D8000* or *DC000*.

Peripheral Setup

Onboard SCSI
This setting enables or disables the onboard SCSI. The settings are ***Enabled*** and *Disabled.*

CPU1 Current Temperature
The current temperature of CPU1 is displayed here.

CPU2 Current Temperature
The current temperature of CPU2 is displayed here.

CPU3 Current Temperature
The current temperature of CPU3 is displayed here.

CPU4 Current Temperature
The current temperature of CPU2 is displayed here.

System Overheat Warning
The settings for this option are *Enabled* or ***Disabled***. When set to *Enabled* this option allows the user to set an overheat warning temperature.

Overheat Warning Temperature
Use this option to set the CPU overheat warning temperature. The settings are *25 °C* through *75 °C* in 1 °C intervals. ***Note: The Optimal and Fail-Safe default settings are 55 °C***.

H/W Monitor CPU1
H/W Monitor CPU2
H/W Monitor CPU3
H/W Monitor CPU4
H/W Monitor (+3.3V)
H/W H/WMonitor (+5V)
H/W Monitor (+12V)
H/W Monitor (+2.5V)
CPU1 Fan
CPU2 Fan
CPU3 Fan
CPU4 Fan

The above features are for PC Health Monitoring. The motherboards with W83781D have seven onboard voltage monitors for the CPU core, CPU I/O, +3.3V, +5V, -5V, +12V, and-12V, and for the four-fan status monitor.

OnBoard FDC
This option enables the FDC (Floppy Drive Controller) on the motherboard. The settings are *Disabled* and ***Enabled***.

OnBoard Serial Port1
This option specifies the base I/O port address of serial port 1. The settings are *Disabled*, ***3F8h***, *2F8h*, *3E8h* and *2E8h.*

OnBoard Serial Port2
This option specifies the base I/O port address of serial port 2. The settings are *Disabled*, *3F8h*, ***2F8h***, *3E8h* and *2E8h.*

Serial Port2 Mode
The settings for this option are ***Normal****, IrDA SIR-A,. IrDA SIR-B, ASKIR, Consumer* and *Raw IR*. When set to anything but *Normal,* the IR Duplex Mode becomes available and can be set to either *Half* or ***Full***.

Serial Port2 Duplex Mode
This option is enabled by the selection made in the previous Serial Port 2 Mode option. This makes the IR Duplex Mode available, which can be set to either *Half* or ***Full***.

Onboard Parallel Port
This option specifies the base I/O port address of the parallel port on the motherboard. The settings are *Auto* (AMIBIOS automatically determines the correct base I/O port address), *Disabled*, ***378h***, *278h* and *38Ch*.

Parallel Port Mode
This option specifies the parallel port mode. The settings are *Normal*, *Bi-Dir, EPP* and ***ECP***. When set to *Normal,* the normal parallel port mode is used. Use *Bi-Dir* to support bidirectional transfers. Use *EPP* (Enhanced Parallel Port) to provide asymmetric bidirectional data transfer driven by the host device. Use *ECP* (Extended Capabilities Port) to achieve data transfer rates of up to 2.5 Mbps. ECP uses the DMA protocol and provides symmetric bidirectional communication. ***Note: The Optimal default setting for this option is ECP and the Fail-Safe setting is Normal***.

EPP Version
The settings are *Enabled* and *Disabled*. ***Note: The Optimal and Fail-Safe default settings are N/A***.

Parallel Port IRQ
This option specifies the IRQ to be used by the parallel port. The settings are *5* and ***7***.

Parallel Port ECP DMA Channel
This option is only available if the setting of the parallel port mode option is *ECP*. The settings are *0*, *1*, *2*, ***3***, *5*, *6* and *7*.

Onboard IDE
This option enables the IDE (Hard Disk Drive Controller) device(s) on the motherboard. The options are ***Enabled*** and *Disabled*.

Auto-Detect Hard Disks

This section allows BIOS to look for and configure any hard disk drives on your system. After highlighting this option, hit <Enter> and wait momentarily while BIOS performs the auto-detect. You will soon see the disk drives appear properly configured.

Change User Password

Change Supervisor Password

The system can be configured so that all users must enter a password every time the system boots or when the AMIBIOS setup is executed. You can set either a Supervisor password or a User password. If you do not want to use a password, just press <Enter> when the password prompt appears.

