SUPER●®

SUPER 370SSA
SUPER 370SSM
SUPER 370SSR
SUPER 370SSE

USER'S MANUAL

Revision 1.3a

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 370SSA/370SSM/370SSR/370SSE motherboard. The SUPER 370SSA/370SSM/***370SSR/*370SSE** supports single Pentium® III FCPGA 500 MHz-1 GHz processors and Celeron FCPGA/PPGA 333-500 processors at front side bus speeds of 133, 100 and 66 MHz. Please refer to the support section of our web site < http://www.supermicro.com/TechSupport.htm > for a complete listing of supported processors. FCPGA Pentium III processors are housed in a 370-pin package. **(*Note: See the note listed on Page 1-3)**

Manual Organization

Chapter 1 includes a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the SUPER 370SSA/370SSM//***370SSR/*370SSE**   mainboards and provides detailed information about the chipset. **(*Note: See the note listed on Page 1-3)**

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and DIMM memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, 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   lists BIOS error beep codes.

Table of Contents

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.

One (1) Supermicro Mainboard **(*Also see the note listed on Page 1-3)**

One (1) ATA100 ribbon cable for IDE devices (370SSA/***370SSR/*370SSE**)

One (1) ATA66 ribbon cable for IDE devices (370SSM)

One (1) floppy ribbon cable for (1) 5.25-inch floppy and (2) 3.5-inch floppy drives

One (1) serial COM 2 cable (retail only)

One (1) I/O shield (***370SSR/SSE** only)

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

One (1) User's/BIOS Manual

(*See the note listed on Page 1-3.)

CONTACTING SUPERMICRO

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Avenue
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
E-mail:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web site:	www.supermicro.com

European Office

Address:	Super Micro Computer B.V.
	Het Sterrenbeeld 28, 5215 ML,
	's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
E-mail:	sales@supermicro.nl (General Information)
	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)

Asia-Pacific

Address:	6th Floor, No. 755 Chung-cheng Road
	Chung-Ho City, Taipei Hsien, Taiwan, R.O.C.
TEL :	886-2-8221-1690 ext.102
FAX :	886-2-82212790
www :	www.supermicro.com.tw
Email:	support@supermicro.com.tw

*Note:
All the 370SSR+, 370SSE+ motherboards
do not have any LDT Ports (-parallel
Ports) installed on the boards. Only
those motherboards that are specified as
the 370SSR or 370SSE motherboards are
shipped with LDT (parallel) ports installed
on the boards.

SUPER 370SSA

Figure 1-1. SUPER 370SSA Image
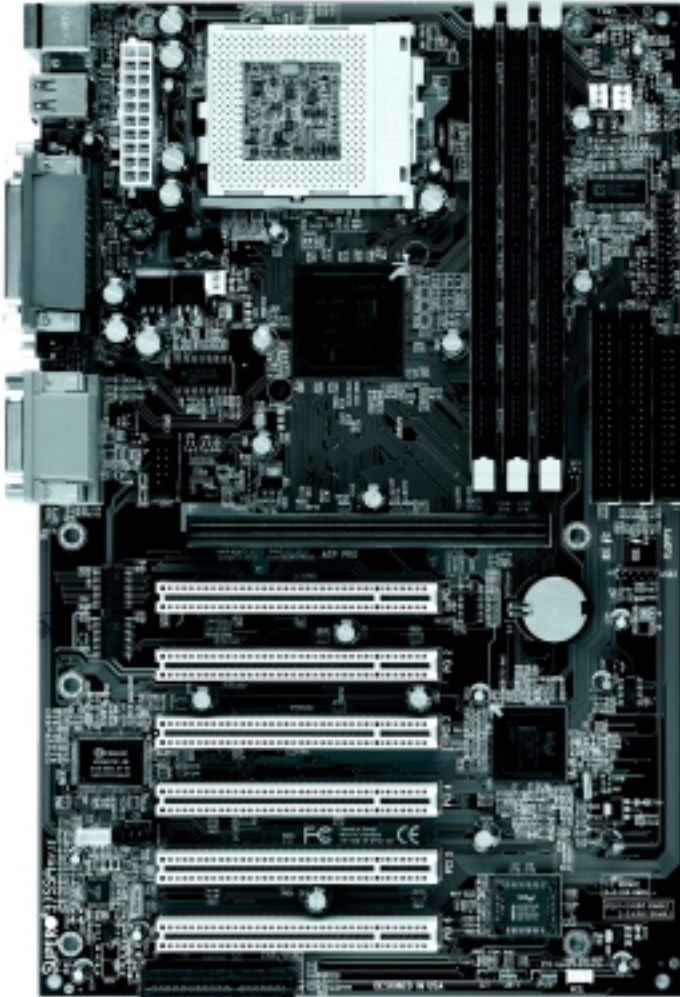
SUPER 370SSM

Figure 1-2. SUPER 370SSM Image
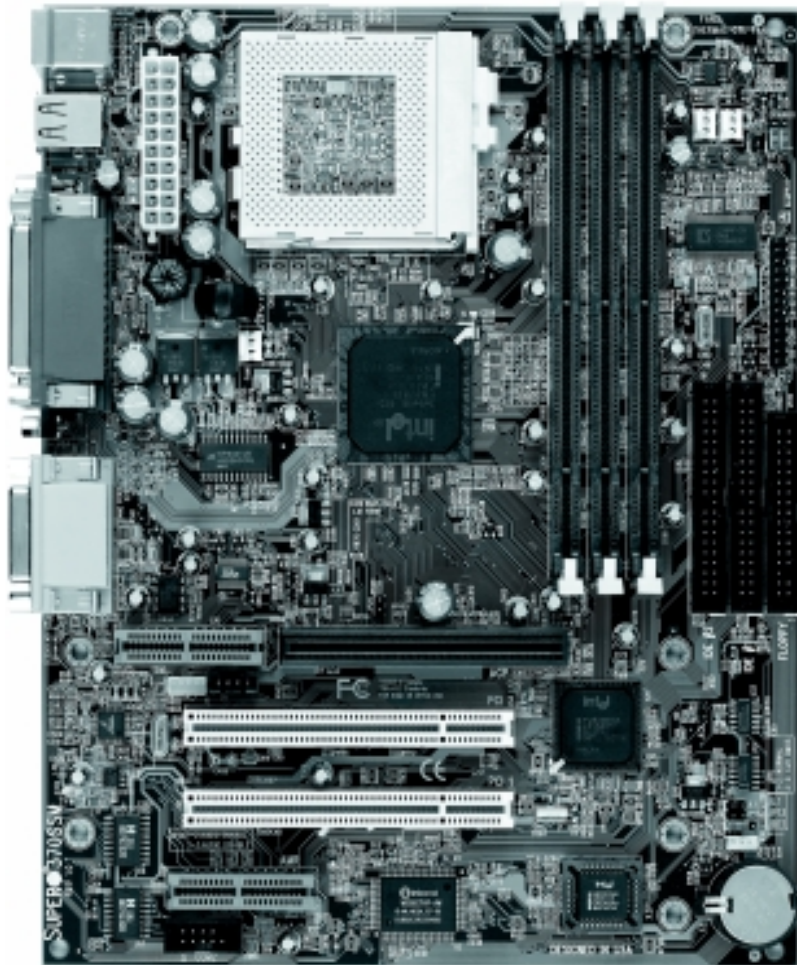
SUPER 370SSR

Figure 1-3. SUPER 370SSR Image
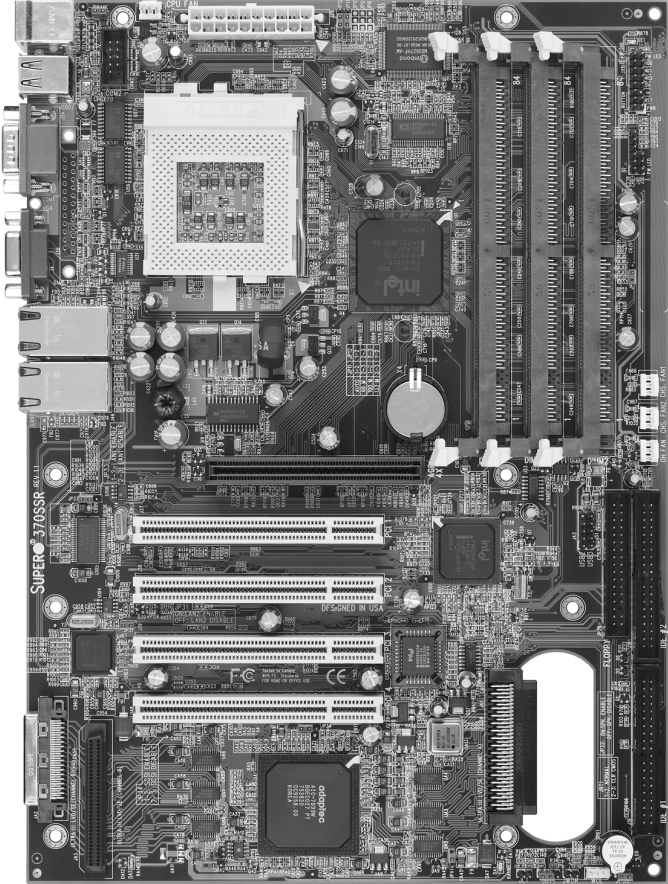
(*See the note listed on Page 1-3.)

SUPER 370SSE

Figure 1-3a. SUPER 370SSE Image
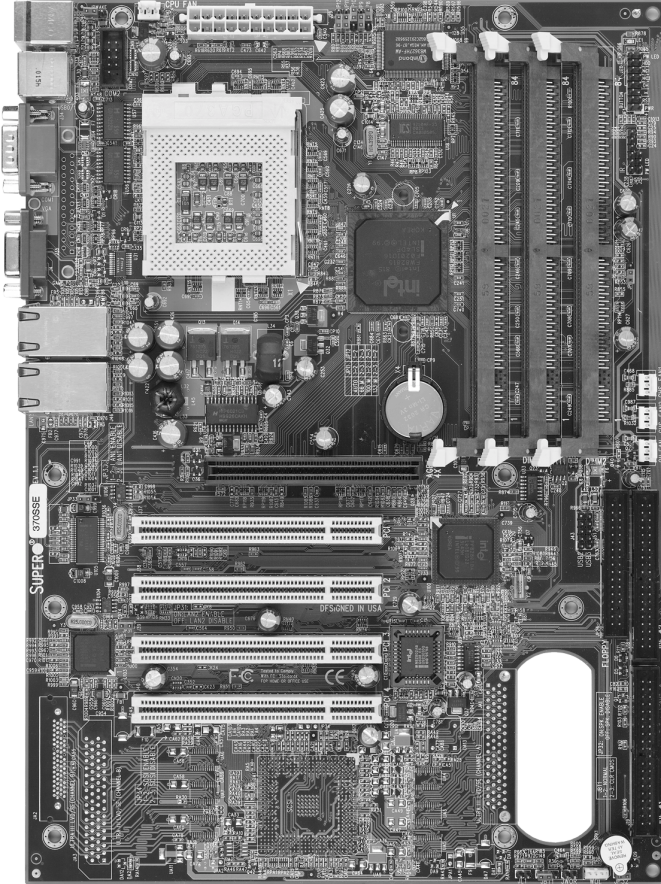
(*See the note listed on Page 1-3.)

Figure 1-4. SUPER 370SSA Layout
(not drawn to scale)
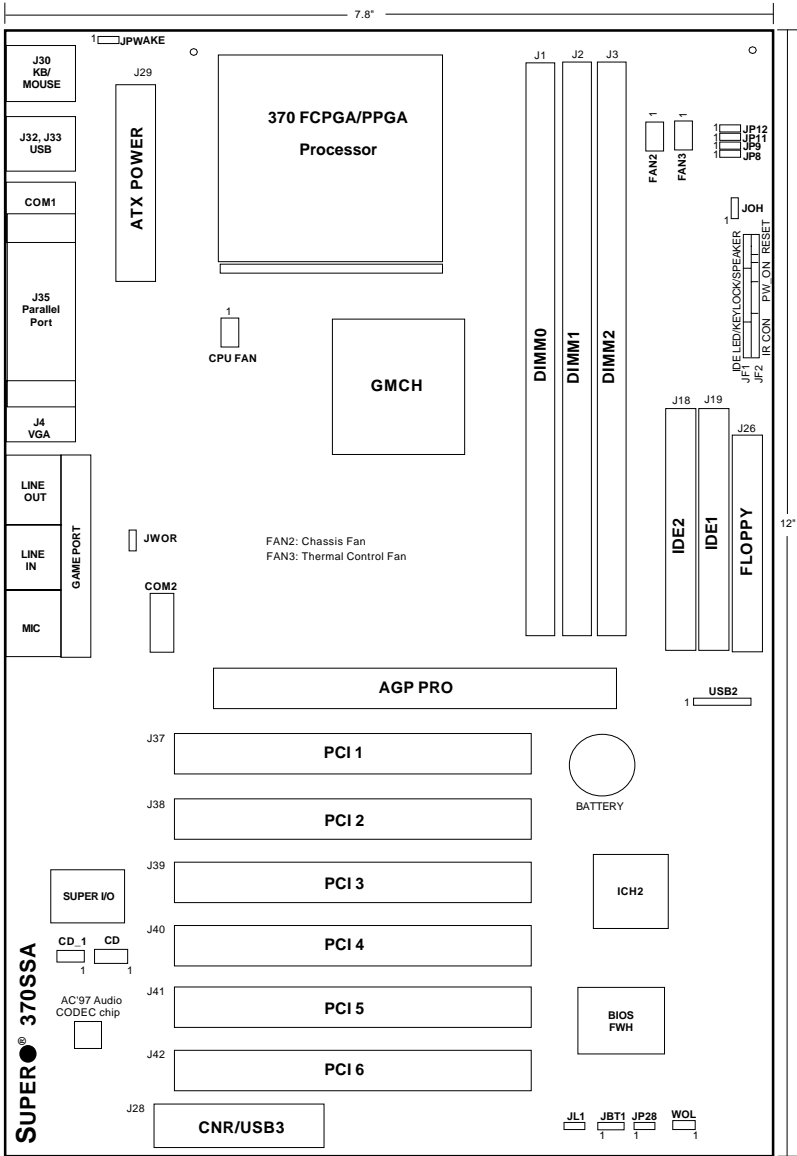
370SSA Quick Reference

Jumpers	**Description**	**Default Setting**
JBT1	CMOS Clear (p. 2-13)	Pins 1-2 (Normal)
JP11/12	Front Side Bus Speed (p. 2-12)	Both: Pins 1-2 (Auto)
JP28	AC97 Audio (p. 2-13)	Pins 1-2 (Enabled)
JPWAKE	Keyboard Wake-Up	Pins 1-2 (Disabled)

Connectors	**Description**
CD	Audio CD Input (large connector) (p. 2-10)
CD_1	Audio CD Input (small connector) (p. 2-10)
CNR	Communications/Networking Riser
COM1/COM2	COM1/COM2 Serial Port Connector
CPU FAN	CPU Fan Header (p. 2-11)
FAN2	Chassis Fan Header (p. 2-11)
FAN3	Thermal Control Fan Header (p. 2-11)
GAME	Game Port
J1, J2, J3	Memory (DIMM) Slots (p. 2-4)
J18, J19	IDE Hard Disk Drive Connectors (p. 2-16)
JP26	Floppy Disk Drive Connector (p. 2-16)
J29	ATX Power Connector (p. 2-7)
J30	PS/2 Keyboard/Mouse (p. 2-9)
J32, J33, J43	Universal Serial Bus Ports (p. 2-9)
J35	Parallel Printer Port (p. 2-16)
JF1, JF2	Front Control Panel (p. 2-6)
JL1	Chassis Intrusion Header (p. 2-11)
JOH	Overheat LED (p. 2-11)
JWOR	Wake-On-Ring Header (p. 2-13)
LINE IN	Audio In Connector
LINE OUT	Audio Out (Speaker) Connector
MIC	Microphone Input
USB3	Universal Serial Bus Port (p.2-10)
WOL	Wake-on-LAN Header (p. 2-10)

Also see the figures on page 2-5 for the I/O ports and page 2-6 for the Front Control Panel (JF1/2) connectors.

