SY-5STM
Mainboard

****

Pentium® Class CPU supported

SiS5598 PCI Mainboard

Micro-ATX Form Factor

Onboard VGA Port

Onboard Audio-Stereo Ports

****

User's Guide
&
Technical Reference

SOYO ™

<div align="right">SY-5STM</div>

About This Guide

This User's Guide is for assisting system manufacturers and end users in setting up and installing the mainboard. Information in this guide has been carefully checked for reliability; however, no guarantee is given as to the correctness of the contents. The information in this document is subject to change without notice.

Copyright Notice

Copyright 1998, Soyo Computer Inc. All rights reserved. This manual is copyrighted by Soyo Computer Inc. You may not reproduce, transmit, transcribe, store in a retrieval system, or translate into any language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise, any part of this publication without express written permission of Soyo Computer Inc.

Trademarks

Soyo is a registered trademark of Soyo Computer Inc. All trademarks are the property of their owners.

Disclaimer

Soyo Computer Inc. makes no representations or warranties regarding the contents of this manual. We reserve the right to revise the manual or make changes in the specifications of the product described within it at any time without notice and without obligation to notify any person of such revision or change. The information contained in this manual is provided for general use by our customers. Our customers should be aware that the personal computer field is the subject of many patents. Our customers should ensure that their use of our products does not infringe upon any patents. It is the policy of Soyo Computer Inc. to respect the valid patent rights of third parties and not to infringe upon or assist others to infringe upon such rights.

Restricted Rights Legend

Use, duplication, or disclosure by the Government is subject to restrictions set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at 252.277-7013.

Product Rights

Products mentioned in this manual are mentioned for identification purpose only. Product names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies.

If you need any further information, please come to our home page on the Internet. The address is **"http://www.soyo.com.tw"**.

Edition: June 1998
Version 1.0
5STM SERIAL

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

100% POST CONSUMER
RECYCLED PAPER

Table of Contents

SY-5STM MAINBOARD LAYOUT
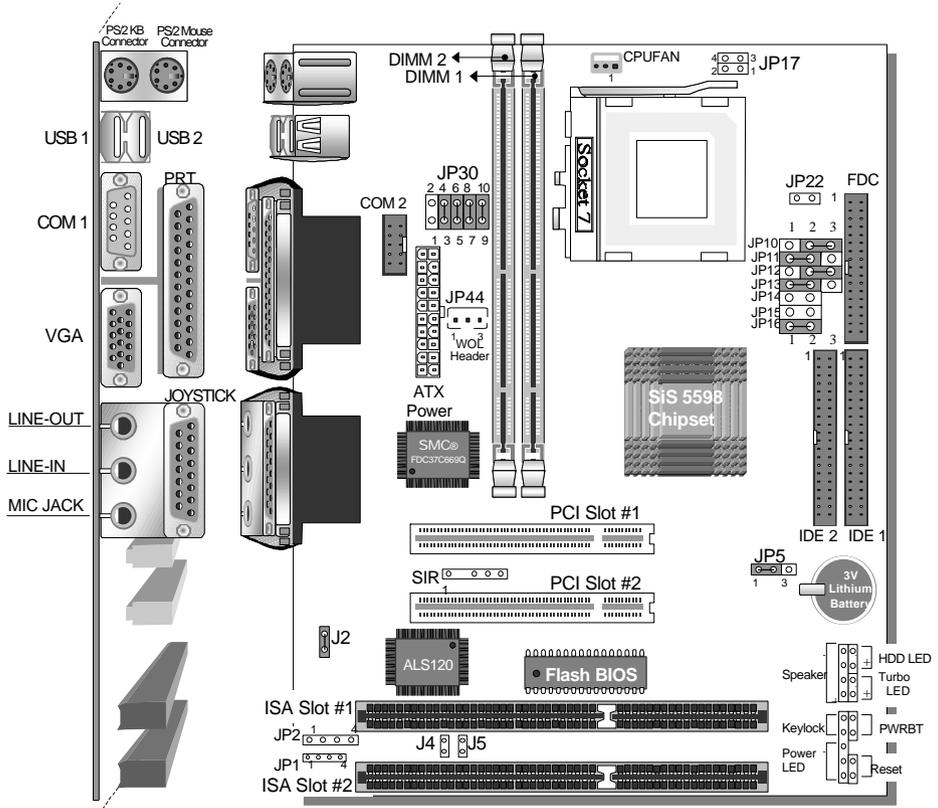
Back Panel

KEY FEATURES

- ➢ VGA onboard supports Unified Memory Architecture (UMA)
- ➢ 3D PnP Audio onboard
- ➢ Supports CPU voltage from 2.0V to 3.5V in 0.1V increment
- ➢ PC97, ACPI, Ultra DMA/33MHz
- ➢ Power-on by modem or alarm
- ➢ Supports Wake-On-LAN (WOL)
- ➢ Supports power-off by hot-key

- ➢ 2 x 32-bit bus mastering PCI slots
- ➢ 2 x USB ports
- ➢ 1 x IrDA port
- ➢ Supports multiple-boot function
- ➢ DMI utility
- ➢ Supports Pentium class CPU with host bus clock of 66/75 MHz
- ➢ Supports system memory up to 256 MBytes

1

MAINBOARD FEATURES

Board Size	4-layer PCB, 19x24.4cm, Micro-ATX Form Factor
Socket 7	Socket for Pentium® class CPUs

with Host Bus frequency of 66/75MHz; Supports:
- Intel Pentium® Processors P54C/P55C (90-233MHz)
- Cyrix 6x86 ™(PR150+-PR200+),
  Cyrix 6x86 MX ™(PR166-PR266) and Cyrix M II ™(300)
- AMD K5 ™(PR90-PR166), and AMD K6 ™(166-300)
  and AMD K6 ™2 266
- IDT WinChip C6 ™(180-240MHz)

Chipset	SiS5598 Pentium® PCI/ISA Bus Chipset with built-in VGA Controller and onboard ALS120 Sound Chipset
ATX Power	20-pin Male Connector
CPUFAN	3-pin CPU Cooling Fan Connector
Memory	DIMM Bank (DIMM1 & DIMM2)

- 168-pin Unbuffered SDRAM DIMM Module
- Supports 8~128MB DIMM in each Bank
- Supports ECC configuration

BIOS	System BIOS built-in, Award BIOS

- "Plug-and-Play" function
- Supports multiple-boot function
- DMI utility

PCI Slots	2 x 32-bit Bus Mastering Slots
ISA Slots	2 x 16-bit ISA Slots
IDE1, IDE2	2 x 40-pin Bus Mastering E-IDE/ATAPI Ports

- IDE1: Primary IDE Device Connector
- IDE2: Secondary IDE Device Connector
- Supports Ultra DMA/33MHz

FDC	1 Floppy Disk Drive (FDD) Port (Supports 1.2MB/1.44MB/2.88MB and LS120/3-mode FDD)
SIR	5-pin Serial Infrared Device Connector
COM2	1 x 9-pin Serial Port Connector
Keylock	5-pin KeyLock Connector
Reset	2-pin Reset Switch Connector
Speaker	4-pin PC Speaker Connector
TB_LED	2-pin Turbo LED Connector

HDD_LED	2-pin IDE Device LED Connector
PWRBT	ATX Power On/Off Switch 2-pin Connector
J2	Microphone Mono/Stereo Jumper
J4, J5	Enable/Disable Onboard Sound Function Jumpers
JP1, JP2	2 x CD Line-in 4-pin Connectors
JP5	CMOS Clear Jumper
JP10~JP13	CPU Host Bus Frequency Jumpers
JP14~JP16	CPU Frequency Multiplier Jumpers
JP17	CPU Single/Dual Voltage Type Jumper
JP22	CPU Burst Mode Jumper
JP30	CPU Voltage Selection Jumper
JP44	WOL (Wake-On-LAN) 3-pin Connector

BACK-PANEL FEATURES

PRT	1 x Onboard 26-pin Female Parallel Printer Port
COM1	1 x Onboard RS-232 Serial Port
PS/2 KB	1 x Onboard PS/2 Keyboard Connector
PS/2 Mouse	1 x Onboard PS/2 Mouse Connector
USB1, USB2	2 x Onboard USB (Universal Serial Bus) Connectors
VGA	1 x Onboard 15-pin VGA Port
JOYSTICK	1 x Onboard 15-pin Joystick Port
LINE-OUT	1 x Onboard Line-out Audio Stereo Jack
LINE-IN	1 x Onboard Line-in Audio Stereo Jack
MIC JACK	1 x Onboard Microphone Stereo Jack

KEY FEATURES

VGA onboard supports Unified Memory Architecture (UMA)

3D PnP Audio onboard

Supports CPU voltage from 2.0V to 3.5V in 0.1V increment

PC97, ACPI, Ultra DMA/33MHz

Power-on by modem or alarm

Supports Wake-On-LAN (WOL)

Supports power-off by hot-key

2 x 32-bit bus mastering PCI slots

2 x USB ports

1 x IrDA port

Supports multiple-boot function

DMI utility

Supports Pentium® class CPU with host bus clock of 66/75 MHz

Supports system memory up to 256 Mbytes

PS/2 Keyboard

PS/2 Mouse

QUICK INSTALLATION GUIDE

Congratulations on your purchase of **SY-5STM** Mainboard. You are about to install and connect your new mainboard.

> 🛑 *Note:* Do not unpack the mainboard from its protective anti-static packaging until you have made the following preparations.

PREPARATIONS

Gather and prepare all the following hardware equipment to complete the installation successfully:

1. Pentium processor with CPU cooling fan.
2. DIMM memory module
3. Computer case and chassis with adequate power supply unit
4. Monitor
5. Keyboard
6. Pointing Device (PS/2 mouse)
7. Speaker(s) (optional)
8. Disk Drives: HDD, CD-ROM, Floppy drive …
9. External Peripherals: Printer, Plotter, and Modem (optional)
10. Internal Peripherals: Modem and LAN cards (optional)

Frequently Asked Questions:

● **Do I need to install a VGA card?**

● **Do I also need to install a sound card?**

The answer is NO to both questions above, since, for your convenience, the SY-5STM mainboard already features one built-in VGA port and three built-in audio-stereo ports (Line-in, Line-out, Microphone).

Notice: If you plan on using the onboard VGA and intend to install only one DRAM memory module, then this single DRAM *must be* installed in bank DIMM1.

● **What kind of speaker can connect to "Line-out" port?**

This motherboard requires a speaker with built-in amplifier to generate proper output sound volume.

UNPACKING THE MAINBOARD

Like most electronic equipment, your mainboard may be damaged by electrostatic discharge. To avoid permanent damage to components ground yourself while working by using a grounding strap. Otherwise, ground yourself frequently by touching the unpainted portion of the computer chassis to drain the static charges.

Handle the mainboard carefully, holding it by the edges.

You are now ready to start the installation.

INSTALLATION GUIDE

We will now begin the installation of the mainboard. Please follow the step-by-step procedure designed to lead you to a complete and correct installation.

Step 1. CPU Installation

Follow these instructions to install your Pentium® class processor correctly.

Locate the CPU socket labeled Socket 7 on your mainboard and note the distinctive pinhole arrangement.

Note the corresponding pinhole arrangement on the processor.
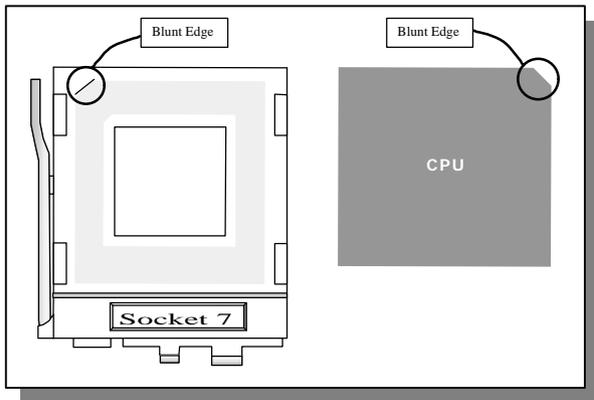
Follow these steps to install the CPU in the Socket 7:

1.   Lift the socket handle up to a vertical position.

2.   Align the blunt edge of the CPU with the matching pinhole
     distinctive edge on the socket.

3.   Seat the processor in the socket completely and without forcing.

4.   Then close the socket handle to secure the CPU in place.
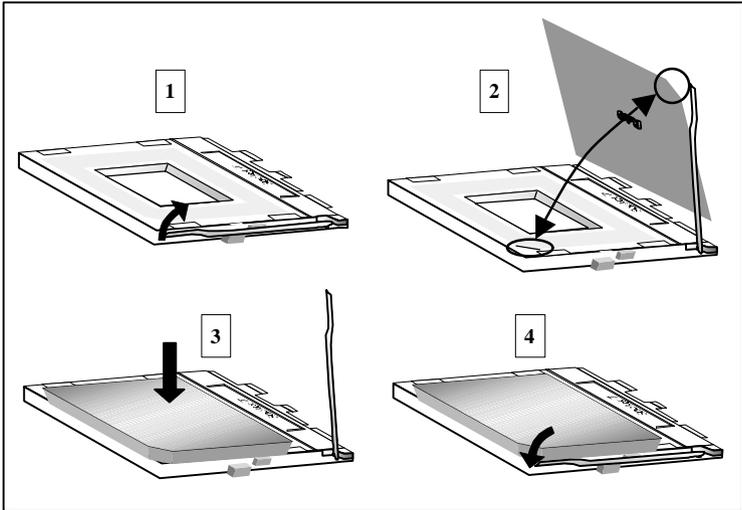
Step 2.   CPU Fan Installation

Your Pentium®processor kit comes with a cooling fan. Mount the fan
on the processor according to the instructions provided by the
manufacturer. The fan is a key component that will ensure system
stability. The fan prevents overheating, therefore prolonging the life
of your CPU.

Note: Remember to connect the fan to the appropriate power
source.

Step 3.   CPU Voltage Setting (JP17, JP30)
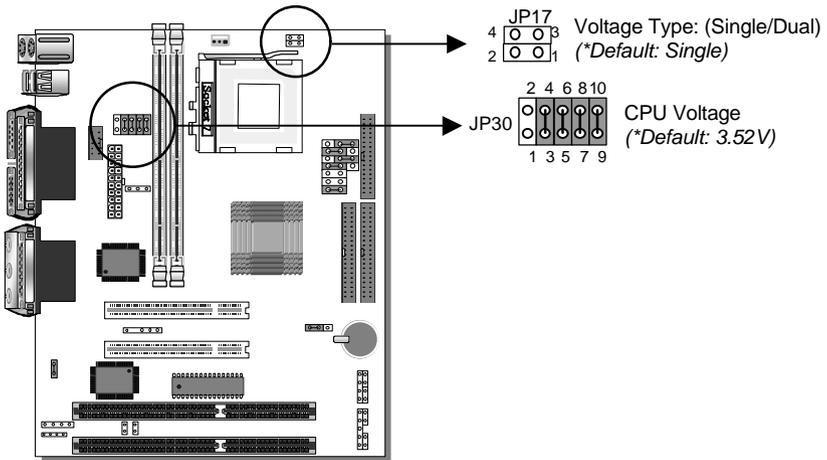
Default CPU voltage settings are as follows:

➤ J17: Single* Voltage *(*Default)*

➤ JP30: 3.52* V *(*Default)*

If the markings on your CPU correspond to the default values, you do not need to set any voltage jumper since your mainboard comes pre-configured with the default values. Please go on to *Step 4*.

