SUPER®

SUPER P4SPA+
SUPER P4SPE

USER'S MANUAL

Revision 1.1a

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Printed in the United States of America

Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER P4SPA+/P4SPE motherboard. The P4SPA+/P4SPE supports single Intel Pentium® 4 478-pin, 0.13 micron processors up to 3.06 GHz at a system bus speed of 800/533/400 MH, or Intel Celeron 478-pin, 0.13 micron processors up to 2.4 GHz at a system bus speed of 400 MHz. Pentium 4 processors are housed in a 478-pin micro PGA (Plastic Grid Array) package. Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product_page/product-m.htm) for updates on supported processors. This product is intended to be professionally installed.

Manual Organization

Chapter 1 includes a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the P4SPA+/P4SPE mainboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when installing the processor and DDR memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, the IDE interfaces, the parallel and serial ports, the mouse and keyboard and the twisted wires for the power supply, the reset button, the keylock/power LED and the speaker.

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 provides BIOS POST Codes.
Appendix B lists BIOS POST Messages.

Table of Contents

Chapter 3: Troubleshooting

Chapter 4: BIOS

Appendices:

Chapter 1
Introduction

1-1 Overview

Checklist

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

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

All Included with Retail Box Only

One (1) Supermicro Mainboard

Two (2) SATA66/100 ribbon cables

One (1) COM port cable with bracket

One (1) IDE cable

One (1) floppy drive ribbon cable

One (1) I/O shield

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

One (1) User's/BIOS Manual

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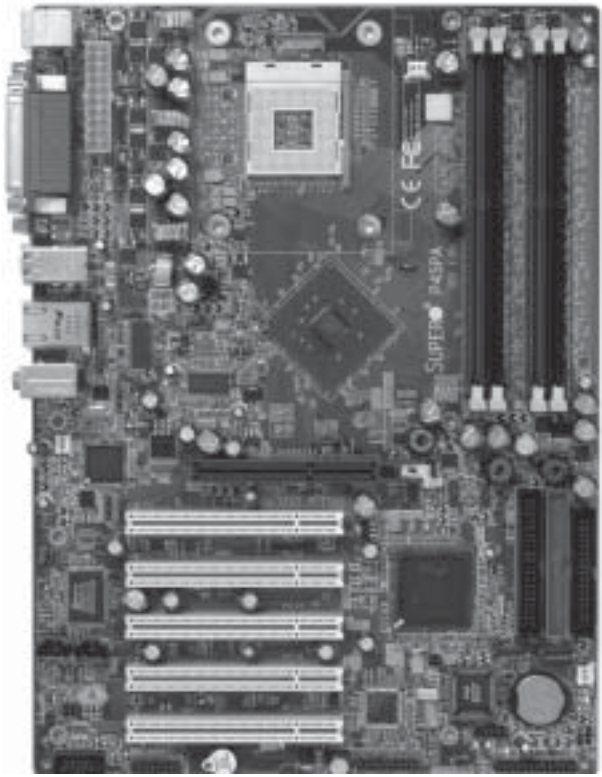
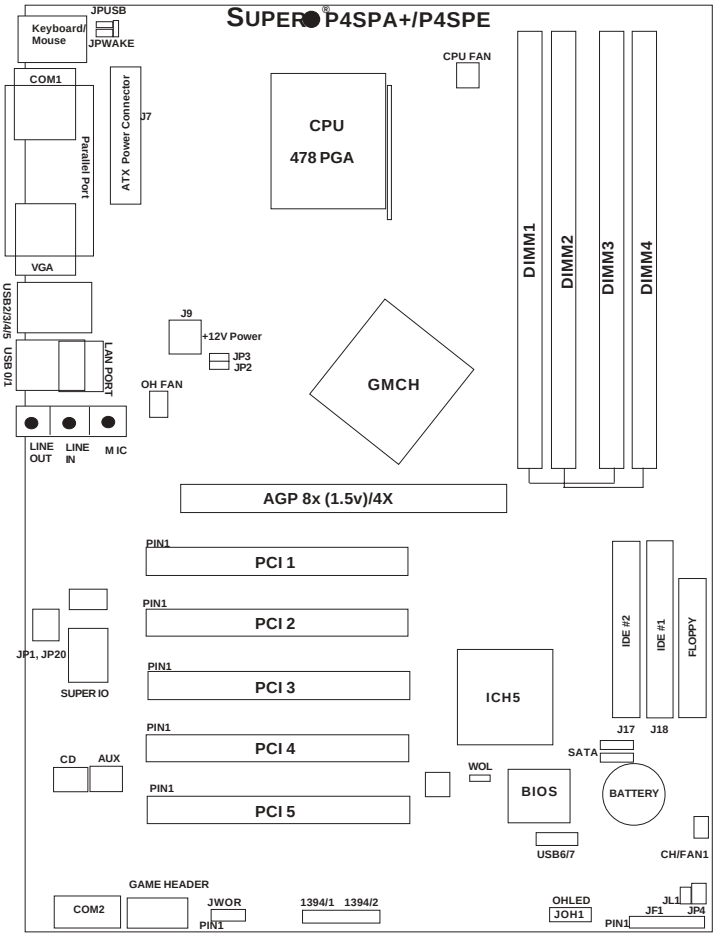
SUPER P4SPA+/P4SPE

Figure 1-1. SUPER P4SPA+ Image



*Note: the only difference between the P4SPE and P4SPA+ is that the P4SPA+ has an onboard VGA Connector and the P4SPE does not.

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



See Chapter 2 for detailed information on jumpers, I/O ports and JF1front panel connections.

Jumpers not indicated are for test purposes only.

*Note: the only difference between the P4SPE and P4SPA+ is that the P4SPA+ has an onboard VGA Connector and the P4SPE does not.

P4SPA+/P4SPE Quick Reference

Jumpers	Description	Default Setting
JBT1	CMOS Clear	See Section 2-7
JP1	Overheat Fan Force-On	Open (Disabled)
JP2, JP3	FSB Speed	Pins 1-2 (Auto)
JP4	Watch Dog	Pins 2-3 (NMI)
JP20	Force Power-On	Open (Disabled)
JPUSB	USB Wake Up (USB0/1)	Pins 1-2 (Disabled)
JPWAKE	KB/Mouse Wake-Up	Pins 1-2 (Disabled)

Connectors	Description
AUX	Auxiliary Port Connector
CD1	Audio CD Input (large connector)
COM1	COM Port/Serial Port 1 Connector
COM2	COM Header/Serial Port 2 Header
Chassis Fan1	Chassis Fan Header
CPU Fan	Processor Fan Header
OH Fan	Overheat Fan Header
DIMM1/2/3/4	Memory (DIMM) Slots (1 through 4)
Ethernet	Gigabit LAN (Ethernet Port)
Floppy Connector(1)	Floppy Disk Connector
Game Port	Game Port
IDE(2)	2 IDE Connectors
SATA	2 SATA Headers
J1	PS/2 Keyboard/Mouse
J4	Parallel Printer Port
J7	ATX Power Connector
J9	12V Power Supply
JF1	Front Control Panel
JL1	Chassis Intrusion Header
JOH1	Overheat LED Header
JWOR	Wake-On-Ring Header
LINE IN	Audio In Connector
LINE OUT	Audio Out (Speaker) Connector
MIC	Microphone Input
USB 0/1/2/3/4/5/6/7	Universal Serial Ports 0-7
VGA	Video/Graphic Connector
WOL	Wake-On-LAN
1394/1, 1394/2	IE Connector -Firewire (*Optional)

*Note: the only difference between the P4SPE and P4SPA+ is that the P4SPA+ has an onboard VGA Connector and the P4SPE does not.

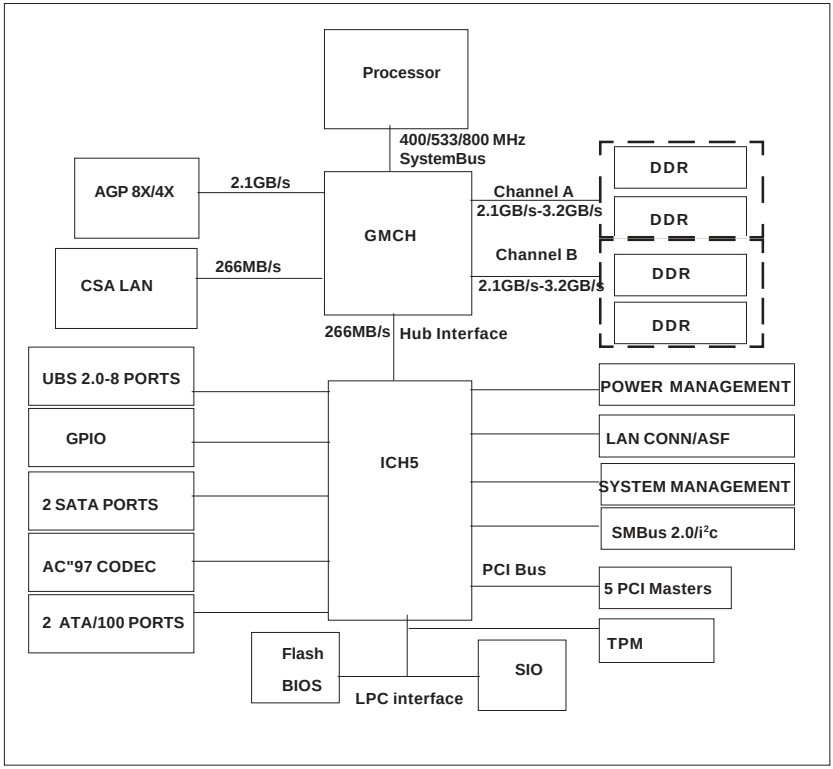


Figure 1-3. 865G/865PE Springdale Chipset: System Block Diagram

Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the following pages for the actual specifications of each motherboard.

