

ASUS[®] KN97
Pentium[®] II Motherboard

USER'S MANUAL

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Product Name:	ASUS KN97
Manual Revision:	1.03
Release Date:	July 1997

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AUDIO

Online help is provided with the Creative 16X audio drivers. A separate manual is provided for the Creative 16C Series audio drivers.

FCC & DOC COMPLIANCE

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

I. INTRODUCTION

How this Manual is Organized

This manual is divided into the following sections:

- I. Introduction:** Manual information and checklist
- II. Features:** Information and specifications concerning this product
- III. Installation:** Instructions on setting up the motherboard.
- IV. BIOS Software** Instructions on setting up the BIOS software
- V. Support Software** Information on the included support software
- VI. ASUS SCSI Cards** Installation of ASUS SCSI cards (optional)
- VII. ASUS Audio Card** Installation of an ASUS audio card (optional)

Item Checklist

Check that your package is complete. If you discover damaged or missing items, contact your retailer.

- ASUS KN97 motherboard
- Retention mechanism & heatsink support
- 2 serial port ribbon cables attached to a mounting bracket
- 1 parallel ribbon cable with mounting bracket
- 1 IDE ribbon cable
- 1 floppy ribbon cable
- ASUS KN97 Support Drivers & Utilities
 - Flash Memory Writer utility to update the FLASH BIOS
 - Desktop Management Interface (DMI) utility
 - LANDesk® Client Manager (LDCM) Software (with optional onboard LM78)
 - Audio drivers and utilities (with ASUS I-A16C audio bundle)
 - Readme files for descriptions and use of the files
 - Technical Support Form
- This user's manual
- Infrared module (optional)
- USB cable with mounting bracket set (optional)
- ASUS PCI-SC200 Fast-SCSI or PCI-SC860 Ultra-Fast SCSI card (optional)
- ASUS I-A16C audio card and manual (optional)

II. FEATURES

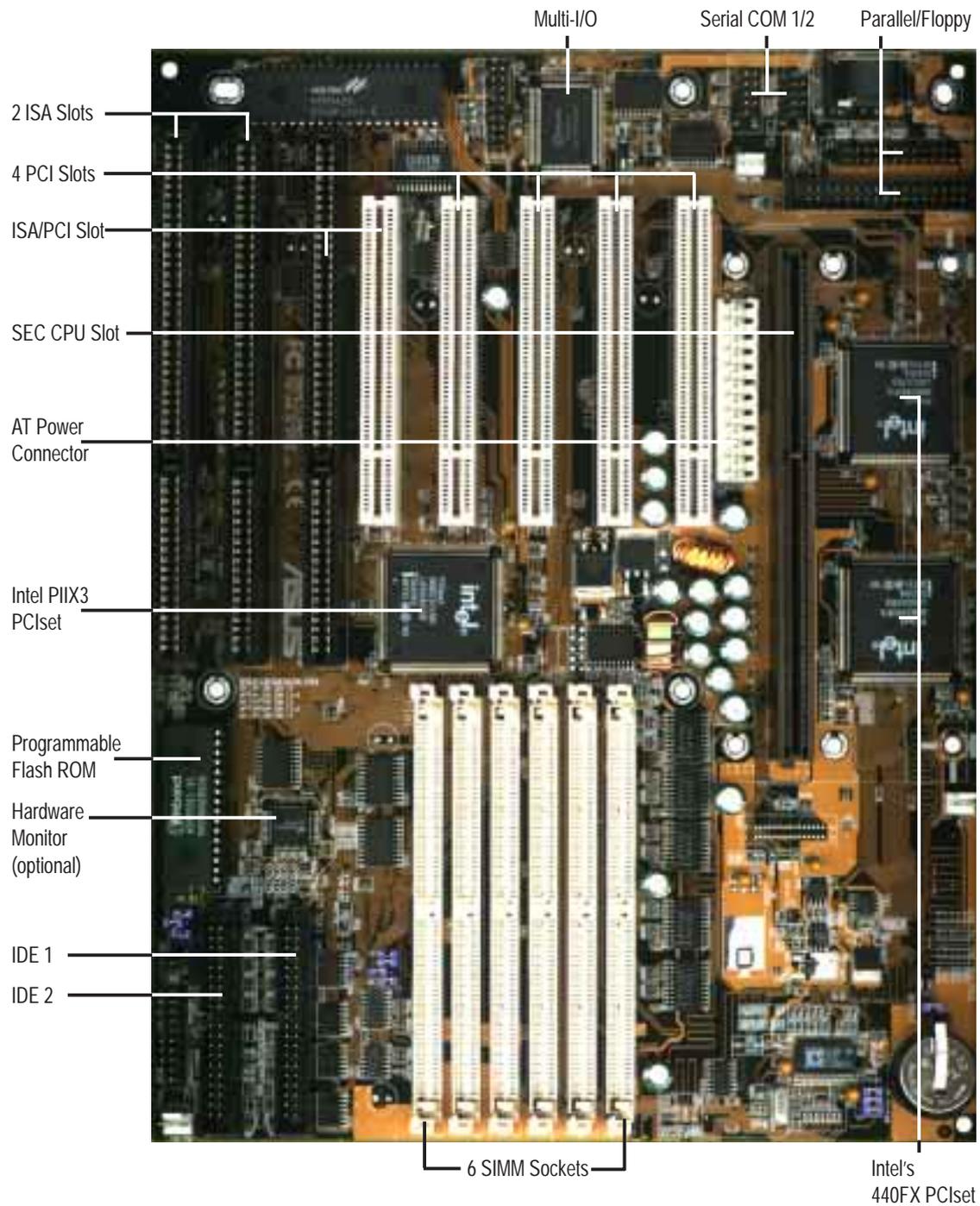
Features of the ASUS KN97 Motherboard

The ASUS KN97 is carefully designed for the demanding PC user who wants many features processed by the fastest CPU in a small package. This motherboard:

- **Versatile Processor Support:** Intel Pentium® II (233MHz–333MHz) processor on SEC slot or Intel Pentium® Pro (150–200MHz) processor with the C-P6S1 Pentium Pro SEC Card.
- **Intel Chipset:** Features Intel's 440FX PCIset with I/O subsystems.
- **Easy Installation:** Is equipped with BIOS that supports auto detection of hard drives, PS/2 mouse, and Plug and Play devices to make setup of hard drives, expansion cards, and other devices virtually automatic.
- **ISA & PCI Expansion Slots:** Provides three 16-bit ISA, and five 32-bit PCI slots.
- **Super Multi-I/O:** Provides two high-speed UART compatible serial ports and one parallel port with EPP and ECP capabilities. UART2 can also be directed from COM2 to the Infrared Module for wireless connections.
- **Desktop Management Interface (DMI):** Supports DMI through BIOS which allows hardware to communicate within a standard protocol creating a higher level of compatibility. (Requires DMI-enabled components.) (See section V)
- **PCI Bus Master IDE Controller:** Comes with an onboard PCI Bus Master IDE controller with two connectors that supports four IDE devices in two channels, supports PIO Modes 3 and 4 and Bus Master IDE DMA Mode 2, and supports Enhanced IDE devices such as Tape Backup and CD-ROM drives. Two floppy drives of either 5.25inch or 3.5inch (1.44MB or 2.88MB) are also supported without an external card. Supports Japanese standard "Floppy 3 mode" (3.5-inch disk drive: 1.2MB) and LS-120 floppy disk drives (3.5-inch disk drive: 120 MB, 1.44MB, 720K). BIOS supports IDE CD-ROM or SCSI device boot-up.
- **CPU Built-In Level 2 Cache:** 512KB or 256KB Pipelined Burst Level 2 cache in the Pentium II Single Edge Contact (SEC) cartridge.
- **Versatile Memory Support:** Equipped with six SIMM sockets to support (4, 8, 16, 32, or 64MB) 72-pin Fast Page Mode (FPM) or Extended Data Output (EDO), or Burst EDO SIMMs. Maximum memory of SIMMs not to exceed 384MB.
- **SCSI BIOS:** Supports optional ASUS SCSI controller cards through onboard firmware.
- **IrDA:** Supports an optional infrared port module for wireless interface.
- **Concurrent PCI:** Concurrent PCI allows multiple PCI transfers from PCI master busses to memory to CPU.
- **Intelligence:** Supports Fan Status Monitoring and Alarm, Temperature Monitoring and Alert, Voltage Monitoring and Alert, System Resources Alert, and Virus Write Protection through the optional onboard LM78 Hardware Monitor and Intel® LANdesk Client Manager (LDCM) software.

II. FEATURES

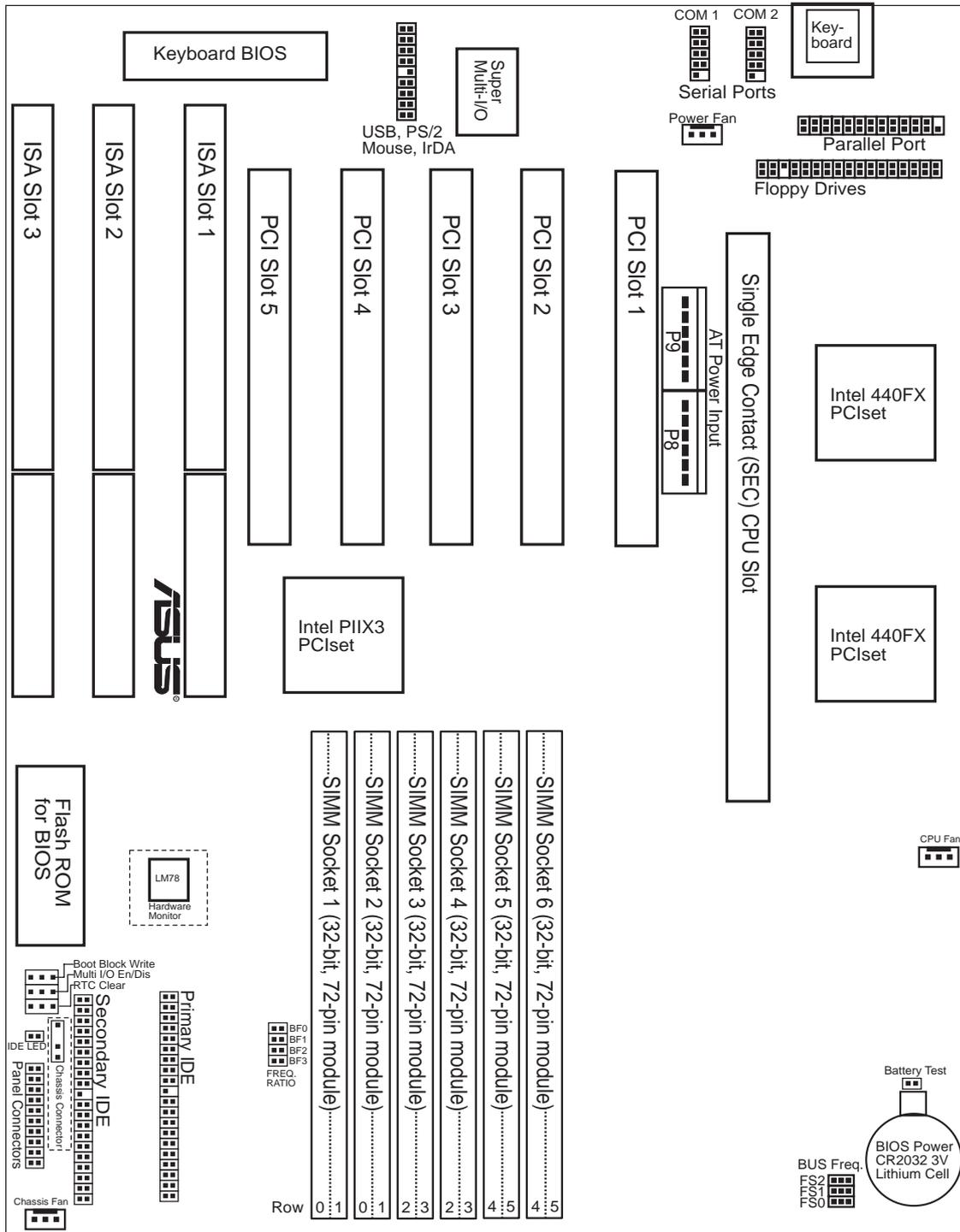
The ASUS KN97 Motherboard



II. FEATURES
(ASUS Board Parts)

III. INSTALLATION

Layout of the ASUS KN97 Motherboard



The items in outline are only available on motherboards with the LM78 Hardware Monitor

III. INSTALLATION

Jumpers

- | | |
|-----------------------|--|
| 1) SIO | p. 13 Onboard Multi-I/O Selection (En./Dis.) |
| 2) BBLKW | p. 13 Flash ROM Boot Block Programming (Protect/Prog.) |
| 3) RTCLR | p. 14 Real Time Clock (RTC) RAM (Keep/Clear CMOS) |
| 4) BATTEST | p. 14 Battery Test (Operation/Test Mode) |
| 5) FS0, FS1, FS2 | p. 15 CPU External Clock (BUS) Frequency Selection |
| 6) BF0, BF1, BF2, BF3 | p. 15 CPU to BUS Frequency Ratio |

Expansion Slots/sockets

- | | |
|---------------------------------|---------------------------------------|
| 1) System Memory | p. 16 System Memory Support |
| 2) SIMM Sockets | p. 17 SIMM Memory Module Support |
| 3) SEC CPU Slot | p. 20 Single Edge Contact CPU Support |
| 4) SLOT1, SLOT2, SLOT3 | p. 25 16-bit ISA Bus Expansion Slots* |
| 5) PCI1, PCI2, PCI3, PCI4, PCI5 | p. 25 32-bit PCI Bus Expansion Slots† |

Connectors

- | | |
|------------------------------|---|
| 1) KB | p. 27 Keyboard Connector (5-pin female) |
| 2) PRINTER | p. 27 Parallel (Printer) Port Connector (25-pin female) |
| 3) FLOPPY | p. 28 Floppy Drive Connector (34-pin Block) |
| 4) PWR_FAN, CPU_FAN, CHA_FAN | p. 28 Power Supply, CPU, Chassis Fan Power (3-pin block) |
| 5) COM1, COM2 | p. 29 Serial Port (Two 9-pin female) |
| 6) PWRAT | p. 29 AT Power Supply Connector (12-pin block) |
| 7) IDE1, IDE2 | p. 30 Primary / Secondary IDE Connector (40-pin blocks) |
| 8) IDELED | p. 30 IDE LED Activity Light |
| 9) TB LED (PANEL) | p. 31 System Power LED (2 pins) |
| 10) SMI (PANEL) | p. 31 SMI Switch Lead (2 pins) |
| 11) RESET (PANEL) | p. 31 Reset Switch Lead (2 pins) |
| 12) KEYLOCK (PANEL) | p. 31 Power LED (3 pins) & Keyboard Lock Switch (2 pins) |
| 13) SPEAKER (PANEL) | p. 31 Speaker Output Connector (4 pins) |
| 14) CHASSIS (optional) | p. 32 Chassis Open Alarm Lead (3-pin Block) |
| 15) USBIRMOUSE | p. 32 Universal Serial BUS Ports 1 & 2 (Two 4-pin female) |

*The onboard hardware monitor uses the I/O address 290H-297H so legacy ISA cards must not use this I/O address or else conflicts will occur.

†PCI slots 4&5 share the same interrupt number (INT#) so PCI cards on these two slots must be able to share an INT# or make sure that one of these PCI cards does not use an INT#.

