ASUS® SP97/SP97-V

Pentium® Motherboard

USER'S MANUAL

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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

I.	**Introduction**	Contents and checklist
II.	**Features**	Product information and specifications
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 optional ASUS SCSI cards
VII.	**ASUS Audio Card**	Installation of an optional 16-bit audio card

Item Checklist

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

☑ ASUS SP97 or SP97-V (onboard VGA) motherboard

☑ 2 serial port ribbon cables with mounting brackets

☑ 1 parallel ribbon cable with mounting bracket

☑ 1 IDE ribbon cable

☑ 1 floppy disk ribbon cable

☑ ASUS SP97 Support Drivers
   • Flash Memory Writer utility to update the FLASH BIOS
   • Desktop Management Interface (DMI) utility
   • Readme files for descriptions and use of the files
   • Technical Support Form

☑ User's Manual (Audio section included with ASUS I-A16C audio bundle)

☐ 1 video ribbon cable with mounting bracket for the 5598 onboard VGA

☐ USB, PS/2 mouse, and IR cable with mounting bracket set (optional)

☐ ASUS PCI-SC200 Fast-SCSI card (optional)

☐ ASUS I-A16C audio card, audio driver CD, and manual* (optional)

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

II. FEATURES

Features of the ASUS SP97 Motherboard

The ASUS SP97 motherboard is carefully designed for the demanding PC user who wants many features in a small package, namely:

- **SiS Chipset:** Features either SiS5582 or SiS5598 chipsets. The SiS5598 chipset has a built-in video controller and supports video shared memory from 1MB to 4MB.

- **Versatile Processor Support:** Intel Pentium® 75–233MHz (P55C-MMX™, P54C/P54CS), IBM®/Cyrix® 6x86-PR166+ (Rev 2.7 or later), IBM®/Cyrix® 6x86MX™ (PR166 & faster), AMD-K5™ (PR75–PR133), AMD-K6™ (PR166 & faster).

- **Versatile Memory Support:** Equipped with four SIMM sockets to support 4–64MB 72-pin Fast Page Mode (FPM) or Extended Data Out (EDO) memory modules up to 256MB.

- **Easy Installation:** Incorporates BIOS that supports autodetection of hard disk drives, PS/2 mouse, and Plug and Play devices to make setup of hard disk drives, expansion cards, and other devices virtually automatic.

- **Dual Power Supply:** Includes both AT and ATX power connectors onboard to support an AT or ATX power supply with soft-on/soft-off features.

- **ISA and PCI Expansion Slots:** Provides two 16-bit ISA slots, three 32-bit PCI slots, and one PCI/ISA shared slot for either a PCI or ISA card.

- **Super Multi-I/O:** Provides two high-speed UART-compatible serial ports and one parallel port with EPP and ECP capabilities.

- **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 Ultra DMA/33 Bus Master IDE controller with two connectors. Supports four IDE devices more than 8.4GB in two channels up to 33MB/sec IDE transfers and Enhanced IDE devices. Also supports PIO Modes 3 and 4 and Bus Master IDE DMA Mode 2. Includes integrated keyboard controller. Supports two of either 5.25- (360KB or 1.2KB) or 3.5-inch disk drives (720KB, 1.44MB, or 2.88MB). Supports Japanese "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 bootup.

- **Level 2 Cache:** Comes with onboard 512K or 256KB Pipelined Burst SRAM.

- **USB, IrDA, PS/2 Mouse Connector:** Supports an optional cable and bracket set to allow connection to an unused expansion slot on the system chassis. A second IrDA connector is available for a standard infrared cable set.

- **IrDA Connector:** Supports an optional infrared module for wireless interface.

- **Symbios SCSI BIOS:** Supports optional ASUS SCSI controller cards through onboard firmware.

II. FEATURES

Introduction to ASUS SP97 Series of Motherboards

Performance
*   **Double the IDE Transfer Speed:** ASUS SP97 series of motherboards with SiS 5582 or SiS 5598 (with VGA) improves IDE transfer rate using Bus Master UltraDMA/33 IDE, which can handle data transfers up to 33MB/s. This new technology is compatible with existing ATA-2 IDE specifications so there is no need to upgrade current hard disk drives or cables.

*   **Concurrent PCI:** Concurrent PCI allows multiple PCI transfers from PCI master busses to memory to CPU.

*   **ACPI Ready:** ACPI (Advanced Configuration and Power Interface) is also implemented on all ASUS SiS 5582 or SiS 5598 (with VGA) series of motherboards. ACPI provides more Energy Saving Features for future operating systems (OS) supporting OS Direct Power Management (OSPM) functionality. With these features implemented in the OS, PCs can be ready around-the-clock, yet satisfy all the energy saving standards. To fully utilize the benefits of ACPI, an ACPI-supported OS, such as the successor to Windows 95, must be used.

*   **PC '97 Compliant:** Both the BIOS and hardware levels of ASUS SP97 series of motherboards meet PC '97 compliancy. The new PC '97 requirements for systems and components are based on the following high-level goals: support for Plug and Play compatibility and power management for configuring and managing all system components, and 32-bit device drivers and installation procedures for both Windows 95 and Windows NT.

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II. FEATURES

The ASUS SP97 Motherboard

USB, PS/2 Mouse, Infrared — Super Multi I/O — Parallel   Serial   Keyboard

3 PCI Slots

2 ISA Slots

1 ISA/PCI
Shared Slot

AT Power Conn.

ATX Power Conn.

Floppy Connector

IDE Connectors

4 SIMM Sockets

SiS5582 or
5598 (VGA)
Chipset

Programmable
Flash ROM

CPU ZIF
Socket 7

Switching Voltage Regulators

512KB/256KB Pipelined
Burst L2 Cache
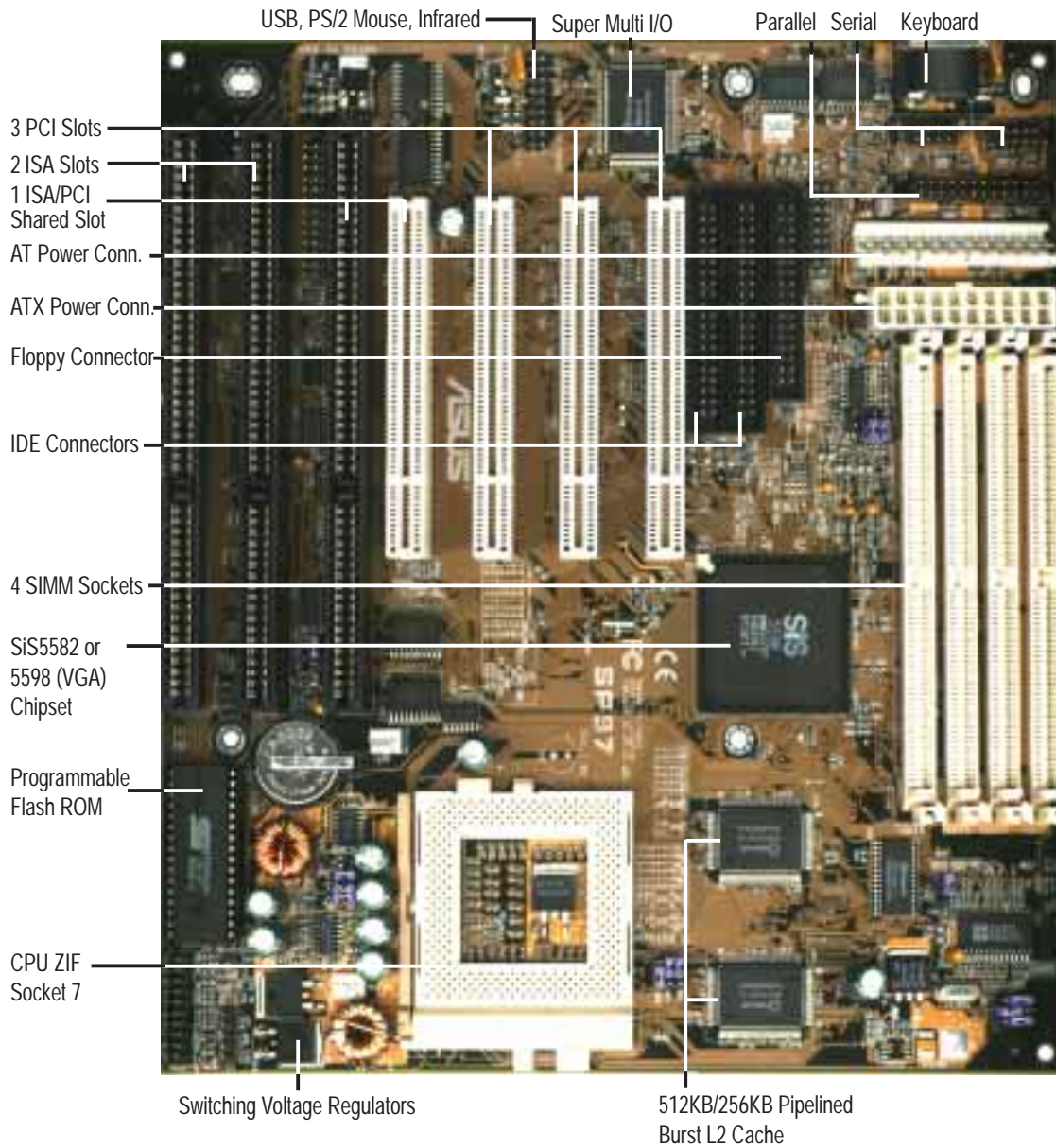
III. INSTALLATION

ASUS SP97 Motherboard Layout

Key-board

COM 1   COM 2
Serial Ports

Power Fan

Super Multi-I/O

USB, PS/2 Mouse, IrDA

VGA Connector

Parallel Port

P8   P9
AT Power Input

ATX Power Input

Primary IDE
Secondary IDE
Floppy Drives

ISA Slot 3
ISA Slot 2
ISA Slot 1
Feature Connector

PCI Slot 4
PCI Slot 3
PCI Slot 2
PCI Slot 1

VGA Select
VGA Select 1

SIMM Socket 1 (32-bit, 72-pin module)
SIMM Socket 2 (32-bit, 72-pin module)
SIMM Socket 3 (32-bit, 72-pin module)
SIMM Socket 4 (32-bit, 72-pin module)

SiS 5582 Chipset
or
SiS 5598 Chipset

Row 0 1 0 1 2 3 2 3

RTC Clear / Battery Test

Clock Freq.
FS3

CPU Fan

BIOS Power

CR2032 3Volts Lithium Cell

Flash BIOS

CPU Voltage
VID2
VID1
VID0

512KB/256KB Pipelined Burst L2 Cache

Clock Freq
FS0
FS1
FS2

Chassis Fan

Freq. Ratio
BF2
BF1
BF0

Panel Connectors
IDE LED
Infrared

Switching Voltage Regulators

CPU ZIF Socket 7

NOTE: Outlined components are available only on motherboards with onboard VGA.

III. INSTALLATION

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3) PRINTER   p. 27 Parallel Port Connector (26-pin block)
4) COM1, COM2   p. 27 Serial Port Connectors (10-pin blocks)
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7) MSG.LED (PANEL)   p. 29 Message LED Lead (2 pins)
8) SMI (PANEL)   p. 29 SMI Suspend Switch Lead (2 pins)
9) PWR.SW (PANEL)   p. 29 ATX Power Switch/Soft Power Switch Lead (2 pins)
10) RESET (PANEL)   p. 29 Reset Switch Lead (2 pins)
11) PWR.LED (PANEL)   p. 29 System Power LED Lead (3 pins)
12) KEYLOCK (PANEL)   p. 29 Keyboard Lock Switch Lead (2 pins)
13) SPEAKER (PANEL)   p. 29 Speaker Output Connector (4 pins)
14) USB_IR_MOUSE   p. 29 USB, Infrared, PS/2 Mouse Module Connector (18-pin block)
15) IR   p. 30 Second IrDA-Compliant Infrared Connector (5-pin block)
16) POWER   p. 30 AT Power Supply Connector (12-pin block)
17) ATXPWR   p. 31 ATX Power Supply Connector (20-pin block)
18) IDELED   p. 32 IDE Activity LED (2 pins)
19) VGACON (optional)   p. 32 VGA Connector (16-pin block)
20) FEATURE   p. 33 Video Feature Connector (28-pin block)

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. **Set Up the BIOS Software**

1. Jumpers

Several hardware settings are made through the use of jumper caps to connect the jumper pins on the motherboard. See layout of motherboard on page 12 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 is always on top [image] or on the left [image] when holding the motherboard with the keyboard connector away from you. A "1" is written beside pin 1 on jumpers with three pins. The jumpers will also be shown graphically as [image] to connect pins 1 & 2 and [image] to connect pins 2 & 3. Jumpers with two pins will be shown as [image] for Short (On) and [image] 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 and components, such as sound cards, contain very delicate Integrated Circuit (IC) chips. To protect them against damage from static electricity, you must 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 circuitry.
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. 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 the AC power, (2) Move this jumper to *Clear CMOS*, (3) Move the jumper back to *Normal Set.*, (4) Turn on your computer, (5) Hold down <Delete> during bootup and enter BIOS setup to re-enter user preferences.

Battery Test Jumper (BAT_TEST)

You can test the battery's current by removing this jumper and attaching a current meter to pins 1 & 2.

> **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 *must* enter BIOS to "Load Setup Defaults" and reenter any user information after removing and reapplying this jumper.