Motherboard Features

CPU ◆ *Latest CPU technology!*

- Single Pentium® 4 478-pin, 0.13 micron processors up to 3.06 GHz(at 800/533/400 MHz FSB) or Intel Celeron 478-pin, 0.13 micron processors up to 2.4 GHz (at 400 MHz FSB).

  Note: Refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product_page/product-m.htm) for updates on supported processors.

Memory ◆ *Latest memory technology!*

- Dual/Single Channel DDR up to 4 GB of two-way interleaved or non-interleaved non-ECC DDR-400/333/266 SDRAM in 4 DIMMS

  Note: See Section 2-4 for details.

Chipset ◆ *Latest Intel chipset technology!*

- Intel Springdale 865G (P4SPA+), 865PE (P4SPE)

Expansion Slots

- Five 32-bit, 33 MHz PCI slots (5V)
- One AGP8x/X4 slot (1.5V)

BIOS

- 4 Mb Firmware Hub AwardBIOS® Flash BIOS
- APM 1.2, DMI 2.3, PCI 2.2, ACPI 1.0, Plug and Play (PnP)

PC Health Monitoring

- Eight onboard voltage monitors for CPU core, +3.3V, +3.3V standby, +5V, +5V standby, Vbat (battery voltage) and ±12V
- Fan status monitor with firmware/software on/off control
- SuperDoctor II, Watch Dog, NMI, LDCM, LDSM
- Environmental temperature monitoring and control
- 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 core

*Note: the only difference between the P4SPE and P4SPA+ boards is that the P4SPE does have the VGA Connector.

ACPI Features

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Main switch override mechanism
- Internal/external modem ring-on

Onboard I/O

- 2 ATA/100 EIDE Channel s for a total of 4 IDE devices backward compatible
- Intel ICH5 SATA Controller, 2 connectors for 2 devices
- 1 floppy port interface (up to 2.88 MB)
- 2 Fast UART 16550 compatible serial ports
- Intel 82547EI Gigabit Ethernet Controller (66MHz)(*For P4SPA+), Intel 82562EZ 10/100 Mb Ethernet LAN Controller (*For P4SPE)
- 1 EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) supported parallel port
- PS/2 mouse and PS/2 keyboard ports
- 1 game port header
- Up to 8 USB (Universal Serial Bus) 2.0 ports for a speed of up to 480Mbps ◆ *Latest USB 2.0 technology!*
- 1 infrared port
- AC'97 audio high quality 6-channel sound

Other

- Hyper-threading enabled
- Wake-on-LAN (WOL)
- Wake-on-Ring (WOR)
- Multiple CPU clock frequency ratio selections (set in BIOS)
- AC97' CODEC
- Suspend-to-RAM
- Onboard +5vsb warning LED ("LE2")

CD Utilities

- BIOS flash upgrade utility
- Drivers and software for Intel 865G/865PE chipset utilities

Dimensions

- ATX form factor, 12" x 8.8" (305 x 223.5 mm)

1-2 Chipset Overview (865G:P4SPA+, 865PE:P4SPE)

Intel's Sprindale (865G, 865PE) chipset is comprised of two primary components: the Graphics Memory Controller Hub (GMCH) and the I/O Controller Hub (ICH5). The Sprindale (865G, 865PE) provides the performance and feature-set required for high-end dual/single-processor desktop and workstation systems.

Graphics Memory Controller Hub (GMCH)

The GMCH provides the host (CPU) interface, DDR (Memory) interface, AGP interface, ICH5(Hub), CSA interface and 8xAGP interface for the Sprindale (865G, 865PE) chipset. The CPU interface supports the Pentium 4 Processor subset of the Extended Mode of the Scalable Bus Protocol. The GMCH memory interface supports dual channel DDR, and the 1.5V AGP slot which supports 8X/4X data transfers and AGP Fast Writes. The Integrated Graphics Controller provides 3D, 2D high performance graphics solution.

Host Interface and System Memory Interface

The Springdale GMCH can utilize a single PGA 478-pin processor. It supports a FSB frequency of 800/533/400 MHz(100 MHz, 133 MHz, and 200 MHz CLK respectively). It supports 32-bit host addressing, decoding up to 4GB of the CPU's memory address space. The Springdale GMCH integrates a system memory DDR Controller which supports dual DDR data channels, with a bandwidth up to 3.2GB/s(DDR 400) for single-channel mode and 6.4GB/s(DDR 400) for dual-channel mode.

Intel ICH5 System Features

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

Graphics Features/Display (865G: for P4SPA+ only)

The Springdale GMCH provides an integrated graphics accelerator delivering 3D, 2D and video capabilities. It also provides interfaces to a progressive scan analog monitor and two DVO devices. It is compliant with DVI specification and has a high-speed interface to a digital display.

1-3 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER P4SPA+/P4SPE. The motherboard has an onboard System Hardware Monitor chip that supports PC health monitoring.

Eight Onboard Voltage Monitors for the CPU Core, Chipset Voltage, +3.3V, +3.3V standby, +5V, +5V standby, Vbat and ±12V

The onboard voltage monitor will scan these 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.

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 fans are controlled by the power management functions.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature reaches the threshold, the CPU thermal trip feature will be activated and it will send a signal to the Speaker LED and, at the same time, the CPU speed will be decreased.

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 3-phase-switching voltage regulator for the CPU core can support up to 60A current and auto-sense voltage IDs ranging from 0.875 V to 1.6V. This will allow the regulator to run cooler and thus make the system more stable.

1-4 Power Configuration Settings

This section describes features of your motherboard that deal with power and power settings.

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, it keyboard will function 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.

Wake-On-Ring (WOR) Header

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.

1-5 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates of 1 GHz and faster.

The SUPER P4SPA+/P4SPE accommodates 12V ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You power supply must supply 1 amp of 5V standby voltage.

It is strongly recommended that you use a high quality power supply that meets 12V ATX power supply Specification 1.1 or above. Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

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 provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a 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 be flexibly adjusted to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

1-6 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.

Chapter 2
Installation

2-1 Static-Sensitive Devices

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

Precautions

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

Unpacking

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

Installation Procedures

Follow the procedures as listed below for full installation of the motherboard into a chassis:

1. Install the processor and the heatsink to the motherboard.

2. Install the motherboard in the chassis.

3. Install the memory and add-on cards.

4. Finally, connect the cables and install the drivers.

2-2 Processor and Heatsink Fan Installation

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

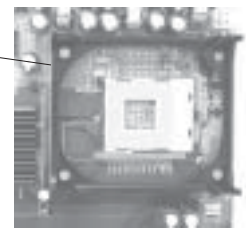
IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

Installation of the Processor and Heatsink

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

Note: The CPU heatsink fan with clips is included only with the retail versions of the P4SPA+/P4SPE. If you buy a boxed Intel Pentium 4 478/ Northwood processor, it should include a heatsink, fan and retention mechanism. If you buy a processor separately, use only a Supermicro or Intel certified heatsink and fan.

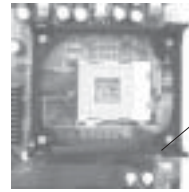
2. Insert the white pegs into the black anchors. Do not force the white pegs all the way in - about 1/3 of the white pegs should be inside the black anchors. (These are for chassis that do not have four CPU retention holes.)

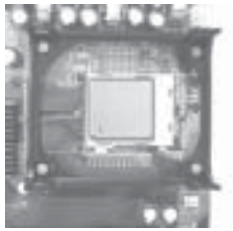


3. Place a retention bracket in the proper position and secure it by pressing two pegs into the retention holes until you hear a *click*. The clicking sound indicates that the peg is locked and secured.