Jumpers not indicated are for test purposes only.

Figure 1-5. SUPER 370SSM Layout
(not drawn to scale)
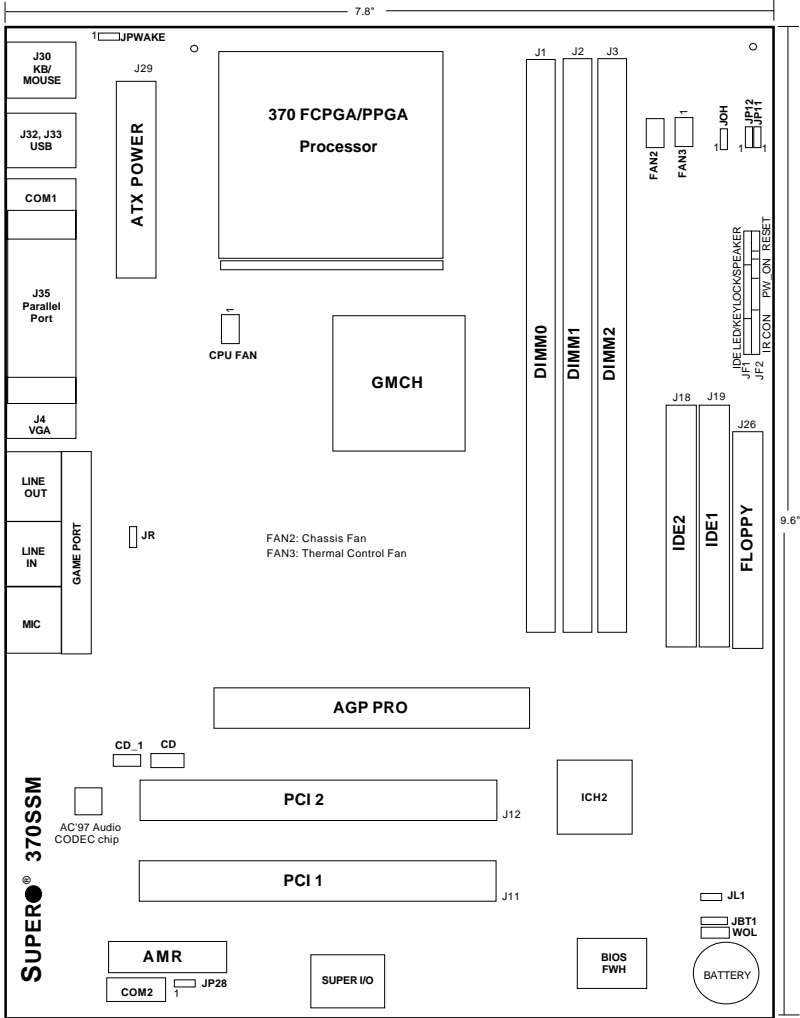
370SSM Quick Reference

Jumpers	Description	Default Setting
JBT1	CMOS Clear (p. 2-13)	Pins 1-2 (Normal)
JP11/12	Front Side Bus Speed (p. 2-12)	Both: Pins 1-2 (Auto)
JP28	AC97 Audio (p. 2-13)	Pins 1-2 (Enabled)
JPWAKE	Keyboard Wake-Up	Pins 1-2 (Disabled)

Connectors	Description
CD	Audio CD Input (large connector)
CD_1	Audio CD Input (small connector)
COM1/COM2	COM1/COM2 Serial Port Connector
CPU FAN	CPU Fan Header (p. 2-11)
FAN2	Chassis Fan Header (p. 2-11)
FAN3	Thermal Control Fan Header (p. 2-11)
GAME	Game Port
J1, J2, J3	Memory (DIMM) Slots (p. 2-4)
J18, J19	IDE Hard Disk Drive Connectors (p. 2-16)
JP26	Floppy Disk Drive Connector (p. 2-16)
J29	ATX Power Connector (p. 2-7)
J30	PS/2 Keyboard/Mouse (p. 2-9)
J32, J33	Universal Serial Bus Ports (p. 2-9)
J35	Parallel Printer Port (p. 2-16)
JF1, JF2	Front Control Panel (p. 2-6)
JL1	Chassis Intrusion Header (p. 2-11)
JOH	Overheat LED (p. 2-11)
JWOR	Wake-On-Ring Header (p. 2-13)
LINE IN	Audio In Connector
LINE OUT	Audio Out (Speaker) Connector
MIC	Microphone Input (p. 2-10)
WOL	Wake-on-LAN Header (p. 2-10)

Also see the figures on page 2-5 for the I/O ports and page 2-6 for the Front Control Panel (JF1/2) connectors.

Jumpers not indicated are for test purposes only.

Figure 1-6. SUPER 370SSR Layout
(not drawn to scale)
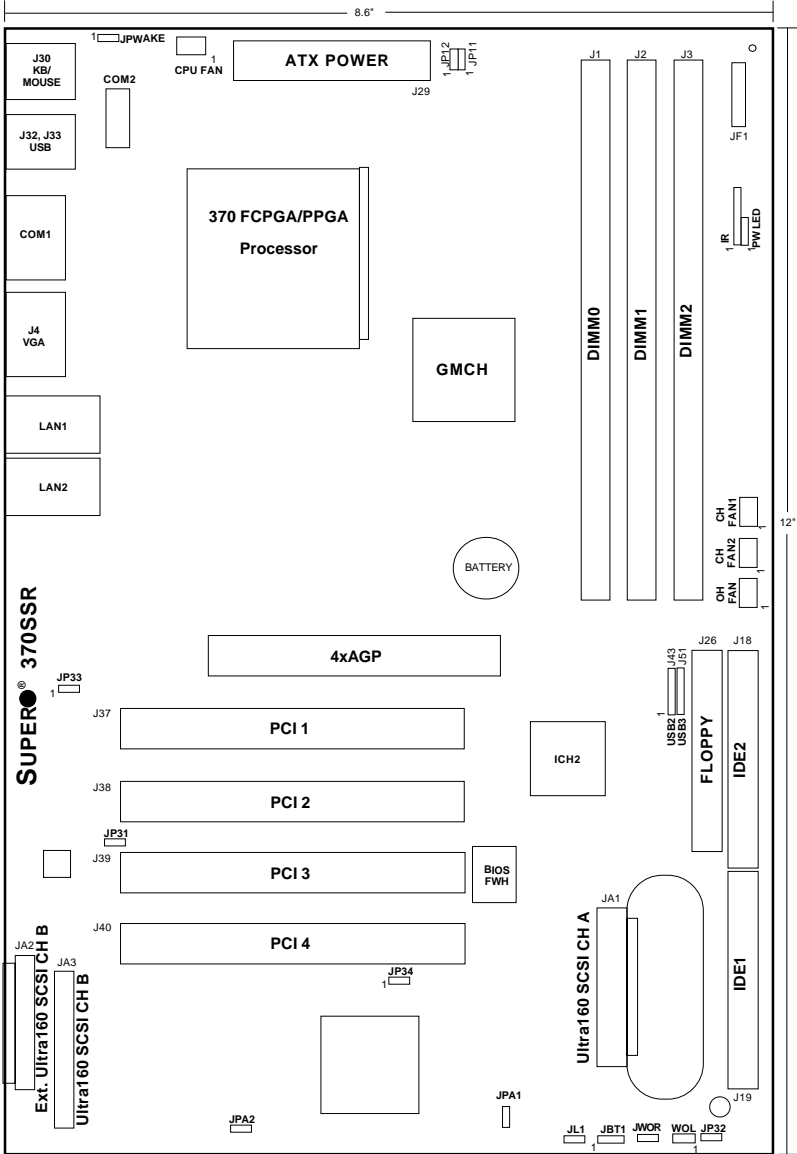
(*See the note listed on Page 1-3.)

370SSR Quick Reference

(*See the note listed on Page 1-3.)

Jumpers	**Description**	**Default Setting**
JBT1	CMOS Clear (p. 2-13)	Pins 1-2 (Normal)
JP11/12	Front Side Bus Speed (p. 2-12)	Both: Pins 1-2 (Auto)
JP31	LAN2 Enable/Disable (p. 2-14)	Closed (Enabled)
JP32	Speaker En/Disable (p. 2-14)	Closed (Enabled)
JP33	LAN1 Enable/Disable (p. 2-14)	Pins 1-2 (Enabled)
JPA1	SCSI Ch A Termination (p. 2-14)	Open (Terminated)
JPA2	SCSI Ch B Termination (p. 2-15)	Open (Terminated)
JPWAKE	Keyboard Wake-Up (p.2-14)	Pins 1-2 (Disabled)

Connectors	**Description**
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CH/OH FAN	CPU/Chassis/Overheat Fan Headers (p. 2-11)
J1, J2, J3	Memory (DIMM) Slots (p. 2-4)
JA1	Ultra160 SCSI Conn. Channel A (p. 2-14)
JA2	Ext. Ultra160 SCSI Conn. Channel B (p. 2-14)
JA3	Ultra160 SCSI Conn. Channel B (p. 2- 15)
J18, J19	IDE Hard Disk Drive Connectors (p. 2-16)
JP26	Floppy Disk Drive Connector (p. 2-16)
J29	ATX Power Connector (p. 2-7)
J30	PS/2 Keyboard/Mouse (p. 2-8)
J32, J33, J43, J51	Universal Serial Bus Port 0/1 (p. 2-9)
JF1	Front Control Panel (p. 2-6)
JL1	Chassis Intrusion Header (p. 2-11)
JOH	Overheat LED (p. 2-11)
JWOR	Wake-On-Ring Header (p. 2-13)
LAN1/LAN2	Ethernet Port 1/2
USB2/3	Universal Serial Bus Port (p.2-10)
VGA	VGA Port (monitor)
WOL	Wake-on-LAN Header (p. 2-10)

Also see the figures on page 2-5 for the I/O ports and page 2-6 for the Front Control Panel (JF1/2) connectors.

Jumpers not indicated are for test purposes only.

Figure 1-6. SUPER 370SSE Layout
(not drawn to scale)
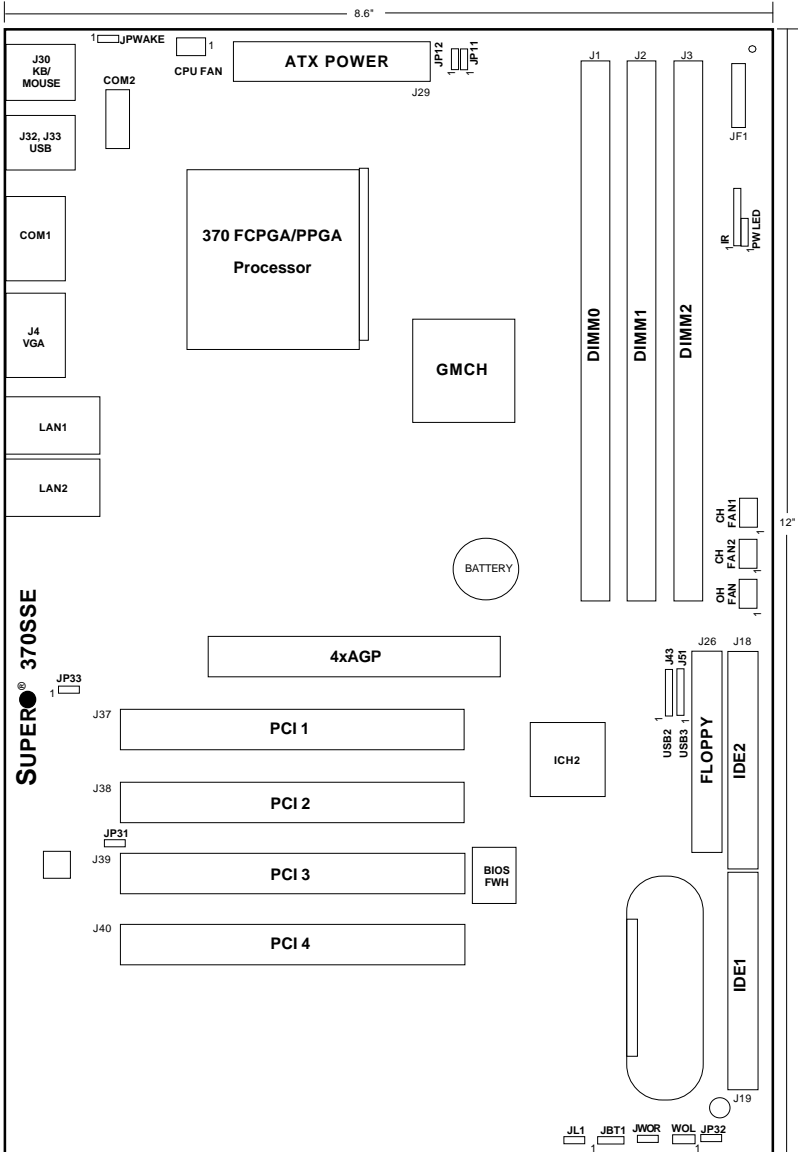
(*See the note listed on Page 1-3.)

370SSE Quick Reference

(*See the note listed on Page 1-3.)

Jumpers	**Description**	**Default Setting**
JP11/12	Front Side Bus Speed (p. 2-13)	Both: Pins 1-2 (Auto)
JP31	LAN2 Enable/Disable (p. 2-12)	Closed (Enabled)
JP32	Speaker En/Disable (p. 2-13)	Closed (Enabled)
JP33	LAN1 Enable/Disable	Pins 1-2 (Enabled)
JPWAKE	Keyboard Wake-Up	Pins 1-2 (Disabled)

Connectors	**Description**
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CH/OH FAN	CPU/Chassis/Overheat Fan Headers (p. 2-11)
J1, J2, J3	Memory (DIMM) Slots (p. 2-4)
J18, J19	IDE Hard Disk Drive Connectors (p. 2-16)
JP26	Floppy Disk Drive Connector (p. 2-16)
J29	ATX Power Connector (p. 2-7)
J30	PS/2 Keyboard/Mouse (p. 2-9)
J32, J33,J43,J51	Universal Serial Bus Port 0/1 (p. 2-9)
JF1	Front Control Panel (p. 2-6)
JL1	Chassis Intrusion Header (p. 2-11)
JOH	Overheat LED (p. 2-11)
JWOR	Wake-On-Ring Header (p. 2-13)
LAN1/LAN2	Ethernet Port 1/2 (p. 2-)
USB2/3	Universal Serial Bus Port (2-13)
VGA	VGA Port (monitor)
WOL	Wake-on-LAN Header (p. 2-13)

Also see the figures on page 2-5 for the I/O ports and page 2-6 for the Front Control Panel (JF1/2) connectors.