For other CPUs that come with different voltages, please verify the correct voltage settings with your dealer before installation. Use the following tables to set JP17 to the proper "Voltage Type" and JP30 to the proper "Voltage Value", according to the specifications marked on your CPU:

Voltage Settings for Various Processors

Processor Voltage Setting	Type	Vcore	Voltage Type: JP17	Voltage Value: JP30
Intel P54C - P90 Intel P54C - P100 Intel P54C - P120 Intel P54C - P133 Intel P54C - P150 Intel P54C - P166 Intel P54C - P180 Intel P54C - P200	Single	3.52V		
Intel P55C - P180 Intel P55C - P200 Intel P55C - P233	Dual	2.8V		
AMD K5 - PR90 AMD K5 - PR100 AMD K5 - PR120 AMD K5 - PR133 AMD K5 - PR150 AMD K5 - PR166	Single	3.52V		
AMD K6 - 166 AMD K6 - 200	Dual	2.9V		
AMD K6 - 233	Dual	3.2V		
AMD K6 - 266 AMD K6 - 300 AMD K6-2　266	Dual	2.2V		
Cyrix 6x86 - PR150+ Cyrix 6x86 - PR166+	Single	3.52V		
* Set the proper CPU voltage according to the marking on the CPU.				

Voltage Settings for Various Processors (continued)

Processor Voltage Setting	Type	Vcore	Voltage Type: JP17	Voltage Value: JP30
Cyrix 6x86 - PR200+	Dual	2.8V	JP17	JP30
Cyrix MX - PR166** Cyrix MX - PR200** Cyrix MX - PR233** Cyrix MX - PR266** Cyrix M II - 300**	Dual	2.9V	JP17	JP30
IDT WinChip C6-180 IDT WinChip C6-200 IDT WinChip C6-225 IDT WinChip C6-240	Single	3.52V	JP17	JP30
* Set the proper CPU voltage according to the marking on the CPU.				

Step 4.   CPU Frequency Setting (JP10~16)
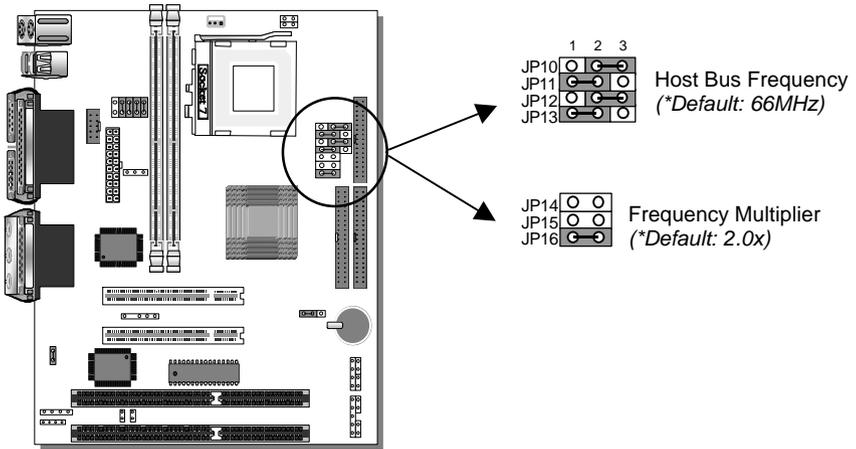
The SY-5STM mainboard is designed to support most Pentium®
class processors currently on the market. Jumpers JP10~16 are
used to configure the mainboard frequency parameters to match the
working frequency of your CPU.

Jumpers JP14, JP15, and JP16 enable you to assign the
"Frequency Multiplier", while jumpers JP10, JP11, JP12, and JP13
can assign the "Host Bus Frequency".

Please refer to the following table that gives you the correct frequency settings for the specific brand and model of CPU you are installing on this mainboard.

Frequency Settings for Intel® Processors

Processor Frequency Setting	Ratio	Bus Clock	Multiplier JP14~16	CPU Host Bus ClockJP10~13
Intel P54C - P90	1.5 x	60MHz		
Intel P54C - P100	1.5 x	66MHz		
Intel P54C - P120	2.0 x	60MHz		
Intel P54C - P133	2.0 x	66MHz		
Intel P54C - P150	2.5 x	60MHz		
Intel P54C - P166	2.5 x	66MHz		
Intel P54C - P180	3.0 x	60MHz		
Intel P54C - P200	3.0 x	66MHz		
Intel P55C - P180	3.0 x	60MHz		
Intel P55C - P200	3.0 x	66MHz		
Intel P55C-P233	3.5 x	66MHz		

* Set the proper CPU frequency according to the marking on the CPU.

Frequency Settings for AMD ™Processors

Processor Frequency Setting	Ratio	Bus Clock	Multiplier JP14~16	CPU Host Bus ClockJP10~13
AMD K5 - PR90	1.5 x	60MHz	JP14, JP15, JP16	JP10~JP13
AMD K5 - PR100	1.5 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K5 - PR120	2.0 x	60MHz	JP14, JP15, JP16	JP10~JP13
AMD K5 - PR133	2.0 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K5 - PR150	2.5 x	60MHz	JP14, JP15, JP16	JP10~JP13
AMD K5 - PR166	2.5 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K6 - 166	2.5 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K6 - 200	3.0 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K6 - 233	3.5 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K6 - 266	4.0 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K6 - 300	4.5 x	66MHz	JP14, JP15, JP16	JP10~JP13
AMD K6-2 266	4.0 x	66MHz	JP14, JP15, JP16	JP10~JP13

* Set the proper CPU frequency according to the marking on the CPU.

Frequency Settings for Cyrix ™Processors

Processor Frequency Setting	Ratio	Bus Clock	Multiplier JP14~16	CPU Host Bus ClockJP10~13
Cyrix 6x86 - PR150+	2.0 x	60MHz	JP14, JP15, JP16	JP10~13
Cyrix 6x86 - PR166+	2.0 x	66MHz	JP14, JP15, JP16	JP10~13
Cyrix 6x86 - PR200+	2.5 x	66MHz	JP14, JP15, JP16	JP10~13
Cyrix MX - PR166**	2.5 x	60MHz	JP14, JP15, JP16	JP10~13
Cyrix MX - PR166**	2.0 x	66MHz	JP14, JP15, JP16	JP10~13
Cyrix MX - PR200**	2.5 x	66MHz	JP14, JP15, JP16	JP10~13
Cyrix MX - PR200**	2.0 x	75MHz	JP14, JP15, JP16	JP10~13
Cyrix MX - PR233**	2.5 x	75MHz	JP14, JP15, JP16	JP10~13
Cyrix MX - PR266**	2.5 x	83MHz	JP14, JP15, JP16	JP10~13
Cyrix M II - 300**	3.5 x	66MHz	JP14, JP15, JP16	JP10~13

** Set the proper CPU frequency according to the marking on the CPU. Over specification is not guaranteed.

Frequency Settings for IDT ™Processors

Processor Frequency Setting	Ratio	Bus Clock	Multiplier JP14~16	CPU Host Bus ClockJP10~13
IDT WinChip C6-180	3.0 x	60MHz	JP14 / JP15 / JP16	JP10~13
IDT WinChip C6-200	3.0 x	66MHz	JP14 / JP15 / JP16	JP10~13
IDT WinChip C6-225	3.0 x	75MHz	JP14 / JP15 / JP16	JP10~13
IDT WinChip C6-240	4.0 x	60MHz	JP14 / JP15 / JP16	JP10~13
* Set the proper CPU frequency according to the marking on the CPU.				
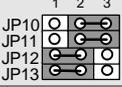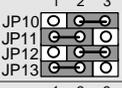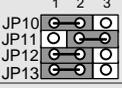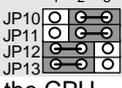
Step 5.   DRAM Module Installation

This mainboard supports two DIMM banks from 8 to 128 MB with no other restrictions on memory configurations. You can install the memory in any combination without having to rely on a memory configuration table. Memory configuration is therefore "table-free" in any memory bank.

DIMM 2 ← → DIMM 1
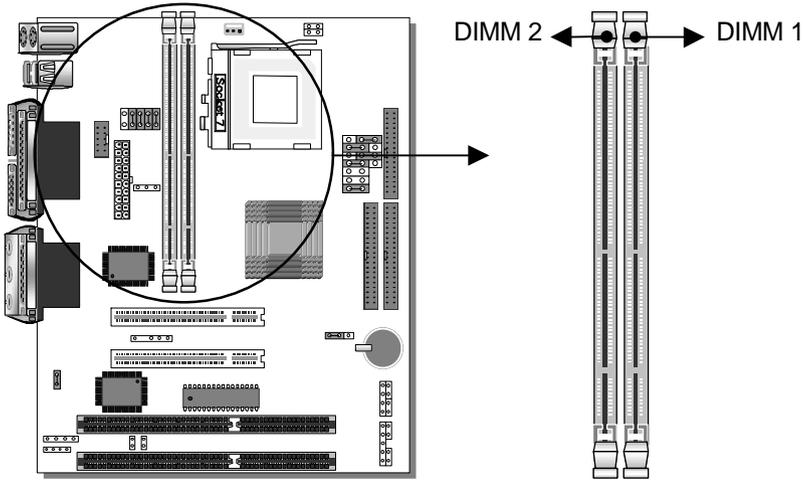
This mainboard supports both EDO and SDRAM types of memory modules.

Note:

(1) Do not install EDO type of DIMM modules if you already use SDRAM in any DIMM bank.

(2) If you plan on using the onboard VGA and intend to install only one DRAM module, then this single DRAM ***must be*** installed in bank DIMM 1.

Refer to *Chapter 2 Hardware Setup* for details on how to install memory modules in DIMM banks.

Step 6.   IDE Device Installation (HDD, CD-ROM)

This mainboard offers two primary and secondary IDE device connectors (IDE1, IDE2.) It can support up to four high-speed HDD or CD-ROM.

Connect one side of the 40-pin flat cable to the IDE device (HDD or CD-ROM) and plug the other end to the primary (IDE1) or secondary (IDE2) directionally keyed IDE connector on the mainboard.

This mainboard can support up to four HDDs.

Step 7.   Floppy Drive Installation

The system supports 5 possible floppy drive types: 720 KB, 1.2 MB, 1.44 MB, 2.88 MB, and LS-120. In addition, this mainboard supports a 3-mode (720KB/1.25MB/1.44MB) floppy commonly used in Japan.

Connect one side of the 34-pin flat cable to the floppy drive and plug the other end to the floppy drive connector on the mainboard.

This mainboard can support up to 2 floppy drives.

Step 8.   Front Panel Connections
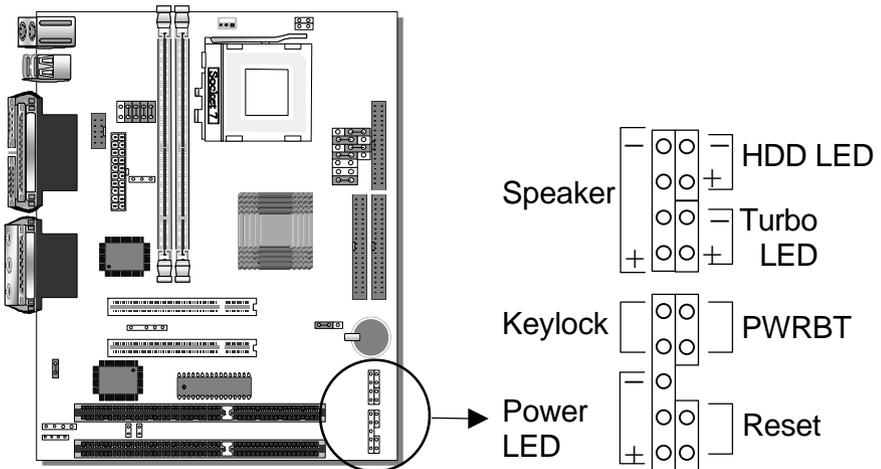
Plug the computer case's front panel devices to the corresponding connectors on the mainboard.

1.   Power LED & KeyLock

Plug the Power LED cable into the 5-pin Keylock connector.
Some systems may feature a KeyLock function with a front panel switch for enabling or disabling the keyboard. Connect the KeyLock switch to the 5-pin Keylock connector on the mainboard.
Please install according to the following pin assignment: pin 1,3 are for Power LED and pin 4,5 are for Keylock.

2.   Reset

Plug the Reset push-button cable into the 2-pin Reset connector on the mainboard. Pushing the Reset button on the front panel will cause the system to restart the boot-up sequence.

3.   Speaker

Attach the 4-pin PC speaker cable from the case to the Speaker connector on the mainboard.

4.   Turbo LED

Connecting the 2-pin Turbo LED cable to the corresponding Turbo LED connector will cause the LED to light whenever the system is in Turbo mode.
The manufacturer has permanently set this mainboard in Turbo mode due to most hardware and software compliance to turbo mode.

5.   IDE LED

Attach the 2-pin IDE device LED cable to the corresponding IDE LED connector on the mainboard. This will cause the LED to lighten when an IDE (HDD, CD-ROM) device is active.

6. ATX Power On/Off Switch

Attach the 2-pin momentary type switch to the PWRBT connector for turning On or Off your ATX power supply.

Step 9.   Back Panel Connections

All external devices such as the keyboard, printer, PS/2 mouse, modem, USB, VGA monitor, joystick, audio-stereo line-in and line-out, and a microphone, can be plugged directly onto the mainboard back panel.

Only after you have fixed and locked the mainboard to the computer case can you start connecting the external peripheral devices.

When connecting an external device, use the following figure to locate and identify which back panel connector to plug the device to.
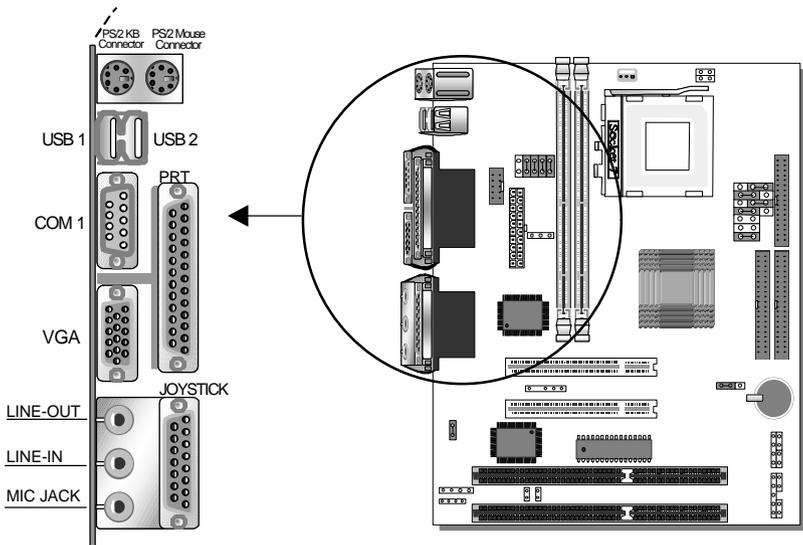
1.   Onboard Serial Port COM1

External peripherals that use serial transmission scheme include:

-   serial mouse,
-   and modem.