4. Secure the other retention bracket into position by repeating Step 3.

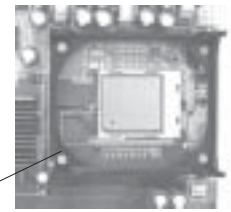
5. Lift the lever on the CPU socket.





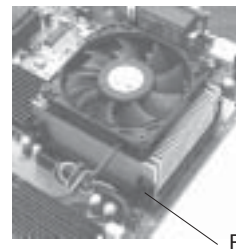
6. Install the CPU in the socket. Make sure that Pin 1 of the CPU is seated on Pin 1 of the socket (both corners are marked with a triangle).

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



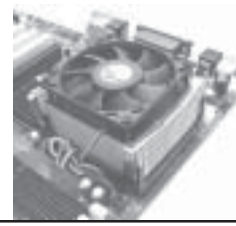
8. Apply the proper amount of thermal compound to the CPU die.

9. Place the heatsink on top of the CPU and press firmly downward - do not twist or slide the heatsink to seat thermal compound.



10. Secure the heat sink by locking the retention clips into their proper position.

11. Connect the CPU fan cable to the CPU Fan header on the motherboard.



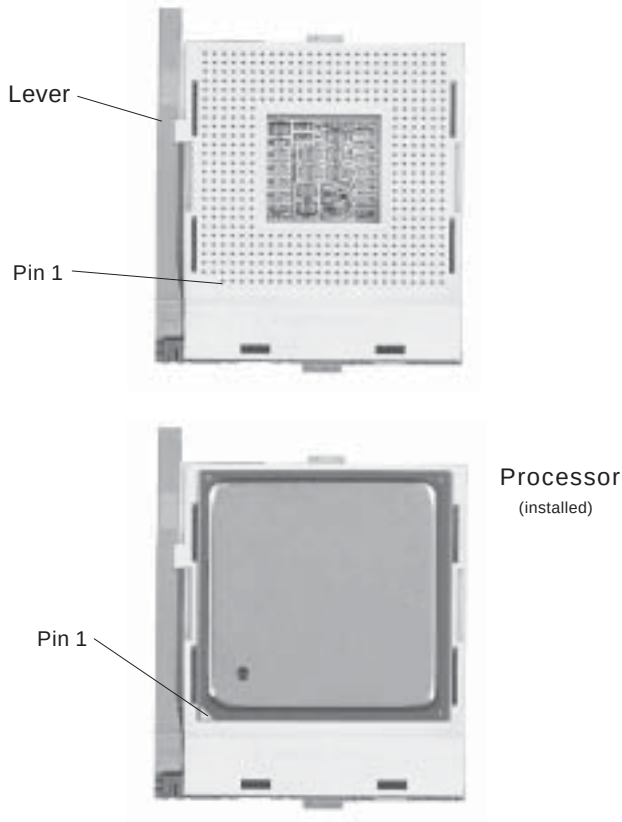


Figure 2-1. 478-pin mPGA Socket: Empty and with Processor Installed

2-3 Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure the location of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-4 Installing DDR Memory

CAUTION

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

Memory Module Installation (See Figure 2-2)

1. Insert each DDR memory module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly. (See support information below.)
2. Gently press down on the memory module until it snaps into place.

Support

The P4SPA+/P4SPE supports Dual or Single channel, Non-ECC, unbuffered DDR-400/333/266 SDRAM. Both interleaved and non-interleaved memory is supported, so you may populate any number of DIMM slots. (Populate DIMM1,DIMM3 and/or DIMM2, DIMM4 with memory modules of the same size/same type will result in the dual channel, two-way interleaved memory which is faster than the single channel, non-interleaved memory.)

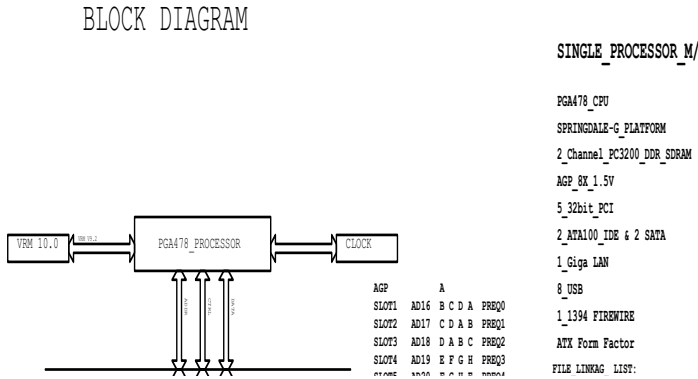
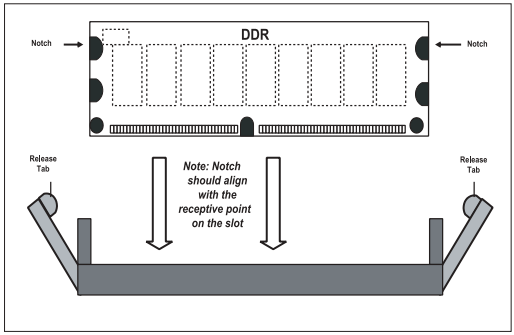
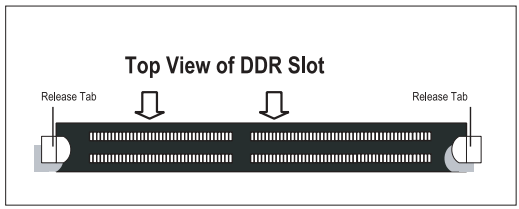


Figure 2-2. Side and Top Views of DDR Module Installation into Slot

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



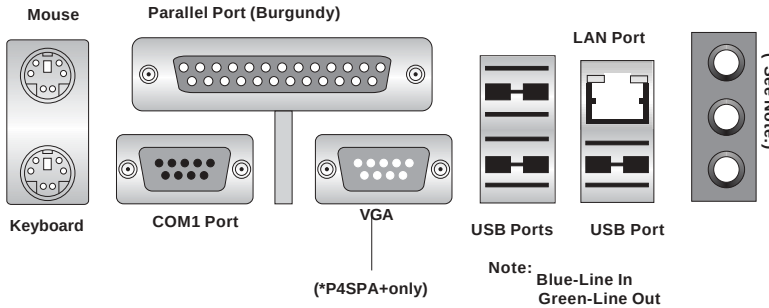
To Remove:
Use your thumbs gently to push each release tab outward to release the DIMM from the slot.



2-5 I/O Port/Control Panel Connector Locations

The I/O ports are color coded in conformance with the PC99 specification to make setting up your system easier. See Figure 2-3 below for the colors and locations of the various IO ports.

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



Front Control Panel

JF1 acontain header pins for various front control panel connectors. See Figure 2-4 for the pin definitions of the various connectors including the speaker. Refer to Section 2-6 for details.

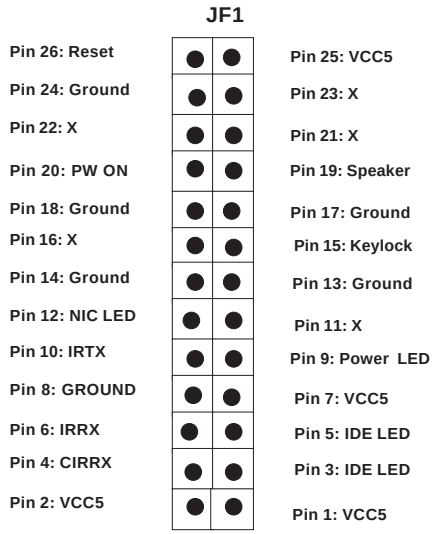


Figure 2-4. Front Control Panel Connectors

2-6 Connecting Cables

Power Supply Connectors

The primary power supply connector(J7) on the P4SPA+/P4SPE meets the SSI (Superset ATX) 20-pin specification. Refer to the table on the right for the pin definitions of the ATX 20-pin power connector. You must also connect the 4-pin (J9) processor power connector to your power supply. Refer to the table below right for the J9 (12V) connector.

ATX 20-pin Power Connector Pin Definitions (J7)

Pin #	Definition	Pin #	Definition
11	+3.3V	1	+3.3V
12	-12V	2	+3.3V
13	COM	3	COM
14	PS_ON	4	+5V
15	COM	5	COM
16	COM	6	+5V
17	COM	7	COM
18	-5V	8	PW-OK
19	+5V	9	5VSB
20	+5V	10	+12V

+12V 4-pin Connector (J9)

Required Connection

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

IR Connector

The infrared connector is located on pins 2,4,6,8, and 10 of JF1. See the table on the right for pin definitions. See the Technical Support section of our web page for information on the infrared devices you can connect to the system.