The password check option is enabled in the Advanced Setup by choosing either *Always* or *Setup*. The password is stored in CMOS RAM. You can enter a password by typing it out on the keyboard or by selecting each letter via the mouse or a pen stylus. Pen access must be customized for each specific hardware platform.

When you select to change the Supervisor or User password, AMIBIOS prompts you for the new password. You must set the Supervisor password before you can set the User password. Enter a 1-6 character password. (It will not appear on the screen when typed.) Retype the new password as prompted and press <Enter>. Make sure you write it down. If you forget it, you must clear CMOS RAM and reset the password.

Change Language Setting

Because this version of BIOS only supports English at this time, this setting cannot be chosen. Future releases may support other languages.

Auto Configuration with Optimal Settings

The Optimal default settings provide optimum performance settings for all devices and system features.

Auto Configuration with Fail Safe Settings

The Fail-Safe default settings consist of the safest set of parameters. Use them if the system is behaving erratically. They should always work but do not provide optimal system performance characteristics.

Save Current Settings and Exit

Highlight this and hit <Enter> when you wish to save any changes made to settings in BIOS and exit back to the system boot-up procedure.

Exit Without Saving

Highlight this and hit <Enter> when you wish to exit back to the system boot-up procedure without saving any changes.

Appendix A
BIOS Error Beep Codes & Messages

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

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

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

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

AMIBIOS Error Beep Codes

1 beep: System needs to update BIOS. Insert the diskette in that has the system BIOS file (SUPER.ROM) in the root directory.

2 beeps: BIOS file (SUPER.ROM) absent or not in root directory.

4 beeps: Flash program successful.

5 beeps: Floppy read error.

7 beeps: No flash part detected. The BIOS cannot be updated.

8 beeps: The ROM checksum value does not match the value encoded in the BIOS.

10 beeps: Flash erase error.

11 beeps: Flash program error.

12 beeps: Wrong BIOS file size.

13 beeps: ROM image mismatch.

If you hear...	it's because...
5 short and 1 long beeps	no memory is installed
6 short and 1 long beeps	EDO memory detected
7 short and 1 long beeps	SMBUS (System Management Bus) error

Notes

Appendix B

AMIBIOS POST Diagnostic Error Messages

This section describes the power-on self-tests (POST) port 80 codes for the AMIBIOS.

Check Point	Description
00	Code copying to specific areas is done. Passing control to INT 19h boot loader next.
03	NMI is Disabled. Next, checking for a soft reset or a power-on condition.
05	The BIOS stack has been built. Next, disabling cache memory.
06	Uncompressing the post code unit next.
07	Next, initializing the CPU init and the CPU data area.
08	The CMOS checksum calculation is done next.
0B	Next, performing any required initialization before keyboard BAT command is issued.
0C	The keyboard controller I/B is free. Next, issuing the BAT command to the keyboard controller.
0E	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test.
0F	The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next.

Check Point	Description
10	The keyboard controller command byte is written. Next, issuing the pin 23 and 24 blocking and unblocking commands.
11	Next, checking if the <End or <Ins> keys were pressed during power on. Initializing CMOS RAM if the Initialize CMOS RAM in every boot AMIBIOS POST option was set in AMIBCP or the <End> key was pressed.
12	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13	The video display has been disabled. Port B has been initialized. Next, initializing the chipset.
14	The 8254 timer test will begin next.
19	The 8254 timer test is over. Starting the memory refresh test next.
1A	The memory refresh test line is toggling. Checking the 15 second on/off time next.
23	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.
24	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on.
25	Interrupt vector initialization is done. Clearing the password if the POST DIAG Switch is on.
27	Any initialization before setting video mode will be done next.

Check Point	Description
28	Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
2A	Bus initialization system, static, output devices will be done next, if present.
2B	Passing control to the video ROM to perform any required configuration before the video ROM test.
2C	All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it.
2D	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control.
2E	Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next.
2F	The EGA/VGA controller was not found. The display memory read/write test is about to begin.
30	The display memory read/write test passed. Look for retrace checking next.
31	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next.
32	The alternate display memory read/write test passed. Looking for alternate display retrace checking next.
34	Video display checking is over. Setting the display mode next.
37	The display mode is set. Displaying the power on message next.