Plug the serial device cables directly into the COM1 9-pin male connector located at the rear panel of the mainboard.

2.   Parallel Port PRT

This parallel port is used to connect the printer or other parallel devices.

Plug the parallel device cable into the 26-pin female connector located at the rear panel of the mainboard.

3.   PS/2 Keyboard

Plug the keyboard jack directly into the 6-pin female PS/2 keyboard connector located at the rear panel of the mainboard.

4.   PS/2 Mouse

Similarly, plug the mouse jack directly into the 6-pin female PS/2 mouse connector.

5.   Universal Serial Bus USB1/USB2

This mainboard provides two USB ports for your additional devices. Plug the USB device jack into the available USB connector USB1 or USB2.

-   USB devices under Win98 are allowed.
-   With Win95, use the flow OpenHCI specifications.

Step 10. Other Connections

1. Serial Port COM 2

In addition to the onboard serial connector COM1 located at the rear panel, your mainboard comes with a second serial port COM2 equipped with a flat cable and external connector.

The mainboard package includes one 9-pin male external serial connector with 9-pin flat cable.

Plug the 9-pin end of the flat cable into the COM2 serial connector on the mainboard, as shown in the figure below, then fix the external 9-pin or 25-pin connector to the rear panel of the computer case. Then plug your serial device cable directly into this 9-pin male connector located at the back of your computer.

9-pin male external serial connector

9-pin serial flat cable

COM 2

ATX Power
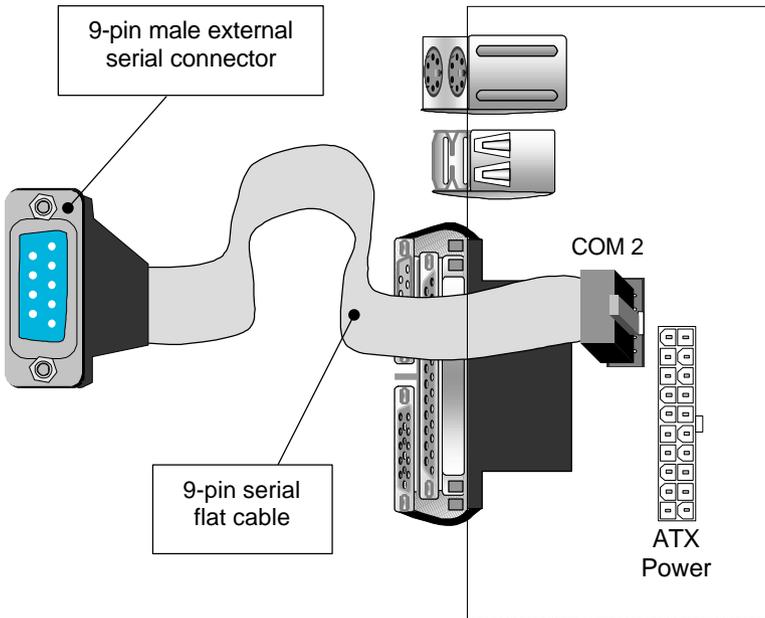
2. Wake-On-LAN (WOL)

Attach the 3-pin connector from the LAN card which supports the Wake-On-LAN   (WOL) function to the JP44 connector on the mainboard. This WOL function lets users wake up the connected computer through the LAN card.

Please install according to the following pin assignment:

Wake-On-LAN
JP44 Pin Assignment

5V___ GND___ SENSOR

1   2   3
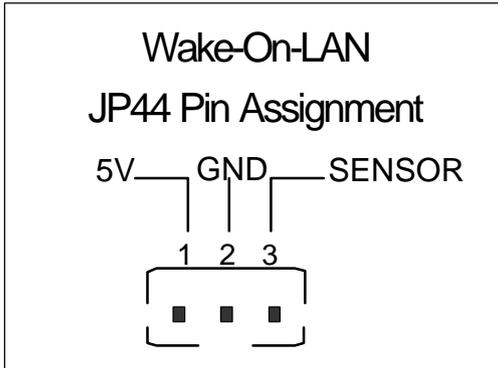
3. Infrared (IR)

Plug the 5-pin infrared device cable to the IR connector. This will enable the infrared transfer function. This mainboard meets both the ASKIR and HPSIR specifications.

Please install according to the following pin assignment:

Serial Infrared (SIR) Connector
SIR Pin Assignment

VCC___   IRRX GND___ IRTX

1   3   2   4   5
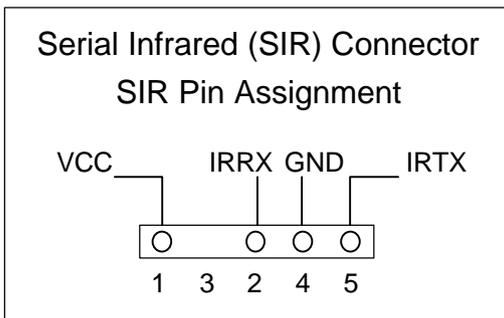
4.   Other Display Cards

Insert other types of VGA cards into the PCI or ISA expansion slots according to card specifications.

Notice: If you install another PCI VGA card, the onboard VGA port will automatically be disabled.

Step 11.   CPU Cooling Fan Installation

After you have seated the CPU cooling fan properly on the processor, attach the 3-pin fan cable to the CPUFAN connector on the mainboard.

To avoid damage to the system, install according to the following pin assignment:

CPU Cooling Fan
CPUFAN Pin Assignment

3   2   1

GND   12V   NC
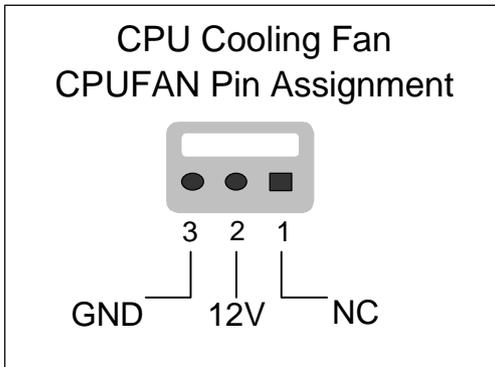
Step 12. ATX Power Supply

Plug the connector from the power directly into the 20-pin male ATX PW connector on the mainboard, as shown in the following figure.
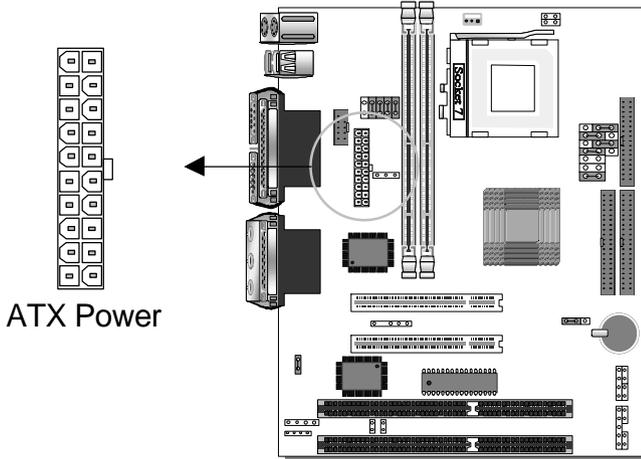
ATX Power

> *Warning:* Follow these precautions to preserve your mainboard from any remnant currents when connecting to ATX power supply:
>
> **Turn off the power supply and unplug the power cord of the ATX power supply before connecting to ATX PW connector.**

The mainboard requires a power supply with at least 200 Watts and a "power good" signal. Make sure the ATX power supply can take at least 10 mA mp* load on the 5V Standby lead (5VSB) to meet the standard ATX specification.

** **Note:*** If you use the Wake-On-LAN (WOL) function, make sure the ATX power supply can support at least 720 mAmp on the 5V Standby lead (5VSB).

Please install the ATX power according to the following pin assignment:

ATX Power

12V	5V
5VSB	5V
PW-0K	-5V
GND	GND
5V	GND
GND	GND
5V	PS-ON
GND	GND
3.3V	-12V
3.3V	3.3V
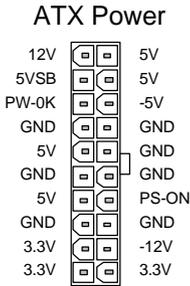
➢ **Pay special care to the directionality.**

➢ **Make sure pin 1 is in its position.**

Step 13. CMOS Clearing (JP5)

After you have turned off your computer, clear the CMOS memory by momentarily shorting pins 2-3 on jumper JP5, for a few seconds. Then restore JP5 to the initial 1-2 jumper setting in order to recover and retain the default settings.

Step 14. Power On

You have now completed the hardware installation of your mainboard successfully.

1. Turn the power on
2. To enter the BIOS Setup Utility, press the <DEL> key while the system is performing the diagnostic checks,

> *Note:* If you have failed to enter the BIOS, wait until the boot up sequence is completed. Then push the RESET button and press <DEL> key again at the beginning of boot-up, during diagnostic checks.

Repeat this operation until you get the following screen.

3. The BIOS Setup screen appears:

```
                    ROM PCI/ISA BIOS
                    CMOS SETUP UTILITY
                  AWARD SOFTWARE, INC.

  STANDARD CMOS SETUP          INTEGRATED PERIPHERALS
  BIOS FEATURES SETUP          SUPERVISOR PASSWORD
  CHIPSET FEATURES SETUP       USER PASSWORD
  POWER MANAGEMENT SETUP       IDE HDD AUTO DETECTION
  PNP/PCI CONFIGURATION        SAVE & EXIT SETUP
  LOAD SETUP DEFAULTS          EXIT WITHOUT SAVING
  LOAD BIOS DEFAULTS

  Esc  : Quit                  ↑↓→←  : Select Item
  F10  : Save & Exit Setup     (Shift) F2  : Change Color
                  Time, Date, Hard Disk Type…
```

You are now ready to configure your system with the BIOS setup program. Go to Chapter 3: **BIOS SETUP**

Or continue to Chapter1: **INTRODUCTION** and Chapter2: **HARDWARE SETUP** for more information about your **SY-5STM** Mainboard.

Step 15. Power Off

There are three possible ways to turn off the system:

1. Use the **Shutdown** command in the **Start Menu** of Windows 95/98 to turn off your computer.

2. Use the power off by hot-key function.
    Press the **Ctrl** + **Alt** + **← (BackSpace)** 3-simultaneous key combination to turn off your system.
    (To activate the power off by hot-key function, in BIOS [Power Management Setup] menu, set the [Hot Key Power Off] field to [Enabled].)

3. Press the mechanical power-button and **hold down for over 4 seconds,** to shutdown the computer. If you press the power-button for less than 4 seconds, then your system will enter into **Suspend Mode.**

Chapter 1

INTRODUCTION

The **SY-5STM** PCI mainboard is a high-performance Micro-ATX form-factor system board. **SY-5STM** uses the SiS5598 PCI Chipset technology and supports Pentium $^{®}$ class processors. This mainboard is fully compatible with industry standards and adds many technical enhancements.

1-1 KEY FEATURES

- **CPU**
  - ➢ Supports Intel Pentium Processor P54C/P55C series CPUs featuring speeds of 90-233 MHz
  - ➢ Supports Cyrix 6x86/6x86L/6x86MX CPUs with PR150-PR266 speeds and Cyrix M Ⅱ-300 CPU
  - ➢ Supports AMD K5 CPUs running at PR90-PR166 speeds, AMD K6 CPUs running at speeds of 166-300 MHz speeds,and AMD K6-2 266 CPU
  - ➢ Support IDT WinChip C6 CPUs at speeds of 150-240 MHz
  - ➢ Features Socket 7 for CPU easy upgrade
  - ➢ Supports P54C/P55C series SMM Mode and CPU Stop Clock
- **L2 Cache Controller**
  - ➢ On-board 512KB Level 2 Pipeline Burst SRAM Cache
- **DRAM Controller**
  - ➢ Supports 2 strips of 168-pin SDRAM unbeffured DIMM 2 x 168-pin DIMM banks support 8/16/32/64/128 MB unbuffered DIMM modules
  - ➢ Memory configuration:
    - ◆ System memory: 8MB to 256MB
    - ◆ Maximum of 256MB with SDRAM

- **BUS Controller**
    - ➢ Compliant with v2.1 PCI specifications
    - ➢ Features 2 x 32-bit PCI slots:
        - ◆ 2 x Bus Mastering PCI Slots
    - ➢ Features 2 x 16-bit ISA slots
    - ➢ Provides on-board USB (Universal Serial Bus) port

- **Peripheral Controller**
    - ➢ Onboard features:
        - ◆ PCI Bus Mastering IDE controller
        - ◆ Floppy controller
    - ➢ Onboard supports:
        - ◆ 2 x high-speed UARTs (with 16550 FIFO) serial ports
        - ◆ 1 x ECP/EPP/SPP multi-mode parallel printer port
        - ◆ 1 x PS/2 mouse port
        - ◆ 1 x PS/2 keyboard port
        - ◆ 1 x VGA port
        - ◆ 1 x Joystick port
        - ◆ 3 x Audio-stereo ports:
            - - Line-in jack
            - - Line-out jack
            - - Mic (microphone) jack
    - ➢ Onboard FLASH Memory for BIOS easy upgrade
    - ➢ Onboard IR function

1-2 UNPACKING THE MAINBOARD

When unpacking the mainboard, check for the following items:

➢ The **SY-5STM** SiS 5598 PCI Mainboard
➢ This *Quick Start Guide* *
➢ The Installation CD-ROM *
➢ One IDE Device Flat Cable
➢ One Floppy Disk Drive Flat Cable
➢ One 9-pin External Serial Connector with 9-pin Flat Cable

* If your board comes with a driver disc and a paper manual, the Quick Start Guide and the CD-ROM are not included in the package.

> **STOP**
> *Warning:* Do not unpack the mainboard from its anti-static packaging until you are ready to install it.

1-3 HANDLING THE MAINBOARD

To avoid damage to your mainboard, follow these simple rules while unpacking:

➢ Before handling the mainboard, ground yourself by grasping an unpainted portion of the system's metal chassis.
➢ Remove the mainboard from its anti-static packaging. Hold the mainboard by the edges and avoid touching its components.
➢ Check the mainboard for damage. If any chip appears loose, press carefully to seat it firmly in its socket.

> **STOP**
> *Warning:* Do not apply power if the mainboard appears damaged. If there is damage to the board, contact your dealer immediately.

1-4 ELECTROSTATIC DISCHARGE PRECAUTIONS

Make sure to ground yourself before handling the mainboard or other system components. Electrostatic discharge can easily damage the components. Note that you must take special precautions when handling the mainboard in dry or air-conditioned environment.

To protect your equipment from electrostatic discharge, take the following precautions:

➢ Do not remove the anti-static packaging until you are ready to install.

➢ Ground yourself before removing any system component from its protective anti-static packaging. (To ground yourself, grasp the expansion slot covers or other unpainted portions of the computer chassis.)

➢ Frequently ground yourself while working or use a grounding strap.

➢ Handle the mainboard by its edges and avoid touching its components.

Chapter 2

HARDWARE SETUP

In addition to the Installation Guide, this section is designed to help you configure the mainboard hardware and to provide complementary knowledge of the hardware. (This chapter is designed for Normal edition mainboard use only.)