Infrared Pin Definitions (JF1)

Pin Number	Definition
2	+5V
4	CIRRX
6	IRRX
8	Ground
10	IRTX

PW_ON Connector

The PW_ON connector is located on pins 18 and 20 of JF1. Connect it to the chassis power button, which you may also configure to put the system into suspend mode (see the Power Button Mode setting in BIOS). To turn off the power when the suspend mode is enabled, depress the power button for at least 4 seconds. See the table on the right for pin definitions.

PW_ON Pin Definitions (JF1)

Pin Number	Definition
20	PW_ON
18	Ground

Reset Connector

The reset connector is located on pins 24 and 26 of JF1. This connector attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Pin Definitions (JF1)

Pin Number	Definition
24	Ground
26	Reset

*IDE/SATA LED(*See Note below)

The IDE LED is located on pins 1, 3, 5, and 7 of JF1. This connects to the IDE/SATA LED to display all activities of all IDE/SATA devices. See the table on the right for pin definitions. (*This LED is for all IDE/SATA devices.)

IDE Pin Definition

Pin Number	Definition
1	+5V
3	HD Active
5	HD Active
7	+5V

Power_LED Connector

The Power LED connector is located on pins 9,11 and 13 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power_LED Pin Definitions (JF1)

Pin Number	Definition
9	+5V
11	+5V
13	Ground

Keylock Connector

The keylock connector is located on pins 15 and 17 of JF1. See the table on the right for pin definitions.

Keylock Pin Definitions (JF1)

Pin Number	Definition
15	Keylock
17	Control

Speaker Connector

The speaker connector is located on pins 19, 21, 23 and 25 of JF1. See the table on the right for pin definitions.

Speaker: Pin Definition

Pin Number	Fucntion	Pin Definition
19		Speaker data
21	Key	No connection
23	Key	No connection
25	+5V	Red wire

Serial Ports

Two serial ports are included on the motherboard: COM1 is a port located beside the mouse/keyboard ports and COM2 is a header located on the motherboard near PCI slot 5. See the table on the right for pin definitions.

*NC indicates no connection.

Serial Port Pin Definitions (COM1, COM2)

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

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

CD Header

There are two 4-pin CD headers of different sizes on the motherboard. These allow you to use the onboard sound for audio CD playback. Connect the audio cable from your CD drive to the header that fits your cable's connector. Only one CD header can be use at any one time. See the tables at right for pin definitions.

Audio CD Header Pin Definitions (CD1)

Pin Number	Definition
1	Left Stereo Signal
2	Ground
3	Ground
4	Right Stereo Signal

Audio CD Header Pin Definitions (CD2)

Pin Number	Definition
1	Right Stereo Signal
2	Ground
3	Left Stereo Signal
4	Ground

Fan Headers

There are four fan headers on the P4SPA+/P4SPE, which are designated CPU Fan, Chassis Fan 1 and Over Heat Fan. Connect the fan on your CPU heatsink to the CPU Fan header. See the table on the right for pin definitions.

Fan Header Pin Definitions (CPU, Chassis and Overheat)

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

Caution: These fan headers are DC power.

Chassis Intrusion

The Chassis Intrusion header is designated JL1. See the board layout in Chapter 1 for the location of JL1 and the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J1. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J1)

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

Universal Serial Bus (USB)

A Universal Serial Bus header on the motherboard, which may be used to provide front side chassis access (cables not included). These additional ports are labeled USB6 to USB7. See the tables on the right (below) for pin definitions.

USB Pin Definition

JPUSB

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

J11

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground

Wake-On-LAN

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

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and be "awakened" by an incoming call when in the suspend state. See the table on the right for pin definitions. You must also have a WOR card and cable to use WOR.

Wake-On-Ring Pin Definitions (JWOR1)

Pin Number	Definition
1	Ground
2	Wake-up

Overheat LED (JOH)

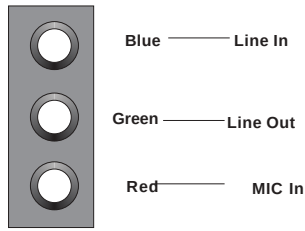
The JOH header is used to connect an LED to provide warning of chassis overheating. Refer to Table 2-15 for pin definitions.

Table 2-15
Overheat LED
Pin Definitions (JOH1)

Pin Number	Definition
1	12VDC
2	OH Active

AC'97 Output

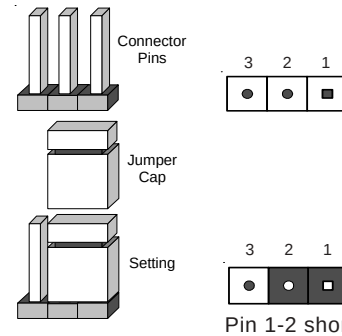
AC'97 provides high quality onboard audio. The P4SPA+/P4SPE features 6-channel sound for front L&R, rear L&R, center and subwoofer speakers. This feature is activated with the Advanced software (on the CD-ROM included with your motherboard). Sound is then output through the Line In, Line Out and MIC jacks (see at right). Activate AC 97 with the "AC 97 Audio" setting in the Advanced Chipset Features section of BIOS.



2-7 Jumper Settings

Explanation of Jumpers

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



Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.

CMOS Clear

JBT1 is not actually a jumper but consists of two contact pads. To clear the contents of CMOS, short these pads together by touching them both with a metal conductor such as the head of a small screwdriver. JBT1 is located near the SATA header on the P4SPA+/P4SPE. **Note:** for ATX power supplies, you must completely shut down the system and remove the AC power cord before clearing CMOS.

USB Wake-Up

Use JPUSB to enable or disable USB Wake-Up, which allows you to wakeup the system by depressing a key on the keyboard or by clicking the mouse when either is connected to the USB0 or USB1 port. This jumper is used together with the USB Wake-Up function in BIOS. Enable both the jumper and the BIOS setting to allow the system to be woken up. See the table on the right for jumper settings.

USB Wake-Up Jumper Settings (JPUSB)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Watch Dog Enable/Disable

JP4 enables controls the Watch Dog function. Watch Dog is a system monitor that takes action when a software application freezes the system. Pins 1-2 will have WD reset the system if a program freezes. Pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings (JP4)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

Front Side Bus Speed Settings

JP 2 and JP3 are the jumpers for the Front Side Bus Speed Select. See the table on the right for pin definitions.

Front Side Bus Speeds: JP2, JP3

JP2	JP3	
1-2	1-2	AUTO
2-3	2-3	100 MHz
2-3	NC	133 MHz
NC	2-3	200 MHz
NC	NC	Reserved

Keyboard Wake-Up

The JPWAKE jumper is used together with the Keyboard Wake-Up function in BIOS. Enable both the jumper and the BIOS setting to allow the system to be woken up by depressing a key on the keyboard. See the table on the right for jumper settings. Your power supply must meet ATX specification 2.01 or higher and supply 720 mA of standby power to use this feature.

Keyboard Wake-Up Jumper Settings (JPWAKE)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Power On

Instead of using the chassis power on switch, you may close jumper JP20 to apply power to the system. See the table on the right for jumper settings. The default setting is Open (normal).

Power On Jumper Settings (JP20)

Jumper Position	Definition
Open	Normal
Closed	Force Power On

Chassis/Overheat Fan Select

A header for the Overheat Fan Force On is located on JP1. Close Pins 1 & 2 of JP 1 to enable the function of OH Fan Force On, which will force the OH Fan to stay on all the time, and the OH Fan will function as a normal Chassis Fan. The default setting is "Open" to disable the function of OH Fan Force On. In this situation, the OH Fan will not be turned on unless an overheat condition occurs in the system.

Overheat Fan Force On (JP1)

Pin Position	Definitions
Open	Disabled
Closed	Enabled

2-8 Game Port, Parallel Port, Floppy Drive, Hard Drive and AGP 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.
- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Game Port Header

There is a game port header on the motherboard See the table on the right for pin definitions.

Game Port Header Pin Definitions (GAME PORT Header)

Pin Number	Function	Pin Number	Function
1	+5V fused	2	GP4 (JSBUTO)
3	GP0 (JSX1R)	4	Ground
5	Ground	6	GP1 (JSY1R)
7	GP5 (JSBUT1)	8	+5V fused
9	+5V fused	10	GP6 (JSBUT2)
11	GP2 (JSX2R)	12	MIDI-OUTR
13	GP3 (JSY2R)	14	GP7 (JSBUT3)
15	MIDI-INR		

Parallel Port Connector

The parallel port is located on J4. Refer to Figure 2-3 for location. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions (J4)

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 J5. Refer to Figure 2-3 for location. See the table on the right for pin definitions.

Floppy Connector Pin Definitions (J5)

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

IDE Connectors

There are no jumpers to configure the onboard IDE interfaces Pins 3, 5 of JF1. Refer to Figure 2-3 for location. See the table on the left for pin definitions.**Note:** You must use the ATA100/66 cable included with your system to benefit from the ATA100/66 technology.