Jumpers not indicated are for test purposes only.
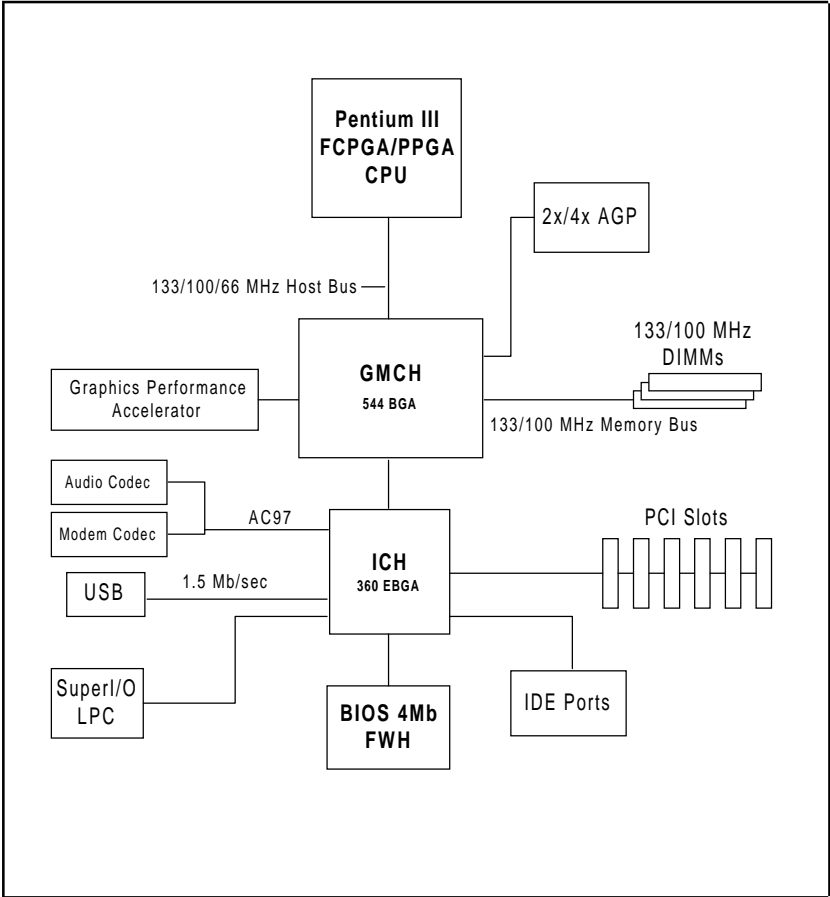
**Figure 1-7. 815/815E Chipset:
System Block Diagram**

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.

Features of the 370SSA/370SSM/*370SSR/*370SSE Motherboard (*See the note listed on Page 1-3.)

CPU

• Single Pentium® III FCPGA 500 MHz-1 GHz processors and Celeron FCPGA/PPGA 333-500 MHz processors at 133/100/66 MHz front side bus speeds

   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

• Three 168-pin DIMM sockets to support up to 512 MB unbuffered SDRAM. PC133 and PC100 SDRAM are fully supported.

Chipset

• Intel 815 (370SSM)
• Intel 815E (370SSA, 370SSR, 370SSE)

Expansion Slots

	370SSA	370SSM	370SSR	370SSE
32-bit PCI slots	6	2	4	4
AGP slots	AGP Pro: 1	4xAGP: 1	4xAGP: 1	4xAGP:1
CRN/AMR slots	CRN slot: 1	ARM slot: 1		

BIOS

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

PC Health Monitoring

• Seven onboard voltage monitors for CPU core, chipset voltage, +3.3V, ±5V and ±12V
• Four-fan status monitor with firmware/software on/off control
• Environmental temperature monitor and control
• CPU fan auto-off in sleep mode
• 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

ACPI/PC 98 Features

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Real-time clock wake-up alarm
- Main switch override mechanism
- External modem ring-on

Onboard I/O

- 2 EIDE bus master interfaces support UDMA/100 (370SSA, 370SSR)
- 2 EIDE bus master interfaces support UDMA/66 (370SSM)
- 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
- 1 infrared port
- 4 USB ports (370SSA) 2 USB ports (370SSM) 3 USB ports (*370SSR/ *370SSE) **(*See the note listed on Page 1-3.)**

Other

- Selectable CPU and chassis fan speed control (set in BIOS)
- 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 815/815E chipset utilities

Dimensions

- SUPER 370SSA - ATX: 12" x 7.8" (305 x 198 mm)
- SUPER 370SSM - MicroATX: 9.6" x 7.8" (244 x 198 mm)
- ***SUPER 370SSR** - ATX: 12" x 8.6" (305 x 218 mm)
- ***SUPER 370SSE** - ATX: 12" x 8.6" (305 x 218 mm)

(*See the note listed on Page 1-3.)

1-2   Chipset Overview

Intel's 815/815E chipset is made up of three main components: the Graphics and Memory Controller Hub (GMCH), the I/O Controller Hub (ICH) and the Firmware Hub (FWH). The GMCH integrates a 133/100/66 MHz system bus controller, a 2D/3D graphics accelerator (AGP2x/4x) discrete graphics card, a 133/100 MHz SDRAM controller and a high-speed hub architecture interface that communicates with the ICH. The ICH integrates a UDMA/100 controller (UDMA/66 for the 815), USB controllers and other I/O functions (see below). The FWH stores both system and video BIOS and includes a Random Number Generator (RNG).

Graphics and Memory Controller Hub (GMCH)

The GMCH includes the host (CPU) interface, DRAM interface, ICH interface and 4xAGP interface for the 815/815E chipset. It contains advanced power management logic and supports dual channels for DRAM. The AGP 2.0 interface supports 4x data transfers and operates at a peak bandwidth of 266 MB/sec. The MCH host interface bus runs at 133/100/66 MHz.

I/O Controller Hub (ICH/ICH2)

The ICH is the I/O Controller Hub subsystem on the 370SSM, which integrates many of the Input/Output functions of the 815 chipset, including a two-channel UDMA/66 Bus Master IDE controller. It also provides the interface to the PCI Bus and communicates with the MCH over a dedicated hub interface. The 370SSA/370SSR/370SSE is based on the 815E chipset and has the more powerful ICH2, which includes UDMA/100 IDE controllers and two USB controllers that offer 24 Mbps of bandwidth across four ports (three on the 370SSR/370SSE). ICH2 also features an enhanced AC'97 interface that supports full surround sound for the Dolby Digital Audio used on DVDs.

Firmware Hub (FWH)

The FWH is a component that brings added security and manageability to the PC platform infrastructure. This device includes an integrated Random Number Generator (RNG) for stronger encryption, digital signing and security protocols. The FWH stores the system BIOS and video BIOS to eliminate a redundant nonvolatile memory component.

Recovery from AC Power Loss

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

1-3   Special Features

Communication and Networking Riser (CNR - 370SSA only)

The CNR slot supports audio, modem and networking cards and provides interfaces that support multichannel audio, V.90 analog modems, home networking through a telephone line, 10/100 Ethernet-based networking and future technologies. Separating sound and communications systems from the motherboard makes them less sensitive to noise.

Audio Modem Riser (AMR - 370SSM only)

The AMR is a new modular specification that integrates the audio/modem functions on the motherboard by assigning the analog I/O functions to a riser card. Integration of the audio/modem function enhances system capabilities while reducing costs. The AMR interface is based on an AC-link that is compliant with Intel's Audio Codec '97 version 2.1 specification.

1-4   PC Health Monitoring

This section describes the PC health monitoring features of the SUPER 370SSA/370SSM/370SSR/370SSE. All three have an onboard System Hardware Monitor chip that supports PC health monitoring.

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

The onboard voltage monitor will scan these seven 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.

Three-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. 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 99 Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that pro- vides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application soft- ware. 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, tele- phones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an oper- ating system-independent interface for configuration control. ACPI lever- ages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Win- dows 98, Windows NT, and Windows 2000.   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 re- quests.

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.

Real Time Clock Wake-Up Alarm

Although the PC may be perceived to be off when not in use, it is still capable of responding to preset wake-up events. In the BIOS, the user can set a timer to wake-up the system at a predetermined time.

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 main 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 re-motely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The 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. It is even more important for processors that have high CPU clock rates of 300 MHz and above.

The SUPER 370SSA/370SSM/***370SSR** accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. **(*See the note listed on Page 1-3.)**

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. Additionally, in ar-eas

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 selec-tion, 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).

(Note: See the note listed on Page 1-3.)

Chapter 2

Installation

2-1   Static-Sensitive Devices

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

Precautions

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

Unpacking

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

2-2   Processor Installation

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

The following pages cover the installation procedure. You should install the processor in the motherboard first, then install the motherboard in the chassis, then the memory and add-on cards, and finally the cables and drivers. Following the installation procedures in the order they appear in this chapter should eliminate the most common problems encountered when installing a system.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components.

Heat Sink

Follow the instructions that came with your processor or heat sink to attach a heat sink to the processor. Your heat sink should have a 3-pin fan, which connects to the CPU FAN header. Make sure that good contact is made between the CPU chip and the heat sink. Insufficient contact will cause the processor to overheat, which may crash the system.

Processor

You are now ready to install the processor. Your motherboard has a 370-pin, FCPGA type socket, which supports 370-pin Pentium III FCPGA (not SEPP) and Celeron PPGA processors. Lift the lever on the FCPGA socket and install with the notched corner of the processor oriented with pin 1. Fully seat the processor into the socket and then close the lever. See Figure 2-1 for views of the FCPGA 370-pin socket before and after processor installation.

Pin 1

Lever

Notched
Corner

Processor
(installed)
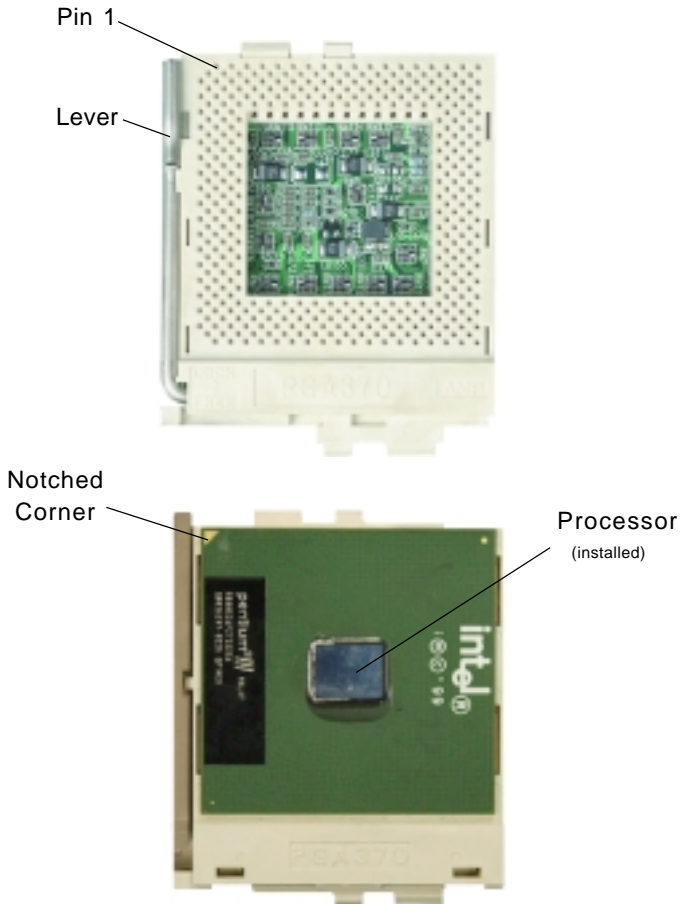
Figure 2-1. FCPGA Socket: Empty and with Processor Installed

2-3   Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. 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.

2-4 Installing DIMMs

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

DIMM Installation (See Figure 2-2)

1. Insert DIMMs in Bank 0 through Bank 2 as required for the desired
    system memory.
2. For the 370SSA/370SSM: insert each DIMM module vertically into its
    slot. For the 370SSR/370SSE: insert each DIMM module into its slot in
    a 25-degree. Pay attention to the two notches along the bottom of
    the module to prevent inserting the DIMM incorrectly.
3. Gently press down on the DIMM module until it snaps into place.
4. If installing only a single DIMM, you may use any Bank. The 370SSA/
    370SSM/370SSR/370SSE will support a total of 512 MB of unbuffered
    SDRAM in its three DIMM slots. ECC type memory is not supported.
    PC133 and PC100 memory are both fully supported at their respective
    speeds. However, if three DIMM modules are installed, the memory
    will run at 100 MHz, even if PC133 memory is used (this is a chipset
    limitation).

Figure 2-2.   Side View of DIMM Installation into Slot

Top View of DIMM Slot

Release Tab   Release Tab

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

2-5   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 I/O ports.

370SSA/370SSM

Mouse(Green)

Keyboard   USBPorts   Parallel Port (Burgundy)
(Purple)
                COM1 Port   VGA (Monitor)   Line Out Line In   Mic
                (Turquoise)   Port (Blue)   (Lime) (Light blue) (Pink)

                                                          Game Port (gold)

Mouse(Green)   Parallel Port (Burgundy)

Keyboard   USBPorts   COM1 Port   VGA (Monitor)
(Purple)   (Turquoise)   Port (Blue)   LAN1   LAN2
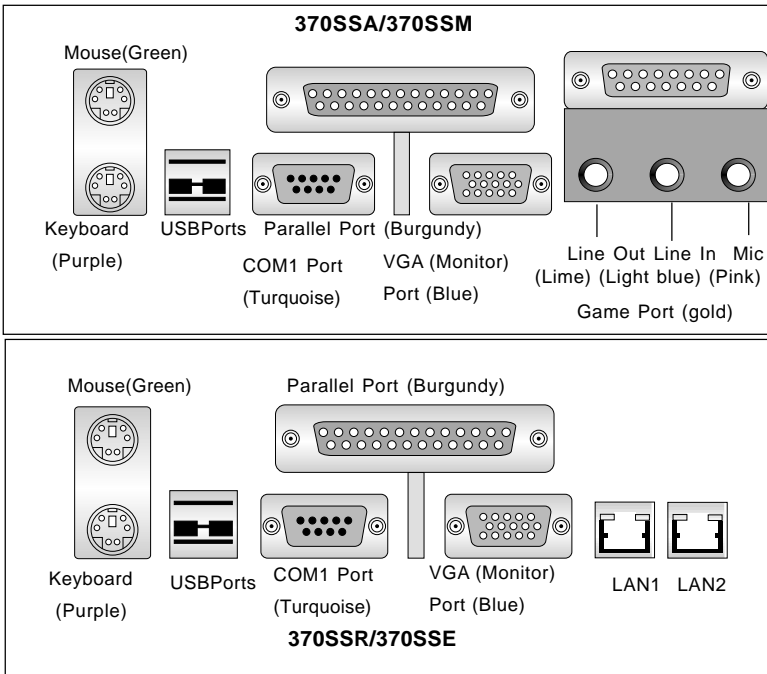
370SSR/370SSE

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

Note: The 370SSR/370SSE do not include the Game, Parallel, Line In/Out
and Mic ports, but they have LAN1 and LAN2 instead.

Front Control Panel

JF1 and JF2 contain header pins for various front control panel connec-
tors. The 370SSA and 370SSM front control panel connectors (JF1 and
JF2) share the same layout. The 370SSR and 370SSE have a single front
control panel connector:JF1(-which is a different configuration) and a 3-
pin Power LED: J50.

Pin definitions for JF1 & JF2 (on the 370SSA/370SSM) and JF1 & J50 (on
the 370SS/370SSE) are provided below. Refer to the Sections 2-6 and 2-
7 for connectors and pin definitions.