RTC RAM   RTCLR
Normal Set.   [1-2] (Default)
Clear CMOS   [2-3] (momentarily)
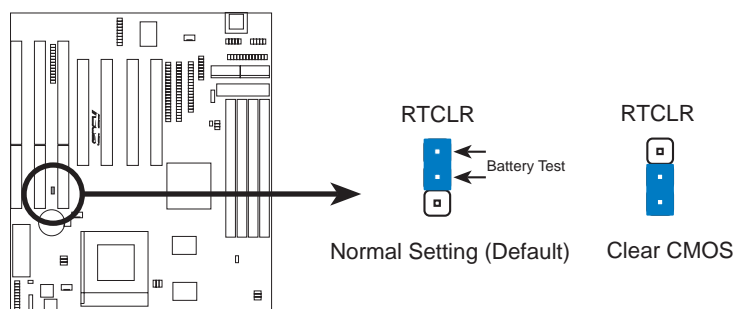
Real Time Clock (RTC) RAM

III. INSTALLATION

Compatible Cyrix CPU Identification

The only Cyrix processor that is supported on this motherboard is labeled Cyrix 6x86-P166+, which should be Revision 2.7 or later. Look on the underside of the CPU for the serial number, which should read G8DC6620A or later.

2. CPU Voltage Output Selection (VID0, VID1, VID2)

These jumpers set the voltage supplied to the CPU. The voltage regulators will automatically detect and switch between **Single Power Plane** & **Dual Power Planes**.
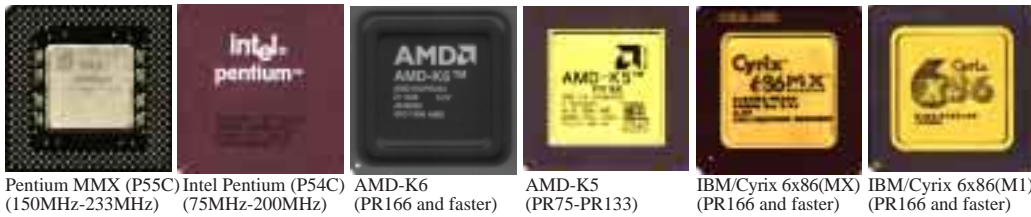
Pentium MMX (P55C)   Intel Pentium (P54C)   AMD-K6   AMD-K5   IBM/Cyrix 6x86(MX)   IBM/Cyrix 6x86(M1)
(150MHz-233MHz)   (75MHz-200MHz)   (PR166 and faster)   (PR75-PR133)   (PR166 and faster)   (PR166 and faster)

Manufacturer	CPU Type	Single Plane	Dual Plane	VID0	VID1	VID2
Intel/AMD/IBM/Cyrix	P54C/CS/K5/6x86	3.5V(VRE)	----	[1-2]	[1-2]	[2-3]
AMD	K6-PR166,200	----	2.9 Volts	[1-2]	[2-3]	[2-3]
Intel/AMD	P54C/CS/K5	3.4V(STD)	----	[2-3]	[2-3]	[2-3]
Intel/IBM/Cyrix	P55C/6x86MX	----	2.8 Volts	[2-3]	[2-3]	[2-3]
AMD	K6-PR233	----	3.2 Volts	[2-3]	[2-3]	[1-2]

	1 2 3	1 2 3	1 2 3	1 2 3
VID2				
VID1				
VID0				
Dual Plane	P55C/MX (2.8Volts)	K6-166/200 (2.9Volts)	K6-233 (3.2Volts)	
Single Plane	P54C/CS/K5 (3.4V) (STD)			P54C/CS/6x86 (3.5V) (VRE)
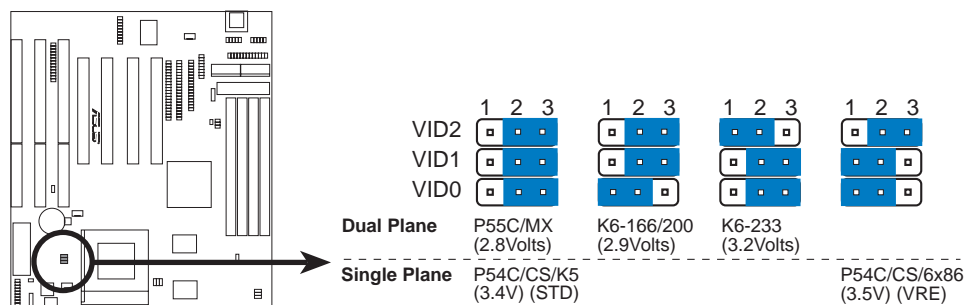
CPU Vcore Voltage ID Selection

III. INSTALLATION

3. CPU External Frequency (BUS) Selection (FS0, FS1, FS2, FS3)

These jumpers tell the clock generator what frequency to send to the CPU. These allow the selection of the CPU's *external* frequency (or *BUS Clock*). The BUS Clock multiplied by the BUS Ratio equals the CPU's *internal* frequency (the advertised CPU speed). When BUS Frequency is set to 75MHz or more, the PCI Frequency Selector (FS3) must be set to asynchronous PCI mode to maintain PCI signal stability.

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

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 jumpers for *CPU External (BUS) Frequency Selection.*

	BF0 BF1 BF2	BF0 BF1 BF2	BF0 BF1 BF2	BF0 BF1 BF2	BF0 BF1 BF2	BF0 BF1 BF2
P54C/K5	1.5x(3/2)	2.0x(2/1)	2.5x(5/2)	3.0x(3/1)	----	----
P55C/K6/MX	3.5x(7/2)	2.0x(2/1)	2.5x(5/2)	3.0x(3/1)	4.0x(4/1)	4.5x(9/2)
IBM/Cyrix 6x86	3.0x(3/1)	2.0x(2/1)	1.0x(1/1)	4.0x(4/1)	----	----

CPU : BUS Frequency Ratio

Complete Names:
Intel Pentium P54C, P55C-MMX
AMD K5, K6
IBM/Cyrix 6x86(M1), 6x86MX(M2)

Sync 50MHz	Sync 60MHz	Sync 66MHz	ASync 75MHz
FS3 1 2 3 / FS0 FS1 FS2	FS3 1 2 3 / FS0 FS1 FS2	FS3 1 2 3 / FS0 FS1 FS2	FS3 1 2 3 / FS0 FS1 FS2

CPU External Clock (BUS) Frequency Selection

III. INSTALLATION

Set the jumpers according to the internal speed of your processor as follows:

| CPU Model	Freq.	Ratio	BUS Freq.	(BUS Freq.) FS0	FS1	FS2	FS3	(Freq. Ratio) BF0	BF1	BF2
Intel Pentium	233MHz	3.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
Intel Pentium	200MHz	3.0x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[2-3]	[1-2]
Intel Pentium	166MHz	2.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[2-3]	[2-3]	[1-2]
Intel Pentium	150MHz	2.5x	60MHz	[1-2]	[2-3]	[2-3]	[1-2]	[2-3]	[2-3]	[1-2]
Intel Pentium	133MHz	2.0x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]
Intel Pentium	120MHz	2.0x	60MHz	[1-2]	[2-3]	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]
Intel Pentium	100MHz	1.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
Intel Pentium	90MHz	1.5x	60MHz	[1-2]	[2-3]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
Intel Pentium	75MHz	1.5x	50MHz	[2-3]	[2-3]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
AMD-K6-PR233	233MHz	3.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
AMD-K6-PR200	200MHz	3.0x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[2-3]	[1-2]
AMD-K6-PR166	166MHz	2.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[2-3]	[2-3]	[1-2]
AMD-K5-PR133	100MHz	1.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
AMD-K5-PR120	90MHz	1.5x	60MHz	[1-2]	[2-3]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
AMD-K5-PR100	100MHz	1.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
AMD-K5-PR90	90MHz	1.5x	60MHz	[1-2]	[2-3]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
AMD-K5-PR75	75MHz	1.5x	50MHz	[2-3]	[2-3]	[2-3]	[1-2]	[1-2]	[1-2]	[1-2]
IBM/Cyrix 6x86MX-PR233	200MHz	3.0x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]	[2-3]	[1-2]
IBM/Cyrix 6x86MX-PR200	166MHz	2.5x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[2-3]	[2-3]	[1-2]
IBM/Cyrix 6x86MX-PR166	150MHz	2.5x	60MHz	[1-2]	[2-3]	[2-3]	[1-2]	[2-3]	[2-3]	[1-2]
IBM/Cyrix 6x86L-P200+	150MHz	2.0x	75MHz	[1-2]	[2-3]	[1-2]	[2-3]	[2-3]	[1-2]	[1-2]
*IBM/Cyrix 6x86-PR166+	133MHz	2.0x	66MHz	[2-3]	[1-2]	[2-3]	[1-2]	[2-3]	[1-2]	[1-2]

*NOTE: Only IBM or Cyrix Rev 2.7 or later is supported on this motherboard (see preceding page). Bootup screen will show **6x86-P166+** with the Cyrix PR166+ installed on this motherboard.

5. VGA Selection (VGA_SEL & VGA_SEL1) (with onboard VGA version only)

These jumpers allow you to turn the onboard VGA on or off. You need to disable the onboard VGA to use your own add-on VGA expansion card.
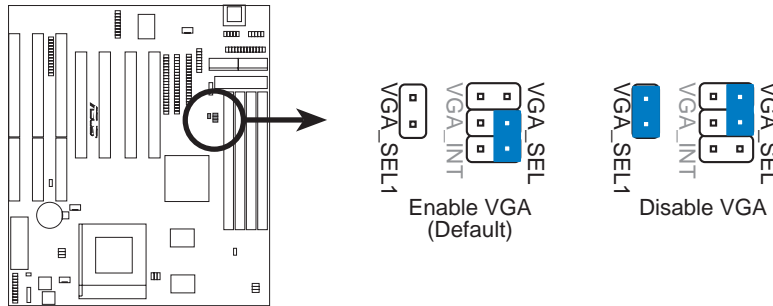
Onboard VGA

6. VGA Selection (VGA_INT) (with onboard VGA version only)

These jumpers allow you to set the VGA interrupt method. The default disables the chipset's internal interrupt routing. Some video capture cards may require that the interrupt be assigned by the onboard chipset.
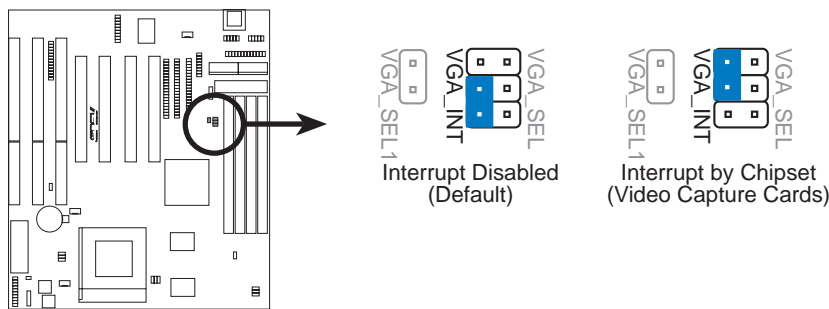
Onboard VGA Interrupt

III. INSTALLATION
(Jumpers)

III. INSTALLATION

2. System Memory (SIMM)

This motherboard supports four 72-pin, 32-bit SIMMs (Single Inline Memory Modules) of 4, 8, 16, 32, or 64MB to form a memory size between 8MB to 256MB. The SIMMs can be either 60ns or 70ns Fast Page Mode (FPM) (Asymmetric or Symmetric), or Extended Data Output (EDO) (BEDO & Parity are not supported). SIMMs must be installed in pairs so that each Row (refer to motherboard layout for Row locations) contains 64-bits of the same size and type of memory chips. One side (with memory chips) of the SIMM module takes up half a Row on the motherboard.

IMPORTANT: Memory speed is set up through "Auto Configuration" in the BIOS Chipset Setup of the BIOS SOFTWARE. If both 60ns and 70ns memory are used, set "Auto Configuration" to 70ns. 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.

Memory Socket	SIMM Memory Module		Total Memory
SIMM Sockets 1&2 (Rows 0 & 1)	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM or EDO SIMM (DIMM Sockets must be empty)	x2	
SIMM Sockets 3&4 (Rows 2 & 3)	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM or EDO SIMM (DIMM Sockets must be empty)	x2	
	Total System Memory (Max 256MB)	=	

IMPORTANT: For the SiS 5598 chipset with VGA, SIMM Sockets 1&2 must be filled before Sockets 3&4. Sockets 3&4 may be filled before 1&2 for other chipsets.

III. INSTALLATION

SIMM Installation

1. The SIMM memory modules will fit in only one orientation as shown because the plastic safety tab on one end of the SIMM sockets requires the notched end of the SIMM memory modules.

1 2 3 4

Notched End
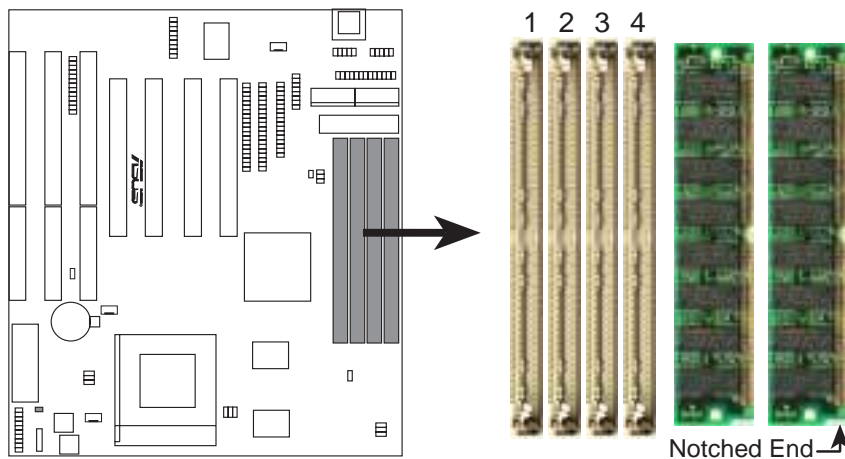
72-Pin SIMM Sockets

2. Press the memory module firmly into place starting from a 45-degree angle, making sure that all the contacts are aligned with the socket.