III. INSTALLATION

Installation Steps

Before using your computer, you must complete the following steps:

1. Set Jumpers on the Motherboard
2. Install DRAM Modules
3. Install the Central Processing Unit (CPU)
4. Install Expansion Cards
5. Connect Ribbon Cables, Cabinet Wires, and Power Supply
6. Setup the BIOS Software

1. Jumpers

Several hardware settings are made through the use of jumper caps to connect jumper pins (JP) on the motherboard. See “Map of the Motherboard” on page 4 for locations of jumpers. The jumper settings will be described numerically such as [---], [1-2], [2-3] for no connection, connect pins 1&2, and connect pins 2&3 respectively. Pin 1 for our motherboards is always on top  or on the left  when holding the motherboard with the keyboard connector away from yourself. A “1” is written besides pin 1 on jumpers with three pins. The jumpers will also be shown graphically such as  to connect pins 1&2 and  to connect pins 2&3. Jumpers with two pins will be shown as  for Short (On) and  for Open (Off). For manufacturing simplicity, the jumpers may be sharing pins from other groups. Use the diagrams in this manual instead of following the pin layout on the board. Settings with two jumper numbers require that both jumpers be moved together. To connect the pins, simply place a plastic jumper cap over the two pins as diagramed.

WARNING! Computer motherboards, baseboards and components, such as SCSI cards, contain very delicate Integrated Circuit (IC) chips. To protect them against damage from static electricity, you should follow some precautions whenever you work on your computer.

1. Unplug your computer when working on the inside.
2. Use a grounded wrist strap before handling computer components. If you do not have one, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case.
3. Hold components by the edges and try not to touch the IC chips, leads or connectors, or other components.
4. Place components on a grounded antistatic pad or on the bag that came with the component whenever the components are separated from the system.

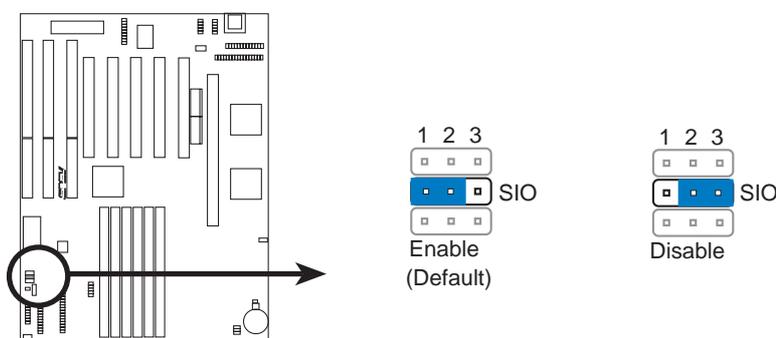
III. INSTALLATION

Jumper Settings

1. Onboard Multi-I/O Selection (SIO)

You can selectively disable each onboard multi-I/O item (floppy, serial, parallel, and IrDA) through the **Chipset Features Setup** under BIOS SOFTWARE *or* disable all multi-I/O items at once with the following jumper so you can use your own multi-I/O card.

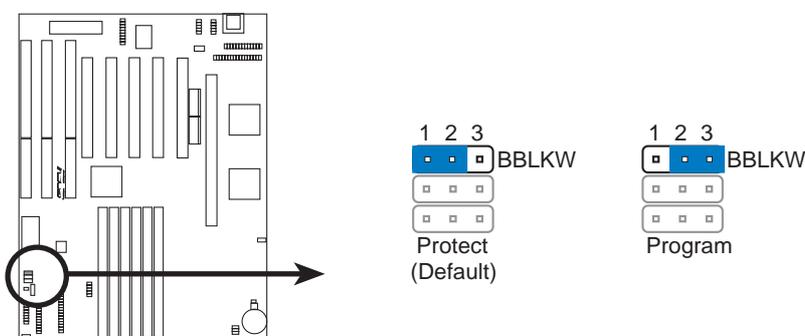
<u>Multi-I/O</u>	<u>SIO: M/IO</u>
Enable	[1-2] (Default)
Disable	[2-3]



2. Flash ROM Boot Block Programming (BBLKW)

This sets the operation mode of the boot block area of the Programmable Flash ROM to allow programming in the *Program* position. This is required only if prompted by the **Flash Memory Writer Utility** as shown in BIOS SOFTWARE.

<u>Programming</u>	<u>BBLKW</u>
Protect	[1-2] (Default)
Program	[2-3]

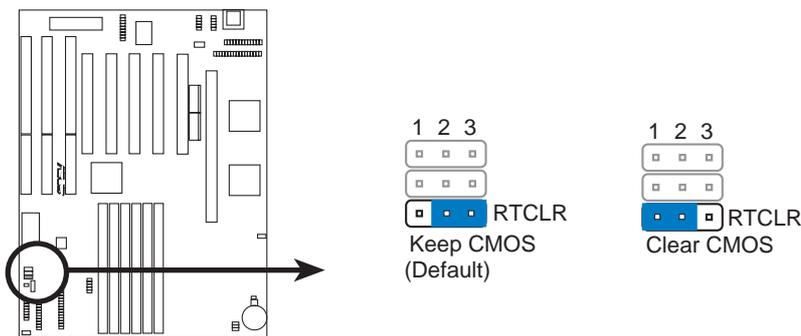


III. INSTALLATION

3. Real Time Clock (RTC) RAM (RTCLR)

The CMOS RAM is powered by the onboard button cell battery. To clear the RTC data: (1) Turn off your computer and unplug your AC power, (2) Move this jumper to “Clear CMOS,” (3) Move the jumper back to “Keep,” (4) Turn on your computer, (5) Hold down <Delete> during bootup and enter BIOS setup to re-enter user preferences.

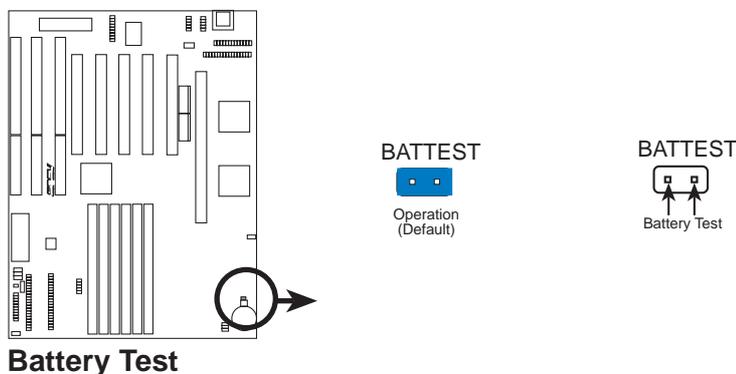
<u>RTC RAM</u>	<u>RTCLR</u>
Keep CMOS	[2-3] (Default)
Clear CMOS	[1-2] (momentarily)



4. Battery Test (BATTEST)

You can test the battery’s current by removing this jumper and attaching a current meter the two pins.

WARNING! You must unplug the power cord to your power supply to ensure that there is no power to your motherboard. The CMOS RAM containing BIOS setup information *may* be cleared by this action. You *should* enter BIOS to “Load Setup Defaults” and re-enter any user information after removing and reapplying this jumper.



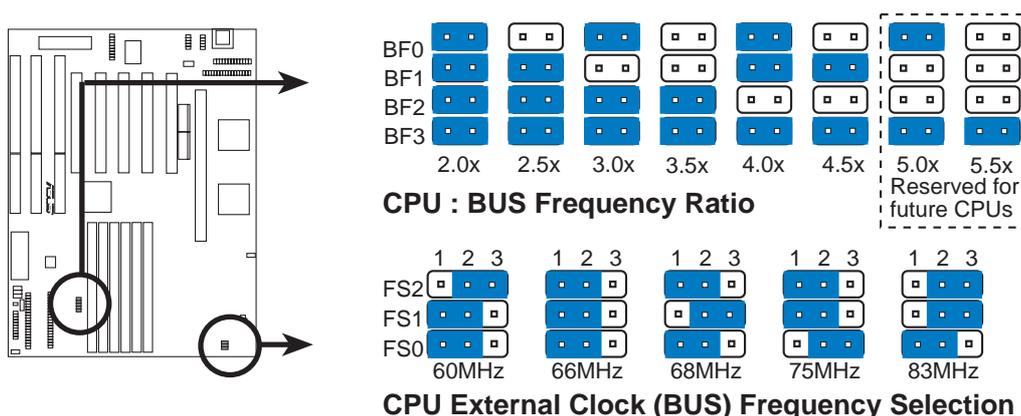
III. INSTALLATION

5. CPU External Clock (BUS) Frequency Selection (FS0, FS1, FS2)

These jumpers tell the clock generator what frequency to send to the CPU. These allow the selection of the CPUs *External* frequency (or *BUS Clock*). The BUS Clock times the BUS Ratio equals the CPUs *Internal* frequency (the advertised CPU speed).

6. CPU to BUS Frequency Ratio (BF0, BF1, BF2, BF3)

These jumpers set the frequency ratio between the *Internal* frequency of the CPU and the *External* frequency (called the *BUS Clock*) within the CPU. These must be set together with the above jumpers *CPU External (BUS) Frequency Selection*.



WARNING! 68MHz, 75MHz, and 83MHz frequencies exceed the specifications for the onboard Intel Chipset and are not guaranteed to be stable.

Set the jumpers by the internal speed of your processor as follows:

CPU Model	Freq.	Ratio	(BUS Freq.)			(Freq. Ratio)				
			BUS Freq.	FS2	FS1	FS0	BF0	BF1	BF2	BF3
[Reserved]	333MHz	5.0x	66MHz	[1-2]	[1-2]	[1-2]	[on]	[off]	[off]	[on]
Intel Pentium II	300MHz	4.5x	66MHz	[1-2]	[1-2]	[1-2]	[off]	[on]	[off]	[on]
Intel Pentium II	266MHz	4.0x	66MHz	[1-2]	[1-2]	[1-2]	[on]	[on]	[off]	[on]
Intel Pentium II	233MHz	3.5x	66MHz	[1-2]	[1-2]	[1-2]	[off]	[off]	[on]	[on]
Pentium Pro	200MHz	3.0x	66MHz	[1-2]	[1-2]	[1-2]	[on]	[off]	[on]	[on]
Pentium Pro	180MHz	3.0x	60MHz	[2-3]	[1-2]	[1-2]	[on]	[off]	[on]	[on]
Pentium Pro	166MHz	2.5x	66MHz	[1-2]	[1-2]	[1-2]	[off]	[on]	[on]	[on]
Pentium Pro	150MHz	2.5x	60MHz	[2-3]	[1-2]	[1-2]	[off]	[on]	[on]	[on]



Intel Pentium II Processor in a SEC Cartridge (233-333MHz 256/512KB L2 Cache)



Intel Pentium Pro Processor (150-200MHz 256/512/1,024KB L2 Cache)

NOTE: Voltage Regulator Output Selection (VID) is not needed for the Pentium II and Pentium Pro processors because these CPUs send a VID signal directly to the onboard power controller.

2. System Memory (SIMM)

This motherboard supports six 72-pin SIMMs (Single Inline Memory Modules) of 4MB, 8MB, 16MB, 32MB, 64MB to form a memory size between 8MB to 384MB. The SIMMs can be either 60ns or 70ns Fast Page Mode (Asymmetric or Symmetric), Extended Data Output (EDO) (Burst Extended Data Output or BEDO and parity are not supported). To support ECC, you must use *true* (as opposed to phantom parity generated by TTL chips) 36-bit parity-type SIMM (e.g. 8 chips + 4 parity chips) in pairs for all modules. Mixing 32-bit non-parity SIMM (e.g., 8 chips) and 36-bit SIMM (e.g., 12 chips) will work minus the ECC feature.

IMPORTANT: Memory setup is required through “Auto Configuration” in the **CHIPSET FEATURES SETUP** of Section IV, BIOS software. Each bank must have the same size memory installed in pairs. Do not use memory modules with more than 24 chips per module. Modules with more than 24 chips exceed the design specifications of the memory subsystem and will be unstable.

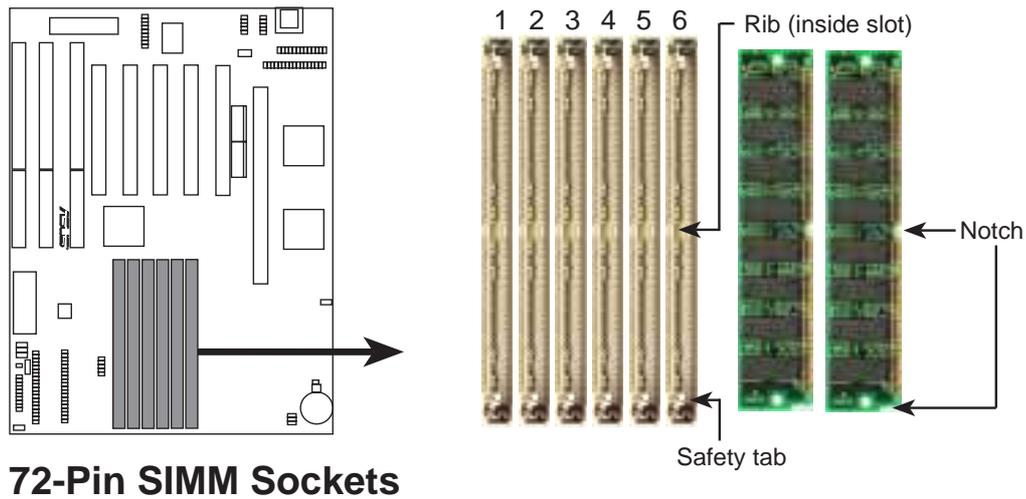
Install memory in any or all of the banks in any combination as follows:

Memory Slots	SIMM Memory Module		Total Memory
SIMM Slots 1 & 2 (Bank0)	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM or EDO SIMM	x2	
SIMM Slots 3 & 4 (Bank1)	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM or EDO SIMM	x2	
SIMM Slots 5 & 6 (Bank2)	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM or EDO SIMM	x2	
Total System Memory (Max 384MB)		=	

III. INSTALLATION

SIMM Memory Installation

1. The SIMM memory modules will only fit one way as shown. The central notch of the module must be aligned with the rib midway inside the slot while the other notch at one end of the module must be aligned with the plastic safety tab on the slot.



2. Push the memory module gently but firmly into place starting from a 45-degree angle making sure that all the contacts are aligned with the socket.
3. With your fingertips (pointer) on the slot's clips and your thumbs holding down its top edges, push the SIMM into a vertical position so that it clicks into place.



4. The plastic guides must go through the two mounting holes on the SIMM's sides.
5. If you need to remove one or more memory modules, remove them by pushing the clips outward. The SIMM will be released from its slot, and you can pull the SIMM straight up and out of the slot.

III. INSTALLATION

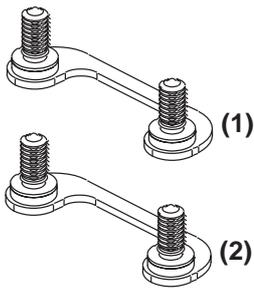
3. Central Processing Unit (CPU)

The ASUS KN97 motherboard provides a Single Edge Contact (SEC) slot for a Pentium II processor packaged in an SEC cartridge (pages 18–22) or a Pentium Pro processor installed in the ASUS C-P6SI Pentium Pro SEC Card (pages 23–24).