> **STOP** | *Warning:* Turn off the power to the mainboard, system chassis, and peripheral devices before performing any work on the mainboard or system.

After you install the mainboard:

1. Set the Voltage Type jumper JP17
2. Select the CPU voltage with jumper JP30
3. Select the CPU frequency with jumpers JP10~16
4. For Cyrix CPUs only, set the CPU burst mode jumper JP22
5. Set the onboard sound options with jumpers J2, J4, J5
6. Attach the Wake-On-LAN Connector JP44 *(optional)*
7. Set the CMOS clear jumper JP5
8. Install memory
9. Make case connections

Refer to this chapter whenever you upgrade or reconfigure your system.

2-1 CPU VOLTAGE SETTING (JP17, JP30)

JP17 and JP30 are the only jumpers that you need to set for your CPU voltage on this mainboard.

There are two kinds of CPU voltages currently on the market depending on the CPU manufacturer:

➢ Single Voltage (CPU: P54C, AMD-K5, Cyrix 6x86, IDT WinChip C6)
➢ Dual Voltage (CPU: P55C, AMD-K6, AMD-K6-2 Cyrix 6x86L,Cyrix 6x86MX, Cyrix M II)

Those processors may come in various voltages on different markets. Therefore, always make sure you know the type of the CPU you are installing and adjust the settings on JP17 and JP30 accordingly.

This motherboard supports CPU voltages from 2.0 to 3.52V in 0.1V increments. Use the following tables to set the CPU voltage jumpers JP17 and JP30 to match the voltage value of your CPU:

Voltage Type: JP17

Voltage Type	1-2	3-4
Single *	open	open
Dual	**short**	**short**

CPU Voltage Setting: JP30

Voltage Value	1-2	3-4	5-6	7-8	9-10
3.52V*	open	**short**	**short**	**short**	**short**
3.3V	open	**short**	**short**	open	**short**
3.2V	open	**short**	**short**	open	open
3.1V	open	**short**	open	**short**	**short**
3.0V	open	**short**	open	**short**	open
2.9V	open	**short**	open	open	**short**
2.8V	open	**short**	open	open	open
2.7V	open	open	**short**	**short**	**short**
2.5V	open	open	**short**	open	**short**
2.2V	open	open	open	**short**	open
2.1V	open	open	open	open	**short**

Refer to the tables *CPU Voltage Settings for Various Processors* on pages 9 and 10 for detailed settings of JP17 and JP30.

2-2 CPU FREQUENCY SETTING (JP10~16)

Configure the JP10~16 jumpers to the settings that match your CPU speed. Refer to the following tables to set the Frequency Multiplier and Host Bus Frequency of your CPU:

Frequency Multiplier

Multiplier	JP14	JP15	JP16
1.5x	open	open	open
2.0x*	open	open	**short**
2.5x	**short**	open	**short**
3.0x	**short**	open	open
3.5x	open	open	open
4.0x	open	**short**	**short**
4.5x	**short**	**short**	**short**

Host Bus Frequency

Host Bus Frequency	JP10	JP11	JP12	JP13
50MHz	2-3	2-3	2-3	1-2
55MHz	1-2	2-3	2-3	1-2
60MHz	2-3	2-3	1-2	1-2
66MHz*	2-3	1-2	2-3	1-2
68MHz	1-2	1-2	1-2	1-2
75MHz	1-2	2-3	1-2	1-2
83MHz	1-2	1-2	2-3	2-3

Example: If the working frequency of your CPU is 133MHz, then select Multiplier=2.0x and Host Bus Frequency=66Mhz accordingly.

Also, as newer and higher frequency CPUs may not be listed in this section, please refer to the tables *CPU Frequency Settings for Various Processors* on pages 12~15 for complementary information.

2-3 CPU BURST MODE JUMPER (JP22)

There are two types of CPU burst modes according to manufacturer design:

> ➢ Interleave Burst (CPU: Intel P54C/P55C, AMD
> K5/K6/K6-2, IDT WinChip C6)
> ➢ Linear Burst (CPU: Cyrix 6x86/L/MX, Cyrix M II)

> You do not need to adjust JP22 if you are using an Intel®
> P54C/P55C, an AMD ™K5/K6/K6-2, or a IDT C6 ™series
> CPU. The default setting on JP22 is Interleave Burst Mode.

If you are using a Cyrix ™6x86/L/MX/M II series CPU, set the burst mode to Linear by shorting pin 1-2 on jumper JP22.

CPU Burst Mode	**Interleave**	**Linear**
	Intel® P54C/P55C AMD ™K5/K6/K6-2	**Cyrix ™6x86/L/MX Cyrix ™M II**
JP22 Setting	When using Intel or AMD CPUs. ⊙ ⊙ **(Default)**	When using Cyrix type of CPU. ⊙—⊙

When using a Cyrix series CPU, follow these steps to select the correct Linear burst mode in BIOS:

1. During the boot-up initial sequence, press the **[Delete]** key to enter the BIOS setup menu.
2. Select the **[CHIPSET FEATURES SETUP]** section in BIOS.
3. In the [CHIPSET FEATURES SETUP] sub-menu, set the **[Linear Burst]** field to **[Enabled]**.
4. Press **[Esc]** to return to the BIOS main menu.
5. Then choose **[Save & Exit Setup]** to re-boot your computer.

> *Notice:* When using the Linear Burst function, both BIOS and hardware (JP22) must be set, or otherwise the system will not function properly.

2-4 SOUND SETTINGS (J4, J5, J2)

The onboard audio features of your mainboard are controlled by
jumpers J4, J5, J2.

Choose the available sound options among the following table:

Sound Settings	J4	J5	J2
Onboard Sound: Enable *	open*	open*	
Onboard Sound: Disable	short	short	
Microphone: Stereo *			short*
Microphone: Mono			open

* Starred items refer to default settings.

2-5 WAKE-ON-LAN CONNECTOR (JP44)

Attach the 3-pin connector from the LAN card which supports the
Wake-On-LAN (WOL) function to the JP44 connector on the
mainboard. This WOL function lets users wake up the connected
computer through the LAN card.

Please install according to the following pin assignment:

Wake-On-LAN

JP44 Pin Assignment

5V___ GND ___ SENSOR

1   2   3
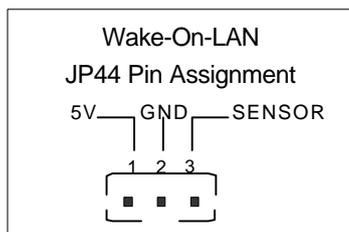
2-6 CMOS CLEAR JUMPER (JP5)

Clear the CMOS memory by momentarily shorting pin 2-3 on jumper
JP5, and then by shorting pin 1-2 to retain new settings. This jumper
can be easily identified by its white colored cap.

CMOS Clearing	Clear CMOS Data		Retain CMOS Data (Default)	
JP5 Setting	Short pin 2-3 for a few seconds to clear the CMOS	O O—O 1 2 3	Short pin 1-2 to retain new settings	O—O O 1 2 3
Note: You must unplug the ATX power cable from the ATX power connector when performing the CMOS Clear operation.				

2-7 CACHE CONFIGURATION

This mainboard has a write-back caching scheme with a built-in 512KB Level 2 Pipelined Burst cache onboard to improve the system performance.

The cache size and RAM locations are specified as follows:

Cache Size	Cache RAM	TAG RAM	Cacheable Range
512 KB	64K x 64 on U20	16K x 8 on U21	128 MB

2-8 MEMORY CONFIGURATION

This mainboard features 2 x DIMM Banks for 168-pin 3.3V unbuffered DIMM modules

Your board comes with two DIMM sockets, providing support for up to 256MB of main memory using DIMM modules from 8MB to 128MB. For 66/75MHz host bus CPUs use 12ns or faster DIMM modules.

Memory configuration Table

MEMORY CONFIGURATION	DIMM Banks	
	DIMM 1	DIMM 2
RAM Type	EDO/SDRAM	EDO/SDRAM
Single RAM Module Size (MB)	8/16/32/64/128	8/16/32/64/128
Notice 1: **Do not use EDO type of DIMM if you already use SDRAM.**		
Notice 2: **If you plan on using the onboard VGA and intend to install only one DRAM module, then this single DRAM *must be* installed in bank DIMM 1.**		

2-9 MULTI I/O ADDRESSES

Default settings for multi-I/O addresses are as follows:

Port	I/O Address	IRQ	Status
LPT1	378H	7	ECP + EPP
COM1	3F8H	4	
COM2	2F8H	3	

> *Warning:* If a default I/O address conflicts with other I/O
> cards such as sound card, you must change one of the I/O
> addresses to remedy to this address conflict. (I/O addresses
> can be adjusted from the BIOS Setup Utility)

2-10 MAKING CONNECTIONS

For making case connections, attach the mainboard to case devices
by plugging flat cables and device cables to the connectors on the
mainboard.

Connect the mainboard to external peripheral devices such as PS/2
keyboard, parallel printer, PS/2 mouse …via the back panel
connectors.

(Refer to the **"Quick Installation Guide"** for directions on how to
make connections to the mainboard.)

Chapter 3

BIOS SETUP UTILITY

This mainboard's BIOS setup program uses the ROM PCI/ISA BIOS program from Award Software Inc.

To enter the Award BIOS program's Main Menu:

1. Turn on or reboot the system.
2. After the diagnostic checks, press the [Del] key to enter the Award BIOS Setup Utility.

ROM PCI/ISA BIOS	
CMOS SETUP UTILITY	
AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
LOAD BIOS DEFAULTS	
Esc : Quit	↑↓→← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type…	

Selecting items

● Use the arrow keys to move between items and select fields.

● From the Main Menu press arrow keys to enter the selected submenu.

Modifying selected items

● Use the [Up]/[Down] keys to modify values within the selected fields. Some fields let you enter values directly.

Hot Keys: Function keys give you access to a group of commands throughout the BIOS utility.

Function	Command	Description
F1	Help	Gives the list of options available for each item.
Shift F2	Color	Change the color of the display window.
F5	Old values	Restore the old values. These are the values that the user started the current session with.
F6	Load BIOS Defaults	Loads all options with the BIOS Setup default values.
F7	Load Setup Defaults	Loads all options with the Power-On default values.
F10	Save & Exit Setup	Saves your changes and reboots the system.
[Esc]	Quit	Lets you return at anytime and from any location to the Main Menu.

SAVE AND EXIT SETUP

Select the [SAVE & EXIT SETUP] option from the Main Menu to save data to CMOS and exit the setup utility. This option saves all your changes and causes the system to reboot.
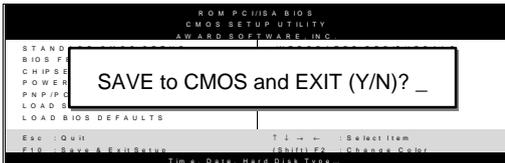
Type [Y] to save the changes and exit or [N] to return to the Main Menu and keep current values.

EXIT WITHOUT SAVING

Selecting the [EXIT WITHOUT SAVING] option allows you to abandon all data and exit setup, therefore ignoring all your changes.
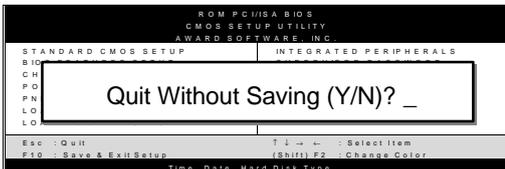
Type [Y] to abandon changes and exit or [N] to return to the Main Menu and keep current values.

3-1 STANDARD CMOS SETUP

Select the [STANDARD CMOS SETUP] option from the Main Menu
and press [Enter] key.

```
                          ROM PCI/ISA BIOS
                        STANDARD CMOS SETUP
                        AWARD SOFTWARE, INC.
  Date (mm:dd:yy)     : Fri, May 29 1998
  Time (hh:mm:ss)     : 9 : 42 : 43

  HARD DISKS          TYPE     SIZE   CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE
  Primary Master    :  AUTO     0      0     0       0       0       0   AUTO
  Primary Slave     :  None     0      0     0       0       0       0   - - - -
  Secondary Master  :  None     0      0     0       0       0       0   - - - -
  Secondary Slave   :  None     0      0     0       0       0       0   - - - -

  Drive A : 1.44M, 3.5 in.                      Base Memory:        640K
  Drive B : None                            Extended Memory:       3328K
  Floppy 3 Mode Support : Disabled             Other Memory:        128K

  Video   :  EGA/VGA
  Halt On  :   All Errors                       Total Memory:       4096K

  Esc   : Quit         ↑↓→←      : Select Item      PU/PD/+/-    : Modify
  F1    : Help      (Shift) F2    : Change Color     F3          : Toggle Calendar
```

This screen allows you to modify the basic CMOS settings.
After you have completed the changes, press [Esc] key to return to
the Main Menu.

3-1.1 Date & Time

	Display	Setting	Please Note
Date	mm/dd/yyyy	Type the current date	You can also the PUp/PDn keys to toggle
Time	hh:mm:ss	Type the current time	24-hour clock format 3:15 PM is displayed as 15:15:00

3-1.2 Hard Disks Type & Mode

Choose the type and mode for the hard disks that you have already installed.

Primary (Secondary) Master & Slave	Setting	Description	Note
Type	Auto	BIOS detects hard disk type automatically.	Default
	1-47	Selects standard hard disk type.	
	User	User defines the type of hard disk.	
Mode	Auto	BIOS detects hard disk mode automatically.	Default
	Normal	Normal IDE hard disk	<528MB
	LBA	Enhanced IDE hard disk	>528MB
	Large	Large IDE hard disk (for certain hard disk)	

> *Note:* If you have any questions on your hard disk type or mode, ask your hard disk provider or previous user for details.

3-1.3 Floppy Drives

Floppy Drives	Setting	Description	Note
Drives A & B	360KB, 5.25 in.		
	1.2MB, 5.25 in.		
	720KB, 3.5 in.		
	1.44MB, 3.5 in.		Default
	2.88MB, 3.5 in.		
	None	Not installed	
Floppy 3-Mode Support	Disabled		Default
	Drive A Drive B Both	Supports 3-mode floppy diskette: 740KB/1.25MB/1.44MB on selected disk drive.	Special disk drive commonly used in Japan

3-1.4 Video

Select the video mode: EGA/VGA (Default), CGA 40, CGA 80,
Mono (Monochrome).

3-1.5 Halt On

When the BIOS detects system errors, this function will stop the
system. Select which type of error will cause the system halt: All
Errors (Default), No Errors, All But Diskette, All But Keyboard, All
But Disk/Key.