IDE Connector Pin Definitions (J6, J7)

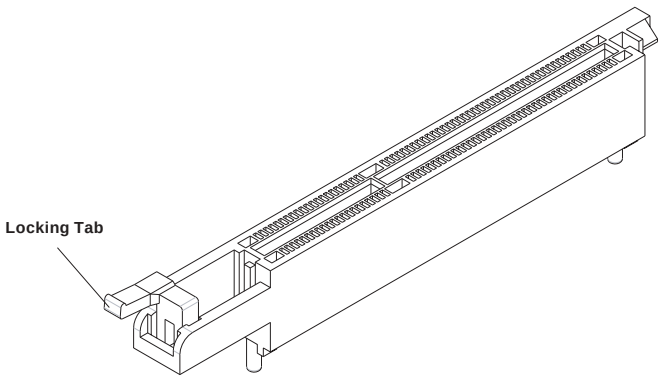
Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	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

1.5V 8xAGP Slot

The P4SPA+/P4SPE includes an 8xAGP slot for high-performance video cards. It is backward compatible with 4xAGP and 2xAGP graphics cards.

To install a VGA card, power down the system and remove the I/O shield corresponding to the AGP slot. Then, pull back the locking tab on the slot before inserting your VGA card. After the card is inserted, close the locking tab if possible (some VGA cards have a notch in the corner of the board to lock it into place, others do not). Replace all chassis covers before restoring power to the system.

Figure 2-5. 8xAGP Slot



2-9 Installing the Operating System and Software Programs

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

Drivers/Tool Installation Display Screen

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

Supero Doctor III

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

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

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

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

Notes

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

Before Power On

1. Check that the +5v standby LED is not lit (LE2 on motherboard).
2. Make sure the 4-pin 12v power connector at J24 is connected to your power supply.
3. Make sure no short circuits exist between the motherboard and chassis.
4. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
5. Remove all add-on cards.
6. Install a CPU and heatsink (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.
2. You should be using unbuffered DDR memory (see next page). Also, it is recommended that you use the same memory speed for all DIMMs in the system. See Section 2-4 for memory limitations.
3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results.
4. Check the power supply voltage 115V/230V switch.

Losing the System's Setup Configuration

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

3-2 Technical Support Procedures

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

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Questions' (FAQs) 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 Supermicro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version (this can be seen on the initial display when your system first boots up)
   - System configuration

   An example of a Technical Support form is posted 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 contacting our technical support department by e-mail at support@supermicro.com.

3-3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: The P4SPA+/P4SPE supports up to 4 GB of non-ECC, **unbuffered** DDR-400/333/266, two-way interleaved or non-interleaved SDRAM. See Section 2-4 for details on installing memory.

Question: How do I update my BIOS?

Answer: It is recommended that you **not** upgrade your BIOS if you are not experiencing problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com/techsupport/BIOS/bios.htm. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your current BIOS before downloading. Select your mainboard model and download the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the awdflash.exe (BIOS flash utility) and the BIOS image (xxxx.bin) files. Copy these files onto a bootable floppy and reboot your system. It is not necessary to set the BIOS boot block protection jumpers on the mainboard. At the DOS prompt upon rebooting, enter the command "awdflash." Then type in the BIOS file that you want to update (xxxx.bin).

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 fix 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 the JPWAKE jumper 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 <Alt> and <F2> at the same time, then turn on the power keeping 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: What's on the CD that came with my motherboard?

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

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

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

Question: How do I utilize the six-channel sound?

Answer: The six-channel sound available on the P4SPA+/P4SPE can be enabled with the audio driver software that was included in your motherboard package. When activated, sound will be routed through the jacks under the Game Port as follows: Line Out = front L&R speakers, Line In = rear L&R speakers, MIC = center and subwoofer speakers. You must also enable the "AC97 Audio" setting in the Advanced Chipset section of the BIOS setup.

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. P4SPA+/P4SPE IRQs

PCI 1 shares an IRQ with USB 2.0, AC 97, and the SM Bus Controller
PCI 2 shares an IRQ with CSA LAN, USB 1.1 (USB5,6)* and SATA
PCI 3 shares an IRQ with USB 1.1 (USB3,4)*
PCI 4 has a dedicated IRQ (does not share)
PCI 5 has a dedicated IRQ (does not share)

*Assumes USB 2.0 drivers have not been installed.

Question: I installed my microphone correctly but I can't record any sound. What should I do?

Answer: Go to <Start>, <Programs>, <Accessories>, <Entertainment> and then <Volume Control>. Under the Properties tab, scroll down the list of devices in the menu and check the box beside "Microphone".

Question: How do I connect the ATA100/66 cable to my IDE device(s)?

Answer: The 80-wire/40-pin high-density ATA100/66 IDE cable that came with your system has two connectors to support two drives. This special cable must be used to take advantage of the speed the ATA100/66 technology offers. **Connect the blue connector to the onboard IDE header and the other connector(s) to your hard drive(s).** Consult the documentation that came with your disk drive for details on actual jumper locations and settings.

Question: After I have installed 4 pieces of 1GB Memory, why does the BIOS only detect about 3.75 GB of memory during POST?

Answer: Because the chipset does not support memory remapping, so there is a memory hole located around the 4GB memory address.

Question: I have a P4SPA+ motherboard. The IDE CD ROM on the Secondary IDE disappears after I install the SATA hard drive.

Answer: To fix this, set SATA to "MANUAL" and set SATA0 to "Primary IDE Master", then both SATA and Secondary IDE can be seen. If you have your IDE CDROM on the Primary IDE, then you need to set the SATA0 to "Secondary IDE Master".

3-4 Returning Merchandise for Service

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

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

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

Chapter 4
BIOS

4-1 Introduction

This chapter describes the AwardBIOS for the P4SPA+/P4SPE. The Award ROM BIOS is stored in a Flash chip and can be easily upgraded using a floppy disk-based program.

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

System BIOS

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

How To Change the Configuration Data

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

Starting the Setup Utility

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

4-2 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 Main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

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

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

1. By pressing <Del> immediately after turning the system on, or
2. When the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Del> key to activate the Main Setup Menu.

Press DEL to enter SETUP

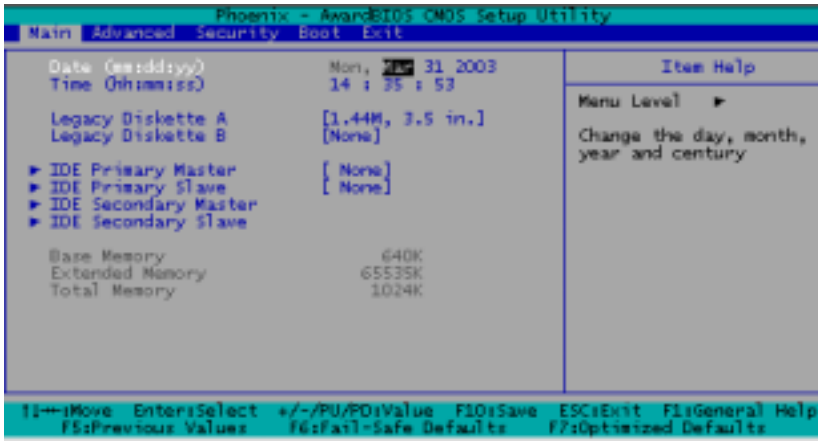
4-3 Main BIOS Setup

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

Use the <Up> <Down> arrow keys or the <Tab> key to move among the different settings in the above menu.

Press the <Esc> key to exit the CMOS Setup Menu and use the <Left> <Right> arrow keys to enter the other categories of BIOS settings. The next section is described in detail to illustrate how to navigate through the menus.

Main BIOS Setup Menu



Date/Time

Set the system date and time. Key in the correct information in the "mm", "dd" and "yy" fields. Press the "Enter" key to save the data.

Legacy Diskette A

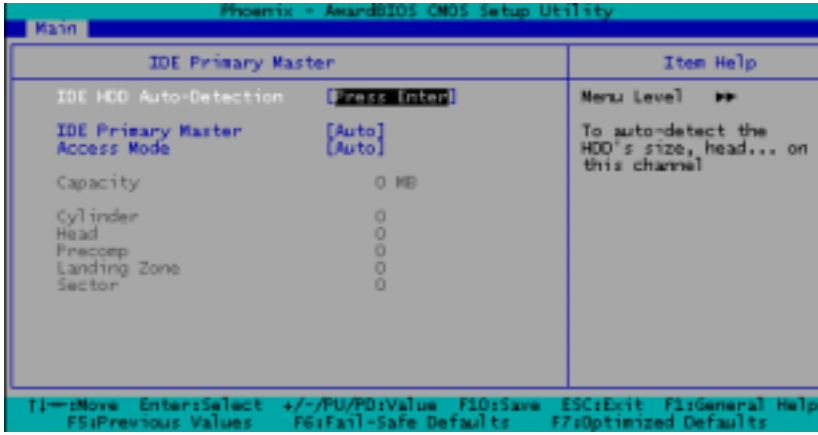
This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are None, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Legacy Diskette B

This setting allows the user to set the type of floppy disk drive installed as diskette B. The options are **None**, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, 1.44/1.25MB, 3.5 in and 2.88MB 3.5 in.