Figure 2-4. Front Control Panel Connectors
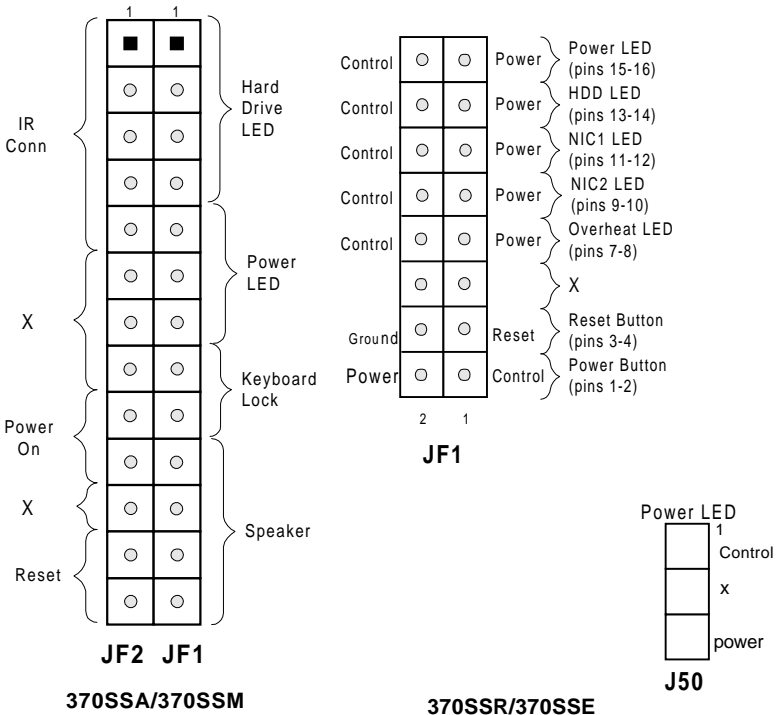
2-6   Connecting Cables (see previous page for locations)

Power Supply Connector

After you have securely mounted the motherboard, memory and add-on cards, you are ready to connect the cables. Attach an ATX power supply cable to J29 by aligning the tabs on both connectors. See Table 2-1 for the pin definitions of an ATX power supply.

Table 2-1
ATX Power Supply Connector
Pin Definitions (J29)

Pin Number	Definition	Pin Number	Definition
1	3.3V	11	3.3V
2	3.3V	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

Infrared Connector

The infrared connectors are located on pins 1-5 of JF2 on the 370SSA/370SSM, and pins 1-5 of J45 for the 370SSR/370SSE. See Table 2-2 for pin definitions. See the Technical Support section of our web page for information on the infrared devices you can connect to the system.

Table 2-2
Infrared Pin
Definitions

Pin Number	Definition
1	+5V
2	Key
3	IRRX
4	Ground
5	IRTX

JF2

370SSA/370SSM

Pin Number	Definition
1	+5V
2	Key
3	IRRX
4	Ground
5	IRTX
6	NC

J45

370SSR/370SSE

PW_ON Connector

The PW_ON connectors are located on pins 9 & 10 of JF2 on the 370SSA/370SSM, and pins 1&2 of JF1 on the 370SSM/370SSR. Momentarily contacting both pins will power on/off the system. The user can also configure this button to function as a suspend button. (See the Power Button Mode setting in BIOS.) To turn off the power when set to suspend mode, hold down the power button for at least 4 seconds. See Table 2-3 for pin definitions.

Table 2-3
PW_ON Connector
Pin Definitions

Pin Number	Definition
9	PW_ON
10	Power

(JF2)

370SSA/370SSM

Pin Number	Definition
1	PW_ON
2	Power

(JF1)

370SSR/370SSE

Reset Connector

The reset connectors are located on pins 12 & 13 of JF2 on the 370SSA/370SSM, and on pins 3 & 4 of JF1 on the 370SSR/370SSE. This connector attaches to the hardware reset switch on the computer case. See Table 2-4 for pin definitions.

Table 2-4
Reset Pin
Definitions

Pin number	Definition
12	Ground
13	Reset

JF2
370SSA/370SSM

Pin number	Definition
3	Reset
4	Ground

JF1
370SSR/370SSE

Hard Drive LED

The hard drive LED are located on pins 1-4 of JF1 on the 370SSA/370SSM, and on pins 13 & 14 of JF1 on the 370SSR/370SSE. Attach the hard drive LED cable to pins 1 and 2. See Table 2-5 for pin definitions.

Table 2-5
Hard Drive LED Pin
Definitions

Pin Number	Definition
1	+5V
2	HD Active
3	HD Active
4	+5V

(JF1)
370SSA/370SSM

Pin Number	Definition
13	+5V
14	HD Active

(JF1)
370SSR/370SSE

Keylock/Power LED Connector

The keylock/power LED connector is located on pins 5 to 9 of JF1 on the 370SSA/370SSM and the power LED connector is on pins 15 &16 of JF1, on pins1-3 of J50 on the 370SSR/370SSE. See Table 2-6 for pin definitions

Table 2-6
Keylock/Power LED Pin
Definitions (JF1)

Pin Number	Function	Definition
5	+5V	LED power
6	+5V	LED power or key
7	Ground	Black wire
8	keylock	Keyboard inhibit
9	Ground	Black wire

370SSA/370SSM

PW LED Pin Definitions

Pin Number	Definition
15	Power
16	Control

(JF1)

3-Pin PWR Option

Pin Number	Definition
1	Control
2	NC*
3	Power

(J50)

370SSR/370SSE

*Note: NC indicates "no connection".

Speaker Connector

The speaker connectors are lo-
cated on pins 10-13 of JF1 on the
370SSA/370SSM and pins 3 &4 of
JF1 on the 370SSR/370SSE . See
Table 2-7 for pin definitions .

Table 2-7
Speaker Connector Pin
Definitions (JF1)

Pin Number	Function	Definition
10	+	Red wire, Speaker data
11	Key	No connection
12		Key
13		Speaker data

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/
2 mouse are located on J30. See
Table 2-8 for pin definitions. (The
mouse port is above the keyboard
port. See Figure 2-3 for locations.)

Table 2-8
PS/2 Keyboard
and Mouse Port
Pin Definitions
(J30)

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

Universal Serial Bus (USB)

(USB Jumper settings:
370SSA: J32,J33,J43
370SSM: J32,J33
370SSR/SSE: J32,J33, J43,J51)
Two Universal Serial Bus connec-
tors (USB0 and USB1) are located
on J32 and J33. See Table 2-9 for
pin definitions. The 370SSA also
provides support for two addi-
tional USB ports: USB2 is a header
located near the IDE connectors
and provides easy front side chas-
sis access (cable not included).
USB3 is incorporated into the CNR
slot - the CNR card you plug in
here should have a USB port.

Table 2-9
Universal Serial Bus Pin Definitions

J32		J33	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground

370SSA/SSM/SSR/SSE

J43		J51	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	key	5	Ground

370SSR/370SSE/370SSA

Serial Ports

Two connectors, for the COM1 and COM2 serial ports, are provided on your board. COM1 is located beside the VGA port (see Figure 2-3) and COM2 is located just behind the Game Port on the 370SSA, beside the AMR slot on the 370SSM and behind the mouse/keyboard ports on the 370SSR and 370SSE. See Table 2-10 for pin definitions. A 10-pin serial ribbon cable is required if connecting a device to a COM header.

Table 2-10
Serial Port Pin Definition

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

370SSA/370SSM/370SSR/370SSE

Wake-On-LAN

The Wake-On-LAN header is located on WOL. Refer to Table 2-11 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.)

Table 2-11
Wake-On-LAN Pin
Definitions (WOL)

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

CD Headers (not on 370SSR/370SSE)

There are two CD headers of different sizes on the motherboard for audio CD playback. You must connect an audio cable from your CD player to the header that fits your cable's connector. Refer to Table 2-12 for pin definitions.

*Note: NC indicates "no connection".

Table 2-12
Audio CD Header Pin Definitions
(CD)

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

Audio CD Header Pin Definitions
(CD_1)

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

Fan Headers*

The CPU, chassis and thermal control fan headers are designated CPU FAN, FAN2 and FAN3 for 370SSA/SSM, and CPU Fan, CHFan1, CHFan2, OHFan for 370SSR/SSE respectively. Refer to Table 2-13 for pin definitions.

Table 2-13
Fan Header Pin Definitions

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 located on JL1. See the board layouts in Chapter 1 for its location. See Table 2-14 for pin definitions.

Table 2-14
Chassis Intrusion
Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

Overheat LED (JOH)

The JOH header is used to connect an LED to provide warning of chassis overheatin. Refer to Table 2-15 for pin definitions. The overheat LED header is located on JOH on the 370SSA/SSM, and JF1 on the 370SSR/370SSE.

Table 2-15
Overheat LED
Pin Definitions (JOH)

Pin Number	Definition
1	12VDC
2	OH Active

(370SSA/SSM)

JF1
Pin Definitions

Pin Number	Definition
7	12VDC
8	OH Active

(370SSA/SSM)

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.

Connector Pins

3 2 1

Jumper Cap

3 2 1

Setting

Pin 1-2 short
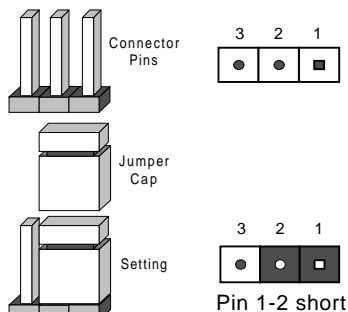
Front Side Bus Speed

The FSB speed is set with JP11 and JP12. Table 2-16 displays the settings for these two jumpers. The CPU speed can also be changed by software control in BIOS (see CPU Speed setting). The CPU Speed setting will show you the actual CPU speed for each FSB speed option selected.
Note: If the system does not reboot after changing the CPU speed, 1) clear CMOS and reboot (as described on the next page) and then set the correct CPU speed with the BIOS setting mentioned above.

**Table 2-16
Front Side Bus Speed Jumper Settings
(JP11, JP12)**

JP11	JP12	FSB Speed
1-2	1-2	Auto
2-3	2-3	66 MHz
1-2	2-3	100 MHz
2-3	1-2	133 MHz

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

CMOS Clear

Refer to Table 2-17 for instructions on how to clear CMOS. Always remove the AC power cord from the system before clearing CMOS.

Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord, then use JBT1 to clear CMOS. Replace JBT1 back to the pin 1-2 position before powering up the system again. <u>Do not</u> use the PW_ON connector to clear CMOS.

Table 2-17
CMOS Clear Jumper Settings (JBT1)

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

AC'97 Enable/Disable (not on 370SSR/370SSE)

AC'97 brings high quality audio to PCs. When enabled with JP28, audio is processed onboard and the AMR slot (370SSM only) will support modems only. The disabled setting should be selected when you wish to use an add-on card for audio either in the AMR or a PCI slot. See Table 2-18 for jumper settings.

Table 2-18
AC'97 Enable/Disable Jumper Settings (JP28)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

Wake-On-Ring

The Wake-On-Ring header is designated as JWOR on the 370SSA/370SSR/370SSE and as JR on the 370SSM. This function allows your computer to receive and be "woken up" by an incoming call when in the suspendstate. Refer to Table 2-19 for pin definitions. You must also have a WOR card and cable to use WOR.

Table 2-19
Wake-On-Ring Pin Definitions (JWOR/JR)

Pin Number	Definition
1	Ground
2	Wake-up

Keyboard Wake-Up

The JPWAKE jumper is used to-
gether with the Keyboard Wake-Up
function in BIOS. Enable both the
jumper and the BIOS setting to al-
low the system to be woken up by
depressing a key on the keyboard.
See Table 2-20 for jumper settings.

Note: Your power supply must meet ATX specifi-
cation 2.01 or higher and supply 720 mA of standby
power to use this feature; however, you would need
1.5A for the SSR/SSE.

Table 2-20
Keyboard Wake-Up
Jumper Settings
(JPWAKE)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Onboard Speaker Enable/ Disable (370SSR/370SSE)

JP32 gives you the option of dis-
abling the onboard speaker. The
default setting is enabled. See
Table 2-21 for jumper settings.

Table 2-21
Speaker Enable/Disable
Jumper Settings (JP32)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

Onboard LAN/NIC Enable/Disable (370SSR/ 370SSE)

SSR/SSE (Rev. 1.1):JP31, JP33
SSR/SSE (Rev.1.2 & above):JP31,
JP35

Change the setting of jumpers
listed in Table 2-22 to enable or
disable LAN1 and LAN2 on your
motherboard, respectively.

Table 2-22b
Onboard LAN2
Enable/Disable
Jumper Settings
(JP31)

Jumper Position	Definition
Closed	Enabled
Open	Disabled

Table 2-22c
Onboard LAN1
Enable/Disable
Jumper Settings
(JP33)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

Table 2-22a
Onboard LAN1
Enable/Disable
Jumper Settings
(JP35)

Jumper Position	Definition
Closed	Enabled
Open	Disabled

LVD Channel A SCSI Termination Enable/ Disable (370SSR only)

Jumper JPA1 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 2-23 for jumper settings.

Table 2-23
LVD CH A SCSI
Termination
Jumper Settings (JPA1)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

LVD Channel B SCSI Termination Enable/ Disable (370SSR only)

Jumper JPA2 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 2-24 for jumper settings.

Table 2-24
LVD CH B SCSI
Termination
Jumper Settings (JPA2)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

SCSI Enable/Disable (370SSR only)

Jumper JP34 allows you to enable or disable all onboard SCSI. The normal (default) position is en-abled. See Table 2-25 for jumper settings.

Table 2-25
SCSI Enable/Disable
Jumper Settings (JP34)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

2-8 Parallel Port, AMR, AGP and Floppy/Hard Disk Drive Connections

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

• The floppy disk drive cable has seven twisted wires.

• A red mark on a wire typically designates the location of pin 1.

• A single floppy disk drive ribbon cable has 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 ATA66/100 (370SSM/370SSA) 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.

Table 2-26
Parallel (Printer) Port Pin Definitions
(J35)

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

Parallel Port Connector (370SSR/370SSE:Optional)

The parallel port is located on J35. See Table 2-26 for pin definitions.

Floppy Connector

The floppy connector is located on JP26. See Table 2-27 for pin definitions.

Table 2-27
Floppy Connector Pin Definitions (JP26)

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

Table 2-28
IDE Connector Pin Definitions
(J18, J19)

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

IDE Connectors

There are no jumpers to configure the onboard IDE interfaces J18 and J19. Refer to Table 2-28 for pin definitions. You must use the ATA100/66 cable included with your system to benefit from the ATA100/66 technology.

AMR Connector(370SSM only)

Refer to Table 2-29 for the pin definitions of the AMR connector.

*Notes:
AMR: SSM only,
CNR: SSA only,
SSR/SSE: AMR & CNR are not available

Table 2-29
AMR Connector Pin Definitions (AMR)

Pin Number	Signal	Pin Number	Signal
B1	AUDIO_MUTE#	A1	AUDIO_PWRDN
B2	GND	A2	MONO_PHONE
B3	MONO_OUT_/PC_BEEP	A3	
B4		A4	
B5		A5	
B6	PRIMARY_DN#	A6	GND
B7	-12V	A7	+5Vdual/+5VSB
B8	GND	A8	USB_OC#
B9	+12V	A9	GND
B10	GND	A10	USB+
B11	+5VD	A11	USB-
	(KEY)		(KEY)
	(KEY)		(KEY)
B12	GND	A12	GND
B13		A13	S/P-DIF_IN
B14		A14	GND
B15	+3.3VD	A15	+3.3Vdual/+3.3VSB
B16	GND	A16	GND
B17	AC97_SDATA_OUT	A17	AC97_SYNC
B18	AC97_RESET#	A18	GND
B19	AC97_SDATA_IN3	A19	AC97_SDATA_IN1
B20	GND	A20	GND
B21	AC97_SDATA_IN2	A21	AC97_SDATA_IN0
B22	GND	A22	GND
B23	AC97_MSTRCLK+RST	A23	AC97_BITCLK

AGP Pro/4xAGP Slot(for 370SSA/370SSM)
4xAGPSlot(for 370SSA/370SSM)

The AGP Pro slot is backward compatible with AGP and 4xAGP graphics cards, which have fewer pins than AGP Pro cards. Because of this, care must be taken when installing a graphics card into this slot, as doing so incorrectly can damage your motherboard. For AGP Pro cards, you should remove the orange sticker covering one end of the slot. For other cards, leave this sticker in place and make sure your card does not plug into the section it covers. A general rule of thumb is to make sure your card fills the center section of pins first, then the end toward the edge of the motherboard if there are more. If the I/O shield of your card is flush with the edge of the motherboard, the card should be inserted correctly.