3. With your fingertips, rock the memory module into a vertical position so that it clicks into place. The plastic guides should go through the two mounting holes and the clips should snap.

Support Clip   **72 Pin DRAM in SIMM Socket**

Safety Tab (This Side Only)   Mounting Hole

To release the memory module, push both clips outward and rock the module out of the clips

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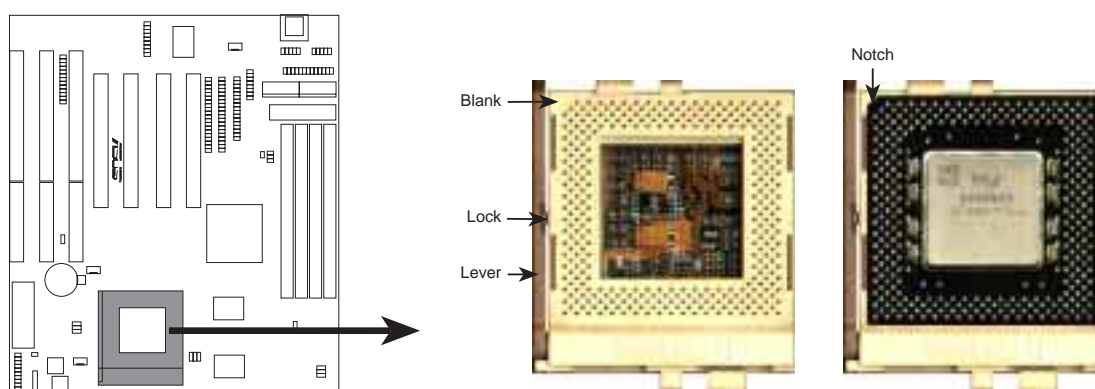**III. INSTALLATION**
(System Memory)

III. INSTALLATION

3. Central Processing Unit (CPU)

The motherboard provides a 321-pin ZIF Socket 7 that is backward compatible with ZIF Socket 5 processors. The CPU that came with the motherboard should have a fan attached to it to prevent overheating. If this is not the case, then install a fan before you turn on your system.

To install a processor, first turn off your system and remove its cover. Locate the ZIF socket and open it by first pulling the lever sideways away from the socket then upward to a 90-degree right angle. Insert the CPU with the correct orientation as shown. Use the notched corner of the CPU with the white dot as your guide. The white dot should point toward the end the of the lever. Notice that there is a blank area where one hole is missing from that corner of the square array of pin holes and a "1" printed on the motherboard next to that corner. Because the CPU has a corner pin for three of the four corners, the CPU will only fit in only one orientation as shown. The picture is for reference only; the CPU fan must cover the face of the processor. With the added weight of the fan, no force is required to insert the processor. Once the processor is completely inserted, hold down on the fan and close the socket's lever.

IMPORTANT: You must set jumpers for *CPU to BUS Frequency Ratio* and jumpers for *BUS Frequency Selection* depending on the processor that you will install.

ZIF Socket 7 with Pentium Processor

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.

III. INSTALLATION

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 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.

To simplify this process, the 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. Leave all PCI INT assignments on "A." PCI slot 1 automatically assigns an INT letter starting from A-B-C-D, PCI slot 2 assigns B-C-D-A, slot 3 assigns C-D-A-B, and slot 4 assigns D-A-B-C in these orders, therefore manual offsetting is not necessary.

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).

III. INSTALLATION

5. External Connectors

> **WARNING!** Some pins are used for connectors or power sources. These are clearly separated from jumpers as shown in the motherboard layout (page 12). Placing jumper caps over these pins will damage your motherboard.

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

Onboard Keyboard Connector
(5-pin female)

This motherboard accepts
a 5-pin AT keyboard connector
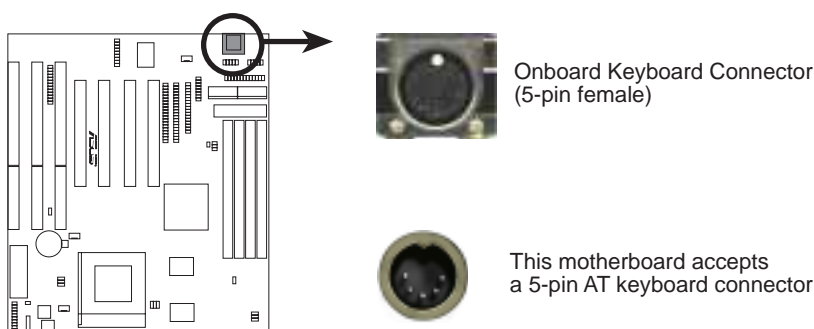
Keyboard Connector

2. **Floppy Disk Drive Connector (FLOPPY, 34-1 pin block)**
   This connector supports the provided floppy disk drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy disk drives. **(Pin 5 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 5 plugged).**

Pin 1

Orient the red stripe on the
floppy ribbon cable to pin 1.
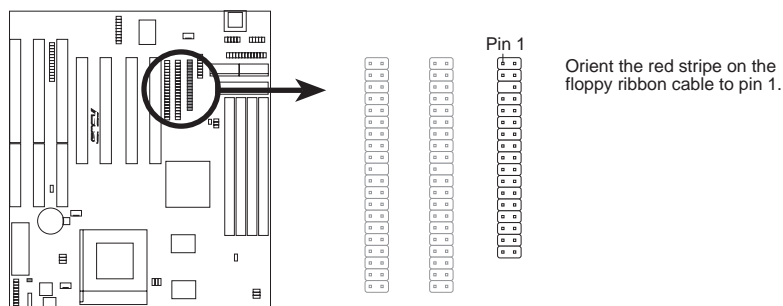
Floppy Disk Drive Connector

III. INSTALLATION

3. Parallel Port Connector (PRINTER, 26-1 pin block)

This connector supports the included parallel port ribbon cable with mounting bracket. Connect the ribbon cable to this connection 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 Parallel Port* in **Chipset Features** of the BIOS SOFT-WARE. **(Pin 26 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 26 plugged).**

Pin 1

Orient the red stripe on the cable to 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 Port Connector

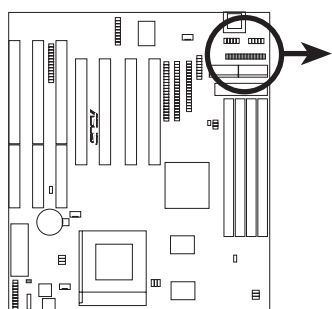**4. Serial Port Connectors (COM1/COM2, two 10-1 pin blocks)**

These 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 SOFT-WARE. **(Pin 10 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 10 plugged).**

COM 1   COM 2

Pin 1   Pin 1

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.

Onboard Serial Port Connectors

III. INSTALLATION

5. **Power Supply, Chassis Fan Connectors (PWR_, CPU_, CHA_FAN, 3 pins)**
   This connector supports a 3-pin cooling fan of 500mAmp (6watts) or less with a minimum of 3,500RPM. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be *Positive* and the black wire should be *Ground*.

> **WARNING!** Damage may occur to the motherboard and/or the fans if these pins are incorrectly used. **DO NOT PLACE JUMPER CAPS OVER THESE PINS.**
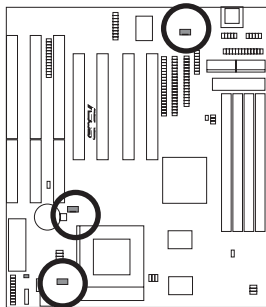
Power Supply, CPU Fan Power
Chassis Fan Power

(NC)
+12 Volt
Ground

12Volt CPU Fan Power

6. **Primary/Secondary IDE Connectors (two 40-1 pin blocks)**
   These 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 set the second drive to Slave mode. 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).**
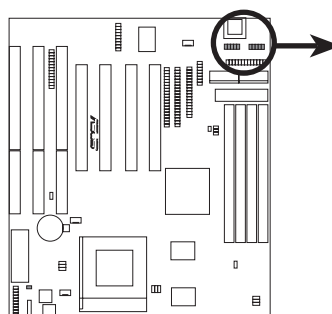
Pin 1

Orient the red stripe on the
IDE ribbon cable to pin 1

Secondary IDE Connector
Primary IDE Connector
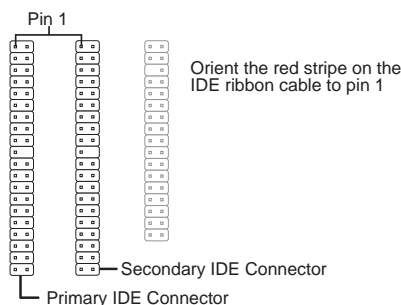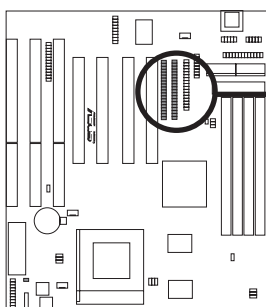
IDE (Hard Disk Drive) Connectors

TIP: You can 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 then select the boot disk through the BIOS Features Setup.

III. INSTALLATION

7. **Message LED Lead (MSG.LED, 2 pins)**
    This indicates whether a message has been received from a fax/modem. The LED will remain lit when there is no signal and blink when there is data transfer or messages waiting in the inbox. This function requires OS and driver support.

8. **SMI Suspend Switch Lead (SMI, 2 pins)**
    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 connects to the case-mounted suspend switch. If the switch is not available, you can use the turbo switch. SMI is activated when it detects a *short to open* moment; leaving it shorted, therefore, will not cause any problems. This may require one or two presses depending on the switch's position. Wake-up can be controlled through the BIOS but the keyboard will always wake-up (the SMI lead cannot wake up) the system. If you want to use this connector, the "Suspend Mode" under **Power Management Setup** of the BIOS SOFTWARE must be set to *Enable.*

9. **ATX Power Switch/Soft Power Switch Lead (PWR.SW, 2 pins)**
    The system power can be controlled by a momentary switch connected to this lead. Pressing the button once will switch the system between ON and SLEEP. Pressing the switch while in the ON mode for more than 4 seconds will turn the system off. The system power LED shows the status of the system's power.

10. **Reset Switch Lead (RESET, 2 pins)**
    This connector connects to the case-mounted reset switch to allow the restarting of your computer without having to turn it off. This is a preferred method of restarting to prolong the life of the system's power supply.

11. **System Power LED (PWR.LED, 3 pins)**
    This connector connects the system power LED, which lights when the system is powered on and blinks when it is in sleep mode.

12. **Keyboard Lock Switch Lead (KEYLOCK, 2 pins)**
    This 2-pin connector connects to the case-mounted keyboard lock switch to allow keyboard locking.

13. **Speaker Connector (SPEAKER, 4 pins)**
    This 4-pin connector connects to the case-mounted speaker.

System Panel Connectors

* Required with an ATX power supply.
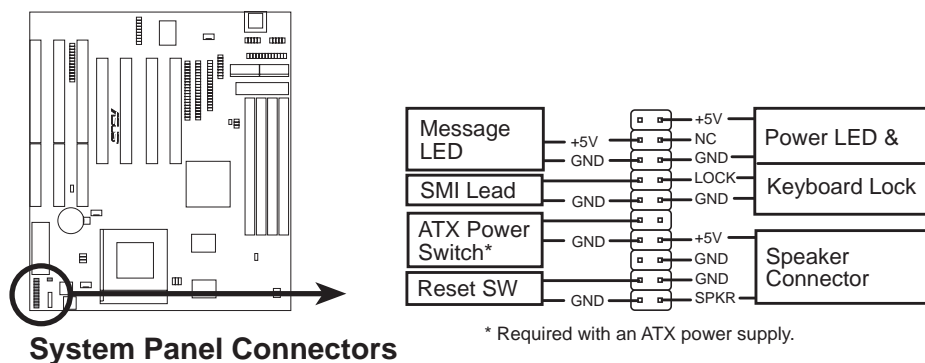
III. INSTALLATION

14. USB, Infrared, PS/2 Mouse Module Connector (USB_IR_MOUSE, 18-1 pin block)

If you want to use USB, PS/2 mouse, or infrared (IrDA) 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. See *Second IrDA...* connector for details on the infrared connector.

```
10  [□ □]  1
    [□ □]
    [□ □]
    [□ □]
    [□ □]
    [□ □]
    [□ □]
    [□ □]
18  [□ □]  9
```

10: USB +5Volt
11: USB Port 1 -
12: USB Port 1 +
13: Ground
14: (no connection)
15: PS/2 Mouse Data
16: Ground
17: Reserved
18: Reserved

1: USB +5Volt
2: USB Port 0 -
3: USB Port 0 +
4: Ground
5: (no connection)
6: PS/2 Mouse Clock
7: Ground
8: Reserved
9: Reserved

USB, Infrared, PS/2 Mouse Bracket

Infrared
PS/2 Mouse
USB 0
USB 1

USB, Infrared, PS/2 Mouse Connector

(Actual Cable Length ≈ 7.6 cm / 3 in.)
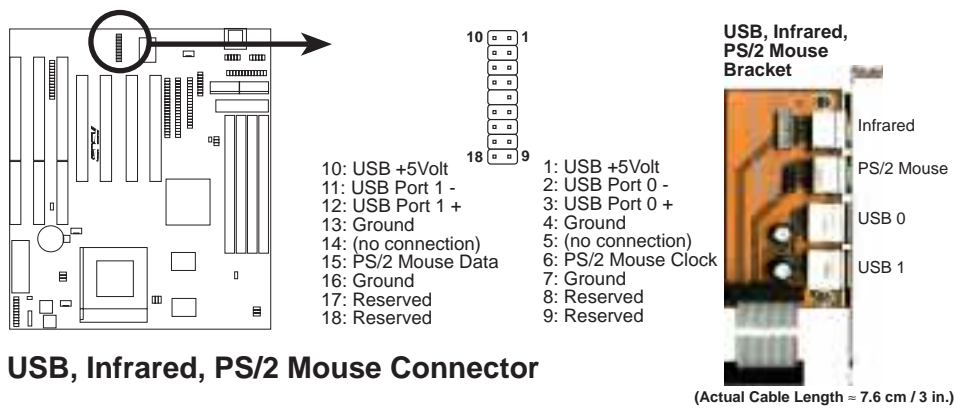
15. Second IrDA-Compliant Infrared Connector (IR, 5-pin block)

This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure the setting through *UART2 Use Infrared* in **Chipset Features Setup** to select whether UART2 is directed for use with COM2 or IrDA. Use the five pins as shown below (Back View) and connect a ribbon cable from the module to the motherboard according to the pin definitions.