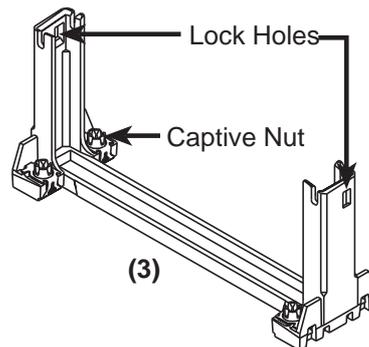
Pentium II Processor

WARNING! Be sure that sufficient air circulation is available across the processor's passive heatsink. Without sufficient circulation, the processor could overheat and damage both the processor and the motherboard. You may install an auxiliary fan, if necessary.

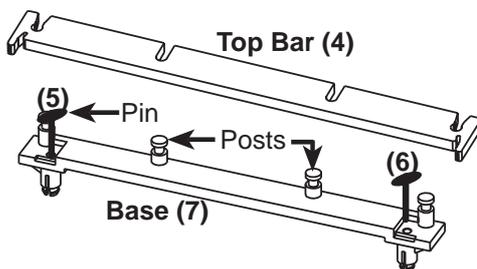
You should check to see that you have the following 9 items. (NOTE: The pictures in the following pages will have the same item numbers next to them for your reference. The design and color of your items may be slightly different.)



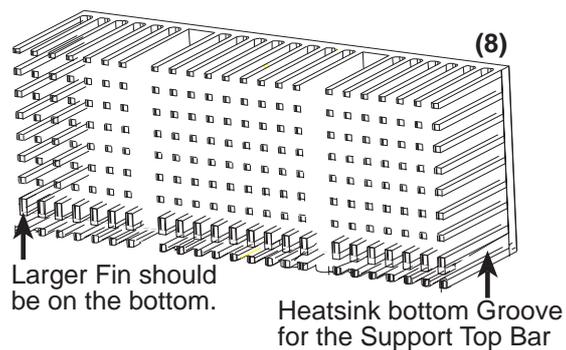
Attach Mount Bridges (Items 1,2)
(Factory Installed)



Pentium II Retention Mechanism (Item 3)



Heatsink Support Base/Top Bar (Items 4-7)



Pentium II Processor Heatsink (Item 8)



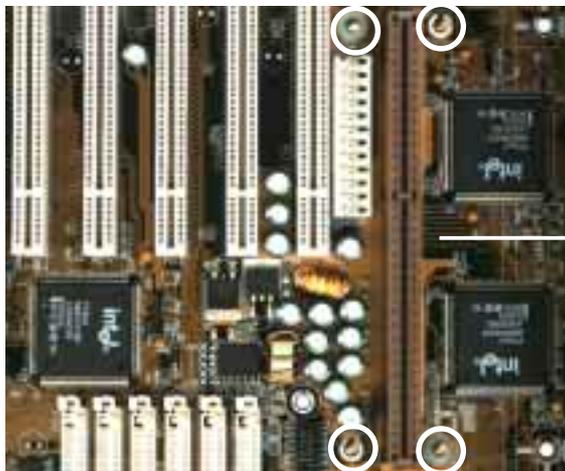
Intel Pentium II Processor in a SEC Cartridge
(233-333MHz 256/512KB L2 Cache)

CPU (Item 9)

III. INSTALLATION

The ASUS KN97 As Shipped

Four screws should be showing next to each corner of the SEC CPU Slot using two attach mount bridges from the underside of the motherboard. A bottom heatsink support base must be mounted over the two chipsets located to the side of the slot.



NOTE: Encircled items are screws from the mount bridges (1 & 2)

SEC CPU slot

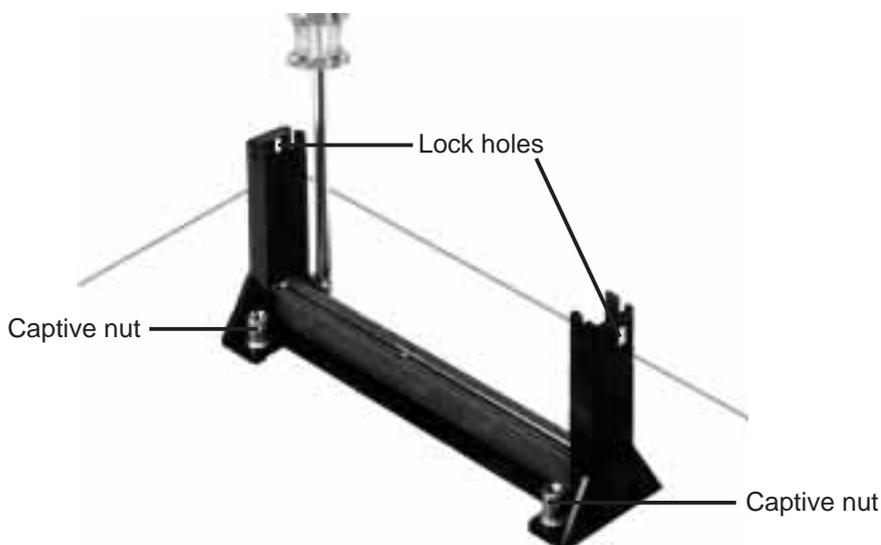
Installing the Pentium II Processor:

- 1. Mount the Pentium II Retention Mechanism:** The retention mechanism is designed to fit into the SEC slot only one way.

TIP: Orient the mechanism's lock holes toward the motherboard's chipsets (see motherboard layout for the location of the Intel 440FXPCiset).

Be sure to align the notch in the mechanism with the small rib on one side of the slot. Screw the captive nuts in place

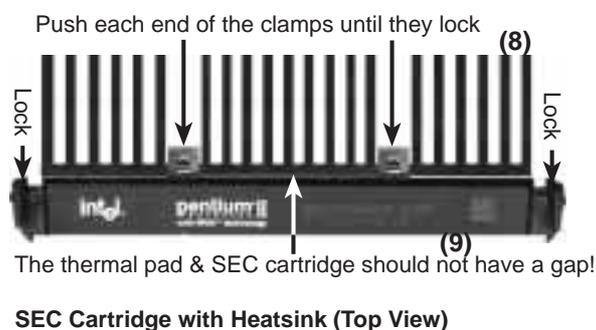
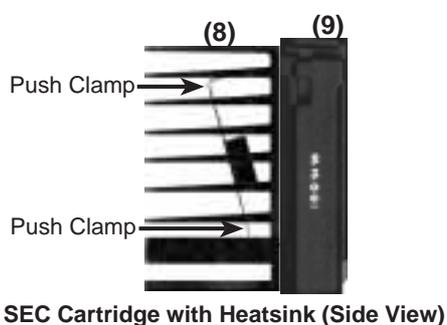
WARNING! Do not overtighten the captive nuts. Doing so could damage your motherboard. Tighten captive nuts to no more than 6 ± 1 inch/pound.



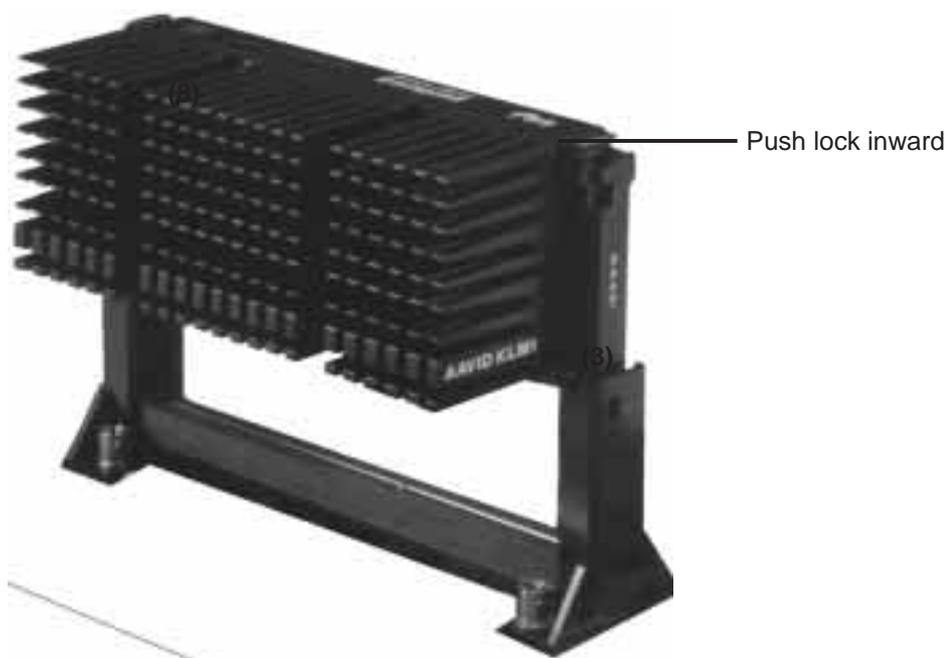
III. INSTALLATION

- Mount the Heatsink:** Place the SEC cartridge face down on a flat surface and lay the heat sink flush on the back (metal side) of the SEC cartridge. Check the orientation of the heatsink against the pictures. The thicker fin must be orientated toward the bottom. The top clamp is wider than the bottom clamp so only this orientation will fit. With a screw driver, push the clamps one at a time into the SEC cartridge. Be sure that the heatsink is firmly pressed against the SEC cartridge. When correctly installed, no light must be showing through between the thermal pad of the heatsink and the SEC cartridge.

WARNING! If the heatsink is not mounted tightly against the SEC cartridge, the CPU will overheat. You may install an auxiliary fan to provide adequate circulation across the processor's passive heatsink.

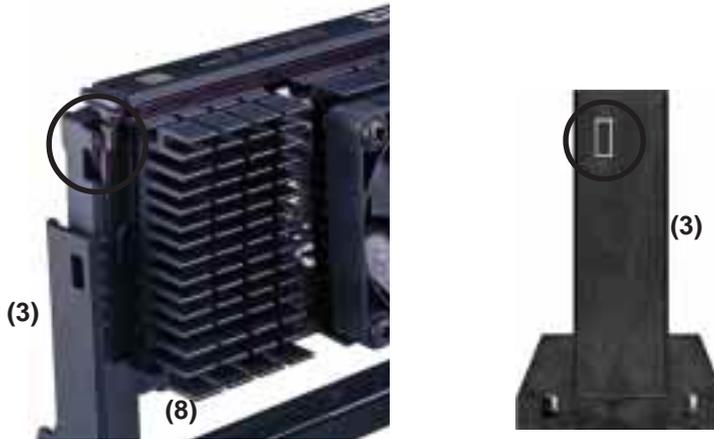


- Insert the SEC Cartridge:** Push the SEC cartridge's two locks inward (the preceding picture shows the locks in the outward position and inward in the picture below). With the heatsink facing the motherboard's chipsets, press the cartridge gently but firmly until it is full inserted.

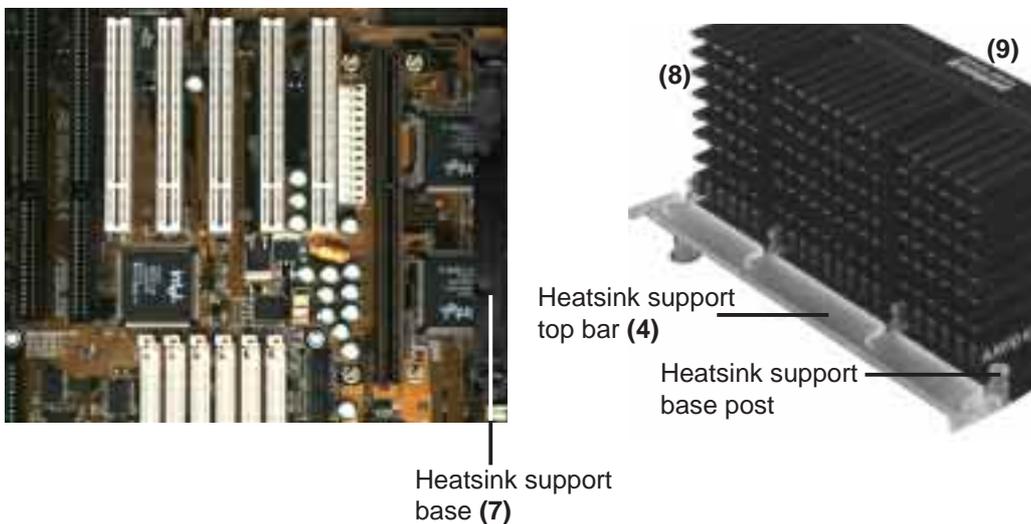


III. INSTALLATION

- Secure the SEC Cartridge:** Secure the SEC cartridge in place by pushing the SEC cartridge locks outward so that the lock shows through the retention mechanism's lock holes.



- Secure the Heatsink:** Install the heatsink support base into the motherboard. This is not, however, necessary if you use a heatsink with fan (see next page). The support base is necessary to secure the heatsink (without fan). Secure the heatsink by sliding the heatsink support top bar into the bottom groove of the heatsink until it locks into the heatsink support base posts.



- Set Jumpers:** Refer to jumper settings for “CPU to BUS Frequency Ratio” and jumpers for “BUS Frequency Selection” if you haven't set them yet.

III. INSTALLATION

The heatsinks shown in this manual are for reference purposes only. The recommended heatsinks for the Pentium II processor are those with three-pin fans that can be connected to the CPU fan connector on motherboard. These heatsinks have the added benefits of proper heat dissipation and with the LM78 hardware monitor, the ability to monitor the fan's RPM and use the alert function through the included LANDesk Client Manager (LDCM) software.

AAVID Heatsink



The procedures for installing the AAVID heatsink with fan is similar as that for the heatsink without a fan. You will not, however, be able to use the heatsink support top bar because of the fan. The heatsink support top bar will, however, still be included in the package, in case you use a heatsink without a fan.

Elan Vital Heatsink

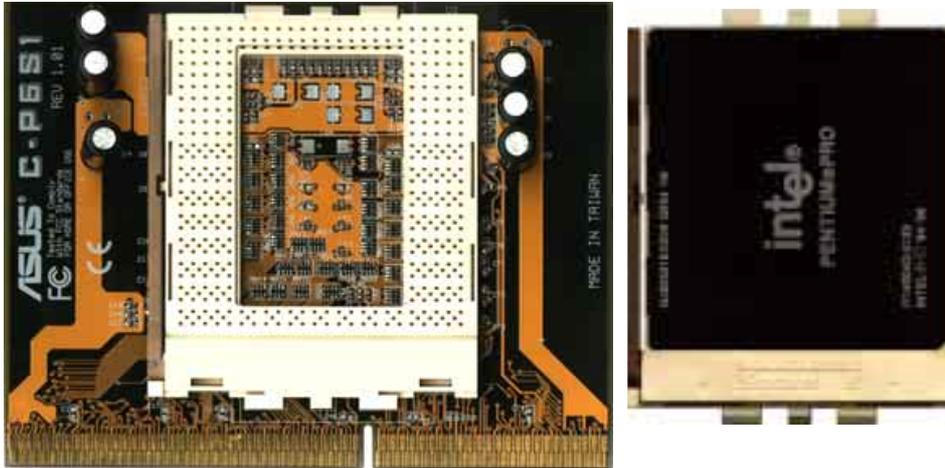


The procedures for installing the Elan Vital heatsink with fan is also similar as that for the heatsink without a fan. The Elan Vital heatsink, however, comes with a lever to clamp the heatsink into the SEC cartridge. Mount the heatsink in the orientation as shown then flip the lever from "Unlock" to "Lock." You will not be able to also use the heatsink support top bar because of the fan. The heatsink support top bar will, however, still be included in the package, in case you use a heatsink without a fan.