AGP Pro Slot

Edge of motherboard
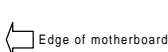
2-9　Installing Software Drivers

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, the display shown in Figure 2-5 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.)

Figure 2-5. Driver/Tool Installation Display Screen

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, you must reboot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, which is optional. The Security and Graphics Drivers support multiple languages. Click the arrows 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.

Note: The memory size reported in the device manager may be less than expected because some is used by the onboard graphics. Higher screen resolutions will take up more of this memory.

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 diagnos-
tics 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 for the
   amount of memory desired.
2. Determine if different speeds of DIMMs have been installed and verify
   that the BIOS setup is configured for the fastest speed of memory
   used. It is recommended to use the same memory speed for all
   DIMMs in the system.
3. For DIMMs, 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 modules between
   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 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 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 Supermicro for technical support:
   • Motherboard model and PCB revision number
   • BIOS release date/version (this can be seen on the initial display when your system first boots up)
   • System configuration
   An example of a Technical Support form is on our web site at http://www.supermicro.com/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 370SSA/ 370SSM/370SSR/370SSE motherboard can support?

Answer: The 370SSA/370SSM/370SSR/370SSE have three 168-pin DIMM slots that support up to 512 MB of unbuffered 3.3V SDRAM (registered DIMMs not supported). ECC memory is not supported. The 133/100 MHz memory bus fully supports both PC133 and PC100 memory. However, if three DIMM modules are installed, the memory will run at 100 MHz, even if PC133 memory is used (this is a chipset limitation).

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 down-

load 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 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 <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 815 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

370SSM

PCI 1 shares an IRQ with the 4xAGP slot and onboard VGA
PCI 2 has a dedicated IRQ (does not share)

370SSA

PCI 1 shares an IRQ with PCI 5, the AGP Pro slot and onboard VGA
PCI 2 shares an IRQ with PCI 6, onboard audio and SM bus*
PCI 3 has a dedicated IRQ (does not share)
PCI 4   shares one IRQ with USB

370SSR

PCI 1 shares an IRQ with Onboard LAN, the AGP Pro slot & Onboard VGA
PCI 2 shares an IRQ with onboard SCSI and SM bus*
PCI 3 has a dedicated IRQ (does not share)
PCI 4 shares an IRQ with USB

370SSE

PCI 1 shares an IRQ with onboardLAN, the AGP Pro slot, and onboard VGA
PCI 2 shares an IRQ with SM bus*
PCI 3 has a dedicated IRQ (does not share)
PCI 4 shares an IRQ with USB

---

*System Management bus

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 ATA66/100 cable to my IDE device(s)?

Answer: The 80-wire/40-pin ATA66/100 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 ATA66/100 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. (The 370SSM has an ATA66 cable and the 370SSA/370SSR/370SSE has an ATA100 cable.)

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 370SSA/370SSM/370SSR/ 370SSE. 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.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The BIOS ROM stores the system parameters, such as amount of memory, type of disk drives and video displays, etc. BIOS ROM requires very little power. When the computer is turned off, a back-up battery provides power to the BIOS ROM, 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 configuration data 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.

An AMIBIOS 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 2.1

- Supports Intel PCI (Peripheral Component Interconnect) (PME) local bus specification

- Supports Advanced Power Management (APM) specification v 1.1

- Supports ACPI

- Supports Flash ROM

AMIBIOS supports the LS120 drive made by Matsushita-Kotobuki Electronics Industries Ltd. The LS120:

- 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:

- CPU temperature

- Additional temperature sensors

- Chassis intrusion detector

- Five positive voltage inputs

- Two negative voltage inputs

- Three 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).

The Main BIOS Setup Menu

Press the <Delete> key during the POST (Power On Self Test) to enter the Main Menu of the BIOS Setup Utility. All Main Setup options are described in this section. The Main BIOS Setup screeen is displayed below.

```
                          BIOS SETUP UTILITY

 Main    Advanced   Chipset  PCIPnP  Power  Boot Security
 Exit


 AMIBIOS Version  :        07.00xx
 BIOS Build Date  :        xx/xx/xx
 BIOS ID :                 SSM70626

 Processor Type   :        PentiumIII™
 Processor Speed  :        933MHz

 System Memory    :        256MB



 System Time               [10:10:00]
 System Date               [Thu 08/24/00]      ↔   Select Screen
                                               ↑↓  Select Item
                                               +-  Change Field
                                               Tab Select Field
                                               F1  General Help
                                               F10 Save and Exit
                                               ESC Exit

      V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.
```

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

When the items "System Time", and "System Date" are highlighted, type in the correct time/date in the time field, and then press "Enter". The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format. The time is in also 24-hour format. For example, 5:30 a.m. appears as 05:30:00 and 5:30 p.m. as 17:30:00.

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

*Note: Items displayed in gray are preset and cannot be selected.

4-4   Advanced Chipset Setup

Choose Advanced BIOS Setup from the AMIBIOS Setup Utility 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, such as SuperIO Configuration, 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.

```
                      BIOS SETUP UTILITY
 Main   Advanced  Chipset PCIPnP  Power  Boot  Security  Exit

 Setup Warning                          Configure SuperIO
 Setting items on this screen to incorrect  Chipset Winbond627F
 values may cause the system to
 malfunction!

 > Health Monitor Features
 > SuperIO Configuration
 > IDE Configuration
 > Floppy Configuration
 > Boot Settings Configuration
 > Peripheral Device Configuration
 > Event Log Configuration
 > Processor Configuration

                                        ↔  Select Screen
                                        ↑↓  Select Item
                                        Enter Go to Sub  Screen
                                        F1  General Help
                                        F10 Save and Exit ESC
                                        Exit


      V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.
```

Use the Up/Down arrow keys to select the "Health Monitor Features" line.

When the "Health Monitor Features" line is highlighted, hit "ENTER" to display its items.

Health Monitor Features

The BIOS continuously monitors the health of your system by measuring certain voltage levels and temperatures.

CPU Overheat Warning

This option allows you to **Enable** or Disable a system overheat warning signal, used to notify you in the event of a dangerous rise in heat levels.

CPU Overheat Warning

This option allows you to specify the temperature threshold that, when exceeded, will trigger the overheat warning alarm.

The rest of the Health Monitor menu lists various voltages and temperatures as they are currently being measured. These include CPU current temperature, CPU voltage, the RPMs of the CPU, H/W MonitorIN0 (CPU1), H/W MonitorIN2 (+3.3V), H/W MonitorIN3 (+5V), H/W MonitorIN4 (+12v), H/W MonitorIN5 (-12V), CPU Fan,Chassis Fan 1, Chassis Fan 2, and thermal control fans. The settings are Enabled or **Disabled**.

Super IO Configuration

After selecting the settings for "Health Monitor Features",use the Up/Down arrow keys to select the "SuperIO Configuration" line.

When the "SuperIO Configuration" line is highlighted, hit "ENTER" to display its menu.

```
                       BIOS SETUP UTILITY
        Advanced

Configure Nat317Serial Port(s)and Parallel P

Serial Port1 Address          [3F8]
Serial Port2 Address          [2F8]
  Serial Port2 Mode           [Normal]
Parallel Port Address         [378]
    Parallel Port Mode        [ECP]
    ECP Mode DMA Channel       [3]
Parallel Port IRQ             [7]
    Onboard Game/Midi Port    [200/298]
    Midi IRQ Select           [5]
Power Loss Control            [Always Off]
Keyboard Wake-up Function     [Space]
                                             ↔   Select Screen
                                             ↑↓  Select Item
                                             +-  Change Option
                                             F1  General Help
                                             F10 Save and
                                             Exit
                                             ESC Exit
     V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.
```

The Super IO Configuration includes the following items:

Serial Port 1 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 1. The settings for this item include Disabled, **3F8/IRQ4**, 3E8/IRQ4 and 2E8/IRQ3. Select the desired setting and then press "Enter".

Serial Port 2 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 2. The settings for this item include Disabled, **2F8/IRQ3**, 3E8/IRQ4 and 2E8/IRQ3.

Serial Port2 Mode

This option specifies Serial Port2 Mode. The settings for this item include **Normal**, IRDA1.6ms, IRDA311.6, ASKIR, ASKIR500, ASKIRDem, ASKIRD500.

Parallel Port Address

This option specifies the I/O address used by the parallel port. The settings for this item include Disabled, **378**, 278 and 3BC. Select your setting and then press "Enter".

Parallel Port Mode

This option specifies the parallel port mode. The settings for this item include Normal, Bi-directional, EPP and **ECP**.

ECP Mode DMA Channel

This option allows the user to set the setting for the ECP Mode of the DMA Channel. The settings for this item include **0**, 1 and 3.

Parallel Port IRQ

This option allows the user to set the Parallel Port IRQ. The settings for this item include 5 and **7**.

Onboard Game/Midi Port (370SSA/370SSM only)

This option allows the user to set the Onboard Game/Midi Port. The settings for this item include Disabled, **200/298**, 200/300, 200/330, 208/300 and 208/330.

Midi IRQ Select (370SSA/370SSM only)

This option allows the user to set the Midi IRQ. The settings for this item are **5**, 7, 9 and 10.

Power Loss Control

This option determines how the system will react when power is reapplied after being lost unexpectedly. The settings are **Always Off** (if the system loses power unexpectedly, the computer system will keep power off until the power button is pressed), Always On (if the system loses power unexpectedly, the computer system will restore power) and Previous (if the system loses power unexpectedly, the computer system restores the system to its previous state before power was lost).

Keyboard Wake-Up Function

Use this option to specify which key is to be depressed to wake-up the system from sleep mode. The settings are Disabled, CTRL F1, **Space** and Any Key. Disabled: This setting prevents the computer system from using the keyboard to power it on. Ctrl F1: This setting allows the computer system to be powered on when the CTRL and F1 keys on the keyboard are pressed. **Space**: This setting allows the computer system to be powered on when the Space bar on the keyboard is pressed. This is the default setting. Any Key*:* This setting allows the computer system to be powered on when any keys on the keyboard are pressed.

IDE Configuration

Onboard PCI IDE Controller

This option allows the user to enable or disable the integrated IDE Controller. The settings include Disabled, Primary, Secondary and **Both**. Select "Disabled" to disable the Integrated IDE Controller. Select "Primary" to enable the Primary IDE ontroller only. Select "Secondary" to enable the Secondary IDE Controller only. Select "Both" to enable both Primary and Secondary IDE Controllers.

Primary IDE Master

When entering "Setup", BIOS automatically detects the presence of IDE devices. This displays the auto detection status of the IDE de vices. You can also manually configure the IDE drives by providing the following information:

Type

This option sets the type of device that the AMIBIOS attempts to boot from after AMIBIOS POST is completed. The settings include Not installed, **Auto**, CDROM and ARMD.   The "Auto" setting allows BIOS to automatically detect the presence of the IDE controller.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capac ity is 137 GB. The settings are Disabled and **Auto**. Select "Disabled" to disable LBA mode. Select "Auto" to enable LBA mode if your device supports it and is not already formatted with the LBA mode.

Block (Multi-Sector Transfer) Mode

This option sets the block mode multi sector transfers option The settings include Disabled and **Auto**. Disabled: This op tion prevents the BIOS from using Multi-Sector Transfer on the specified channel. The data to and from the device will occur one sector at a time.   Auto: This option allows the BIOS to auto detect device support for Multi-Sector Trans fers on the specified channel. If supported, this option al lows the BIOS to auto detect the number of sectors per block for transfer from the hard disk drive to memory. The data transfer to and from the device will occur multiple sectors at a time (if the device supports it).

PIO Mode

IDE PIO (Programmable I/O) mode programs timing cycles be tween the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The settings are: **Auto**, 0, 1, 2, 3 and 4.

DMA

This item allows the users to select the DMA mode. The settings are: **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0, MWDMA1, MWDM2, UWDMA0, UWDMA1, UWDMA2, UWDMA3 and UWDMA4. Select Auto to auto de-

tect the DMA Mode. Select SWDMA0 through SWDMA2 to set single word DMA0 through DMA2. Select MWDMA0 through MWDMA2 to set Multi-word DMA0 through DMA2. Select UDMA0 trhough UDMA4 to set Ultra DMA0 through Ultra DMA4.

S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring Analysis and Reporting Technology, a feature that can help predict impending drive failures. The settings are **Auto**, Disabled and Enabled. Select "Enabled" or "Disabled" to enable or disable the S.M.A.R.T. Select "Auto" to auto detect S.M.A.R.T.

32Bit Data Transfer

The settings are Auto, Disabled and **Enabled**. Select "En- abled" or "Disabled" to enable or disable the 32-bit Data Transfer function. Select "Auto" to auto detect the 32-bit Data Transfer function.

ARMD Emulation

This option is used to select the emulation used when config uring an LS120, MO (Magneto-Optical), or Iomega Zip drive. The settings are **Auto**, Floppy and HardDisk.

Primary IDE Slave

When the system enters "Setup", BIOS automatically detects the presence of IDE devices. This option displays the auto detection status of IDE de- vices. The settings for "Primary IDE Slave" are the same as those for the "Primary IDE Master".

Secondary IDE Master

This displays the status of auto detection of IDE devices. The settings for "Secondary IDE Master" are the same as those for the "Primary IDE Master".

Secondary IDE Slave

This displays the status of auto detection of IDE devices. The settings for "Secondary IDE Slave" are the same as those for the "Primary IDE Master".

Hard Disk Write Protect

This item allows the user to prevent the hard disk from being overwritten. The options are Enabled or **Disabled**. Enabled allows the drive to be used normally; read, write and erase functions can all be performed. Disabled prevents the hard disk from being erased. This function is effective only when the device can be accessed through BIOS.

ATA(PI) Detect Timeout

Set this option to stop the system search for ATAPI devices within the specified number of seconds. The options are 0, 5, 10, 15, 20, 25, 30, and **35** (seconds). Most ATA disk drives can be detected within 5 seconds.

ATA(PI) 80Pin Cable Detection

This option selects the mechanism for detecting the 80-pin ATA(PI) cable. Options include **Host and Device**, Host, and Device. Host: This   option uses the motherboard onboard IDE controller to detect the type of IDE cable used. Device This option uses the IDE disk drive to detect the type of IDE cable used. Host & Device: This option uses both the motherboard onboard IDE controller and IDE disk drive to detect the type of IDE cable used.

Floppy Configuration

Floppy A

Use this option to specify which of floppy drive you have installed in the A drive. The settings are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2".

Floppy B

Use this option to specify which of floppy drive you have installed in the B drive. The settings are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3 1/2", **1.44 MB 3 1/2"** and 2.88 MB 3 1/2".

Floppy Drive Seek

Use this option to Enable or **Disable** the floppy seek routine on bootup.

Boot Settings Configuration

Quick Boot

This option allows the BIOS to skip certain tests that are normally perfomred on boot up. You can disable the option to speed up boot time. The settings are **Disabled** and Enabled.

Quiet Boot

If Disabled, this option will cause the normal POST messages to be displayed upon setup. When **Enabled**, the OEM logo is displayed instead of the POST messages.