Front View   Back View

FIRRX —— +5V
GND —— IRRX
—— IRTX

IRTX —— +5V
GND —— (NC)
IRRX

Infrared Module Connector

For the infrared feature to be available, you must connect an optional Infrared module to the motherboard.

16. AT Power Supply Connector (POWER, 12-pin block)

This 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.

AT Power Connector

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.

17. ATX Power Supply Connector (ATXPWR, 20-pin block)

This connector connects to an ATX power supply. The plug from the power supply will only insert in one way because of the different hole sizes. Find the proper orientation and push down firmly making sure that the pins are aligned.

IMPORTANT: Make sure that the ATX power supply can take at least 10mA load on the 5-volt standby lead (5VSB). You may experience difficulty in powering on your system if your power supply cannot support the load.

ATX Power Connector

III. INSTALLATION

18. IDE Activity LED (IDELED, 2 pins)

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.
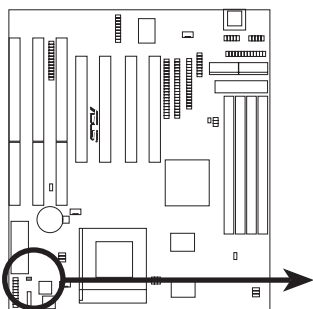
TIP: If the case-mounted LED does not light, try reversing the 2-Pin plug.

IDE LED

+ −

IDE Activity LED Lead

19. VGA Connector (VGACON, 16 pins) (with onboard VGA version only)

This connector, available only on motherboards with the SiS5598 chipset, supports the provided video or monitor cable with mounting bracket. Connect the cable to this connector and mount the bracket to the case on a free expansion slot. You can make available the monitor port by setting the VGA_SEL jumper to *Enable* (see Jumpers for the VGA settings).

1 2
15 16
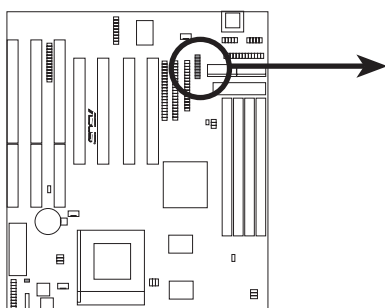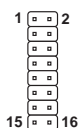
Orient the red stripe on the monitor cable with pin 1
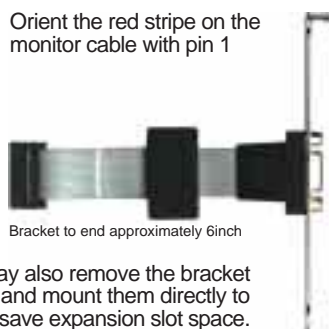
Bracket to end approximately 6inch

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

VGA (Monitor) Connector

20. Video Feature Connector (26 pins) (with onboard VGA version only)

This connector is used for third-party video accessories such as video capture cards or television tuners.
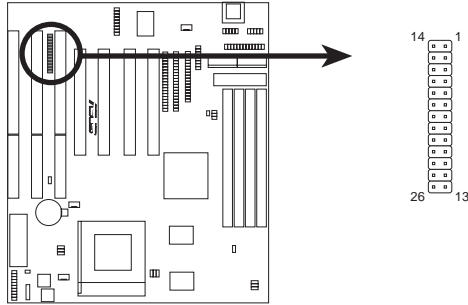
Video Feature Connector

(This page was intentionally left blank)

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 your computer's power supply.

4. Connect the power cord into a power outlet that is equipped with 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 in the chain)
   c. Your system power. For ATX power supplies, you need to switch on the power supply as well as press the ATX power switch on the front of the case.

6. The power LED on the front panel of the system case will light. For ATX power supplies, the system LED will light when the ATX power switch is pressed. 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, press <Delete> to enter the BIOS setup. Follow the instructions on the next section, "BIOS SOFTWARE."

* **Powering Off Your Computer:** You must first exit or shut down your operating system before switching off the power switch. For ATX power supplies, you can press the ATX power switch after exiting or shutting down your operating system. For Windows 95 users, you can click **Shut down the computer?** from the **Start** button and the system will give three quick beeps after about 30 seconds and power off after Windows shuts down.

   NOTE: The message, **It's now safe to turn off your computer**, will not be shown in Windows 95 when using shut down with ATX power supplies.

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 motherboard. To determine the BIOS version, check the last four numbers of the code displayed on the upper left-hand corner of your screen during bootup. Larger numbers represent a newer BIOS file.

NOTE: A binary BIOS file is no longer included with the support software. Save the motherboard's BIOS file to a floppy disk as soon as your system is operational. See "Flash Memory Writer Utility" in this section to "Save Current BIOS to File."

Flash Memory Writer Utility

```
                        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 Feature


    Enter Choice: [ 1]


    Press ESC To Exit
```

xxxx denotes the current BIOS version stored in the Flash EPROM

IMPORTANT: Flash Type may also be "INTEL 28F001BXT." If "unknown" is shown after "Flash type --," then this ROM chip is not programmable or not supported with the PnP BIOS and therefore cannot be programmed by the Flash Memory Writer.

Main Menu

1. Save Current BIOS To File (Perform as soon as system is operational)
This option allows you to copy the contents of the Flash memory chip onto a disk. This gives you a backup copy of the original motherboard BIOS in case you need to reinstall it.

Create a system disk by typing FORMAT A:/S on the DOS prompt (do not create "AUTOEXEC.BAT" and "CONFIG.SYS"), then save the PFLASH.EXE file and the BIOS to the system disk.

2. Update BIOS Main Block From File

This option updates the BIOS from a file on the disk. This can either be a new file or a backup file created by the "Save Current BIOS to File" option. This will not update the Boot Block if the Boot Block is different. You will be prompted with the following if advanced features if necessary.

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

3. Advanced Feature

Selecting this option brings up the Advanced Feature screen for clearing the PnP configuration record and updating the motherboard BIOS.

Advanced Feature Menu

```
                          Advanced Feature


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 Return To Main Menu
```

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 motherboard BIOS and the PnP ESCD Parameter Block from a new BIOS file.

NOTE: "Update BIOS Main Block from File" and "Update BIOS Including Boot Block and ESCD" require that the system is running in real mode. This utility will not operate if the system is under protected mode or virtual mode. You must boot from a system floppy disk without the "AUTOEXEC.BAT" and "CONFIG.SYS" files.

IV. BIOS
(Flash Memory Writer)

IV. BIOS SOFTWARE

Managing and Updating Your Motherboard's BIOS

Upon First Use of the Computer System
1. Create a bootable system floppy diskette by typing [FORMAT A:/S] from the DOS prompt without creating "AUTOEXEC.BAT" and "CONFIG.SYS" files.
2. Copy PFLASH.EXE to your new diskette.
3. Run PFLASH.EXE from your new diskette and select option 1 "Save Current BIOS to File." Enter the "Current BIOS Revision:" for the file name.

Updating BIOS Procedures (only when necessary)

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.

1. Download an updated ASUS BIOS file from the Internet (WWW or FTP) or a BBS (Bulletin Board Service) (see ASUS CONTACT INFORMATION on page 3 for details) and save to the disk you created earlier.
2. Turn off your computer..
3. Boot from the disk you created earlier.
4. At the "A:\" prompt, type PFLASH and then press <Enter>.
5. Enter 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. The program displays a second screen prompting you for the name of the BIOS file. Type in the complete file name and extension of the new BIOS, and then 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 your system since this might prevent your system from booting up. Just repeat the process, and if the problem still persists, update the original BIOS file you saved to disk above. If the Flash Memory Writer utility was not able to successfully update a complete BIOS file, your system may not be able to boot up. If this happens, your system will need service.

7. After successfully updating the new BIOS file, exit the Flash Memory Writer utility and then turn off your system.
8. Turn on your computer and press <Delete> to enter BIOS setup. You must select "Setup Default" to effect the new BIOS, after which you may set the other items from the Main Menu.

IV. BIOS SOFTWARE

6. BIOS Setup

The motherboard supports two programmable Flash ROM chips: 5 volts and 12 volts. 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, run 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 <Delete>, 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. Do this only, however, if the first two methods fail.

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

IV. BIOS SOFTWARE

Load Defaults

Load BIOS Defaults loads the minimized 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 preceding 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

Standard CMOS Setup 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.

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.

IV. BIOS SOFTWARE

Details of Standard CMOS Setup:

Date

To set the date, highlight the "Date" field and then press either <Page Up>, <Page Down>, plus or minus signs (on the numeric keypad) to set the current date. Follow the month, day and year format. Valid values are **Month: (1 to 12), Day: (1 to 31), Year: (up to 2079)**.

Time

To set the time, highlight the "Time" field and then press either <Page Up>, <Page Down>, plus or minus signs (on the numeric keypad) to set the current time. Follow the hour, minute and second format. Valid values are **Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59)**.

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 Disk Drives

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 because they operate using device drivers and are not supported by any BIOS. If you install the optional PCI-SC200 SCSI controller card into the motherboard (see section VI for instructions). If you install other vendor's SCSI controller card, refer to the documentation that came with the card 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 came with your hard disk should provide you with the information regarding the drive specifications.

IV. BIOS SOFTWARE

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.

Autodetection 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 disk drives 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 using 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 3.5-inch disk drive. This is normally disabled but you may choose from either *Drive A*, *Drive B*, *Both*, or *Disabled.*

Video (EGA/VGA)
Set this field to the type of video display card installed in your system. The options are *EGA/VGA*, *CGA 40*, *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 either *All Errors*; *No Errors*; *All, But Keyboard*; *All, But Diskette*; or *All, But Disk/Key.*

IV. BIOS SOFTWARE

BIOS Features Setup

BIOS Features Setup 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.

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 of conflicts with new operating systems or some programs. Installation of these programs requires that you disable *Virus Warning* to prevent write errors.

CPU Internal Cache (Enabled)
Choose *Disable* to turn off the CPU's built-in level 1 cache.

External Cache (Enabled)
Choose *Disable* to turn off the CPU's external level 2 cache.

Quick Power On Self Test (Enabled)
This field speeds up the Power-On Self Test (POST) routine by skipping retesting a second, third, and forth 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.

IV. BIOS SOFTWARE

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 default 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 one time.

Floppy Disk Access Control (R/W)
This allows protection of files from the computer system to be copied to floppy disk drives 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)
This 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 boot up. The other option is *Setup*, where the system always boots up, and prompts for the Supervisor Password only when the Setup utility is called up. You can specify a password by using the *Supervisor Password* or *User Password* option from the main screen as explained later in this section.

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. *Disabled* will reserve IRQ12 for expansion cards and therefore the PS/2 Mouse will not function.

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 *Enable* this option 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 640KB and 1024KB by the amount used for this purpose.

IV. BIOS SOFTWARE

Boot Up NumLock Status (On)
This field enables users to activate the Number Lock function upon system boot.

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.

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 9 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 Leadoff Time (Leave on default setting of 5T)

IV. BIOS SOFTWARE

Linear Mode SRAM Support (*Leave on default setting of* Disabled)
For a slightly better performance on IBM/Cyrix CPUs, this function can be Enabled to switch from Toggle mode SRAM to Linear mode SRAM support. **WARNING:** Intel CPUs currently only support the Toggle mode so this function should be *Disabled* when using Intel CPUs.

16-bit ISA Wait State (*Leave on default setting of* 1 Wait)
Timing for 16-bit ISA cards.

16-bit I/O Recovery Time (*Leave on default setting of* 5 BUSCLK)
Timing for 16-bit ISA cards.

8-bit I/O Recovery Time (*Leave on default setting of* 8 BUSCLK)
Timing for 8-bit ISA cards.

ISA Bus Clock (*Leave on default setting of* PCICLK/4)
Timing for the ISA bus clock.

Video BIOS Cacheable (*Leave on default setting of* Enabled)
This allows the video BIOS to be cached to allow faster execution.

Memory Hole at Address (None)
This feature reserves memory address space, *15M-16M*, *14M-16M*, or *12M-16M*, to ISA expansion cards that specifically require this setting. This, however, makes the memory from the specified and up unavailable to the system because expansion cards can only access memory up to 16MB.

Refresh Cycle Time (187.2 us)
This function sets the DRAM refresh rate. A slow refresh cycle time increases the bandwidth available for data transfers. **NOTE:** Some DRAMs are known to lose data without frequent refreshing so the default is set at *187.2 us*.

Delayed Transaction (Enabled)
The default setting of *Enabled* frees the PCI Bus during CPU accessing of 8-bit ISA cards, which normally consume about 50–60 PCI clocks without PCI delayed transaction. For PCI bus masters that cannot use the PCI Bus and some ISA cards that are not PCI 2.1 compliant, set this to *Disabled*.

Onboard VGA Memory Size (1MB)
This function allows the user to allocate either 1MB, 2MB or 4MB memory for the onboard video controler. Larger memory allows more colors and a higher resoultion to be selected within each operating system.