III. INSTALLATION

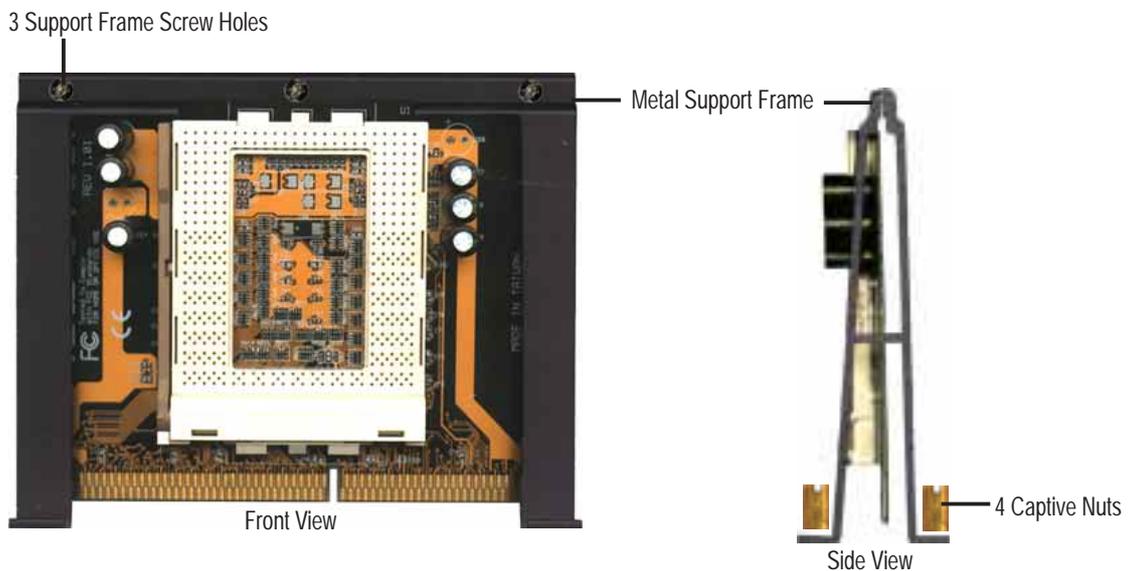
Pentium Pro SEC Card

The C-P6S1 Pentium Pro SEC Card allows you to interface a 387-pin ZIF Socket 8 onto your Pentium II Slot so that Pentium Pro processors can be used on Pentium II motherboards.



Installing the Pentium Pro Processor

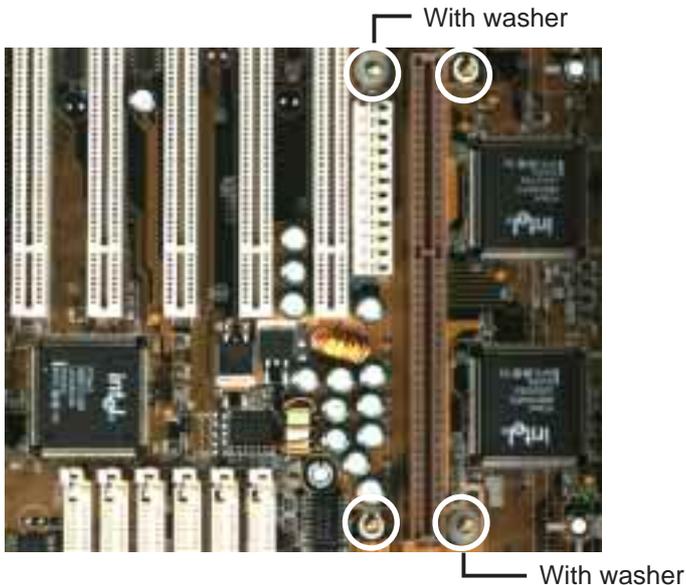
- 1. Mount the Metal Support Frame:** Place the Metal Support Frame over the C-P6S1 Pentium Pro SEC Card as shown and tighten the three support frame screws, if necessary.



III. INSTALLATION

2. **Secure the SEC Card:** Place the four plastic washers over the mount bridge screws (encircled) and secure the C-P6S1 Pentium Pro SEC Card using the four captive nuts.

WARNING! Do not overtighten the captive nuts. Doing so could damage your motherboard. Tighten captive nuts to no more than 6 ± 1 inch/pound.



3. **Install the Processor:** Install a Pentium Pro processor with a heatsink and fan. To install the processor, open the ZIF socket by first pulling the lever sideways away from the socket's "Lock" then upwards to a 90-degree right angle. Insert the CPU with the correct orientation. Look to see that the pins are more dense on one half compared to the other half. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, hold down on the fan and close the socket's lever.

WARNING! Without a fan, the CPU can overheat and cause damage to both the CPU and the motherboard.

4. **Set Jumpers:** Refer to jumper settings for "CPU to BUS Frequency Ratio" and jumpers for "BUS Frequency Selection" if you haven't set them yet.

III. INSTALLATION

4. Expansion Cards

WARNING! Unplug your power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

First read your expansion card documentation for hardware and software settings that may be required to set up your specific card.

Expansion Card Installation Procedure

1. Read the documentation for your expansion card.
2. Set any necessary jumpers on your expansion card.
3. Remove your computer system's cover.
4. Remove the bracket on the slot you intend to use. Keep the bracket for possible future use.
5. Carefully align the card's connectors and press firmly.
6. Secure the card on the slot with the screw you removed in step 4.
7. Replace the computer system's cover.
8. Set up the BIOS if necessary (such as *IRQ xx Used By ISA: Yes* in PNP AND PCI SETUP)
9. Install the necessary software drivers for your expansion card.

Assigning IRQs for Expansion Cards

Some expansion cards need to use an IRQ to operate. Generally an IRQ must be exclusively assigned to one use. In a standard design there are 16 IRQs available but most of them are already in use, leaving 6 IRQs free for expansion cards.

Both ISA and PCI expansion cards may require to use IRQs. System IRQs are available to cards installed in the ISA expansion bus first, then any remaining IRQs are available to PCI cards. Currently, there are two types of ISA cards. The original ISA expansion card design, now referred to as legacy ISA cards, requires that you configure the card's jumpers manually and then install it in any available slot on the ISA bus. You may use Microsoft Diagnostics (MSD.EXE) utility located in the Windows directory to see a map of your used and free IRQs. If you use Windows 95, the **Resources** tab under **Device Manager** displays the resource settings being used by a particular device (to gain access, double-click the **System** icon under the **Control Panel** program). Ensure that no two devices share the same IRQs or your computer will experience problems when those two devices are in use at the same time.

III. INSTALLATION

To simplify this process, this motherboard complies with the Plug and Play (PnP) specification, which was developed to allow automatic system configuration whenever a PnP-compliant card is added to the system. For PnP cards, IRQs are assigned automatically from those available.

If the system has both legacy and PnP ISA cards installed, IRQs are assigned to PnP cards from those not used by legacy cards. The PCI and PNP configuration section of the BIOS setup utility can be used to assign which IRQs are being used by legacy cards. For older legacy cards that do not work with the BIOS, you may contact your vendor for an ISA Configuration Utility.

An IRQ number is automatically assigned to PCI expansion cards after those used by legacy and PnP ISA cards. In the PCI bus design, the BIOS automatically assigns an IRQ to a PCI slot that contains a card requiring an IRQ. To install a PCI card, you need to set the INT (interrupt) assignment. Since all the PCI slots on this motherboard use an INTA #, set the jumpers on your PCI cards to INT A.

Assigning DMA Channels for ISA Cards

Some ISA cards, both legacy and PnP, may also need to use a DMA (Direct Memory Access) channel. DMA assignments for this motherboard are handled the same way as the IRQ assignment process described earlier. You can select a DMA channel in the PCI and PnP configuration section of the BIOS Setup utility.

IMPORTANT: To avoid conflicts, reserve the necessary IRQs and DMAs for legacy ISA cards (under PNP AND PCI SETUP of the BIOS SOFTWARE, choose *Yes* in *IRQ xx Used By ISA* and *DMA x Used By ISA* for those IRQs and DMAs you want to reserve).

ISA Cards and Hardware Monitor

The onboard hardware monitor uses the I/O address 290H-297H so legacy ISA cards must not use this I/O address otherwise conflicts will occur.

III. INSTALLATION

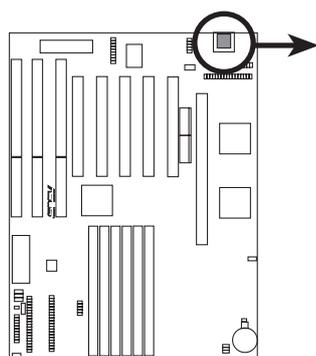
5. External Connectors

WARNING! Some pins are used for connectors or power sources. These are clearly differentiated from jumpers as shown in the baseboard layout on page 10. Placing jumper caps over these pins will cause damage to your baseboard.

IMPORTANT: Connect ribbon cables such that the red stripe is on the pin 1 side of the connector. The four corners of the connectors are labeled on the baseboard. Pin 1 is the side closest to the power connector on hard and floppy disk drives. IDE ribbon cable must be less than 18in. (46cm), with the second drive connector no more than 6in. (15cm) from the first connector.

1. Keyboard Connector (KB)

This **5-pin female** connector is for either a standard IBM-compatible, 101/102-key, or 104-key (Windows 95-compatible) keyboard.



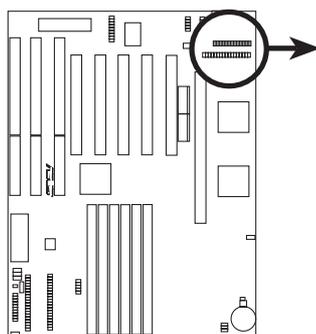
Onboard Keyboard Connector
(5-pin female)



This motherboard accepts
a 5-pin AT Keyboard Connector

2. Parallel Printer Connector (PRINTER)

This **26-pin block** connector supports the included parallel port ribbon cable with mounting bracket. Connect the ribbon cable to this connector and mount the bracket to the case on an open slot. You can make available the parallel port and choose the *IRQ Onboard Parallel Port* in **Chipset Features** of the BIOS SOFTWARE. (**Pin 26 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 26 plugged**)



Pin 1

Orientate the floppy ribbon cable's red stripe to the connector's Pin 1.



For this connector to be available, you must connect the included Parallel (25-Pin female) cable set to a free expansion slot opening.

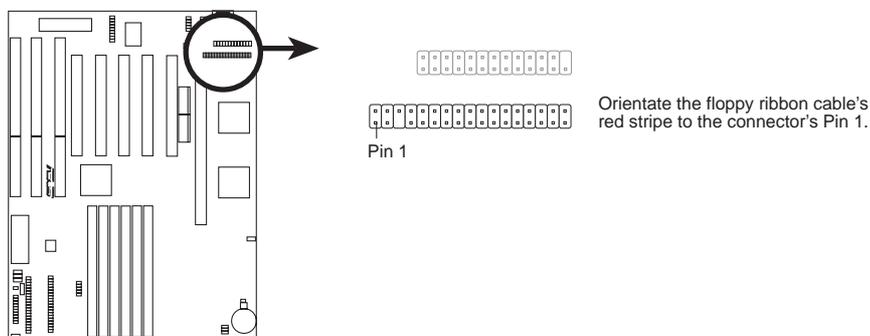
TIP: You may also remove the bracket connectors and mount them directly to the case to save expansion slot space.

Parallel (Printer) Connector

III. INSTALLATION

3. Floppy Disk Drive Connector (FLOPPY)

This **34-pin block** connector supports the provided floppy drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy drives. **(Pin 5 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 5 plugged).**

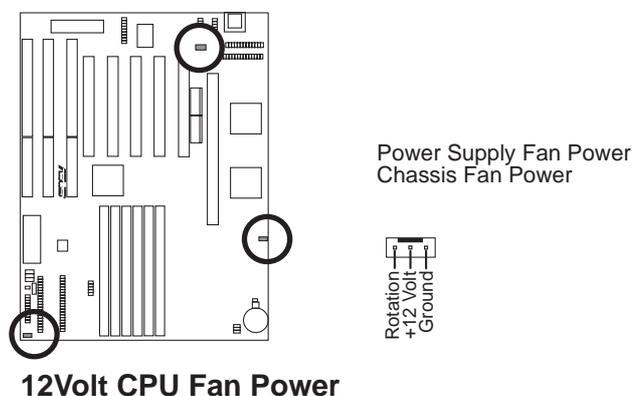


Floppy Drive Connector

4. Power Supply, CPU Fan Connectors (FAN)

These connectors support cooling fans of 500mA (6W) or less. Orientate the fans so that the heat sink fins allow airflow to go across the onboard heat sink(s) instead of the expansion slots. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of this connector. **NOTE: The "Rotation" signal is to be used only by a specially designed fan with rotation signal.**

WARNING! The CPU and/or motherboard will overheat if there is no airflow across the CPU and heatsinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. **These are not jumpers, do not place jumper caps over these pins.**

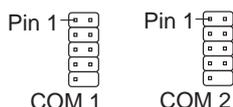
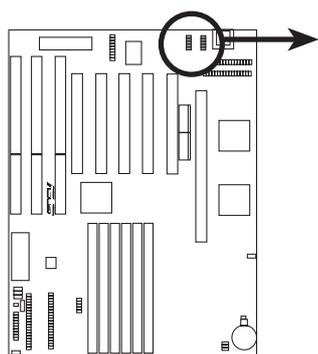


12Volt CPU Fan Power

III. INSTALLATION

5. Serial Port Connectors (COM1, COM2)

These 10-pin block connectors support the provided serial port ribbon cables with mounting bracket. Connect the ribbon cables to these connectors and mount the bracket to the case on an open slot. You can make available the parallel port and choose the IRQ through the *Onboard Serial Port* in **Chipset Features** of the BIOS SOFTWARE. (Pin 10 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 10 plugged).



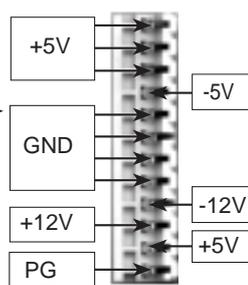
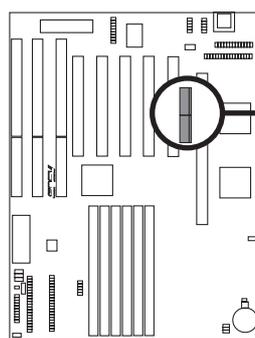
For these connectors to be available, you must connect the included serial cable set from COM1 (using the 9-Pin male) & COM2 (using the 25-Pin male) to a free expansion slot opening.

TIP: You may also remove the bracket connectors and mount them directly to the case to save expansion slot space.

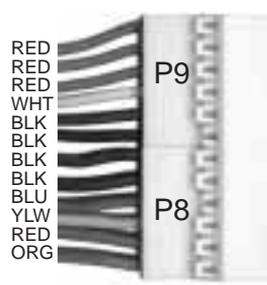
Serial Port Connectors

6. AT Power Supply Connector (PWRAT)

This 12-pin block connector connects to a standard 5-volt power supply. To connect the leads from the power supply, ensure first that the power supply is not plugged. Most power supplies provide two plugs (P8 and P9), each containing six wires, two of which are black. Orient the connectors so that the black wires are together.