Add-On ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. The settings for this option are **Force BIOS** and Keep Current. Force BIOS allows the computer to force a third party BIOS to display during system boot. Keep Current has the system display AMIBIOS information on bootup.

BootUp Num Lock

This option is used to select the status of the Number Lock function on your keyboard on bootup. The settings are **On** and Off.

BootUp CPU Speed

This option is used set the CPU speed to either **High** or Low.

PS/2 Mouse Support

This option specifies whether a PS/2 Mouse will be supported. Settings are **Enabled** and Disabled.

Typematic Rate

Set this option to select the rate at which the computer repeats a key that is held down. Settings are **Fast** and Slow. Fast: This sets the rate the computer repeats a key to over 20 times per second. Under normal operations, this setting should not be changed. Slow: This sets the rate the computer repeats a key to under 8 times per second.

System Keyboard

This option is to let the system know if a keyboard is **Present** or Absent.

Primary Display

This option specifies the type of monitor display you have installed on the system. The settings are Absent, **VGA/EGA**, Color 40 x 25, Color 80 x 25 and monochrome.

Parity Check

Use this option to either Enable or **Disable** the use of memory parity checking.

Boot to OS/2

This option can be used to boot the system to an OS/2 operating system. The settings are **No** and Yes.

Wait for F1 if Error

This settings for this option are **Enabled** and Disabled. Disabled: This prevents the AMIBIOS to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to bootup in to the operating system. If 'F1' is enabled, the system will wait until the BIOS setup is entered. Enabled: This option allows the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and the BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognize it.

Hit "Delete" Message Displayed

This option tells the system to display or not display the "Hit Delete to Enter Setup" message. The settings are **Enabled** and Disabled.

Internal Cache

This option is for enabling or disabling the internal CPU L1 cache. Settings include Disabled, Write-Thru and **Write-Back**. Disabled: This option prevents the system from using the internal CPU L1 cache. This setting should

be used to slow the computer system down or to troubleshoot error mes-
sages. Write-Thru: This option allows the computer system to use the
internal CPU L1 cache as Write-Though cache. Write-Through cache is
slower than Write-Back cache. It performs write operations to the internal
L1 CPU cache and system memory simultaneously.Write-Back   T h i s
option allows the computer system to use the internal CPU L1 cache as
Write-Back cache. Write-Back cache is faster than Write-Through cache.
Write-Back cache is a caching method in which modifications to data in the
cache aren't copied to the cache source until absolutely necessary. Write-
back caching is available on all CPUs supported by this BIOS. With these
CPUs, write operations stored in the L1 cache aren't copied to main memory
until absolutely necessary. This is the default setting.

External Cache

This option is for enabling or disabling the internal CPU L2 cache.   Settings
include Disabled, Write-Thru and **Write-Back**. See description above.

Peripheral Device Configurations

This option allows the user to set the configurations for the devices listed
below. The options for these devices are: Disabled, **Enabled**.

Onboard SCSI Option-ROM (370SSR only)

Onboard LAN1 Option-ROM (370SSR/370SSE only)

Onboard LAN2 Option-ROM (370SSR/370SSE only)

Event Log Configuration

Event Logging

This option **Enables** or Disables the logging of events. You can use this screen to select options for the Event Log Configuration Settings. You can access sub screens to view the event log and mark all events as read. Use the up and down arrow keys to select an item, and the plus (+) and minus (-) keys to change the option setting. The settings are described on the following pages. The screen is shown below.

ECC Event Logging

This option Enables or **Disables** the logging of ECC events. The events logged by AMIBIOS are post errors such as a bad BIOS, floppy errors, or hard drive errors.

Clear All Event Logs

This option can be used to tell the system to clear the event log on the next boot up. The settings are **No** and Yes.

View Event Log

This option allows the user view the events of the system. The settings are **No** and Yes.

Mark all Events as Read

This option allows the user to use the screen to mark all events as read. The settings are **OK** and Cancel.

4-5 Chipset Setup

Choose Chipset Setup from the AMIBIOS Setup Utility main menu. The screen is shown below. All Chipset Setup options are described following the screen. You can use this screen to select options for the GHCH Configuration.

```
                         BIOS SETUP UTILITY

 Main    Advanced    Chipset    PCIPnP   Power   Boot   Security   Exit

 > GMCH Configuration                              Options for MCH
 > ICH Configuration

 Processor Serial Number          [Disabled]
 CPU Latency Timer                [Disabled]

 C000,16k Shadow                  [Cached/WP]
 C400,16k Shadow                  [Cached/WP]
 C800,16k Shadow                  [Disabled]
 CC00,16k Shadow                  [Disabled]
 D000,16k Shadow                  [Disabled]
 D400,16k Shadow                  [Disabled]     ↔   Select Screen
 D800,16k Shadow                  [Disabled]     ↑↓  Select Item
 DC00,16k Shadow                  [Disabled]     +-  Change Option
                                                 F1  General Help
                                                 F10 Save and Exit
                                                 ESC Exit


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```

GMCH Configuration

You can use this screen to select options for the GMCH Configuration. Use the up and down arrow keys to select an item, and the plus (+) and minus (-) keys to change the option setting. The settings are described on the following pages.

Primary Video Device

This option specifies the primary display device on your system. Settings include Internal, External PCI, External AGP and **Auto**. Auto: This setting allows the BIOS to select the primary video device at bootup. Internal: This setting allows the onboard video display adapter to be the primary video device at bootup. External PCI: This setting allows a PCI Display Adapter card to be the primary video device at bootup. External AGP: This setting allows an AGP Display Adapter to be the primary video device at bootup.

Internal Graphics Mode Select

This option selects the mode for the internal graphics mode. Settings include Disabled, Enabled; 512 KB and **Enabled; 1 MB**. Enabled; 1MB: This option allows the Internal Graphic controller to allocate 1 MB of system memory for video display use. Enabled; 512KB: This option allows the Internal Graphic controller to allocate 512 KB of system memory for video display use. Disabled: This option allocates no system memory for video display use.

Display Cache Window Size

This option sets the size of the display cache window. The settings are **64 MB** and 32 MB.

Display VBIOS Message:

This option allows the BIOS to display VBIOS messages. The settings are **Enabled,** or disabled.

Internal Graphics Scaling

This option allows the Internal Graphics Scaling to be manually set or automatically set. The settings for this option for this setting include Disabled, Auto and Enabled. Auto: This setting allows the Internal Graphics scaling to auto select itself. This setting sets the Internal Graphics scaling off. Enabled: This setting sets the Internal Graphics scaling on.

AGP Graphics Aperture Size

This option allows you to adjust the graphics aperture size to either **64 MB** or 32 MB.

Internal Graphics TV Format

This option specifies the type of TV format that will be used with the onboard graphics. The settings are **NTSC** and PAL.

Output Device Synch/Non-Synch

This option allows you to set the output device as either **Non-Synchro-nous** (Asynchronous) or Synchronous. Synchronous means the output device will match the frequency of the bus speed. Asynchronous or Non-Synchronous allows data to be sent and received at a different frequency than the bus.

Digital Device Priority

Use this option to prioritize the type(s) of display device on your system. The settings are **CRT/FP/TV**, FP/CRT/TV, CRT/TV/FP, TV/CRT/FP, FP/TV/CRT and TV/FP/CRT. (FP stands for flat panel.)

Init Display Cache Memory

This option allows the Initial Display cache memory to be adjusted. The setting are **Enabled** and Disabled.

Paging Mode Control

This option allows the paging mode controls to be adjusted to either **Close** or Open.

RAS-to-CAS Latency Override

The RAS-to-CAS Override is adjusted with this option. The settings are **Disabled** and Enabled. Disabled: This option allows RAS-to-CAS. Enabled: This option overrides RAS-to-CAS. SDRAM stores informa tion in blocks of rows and columns. RAS stands for Row Address Strobe. CAS stands for Column Address Strobe.

CAS Latency

This option regulates the speed of the Column Address Strobe (CAS) as either Fast or **Slow**, which is higher or lower latency. CAS latency optimizes the speed at which data is accessed in a column by defining CAS latency time in 100 MHz or 133 MHz clocks (dependent on the memory bus speed). It controls the time delay (in clocks) before SDRAM starts a read command after receiving it. Reading RAS data can be read twice as fast as reading CAS. Lowering the latency can increase the speed of the SDRAM, but at the expense of stability.

RAS Timing

This option regulates the speed of the Row Address Strobe (RAS) as either Fast or **Slow**. As with CAS Latency, lowering the timing can increase the speed of the SDRAM, but at the expense of stability.

RAS Pre-charge

The precharge time is the number of cycles it takes for the RAS to accumulate a charge before a DRAM refresh. Insufficient recharge time may cause the DRAM to lose data. The settings are Fast and **Slow**, which is more stable.

System Memory Frequency

This option allows the system memory frequency to be adjusted. The settings are 100 MHz (for PC100 memory), 133 MHz (for PC133 memory) and **Auto**, which allows the system memory frequency to auto select itself

SDRAM Refresh

This option sets the refresh rate for the system memory. Settings include **Auto**, 15.6 mS, 7.8 mS and 128 CLKS.

DRAM Cycle Time (SCLKS)

This option allows you set the DRAM cycle time to 5/7, 6/8 or **Auto**.

CAS Latency (SCLKS)

This option allows you to set the CAS latency time to 3, 2 or **Auto**.

RAS# to CAS# Delay (SCLKS)

The settings for this option are 3, 2 or **Auto**.

RAS# Precharge (SCLKS)

This option sets the RAS# precharge time. The settings are 3, 2 **Auto**.

DRAM Page Closing Policy

The settings for this option are Close and **Open**.

Memory Hole

Some ISA cards may require specific areas of memory to function. This can be done by choosing the 15 MB - 16 MB option to reserve the area. The settings for this option are **Disabled** and 15 MB-16 MB.

ICH Configuration (370SSM) and ICH2 Configuration (370SSA/370SSR/370SSE)

You can use this screen to select options for the ICH Configuration (370SSM) and for the ICH2 Configuration (370SSA/370SSR/370SSE). Use the up and down arrow keys to select an item, and the plus (+) and minus (-) keys to change the option setting. The settings are described on the following pages. ICH stands for I/O Controller Hub, which is a chipset on the motherboard that controls the basic I/O functions, USB ports, audio functions, modem functions, IDE channels, and PCI slots.

Moon ISA Device Enable

This option allows a Moon ISA device to be supported. The settings are **Disabled** and Enabled. A Moon ISA device is a device that contains an Intel® PCIset S82380AB PCI to ISA in a 160-pin MQFP chipset. This chipset is called an Intel® Moon ISA or Intel® MISA. This chipset is used to connect ISA devices to computers that do not have a physical ISA slot. The best example of this is a notebook computer (No ISA Slots) when used with a docking station (contains up to three ISA peripherals). The docking station would contain the Intel® Moon ISA chipset.

ICH Positive Decode(370SSM), ICH2 Positive Decode (370SSA/ 370SSR/370SSE)

This option allows the ICH Positive Decode or ICH2 Positive Decode to be set. The settings are **Disabled** and Enabled.

Onboard Audio Codec (370SSA/370SSM)

This option allows the system to Enable Onboard Audio Codec. The settings are Disabled and **Enabled**.

CPU Bist Enable

This option allows the CPU Bist Enable to be set. The settings are **Disabled** and Enabled.

ICH DCB Enable(370SSM), ICH2 DCB Enable (370SSA/370SSR/370SSE)

This option allows the ICH DCB and ICH2 DCB to be set. The settings are **Disabled** and Enabled.

SMBus Controller

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

AC97 Audio Controller(370SSA/370SSM)

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

AC97 Modem Controller(370SSA/370SSM)

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

Sound Blaster Decode(370SSA/370SSM)

This option is for adjusting the Sound Blaster Decode. The settings are **Disabled**, 220h-233h, 240h-253h, 260h-273h and 280h-293h.

Microsoft Sound Decode(370SSA/370SSM)

This option is for adjusting the Microsoft Sound Decode. The settings are **Disabled**, 530h-537h, 604h-60Bh, E80h-E87h and F40h-F47h.

MIDI Decode (370SSA/370SSM)

This option allows the MIDI Decode to be set. The settings are **Disabled**, 330h-331h and 300h-301h.

Adlib Range 388h-38Bh (370SSA/370SSM)

This option allows the Adlib Range 388h-38Bh to be set. The settings are Disabled and **Enabled**.

Game Port(370SSA/370SSM)

This option allows the Game Port to be set. The settings are Disabled and **Enabled**.

LPC 4Eh-4Fh Decode

This option allows the LPC 4Eh-4Fh to be set. The settings are Disabled and **Enabled**.

DMA-0 Type

DMA-1 Type

DMA-2 Type

DMA-3 Type

DMA-4 Type

DMA-5 Type

DMA-6 Type

DMA-7 Type

This above options allow you to change the protocol for DMA-0 through DMA-7. The settings for all are PC/PCI and **LPC DMA**.

Processor Serial Number

Intel includes a serial number in their processors to act as a unique system identifier. For privacy reasons, you can disable the release of this identifier. The settings for this option are **Disabled** and Enabled. Disabled: This setting restricts all access to the CPU serial number from your CPU. Enabled: This setting allows the operating system and applications to be able to read the CPU serial number from your CPUs. **Note:** If the CPU is a Intel® Celeron Processor, then this selection will be grayed out. Intel® Celeron Processors do not contain a processor serial number.

CPU Latency Timer

This option allows the CPU Latency Timer to be modified. The settings for this option are **Disabled** and Enabled. Disabled: The deferrable processor cycle will be deferred immediately after receiving another ADS#. Enabled: The deferrable processor cycle will only be deferred after it has been in a "Snoop Stall" for 31 clocks and another ADS# has arrived.

C000, 16k Shadow

C400, 16k Shadow

C800, 16k Shadow

CC00, 16k Shadow

D000, 16k Shadow

D400, 16k Shadow

D800, 16k Shadow

DC00, 16k Shadow

These options specify how the 16 KB of video ROM at each of the above addresses is treated. The settings are Disabled, Enabled, and Cached/WP . When Disabled, the contents of the video ROM are not copied to RAM. When Enabled, the contents of 16 KB of video ROM beginning at the above address are copied (shadowed) from ROM to RAM for faster application. When set to Cached/WP, the contents of 16 KB of video ROM beginning at the above address are copied (shadowed) from ROM to RAM and can be written to or read from cache memory. The settings for this option are Disabled, Enabled and Cached/WP. (The optimal settings are Cached/WP for C000 and C400 and Disabled for all the other settings.

4-6   PCI PnP Setup

Choose PCI/PnP Setup from the AMIBIOS Setup main menu. All PCI/PnP options are described in this section. The PCI/PnP Setup screen is shown below.

```
                           BIOS SETUP UTILITY
 Main    Advanced    Chipset    PCIPnP   Power   Boot   Security   Exit

                                                    No: lets the BIOS
 Plug & Play O/S                  [No]              configure all the
 Reset Config Data                [No]              devices in the system.
 PCI Latency Timer                [64]              Yes: lets the
 Allocate IRQ to VGA              [Yes]             operating system
 Palette Snooping                 [Disabled]        configure Plug and
 PCI IDE BusMaster                [Disabled]        Play (PnP) devices not
 OffBoard PCI/ISA IDE Card        [Auto]            required for boot if
 OffBoard PCI IDE Primary IRQ     [Disabled]        your system has a Plug
 OffBoard PCI IDE Secondary       [Disabled]        and Play operating
                                                    system.