Onboard VGA Memory Clock (Leave on default setting of Fast)
This function allows the selection of the video speed. Normal uses 50MHz, Fast uses 60MHz, and Fastest uses 66MHz. If your monitor displays unrecognizable information, *you must* decrease the speed to match your monitor's frequency rate.

....

Onboard FDC Controller (Enabled)
When enabled, this field allows you to connect your floppy disk drives to the onboard floppy drive connector instead of a separate controller card. If you want to use a different controller card, 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* (default), *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* (default), *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* (default)*, 278H/IRQ 5,* or *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* (default) 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* (default), 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 section III for the **IrDA-compliant infrared module connector.**

Onboard PCI IDE Enable (Both)
You can select to enable the *Primary* IDE channel, *Secondary* IDE channel, *Both* (default), or *Disable* both channels (for systems with only SCSI drives).

IDE Ultra DMA Mode (Auto)
This sets the IDE UltraDMA to be active when using UltraDMA-capab;e IDE devices. TheBIOS will automatically adjust or disable this setting for slower IDE devices so that *Auto* or high settings will not cause problems for older IDE devices. Choose *Disable* if you do not want this feature for all devices.

IDE 0 Master/Slave PIO/DMA Mode, IDE 1 Master/Slave PIO/DMA 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. PIO and DMA settings can be independently set. The default setting of *Auto* will allow autodetection 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.

```
                  ROM PCI/ISA BIOS (<<SP97>>)
                     POWER MANAGEMENT SETUP
                      AWARD SOFTWARE, INC.

  Power Management    : User Define    IRQ3  (COM 2)       : Enable
  Video Off Option    : Susp,Stby -> Off  IRQ4  (COM 1)       : Enable
  Video Off Method    : DPMS OFF       IRQ5  (LPT 2)       : Enable
                                       IRQ6  (Floppy Disk): Enable
          ** PM Timers **              IRQ7  (LPT 1)       : Enable
  HDD Power Down      : Disable        IRQ8  (RTC Alarm)   : Disable
  Doze Mode           : Disable        IRQ9  (IRQ2 Redir)  : Enable
  Standby Mode        : Disable        IRQ10 (Reserved)    : Enable
  Suspend Mode        : Disable        IRQ11 (Reserved)    : Enable
                                       IRQ12 (PS/2 Mouse)  : Enable
       ** Power Up Control **          IRQ13 (Coprocessor) : Enable
  Ring Power Up       : Disable        IRQ14 (Hard Disk 1) : Enable
  Automatic Power Up  : Disable        IRQ15 (Hard Disk 2) : Enable


                                    ESC : Quit         ↑↓→← : Select Item
                                    F1  : Help         PU/PD/+/-  : Modify
                                    F5  : Old Values   (Shift)F2  : Color
                                    F6  : Load BIOS  Defaults
                                    F7  : Load Setup Defaults
```

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. *User Define* allows you to set power saving options according to your preference; *Disable* disables the power saving features; *Min Saving* puts the system into power saving mode after 40 min of system inactivity; *Max Saving* puts the system into power saving mode after 30 sec of system inactivity.

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 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.

....

PM Timers

This section controls the time-out settings. 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 (Disable)

This shuts down any IDE hard disk drives in the system after a period of inactivity, configurable to *1-15 Mins* or *Disable*. This feature does not affect SCSI hard disks.

Doze Mode, Standby Mode, Suspend Mode (Disable)

These fields set the period of time after which each of these modes activate: *30 Sec*, *1 Min*, *2 Min*, *4 Min*, *8 Min*, *20 Min*, *30 Min*, *40 Min*, *1 Hour*, and *Disable*.

....

Power Up Control

This section determines the ways the system can be controlled when modem activity is detected, or when power to the computer is interrupted and reapplied.

Ring Power Up Act (Disable)

Allows either settings of *Enable* or *Disable* (default) for powering up the computer (turns the ATX power supply on) when the modem begins receiving or transmitting data while the computer is off.

Automatic Power Up (Disable)

Allows you to have an unattended or automatic power up of your system. The default does not allow automatic power up. You may, however, configure your system to power up at a certain time of the day by selecting *Everyday*, which will allow you to set the time or at a certain time and day by selecting *By Date.*

....

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)

When Plug and Play operating systems (OS) are installed, interrupts may be reassigned by the OS when *Yes* is selected. When a non-Plug and Play OS is installed or to prevent reassigning of interrupt settings, select *No*.

Slot 1/2/3/4 IRQ (Auto)

The first four fields on the screen set how IRQ use is determined for each PCI slot. Slot 1 (Right) is nearest the memory sockets. The default setting for each field is *Auto*, which uses autorouting to determine IRQ use. The other options are the 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.

IV. BIOS SOFTWARE

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 (non-PnP) 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*.

....

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 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 C800, CC00, D000, D400, D800, and DC00 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, 32K, 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)
The motherboard supports Universal Serial Bus (USB) devices but current operating systems do not. The default is set to *Disabled.* If you have the necessary support disks and USB devices, set this function to *Enabled* to use the onboard USB connector.

USB IRQ (Auto)
When USB devices are connected to the onboard USB connector, the resource settings or IRQs for these devices are, by default, automatically assigned by the BIOS. You may manually select the settings: *5*, *7*, *9*, *10*, *11*, *12*, *14*, and *15.* If you are not using any USB devices, you may set this field to *N/A*.

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 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 the 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.
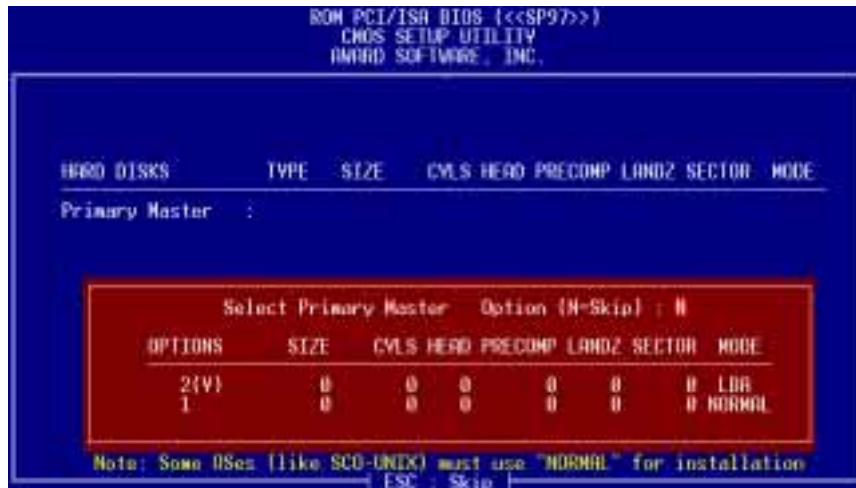
Up to four IDE drives can be detected, with parameters for each listed inside the box. To accept the optimal entries, press <Y>, otherwise select from the numbers displayed under the OPTIONS field (2, 1, 3 in this case); to skip to the next drive, press <N>. If you accept the values, the parameters will 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.

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 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 autodetection 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 autodetecting 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 autodetection feature can only detect one set of parameters for a particular IDE hard disk. Some IDE drives can use more than one set. This is not a problem if the drive is new and there is nothing on it.

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 drive was formatted, the drive will not be readable. If the autodetected parameters do not match the ones that should be used for your drive, do not accept them. Press <N> to reject the presented settings and enter the correct ones manually from the "Standard CMOS Setup" screen.

Save and Exit Setup

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

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 "Exit Without Saving" on the main screen, type "Y", and then press <Enter>.

V. SUPPORT SOFTWARE

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 autodetect 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. SUPPORT SOFTWARE

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 autodetected 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.

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.

V. SOFTWARE
(Using DMI Utility)

VI. ASUS PCI SCSI Cards

Symbios SCSI BIOS and Drivers

NOTE: The ASUS PCI-SC860 is not supported on the SP97 at this time.

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.

Interrupt Settings (A, B, C, or D)
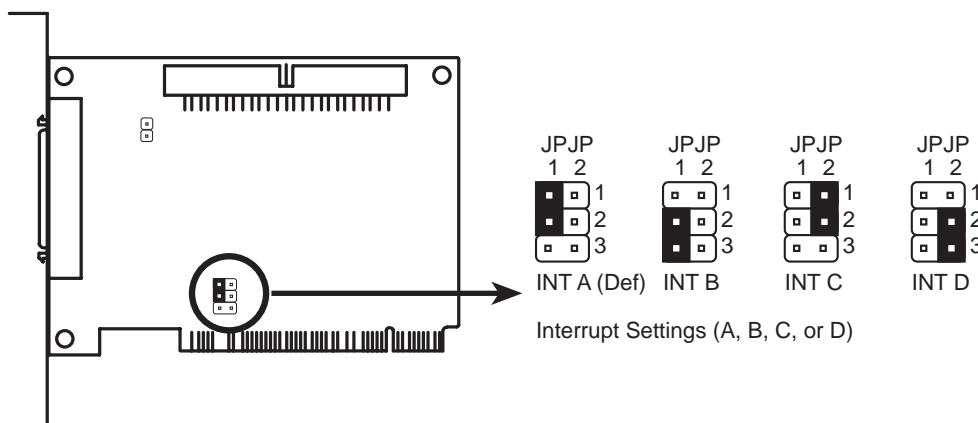
Terminator Requirements for SCSI Devices

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.
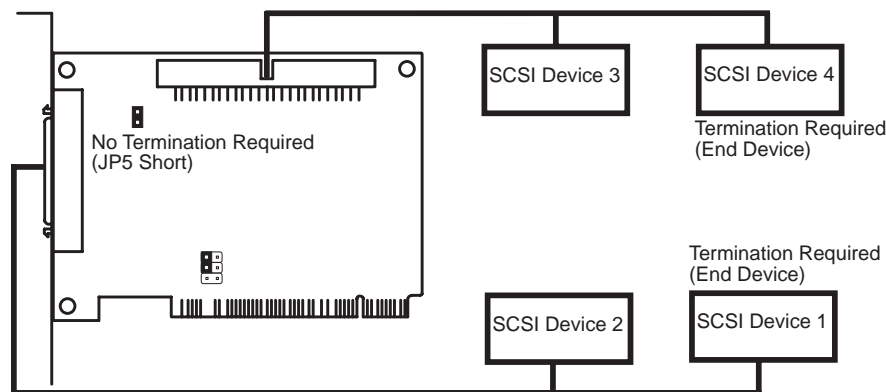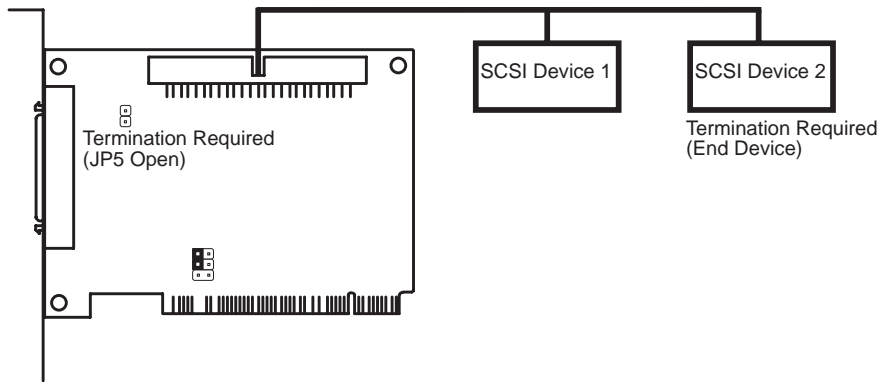
Terminator Settings for the ASUS PCI-SC200

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.

JP
5
Terminated (Default)

JP
5
Not Terminated

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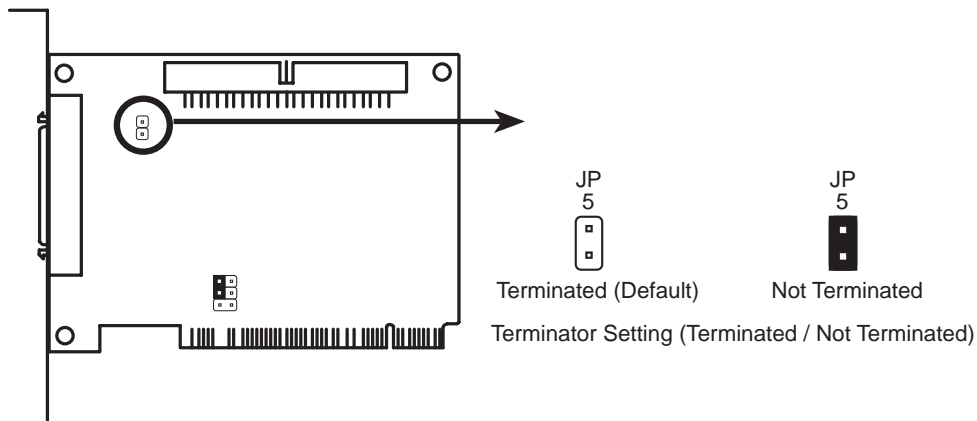
Decide whether or not you need to terminate the ASUS PCI-SC200 based on its position in the SCSI chain. Only the devices at each end of the chain need to be terminated. If you have **only** internal or **only** external devices connected to the ASUS PCI-SC200, then you **must** terminate the ASUS PCI-SC200.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

VI. ASUS PCI SCSI Cards

Termination Required
(JP5 Open)

SCSI Device 1

SCSI Device 2

Termination Required
(End Device)

No Termination Required
(JP5 Short)

SCSI Device 3

SCSI Device 4

Termination Required
(End Device)

Termination Required
(End Device)

SCSI Device 2

SCSI Device 1

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 mother-board 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