3-2 BIOS FEATURES SETUP

Select the [BIOS FEATURES SETUP] option from the Main Menu
and press [Enter] key.

```
                        ROM PCI/ISA BIOS
                      BIOS FEATURES SETUP
                     AWARD SOFTWARE, INC.

Virus Warning              : Disabled    Video    BIOS Shadow  : Enabled
CPU Internal Cache         : Enabled     C8000-CBFFF Shadow   : Disabled
External Cache             : Enabled     CC000-CFFFF Shadow   : Disabled
Quick Power On Self Test   : Enabled     D0000-D3FFF Shadow   : Disabled
Boot Sequence              : A, C, SCSI  D4000-D7FFF Shadow   : Disabled
Swap Floppy Drive          : Disabled    D8000-DBFFF Shadow   : Disabled
Boot Up NumLock Status     : On          DC000-DFFFF Shadow   : Disabled
Gate A20 Option            : Fast
Memory Parity Check        : Enabled
Typematic Rate Setting     : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec)     : 250         ESC : Quit      ↑↓→←   : Select Item
Security Option            : Setup       F1  : Help      PU/PD/+/- : Modify
PS/2 mouse function control: Enable      F5  : Old Values (Shift) F2  : Color
PCI/VGA Palette Snoop      : Disabled    F6  : Load BIOS Defaults
OS Select For DRAM > 64MB  : Non-OS2     F7  : Load Setup Defaults
```

After you have completed the changes, press [Esc] key and follow
the instructions on your screen to save your settings or exit without
saving.

3-2.1 Virus Warning

	Setting	Description	Note
Virus Warning	Disabled		Default
	Enabled	Enable this option to protect the boot sectors and partition tables of your hard disk. Any attempt to write to them will the system to halt and display a warning message.	

3-2.2 Cache Memory Options

	Setting	Description	Note
CPU Internal Cache	Disabled		
	Enabled	Enables the CPU's internal cache.	Default
External Cache	Disabled		
	Enabled	Enables the external memory.	Default
CPU L2 Cache ECC Checking	Disabled		
	Enabled	This option activates the CPU L2 cache ECC checking function.	Default

3-2.3 System Boot Control Settings

System Boot Control Settings	Setting	Description	Note
Quick Power On Self Test	Disabled		
	Enabled	Provides a fast POTS at boot-up.	Default
Boot Sequence	A, C, SCSI	Choose the boot sequence adapted to your needs, for example: ● [A, C, SCSI] means the BIOS will look for an operating system first in drive A, then in drive C, and eventually in SCSI device.	
	C, A, SCSI		
	C, CD-ROM, A		
	CD-ROM, C, A		
	D, A, SCSI		
	E, A, SCSI		
	F, A, SCSI		
	SCSI, A, C		
	SCSI, C, A		
	C only		
	LS/ZIP, C		
Swap Floppy Drive	Disabled		Default
	Enabled	Changes the sequence of A and B drives.	
Boot Up NumLock Status	On	Puts numeric keypad in NumLock mode at boot-up.	Default
	Off	Puts numeric keypad in arrow key mode at boot-up.	

45

System Boot Control Settings (continued)

System Boot Control Settings	Setting	Description	Note
Gate A20 Option	Normal		
	Fast	Allows RAM access above 1MB using the fast gate A20 line.	Default
Memory Parity Check	Enabled	This allows to perform a redundancy check on the parity bit in the data strings. This method is used for error detection when the parity is not found.	Default
	Disabled		

3-2.4 Typematic Settings

Typematic Settings	Setting	Description	Note
Typematic Rate Setting	Disabled		Default
	Enabled	Enables to adjust the keystroke repeat rate.	
The following [Typematic Rate] and [Typematic Delay] fields are active only if [Typematic Rate Setting] is set to [Enabled]			
Typematic Rate	6 (Char/sec) 8 (Char/sec) 10 (Char/sec) 12 (Char/sec) 15 (Char/sec) 20 (Char/sec) 24 (Char/sec) 30 (Char/sec)	Choose the rate at which a character is repeated when holding down a key.	Default
Typematic Delay	250 (msec) 500 (msec) 750 (msec) 1000 (msec)	Choose how long after you press a key down the character begins repeating.	Default

3-2.5 Security Option

Use this feature to prevent unauthorized system boot-up or use of

BIOS Setup. The following table describes the security settings.

	Setting	**Description**
Security Option	System	Each time the system is booted, the password prompt appears.
	Setup	If a password is set, the password prompt only appears when you attempt to enter the BIOS Setup program.

3-2.6 Other Control Options

Other Control Options	**Setting**	**Description**	**Note**
PS/2 mouse function	Disabled	Turn off the on-board IDE.	
	Enabled	Use a PS/2 mouse.	Default
PCI/VGA Palette Snoop	Disabled		Default
	Enabled		
		The color of the monitor may be altered when using an MPEG card. Enable this option to restore the monitor's normal color.	
OS Select for DRAM>64MB	OS2	When using an OS2 operating system.	
	Non-OS2	When using another, non-OS2 operating system.	Default
Video or Adapter BIOS Shadow	Disabled		
	Enabled		Default
		The BIOS is shadowed in a 16K segment if it is enabled and if it has BIOS present. These 16 segments can be shadowed from ROM to RAM. BIOS shadow copies BIOS code from slower ROM to faster RAM. BIOS can then execute from RAM.	

3-3 CHIPSET FEATURES SETUP

	Caution: Change these settings only if you are already familiar with the Chipset.

The [CHIPSET FEATURES SETUP] option changes the values of the chipset registers. These registers control the system options in the computer.

```
                          ROM PCI/ISA BIOS
                       CHIPSET FEATURES SETUP
                        AWARD SOFTWARE, INC.

  Auto Configuration        : Enabled    CPU to PCI Burst Mem. WR  : Disabled
                                         ISA Bus Clock Frequency   : PCICLK/4
  L2 (WB) Tag Bit Length    : 7bits      System BIOS Cacheable     : Enabled
  SRAM Back-to-Back         : Enabled    Video BIOS Cacheable      : Enabled
  NA# Enable                : Enabled    Memory Hole At 15M-16M    : Disabled
  Starting Point of Paging  : 1T         VGA Shared Memory Size    : 1   MB
  Refresh Cycle Time (us)   : 15.6       VGA Memory Clock (MHz)    : 55
  RAS Pulse Width Refresh   : 6T         Linear Mode SRAM Support  : Disabled
  RAS Precharge Time        : 3T
  RAS to CAS Delay          : 3T
  CAS# Pulse Width (FP)     : 2T
  CAS# Pulse Width (EDO)    : 1T
  RAMW# Assertion Timing    : 3T
  CAS Precharge Time (FP)   : 1T/2T      ESC : Quit                   : Select Item
  CAS Precharge Time (EDO)  : 1T/2T      F1  : Help       PU/PD/+/-   : Modify
  SDRAM WR Retire Rate      : X-2-2-2    F5  : Old Values  (Shift) F2 : Color
  SDRAN Wait State Control  : 1WS        F6  : Load BIOS Defaults
  Enhanced Memory Write     : Disabled   F7  : Load Setup Defaults
  Read Refresh Memory RD    : Enabled
  CPU to PCI Post Write     : 4T
```

After you have completed the changes, press [Esc] and follow the instructions on your screen to save your settings or exit without saving.

The following table describes each field in the CHIPSET FEATURES SETUP Menu and how to configure each parameter.

CHIPSET FEATURES SETUP

CHIPSET FEATURES	Setting	Description	Note
Auto Configuration	Disabled		
	Enabled	It is strongly recommended to enable this option so that the system automatically sets all chipset feature options on the left panel of the screen (except for cache update & BIOS cacheable).	Default
L2 (WB) Tag Bit Length	7bits	Use the default setting	Default
	8bits		
SRAM Back-to-Back	Disabled		
	Enabled	Use this default setting	Default
NA# Enable	Disabled		
	Enabled	Use this default setting	Default
Starting Point of Paging	1T	Use this default setting	Default
	2T,4T,8T		
The following fields are READ-ONLY if [Auto Configuration] is set to [Enabled]			
Refresh Cycle Time	15.6 62.4 124.8 187.2	Use the default setting	Default
RAS Pulse Width Refresh	4T,5T 6T 7T	Use the default setting	Default
RAS Precharge Time	2T 3T 4T,5T	Use the default setting	Default
RAS to CAS Delay	2T 3T 4T,5T	Use the default setting	Default

CHIPSET FEATURES SETUP (Continued)

CHIPSET FEATURES	Setting	Description	Note
CAS# Pulse Width (FP)	2T 1T	Use the default setting	Default
CAS# Pulse Width (EDO)	1T 2T	Use the default setting	Default
RAMW# Assertion Timing	3T 2T	Use the default setting	Default
CAS Precharge Time (FP)	1T/2T 2T,1T	Use the default setting	Default
CAS Precharge Time (EDO)	1T/2T 2T,1T	Use the default setting	Default
SDRAM WR Retire Rate	X-2-2-2 X-1-1-1	Use the default setting	Default
SDRAM Wait State Control	1WS 0WS	Use the default setting	Default
Enhanced Memory Write	Disabled	Use the default setting	Default
	Enabled		
Read Refresh Memory RD	Disabled	Use the default setting	Default
	Enabled		
CPU to PCI Post Write	Disable		
	3T		
	4T	Use the default setting	Default
CPU to PCI Burst Mem. WR	Disabled	Use the default setting	Default
	Enabled		

CHIPSET FEATURES SETUP (Continued)

CHIPSET FEATURES	Setting	Description	Note
ISA Bus Clock Frequency	PCILK/4	The ISA bus runs on PCI Bus Clock divided by 4.	Default
	PCILK/3	The ISA bus runs on PCI Bus Clock divided by 3.	
	7.159MHz	ISA bus clock fixed to 7.159MHz when [Auto Configuration] field is set to [Enabled].	Read-Only
System BIOS Cacheable	Disabled		
	Enabled	The ROM area F0000H-FFFFFH is cacheable.	Default
Video BIOS Cacheable	Disabled		
	Enabled	The video BIOS C0000H-C7FFFH is cacheable.	Default
Memory Hole At 15M-16M	Disabled		Default
	Enabled	Some interface cards will map their ROM address to this area. If this occurs, select [Enabled] in this field.	
VGA Shared Memory Size	1 MB	VGA memory size shared with system memory.	Default
	0.5-4 MB		
VGA Memory Clock (MHz)	40	Selects the frequency of the VGA memory clock.	Default
	40-70 MHz		
The following field applies to Cyrix type of CPUs only.			
Linear Mode SRAM Support	Disabled		Default
	Enabled	Linear mode SRAM support for Cyrix type of CPU.	

3-4 POWER MANAGEMENT SETUP

The [POWER MANAGEMENT SETUP] sets the system's power saving functions.

```
                        ROM PCI/ISA BIOS
                    POWER MANAGEMENT SETUP
                     AWARD SOFTWARE, INC.

Power Management    : User Define    VGA Activity                : Disabled
PM Control by APM   : Yes            IRQ 3    (COM 2)            : Enabled
Video Off Option    : Susp, Stby → Off IRQ 4   (COM 1)          : Enabled
Video Off Method    : V/H SYNC+Blank IRQ 5    (LPT 2)           : Enabled
Switch Function     : Break/Wake     IRQ 6    (Floppy Disk)     : Enabled
Doze Speed (div by) : 2              IRQ 7    (LPT 1)           : Enabled
Stdby Speed (div by): 3              IRQ 8    (RTC Alarm)       : Disabled
MODEM Use IRQ       : 3              IRQ 9    (IRQ2 Redir)      : Enabled
Hot Key Power Off   : Enabled        IRQ 10   (Reserved)        : Enabled
                                     IRQ 11   (Reserved)        : Enabled
         ** PM Timers **             IRQ 12   (PS/2 Mouse)      : Enabled
HDD Off After       : Disable        IRQ 13   (Coprocessor)     : Enabled
Doze Mode           : Disable        IRQ 14   (Hard Disk)       : Enabled
Standby Mode        : Disable        IRQ 15   (Reserved)        : Enabled
Suspend Mode        : Disable

         ** PM Events **             ESC  : Quit      ↑↓→← : Select Item
COM Ports Activity   : Enabled       F1   : Help      PU/PD/+/- : Modify
LPT Ports Activity   : Enabled       F5   : Old Values  (Shift) F2 : Color
HDD Ports activity   : Enabled       F6   : Load BIOS Defaults
                                     F7   : Load Setup Defaults
```

After you have completed the Power Management Setup, press [Esc] to return to the Main Menu.

3-4.1 Power Management Controls

Power Management Controls	Setting	Description		Note
Power Management	User Define	Lets you define the HDD and system power down times.		
	Disabled	Disables the Green PC Features.		Default
		Doze timer	Standby timer	Suspend timer
	Min Saving	40 Min	40 Min	40 Min
	Max Saving	20 Sec	20 Sec	20 Sec
PM Control by APM	Yes	To use Advanced Power Management (APM) you must run [power.exe] under DOS V6.0 or later version.		Default
	No			
Video Off Option	Susp,Stby→ off	Video off when the system runs into Suspend or Standby mode.		
	All Modes→ off	Video off in all modes		
	Always On	Video never off		
	Suspend→ off	Video off when the system runs into Suspend mode.		
Video Off Method	V/H Sync+Blank	Selects the method by which the monitor is blanked.		Default
	Blank screen			
	DPMS Supported			
Switch Function	Break/Wake			Default
	Disabled			
	Deturbo			
	Break			

Power Management Controls (continued)

Power Management Controls	Setting	Description	Note
Doze Speed (div by)	2	When the system enters "doze mode", the system clock is divided by the value of the integer selected in this field.	Default
	1-8		
Stdby Speed (div by)	3	When the system enters "standby mode", the system clock is divided by the value of the integer selected in this field.	Default
	1-8		
MODEM Use IRQ	3	Assigns an IRQ# to the modem device.	Default
	3-11, NA		
The following [Hot Key Power Off] field may be configured only if [Power Management] is set to [User Define]			
Hot Key Power Off	Disabled		
	Enabled	Enables to power off the system by pressing the appropriate hot-key combination: **Ctrl + Alt + ←(BackSpace)**	Default

54

3-4.2 PM Timers

PM Timers	Setting	Description	Note
HDD Off After	Disable		Default
	1-15Min	When the set time has elapsed, BIOS sends a command to the HDD to power down. This turns off the HDD motor.	Some older model HDDs may not support this advanced function.

The following [Doze Mode] field may be configured only if [Power Management] is set to [User Define]

Doze Mode	Disable		Default
	20sec-40Min	When the set time has elapsed, BIOS sends a command to the system to enter Doze Mode.	System clock drops to 33MHz.

The following [Standby Mode] field may be configured only if [Power Management] is set to [User Define]

Standby Mode	Disable		Default
	20sec-40Min	When the set time has elapsed, BIOS sends a command to the system to enter Standby Mode.	

The following [Suspend Mode] field may be configured only if [Power Management] is set to [User Define]

Suspend Mode	Disable		Default
	20sec-40Min	In Suspend mode, the CPU stops completely (no instructions are executed.)	Only an SL-Enhanced (or SMI) CPU can enter this mode.