 USB Controller                   [Enabled]
 Legacy USB Support               [Disabled]        ↔   Select Screen
                                                    ↑↓  Select Item
                                                    +-  Change Option
 IRQ3                             [Available]       F1  General Help
 IRQ4                             [Available]       F10 Save and Exit
 IRQ5                             [Available]       ESC Exit
 IRQ7                             [Available]
 IRQ9                             [Available]
 IRQ10                            [Available]

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```

Plug & Play OS

Choose the **No** setting for computers that do not meet the Plug and Play specifications, which will allow the BIOS to configure all the devices in the system. Choosing the Yes setting lets the operating system configure PnP devices that are not required for boot up (if the system has a PnP operating system). The operating system would have the ability to change interrupt, I/O, and DMA settings. Normally, this option is set to "Disabled".

Reset Configuration Data

Choosing the Yes setting will cause the PnP configuration data in the BIOS to be cleared on the next boot up. Choosing the **No** setting does not force PnP data to be cleared on the next boot.

PCI Latency Timer

This option specifies the latency timing of the PCI clocks for all PCI devices. Settings include 32, **64**, 96, 128, 160, 192, 224 and 248 PCI clocks.

Allocate IRQ to PCI VGA

This option lets you allocate an interrupt request (IRQ) to the PCI VGA adapter card (if used). The settings are **Yes** and No.

Palette Snooping

When enabled, this option informs PCI devices that an ISA graphics device is installed. The settings are **Disabled** and Enabled. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with your adapter card manuals first, before modifying the default settings in the BIOS.

PCI IDE BusMaster

The settings for this option are **Disabled** and Enabled. This option is only available on non-Microsoft Operating Systems.

OffBoard PCI/ISA IDE Card

This option specifies which PCI slot has an IDE controller card installed. Settings are **Auto**, PCI slot 1, PCI slot 2, PCI slot 3, PCI slot 4, PCI slot 5 and PCI slot 6. (PCI slot numbers will be available in this option even if your motherboard does not have that slot number. If your motherboard does not have a PCI slot 5, for example, do not set this option to "PCI slot5".)

OffBoard PCI Primary IRQ

This option specifies the primary IRQ for the PCI. Settings include **Disabled**, INTA (Interrupt A), INTB, INTC, INTD and Hardwired. Hardwired tells the BIOS that the OffBoard IDE Primary controller is a legacy device and the interrupt request channels cannot participate in PCI "Swizzle". (PCI "Swizzle" is a term used to describe IRQ sharing.)

USB Function

The settings for this option are Disabled and **Enabled**. Disabled prevents the use of the USB ports and Enabled allows the use of the USB ports.

Legacy USB Support

This option allows Legacy USB support. The settings are **Disabled**, Enabled and Auto. Disabled prevents the use of any USB device in DOS or during system boot. Enabled allows the use of USB devices during boot and while using DOS. The Auto setting auto detects USB keyboards or mice and if found, allows them to be utilized during boot and while using DOS.

PCI Slot1 IRQ Preferrence

PCI Slot2 IRQ Preferrence

PCI Slot3 IRQ Preferrence

PCI Slot4 IRQ Preferrence

The settings for the above options are **Auto**, 3, 4, 5 ,7, 9, 10, 11, 12, 14, 15.

IRQ 3

IRQ 4

IRQ 5

IRQ 7

IRQ 9

IRQ 10

IRQ 11

IRQ 14

IRQ 15

The settings for the above options are **Available** and Reserved. Available allows the specified IRQ to be available for use by PCI/PnP devices. Reserved means the specified IRQ is reserved for use by Legacy ISA devices.

DMA Channel 0

DMA Channel 1

DMA Channel 3

DMA Channel 5

DMA Channel 6

DMA Channel 7

Each of the above list of DMA channel setting options can be set to **Available** and Reserved. Available means the specified DMA channel is available for use by PCI/PnP devices. Reserved means the specified DMA channel is reserved for use by Legacy ISA devices.

Reserved Memory Size

This option specifies the size of a memory area to be reserved for Legacy ISA adapter cards. The settings are **Disabled**, 16k, 32k and 64k.

Reserved Memory Address

The option specifies the beginning address of the reserved memory area to be used for Legacy ISA adapter cards. The settings are C0000, C4000, **C8000**, CC000, D0000, D4000, D8000 and DC000.

4-7   Power Setup

Choose Power Setup from the AMIBIOS Setup main menu. All Power Setup options are described in this section. The Power Setup screen is shown below.

```
                        BIOS SETUP UTILITY
┌──────────────────────────────────────────────────────────────────────┐
│ Main    Advanced    Chipset    PCIPnP    Power    Boot   Security  Exit│
├──────────────────────────────────────────────────────────────────────┤
│                                                                        │
│ ACPI Aware O/S                    [No]                                 │
│ Suspend to RAM Support            [Disabled]                           │
│ Repost Video on S3 Resume         [Yes]                                │
│                                                                        │
│                                                                        │
│ Power Management/APM              [Enabled]                            │
│ Standby Time Out                  [Disabled]                           │
│ Suspend Power Saving              [S1]                                 │
│ Suspend Time Out                  [Disabled]                           │
│ Power Button Mode                 [On/Off]                             │
│ AfterG3 Enable                    [Disabled]                           │
│ Green PC Monitor Power State      [Suspend]       ↔  Select Screen     │
│ Video Power Down Mode             [Suspend]       ↑↓  Select Item      │
│ Hard Disk Power Down Mode         [Suspend]       +-  Change Option    │
│ Hard Disk Time Out (Minute)       [Disabled]      F1  General Help     │
│ Display Activity                  [Ignore]        F10 Save and Exit    │
│ Manual Throttle Ratio             [50%]           ESC Exit             │
│ THRM throttle Ratio               [50%]                                │
│ Intruder Sel                      [SMI]                                │
│                                                                        │
├──────────────────────────────────────────────────────────────────────┤
│       V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.         │
└──────────────────────────────────────────────────────────────────────┘
```

ACPI Aware O/S

This option allows the system to utilize Intel's ACPI (Advanced Configuration and Power Interface) specification. Settings are No and **Yes**. DOS®, Windows 3.x®, Windows 95 and Windows NT® are examples of non-ACPI aware operating systems. Windows 98®, Windows ME, and Windows 2000® are examples of ACPI aware operating systems.

Suspend to RAM Support

This allows you to enable or disable the Suspend to RAM feature. Settings are **Disabled** and Enabled. The Disabled setting prevents the system from saving information to main memory when in a low power state. Enabled causes the system to enter a low power state instead of being completely shut off. This allows the computer system to bootup in a few seconds. Suspend to RAM (STR) is a technology that is closely associated with the S3 state of the ACPI (Advanced Configuration and Power Interface) speci-fication. STR allows a properly configured system to go into a low power state while saving information to main memory about the system's configu-ration, open applications, and active files. While in the low power (STR) state, memory remains powered to retain the system information while most other components turn off to conserve energy. Fans are turned off to pro-vide silent operation and to minimize power consumption. Properly config-ured systems in STR typically can consume less than 5 watts.

Repost Video on S3 Resume

This option determines whether or not to invoke the VGA BIOS post test when resuming from STR or the S3 state. Settings are No and **Yes**. (Used with ACPI only.)

Power Management /APM

This option allows you to select using APM (Advanced Power Manage-ment). The settings are Disabled and **Enabled**.

Standby Time Out

This option specifies the length of system inactivity time that should expire before the computer enters a standby power state. The settings are **Dis-abled**, 1Min, 5Min and 10Min.

Suspend Power Saving Type

The settings for this option are C2 and S1. The C2 setting allows the CPU (microprocessor) to be put in a low power state. In this state, incoming interrupts wake-up the CPU (microprocessor) to process them (I/O APIC). S1 allows the system to enter the S1 POS (Power On Suspend) state. While the system is in this state, the CPU is not executing instructions, all power resources that supply system level reference of S0 are off, system memory context is maintained, devices that reference power resources that are on are on, and devices that can wake-up the system can cause the CPU to continue to execute from where it left off.

Suspend Time Out

This option specifies the length of system inactivity while in the standby state that should expire before the computer enters a suspend power state. The settings are **Disabled**, 1Min, 5Min and 10Min.

Power Button Mode

This option specifies how the external power button on the computer chassis functions. When set to **On/Off**, depressing the power button turns the computer on or off. When set to Suspend, depressing the power button places the computer in Suspend mode or Full On power mode. The Standby setting places the computer in Standby or Full On mode.

After G3 Enable

This option allows AfterG3 Enable support. The settings are **Disabled** and Enabled. Disabled prevents the system to power on after power is applied to the system. Enabled allows the system to power on after power is applied to the system. This means that if an ATX compliant power supply is turned hard off or unplugged from the wall (power socket supplying it power), the computer system will not power back on immediately after the power cord is reattached or the hard off switch is flipped back on. The power button on the front of the chassis is usually the soft off, meaning that there is still power being supplied to the motherboard even though the system looks completely off. Hard off means that there is not power being supplied to the system at all. The only power is coming from the backup battery on the motherboard.

Green PC Monitor Power State

This option specifies the power state that a green PC-compliant monitor enters when BIOS places it in a power saving state after the specified period of display inactivity has expired. The settings include Standby, **Suspend** and Off.

Video Power Down Mode

This option specifies the power state that the VGA video subsystem enters after the specified period of display inactivity has expired. The settings include Disabled, Standby and **Suspend**.

Hard Disk Power Down Mode

This option specifies the power conserving state that the hard disk drive(s) enters after the specified period of inactivity has expired. The settings include Disabled, Standby and **Suspend**.

Hard Disk Time Out (Minutes)

This option specifies the length of hard disk inactivity time that should expire before entering the power conserving state specified in the previous setting. The settings include **Disabled** and increments of 1-15 minutes.

Display Activity

This option specifies if BIOS is to monitor for display activity when in a power saving state. The **Ignore** setting means any display activity will not wake the system up from a power management state. The Monitor setting allows display activity to wake up the system from a power management state.

Manual Throttle Ratio

When in a power management state, throttling can be used to lower power consumption and reduce heat. This option allows the CPU to operate at a reduced average power, which includes a sacrifice in performance. The settings include 87.5%, 75.0%, 62.5%, **50%**, 37.5%, 25% and 12.5%. (A setting of 75.0% means the BIOS will throttle back the CPU clock to operate 75% of the time.)

THRM Throttle Ratio

THRM throttling is used to lower power consumption and reduce heat. The settings include 87.5%, 75.0%, 62.5%, **50%**, 37.5%, 25% and 12.5%.

Intruder Sel

This option allows you to set the Intruder SEL setting to SCI or **SMI**. SCI stands for System Control Interrupt. This is considered to be ACPI (Advanced Configuration and Power Interface) mode. The operating system uses the SCI interrupt to process ACPI (Advanced Configuration and Power Interface) events signaled by GPEs (general Purpose Event), whether the system is asleep or awake when the event occurs. In other words, the wake event has the side effect of causing the system to wake up if it is asleep, but its primary purpose is to generate an SCI that notifies the operating system that the event has occurred. SMI stands for System Management Interrupt. This is considered to be Legacy mode. It is used to log interrupt events to operating systems that do not support ACPI (Advanced Configuration and Power Interface) and operating systems that do.

Timer Overflow Enable

This allows the system to generate a System Management Interrupt after a specific amount of time has passed. The settings for this option are **Disabled** and Enabled.

Thermal SMI Enable

This allows the system to generate a System Management Interrupt after a specific temperature has been exceeded. The settings for this option are **Disabled** and Enabled.

PME SMI Enable

This allows the system to generate a System Management Interrupt after a Power Management event has ocurred. The settings for this option are **Disabled** and Enabled.

SW SMI Timer Enable

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

TCO Logic SMI Enable

This allows the system to generate a System Management Interrupt when a century rollover occurs. The settings for this option **Disabled** and Enabled.

RTC Resume

This allows you to direct the system to resume operation at a predetermined time by using the real-time clock. The settings for this option **Disabled** and Enabled.

RTC Alarm Date

This allows you to input the date you want the system to resume operation according to a real-time clock wake-up. Input a number from 1 to 31 to indicate the day of the month.

RTC Alarm Time

This allows you to input the time you want the system to resume operation according to a real-time clock wake-up. Input the hour and minutes as desired.

AC97 Logic Resume (370SSA/370SSM)

This allows you to wake up the system from an AC97 modem. The settings for this option **Disabled** and Enabled.

USB Controller Resume

This allows you to wake up the system from a USB device. The settings for this option **Disabled** and Enabled.

PME Resume

This allows you to wake up the system from a PME device. The settings for this option **Disabled** and Enabled.

RI Resume

The settings for this option **Disabled** and Enabled.

SMBUS Resume

This allows you to wake up the system from a System Management Bus device. The settings for this option **Disabled** and Enabled.

LAN Wake-Up (370SSR/370SSE)

This allows you to wake up LAN1 and LAN2 from a System Management Bus device. The settings for this option **Disabled** and Enabled.

4-8 Boot Setup

Choose Boot Setup from the AMIBIOS Setup main menu. All Boot Setup options are described in this section. The Boot Setup screen is shown below.

```
                        BIOS SETUP UTILITY

Main    Advanced   Chipset   PCIPnP   Power   Boot   Security   Exit

 >   Boot Device Priority
 >   Hard Disk Drives
 >   Removable Devices
 >   ATAPI CDROM Drives


                                          ↔       Select Screen
                                          ↑↓      Select Item
                                          Enter   Go to Sub Screen
                                          F1      General Help
                                          F10     Save and Exit
                                          ESC     Exit

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```

Boot Device Priority

1st Boot Device

AMI BIOS automatically detects hardware devices of the system. This option allows the BIOS to specify the order of boot sequence that is auto - detected by the BIOS. The settings for the 1st Boot Device are **Removeable Device**, Hard Drive, ATAPI CDROM, Onboard LAN1 option, and Onboard LAN2 option.

2nd Boot Device

The settings for the 2nd Boot Device are Removeable Device, **Hard Drive**, ATAPI CDROM, Onboard LAN1Option and Onboard LAN2 Option.

3rd Boot Device

The settings for the 3rd Boot Device are Removeable Device, Hard Drive, **ATAPI CDROM,** Onboard LAN1Option and Onboard LAN2 Option.

Hard Disk Drives

Use this screen to view the hard drives that have been auto-detected or entered manually on your system.

Removeable Devices

Use this screen to view the removeable devices that have been auto-detected or entered manually on your system.

ATAPI CDROM Drives

Use this screen to view the ATAPI CDROM drives that have been auto-detected or entered manually on your system.

4-9   Security Setup

Choose Security Setup from the AMIBIOS Setup main menu. All Security
Setup options are described in this section. The Security Setup screen is
shown below.

```
+-------------------------------------------------------------------+
|                        BIOS SETUP UTILITY                         |
+-------------------------------------------------------------------+
| Main   Advanced   Chipset   PCIPnP   Power   Boot   Security  Exit |
+-------------------------------------------------------------------+
|                                          | Install or Change the  |
| Supervisor Password  :       Not Installed| password.             |
| User Password        :       Not Installed|                       |
|                                          |                        |
| >  Change Supervisor Password            |                        |
| >  Change User Password                  |                        |
| >  Clear User Password                   |                        |
| Boot Sector Virus Protection   [Disabled]|                        |
|                                          |                        |
|                                          |                        |
|                                          | ↔      Select Screen   |
|                                          | ↑↓     Select Item     |
|                                          | Enter  Go to Sub Screen|
|                                          | F1     General Help    |
|                                          | F10    Save and Exit   |
|                                          | ESC    Exit            |
|                                          |                        |
+-------------------------------------------------------------------+
|      V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.      |
+-------------------------------------------------------------------+
```

Supervisor Password

User Password

AMIBIOS provides both Supervisor and User password functions. If you
use both passwords, the Supervisor password must be set first. The sys-
tem can be configured so that all users must enter a password every time
the system boots or when AMIBIOS Setup is executed, using either or both
the Supervisor password or User password. The Supervisor and User
passwords activate two different levels of password security. If you select
password support, you are prompted for a 1 – 6 character password. Type
the password on the keyboard. The password does not appear on the
screen when typed. Make sure you write it down. If you forget it, you must
clear CMOS and reconfigure. **Remember your Password!** Keep a record
of the new password when the password is changed. If you forget the
password, you must erase the system configuration information in CMOS.

Change Supervisor Password

This option allows you to change a supervisor password that was entered previously.

Change User Password

This option allows you to change a user password that was entered previously.

Clear User Password

Use this option to clear the user password so that it is not required to be entered when the system boots up.

Boot Sector Virus Protection

This option allows you to enable or disable a virus detection program to protect the boot sector of your hard disk drive. The settings for this option **Disabled** and Enabled. If Enabled, AMIBIOS will display a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive.

4-10 Exit Setup

Choose Exit Setup from the AMIBIOS Setup main menu. All Exit Setup options are described in this section. The Exit Setup screen is shown below.