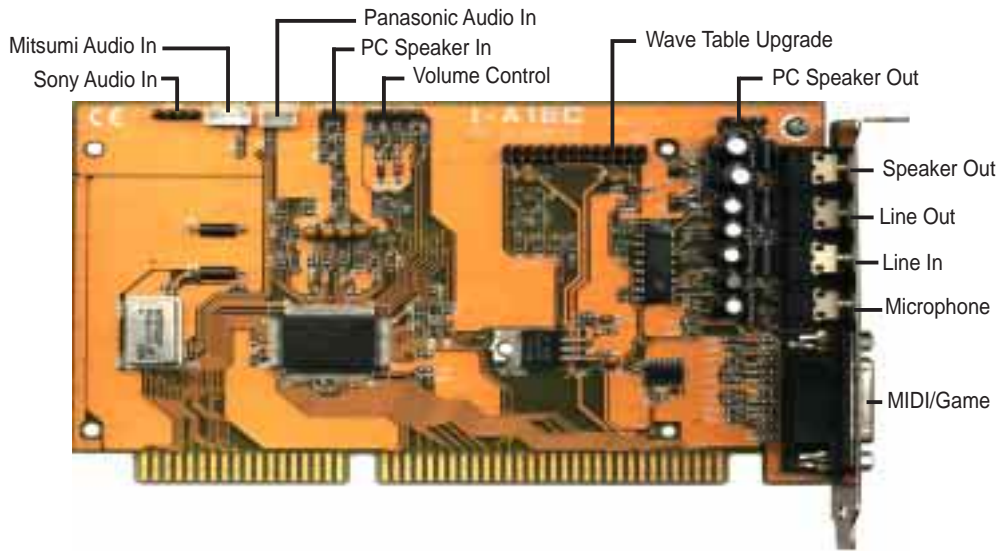## Unpacking and Handling Precautions

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 form 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

Layout and Connectors

Mitsumi Audio In
Sony Audio In
Panasonic Audio In
PC Speaker In
Volume Control
Wave Table Upgrade
PC Speaker Out
Speaker Out
Line Out
Line In
Microphone
MIDI/Game

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

Sony Audio In

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

Mitsumi Audio In

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

Panasonic Audio In

Pin	Definition
1	Left Signal
2	Ground
3	Right Signal
--	----

PC Speaker In

Pin	Definition
1	Mono Signal
2	Ground
--	----
--	----
--	----

PC Speaker Out

Pin	Definition
1	Right Signal
2	Ground
3	Left Signal
4	Ground
--	----

Volume Control

Pin	Definition
1	Ground
2	Volume Up
3	Ground
4	Volume Down
5	Ground

/ISUS® SP97-V
Pentium® Motherboard

VIDEO SOFTWARE
USER'S MANUAL

CONTENTS

VIII. DOS UTILITY

DOS Utility

1. SVGAUTL.EXE
1.1 General Description

SVGAUTL.EXE is one of the utilities of SiS 5597/5598. It supports three functions:

  (1) Video Mode Setting

  (2) Frame Rate Setting

  (3) Power Saving Setting

Since SiS 5597/5598 supports many enhanced Text Mode and Graphic Mode, you can use SVGAUTL.EXE to select the desired video mode.

For 640x480, 800x600, 1024x768, and 1280x1024 resolutions, SiS 5597/5598 supports multiple frame rates.

If your monitor could synchronize with these frame rates, you can use SVGAUTL.EXE to get advantage.

SiS 5597/5598 also supports VESA DPMS Power Saving Modes.

SVGAUTL.EXE can help you to set the capability.

1.2 How to Use?

To use SVGAUTL.EXE:

1. Type SVGAUTL in the directory where it resides.

   For example,   **C:\> SVGAUTL <Enter>** (assuming SVGAUTL.EXE is in C:\)

2. The Main Menu would appear and direct you to configure SiS 5597/5598.

3. When you complete configuration, you may save your preferences to "AUTOEXEC.BAT file and use it as your power-on (or hardware reset) default environment.

1.3 What the Parameters Stand for?

The meaning of parameters used by SVGAUTL.EXE are explained below:

Syntax:

>SVGAUTL [/D:mode_no] [/F0:n0] [/F1:n1] [/F2:n2] [/F3:n3] [/PA:ta] [/PB:tb]

where

/D: Set the Video Mode to be mode_no which is a hex number.

For example: Set 1024x768 256 color graphic mode.

>SVGAUTL /D:38 <Enter>

/F0: For 640x480, set frame rate to be n0 Hz.

Three availabe frame rates are 60, 72, and 75 Hz.

For example : Set 640x480 graphic mode with 60Hz frame rate

>SVGAUTL /F0:60 <Enter>

/F1: For 800x600, set frame rate to be n1 Hz.

Four availabe frame rates are 56, 60, 72, and 75 Hz.

For example : Set 800x600 graphic mode with 72Hz frame rate.

>SVGAUTL /F1:72 <Enter>

/F2: For 1024x768, set frame rate to be n2 Hz.

Four availabe frame rates are 87 (Interlace), 60, 70, and 75 Hz.

For example : Set 1024x768 graphic mode with 60Hz frame rate.

>SVGAUTL /F2:60 <Enter>

/F3: For 1280x1024, set frame rate to be n3 Hz.

Two availabe frame rates are 87 (Interlace) and 60 Hz.

For example : Set 1280x1024 graphic mode with 60Hz frame rate.

>SVGAUTL /F3:60 <Enter>

/PA: Set Standby Timer to be ta minutes. (0 < ta < 15 min.)

For example : Set Standby Timer be 5 minutes.

>SVGAUTL /PA:5 <Enter>

/PB: Set Suspend Timer to be tb minutes. (0 < tb < 15 min.)

For example : Set Suspend Timer be 5 minutes.

>SVGAUTL /PB:5 <Enter>

Note: 1. Suspend Time would be "ta + tb". (i.e. standby time + suspend time)
2. The timers will not be very accurate and would just be around the time.

VIII. DOS UTILITY

A1. Video Modes

A1.1 Standard VGA Modes

MODE	TYPE	DISPLAY SIZE	COLORS SHADES	ALPHA FORMAT	BUFFER START	BOX SIZE	MAX PAGES
0	A/N	320x200	16	40x25	B800	8x8	8
0*	A/N	320x350	16	40x25	B800	8x14	8
0+	A/N	360x400	16	40x25	B800	9x16	8
1	A/N	320x200	16	40x25	B800	8x8	8
1*	A/N	320x350	16	40x25	B800	8x14	8
1+	A/N	360x400	16	40x25	B800	9x16	8
2	A/N	640x200	16	80x25	B800	8x8	8
2*	A/N	640x350	16	80x25	B800	8x14	8
2+	A/N	720x400	16	80x25	B800	9x16	8
3	A/N	640x200	16	80x25	B800	8x8	8
3*	A/N	640x350	16	80x25	B800	8x14	8
3+	A/N	720x400	16	80x25	B800	9x16	8
4	APA	320x200	4	40x25	B800	8x8	1
5	APA	320x200	4	40x25	B800	8x8	1
6	APA	640x200	2	80x25	B800	8x8	1
7	A/N	720x350	4	80x25	B000	9x14	8
7+	A/N	720x400	4	80x25	B000	9x16	8
0D	APA	320x200	16	40x25	A000	8x8	8
0E	APA	640x200	16	80x25	A000	8x8	4
0F	APA	640x350	2	80x25	B000	8x14	2
10	APA	640x350	16	80x25	A000	8x14	2
11	APA	640x480	2	80x30	A000	8x16	1
12	APA	640x480	16	80x30	A000	8x16	1
13	APA	320x200	256	40x25	A000	8x8	1

NOTE: 1. A/N: Alpha/Numeric

2. APA: All Point Addressable (Graphics)

MODE	DISPLAY SIZE	COLORS SHADES	FRAME RATE.	H-SYNC.	VIDEO FREQ.
0	320x200	16	70	31.5 K	25.1 M
0*	320x350	16	70	31.5 K	25.1 M
0+	360x400	16	70	31.5 K	28.3 M
1	320x200	16	70	31.5 K	25.1 M
1*	320x350	16	70	31.5 K	25.1 M
1+	360x400	16	70	31.5 K	28.3 M
2	640x200	16	70	31.5 K	25.1 M
2*	640x350	16	70	31.5 K	25.1 M
2+	720x400	16	70	31.5 K	28.3 M
3	640x200	16	70	31.5 K	25.1 M
3*	640x350	16	70	31.5 K	25.1 M
3+	720x400	16	70	31.5 K	28.3 M
4	320x200	4	70	31.5 K	25.1 M
5	320x200	4	70	31.5 K	25.1 M
6	640x200	2	70	31.5 K	25.1 M
7*	720x350	4	70	31.5 K	28.3 M
7+	720x400	4	70	31.5 K	28.3 M
0D	320x200	16	70	31.5 K	25.1 M
0E	640x200	16	70	31.5 K	25.1 M
0F	640x350	2	70	31.5 K	25.1 M
10	640x350	16	70	31.5 K	25.1 M
11	640x480	2	60	31.5 K	25.1 M
12	640x480	16	60	31.5 K	25.1 M
13	320x200	256	70	31.5 K	25.1 M

NOTE: i - interlaced mode

          n - noninterlaced mode

VIII. DOS UTILITY

A1.2 Enhanced Video Modes

MODE	TYPE	DISPLAY SIZE	COLORS SHADES	ALPHA FORMAT	BUFFER START	BOX SIZE	MAX. PAGES
22	A/N	1056x352	16	132x44	B800	8x8	2
23	A/N	1056x350	16	132x25	B800	8x14	4
24	A/N	1056x364	16	132x28	B800	8x13	4
25	APA	640x480	16	80x60	A000	8x8	1
26	A/N	720x480	16	80x60	B800	9x8	3
29	APA	800x600	16	100x37	A000	8x16	1
2A	A/N	800x600	16	100x40	B800	8x15	4
2D	APA	640x350	256	80x25	A000	8x14	1
2E	APA	640x480	256	80x30	A000	8x16	1
2F	APA	640x400	256	80x25	A000	8x16	1
30	APA	800x600	256	100x37	A000	8x16	1
37	APA	1024x768	16	128x48	A000	8x16	1
38	APA	1024x768	256	128x48	A000	8x16	1
39	APA	1280x1024	16	160x64	A000	8x16	1
3A	APA	1280x1024	256	160x64	A000	8x16	1
40	APA	320x200	32K	40x25	A000	8x8	1
41	APA	320x200	64K	40x25	A000	8x8	1
42	APA	320x200	16.8M	40x25	A000	8x8	1
43	APA	640x480	32K	80x30	A000	8x16	1
44	APA	640x480	64K	80x30	A000	8x16	1
45	APA	640x480	16.8M	80x30	A000	8x16	1
46	APA	800x600	32K	100x37	A000	8x16	1
47	APA	800x600	64K	100x37	A000	8x16	1
48	APA	800x600	16.8M	100x37	A000	8x16	1
49	APA	1024x768	32K	128x48	A000	8x16	1
4A	APA	1024x768	64K	128x48	A000	8x16	1
4B	APA	1024x768	16.8M	128x48	A000	8x16	1
4C	APA	1280x1024	32K	160x64	A000	8x16	1
4D	APA	1280x1024	64K	160x64	A000	8x16	1

NOTE: 1. A/N: Alpha/Numeric
       2. APA: All Point Addressable (Graphics)

MODE	DISPLAY SIZE	COLORS SHADES	FRAME RATE.	H-SYNC.	VIDEO FREQ.
22	1056x352	16	70	30.5 K	40.0 M
23	1056x350	16	70	30.5 K	40.0 M
24	1056x364	16	70	30.5 K	40.0 M
25	640x480	16	60	31.5 K	25.1 M
26	720x480	16	60	31.5 K	25.1 M
29	800x600	16	56	35.1 K	30.0 M
29*	800x600	16	60	37.9 K	40.0 M
29+	800x600	16	72	48.0 K	50.0 M
29#	800x600	16	75	46.8 K	50.0 M
29##	800x600	16	85	53.7 K	56.3 M
2A	800x600	16	56	35.1 K	36.0 M
2D	640x350	256	70	31.5 K	25.1 M
2E	640x480	256	60	31.5 K	25.1 M
2E*	640x480	256	72	37.9 K	31.5 M
2E+	640x480	256	75	37.5 K	31.5 M
2E++	640x480	256	85	43.4 K	36.0 M
2F	640x400	256	70	31.5 K	25.1 M
30	800x600	256	56	35.1 K	36.0 M
30*	800x600	256	60	37.9 K	40.0 M
30+	800x600	256	72	48.0 K	50.0 M
30#	800x600	256	75	46.8 K	50.0 M
30##	800x600	256	85	53.7 K	56.3 M
37i	1024x768	16	87	35.5 K	44.9 M
37n	1024x768	16	60	48.4 K	65.0 M
37n+	1024x768	16	70	56.5 K	75.0 M
37n#	1024x768	16	75	60.2 K	80.0 M
37n##	1024x768	16	85	68.7 K	94.5 M
38i	1024x768	256	87	35.5 K	44.9 M
38n	1024x768	256	60	48.4 K	65.0 M
38n+	1024x768	256	70	56.5 K	75.0 M
38n#	1024x768	256	75	60.2 K	80.0 M
38n##	1024x768	256	85	68.7 K	94.5 M
39i	1280x1024	16	87	48.8 K	80.0 M
39n	1280x1024	16	60	65.0 K	110.0 M
39n+	1280x1024	16	75	80.0 K	135.0 M
3Ai	1280x1024	256	87	48.8 K	80.0 M
3An	1280x1024	256	60	65.0 K	110.0 M
3An+	1280x1024	256	75	80.0 K	135.0 M
40	320x200	32K	70	31.5 K	25.1 M
41	320x200	64K	70	31.5 K	25.1 M
42	320x200	16.8M	70	31.5 K	25.1 M
43	640x480	32K	60	31.5 K	25.1 M
43*	640x480	32K	72	37.9 K	31.5 M
43+	640x480	32K	75	37.5 K	31.5 M
43++	640x480	32K	85	43.4 K	36.0 M
44	640x480	64K	60	31.5 K	25.1 M
44*	640x480	64K	72	37.9 K	31.5 M
44+	640x480	64K	75	37.5 K	31.5 M