▶Primary Master/Primary Slave/Secondary Master/Secondary Slave

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



IDE HDD Auto-Detection

This option allows the user to determine the manner in which the AwardBIOS sets the settings for the IDE Primary Master Device. The options are "None", "**Auto**" and "Manual."

IDE Primary Master

Press the <Enter> key to activate the 'IDE HDD Auto-Detection" function, which will allow BIOS to automatically detect the status of the IDE HDD installed in the system, such as the size, the number of cylinders, the configurations of items such as Head, Precomp, Landing Zone and Sector.

Access Mode

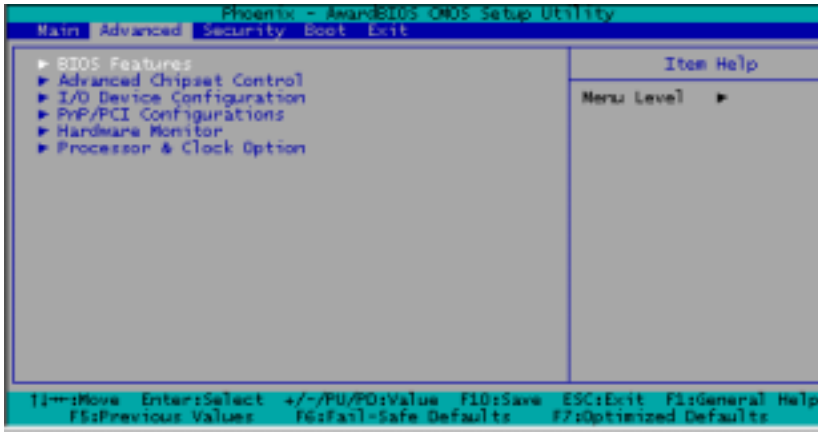
This item determines the location through which the AwardBIOS accesses the IDE Primary Master Device. The settings are "CHS", "LBA", "Large", and "**Auto**".

Base Memory/Extended Memory/Total Memory

These are displays that inform you how much of each type of memory is recognized as being present in the system.

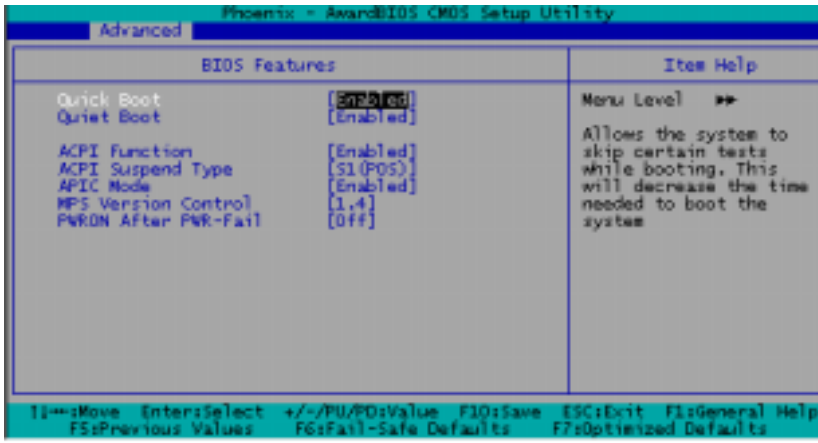
4-4 Advanced BIOS Setup

Choose Advanced BIOS Setup from the Award BIOS main menu with the Left/ Right arrow keys. You should see the following display. Select one of the items in the left frame of the screen to go to the sub screen for that item. Advanced BIOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced BIOS Setup options are described in this section.



4-4.1 Advanced BIOS Features

When the item of Advanced BIOS Features is highlighted, press the <Enter> key to activate the screen below:



Quick Boot

If enabled, this feature allows the system to skip certain tests while booting. This will decrease the time needed to boot the system. The settings are "**Enabled**" and "Disabled".

Quiet Boot

This feature allows the user to activate the function of "Quiet Boot". "**Enabled**" and "Disabled".

ACPI Function

Select "Enabled" to activate the function of BIOS Support for Advanced Configuration and Power Interface features. The settings are "**Enabled**" or "Disabled".

ACPI Suspend Type

If enabled, the option allows the user to determine the ACPI Suspend type. The options are **S1(POS)**, S3(STR), S1&S3.

APIC Mode

This setting allows you to **Enable** or Disable APIC. APIC is used to assign interrupt signals to a specific processor on multi-processor system and provides IRQs beyond the conventional 16 under Windows 2000 or XP. It has no effect on single processor systems.

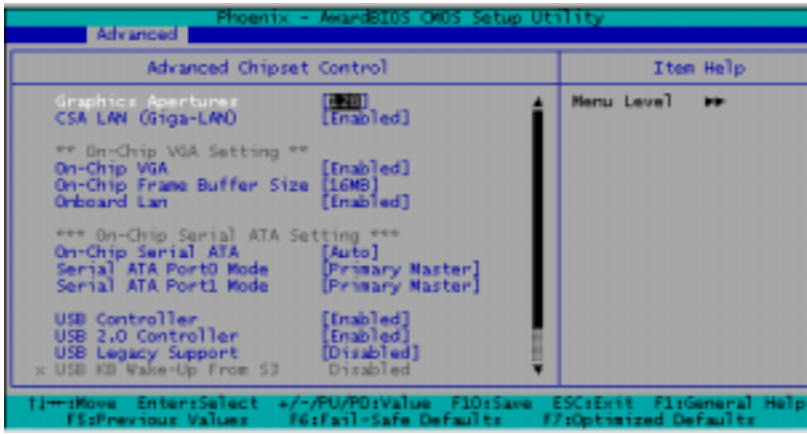
MPS Version Control for OS

This setting allows you to state the MPS version for your operating system. Options are "1.1" and "**1.4**".

PWRON After PWR-Fail

This setting allows the user to specify how the system will respond when power is reapplied after the system has gone down due to a power failure. The options are "**Off**", "On" and "Former-Sts".

4-4.2 Advanced Chipset Control



Graphics Apertures

This option allows the BIOS to set the size of system memory reserved for AGP Graphic access. The options are 4, 8, 16, 32, 64, **128**, and 256.

CSA LAN(Giga-LA)

This setting allows you to enable or disable the CSA (GLAN) Controller. The options are "**Enabled**", and "Disabled."

On-Chip VGA

This setting allows you to enable or disable On-Chip VGA Controller. The options are "**Enabled**", and "Disabled."

On-Chip Frame Buffer Size

This setting allows you to set On-Chip Frame Buffer Size. The options are "1 MB", "4 MB", "8 MB", "**16 MB**" and "32 MB."

Onboard LAN

This setting allows you to enable or disable the Onboard LAN Controller. The options are "**Enabled**", and "Disabled."

On-Chip Serial ATA

Select "Disabled" to disable SATA Controller. Select "Auto" to allow the BIOS to make arrangements automatically. The options are "Disabled", "**Auto**", and "Manual". However, if Primary IDE and Secondary IDE drives are not populated, the Award BIOS will display "Pri Master" for the item "Onboard SATA1", and "Sec Master" for the item "Onboard SATA2". If the Primary IDE is populated and the Secondary IDE drive is not populated, the Award BIOS will display "Sec Master" for the item

"Onboard SATA1", and "Sec Slave" for the item "Onboard SATA2". If the Primary IDE is not populated and the Secondary IDE drive is populated, the Award BIOS will display "Pri Master" for the item "Onboard SATA1", and "Pri Slave" for the item "Onboard SATA2". **If both Primary IDE and the Secondary IDE drives are populated, the Award BIOS will assign "Tertiary" for the item "Onboard SATA1", and "Quad" for the item "Onboard SATA2". (***The last option is supported by XP or the later version of OS only.)

On-Chip Serial ATA Port0/Port1 Mode.

The option allows you to select SATA Port0 mode. The options are "Primary Master", "Primary Slave", "Secondary Master", "Secondary Slave", "Logical Primary", "Logical Secondary", "Tertiary Master", and "Quaternary Master". The default setting for On-Chip SATA Port0 is "**Logical Primary**", and the default setting for Port1 is "**Logical Secondary**."

USB Controller

This setting allows you to enable or disable the USB Controller. The options are **Enabled**, and Disabled.

USB 2.0 Controller

This setting allows you to enable or disable USB 2.0 (EHCI) Controller. The options are **Enabled**, and Disabled.