Power Connector on Motherboard



Power Plugs from Power Supply

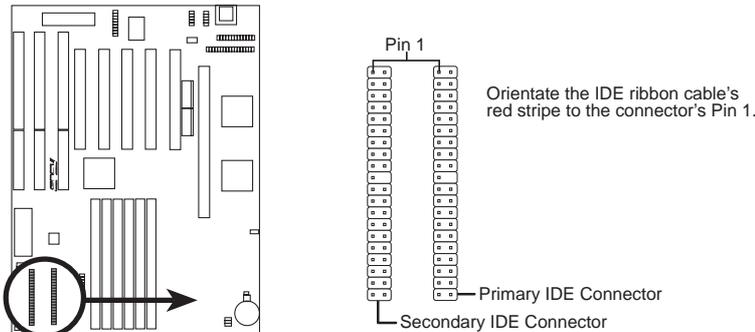
Using a slight angle, align the plastic guide pins on the lead to their receptacles on the connector. Once aligned, press the lead onto the connector until the lead locks into place.

III. INSTALLATION

7. Primary/Secondary IDE connectors (IDE1, IDE2)

These 40-pin block connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Please refer to the documentation of your hard disk for the jumper settings. BIOS now supports SCSI device or IDE CD-ROM bootup (see “HDD Sequence SCSI/IDE First” & “Boot Sequence” in the **BIOS Features Setup** of the BIOS SOFTWARE) (**Pin 20 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 20 plugged**).

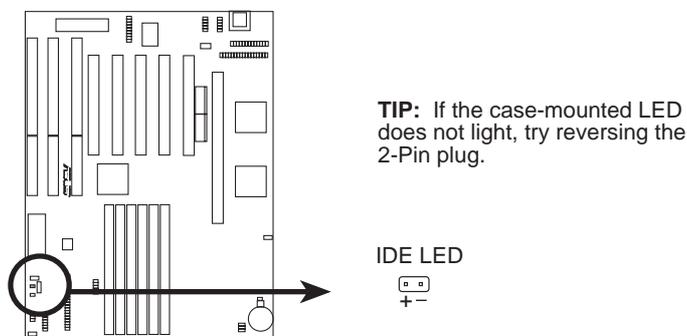
TIP: You may configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector. You may install one operating system on an IDE drive and another on a SCSI drive and select the boot disk through BIOS Features Setup.



IDE (Hard Drive) Connectors

8. IDE activity LED (IDELED)

This connector supplies power to the cabinet's IDE activity LED. Read and write activity by devices connected to the Primary or Secondary IDE connectors will cause the LED to light up.



IDE (Hard Drive) LED Lead

III. INSTALLATION

9. Turbo LED Lead (TB LEAD)

The turbo function is always on. The turbo LED connection is labeled here but the LED will remain constantly lit while the system power is on. You may wish to connect the Power LED from the system case to this lead.

10. SMI Suspend Switch Lead (SMI)

This allows the user to manually place the system into a suspend mode or “Green” mode where system activity will be instantly decreased to save electricity and expand the life of certain components when the system is not in use. This 2-pin connector (see the figure below) connects to the case-mounted suspend switch. If you do not have a switch for the connector, you may use the “Turbo Switch” since it does not have a function. SMI is activated when it detects a *short to open* moment and therefore leaving it shorted will not cause any problems. May require one or two pushes depending on the position of the switch. Wake-up can be controlled by settings in the BIOS but the keyboard will always allow wake-up (the SMI lead cannot wake-up the system). If you want to use this connector, “Suspend Switch” in the **Power Management Setup** of the BIOS SOFTWARE section should be on the default setting of *Enable*.

11. Reset Switch Lead (RESET)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting to prolong the life of the system’s power supply.

12. System Power LED (KEYLOCK)

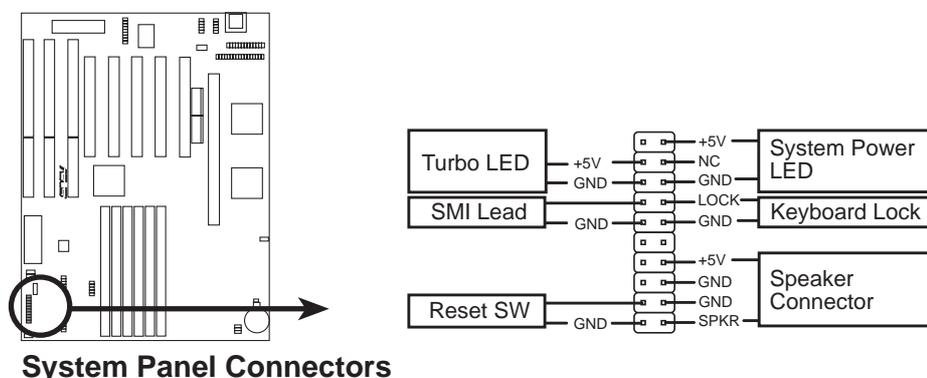
This 3-pin connector connects the system power LED, which lights when the system is powered on and blinks when it is in sleep mode.

Keyboard Lock Switch Lead (KEYLOCK)

This 2-pin connector connects to the case-mounted keyboard lock switch to allow keyboard locking.

13. Speaker Connector (SPEAKER)

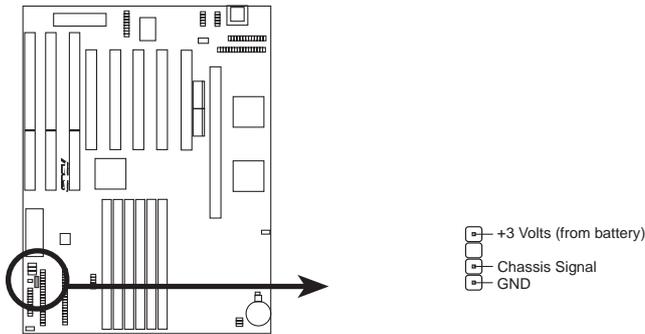
This 4-pin connector connects to the case-mounted speaker.



III. INSTALLATION

14. Chassis Open Alarm Lead (CHASSIS)

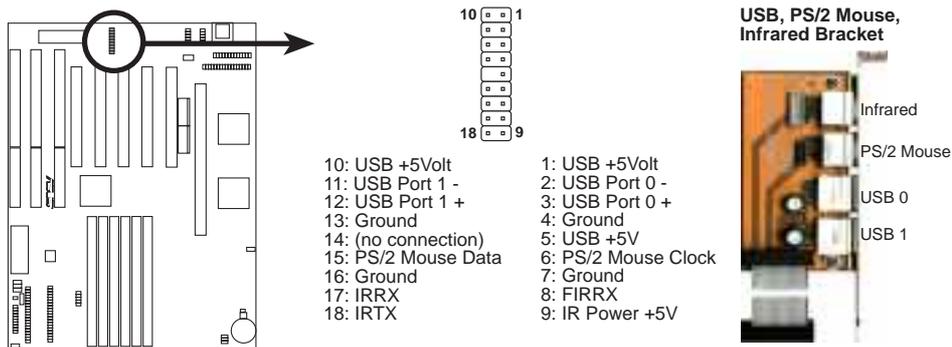
This lead is for an open chassis monitor. A high level signal to the CHASSIS lead will indicate to the system that the chassis has been opened. The +3V lead comes from the onboard button cell battery to retain its function even if the power cord has been unplugged from the AT power supply. Be sure that the load on the +5V lead is minimal to prevent constant battery replacements.



Chassis Open Alarm Lead

15. USB, Infrared (IrDA), P/2 Mouse Module Connector (USBIRMOUSE)

If you want to use USB, PS/2 mouse, or infrared devices, you need to purchase an external connector set. The external connector set connects to the 18-pin block and mounts to an open slot on your computer's chassis. The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, expansion cards can use IRQ12. See *PS/2 Mouse Control* in **BIOS Features Setup** and *USB Function* in **PnP and PCI Setup** of the BIOS SOFTWARE.



USB, PS/2 Mouse, Infrared Connector

III. INSTALLATION

Power Connection Procedures

1. After all jumpers and connections are made, close the system case cover.
 2. Make sure that all switches are off (in some systems, marked with ○).
 3. Connect the power supply cord into the power supply located on the back of your system case as instructed by your system user's manual.
 4. Connect the power cord into a power outlet that is equipped by a surge protector.
 5. You may then turn on your devices in the following order:
 - a. Your monitor
 - b. External SCSI devices (starting with the last device on the chain)
 - c. Your system power.
 6. The power LED on the front panel of the system case will light. The monitor LED may light up after the system's if it complies with "Green" standards or if it has a power standby feature. The system will then run power-on tests. While the tests are running, additional messages will appear on the screen. If you do not see anything within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Recheck your jumper settings and connections or call your retailer for assistance.
 7. During power-on, hold down <Delete> to enter BIOS setup. Follow the next section "BIOS SOFTWARE" for instructions.
- * **Powering Off your computer:** You must first quit or shut down your operating system before switching off the power switch.

IV. BIOS SOFTWARE

Support Software

FILELIST.TXT – View this file to see the files included in the support software.

PFLASH.EXE – This is the Flash Memory Writer utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM chip on the baseboard. To determine the BIOS version, check the last four numbers of the code displayed on the upper left corner of your screen during the test routines when you turn on your machine.

xxxxip.xxx – BIOS file for the KN97 for use with a Pentium Pro processor on the ASUS C-P6S1 SEC card.

xxxxi.xxx – BIOS file for the KN97 for use with a Pentium II processor.

Flash Memory Writer Utility

The flash memory writer utility must be run while the system is in **real mode**. In particular, the “Update BIOS Main Block From File” and “Update BIOS Including Boot Block and ESCD” options require real mode. To run this utility, boot from a system floppy disk without the AUTOEXEC.BAT and CONFIG.SYS files.

```
ASUSTeK PnP BIOS
FLASH MEMORY WRITER V1.5
Copyright (C) 1995, ASUSTeK COMPUTER Inc.

Flash Type -- SST 29EE010
Current BIOS Revision: #401A0-xxxx
Choose one of the following:
  1. Save Current BIOS To File
  2. Update BIOS Main Block From File
  3. Advanced Features

Enter Choice: [ 1]

Press ESC To Exit
```

xxxx denotes the current BIOS version stored in the Flash EPROM

IMPORTANT: If “unknown” is displayed after **Flash Type --**, the memory chip is not programmable or is not supported with the PnP BIOS and therefore cannot be programmed by the Flash Memory Writer utility.

IV. BIOS SOFTWARE

Main Menu

1. Save Current BIOS To File

This option allows you to copy the contents of the flash memory onto a floppy disk. This gives you a backup copy of the original motherboard BIOS in case you need to reinstall it. Create a bootable DOS diskette without AUTOEXEC.BAT and CONFIG.SYS and save both PFLASH.EXE and the BIOS file(s) to it. **Note:** BIOS FEATURES SETUP Boot Sequence needs to be set to A first in order to boot from your disk drive A.

2. Update BIOS Main Block From File

This option updates the BIOS from a file on the disk. The file can be either a new file or a backup file created by the “Save Current BIOS To File” option. If the boot block in the file is different from the current boot block, this option will not update the main block. Instead, it will display the following messages.

```
Boot Block of New BIOS is different from old one !!!  
Please Use 'Advanced Features' to flash whole BIOS !!!
```

3. Advanced Features

This option displays the Advanced Features screen for clearing the PnP configuration record and updating the motherboard BIOS.

Advanced Features Menu

```
Advanced Features  
  
Flash Type -- SST 29EE010  
Current BIOS Revision: #401A0-xxxx  
Choose one of the following:  
1. Clear PNP ESCD Parameter Block  
2. Update BIOS Including Boot Block and ESCD  
  
Enter Choice: [ 2]  
  
Press ESC To Exit
```

xxxx denotes the current BIOS version stored in the Flash EPROM

1. Clear PNP ESCD Parameter Block

This option erases the Plug-and-Play (PnP) configuration record.

2. Update BIOS Including Boot Block and ESCD

This option updates the boot block, the baseboard BIOS, and the PnP extended system configuration data (ESCD) parameter block from a new BIOS file.

IV. BIOS SOFTWARE

Managing & Updating your Motherboard's BIOS

About the BIOS files:

When purchasing the ASUS KN97 motherboard, the BIOS image file (xxxxi.xxx) is pre-programmed for the Pentium II processor. Another BIOS image file (xxxxip.xxx) will be provided on the support disk for use with the Pentium Pro processor when the C-P6S1 SEC card is purchased. Make sure that the correct BIOS is installed for your motherboard and processor configuration or else your system may be unstable.

Updating BIOS (only when necessary):

1. Download an updated BIOS file from the Internet (WWW or FTP) or BBS, and save it to the disk you created earlier. See ASUS Contact Information on page 3 for details.
2. Turn off your computer, open the system cabinet, and set the **Flash ROM Boot Block Programming** jumper of the baseboard to *Program* or *Enabled*.
3. Boot from the floppy disk you created earlier.
4. At the DOS prompt, type PFLASH <Enter>
5. Select option "2. Update BIOS Main Block From File" from the Main Menu (or option "2. Update BIOS Including Boot Block and ESCD" from the Advanced Features menu if prompted by option 2 of the Main Menu).
6. On the next screen displayed, type the complete filename and extension of the new BIOS file, and press <Enter>. The utility then updates the BIOS file from disk.

WARNING! If you encounter problems while updating the new BIOS, **do not** turn off the system because doing so may prevent your system from restarting. Instead, repeat the process. If the problem persists, use the original BIOS file you saved to the disk earlier. If the utility is unable to successfully update a complete BIOS file, your system may not boot up. If this happens, your system will need service.

7. After successfully updating the new BIOS file, exit the utility. Turn off the system, then set the **Flash ROM Boot Block Programming** jumper of the baseboard back to its default setting of *Protect* or *Disabled*.
8. Turn on your computer and hold down <Delete> to run the CMOS Setup Utility. Select "Load Setup Defaults" to load the new BIOS, after which you may set other items from the main menu.

IV. BIOS SOFTWARE

6. BIOS Setup

The motherboard supports two programmable Flash ROM chips: 5 Volt and 12 Volt. Either of these memory chips can be updated when BIOS upgrades are released. Use the Flash Memory Writer utility to download the new BIOS file into the ROM chip as described in detail in this section.

All computer motherboards provide a Setup utility program for specifying the system configuration and settings. If your motherboard came in a computer system, the proper configuration entries may have already been made. If so, invoke the Setup utility, as described later, and take note of the configuration settings for future reference; in particular, the hard disk specifications.

If you are installing the motherboard, reconfiguring your system or you receive a Run Setup message, you will need to enter new setup information. This section describes how to configure your system using this utility.

The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the system provides you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <Delete> to call up the Setup utility. If you are a little bit late pressing the mentioned key(s), POST will continue with its test routines, thus preventing you from calling up Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the Reset button on the system case. You can also restart by turning the system off and then back on again. But do so only if the first two methods fail.

When you invoke Setup, the CMOS SETUP UTILITY main program screen will appear with the following options:



IV. BIOS
(BIOS Setup)

IV. BIOS SOFTWARE

Load Defaults

The “Load BIOS Defaults” option loads the minimum settings for troubleshooting. “**Load Setup Defaults**”, on the other hand, is for loading optimized defaults for regular use. Choosing defaults at this level, will modify all applicable settings.

A section at the bottom of the above screen displays the control keys for this screen. Take note of these keys and their respective uses. Another section just below the control keys section displays information on the currently highlighted item in the list.

Standard CMOS Setup

This “Standard CMOS Setup” option allows you to record some basic system hardware configuration and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option anymore. However, if the configuration stored in the CMOS memory on the board gets lost or damaged, or if you change your system hardware configuration, you will need to respecify the configuration values. The configuration values usually get lost or corrupted when the power of the onboard CMOS battery weakens.



IV. BIOS
(Standard CMOS)

The preceding screen provides you with a list of options. At the bottom of this screen are the control keys for this screen. Take note of these keys and their respective uses.