Check Point	Description
38	Initializing the bus input, IPL, and general devices next, if present.
39	Displaying bus initialization error messages.
3A	The new cursor position has been read and saved. Displaying the Hit <DEL> message next.
40	Preparing the descriptor tables next.
42	The descriptor tables are prepared. Entering protected mode for the memory test next.
43	Entered protected mode. Enabling interrupts for diagnostics mode next.
44	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next.
45	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next.
46	The memory wraparound test has completed. The memory size calculation has been completed. Writing patterns to test memory next.
47	The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next.
48	Patterns written in base memory. Determining the amount of memory below 1 MB next.
49	The amount of memory below 1 MB has been found and verified. Determining the amount of memory above 1 MB memory next.
4B	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next.

Check Point	Description
4C	The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next.
4D	The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next.
4E	The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next.
4F	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next.
50	The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next.
51	The memory size display was adjusted for relocation and shadowing. Testing the memory above 1 MB next.
52	The memory above 1 MB has been tested and initialized. Saving the memory size information next.
53	The memory size information and the CPU registers are saved. Entering real mode next.
54	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next.
57	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next.
58	The memory size was adjusted for relocation and shadowing. Clearing the Hit <DEL> message next.
59	The Hit <DEL> message is cleared. The <WAIT> message is displayed. Starting the DMA and interrupt controller test next.

Check Point	Description
60	The DMA page register test passed. Performing the DMA Controller 1 base register test next.
62	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next.
65	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66	Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next.
7F	Extended NMI source enabling is in progress.
80	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next.
81	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83	The command byte was written and global data initialization has been completed. Checking for a locked key next.
84	Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next.
85	The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next.
86	The password was checked. Performing any required programming before WINBIOS Setup next.

Check Point	Description
87	The programming before WINBIOS Setup has been completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next.
88	Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next.
89	The programming after WINBIOS Setup has been completed. Displaying the power-on screen message next.
8B	The first screen message has been displayed. The <WAIT...> message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check next.
8C	Programming the WINBIOS Setup options next.
8D	The WINBIOS Setup options are programmed. Resetting the hard disk controller next.
8F	The hard disk controller has been reset. Configuring the floppy drive controller next.
91	The floppy drive controller has been configured. Configuring the hard disk drive controller next.
95	Initializing the bus option ROMs from C800 next.
96	Initializing before passing control to the adaptor ROM at C800.
97	Initialization before the C800 adaptor ROM gains control has been completed. The adaptor ROM check is next.
98	The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.

Check Point	Description
99	Any initialization required after the option ROM test has been completed. Configuring the timer data area and printer base address next.
9A	Set the timer and printer base addresses. Setting the RS-232 base address next.
9B	Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next.
9C	Required initialization before the Coprocessor test is over. Initializing the Coprocessor next.
9D	Coprocessor initialized. Performing any required initialization after the Coprocessor test next.
9E	Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next.
A2	Displaying any soft errors next.
A3	The soft error display has completed. Setting the keyboard typematic rate next.
A4	The keyboard typematic rate is set. Programming the memory wait states next.
A5	Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next.
A7	NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next.
A8	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next.

Check Point	Description
A9	Returned from adaptor ROM at E000h control. Next, performing any initialization required after the E000 option ROM had control.
AA	Initialization after E000 option ROM control has completed. Displaying the system configuration next.
AB	Building the multiprocessor table, if necessary. POST next.
B0	The system configuration is displayed.
AC	Uncompressing the DMI data and initializing DMI.
B1	Copying any code to specific areas.
D0h	The NMI is disabled. Power on delay is starting. Next, the initialization cade checksum will be verified.
D1h	Initializing the DMA controller. Performing the keyboard controller BAT test. Starting memory refresh, and entering 4 GB flat mode next.
D3h	Starting memory sizing next.
D4h	Returning to real mode. Executing any OEM patches and setting the stack next.
D5h	Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0.
D6h	Control is in segment 0. Next, checking if <Ctrl><Home>was pressed and verifying the system BIOS checksum. If either <Ctrl><Home> was pressed or the system BIOS checksum is bad, next the system will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h.

Notes