3-4.3 PM Events

PM Events	Setting	Description	Note
COM Ports Activity	Disabled		
	Enabled	Enables the power management timers when a [no activity] event is detected on the COM ports.	Default
LPT Ports Activity	Disabled		
	Enabled	Enables the power management timers when a [no activity] event is detected on the printer ports.	Default
HDD Ports Activity	Disabled		
	Enabled	Enables the power management timers when a [no activity] event is detected on the Hard Disk Drive device.	Default
VGA Activity	Disabled		Default
	Enabled	Enables the power management timers when a [no activity] event is detected on the monitor.	
IRQ 8	Disabled		Default
	Enabled	Enables the PM timers when a [No Activity Event] is detected on the device assigned to IRQ8.	
IRQ (3-7,9-15)	Disabled		
	Enabled	Enables the PM timers when a [No Activity Event] is detected on the device assigned to this IRQ number.	Default

3-5 PNP/PCI CONFIGURATION SETUP

This option sets the mainboard's PCI Slots.

```
                          ROM PCI/ISA BIOS
                       PNP/PCI CONFIGURATION
                       AWARD SOFTWARE, INC.
 Resources Controlled By   : Manual      PCI IRQ Activated By      : Level
 Reset Configuration Data  : Disabled    PCI IDE 2nd Channel       : Enabled
                                         PCI IDE IRQ Map To        : PCI-AUTO
 IRQ-3    assigned to  : PCI/ISA PnP*       Primary   IDE  INT#    : A
 IRQ-4    assigned to  : PCI/ISA PnP*       Secondary IDE  INT#    : B
 IRQ-5    assigned to  : PCI/ISA PnP*
 IRQ-7    assigned to  : Legacy ISA*
 IRQ-9    assigned to  : PCI/ISA PnP*
 IRQ-10   assigned to  : PCI/ISA PnP*
 IRQ-11   assigned to  : PCI/ISA PnP*
 IRQ-12   assigned to  : PCI/ISA PnP*
 IRQ-14   assigned to  : Legacy ISA*
 IRQ-15   assigned to  : Legacy ISA*
 DMA-0    assigned to  : PCI/ISA PnP*    ESC  : Quit      ↑↓→←     : Select Item
 DMA-1    assigned to  : PCI/ISA PnP*    F1   : Help      PU/PD/+/- : Modify
 DMA-3    assigned to  : PCI/ISA PnP*    F5   : Old Values (Shift) F2  : Color
 DMA-5    assigned to  : PCI/ISA PnP*    F6   : Load BIOS Defaults
 DMA-6    assigned to  : PCI/ISA PnP*    F7   : Load Setup Defaults
 DMA-7    assigned to  : PCI/ISA PnP*
```

> *Note:* Starred (*) items will disappear when the [Resources Controlled By] option is set to [Auto].

After you have completed the PCI Slot Configuration, press [Esc] and follow the instructions on your screen to save your settings or exit without saving.

3-5.1 PNP/PCI Configuration Controls

PNP/PCI Controls	Setting	Description	Note
Resources Controlled By	Manual	BIOS does not manage PCI/ISA PnP card IRQ assignment.	
		Requires to assign IRQ-# and DMA-# to PCI or ISA PnP manually.	
		IRQ-3,4,5,7,9,10,11,12,14,15 assigned to: _	
		DMA-0,1,3,5,6,7 assigned to: _	
	Auto	The Plug-and-Play BIOS auto manages PCI/ISA PnP card IRQ assignment automatically.	**Recommended**
Reset Configuration Data	Disabled	Retain PnP configuration data in BIOS.	Default
	Enabled	Reset PnP configuration data in BIOS.	

3-5.2 PNP/PCI Configuration Setup

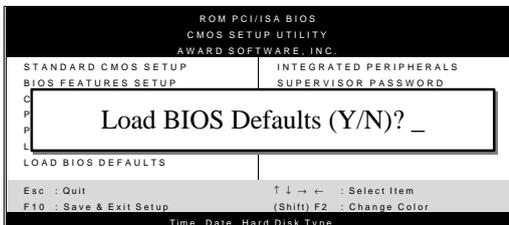| PNP/PCI Setup	Setting	Description	Note
If [Resources Controlled By] is set to [Manual]			
IRQ-# and DMA-# assigned to:	PCI/ISA PnP	Choose IRQ-# and DMA-# assigned to PCI/ISA PnP card.	IRQ-3,4,5,7,9,10, 11,12,14,15 DMA-0,1,3,5,6,7
	Legacy ISA	Choose IRQ-# and DMA-# assigned to Legacy ISA card.	IRQ-3,4,5,7,9,10, 11,12,14,15 DMA-0,1,3,5,6,7
PCI IRQ Activated By:	Edge		
	Level	Most PCI trigger-signals are Level.	Setting must match PCI card.
PCI IDE 2nd Channel:	Disabled		
	Enabled	Allows you to use the secondary IDE port.	Default
PCI IDE IRQ Map To:	ISA	Specifies the ISA slot as IDE disk controller.	**Not recommended**
	PCI-AUTO	Select this option for Plug-and-Play.	Default
If [PCI IDE IRQ Map To] field is set to [PCI-AUTO]			
Primary IDE INT#:	A	Specifies the PCI interrupt assigned to the primary IDE hard disk.	Default **(recommended)**
	A, B, C, D		
Secondary IDE INT#:	B	Specifies the PCI interrupt assigned to the secondary IDE hard disk.	Default **(recommended)**
	A, B, C, D		

3-6 LOAD SETUP DEFAULTS

Select the [LOAD SETUP DEFAULTS] option from the Main Menu to load the system values you have previously saved. This option is recommended if you need to reset the system setup and to retrieve the old values.
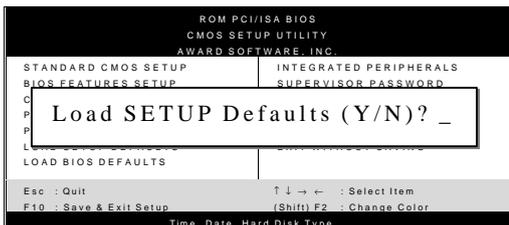
```
                    R O M   P C I / I S A   B I O S
                    C M O S   S E T U P   U T I L I T Y
                    A W A R D   S O F T W A R E ,   I N C .
 S T A N D A R D   C M O S   S E T U P        I N T E G R A T E D   P E R I P H E R A L S
 B I O S   F E A T U R E S   S E T U P        S U P E R V I S O R   P A S S W O R D
 C
 P    Load SETUP Defaults (Y/N)? _
 P
 L
 L O A D   B I O S   D E F A U L T S

 E s c   : Q u i t                     ↑ ↓ → ←   : S e l e c t   I t e m
 F 1 0   : S a v e   &   E x i t   S e t u p    ( S h i f t )   F 2   : C h a n g e   C o l o r
                    T i m e ,   D a t e ,   H a r d   D i s k   T y p e ...
```

Type [Y] to use the Setup Defaults followed by [Enter] or otherwise [N] to return to the Main Menu and keep current values.

3-7 LOAD BIOS DEFAULTS

Select the [LOAD BIOS DEFAULTS] option from the Main Menu to load the system default values. BIOS Defaults values are adjusted to yield high performance.

```
                    R O M   P C I / I S A   B I O S
                    C M O S   S E T U P   U T I L I T Y
                    A W A R D   S O F T W A R E ,   I N C .
 S T A N D A R D   C M O S   S E T U P        I N T E G R A T E D   P E R I P H E R A L S
 B I O S   F E A T U R E S   S E T U P        S U P E R V I S O R   P A S S W O R D
 C
 P    Load BIOS Defaults (Y/N)? _
 P
 L
 L O A D   B I O S   D E F A U L T S

 E s c   : Q u i t                     ↑ ↓ → ←   : S e l e c t   I t e m
 F 1 0   : S a v e   &   E x i t   S e t u p    ( S h i f t )   F 2   : C h a n g e   C o l o r
                    T i m e ,   D a t e ,   H a r d   D i s k   T y p e ...
```

Type [Y] to use the Setup Defaults followed by [Enter] or otherwise [N] to return to the Main Menu and keep current values.

> 🛑 *Warning:* If you run into any problems after loading BIOS DEFAULTS, please load the SETUP DEFAULTS for stable performance.

3-8 INTEGRATED PERIPHERALS

🛑 *Caution:* Change these settings only if you are already familiar with the Chipset.

The [INTEGRATED PERIPHERALS] option changes the values of the chipset registers. These registers control the system options in the computer.

The following screen shows default settings.

```
                        ROM PCI/ISA BIOS
                      INTEGRATED PERIPHERALS
                       AWARD SOFTWARE, INC.

Internal PCI/IDE           : Both      Onboard Parallel Port    : 378
IDE Primary Master PIO     : Auto      Parallel Port Mode       : Normal
IDE Primary Slave PIO      : Auto      ECP Mode Use DMA         : 3
IDE Secondary Master PIO   : Auto      Parallel Port EPP Type   : EPP1.9
IDE Secondary Slave PIO    : Auto      USB Controller           : Disabled
Primary Master    UltraDMA : Auto      Power Button Over Ride   : Enabled
Primary Slave     UltraDMA : Auto      Ring Power Up Control    : Enabled
Secondary Master  UltraDMA : Auto      Power Up by Alarm        : Disabled
Secondary Slave   UltraDMA : Auto
IDE Burst Mode             : Enabled
IDE Data Port Post Write   : Enabled
IDE HDD Block Mode         : Enabled

Onboard FDC Controller     : Enabled
Onboard UART 1             : 3F8/IRQ4   ESC : Quit       ↑↓→← : Select Item
Onboard UART 2             : 2F8/IRQ3   F1  : Help     PU/PD/+/- : Modify
Onboard UART 2 Mode        : Standard   F5  : Old Values  (Shift) F2 : Color
IR Duplex Mode             : Half       F6  : Load BIOS Defaults
Use IR Pins                : IR-RX2TX2  F7  : Load Setup Defaults
```

The following tables describe each field in the INTEGRATED PERIPHERALS Menu and provide instructions on how to configure the IDE controls, FDC controls, and the onboard serial and parallel ports.

3-8.1 IDE Device Controls

IDE Controls	Setting	Description	Note
Internal PCI/IDE	Both	Selects which PCI IDE controller to use.	Default
	Disabled		
	Primary		
	Secondary		

The following fields may be configured only if [Internal PCI/IDE] is set to [Both], [Primary], or [Secondary].

IDE ➢ **Primary Master PIO** ➢ **Primary Slave PIO** ➢ **Secondary Master PIO** ➢ **Secondary Slave PIO**	Mode 0-4	0 is the slowest speed 4 is the fastest speed	
	Auto	For better performance and stability, we suggest you use the Auto setting to set the HDD control timing.	Default
➢**Primary Master UltraDMA** ➢**Primary Slave UltraDMA** ➢**Secondary Master U-DMA** ➢**Secondary Slave U-DMA**	Disabled		
	Auto	Select Auto to enable Ultra DMA Mode support.	Default

The following field may be configured only if [Internal PCI/IDE] is set to [Both], [Primary], or [Secondary].

IDE Burst Mode	Disabled		
	Enabled	Select this option if your hard disk support this function.	Default
IDE Data Port Post Write	Disabled		
	Enabled	Select this option if your hard disk support this function.	Default
IDE HDD Block Mode	Disabled		
	Enabled	Invokes multi-sector transfer instead of one sector per transfer. Not all HDDs support this function.	Default

3-8.2 FDC Controls

FDC Controls	Setting	Description	Note
Onboard FDC controller	Disabled	Turn off the on-board floppy controller	
	Enabled	Use the on-board floppy controller	Default

3-8.3 Onboard Serial Ports

Onboard Serial Ports	Setting	Description	Note
Onboard UART 1	Disabled		
Onboard UART 2	3F8/IRQ4	Choose serial port 1 & 2's I/O address.	Default (port 1)
	2F8/IRQ3	Do not set port 1 & 2 to the same address	Default (port 2)
	3E8/IRQ4	except for Disabled or	
	2E8/IRQ3	Auto.	
	Auto		
Onboard UART 2 Mode	Standard	Supports a serial infrared IrDA.	Default
	HPSIR	Supports HP serial infrared interface format.	
	ASKIR	Supports a Sharp serial interface format.	
If [Onboard UART 2 Mode] is set to [HPSIR] or [ASKIR]			
IR Duplex Mode	Half	Use this setting	Default
	Full		
Use IR Pins	IR-RX2TX2	Use this setting	Default
	IR-RX TX		

3-8.4 Onboard Parallel Ports

Onboard Parallel Ports	Setting	Description	Note
Onboard Parallel Port	378	Choose the printer I/O address.	Default
	Disabled		
	3BC		
	278		
Parallel Port Mode	ECP + EPP	The mode depends on your external device that connects to this port.	
	Normal		Default
	EPP		
	ECP		
If [Parallel Port Mode] is set to [ECP] or [ECP+EPP].			
ECP Mode Use DMA	3	Choose DMA3	Default
	1	Choose DMA1	
If [Parallel Port Mode] is set to [EPP] or [ECP+EPP].			
Parallel Port EPP Type (EPP Version)	EPP1.9	Choose EPP Ver. 1.9	Default
	EPP1.7	Choose EPP Ver. 1.7	

3-8.5 Other Controls

Other Controls	Setting	Description	Note
USB Controller	Disabled	Turn off the on-board USB controller.	Default
	Enabled	Use the on-board USB controller.	
Power Button Over Ride	Disabled		
	Enabled	You can power off the system by means other than the power mechanical button.	Default
Ring Power Up Control	Disabled		
	Enabled	Select this item when using ake-On-LAN (WOL) or Modem Ring to wake up the system.	Default
Power Up by Alarm	Disabled		Default
	Enabled	Allows you to set date and time for the timer clock that will automatically wake-up the system.	

3-9 SUPERVISOR PASSWORD

Based on the setting you have made in the [Security Option] of the [BIOS FEATURES SETUP] section, the password prevents access to the system or the setup program by unauthorized users. Follow this procedure to set a new password or disable the password:

1. Choose [BIOS FEATURES SETUP] in the Main Menu and press [Enter]. Select the [Security Options] item and set the field to:
    a. [System]: The password is required every time the system is booted. This means only a person who knows the password can use this computer.
    b. [Setup]: The password is required only when you attempt to enter the BIOS Setup program.

2. Choose [SUPERVISOR PASSWORD] from the Main Menu and press [Enter]. The following prompt appear:

    > Enter Password:

Warning: If you forget or lose the password, the only way to access the system is to set jumper JP5 to clear the CMOS RAM. All setup information is lost and you must run the BIOS setup program again.

Note: If you do not wish to use the password function, press [Enter] directly and the following message appears:
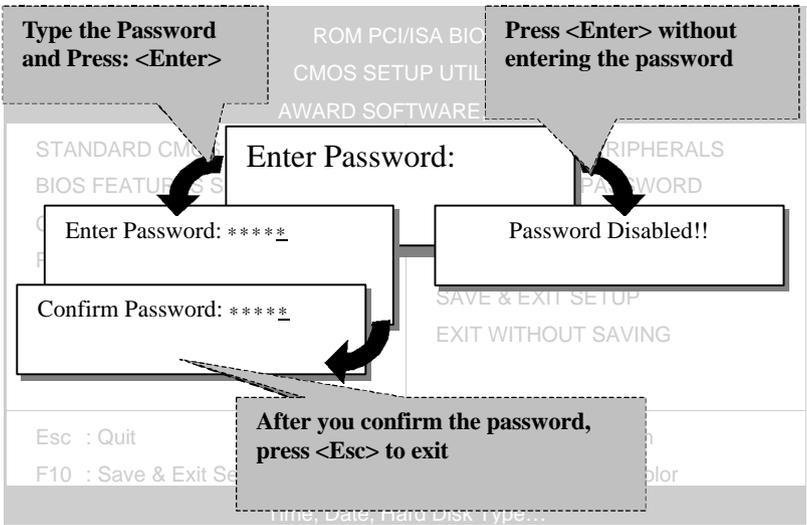
    > Password Disabled!!