User-configurable fields appear in a different color. If you need information on the selected field, press <F1>. The help menu will then appear to provide you with the information you need. The memory display at the lower right-hand side of the screen is read-only and automatically adjusts accordingly.

Details of Standard CMOS Setup:

Date

To set the date, highlight the “Date” field and then press either <Page Up>/<Page Down> or <+>/<-> to set the current date. Follow the month, day and year format. Valid values for month, day and year are: **Month: (1 to 12), Day: (1 to 31), Year: (up to 2079)**

IV. BIOS SOFTWARE

Time

To set the time, highlight the “Time” field and then press either <Page Up>/<Page Down> or <+>/<-> to set the current time. Follow the hour, minute and second format. Valid values for hour, minute and second are: (**Hour: (00 to 23)**), (**Minute: (00 to 59)**), (**Second: (00 to 59)**). Press <Enter> twice if you do not want to modify the current time.

NOTE: You can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

Hard Disks

This field records the specifications for all non-SCSI hard disk drives installed in your system. The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first of which is the “master” and the second is the “slave”.

Specifications for SCSI hard disks need not to be entered here since they operate using device drivers and are not supported by any the BIOS. If you install either the optional PCI-SC200 or PCI-SC860 SCSI controller card into the motherboard, see section VI for instructions. If you install other vendor’s SCSI controller card, refer to their respective documentations on how to install the required SCSI drivers.

For IDE hard disk drive setup, you can:

- Use the *Auto* setting for detection during bootup.
- Use the IDE HDD AUTO DETECTION in the main menu to automatically enter the drive specifications.
- Enter the specifications yourself manually by using the “User” option.

The entries for specifying the hard disk type include **CYLS** (number of cylinders), **HEAD** (number of read/write heads), **PRECOMP** (write precompensation), **LANDZ** (landing zone), **SECTOR** (number of sectors) and **MODE**. The **SIZE** field automatically adjusts according to the configuration you specify. The documentation that comes with your hard disk should provide you with the information regarding the drive specifications.

The **MODE** entry is for IDE hard disks only, and can be ignored for MFM and ESDI drives. This entry provides three options: *Normal*, *Large*, *LBA*, or *Auto* (see below). Set **MODE** to the *Normal* for IDE hard disk drives smaller than 528MB; set it to *LBA* for drives over 528MB that support Logical Block Addressing (LBA) to allow larger IDE hard disks; set it to *Large* for drives over 528MB that do not support LBA. *Large* type of drive can only be used with MS-DOS and is very uncommon. Most IDE drives over 528MB support the *LBA* mode.

IV. BIOS SOFTWARE

Auto detection of hard disks on bootup

For each field: Primary Master, Primary Slave, Secondary Master, and Secondary Slave, you can select *Auto* under the TYPE and MODE fields. This will enable auto detection of your IDE hard disk during bootup. This will allow you to change your hard disks (with the power off) and then power on without having to reconfigure your hard disk type. If you use older hard disks that do not support this feature, then you must configure the hard disk in the standard method as described earlier by the “User” option.

NOTE: After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (such as with FDISK) and then formatted before data can be read from and write on. Primary IDE hard disk drives must have its partition set to *active* (also possible with FDISK).

NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Drive A / Drive B (None)

These fields record the types of floppy disk drives installed in your system. The available options for drives A and B are: *360KB, 5.25 in.; 1.2MB, 5.25 in.; 720KB, 3.5 in.; 1.44MB, 3.5 in.; 2.88MB, 3.5 in.; None*

To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the left- or right-arrow keys.

Floppy 3 Mode Support (Disabled)

This is the Japanese standard floppy drive. The standard stores 1.2MB in a 3.5inch diskette. This is normally disabled but you may choose from either: *Drive A, Drive B, Both, and Disabled*

Video (EGA/VGA)

Set this field to the type of video display card installed in your system. The options are *EGA/VGA, CGA 49, CGA 80, and Mono* (for Hercules or MDA).

If you are using a VGA or any higher resolution card, choose *EGA/VGA*.

Halt On (All Errors)

This field determines which types of errors will cause the system to halt. Choose from *All Errors; No Errors; All,But Keyboard, All,But Diskette; and All,But Disk/Key*.

IV. BIOS SOFTWARE

BIOS Features Setup

This “BIOS Features Setup” option consists of configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Some entries are required by the motherboard’s design to remain in their default settings.



A section at the lower right of the screen displays the control keys you can use. Take note of these keys and their respective uses. If you need information on a particular entry, highlight it and then press <F1>. A pop-up help menu will appear to provide you with the information you need. <F5> loads the last set values, <F6> and <F7> loads the BIOS default values and Setup default values, respectively.

NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of BIOS Features Setup

Virus Warning (Disabled)

This field protects the boot sector and partition table of your hard disk against accidental modifications. Any attempt to write to them will cause the system to halt and display a warning message. If this occurs, you can either allow the operation to continue or use a bootable virus-free floppy disk to reboot and investigate your system. This setting is recommended because conflicts with new operating systems. Installation of new operating systems require that you disable this to prevent write errors.

CPU Level 1 Cache / CPU Level 2 Cache (Enabled)

These fields allow you to choose from the default of *Enabled* or choose *Disabled* to turn on or off the CPU’s Level 1 and Level 2 built-in cache.

BIOS Update (Enabled)

This functions as an update loader integrated into the BIOS to supply the processor with the required data. The BIOS will load the update on all processors during system bootup in the default position of *Enabled*.

IV. BIOS SOFTWARE

CPU Fast String (Enabled)

Leave on default setting of *Enabled* for best performance.

Deturbo Mode (Disabled)

When *Enabled*, FLUSH# signal is held asserted to disable caching and the P6 bus pipeline will be stalled. This allows software to run at a reduced-speed. The default is set to *Disabled* to allow maximum processing speed.

Quick Power On Self Test (Enabled)

This field speeds up the Power-On Self Test (POST) routine by skipping retesting a second, third, and fourth time. Setup default setting for this field is *Enabled*. A complete test of the system is done on each test.

HDD Sequence SCSI/IDE First (IDE)

When using both SCSI and IDE hard disk drives, IDE is always the boot disk using drive letter C (default setting of *IDE*). This new feature allows a SCSI hard disk drive to be the boot disk when set to *SCSI*. This allows multiple operating systems to be used on both IDE and SCSI drives or the primary operating system to boot using a SCSI hard disk drive.

Boot Sequence (C,A)

This field determines where the system looks first for an operating system. Options are *C,A*; *A,CDROM,C*; *CDROM,C,A*; *D,A*; *E,A*; *F,A*; *C only*; *LS/ZIP, C*; and *A,C*. The setup default setting is to check first the hard disk and then the floppy disk drive, that is, *C, A*.

Boot Up Floppy Seek (Disabled)

When enabled, the BIOS will seek drive A once.

Floppy Disk Access Control (R/W)

This allows protection of files from the computer system to be copied to floppy disks by allowing the setting of *Read Only* to only allow reads from the floppy disk drive but not writes. The setup default *R/W* allows both reads and writes.

IDE HDD Block Mode Sectors (HDD MAX)

This field enhances hard disk performance by making multi-sector transfers instead of one sector per transfer. Most IDE drives, except older versions, can utilize this feature. Selections are *HDD MAX*, *Disabled*, *2*, *4*, *8*, *16*, and *32*.

Security Option (System)

When you specify a *Supervisor Password* and/or *User Password* (explained later in this section), the Security Option field determines when the system prompts for the password. The default setting is *System*, where the system prompts for the User Password every time you start your system. The other option is *Setup*, where the system goes through its startup routine unless the Setup utility is called, when the system prompts for the Supervisor Password.

IV. BIOS SOFTWARE

PS/2 Mouse Function Control (Auto)

The default of *Auto* allows the system to detect a PS/2 mouse on bootup. If detected, IRQ12 will be used for the PS/2 mouse. IRQ12 will be reserved for expansion cards if a PS/2 mouse is not detected. *Enabled* will always reserve IRQ12, whether on bootup a PS/2 mouse is detected or not.

PCI/VGA Palette Snoop (Disabled)

Some display cards that are nonstandard VGA such as graphics accelerators or MPEG Video Cards may not show colors properly. The setting *Enabled* should correct this problem. Otherwise leave this on the setup default setting of *Disabled*.

OS/2 Onboard Memory > 64M (Disabled)

When using OS/2 operating systems with installed DRAM of greater than 64MB, you need to set this option to *Enabled* otherwise leave this on the setup default of *Disabled*.

.....

Video ROM BIOS Shadow (Enabled)

This field allows you to change the video BIOS location from ROM to RAM. Relocating to RAM enhances system performance, as information access is faster than the ROM.

C8000-CBFFF to DC000-DFFFF (Disabled)

These fields are used for shadowing other expansion card ROMs. If you install other expansion cards with ROMs on them, you will need to know which addresses the ROMs use to shadow them specifically. Shadowing a ROM reduces the memory available between 640K and 1024K by the amount used for this purpose.

Boot Up NumLock Status (On)

This field enables users to activate the Number Lock function upon system boot.

Boot Up System Speed (High)

This has no function and should be left on the setup default.

Typematic Rate Setting (Disabled)

When enabled, you can set the two typematic controls listed next. Setup default setting is *Disabled*.

Typematic Rate (Chars/Sec) (6)

This field controls the speed at which the system registers repeated keystrokes. Options range from 6 to 30 characters per second. Setup default setting is **6**; other settings are 8, 10, 12, 15, 20, 24, and 30.

Typematic Delay (Msec) (250)

This field sets the time interval for displaying the first and second characters. Four delay rate options are available: 250, 500, 750, and 1000.

IV. BIOS SOFTWARE

Chipset Features Setup

This “Chipset Features Setup” option controls the configuration of the board’s chipset. Control keys for this screen are the same as for the previous screen.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of Chipset Features Setup

Auto Configuration (60ns DRAM)

The default setting of *60ns DRAM* sets the optimal timings for items 2 through 6 for 60ns DRAM modules. If you are using 70ns DRAM modules, you must change this item to *70ns DRAM*. See section III for DRAM installation information.

DRAM Refresh Type (RAS Only)

Leave on default setting of *RAS Only* as this is the current standard.

CPU-to-PCI IDE Posting (Enabled)

Leave on default setting of *Enabled* so that the CPU to PCI IDE posting cycles are treated as normal I/O write transactions.

USWC Write Posting (Enabled)

Leave on default setting of *Enabled* to allow USWC write posting during I/O bridge access.

CPU-to-PCI Write Post (Enabled)

The default setting of *Enabled* will increase the efficiency of the PCI bus and speed up the execution in the processor.

PCI-to-DRAM Pipeline (Enabled)

The default of *Enabled* will increase the bandwidth of the path between the PCI and the DRAM to enhance the PCI bus efficiency and DRAM accessing.

PCI Burst Write Combining (Enabled)

The default setting of *Enabled* will increase the efficiency of PCI bus by combining several CPU to PCI write cycles into one. VGA performance is increased by this action.

IV. BIOS SOFTWARE

Read-Around-Write (Enabled)

The default setting of *Enabled* will increase the execution efficiency of the processor. It allows the processor to execute read commands out of order if there is no dependence between these read and other write commands.

16-bit I/O Recovery Time (1 BUSCLK)

Timing for 16-bit ISA cards (leave on default setting of *1 BUSCLK*)

8-bit I/O Recovery Time (1 BUSCLK)

Timing for 8-bit ISA cards (leave on default setting of *1 BUSCLK*)

Video Memory Cache Mode (UC)

USWC (uncacheable, speculative write combining) is a new cache technology for the video memory of the processor. It can greatly improve the display speed by caching the display data. You must leave this on the default setting of *UC* (uncacheable) if your display card cannot support this feature or else your system may not boot.

Memory Hole At 15M–16M (Disabled)

Enabling this feature reserves 15MB to 16MB memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default is *Disabled*.

[DRAM and ECC]

If all your DRAM modules have parity chips (e.g., 8 chips + 4 parity chips), they are considered 36bits. This motherboard sums the memory per bank and therefore two modules will give 72bits and the following will be displayed:

```
DRAM are 72 bits wide      F5 : Old Values (Shift)F2 : Color
Data Integrity (PAR/ECC) : Disabled  F6 : Load BIOS Defaults
DRAM ECC/PARITY Select   : Parity    F7 : Load Setup Defaults
```

If your DRAM modules do not have parity chips (e.g. 8 chips), they are considered 32bits and the following will be displayed instead:

```
DRAM are 64 (Not 72) bits wide  F5 : Old Values (Shift)F2 : Color
Data Integrity (PARITY) : Disabled F6 : Load BIOS Defaults
                          F7 : Load Setup Defaults
```

The default of *Disabled* for **Data Integrity** will not show memory errors on your monitor. When using parity DRAM modules, you can select *ECC* (Error Checking and Correcting) to correct 1 bit memory errors that may occur in the memory, otherwise *Parity* is the default. (See section III for more information on DRAM memory modules.)

.....

Onboard FDC Controller (Enabled)

When *Enabled* (default), this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to *Disabled*.

IV. BIOS SOFTWARE

Onboard FDC Swap A & B (No Swap)

This field allows you to reverse the hardware drive letter assignments of your floppy disk drives. Two options are available: *No Swap* and *Swap AB*. If you want to switch drive letter assignments through the onboard chipset, set this field to *Swap AB*.

Onboard Serial Port 1 (3F8H/IRQ4)

Settings are *3F8H/IRQ4*, *2F8H/IRQ3*, *3E8H/IRQ4*, *2E8H/IRQ10*, and *Disabled* for the onboard serial connector.

Onboard Serial Port 2 (2F8H/IRQ3)

Settings are *3F8H/IRQ4*, *2F8H/IRQ3*, *3E8H/IRQ4*, *2E8H/IRQ10*, and *Disabled* for the onboard serial connector.

Onboard Parallel Port (378H/IRQ7)

This field sets the address of the onboard parallel port connector. You can select either: *3BCH/IRQ 7*, *378H/IRQ 7*, *278H/IRQ 5*, *Disabled*. If you install an I/O card with a parallel port, ensure that there is no conflict in the address assignments. The PC can support up to three parallel ports as long as there are no conflicts for each port.

Parallel Port Mode (ECP+EPP)

This field allows you to set the operation mode of the parallel port. The setting *Normal*, allows normal-speed operation but in one direction only; *EPP* allows bidirectional parallel port operation at maximum speed; *ECP* allows the parallel port to operate in bidirectional mode and at a speed faster than the maximum data transfer rate; *ECP+EPP* allows normal speed operation in a two-way mode.

ECP DMA Select (3)

This selection is available only if you select *ECP* or *ECP+EPP* in the **Parallel Port Mode**. Select either DMA Channel *1*, *3*, or *Disable*.

UART2 Use Infrared (Disabled)

When enabled, this field activates the onboard infrared feature and sets the second serial UART to support the infrared module connector on the motherboard. If your system already has a second serial port connected to the onboard COM2 connector, it will no longer work if you enable the infrared feature. By default, this field is set to *Disabled*, which leaves the second serial port UART to support the COM2 serial port connector. See **IrDA-compliant infrared module connector** under section III.

Onboard PCI IDE Enable (Both)

You can select to enable the *primary* IDE channel, *secondary* IDE channel, *both*, or *disable* both channels (for systems with only SCSI drives).

IDE 0 Master/Slave Mode, IDE 1 Master/Slave Mode (Auto)

Each channel (0 and 1) has both a master and a slave making four IDE devices possible. Because each IDE device may have a different Mode timing (*0*, *1*, *2*, *3*, *4*), it is necessary for these to be independent. The default setting of *Auto* will allow auto-detection to ensure optimal performance.