USB Legacy Support

This setting allows you to enable or disable the functions of USB, Keyboard/Mouse under POST and DOS. The options are **"Disabled"**, and "Enabled."

USB KB Wake-Up From S3

This setting allows you to enable or disable the function of USB KB Wake-Up from S3. The options are **"Disabled"**, and "Enabled."

AC97 Audio

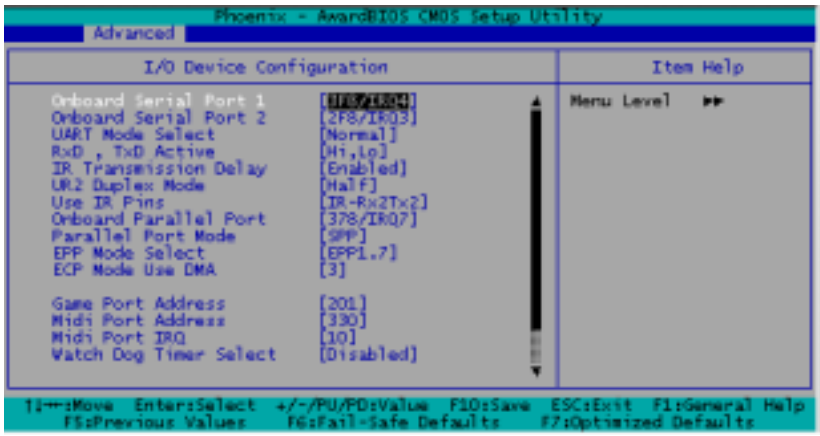
Select "Disable" to disable AC 97 Controller. Select "Auto" to allow the BIOS select AC97 automatically. The options are **"Auto"**, and "Disabled."

CPU THRM-Throttling

THRM throttling is used to lower power consumption and reduce the heat generated by the CPU. The options for this setting are "**87.5%**", "75%",

"62.5%", "50%", "37.5%", "25%' and "12.5%'.

4-4.3 I/O Device Configuration



Onboard Serial Port1/Onboard Serial Port2

This setting allows the user to set the address and the corresponding IRQ for the Serial Port1 and Serial Port 2. The options are "Disabled" , "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3", and "Auto". The default setting for Serial Port1 is "**3F8/IRQ4**" and the default for Port 2 is "**2F8/IRQ3**".

UART Mode Select

This setting allows the user to select the UART mode for the BIOS. The options are "IrDA", "ASKIR" and "**Normal**."

RxD, TxD Active

This allows the user to change the settings for the "RxD, TxD Active" function. The options are "Hi, Hi", "**Hi, Lo**", "Lo, Hi", and "Lo, Lo".

IR Transmission Delay

If "Enabled", the transmission of IR (infrared) signals will be delayed. The options are "**Enabled**" and "Disabled".

UR2 Duplex Mode

This setting set the mode for the UR2 Duplex Mode. The options are "Full" and "**Half**".

Use IR Pins

This item sets the usage of the IR pins. The options are "RxD2, TxD2" and "**IR-Rx2Tx2**".

Onboard Parallel Port

This setting allows the user to set the address and the corresponding IRQ for the onboard parallel port. The options are "Disabled", "**378/IRQ7**", "278/ IRQ5" and "3BC/IRQ7".

Parallel Port Mode

This setting sets the mode for the onboard Parallel port. The options are "**SPP**," "EPP", "ECP" "ECP+EPP" and "Normal".

EPP Mode Select

This setting allows the user to select the EPP port type. The options are "EPP 1.9" and "**EPP 1.7**".

ECP Mode Use DMA

This setting allows the user to select the DMA channel for the ECP mode (port) to use. The options are "1" and "**3**".

Game Port Address

This setting allows the user to set the address for the Game Port. The options are "Disabled", "**201**" and "209".

Midi Port Address

This setting allows the user to set the address for the Midi Port. The options are "Disabled", "**330**", "300" and "290".

Midi Port IRQ

This setting allows the user to set the IRQ for the Midi Port. The options are "5", and"**10**".

Watch Dog Timer Select

This setting allows you to set the Watch Dog Timer. You must also change

the setting of the Watch Dog jumper in order for this function to work well (-see jumper settings in Chapter 2). Options are "10 Sec", "20 Sec", "30 Sec", "40 Sec", "1 Min", "2 Min", "4 Min" and "**Disabled**".

Power On Function

This setting allows the user to decide which method to use to power on the system. The options are "Password", "Hot Key", "Mouse Left", "Mouse Right", "Any Key", and "**Button Only**".

KB Power On Password

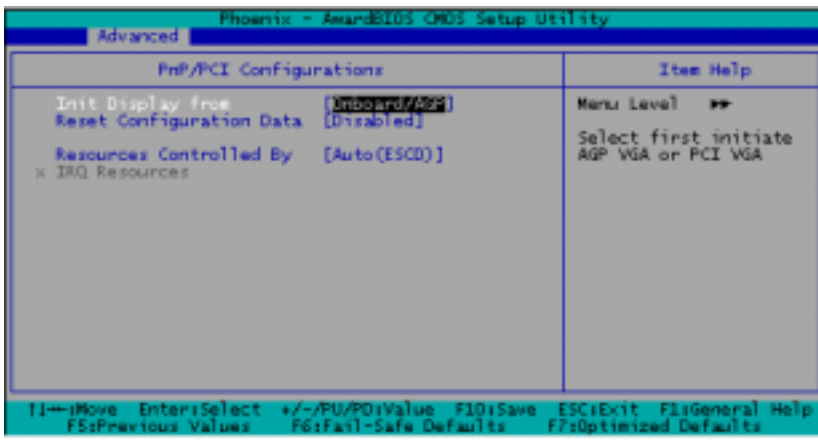
This setting allows the user to enter the Password when the system is powered on via keyboard.

Hot Key Power On

This setting allows the user to decide which hot-keys to use in order to power on the system. The options are "**Ctrl-F1**", "Ctrl-F2, Ctrl-F3", "Ctrl-F4", "Ctrl-F5", "Ctrl-F6", "Ctrl-F7", and "Ctrl-F8".

4-4.4 PnP Configuration

Choose PCI/PnP Configurations from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Initial Display From

This feature sets the device that will initiate the monitor display when the system is first turned on. The Options are "PCI Slot" and "**Onboard/AGP**".

Reset Configuration Data

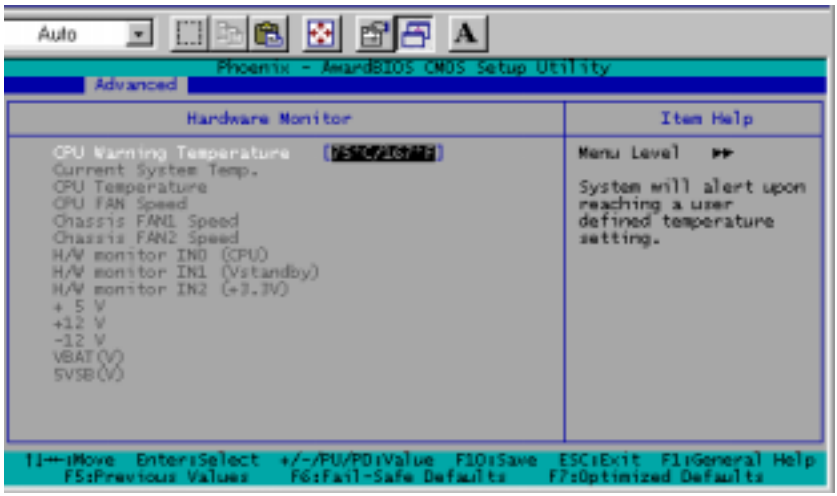
Enabling this setting resets the extended system configuration data when you exit setup. Do this when you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot reboot the system. The options are "Enabled" and "**Disabled**".

Resources Controlled By

This setting allows BIOS to automatically configure all boot and Plug and Play compatible devices. If you choose Auto, you cannot select the IRQ, DMA and memory base address fields, because BIOS automatically assigns them. The options are "**Auto <ESCD>**" and "Manual".

4-4.5 Hardware Monitors

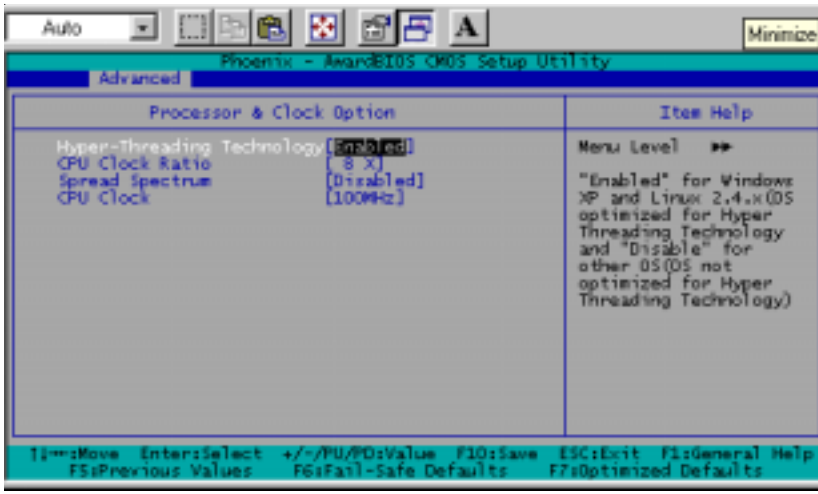
There are only three settings on this menu (below). The rest of this menu shows various temperatures and voltage levels as indicated.