VIII. DOS UTILITY

MODE	DISPLAY SIZE	COLORS SHADES	FRAME RATE.	H-SYNC.	VIDEO FREQ.
44++	640x480	64K	85	43.4 K	36.0 M
45	640x480	16.8M	60	31.5 K	25.1 M
45*	640x480	16.8M	72	37.9 K	31.5 M
45+	640x480	16.8M	75	37.5 K	31.5 M
45++	640x480	16.8M	85	43.4 K	36.0 M
46	800x600	32K	56	35.1 K	36.0 M
46*	800x600	32K	60	37.9 K	40.0 M
46+	800x600	32K	72	48.0 K	50.0 M
46#	800x600	32K	75	46.8 K	50.0 M
46##	800x600	32K	85	53.7 K	56.3 M
47	800x600	64K	56	35.1 K	36.0 M
47*	800x600	64K	60	37.9 K	40.0 M
47+	800x600	64K	72	48.0 K	50.0 M
47#	800x600	64K	75	46.8 K	50.0 M
47##	800x600	64K	85	53.7 K	56.3 M
48	800x600	16.8M	56	35.1 K	36.0 M
48*	800x600	16.8M	60	37.9 K	40.0 M
48+	800x600	16.8M	72	48.0 K	50.0 M
48#	800x600	16.8M	75	46.8 K	50.0 M
48##	800x600	16.8M	85	53.7 K	56.3 M
49i	1024x768	32K	87	35.5 K	44.9 M
49n	1024x768	32K	60	48.4 K	65.0 M
49n+	1024x768	32K	70	56.5 K	75.0 M
49n#	1024x768	32K	75	60.2 K	80.0 M
49n##	1024x768	32K	85	68.7 K	94.5 M
4Ai	1024x768	64K	87	35.5 K	44.9 M
4An	1024x768	64K	60	48.4 K	65.0 M
4An+	1024x768	64K	70	56.5 K	75.0 M
4An#	1024x768	64K	75	60.2 K	80.0 M
4An##	1024x768	64K	85	68.7 K	94.5 M
4Bi	1024x768	16.8M	87	35.5 K	44.9 M
4Bn	1024x768	16.8M	60	48.4 K	65.0 M
4Bn+	1024x768	16.8M	70	56.5 K	75.0 M
4Bn#	1024x768	16.8M	75	60.2 K	80.0 M
4Bn##	1024x768	16.8M	85	68.7 K	94.5 M
4Ci	1280x1024	32K	89	48.8 K	80.0 M
4Di	1280x1024	64K	89	48.8 K	80.0 M

NOTE: i - interlaced mode
          n - noninterlaced mode

***   For the limitation of memory bandwidth in 1MB DRAM configuration, the
following video modes is not supported in 1MB configuration: modes 45*,
45+, 46+, 46#, 47+, and 47#.**

IX. SOFTWARE DRIVERS

Software Drivers

To make use of the advance features of SiS 5597/5598, extended graphic and text modes are supported by software application drivers developed by SiS. The following applications are currently supported:

- 3D Studio Ver. 3.0

- AutoCAD/386 Release 11, 12

- Auto Shade/386 Ver. 2.0

- MicroSoft Windows 3.1

- MicroSoft Windows NT Ver. 3.1, 3.5, 3.51, 4.0

- MicroSoft Windows 95

- OS/2 Presentation Manager 2.1 & 3.0

IX. SOFTWARE DRIVERS

1. Windows 3.1

1.0 Version Notes

The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

1.1 Driver Files

1. The enclosed SiS 5597/5598 Windows 3.1 driver contains SETUP.EXE and other installation-related files.

IX. SOFTWARE DRIVERS

1.2 Installation

1.2.1 Unpack & Copy

To unpack and copy drivers to where they should reside, please follow the following procedures:

1. Boot up Windows using standard VGA mode.

2. In Windows Program Manager Screen, choose "File" item.

3. In "File Item List", choose "Run" item.

4. In "Run" Screen, select your driver source. e.g. D:\MM\WIN31\SETUP.EXE

5. Follows the directions appeared on the screen to complete the unpack & copy procedures.

6. After unpack & copy complete, a SiS Multimedia Vx.xx" program group would be created and shown on screen.

7. In the "SiS Multimedia Vx.xx" program group, there would be five icons:

    (1) SiS Multimedia Manager: To create a small "SiS Multimedia" icon on the corner of the screen.

    (2) SVGA Setup: SiS VGA graphics configuration system

    (3) SiS MMPlayer: To create a SiS MMPlayer" VCP-like icon on the screen.

    (4) Center Screen:An utility to adjust the position of display on the screen.

    (5) Uninstall utility.

1.2.2 Graphics Setup

1. In "SiS Multimedia Vx.xx" program group, choose "SVGA Setup" icon to enter "SiS VGA Configuration System" screen.

2. In "SiS VGA Configuration System" Screen, choose which options you would like to use.

3. After completing your selections, choose "OK" to make all your selections effective.

4. Choose "Restart Winodws" to re-boot Windows using new settings. Or, choose "Continue" to continue your current Windows processes. (But when you re-boot Windows, the new settings would take effect.)

IX. Software Drivers
(Windows 3.1)

IX. SOFTWARE DRIVERS

1.2.3 Power Saving Setup in Windows

1. In "SiS VGA Configuration System" screen, choose "power saver" item to enter "Power Saver" screen.

2. In "Power Saver" Screen, choose which options you would like to use.

3. After completing the selections, choose "OK" to make all your selections effective.

4. After complete setup, the power_saver would take effect as you request when time up and you may continue your normal process.

1.2.4 Zoom_Key Setup

In "SiS VGA Configuration System" screen, choose "zooming" item to define "hot keys" for zoom-in or zoom-out screen without entering setup program.

The operation principles of zoom-in and zoom-out are as follow:

  (1) The resolution change sequence for zoom-in is

      1024x768 ===> 800x600 ===> 640x480 .

  (2) The resolution change sequence for zoom-out is

      640x480 ===> 800x600 ===> 1024x768 .

  (3) But you must first be able to zoom-in before you may zoom-out, that means you can not get a resolution larger than that you setup.

To use this feature, please follow the following procedures.

1. In "SiS VGA Configuration System" screen, choose "zooming" item to enter "Zooming Hotkey" screen.

2. In "Zooming Hotkey" Screen, choose which "hot key" you would like to use and enable it.

3. After completing the selections, choose "OK" to make all your selections effective.

4. After complete setup, you may use your own defined hot key to zoom-in or zoom-out screen.

1.2.5 Notes

1. The power saver's timer settings would be effective even exit Windows back to DOS.

IX. SOFTWARE DRIVERS

1.3 Video Operations

1.3.1 DCI Function

SiS 5597/5598 supports DCI driver for software MPEG playback and other media player programs which could take advantage of DCI.

The SiS 5597/5598 DCI driver is automatically loaded during "Windows Driver Unpack & Copy" process. Therefore it should be transparent to the end-user and any media players could take advantage of it.

1.3.2 SiS MMPlay (SW MPEG)

To make SW MPEG playback more friendly than original SW MPEG player supplier provided, SiS provide an MMPlayer application program to provide an VCP-like (Video Cassette Player) interface.
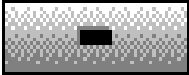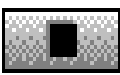
To take advantage of the SiS MMPlayer, you must first install "SW MPEG Player". All the SiS provided is just an interface but not a SW MPEG Player at present. If the SW MPEG Player does not exist, the SiS MMPlayer will not work. (Xing or Mediamatics SW MPEG Player supported)

To use the SiS MMPlayer, you just follow the procedures below:

1. In "SiS Multimedia Vx.xx" program group, choose "SiS MMPlayer" icon and SiS MMPlayer VCP-like icon would appear.

2. Enjoy the SW MPEG playback as you like.

IX. SOFTWARE DRIVERS

MMPLAY.EXE Button Description

Button		Description
■	:	Power On/Off
▼	:	Open File & Type Control
◆	:	Minimize This Application
▲	:	Eject CD Title (Not implemented yet.)
◀◀	:	Fast Backward
▶▶	:	Fast Forward
I◀	:	Mark in
▶I	:	Mark out
II	:	Pause
▶	:	Play
■	:	Stop
▶I	:	End
I◀	:	Begin
▲	:	Volume increase (Not implemented yet.)
▼	:	Volume decrease (Not implemented yet.)

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IX. SOFTWARE DRIVERS

2. Windows 95

2.0 Version Note

The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

2.1 Driver Files

1. The enclosed SiS 5597/5598 Windows 95 drivers files are:

   SETUP.EXE   **SIS597.DRV**   **SIS597.INF**

   SISMINI.VXD   **Other Files**

2. All the 16-color, 256-color, 32K/64K-color, and 16M-color drivers are available.

2.2 Installation

1. Boot up Windows 95.

2. In Windows 95 "Booted" Screen, select "My Computer" icon.

3. In "My computer" Screen, select "Control Panel" icon.

4. In "Control Panel" Screen, select "Display" icon.

5. In "Display Properties" Screen, select "Settings" item.

6. In refreshed "Display Properties" Screen, select "Change Display_Type" item.

7. In "Change Display Type" Screen, select "Adapter Type ==> Change" item.

8. In "Select Device" Screen, select "Have Disk..." item.

9. In "Install From Disk" Screen, select your driver source.e.g. A:\WIN95

10. In new "Select Device" Screen, "SiS 5597/5598" would appear and select "OK". Then Windows 95 would perform driver installation.

11. After completing installation, Windows 95 would go back to "Change Display Type" Screen, select "Close" item.

12. Windows 95 would go back to "Display Properties" Screen, select "Close" or "Apply" item.

13. In "System Settings Change" Screen, select "Yes" item to restart your computer.

14. After restarting, Windows 95 will run on 640x480x256 color, 60NI.

IX. SOFTWARE DRIVERS

2.3 Using "Display Modes"

1. Go to "Display Properties" Screen and you will find that "Display Modes" item had been added.

2. First select "Display Modes" item and you may select desired resolution by changing "Desktop area" pointer, desired color by changing "Color palette" value, desired font size by changing "Font size", and   desired refresh rate by changing "Refresh rate".

3. After completing selection, select "OK" or "Apply" to complete the whole installation.

4. In "SiS 5597/5598 Settings" Screen, select "OK".

5. Two cases happen :

   a). You did not change "color" and/or "font size".

      1. "SiS 5597/5598 Settings" Screen appears again,

      2. Select "Yes" and you may work on your selected mode now.

   b). You changed "color" and/or "font size".

      1. System will reboot.

      2. You may work on your selected mode now.

IX. SOFTWARE DRIVERS

2.4 Utilities

2.4.1 Installation

1. From "Start Menu", select "Run" item.

2. In "Run" Screen, select your source execution file.

    e.g. D:\MM\WIN95\SETUP.EXE

3. In "SiS Multimedia Setup Ver x.xx", select "OK".

4. A "SiS Multimedia Vx.xx" program group would be created and shown on screen, select "Restart Now".

5. In the "SiS Multimedia Vx.xx" program group, there are three icons:

    (1) SiS Multimedia Package: To create a small "SiS Multimedia" icon on the corner of the screen.

    (2) SiS MMPlayer: To create a "SiS MMPlayer" VCP-like icon on the screen.

    (3) Center Screen: An utility to adjust the position of display on the screen.

6. "SiS Multimedia V x.xx" program group has been created, select "Restart Now".

2.4.2 Operation

1. For Video Operations ("SiS MMPlayer"), please refer to section 1.3.

IX. SOFTWARE DRIVERS

3. Windows NT 3.5 & 3.51

3.0 Version Note

The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

3.1 Driver Files

(1) The enclosed SiS 5597/5598 Windows NT 3.5 & 3.51 drivers are:

      SISTAG   SISV.SYS   SISV256.DLL

      SISV.DLL   OEMSETUP.INF

(2) All the 16-color, 256-color, 32K/64K-color, and 16M-color drivers are available.

3.2 Installation

1. Select Control Panel from Main group.
2. Select Display icon.
3. Select Change Display Type from Display Settings.
4. Select Change from Display Type.
5. Select Other from Select Device.
6. Place the SiS 5597/5598 CD-title Disk into CD-ROM Drive.
7. When the "Install from Disk" dialog box appears, type the directory storing the drivers and click "OK".
    The directory in CD-Title   is at "D:\MM\WINNT\WINNT35".
8. Select Install and click "Yes" when the "Installing Driver" dialog box appears.
9. Select New when the "Windows NT Setup" dialog box appears.
10. Click "Continue" - A message will appear stating that the drivers were successfully installed. Click "OK". You must now restart Windows NT 3.51.

3.3 Selecting resolution and color depth

1. Select Control Panel from Main group.
2. Select Display icon.
3. Select Color Palette to change between 16 colors, 256 colors, 32768 colors, 65536 colors, and 16777216 colors.
4. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640x480, 800x600, 1024x768, and 1280x1024.
5. Select Test to test the resolution.
    If the display test screen was good then select "Yes" when the "Testing Mode" dialog box appears. If the display test screen was bad then select "No". Windows NT will give you an error message.
6. If the display test screen was good and you select "Yes", Windows NT 3.51 will prompt you to restart Windows NT 3.51.

IX. SOFTWARE DRIVERS

4. Windows NT 4.0

4.0 Version Note

The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

4.1 Driver Files

(1) The enclosed SiS 5597/5598 Windows NT 4.0 drivers are:

SISV.SYS	SISV256.DLL
SISV.DLL	SISV5597.INF

(2) All the 16-color, 256-color, 32K/64K-color, and 16M-color drivers are available.