IV. BIOS SOFTWARE

Power Management Setup

This “Power Management Setup” option allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of Power Management Setup

Power Management (User Define)

This field acts as the master control for the power management modes. *Max Saving* puts the system into power saving mode after a brief period of system inactivity; *Min Saving* is almost the same as *Max Saving* except that this time the system inactivity period is longer; *Disable* disables the power saving features; *User Define* allows you to set power saving options according to your preference.

IMPORTANT: Advanced Power Management (APM) should be installed to keep the system time updated when the computer enters suspend mode activated by the BIOS Power Management. For DOS environments, you need to add the statement, `DEVICE=C:\DOS\POWER.EXE`, in you `CONFIG.SYS`. For Windows 3.x and Windows 95, you need to install Windows with the APM feature. A battery and power cord icon labeled “Power” will appear in the “Control Panel.” Choose “Advanced” in the Power Management Field.

Video Off Option (Susp,Stby -> Off)

This field determines when to activate the video off feature for monitor power management. The settings are *All Modes -> Off*; *Always On*; *Suspend -> Off*; and *Susp,Stby -> Off*.

IV. BIOS SOFTWARE

Video Off Method (DPMS OFF)

This field defines the video off features. The following options are available: *DPMS OFF*, *DPMS Reduce ON*, *Blank Screen*, *V/H SYNC+Blank*, *DPMS Standby*, and *DPMS Suspend*. The DPMS (Display Power Management System) features allow the BIOS to control the video display card if it supports the DPMS feature. *Blank Screen* only blanks the screen (use this for monitors without power management or “green” features. If set up in your system, your screen saver will not display with *Blank Screen* selected). *V/H SYNC+Blank* blanks the screen and turns off vertical and horizontal scanning.

Suspend Switch (Enable)

This field enables or disables the SMI connector on the motherboard. This connector connects to the lead from the Suspend switch mounted on the system case.

Doze Speed / Stdby Speed (8/32)

These two fields set the CPU speed during each mode. The number indicates what the normal CPU speed is divided by.

PM Timers (Disable)

This section controls the time-out settings for the Power Management scheme. The fields included in this section are “HDD Power Down”, which places the hard disk into its lowest power consumption mode, and the Doze, Standby and Suspend system inactivation modes.

The system automatically “wakes up” from any power saving mode when there is system activity such as when a key is pressed from the keyboard, or when there is activity detected from the enabled IRQ channels.

HDD Power Down shuts down any IDE hard disk drives in the system after a period of inactivity. This time period is user-configurable to *1–15 Min* or *Disable*. This feature does not affect SCSI hard drives.

The **Doze Mode**, **Standby Mode**, and **Suspend Mode** fields set the period of time after which each of these modes activate: *1 Min*, *2 Min*, *4 Min*, *8 Min*, *10 Min*, *20 Min*, *30 Min*, *1 Hour*, *2 Hour*, and *4 Hour*.

PM Events

This section sets the wake-up call of the system. If activity is detected from any enabled IRQ channels in the left-hand group, the system wakes up from suspended mode. You can enable power management for IRQ3–IRQ15 individually in the list at the right of the screen. The power management feature will work on the enabled IRQ channels.

NOTE: A Microsoft serial mouse or compatible will use either COM1 (IRQ4) or COM2 (IRQ3), and a PS/2 mouse will use IRQ12. If you know which IRQ your mouse is using, you can enable the wake-up Event for that IRQ here and the system will wake up when you move the mouse or click its button.

.....

IRQ3 (device)-IRQ15 (device)

You can individually *Enable* or *Disable* each IRQ to include in the sleep function. IRQ8 (RTC Alarm) is usually set to *Disable* so that any software alarm clock or event calendar can wake up the system.

IV. BIOS SOFTWARE

PNP and PCI Setup

This “PNP and PCI Setup” option configures the PCI bus slots. All PCI bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of PNP and PCI Setup

PNP OS Installed (No)

This field allows you to use a Plug-and-Play (PnP) operating system to configure the PCI bus slots instead of using the BIOS. Thus interrupts may be reassigned by the OS when *Yes* is selected. When a non-PnP OS is installed or to prevent reassigning of interrupt settings, select the default setting of *No*.

Slot 1 (RIGHT) IRQ to Slot 4/5 (LEFT) IRQ (Auto)

These fields set how IRQ use is determined for each PCI slot. The default setting for each field is *Auto*, which uses auto-routing to determine IRQ use. The other options are manual settings of *NA*, *5*, *7*, *9*, *10*, *11*, *12*, *14* or *15* for each slot.

PCI Latency Timer (32 PCI Clock)

The default setting of *32 PCI Clock* enables maximum PCI performance for this motherboard.

IRQ xx Used By ISA (No/ICU)

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) ISA card. Two options are available: *No/ICU* and *Yes*. The first option, the default value, indicates either that the displayed IRQ is not used or an ISA Configuration Utility (ICU) is being used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ, and you are not using an ICU, you must set the field for that IRQ to *Yes*. For example: If you install a legacy ISA card that requires IRQ 10, then set **IRQ10 Used By ISA** to *Yes*.

.....

IV. BIOS SOFTWARE

DMA x Used By ISA (No/ICU)

These fields indicate whether or not the displayed DMA channel for each field is being used by a legacy (non-PnP) ISA card. Available options include: *No/ICU* and *Yes*. The first option, the default setting, indicates either that the displayed DMA channel is not used or an ICU is being used to determine if an ISA card is using that channel. If you install a legacy ISA card that requires a unique DMA channel, and you are not using an ICU, you must set the field for that channel to *Yes*.

ISA MEM Block BASE (No/ICU)

This field allows you to set the base address and block size of a legacy ISA card that uses any memory segment within the C800H and DFFFH address range. If you have such a card, and you are not using an ICU to specify its address range, select a base address from the six available options; the **ISA MEM Block SIZE** field will then appear for selecting the block size. If you have more than one legacy ISA card in your system that requires to use this address range, you can increase the block size to either 8K, 16K, 36K, or 64K. If you are using an ICU to accomplish this task, leave **ISA MEM Block BASE** to its default setting of *No/ICU*.

SYMBIOS SCSI BIOS (Auto)

The default uses *Auto* settings for the onboard SCSI BIOS. If you do not want to use the onboard SCSI BIOS, choose *Disabled*

USB Function (Disabled)

This motherboard supports Universal Serial Bus (USB) devices but current operating systems do not. The default is set to *Disabled* until support disks and USB devices are available in which time you can set this function to *Enabled*.

Passive Release (Enabled)

This function allows the passive release to be *Enabled* or *Disabled*. The default setting of *Enabled* allows better performance.

IV. BIOS SOFTWARE

Load BIOS Defaults

This “Load BIOS Defaults” option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high performance features. To load these default settings, highlight “Load BIOS Defaults” on the main screen and then press <Enter>. The system displays a confirmation message on the screen. Press <Y> and then <Enter> to confirm. Press <N> and then <Enter> to abort. This feature does not affect the fields on the Standard CMOS Setup screen.

Load Setup Defaults

This “Load Setup Defaults” option allows you to load the default values to the system configuration fields. These default values are the optimized configuration settings for the system. To load these default values, highlight “Load Setup Defaults” on the main screen and then press <Enter>. The system displays a confirmation message on the screen. Press <Y> and then <Enter> to confirm. Press <N> and then <Enter> to abort. This feature does not affect the fields on the Standard CMOS Setup screen.



IV. BIOS
(Load Defaults)

IV. BIOS SOFTWARE

Smart Alarm (LM78) Setup

This menu controls the functions of the LM78 hardware monitor chip on this motherboard. Certain hardware components are necessary for the all the features to be available.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of Smart Alarm (LM78) Setup

Fan Monitor: CPU1 Fan Speed, CPU2 Fan Speed, Power Fan Speed (xxxxRPM)

The onboard hardware monitor is able to detect the Chassis Fan Speed, CPU Fan Speed, and the Power Supply Fan Speed in Rotations Per Minute (RPM). These values refresh upon any key entry in the BIOS setup screens. Set to *Ignore* if one of these are not used so that error messages will not be given.

Thermal Monitor: MB Temperature (xxxC/xxxF)

The onboard hardware monitor is able to detect the Motherboard temperatures. These values refresh upon key entries. Set to *Ignore* only if necessary.

Voltage Monitor: VCore, +3.3V, +5V, +12V, -12V, -5V (+/- xx.xV)

The onboard hardware monitor is able to detect the voltages put out by the voltage regulators. These values refresh upon key entries. Set to *Ignore* only if necessary.

NOTE: If any of the monitored items are out of range during system bootup, you will be prompted by this message: “Hardware Monitor found an error, enter POWER MANAGEMENT SETUP for details.” The bottom of the screen will instruct you to: “Press **F1** to continue, **DEL** to enter SETUP.”

IV. BIOS SOFTWARE

Supervisor Password and User Password

These two options set the system passwords. “Supervisor Password” sets a password that will be used to protect the system and the Setup utility; “User Password” sets a password that will be used exclusively on the system. By default, the system comes without any passwords. To specify a password, highlight the type you want and then press <Enter>. A password prompt appears on the screen. Taking note that the password is case sensitive, and can be up to 8 alphanumeric characters long, type in your password and then press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically reverts to the main screen.



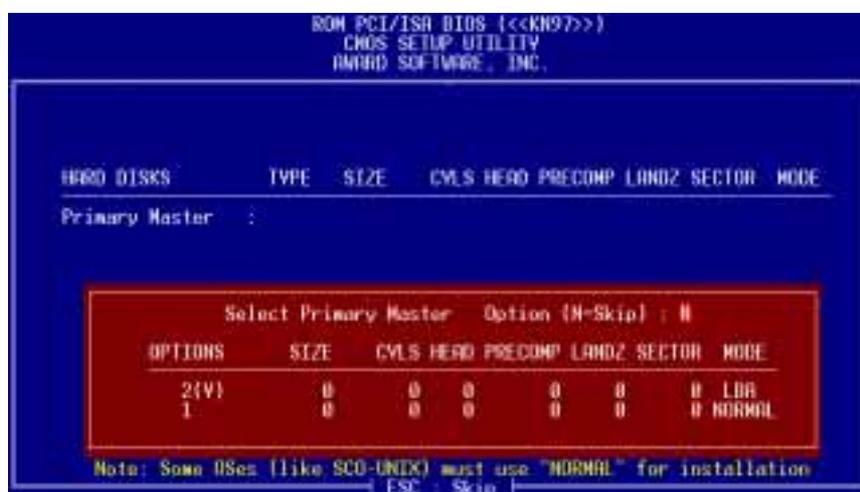
To implement password protection, specify in the “Security Option” field of the BIOS Features Setup screen when the system will prompt for the password. If you want to disable either password, press <Enter> instead of entering a new password when the “Enter Password” prompt appears. A message confirms the password has been disabled.

NOTE: If you forget the password, see CMOS RAM in section III for procedures on clearing the CMOS.

IV. BIOS SOFTWARE

IDE HDD Auto Detection

This “IDE HDD Auto Detection” option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.



Up to four IDE drives can be detected, with parameters for each listed inside the box. To accept the optimal entries, press <Y> or else select from the numbers displayed under the OPTIONS field (2, 1, 3 in this case); to skip to the next drive, press <N>. If you accept the values, the parameters will appear listed beside the drive letter on the screen. The process then proceeds to the next drive letter. Pressing <N> to skip rather than to accept a set of parameters causes the program to enter zeros after that drive letter.

Remember that if you are using another IDE controller that does not feature Enhanced IDE support for four devices, you can only install two IDE hard disk drives. Your IDE controller must support the Enhanced IDE features in order to use Drive E and Drive F. The onboard PCI IDE controller supports Enhanced IDE, with two connectors for connecting up to four IDE devices. If you want to use another controller that supports four drives, you must disable the onboard IDE controller in the Chipset Features Setup screen.

When auto-detection is completed, the program automatically enters all entries you accepted on the field for that drive in the Standard CMOS Setup screen. Skipped entries are ignored and are not entered in the screen.

If you are auto-detecting a hard disk that supports the LBA mode, three lines will appear in the parameter box. Choose the line that lists LBA for an LBA drive. Do not select Large or Normal.

The auto-detection feature can only detect one set of parameters for a particular IDE hard drive. Some IDE drives can use more than one set. This is not a problem if the drive is new and empty.

IV. BIOS SOFTWARE

IMPORTANT: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk.

If the parameters listed differ from the ones used when the disk was formatted, the disk will not be readable. If the auto-detected parameters do not match the ones that should be used for your disk, do not accept them. Press <N> to reject the presented settings and enter the correct ones manually from the Standard CMOS Setup screen.

Save & Exit Setup

Select this option to save into the CMOS memory all modifications you specified during the current session. To save the configuration changes, highlight the “Save & Exit Setup” option on the main screen, type “Y”, and then press <Enter>.



IV. BIOS
(Save & Exit)

Exit Without Saving

Select this option to exit the Setup utility without saving the modifications you specify during the current session. To exit without saving, highlight the “Exit Without Saving” option on the main screen and then press <Enter>.

V. DESKTOP MANAGEMENT

Desktop Management Interface (DMI)

Introducing the ASUS DMI Configuration Utility

This motherboard supports DMI within the BIOS level and provides a DMI Configuration Utility to maintain the Management Information Format Database (MIFD). DMI is able to auto-detect and record information pertinent to a computer's system such as the CPU type, CPU speed, and internal/external frequencies, and memory size. The onboard BIOS will detect as many system information as possible and store those collected information in a 4KB block in the motherboard's Flash EPROM and allow the DMI to retrieve data from this database. Unlike other BIOS software, the BIOS on this motherboard uses the same technology implemented for Plug and Play to allow dynamic real-time updating of DMI information versus creating a new BIOS image file and requiring the user to update the whole BIOS. This DMI Configuration Utility also allows the system integrator or end user to add additional information into the MIFD such as serial numbers, housing configurations, and vendor information. Those information not detected by the motherboard BIOS and has to be manually entered through the DMI Configuration Utility and updated into the MIFD. This DMI Configuration Utility provides the same reliability as PnP updating and will prevent the refreshing failures associated with updating the entire BIOS.

System Requirements

The DMI Configuration Utility (DMICFG.EXE) must be used in real mode in order for the program to run, the base memory must be at least 180K. Memory managers like HIMEM.SYS (required by windows) must not be installed. You can boot up from a system diskette without AUTOEXEC.BAT and CONFIG.SYS files, "REM" HIMEM.SYS in the CONFIG.SYS, or press <F5> during bootup to bypass your AUTOEXEC.BAT and CONFIG.SYS files.

V. DESKTOP MANAGEMENT

Using the ASUS DMI Configuration Utility

Edit DMI (or delete)



Use the ←→ (left-right) cursors to move the top menu items and the ↑↓ (up-down) cursor to move between the left hand menu items. The bottom of the screen will show the available keys for each screen. Press enter at the menu item to enter the right hand screen for editing. “Edit component” appears on top. The reversed color field is the current cursor position and the blue text are available for editing. The orange text shows auto-detected information and are not available for editing. The blue text “Press [ENTER] for detail” contains a second pop-up menu is available, use the + - (plus-minus) keys to change the settings. Enter to exit *and save*, ESC to exit *and not save*.

If the user has made changes, ESC will prompt you to answer Y or N. Enter Y to go back to the left-hand screen *and save*, enter N to go back to left-hand screen and *not save*. If editing has not been made, ESC will send you back to the left hand menu without any messages.

Notes

A heading, *** BIOS Auto Detect *** appears on the right for each menu item on the left side that has been auto detected by the system BIOS.