3. Enter your new password and press [Enter]. The following message appears, prompting to confirm the new password:

> Confirm Password:

4. Re-enter your password and then press [Enter] to exit to the Main Menu.

This diagram outlines the password selection procedure:

3-10 USER PASSWORD

When the user password option is on, you are not allowed to change any setting in the [CMOS SETUP UTILITY] except for changing the user's password.

The password setting procedure is similar to that for the [SUPERVISOR PASSWORD] (Refer to section 3-9).

3-11 IDE HDD AUTO DETECTION

This Main Menu function automatically detects the hard disk type
and configures the STANDARD CMOS SETUP accordingly.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	: AUTO	0	0	0	0	0	0	AUTO
Primary Slave	: None	0	0	0	0	0	0	- - - -
Secondary Master	: None	0	0	0	0	0	0	- - - -
Secondary Slave	: None	0	0	0	0	0	0	- - - -

Do you accept this drive C (Y/N)? _

ESC : Skip

Note: This function is only valid for IDE type of hard disk drives.

Chapter 4

ONBOARD VGA AND AUDIO

4-1 Onboard VGA

This mainboard offers an onboard Video Graphics Accelerator (VGA), provided by the SiS 5598 chipset and related application programs.

Note: Please refer to *Chapter 6 - SiS VGA Driver Installation* for a detailed procedure on how to install the video driver depending on the particular environment (DOS, Win NT 3.5/3.51/4.0, Win 95, Win 3.x, IBM OS/2 Warp 3.0 Double Byte/Single Byte) installed on your system.

Features

● Shared system memory area: 0.5MB to 4MB in 0.5MB increments
● Support 32-bit PCI local bus standard revision 2.1
● Built-in 64-bit BITBLT graphics engine
● Built-in programmable 24-bit true-color RAMDAC
● Support FPM/EDO/Synchronous DRAM
● Support the following high-resolution graphic modes:
   ➢ 1280x1024 pixels with 16/256 colors
   ➢ 1024x768 with 16/256/32K/64/16M colors
   ➢ 800x768 pixels with 16/256/32K/64/16M colors
   ➢ 640x480 pixels with 256/32K/64/16M colors
      (Win95 Standard)

Video Functions

● Support single frame buffer architecture to save the DRAM cost

● Support graphics/video overlay function by color-key and/or chroma-key operations

● Support multi-format Video For windows such as YUV420, YUV422, RGB565, and RGB555

● Support YUV-to-RGB color space conversion

● Support Microsoft Video For Windows

● Support DCI Drivers

● Support Direct Draw Drivers

● Support Direct MPEG Drivers

Connecting to the VGA Port

To connect your computer screen, attach one end of the video cable supplied with your VGA monitor to the corresponding port at the back of the monitor and plug the other end into the 15-pin VGA port at the back panel of the mainboard.
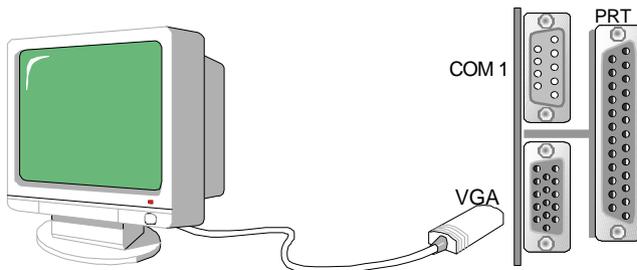
4-2 Onboard Joystick Port

A joystick, in computer graphics, is a lever with at least two degrees of freedom used as an input device. The joystick is normally used as a locator in at least a 2-D plane.

The joystick device is most widely used in video games applications. Attach the joystick cable to the 15-pin JOYSTICK port at the rear panel of your mainboard.

4-3 Onboard Audio

This mainboard features three built-in audio-stereo ports (labeled line-in, line-out, and mic jack) convenient to directly plug-in all your external audio devices. Your SY-5STM mainboard is making use of the ALS120 sound chipset technology and applications programs.

Note: Please refer to *Chapter 5- ALS120 Audio Driver Installation* for a detailed procedure on how to install the audio driver depending on the particular environment (DOS, Win NT 3.5/4.0, Win 95, Win 3.1) installed on your system.

Features

- Single, mixed-signal, high performance VLSI sound ASIC
- Built-in 3D Sound Effect Processor
- Built-in ALSFM Synthesizer with external wavetable support
- ISA plug-and-Play support logic
- Supports Sound Blaster ADPCM decompression
- MPU-401 MIDI controller with FIFO
- Support 8-bit Type F DMA playback
- Software selectable DMA lines (0, 1, 3)
- 8/16-bit mono/stereo digital audio from 4 kHz to 48 kHz
- Enhanced normal & digital game port support
- MIDI port with input and output FIFO
- 16-bit PNP address I/O decoder

Software Support

- Windows 3.1
- Windows 95
- Windows NT 3.5/4.0
- Windows Sound System
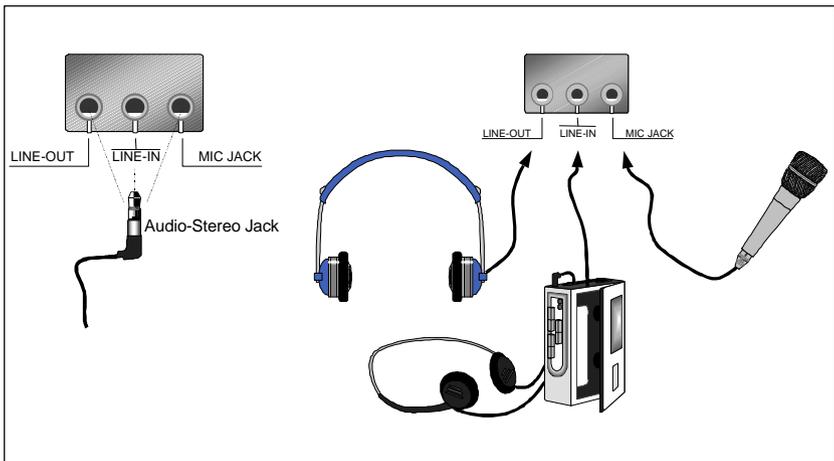- All DOS-based Games

Compatibility

- Sound Blaster ™
- Sound Blaster Pro ™
- Sound Blaster 16 ™Emulation
- Windows Sound System ™

Connecting your Audio Devices

You can connect audio devices to the following ports:

- headphones or pre-amplified speakers to the "line-out" port;
- a line-in device such as CD/Cassette player to the "line-in" port;
- a microphone to the "mic" port.

Connecting Speakers

You can connect external speakers to the "Line-out" port on your SY-5STM mainboard.

(Amplified Speakers)
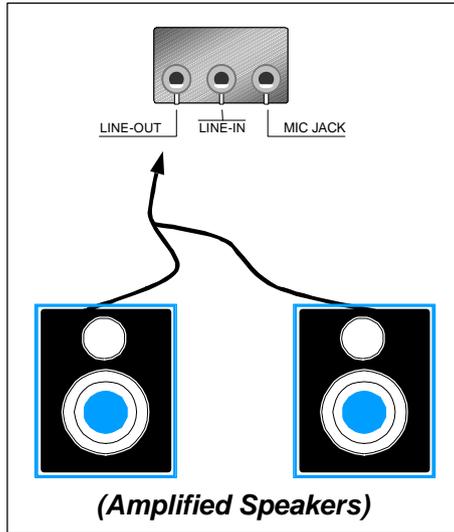
> *Note:* This mainboard requires a speaker with **built-in amplifier (Amplified Speaker)** to generate proper output sound volume.

Using the Avance Audio Driver

To access the Avance ™Sound Mixer audio driver controls, follow these steps:

1. Open the Windows 95/98 **[Start]** menu.

2. Select **[Programs], [Accessories],** and **[Multimedia]** path.

3. Find and click the **[Volume Control]** option to run the application.

The audio control panel appears as shown in the following figure. The audio mixer gives control of the sound inputs of all audio devices. You can adjust the internal volume and balance of each individual audio device. Also, this audio mixer lets you apply ave sound effects.

> *Important:* The **[Playback]** volume controls the master output sound volume of your system. Depending on the speaker you use you will need to adjust both the volume control on the speaker itself and the audio volume control menu under Windows 95/98 to get the proper sound output.
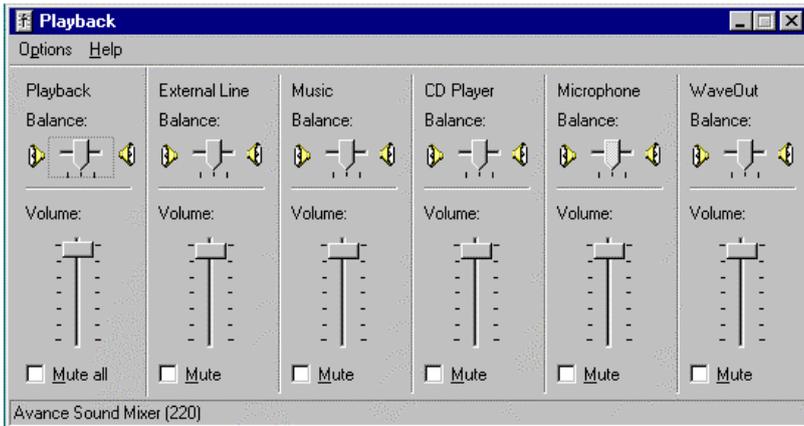
Chapter 5

ALS120 AUDIO DRIVER INSTALLATION

This section describes how to install the ALS120 audio driver and application program. Your mainboard comes with a ALS120 installation CD-ROM. The "CD Title Disk" contains the following applications programs:

- Windows 3.1
- DOS Utility (DOSINST.EXE)
- Windows 95
- Windows NT 3.5/4.0
- Setup Utility Program (A3CONFIG.EXE)

5-1 Windows 3.1

Follow these steps to perform the ALS120 audio driver installation in Windows 3.1 environment:

1. Start Windows 3.1.
2. Insert the "CD Title Disk" into diskette drive D (CD-ROM).
3. Select [Run] from the Program Manager File menu and type **D:\SOYO_CD\rev_10\utility\sis_aud\setup** on the command line.
4. A Welcome dialog box will appear. Click [Next] to continue the installation.
5. A Choose Destination Location dialog box will appear. Click [Next] in the Choose Destination dialog box to install the ALS120 sound driver to the default directory or click on [Browse] if you want to install to a different directory.
6. Setup will automatically create a folder and icons for the sound application.
7. A Modifying AUTOEXEC.BAT dialog box will appear. Click on [Next] to accept the default and "Let Setup modify the AUTOEXEC.BAT. file".
8. A Configuration Panel dialog box will appear for the first time installation and please check each hardware settings and make changes according to hardware installed and also if you do not hear music at tests.
9. Click on [Finish]. Setup will configure the hardware settings. Refer to the "Setup Utility Program" in a next chapter to configure your sound card.

5-2 DOS Utility (DOSINST.EXE)

You can also install the ALS120 audio driver by running the DOSINST.EXE application program in DOS environment:

1.   Insert the CD Title Disk into diskette drive D (CD-ROM).
2.   If Windows 3.1/95 is running, exit the application.
3.   At the C:\> prompt, type **d:** (CD-ROM) and press the <Enter> key.
4.   At the D:\SOYO_CD\rev_10\utility\sis_aud\> prompt, type **DOSINST.EXE** and press the <Enter> key.
5.   The Avance Sound Chip Installation Program screen will be displayed showing the following defaults:

   Avance software copy to: C:\A3SOUND

   System bootup drive: C:\

   ● To make changes to the defaults, select the parameter with the Up/Down Arrow keys and press the <Enter> key. Then change the parameter and press the <Enter> key again to accept the changes.
   ● When satisfied with the new parameters or to accept the defaults, select "accept the above" with the Up/Down Arrow keys and press the <Enter> key.
6.   The installation of the Avance Logic software drivers will now begin.
7.   When all of the files are copied to the fixed disk, installation program will automatically update the AUTOEXEC.BAT, saving copies of the original files with the extension ".ALS", and the A3CONFIG.EXE utility will automatically start. Use the instructions given in "Setup Utility Program" in a next section to set up the ALS120 sound card.

5-3 Windows 95

To perform the ALS120 audio driver installation in Windows 95 environment, follow these steps:

1.   Power on the system and when the "New Hardware Found" window comes up, click [OK] to accept the default. Select "Driver from disk pro-vided by hardware manufacturer."

2.   Click on [OK] when the "Install From Disk" dialog box appears.

3.   Insert the "CD Title Disk" into diskette drive D (CD-ROM). Select the **D:\SOYO_CD\rev_10\utility\sis_aud** directory and click on [OK]. Windows 95 will automatically copy all of the needed files and configure the ALS120 sound card.

4.   The sound application is included on this diskette and you have the option to install it now. If you do not need to install the application, remove the diskette from the diskette drive and skip steps 5 through 10.

5.   Select [Run] from the start menu.

6.   Type **D:\SOYO_CD\rev_10\utility\sis_aud\setup** and Click on [OK]. (D=CD-ROM)

7.   Click [Next] in the Welcome dialog box.

8.   A Choose Destination dialog box will appears, Click [Next] to install the sound driver to the default directory or click on [Browse] if you want to install to a different directory.

9.   Windows will automatically create a folder and icon for the sound application.

10. Click [Finish]. The installation is complete.

5-4 Windows NT 3.5/4.0

1. Ensure that ALS120 is installed properly and power on the system.
2. Insert the 'CD Title Disk' into drive D (CD-ROM). Go to [Control Panel/Multimedia/Device/Add] and choose [OK] for 'Avance Logic, Inc. Sound Chip'.
3. While installing, "Driver Exists" warning message will appear and ask whether to keep the old 'midimap.cfg' or [re-install]. Please select [re-install], otherwise MIDI will not function properly.
4. Configure the proper I/O's and DMA's if necessary as they appear on screen.

5-5 Setup Utility Program

A3CONFIG.EXE

This utility program is used to set up the ALS120 sound card. It is automatically started when the Avance Logic software drivers are first installed in a DOS or Windows 3.1 application. It should be re-run anytime the system hardware configuration is changed or a change to the ALS120 sound card configuration is desired. The A3CONFIG.EXE utility resides in the directory into which the Avance Logic software drivers were stored.

Configuration

To run the A3CONFIG.EXE, perform the following:

1. If Windows 3.1 is running, exit the application and at the C:\> prompt, set the current directory to the directory containing the A3CONFIG.EXE utility (A3SOUND was the default directory at the time of installation), type **A3CONFIG.EXE**, and then press the <Enter> key to execute the utility.

2. The ALS120 Sound Chip Configuration Program screen will be displayed. Use the Tab, Space, Enter, Down Arrow, and ESC keys and/or the mouse to select and set options in menus, to move between menus, and to make and set changes to values.

3. In the Sound Chip Configuration Program menu, the SB16 configuration screen showing the I/O port, DMA, and IRQ settings will be displayed, and the default settings are: I/O Port: 220, DMA1: 1, DMA2:3 and IRQ: 5. Select and set any changes or accept the defaults.