4.2 Installation

1. Click "Start" menu and select Control Panel from Settings group.
2. Select Display icon.
3. Select Settings of Display Properties.
4. Select Display Type.
5. Select Change from the Adapter Type area.
6. Select Have Disk of Change Display.
7. Place the SiS 5597/5598 CD-Title Disk into CD-ROM Drive.
8. When the "Install from Disk" dialog box appears, type the directory storing the drivers and click "OK".
   The directory in CD-Title is at "D:\MM\WINNT\WINNT40".
9. When the "Change Display" dialog box appears, click "OK".
10. When the "Third-party Drivers" dialog box appears, click "Yes" - A message will appear stating that the drivers were successfully installed.
11. Click "OK". You must now restart Windows NT 4.0.

4.3 Selecting resolution and color depth

1. Click "Start" menu and select Control Panel from Settings group.
2. Select Display icon.
3. Select Settings.
4. Select Color Palette to change between 16 colors, 256 colors, 32768 colors, 65536 colors, and 16,777,216 colors.
5. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640x480, 800x600, 1024x768, and 1280x1024.
6. Select Test to test the resolution. If the display test screen was good then select "Yes" when the "Testing Mode" dialog box appears. If the display test screen was bad then select "No". Windows NT 4.0 will give you an error message.
7. Click "OK". If the display test screen was good and you select "Yes", Windows NT 4.0 will change the mode without restarting Windows NT 4.0.

IX. SOFTWARE DRIVERS

5. Autodesk ADI 4.2 -Protected Mode

5.0 General Description

5.0.1 Driver Files

1. The enclosed SiS 5597/5598 ADI driver contains the following file:

    RCPSIS.EXP SiS ADI Driver (for all resolutions & colors)

    Note: This version of ADI driver does not support 16-color operation.

2. This driver fits for a series of Autodesk Inc. products including:

    (1) AutoCAD/386 R11

    (2) AutoCAD/386 R12

    (3) AutoShade/386 V2.0

    (4) 3D Studio V3.0

3. Their installation procedures are different from one program to the others. But the first step of installation is the same for all these programs, that is "To unpack and copy drivers to where you would like them to reside." Therefore, we will state this step below.

4. As to the real installation procedures for each program, we will give a detail description in Sec. 5.1 to Sec. 5.4.

5.0.2   Unpack & Copy

To unpack and copy drivers to where they should reside, please follow the following procedures:

1. Run "INSTDRV.EXE" where it resides.

2. In "SiS Super VGA Drivers Installation" menu, select "A. ADI 4.2" to unpack and copy drivers. (To select, type "A")

3. In "Unpack & Copy ADI 4.2 Drivers" screen, **keyin the "drive:\directory" where these drivers would reside** (default C:\ADI42). Program would unpack & copy all related driver files to where you assign.

4. After "unpack and copy" completed, exit the INSTDRV.EXE program.

5. Refer to Sec. 5.1 to Sec. 5.4 for the real installation procedures for each program.

IX. SOFTWARE DRIVERS

5.1 AutoCAD R11 Setup

1. The following procedures assume that

   (1) You have complete "unpack & copy" procedure.

   (2) Your ADI 4.2 drivers are located in C:\ADI42.

2. Add the following setting to your own batch file for AutoCAD R11 (say ACADR11.BAT) or to your "AUTOEXEC.BAT" file:

   SET DSPADI=\ADI42\RCPSIS.EXP <Enter>

3. Delete the configure file ACAD.CFG resides in \ACAD directory.

4. Type ACADR11 <Enter> to configure your AutoCAD R11 system.

5. In "Select Display Device:" item, choose "ADI P386 V4.0/4.1 display"

6. In "Select Display Resolution" screen, choose which display driver you want to use.

7. Go through the whole instrutions, and the system would start with the desired display setting.

IX. Software Drivers
(AutoCAD R1.1)

IX. SOFTWARE DRIVERS

5.2 AutoCAD R1.2 Setup

1. The following procedures assume that

   (1) You have complete "unpack & copy" procedure.

   (2) Your SiS ADI 4.2 drivers are located in C:\ADI42.

   (3) Your AutoCAD R12 program is located in C:\ACADR12.

   (4) Your AutoCAD R12 default drivers are located in C:\ACADR12\DRV.

   (5) Your AutoCAD R12 configure file ACAD.CFG is located in C:\ACADR12.

2. Copy the following driver file to C:\ACADR12\DRV: RCPSIS.EXP.

   You may complete this step by COPY C:\ADI42\RCPSIS.EXP C:\ACADR12\DRV.

3. Delete your original ACAD.CFG file. You may complete this step by DEL C:\ACADR12\ACAD.CFG.

4. Restart your AutoCAD R12 program as usual.

5. AutoCAD R12 will ask you to complete the configuration procedures since it can't find the configure file ACAD.CFG.

6. Follow the instructions of AutoCAD R12 to proceed configuration.

7. In "Available Video Displays:" item, choose the "SiS Super VGA ADI v4.2 Display and Rendering driver" item.

8. In "Select Display Resolution" screen, choose which display driver you want to use.

9. Go through the whole instructions, and the system would start with the selected display setting.

IX. SOFTWARE DRIVERS

5.3 AutoShade R2.0 Setup

1. The following procedures assume that

   (1) You have complete "unpack & copy" procedure.

   (2) Your ADI 4.2 drivers are located in C:\ADI42.

2. Add the following settings to your batch file for AutoShade R2.0 (say SHADE2.BAT) or to your "AUTOEXEC.BAT" file.

   (a) For display driver setting, SET DSPADI=\ADI42\RCPSIS.EXP.

   (b) For rendering driver setting, SET RDPADI=\ADI42\RCPSIS.EXP.

3. Delete the configure file SHADE.CFG.

4. Type SHADE2 <Enter> to re-configure the AutoShade.

5. While prompting "Select display device:", choose "P386 AutoDesk Device Interface display driver."

6. While prompting "Select rendering display driver:", choose "P386 AutoDesk Device Interface rendering driver."

7. Go through all the instructions, the system would start with the desired display setting.

IX. Software Drivers
(AutoCAD R2.0)

5.4 3D Studio Version 3.0 Setup

1. The following procedures assume that

   (1) You have complete "unpack & copy" procedure.

   (2) Your ADI 4.2 drivers are located in C:\ADI42.

2. Create your own **3D Studio V3.0 batch file (say 3DS3.BAT)** and add the following settings to it, or add the following settings to your **"AUTOEXEC.BAT"** file.

   (1) **SET RCPADI=C:\ADI42\RCPSIS.EXP**

   (2) **SET RDPADI=C:\ADI42\RCPSIS.EXP**

3. Execute the new 3DS batch file or reboot the computer using the new "AUTOEXEC.BAT" as to make the new settings effective.

4. Change your current working directory to \3DS3 (where your 3D Studio V3.0 usually resides).

5. Delete original configuration file "3DADI.CFG".

6. Type **3DS VIBCGF <Enter>** to configure your display environment.

7. After the "Company Register Screen" appears, press **<Enter>** to continue.

8. The "Video Environment Configuration Screen" will appear.

   Please follow the following procedures to configure your video display environment.

   (1) In Main-Display" item,

      (a) Press **<Enter>** The selection menu will appear.

      (b) In selection menu, move cursor to **"RCPADI"**. Press **<Enter>** to select.

   (2) In "Material-Display" item,

      (a) Press **<Enter>** The selection menu will appear.

      (b) In selection menu, move cursor to **"RCPADI"**. Press **<Enter>** to select.

   (3) In "Render-Display" item,

      (a) Press **<Enter>** The selection menu will appear.

      (b) In selection menu, move cursor to **"RCPADI"** or **"RDPADI".** Press **<Enter>** to select.

   (4) Complete the other selections and exit configuration.

IX. Software Drivers
(3D Studio)

9. After exit configure, 3DS will boot automatically using the environment you just select.

10. If your previous configuration is OK, 3DS will ask you to make detail configuration for SiS 5597/5598 drivers. If this didn't happen, please check your previous procedures or contact the technical support people.

11. In the detail configuration for SiS 5597/5598 drivers, just follow the instructions appear on the screen and make your own choice. If you are confused in anything, contact the technical support people for solution.

12. After detail configuration, you will enter the 3DS main display screen and you may begin your 3D Studio work in the environment you make before.

13. Once completing the detail configuration,   you may enter 3D Studio in the same configuration simply by type **\3DS3\3DS <Enter>** next time.

14. If you want to change your video configuration, just follow the procedures mentioned before to re-configure.

IX. Software Drivers
(3D Studio)

IX. SOFTWARE DRIVERS

6. OS/2 V2.1

6.0 Driver Notes

1. The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

6.1 Driver Files

1. The enclosed SiS 5597/5598 OS/2 2.1 driver contains the following files:

SISINST.CMD	SiS driver install program
SVGA.EXE	SiS PMI Generator
S768256.DL@	SiS IBMDEV32.DLL Display Driver
OTHERS	other files required during installation

6.2 Installation

Before install SiS 5597/5598 OS/2 drivers, make sure:

1. Install your OS/2 system using **"VGA display"** option (i.e. standard VGA).
2. Start your OS/2 system.

Install SiS 5597/5598 OS/2 2.1 drivers as following procedures:

1. Enter "OS/2 window" or "OS/2 full screen".
2. Change directory to which holds the SiS 5597/5598 OS/2 2.1 display drivers and type SISINST <Enter>.

   For example, A:\OS2\SBCS.21>SISINST

3. All the Driver Files will be copied to a subdirectory C:\SISDRV and the "Select Screen parameters for SiS SVGA" menu appears and all the resolution (and color) and frame rate supported would be shown on the screen.
4. Choose which one you would like to use and click "OK".
5. Then installation program would complete all installation process and create a "SiS Setup" for future change mode usage.
6. Shutdown and re-boot OS/2 to make your selection effectively.

IX. SOFTWARE DRIVERS

7. OS/2 V3.0 (Warp)

7.0 Driver & OS/2 Version Notes

1. The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

2. All the OS/2 Warp Versions up to SiS 5597/5598 driver Rev. 1.03 would be installed as described in this section except for Double Bytes OS/2 Warp (i.e. Chinese, Japanese, Korea, etc.).

3. For Double Bytes OS/2 Warp installation, please refer to "Sec. 8 Double Bytes OS/2 Warp".

7.1 Driver Files

The enclosed SiS 5597/5598 OS/2 3.0 driver contains the following files:

SISINST.CMD	SiS driver install program
SVGA.EXE	SiS PMI Generator
S768256.DL@	SiS IBMDEV32.DLL Display Driver
OTHERS	other files required during installation

7.2 Installation

Before install SiS 5597/5598 OS/2 drivers, make sure:

1. Install your OS/2 system using **"VGA display"** option (i.e. standard VGA).

2. Start your OS/2 system.

Install SiS 5597/5598 OS/2 Warp drivers as following procedures:

1. Enter "OS/2 window" or "OS/2 full screen".

2. Change directory to which holds the SiS 5597/5598 OS/2 3.0 display drivers and type SISINST <Enter>. For example, A:\OS2\SBCS.30>SISINST

3. All the Driver Files will be copied to a subdirectory C:\SISDRV and the "Select Screen parameters for SiS SVGA" menu appears and all the resolution (and color) and frame rate supported would be shown on the screen.

4. Choose which one you would like to use and click "OK".

5. Then installation program would complete all installation process and create a "SiS Setup" for future change mode usage.

6. Shutdown and re-boot OS/2 to make your selection effectively.

IX. SOFTWARE DRIVERS

8. Double Bytes OS/2 Warp

8.0 Driver & OS/2 Version Notes

1. The following description apply to "SiS 5597/5598 Driver Release V1.03" and maybe later release version but not guaranteed.

2. The following description apply to "Double Bytes OS/2 Warp" only. (i.e. Chinese, Japanese, Korea, etc.)

8.1 Driver Files

The enclosed SiS 5597/5598 Double Byte OS/2 3.0 driver contains the following files:

SETUP.CMD	SiS driver install program
SVGA.EXE	SiS PMI Generator
S768256.DL@	SiS IBMDEV32.DLL Display Driver
OTHERS	other files required during installation

IX. SOFTWARE DRIVERS

8.2 Installation

For Double Byte OS/2 Warp limitation, the installation process is a two phase installation and can't complete the whole installation in one-time-process.

1st phase: copy files, modify "config.sys", create "SiS Install" icon then shutdown and re-boot OS/2.

2nd phase: double clicks "SiS Install" icon to complete the installation

Before install SiS 5597/5598 OS/2 drivers, make sure:

1. Install your OS/2 system using **"VGA display"** option (i.e. standard VGA).

2. Start your OS/2 system.

Install SiS 5597/5598 OS/2 Warp drivers as following procedures:

1st phase:

1. Enter "OS/2 window" or "OS/2 full screen".

2. Change directory to which holds the SiS 5597/5598 OS/2 3.0 display drivers and type SETUP <Enter>, For example, A:\OS2\DBCS.30>SETUP

3. All the Driver Files will be copied to a subdirectory C:\SISDRV and "SiS Install" icon would be created.

4. After completing "setup" program, shutdown and re-boot OS/2.

2nd phase:

5. After re-booting OS/2, double clicks "SiS Install" icon. Then the "SiS Install" icon would be executed automatically and "Select Screen parameters for SiS SVGA" screen would appeared on the screen.

6. Select the desired resolution (and color) and frame rate on this screen, then click "OK" to complete installation and "SiS Setup" icon would be created for future change modes and frame rate usage.

7. After completing installation, shutdown and re-boot OS/2 to make your selection effectively.

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