A heading, *** User Modified *** will appear on the right for menu items that has been modified by the user.



V. DESKTOP MANAGEMENT

Save MIFD



You can save the MIFD (normally only saved to flash ROM) to a file by entering the drive and path here. If you want to cancel save, you may press ESC and a message “Bad File Name” appears here to show it was not saved.

Load MIFD



You can load the disk file to memory by entering a drive and path and file name here.

Load BIOS Defaults



You can load the BIOS defaults from a MIFD file and can clear all user modified and added data. You must reboot your computer in order for the defaults to be saved back into the Flash BIOS.

VI. ASUS PCI SCSI Cards

Symbios SCSI BIOS and Drivers

Aside from the system BIOS, the Flash memory chip on the motherboard also contains the Symbios SCSI BIOS. This Symbios SCSI BIOS works in conjunction with the optional ASUS PCI-SC200 controller card to provide Fast SCSI-2 interface when using compatible SCSI devices or the ASUS PCI-SC860 SCSI controller cards to provide Ultra-Fast SCSI-2 interface when using Ultra-Fast SCSI-2 devices.

All SCSI devices you install on your system require driver software to function. The Symbios SCSI BIOS directly supports SCSI hard disks under the DOS, Windows and OS/2 environments. It also uses device drivers from the DOS floppy disk included in the ASUS PCI-SC200 and ASUS PCI-SC860 controller card packages to support hard disks and other SCSI devices working under DOS, Microsoft Windows, Microsoft Windows NT, Novell NetWare and IBM OS/2. These drivers provide higher performance than the direct BIOS support. To use these drivers, you must install them into your system and add them to your system configuration files. Driver support for SCSI devices used with SCO UNIX is also provided. These drivers are included in the second SCO UNIX floppy disk. Windows 95 support is also available using the device drivers included within the Windows software. The ASUS PCI-SC200 and ASUS PCI-SC860 are Plug and Play adapters that are auto detected by BIOS and current operating systems that support Plug and Play features.

For information about these drivers and their usage, please view the Readme files included in the driver packages.

ASUS PCI-SC200 & PCI-SC860 SCSI Cards

The ASUS PCI-SC200 or the ASUS PCI-SC860 may be bundled with your motherboard or purchased separately. Both cards provide the option of connecting internal or external SCSI devices for a total of 7 devices on each SCSI card.



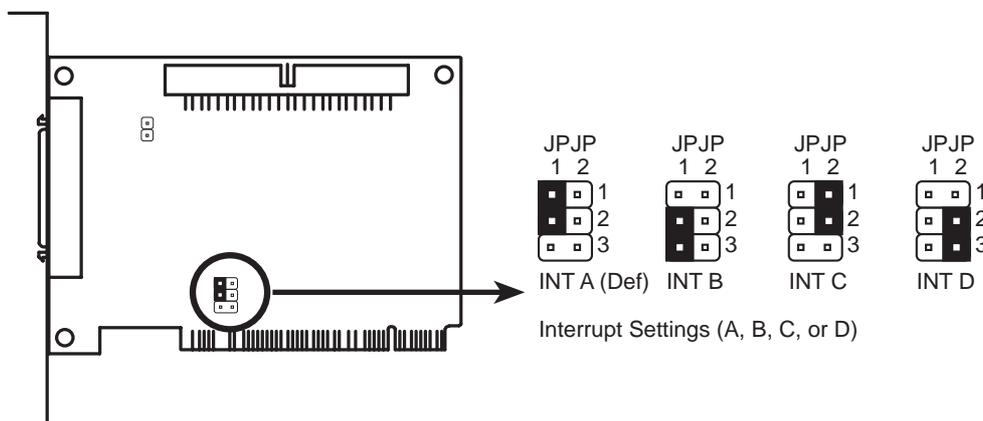
VI. ASUS PCI SCSI Cards

Setting Up the ASUS PCI-SC200 & PCI-SC860

There are two jumper settings you may need to make on the ASUS PCI-SC200 to set it up. One setting assigns the PCI INT interrupt, the other sets the card's termination. The ASUS PCI-SC860 has no jumper settings but you should read the "Terminator Requirements."

Setting the INT Assignment for the ASUS PCI-SC200

You must use PCI INT A setting in order to properly assign the ASUS PCI-SC200's interrupt. On the ASUS PCI-SC200, you assign the INT by setting jumper JP1 or JP2. The default setting for the card already is INT A, so you do not need to change the setting to use the ASUS PCI-SC200 with this motherboard.



Terminator Requirements for SCSI Devices

SCSI devices are connected together in a "chain" by cables. Internal devices connect to the ASUS PCI-SC200 or ASUS PCI-SC860 with a fifty-pin flat ribbon cable. External devices connect to the external port with a SCSI-2 cable. If there are more than one internal or external devices, additional devices are connected with cables to form a "daisy chain." Terminating the devices on the ends of the SCSI Bus "chain" is necessary for SCSI devices to work properly. Termination of the devices between the ends must be *Disabled*.

VI. ASUS PCI SCSI Cards

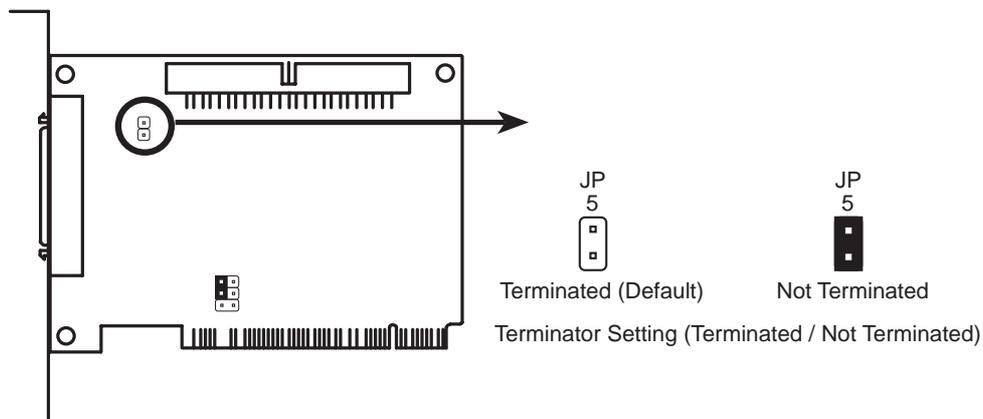
Terminator Settings for the ASUS PCI-SC860

Many SCSI devices including the ASUS PCI-SC860 use a set of onboard active resistors to terminate the devices at the ends automatically. Automatic termination requires that the SCSI devices be connected in a straight linear connection or “chain.” Connect SCSI devices to one or two of the SCSI connectors in a linear “chain” for auto termination of the ASUS PCI-SC860 to be effective. Other formations will cause your SCSI devices to not mount properly. You must use the **end** of the ribbon cable when using the internal connector(s) to keep a linear path.

Additional Note: The Symbios Logic SCSI Configuration Utility is a powerful tool. If, while using it, you somehow disable all your controllers or cannot enter the configuration utility, pressing “Ctrl-A” after memory count during reboot allows you to recover and reconfigure.

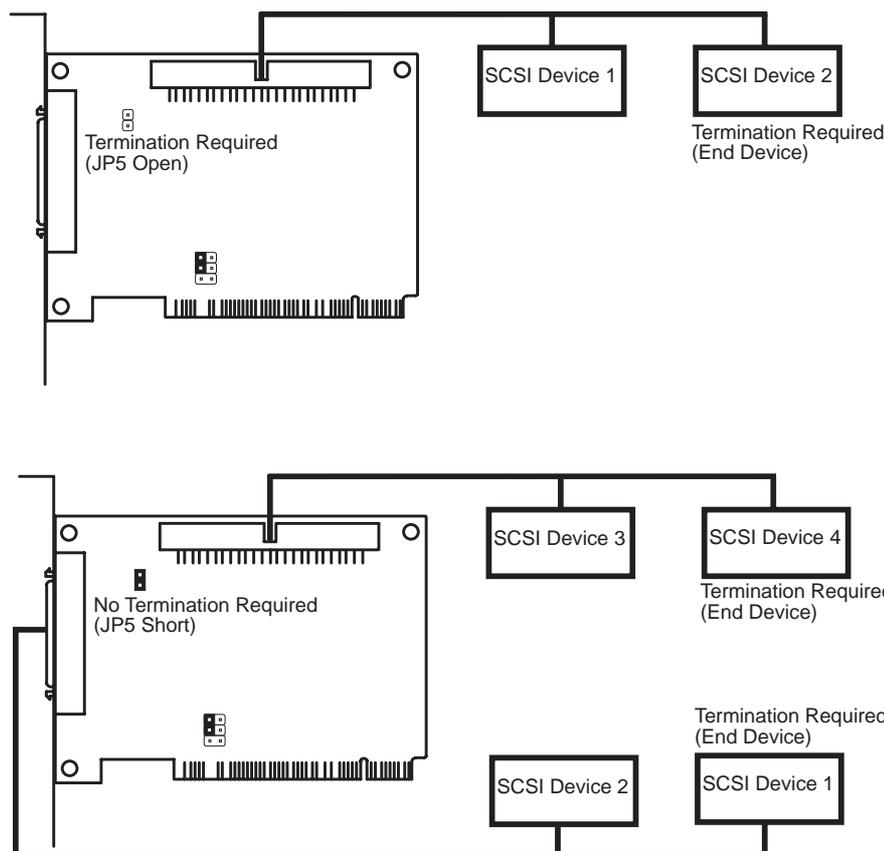
Terminator Settings for the ASUS PCI-SC200

The ASUS PCI-SC200, on the other hand, has “active” termination that you must set using jumper JP5. There are two settings, "terminated" and "not terminated," as shown below.



Decide whether or not you need to terminate the ASUS PCI-SC200 based on its position in the SCSI chain. Only the devices at each end of the chain need to be terminated. If you have **only** internal or **only** external devices connected to the ASUS PCI-SC200, then you **must** terminate the ASUS PCI-SC200. If you have **both** internal and external devices connected, you **must not** terminate the card. See the following example which illustrates this concept.

VI. ASUS PCI SCSI Cards



SCSI ID Numbers for SCSI Devices

All SCSI devices, including the ASUS PCI-SC200 and ASUS PCI-SC860 interface card must have a SCSI identification number that is not in use by any other SCSI device. There are eight possible ID numbers, 0 through 7. The ASUS PCI-SC200 and ASUS PCI-SC860 cards have fixed SCSI IDs of 7. The SCSI ID serves two purposes:

- It uniquely defines each SCSI device on the bus.
- It determines which device controls the bus when two or more devices try to use it at the same time.

SCSI IDs on one channel do not interfere with the IDs on another channel. This applies to two SCSI host adapters that implement different buses as well as dual channels on a single host adapter. You can connect up to seven SCSI devices to the interface card. You must set a SCSI ID number (ID 0 to ID 6) for each device. SCSI devices vary in how they set the ID number. Some use jumpers, others have some kind of selector switch. Refer to the manual for any device you install for details on how to set its ID number.

SCSI ID Priority

The ASUS PCI-SC200 and ASUS PCI-SC860 are 8bit single-channel SCSI cards. SCSI ID 7 has the highest priority, and SCSI ID 0 has the lowest priority.

VII. ASUS I-A16C Audio Card

NOTE: The ASUS I-A16C 16-bit ISA audio card comes with certain motherboard bundles only and is not for sale separately.

ASUS I-A16C Audio Features

- Creative Labs ViBRA 16C PnP Audio Chip
- Full Duplex Supports
- 16/8-bit PCM 5KHz to 44.1KHz
- Wave Table Upgradeable
- Software Includes:
 - DOS and Window 3.1 Drivers
 - Windows 95 Driver
 - Wave Editor
 - Wave OLE
 - Quick CD
 - Mixer Control
 - Quick Player

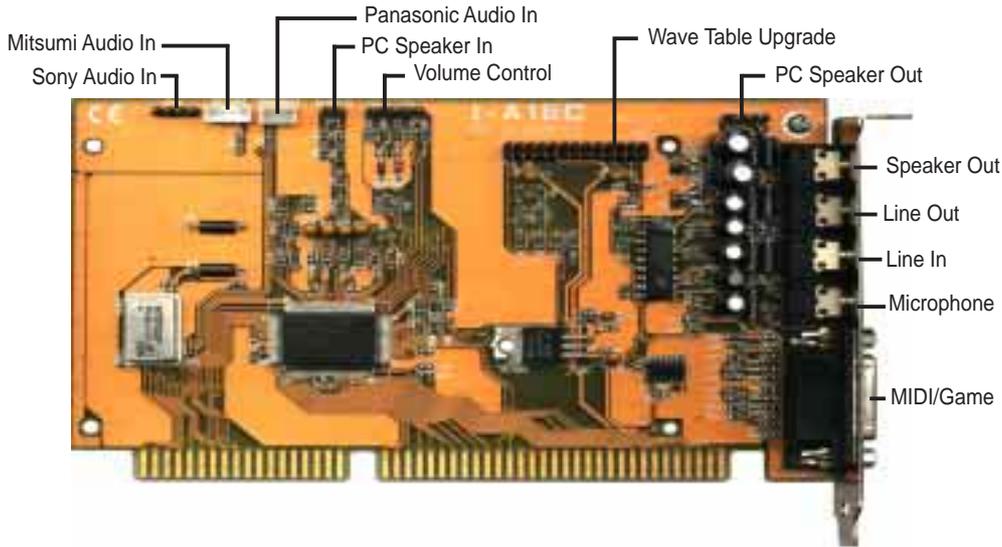
Unpacking and Handling Precautions

WARNING! Keep the ASUS I-A16C stored in its anti-static bag until you are ready to install it in your system. The ASUS I-A16C is easily damaged by static electricity.

Observe the following precautions while unpacking and handling the board:

- Before handling the board, discharge static electricity from your body by touching an unpainted area of the system's metal chassis. While installing the board, ground yourself frequently to discharge any static electricity that may accumulate in your body.
- After removing the board from the anti-static bag, place it on a grounded surface with the components facing up.
- Check the board for damage. If any socketed component appears loose, press firmly but carefully to seat the chip in its socket. Otherwise, avoid touching the components on the board. Always handle the board by the edges.

VII. ASUS I-A16C Audio Card



VII. ASUS I-A16C
(Layout / Connectors)

Connectors

The audio input connectors are used when you wish to control software mixer settings (e.g., bass, treble, volume) for CDs that are played with your CD-ROM drive. If the “Audio Out” from the CD-ROM drive is not connected to the “Audio In” on the card, you can only use the direct output located in the front panel of the CD-ROM drive and adjust volume level by the knob.

CD-Audio Connector Pin Definitions

<i>Sony Audio In</i>	<i>Mitsumi Audio In</i>	<i>Panasonic Audio In</i>
<u>Pin Definition</u>	<u>Pin Definition</u>	<u>Pin Definition</u>
1 Right Signal	1 Ground	1 Left Signal
2 Ground	2 Left Signal	2 Ground
3 Ground	3 Ground	3 Right Signal
4 Left Signal	4 Right Signal	-- ----

<i>PC Speaker In</i>	<i>PC Speaker Out</i>	<i>Volume Control</i>
<u>Pin Definition</u>	<u>Pin Definition</u>	<u>Pin Definition</u>
1 Mono Signal	1 Right Signal	1 Ground
2 Ground	2 Ground	2 Volume Up
-- ----	3 Left Signal	3 Ground
-- ----	4 Ground	4 Volume Down
-- ----	-- ----	5 Ground