```
┌─────────────────────────────────────────────────────────────────────┐
│                         BIOS SETUP UTILITY                           │
├─────────────────────────────────────────────────────────────────────┤
│ Main   Advanced   Chipset   PCIPnP   Power   Boot   Security   Exit  │
├───────────────────────────────────────────┬─────────────────────────┤
│                                            │ Exit system setup with  │
│  >  Exit Saving Changes                    │ saving the changes.     │
│  >  Exit Discarding Changes                │                         │
│  >  Load Optimal Defaults                  │                         │
│  >  Load Fail-Safe Defaults                │                         │
│  >  Discard Changes                        │                         │
│                                            │                         │
│                                            │                         │
│                                            │ ↔      Select Screen    │
│                                            │ ↑↓     Select Item      │
│                                            │ Enter  Go to Sub Screen │
│                                            │ F1     General Help     │
│                                            │ F10    Save and Exit    │
│                                            │ ESC    Exit             │
│                                            │                         │
├───────────────────────────────────────────┴─────────────────────────┤
│       V02.03 (C)Copyright 1985-2000, American Megatrends, Inc.       │
└─────────────────────────────────────────────────────────────────────┘
```

Exit Saving Changes

Highlighting this setting and then pressing <Enter> will save any changes you made in the BIOS Setup program and then exit. Your system should then continue with the boot up procedure.

Exit Discarding Changes

Highlighting this setting and then pressing <Enter> will ignore any changes you made in the BIOS Setup program and then exit. Your system should then continue with the boot up procedure.

Load Optimal Defaults

Highlighting this setting and then pressing <Enter> provides the optimum performance settings for all devices and system features.

Load Failsafe Defaults

Highlighting this setting and then pressing <Enter> provides the safest set of parameters for the system. Use them if the system is behaving erratically.

Discard Changes

Highlighting this setting and then pressing <Enter> will ignore any changes you made in the BIOS Setup program but will not exit the BIOS Setup program.

Notes

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 Beep Code 8, are fatal errors.

AMI BIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	*The memory refresh circuitry on the motherboard is faulty*
2 beeps	BIOS ROM file absent	*The BIOS was unable to find the specific file name required to flash the BIOS*
3 beeps	Base 64KB memory failure	*Memory failure occurred in the first 64KB of Memory*
4 beeps	Flash program successful	*The flash was properly programmed with the BIOS ROM file.*
5 beeps	Media read error	*The floppy or ATAPI media is not presented or cannot be read*
6 beeps	Keyboard controller Gate A20 failure	*The keyboard controller may be bad. The BIOS cannot switch to protected mode.*
7 beeps	Processor exception interrupt error	*The CPU generated an exception interrupt*
8 beeps	Display memory read/write error	*The system video adapter is either missing or its memory is faulty. This is not a fatal error.*
10 beeps	Flash erase error	*The flash device was unable to be properly programmed.*
11 beeps	Flash program error	*The flash device was unable to be properly programmed.*
12 beeps	BIOS ROM file incorrect size	*The BIOS ROM file found does not match the size of the flash device*
13 beeps	BIOS ROM image mismatch	*The BIOS ROM file layout configuration does not match image present in the flash device.*
5 short +_1 long beeps	Memory Error	*No memory detected in the system*
6 short + 1 long beeps	Memory Error	*EDO memory detected in system*
7 short + 1 long beeps	SMBUS Error	*SMBUS error*

Appendix B
AMIBIOS POST Checkpoint Codes

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

B-1 Uncompressed Initialization Codes

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

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

B-2 Bootblock Recovery Codes

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

Checkpoint   Code Description

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

B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution.
These codes are uncompressed in F0000h shadow RAM.

Checkpoint   Code Description

03h   The NMI is disabled. Next, checking for a soft reset or a power on
         condition.
05h   The BIOS stack has been built. Next, disabling cache memory.
06h   Uncompressing the POST code next.
07h   Next, initializing the CPU and the CPU data area.
08h   The CMOS checksum calculation is done next.
0Ah   The CMOS checksum calculation is done. Initializing the CMOS status
         register for date and time next.
0Bh   The CMOS status register is initialized. Next, performing any required
         initialization before the keyboard BAT command is issued.
0Ch   The keyboard controller input buffer is free. Next, issuing the BAT
         command to the keyboard controller.
0Eh   The keyboard controller BAT command result has been verified. Next,
         performing any necessary initialization after the keyboard controller BAT
         command test.
0Fh   The initialization after the keyboard controller BAT command test is done.
         The keyboard command byte is written next.
10h   The keyboard controller command byte is written. Next, issuing the Pin 23
         and 24 blocking and unblocking command.
11h   Next, checking if <End or <Ins> keys were pressed during power on.
         Initializing CMOS RAM if the *Initialize CMOS RAM in every boot*
         AMIBIOS POST option was set in AMIBCP or the <End> key was pressed.
12h   Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13h   The video display has been disabled. Port B has been initialized. Next,
         initializing the chipset.
14h   The 8254 timer test will begin next.
19h   The 8254 timer test is over. Starting the memory refresh test next.
1Ah   The memory refresh line is toggling. Checking the 15 second on/off time
         next.
2Bh   Passing control to the video ROM to perform any required configuration
         before the video ROM test.
2Ch   All necessary processing before passing control to the video ROM is done.
         Looking for the video ROM next and passing control to it.
2Dh   The video ROM has returned control to BIOS POST. Performing any
         required processing after the video ROM had control.
23h   Reading the 8042 input port and disabling the MEGAKEY Green
         PC feature next. Making the BIOS code segment writable and
         performing any necessary configuration before initializing the
         interrupt vectors.
24h   The configuration required before interrupt vector initialization
         has completed. Interrupt vector initialization is about to begin.

Checkpoint   Code Description

25h   Interrupt vector initialization is done. Clearing the password if the
          POST DIAG switch is on.
27h   Any initialization before setting video mode will be done next.
28h   Initialization before setting the video mode is complete. Configuring
          the monochrome mode and color mode settings next.
2Ah   Bus initialization system, static, output devices will be done next, if
          present. See the last page for additional information.
2Eh   Completed post-video ROM test processing. If the EGA/VGA
          controller is not found, performing the display memory read/write
          test next.
2Fh   The EGA/VGA controller was not found. The display memory read/write
          test is about to begin.
30h   The display memory read/write test passed. Look for retrace checking
          next.
31h   The display memory read/write test or retrace checking failed. Performing
          the alternate display memory read/write test next.
32h   The alternate display memory read/write test passed. Looking for alternate
          display retrace checking next.
34h   Video display checking is over. Setting the display mode next.
37h   The display mode is set. Displaying the power on message next.
38h   Initializing the bus input, IPL, general devices next, if present. See the last
          page of this chapter for additional information.
39h   Displaying bus initialization error messages. See the last page of this
          chapter for additional information.
3Ah   The new cursor position has been read and saved. Displaying the *Hit
          <DEL>* message next.
3Bh   The *Hit <DEL>* message is displayed. The protected mode memory test is
          about to start.
40h   Preparing the descriptor tables next.
42h   The descriptor tables are prepared. Entering protected mode for the
          memory test next.
43h   Entered protected mode. Enabling interrupts for diagnostics mode next.
44h   Interrupts enabled if the diagnostics switch is on. Initializing data to check
          memory wraparound at 0:0 next.
45h   Data initialized. Checking for memory wraparound at 0:0 and finding the
          total system memory size next.
46h   The memory wraparound test is done. Memory size calculation has been
          done. Writing patterns to test memory next.
47h   The memory pattern has been written to extended memory. Writing patterns
          to the base 640 KB memory next.
48h   Patterns written in base memory. Determining the amount of memory below
          1 MB next.
49h   The amount of memory below 1 MB has been found and verified.
          Determining the amount of memory above 1 MB memory next.

Checkpoint   Code Description

4Bh   The amount of memory above 1 MB has been found and verified. Checking
         for a soft reset and clearing the memory below 1 MB for the
         soft reset next. If this is a power on situation, going to checkpoint 4Eh next.

4Ch   The memory below 1 MB has been cleared via a soft reset. Clearing
         the memory above 1 MB next.

4Dh   The memory above 1 MB has been cleared via a soft reset. Saving the
         memory size next. Going to checkpoint 52h next.

4Eh   The memory test started, but not as the result of a soft reset.
         Displaying the first 64 KB memory size next.

4Fh   The memory size display has started. The display is updated during
         the memory test. Performing the sequential and random memory test
         next.

50h   The memory below 1 MB has been tested and initialized. Adjusting
         the displayed memory size for relocation and shadowing next.

51h   The memory size display was adjusted for relocation and shadowing.
         Testing the memory above 1 MB next.

52h   The memory above 1 MB has been tested and initialized. Saving
         the memory size information next.

53h   The memory size information and the CPU registers are saved.
         Entering real mode next.

54h   Shutdown was successful. The CPU is in real mode. Disabling the
         Gate A20 line, parity, and the NMI next.

57h   The A20 address line, parity, and the NMI are disabled. Adjusting
         the memory size depending on relocation and shadowing next.

58h   The memory size was adjusted for relocation and shadowing.
         Clearing the *Hit <DEL>* message next.

59h   The *Hit <DEL>* message is cleared. The *<WAIT...>* message is
         displayed. Starting the DMA and interrupt controller test next.

Checkpoint   Code Description

60h   The DMA page register test passed. Performing the DMA Controller 1
          base register test next.
62h   The DMA controller 1 base register test passed. Performing the DMA
          controller 2 base register test next.
65h   The DMA controller 2 base register test passed. Programming DMA
          controllers 1 and 2 next.
66h   Completed programming DMA controllers 1 and 2. Initializing the 8259
          interrupt controller next.
67h   Completed 8259 interrupt controller initialization.
7Fh   Extended NMI source enabling is in progress.
80h   The keyboard test has started. Clearing the output buffer and checking
          for stuck keys. Issuing the keyboard reset command next.
81h   A keyboard reset error or stuck key was found. Issuing the keyboard
          controller interface test command next.
82h   The keyboard controller interface test completed. Writing the command
          byte and initializing the circular buffer next.
83h   The command byte was written and global data initialization has
          completed. Checking for a locked key next.
84h   Locked key checking is over. Checking for a memory size mismatch
          with CMOS RAM data next.
85h   The memory size check is done. Displaying a soft error and checking
          for a password or bypassing WINBIOS Setup next.
86h   The password was checked. Performing any required programming
          before WINBIOS Setup next.
87h   The programming before WINBIOS Setup has completed.
          Uncompressing the WINBIOS Setup code and executing the
          AMIBIOS Setup or WINBIOS Setup utility next.
88h   Returned from WINBIOS Setup and cleared the screen. Performing any
          necessary programming after WINBIOS Setup next.

Checkpoint   Code Description

89h   The programming after WINBIOS Setup has completed. Displaying the
          power on screen message next.
8Bh   The first screen message has been displayed. The *<WAIT...>* message is
          displayed. Performing the PS/2 mouse check and extended BIOS data area
          allocation check next.
8Ch   Programming the WINBIOS Setup options next.
8Dh   The WINBIOS Setup options are programmed. Resetting the hard disk
          controller next.
8Fh   The hard disk controller has been reset. Configuring the floppy drive
          controller next.
91h   The floppy drive controller has been configured. Configuring the hard disk
          drive controller next.
95h   Initializing the bus option ROMs from C800 next. See the last page of this
          chapter for additional information.
96h   Initializing before passing control to the adaptor ROM at C800.
97h   Initialization before the C800 adaptor ROM gains control has completed. The
          adaptor ROM check is next.
98h   The adaptor ROM had control and has now returned control to BIOS POST.
          Performing any required processing after the option ROM returned control.
99h   Any initialization required after the option ROM test has completed.
          Configuring the timer data area and printer base address next.
9Ah   Set the timer and printer base addresses. Setting the RS-232 base address
          next.

Checkpoint   Code Description

9Bh   Returned after setting the RS-232 base address. Performing any required
         initialization before the Coprocessor test next.
9Ch   Required initialization before the Coprocessor test is over. Initializing the
         Coprocessor next.
9Dh   Coprocessor initialized. Performing any required initialization after the
         Coprocessor test next.
9Eh   Initialization after the Coprocessor test is complete. Checking the extended
         keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID
         command next.
A2h   Displaying any soft errors next.
A3h   The soft error display has completed. Setting the keyboard typematic rate
         next.
A4h   The keyboard typematic rate is set. Programming the memory wait states
         next.
A5h   Memory wait state programming is over. Clearing the screen and enabling
         parity and the NMI next.
A7h   NMI and parity enabled. Performing any initialization required before
         passing control to the adaptor ROM at E000 next.
A8h   Initialization before passing control to the adaptor ROM at E000h completed.
         Passing control to the adaptor ROM at E000h next.
A9h   Returned from adaptor ROM at E000h control. Performing any initialization
         required after the E000 option ROM had control next.
Aah   Initialization after E000 option ROM control has completed. Displaying the
         system configuration next.
Abh   Uncompressing the DMI data and executing DMI POST initialization next.
B0h   The system configuration is displayed.
B1h   Copying any code to specific areas.
00h   Code copying to specific areas is done. Passing control to INT 19h boot
         loader next.

B-4 Bus Checkpoint Codes

The system BIOS passes control to different buses at the following checkpoints:

Checkpoint   Code Description
2Ah   Initializing the different bus system, static, and output devices, if present.
38h   Initialized bus input, IPL, and general devices, if present.
39h   Displaying bus initialization error messages, if any.
95h   Initializing bus adaptor ROMs from C8000h through D8000h.

Additional Bus Checkpoints
While control is inside the different bus routines, additional
checkpoints are output to I/O port address 0080h as word to identify
the routines being executed. These are word checkpoints.

The low byte of checkpoint is the system BIOS checkpoint where control is
passed to the different bus routines.

The high byte of checkpoint indicates that the routine is being executed in
Different buses.

High Byte
The high byte of these checkpoints includes the following information:

Bits   Description
Bits 7-4
0000 Function 0. Disable all devices on the bus.
0001 Function 1.   Initialize static devices on the bus.
0010 Function 2.   Initialize output devices on the bus.
0011 Function 3.   Initialize input devices on the bus.
0100 Function 4.   Initialize IPL devices on the bus.
0101 Function 5.   Initiate general devices on the bus.
0110 Function 6.   Initialize error reporting on the bus.
0111 Function 7.   Initialize add-on ROMs for all buses.

Bits 3-0 Specify the bus
0   Generic DIM Device Initialization Manager.
1   Onboard System devices.
2   ISA devices.
3   EISA devices.
4   ISA PnP devices.
5   PCI devices.

Notes