CPU Warning Temperature

This allows you to set the CPU warning temperature. If the CPU temperature reaches this threshold, an alarm will activate and a warning message will be displayed onscreen. The options are "Disabled", "60^{0}C/140^{0}F", "65^{0}C/149^{0}F", "70^{0}C/158^{0}F", "**75^{0}C/167^{0}F**", "80^{0}C/176^{0}F" and "85^{0}C/185^{0}F".

4-4.6 Processor & Clock Options



Hyper-Threading

Set this option to "Enabled" to activate the hyper-threading function of the CPUs. Enabling the hyper-threading function makes each CPU appear as two to any programs that support it (you must have OS support also). The settings are "Disabled" and "**Enabled**."

CPU Clock Ration

Use this option to set the clock ratio of the processor. The settings are "**x8**" "x9", "x10", "x11", "x12", "x13", "x14", "x15", "x16", "x17", "x18", "x19", "x20", "x21", "x22" and "x23".

Spread Spectrum

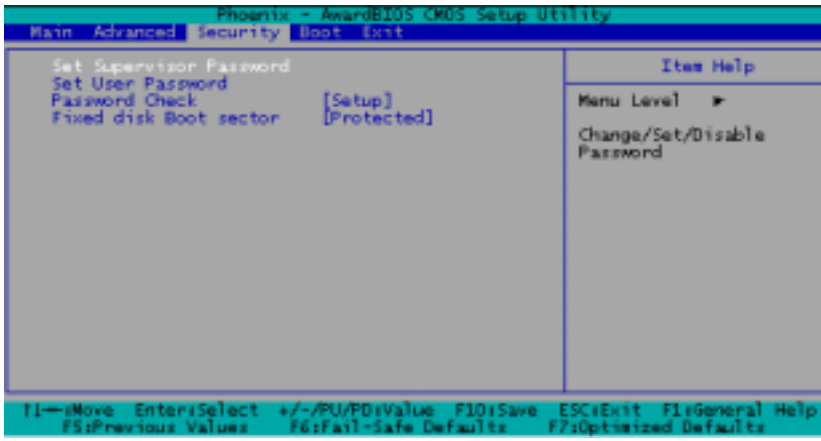
Spread Spectrum is a technique used to stablize a system by reducing the level of ElectroMagnetic Interference. The options are "Enabled" and **"Disabled"**.

CPU Clock

Key in the number you want to set for the CPU clock (MHz). Supermicro does not recommend or make any guarantees with CPU overclocking.

4-5 Security

Choose Security from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Set Supervisor Password

When the item "Set Supervisor Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the Supervisor Password in the dialogue box to set or to change the Supervisor Password.

Set User Password

When the item "Set User Password" is highlighted on the above screen, press the <Enter> key. When prompted, type the User Password in the dialogue box to set or to change the User Password.

Password Check

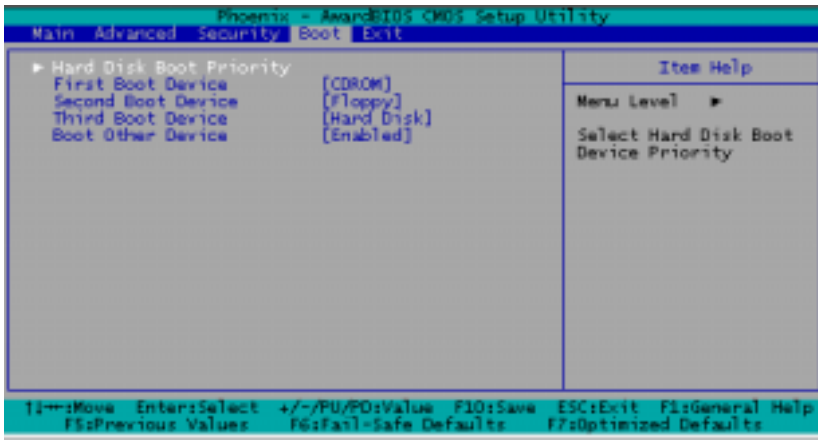
This setting allows the user to determine if the password is required every time when the system boots up or if the password is required only when you enter the CMOS setup. The options are "System" and "**Setup**".

Fixed Disk Boot Sector

This setting allows the user to configure the Fixed Disk Boot Sector. The default setting is "**Protected**".

4-6 Boot

Choose Boot from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Award BIOS attempts to load the operating system from devices specified by the users in a user-specified sequence.

Hard Disk Boot Priority

This item allows the user to select the Boot Priority of Hard Disk Devices.

First Boot Device

This item allows the user to set the first boot-up device. The options are "Floppy", "LS120", "HDD", **"CDROM",** "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Second Boot Device

This item allows the user to set the second boot-up device. The options are **"Floppy"**, "LS120", "HDD", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Third Boot Device

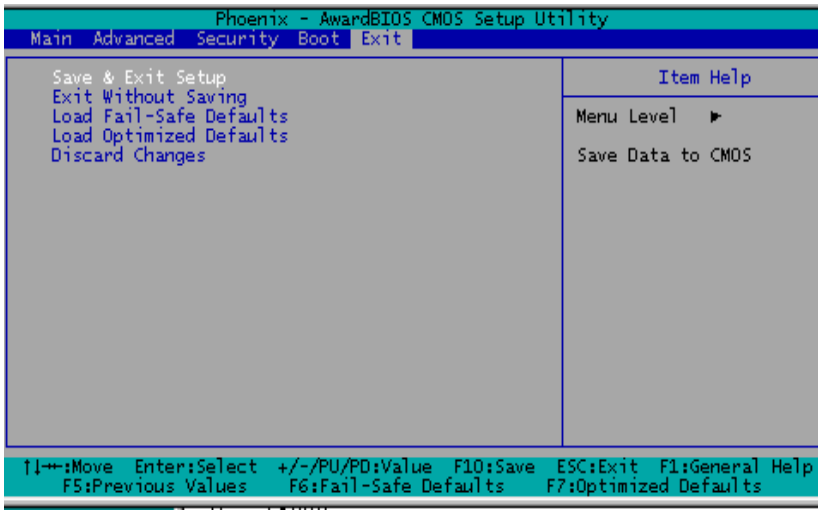
This item allows the user to set the third boot-up device. The options are "Floppy", "LS120", "**HDD**", "SCSI", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN" and "Disabled".

Boot Other Device

If enabled, this option enables the BIOS to load the OS from another device rather than the ones that have been specified as the first, second and third boot up devices. The settings are "**Enabled**" and "Disabled".

4-7 Exit

Choose Exit from the Award BIOS main menu with the Left/Right arrow keys. You should see the following display:



Save & Exit Setup

When the item "Save & Exit Setup" is highlighted, press <Enter> to save the changes you've made in the BIOS program (CMOS) and exit. Your system should, then, continue with the boot-up procedure.

Exit without Saving

When the item "Exit without Saving" is highlighted, press <Enter> to exit the Setup routine without saving any changes you may have made. Your system should then continue with the boot-up procedure.

Load Fail-Safe Defaults

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

Load Optimized Defaults

Highlight this item and hit <Enter> to load the optimized settings for all items in the BIOS Setup. These settings provide you with optimal system performance.

Discard Changes

When the item "Discard Changes" is highlighted, press <Enter> to discard any changes you made to the BIOS settings and to stay in BIOS Setup. Your system should then continue with the boot-up procedure.

Appendix A
BIOS POST Messages

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

Beeps	Error Messages
1 long beep	Memory Modules Errors
1 long beep+2 short beeps	VGA Errors

Notes

Appendix B: Award BIOS POST Codes

This section lists the POST (Power On Self Testing) Codes for the Award BIOS.

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	● Disable PS/2 mouse interface (optional). ● Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). ● Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.

POST (hex)	Description
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	• Program CPU internal MTRR (P6 & PII) for 0-640K memory address. • Initialize the APIC for Pentium class CPU. • Program early chipset according to CMOS setup. Example: onboard IDE controller. • Measure CPU speed. • Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved

POST (hex)	Description
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.

POST (hex)	Description
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.

POST (hex)	Description
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text font used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

NOTES