4. In the Sound Chip Configuration Program menu, select **"MPU401"** to configure the external MIDI. The Enable/Disable box can be selected by using mouse or [space] key. If the external MIDI is enabled, the I/O port and IRQ settings will be displayed and can be changed by mouse control or [down arrow] key. The default settings are: I/O Port: 330 and IRQ: 9. Select and set any changes or accept the defaults.

5. In the Sound Chip Configuration Program menu, select **"CD-ROM"** to configure the CD-ROM. The Enable/Disable box can be selected by using mouse or [space] key.

6. In the Sound Chip Configuration Program menu, select **"ADLIB"** to configure the OPL3. The Enable/Disable box can be selected by using mouse or [space] key.

7. In the Sound Chip Configuration Program menu, select **"Game Port"** to configure the game port. The Enable/Disable box can be selected by using mouse or [space] key.

8. In the Sound Chip Configuration Program menu, select **"Set Volume"**. The Setting Volume screen will be displayed. Make and set any changes or accept the existing settings and return to the Main Menu.

9. In the Sound Chip Configuration Program menu, **8-Bit Sound/16-Bit Sound/FM Music** box will be displayed. Select each box and verify the correct operation of the ALS120 sound card. Follow the instructions given for each mode. If the sound card does not operate correctly in any mode, reconfigure it by re-running this procedure.

10. When satisfied with the operation of the ALS120 sound card, select [OK] to exit the utility.

5-6 Troubleshooting

The ALS120 sound card is designed to run trouble free once it is installed and set up. Most problems will be encountered during installation and setup or will be encountered later when something is changed in the system. The following are descriptions of and solutions for the more common problems that you may encounter. Please review these problems before requesting technical assistance.

Troubleshooting in DOS

Symptom	Possible Cause	Corrective Action
No sound when playing a DOS game	There may be a conflict in the SB16 settings.	Rerun the A3CONFIG.EXE utility and try another Port, DMA, or IRQ address.

Troubleshooting in Windows 3.1

Symptom	Possible Cause	Corrective Action
There is no "Sound" or "MIDI Sequencer" item in the Device pull-down menu in the Media Player or the alsrack.exe application does not work.	The MIDI software driver may not be loaded. Check the system.ini file for the following lines. If any are missing, perform the steps outlined in the Solution. If all are present, call for technical assistance.	Run the A3CONFIG.EXE utility in its entirety.

Chapter 6

SiS VGA DRIVER INSTALLATION

6-1 Introduction

To make use of the advanced features of SiS 5597/5598 chipsets, software drivers developed by SiS support application programs, extended graphics and text modes. You may also refer to the SiS website at http://www.sis.com.tw for more information.

The following applications programs are supported by the enclosed CD-ROM:

- DOS Utility(SVGAUTL.EXE)
- Autodesk ADI 4.2-Protected Mode
  - ➢ AutoCAD/386 Release 11,12
  - ➢ AutoShade R2.0 SetupCAD/386 Release 11,12
  - ➢ 3D Studio Version 3.0 Setup
- ET24 (Chinese)
- Microsoft Windows NT Ver.3.5,3.51&4.0
- Microsoft Windows 95
- Microsoft Windows 3.x
- IBM OS/2 Warp 3.0 (Double Byte Character)
- IBM OS/2 Warp 3.0 (Single Byte Character)

6-2 DOS Utility

6-2.1 SVGAUTL.EXE

General Description

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

1.   Video Mode Setting
2.   Frame Rate Setting
3.   Power Saving Setting

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

For 640x480, 800x600, 1024x768, and 1280x1024 resolutions, SiS 55597/5598 supports multiple frame rates. If your monitor can synchronize with these frame rates, you can use SVGAUTL.EXE to get the best advantage.

SiS 5597/5598 also supports VESA DPMS Power Saving Modes, SVGAUTL.EXE can help you set this capability.

How to Install

1.   To use SVGAUTL.EXE,
2.   Type "SVGAUTL" in the directory where it resides.
     For example,
     D:\>SOYO_CD\REV_10\UTILITY\SIS_VGA\DOS\SVGAUTL<Enter> (assuming SVGAUTL.EXE resides in CD-ROM "D")
3.   The Main Menu will appear and direct you to configure SiS 5597/5598.
4.   When you complete the configuration, you may save your preferences to the AUTOEXEC.BAT file and use it as your power-on (or hardware reset) default environment.

What the Parameters Represent

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 available 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 available 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 available 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 available 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 to be 5 minutes.

                        >SVGAUTL/PA:5<Enter>

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

     For example: Set Suspend Timer to be 5 minutes.

                        >SVGAUTL/PB:5<Enter>

Note:

1. Suspend Time is "ta+tb"(i.e. standby time + suspend time).
2. The timers are not very accurate.

6-3 Autodesk ADI 4.2 Protected Mode

6-3.1 General Description

Driver Files

1. The enclosed CD-ROM contains the following SiS 5597/5598 ADI file: **RCPSIS.EXP** SiS ADI driver (for all resolutions & colors).

Note:

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

2. This driver fits for a series of Autodesk Inc. products including:
   - ➢ AutoCAD/386 R11
   - ➢ AutoCAD/386 R12
   - ➢ AutoShade/386 B2.0
   - ➢ 3D Studio V3.0

3. Their installation procedures are different from program to program. The first step of installation is the same for all these programs. Make sure you unpack and copy drivers to where you would like them to reside.

4. A detailed description of the installation procedures for each program is given in Sec. 1.2.2 to Sec. 1.2.5.

Unpack & Copy

To unpack and copy drivers please perform the following procedures:

1. Run "INSTDRV.EXE" where it resides. For example, **D:\>SOYO_CD\REV_10\UTILITY\SIS_VGA\DOS\INSTDRV <Enter>** (assuming INSTDRV.EXE resides in CD-ROM "D")

2. In SiS's Super VGA Driver 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, key in the
    "drive:\directory" where these drivers will reside (default
    C:\ADI43). The program will unpack and copy all related driver
    files to the designation you assign.

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

5. Refer to Sec.1.2.2 to SEC. 1.2.5 for the installation procedures
    of each program.

6-3.2 AutoCAD R11 Setup

1. The following procedures assume that
    ➢ You have completed the "unpack & copy" procedure.
    ➢ Your ADI 4.2 drivers are located in C:\ADI42.

2. Add the following setting to your own batch file for AutoCAD R11
    (i.e. ACADR11.BAT) or to your AUTOEXEC.BAT file:
    SETDSPADI=\ADI42\RCPSIS.EXP <Enter>

3. Delete the configuration file *ACAD.CFG* that resides in the
    \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. Perform the listed instructions on the screen and the system will
    start with the selected display setting.

6-3.3 AutoCAD R12 Setup

1. The following procedures assume that
   - ➤ You have completed the unpacking & copy procedure.
   - ➤ Your SiS ADI 4.2 drivers are located in C:\ADI42.
   - ➤ Your AutoCAD R12 program is located in C:\ACADR12.
   - ➤ Your AutoCAD R12 default drivers are located in C:\ACADR12\DRV.
   - ➤ Your AutoCAD R12 configure file ACAD.CFG is located in C:\ACADR12.

2. Copy the **RCPSIS.EXP** driver file to C:\ACADR12\DRV. You may complete this step with the following command:
   COPY C:\ADI42\RCPSIS.EXP C:\ACADR12\DRV

3. Delete your original ACAD.CFG file. You may complete this step with the following command:
   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 cannot find the configuration file ACAD.CFG.

6. Follow the instructions of AutoCAD R12 to proceed with 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. Perform the listed instructions and the system will start with the selected display setting.

6-3.4 AutoShade R2.0 Setup

1. The following procedures assume that
   - ➢ You have completed the "unpack & copy" procedure.
   - ➢ Your ADI 4.2 drivers are located in C:\ADI42.

2. Add the following settings to your own batch file for AutoShade R2.0 (i.e. SHADE2.BAT) or to your AUTOEXEC.BAT file.
   - ➢ For display driver settings:
     SET DSPADI=\ADI42\RCPSIS.EXP
   - ➢ For rendering driver settings:
     SET RDPADI=\ADI42\RCPSIS.EXP

3. Delete the configuration 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. Perform all the listed instructions and the system will start with the desired display settings.

6-3.5 3D Studio Version 3.0 Setup

1. The following procedures assume that
   - ➢ You have completed the "unpack & copy" procedure.
   - ➢ 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:
   - ➢ **SET RCPADE=C:\ADI42\RCPSIS.EXP**
   - ➢ **SET RDPADI=C:\ADI42\RCPSIS.EXP**

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

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

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

6. Type **3DS VIBCFG <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.

   ● In "Main-Display" item,
     ➢ Press **<Enter>**. The selection menu will appear.
     ➢ In selection menu, move cursor to **"RCPADI"**
     ➢ Press **<Enter>** to select.

   ● In "Material-Display" item,
     ➢ Press **<Enter>.** The selection menu will appear.
     ➢ In selection menu, move cursor to **"RCPADI"**
     ➢ Press **<Enter>** to select.

   ● In "Render-Display" item,
     ➢ Press **<Enter>.** The selection menu will appear.
     ➢ In selection menu, move cursor to **"RCPADI" or "RDPADI".**
     ➢ Press **<Enter>** to select.

   ● Complete the other selections and exit configuration.

9. After the exiting configuration, 3DS will boot automatically using the environment you just selected.

10. If your previous configuration is good, 3DS will ask you to make a detailed configuration for SiS 5597/5598 drivers. If this does not happen, please check your previous configuration.

11. In the detailed configuration for SiS 5597/5598 drivers, follow the instructions that appear on the screen and make your own choices.

12. After the detailed configuration, you will enter the 3DS main display screen and you may begin your 3D Studio work in the environment you just made.

13. Once completing the detailed configuration, you may enter 3D Studio by typing: **\3DS3\3DS <Enter>**.

14. To change your video configuration again, follow the procedures mentioned above.

6-4 ET24 (Chinese)

This is an ETen Chinese System Display driver (ETDSPDRV.COM) for SiS VGA chips.

1. To install this driver, Copy "SVGAUTL.EXE" to <drive>:\<directory>, i.e.C:\SiS.

2. In default mode (1024x768x16c, 87Hz Interlaced), this Display Driver will force ET Chinese System to "software scrolling" (scrolling with slower speed). To make use of "hardware scrolling", you must set the Frame Rate to non-interlaced mode before entering ET Chinese system. Do so by adding the following line to the top of the Autoexec.bat or ET24.bat.file. The last two number of the line correspond with the refresh rate of your monitor:
   <drive>:\<directory>\SVGAUTL\F2:60 (for 60Hz non-interlaced mode)

3. You may also use F2:70 and F2:75 for 70Hz and 75Hz non-interlaced modes. Here is an example:
   "C:\SiS\SVGAUTL\F2:60" to Autoexec.bat or ET24.bat

4. Please note that some monitors may not support 70Hz non-interlaced modes.

6-5 Windows NT 3.5 & 3.51

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.

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 CD-ROM disk into the CD drive.
7. When the "Install from Disk" dialog box appears, type the
    directory storing the drivers and click "OK". The directory in the
    CD-ROM is at
    D:\SOYO_CD\REV_10\UTILITY\SIS_VGA\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.

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.

6-6 Windows NT 4.0

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.

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 CD-ROM disk into the CD drive.
8. When the "Install from Disk" dialog box appears, type the directory storing the drivers and click "OK". The directory in the CD-ROM is at
   D:\SOYO_CD\REV_10\UTILITY\SIS_VGA\WINNT\WINNT40.
9. Click on Open when the file name appears on screen.
10. Click on "OK" when the "Install From Disk" dialog box appears again.
11. When the "Change Display" dialog box appears, click "OK".
12. When the "Third-party Drivers" dialog box appears, click "Yes".
A message will appear stating that the drivers were successfully installed. Click "OK". You must now restart Windows NT 4.0. Upon restarting, you will be prompted to test the new driver. After testing is completed, you will need to restart Windows NT again.

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 16777216 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.

6-7 Windows 95

Driver Files

1. The enclosed SiS 5597/5598 Windows NT 95 drivers files are:
   - ➢ **SETUP.EXE**
   - ➢ **SIS597.DRV**
   - ➢ **SIS597.INF**
   - ➢ **SISMINI.VXD**
   - ➢ **Other Files Related to driver installation.**

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

Installation

1. Click "Start" menu and select Control Panel from Settings group.
2. Select "Display" icon.
3. Select "Settings" index in the display properties sheet.
4. Select "Change Display Type" button.
5. Select "Change .." button in "Adapter Type" group.
6. Select "Have Disk" button.
7. Place CD-ROM disk into the CD drive.
8. When the "Install from Disk" dialog box appears, type the directory storing the drivers and click "OK". The directory in the CD-ROM is at D:\SOYO_CD\REV_10\UTILITY\SIS_VGA\WIN95.
9. The "Select Device" dialog box will appear, showing the driver. Click on "OK" and the driver will be installed.
10. Select "Close" or "Apply" button from display properties sheet.
11. A message will appear stating you must restart the Windows 95 system, select "Yes" to restart.
12. After restarting, Windows 95 will run on 640x480x256 color, 75NI.

Selecting Resolution, Color Depth and Refresh Rate

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, Hi color, and True color.

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 Display Modes.

7. Select value in Refresh rate list box to change the screen refresh rate.

8. Click "OK" or "Apply".

Utilities

1. Place CD-ROM disk into the CD drive.

2. Click "Start" menu and select "Run ..". menu item.

3. In "Run" dialog, type the source execution file, then press "OK". The execution file in the CD-ROM is at D:\SOYO_CD\REV_10\UTILITY\SIS_VGA\WIN95\SETUP.EXE" .

4. The setup procedure will create a "SiS Multimedia Vx.xx" program group which will contain 2 items:
   - ➢ Multimedia Manager
   - ➢ Center Screen

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. A setup successful dialog will appear when setup is complete. The user can choose to restart system now or restart later.

6-8 Windows 3.1

Driver Files

The enclosed SiS 5597/5598 Windows 3.1 driver contains the
following files (in compressed format):

> **SETUP.EXE**
> **Other Files Related to driver installation.**

Installation

1. Click "File" menu and select "Run ..". menu item.
2. In "Run" dialog, type the source execution file, then press "OK".
   The execution file in the CD-ROM is at
   D:\SOYO_CD\REV_10\UTILITY\SIS_VGA\WIN31\SETUP.EXE"
   .
3. Follow the setup program on-screen instructions.
4. The setup procedure will create a "SiS Multimedia Vx.xx"
   program group which will contain 4 items:
   > Multimedia Manager
   > SVGA Setup
   > Center Screen
   > Uninstall
5. A successful setup dialog will appear when setup is complete.
   The user can choose to restart system now or restart later.

Graphics Setup

1. In "SiS Multimedia Vx.xx" program group, choose the "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 Windows" to re-boot Windows using new settings or choose "Continue" to continue your current Windows processes. The next time you re-boot Windows, the new settings will take effect.

Power Saving Setup in Windows

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

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

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

4. After completing setup, the power saver will take effect according to your specified times and you may continue your normal process.

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 follows:

➢ The resolution change sequence for zoom-in is

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

➢ The resolution change sequence for zoom-out is

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

➢ You must first be able to zoom-in before you may zoom-out. In other words, you can not get a resolution larger than that which you setup.

To use this feature, please follow the following procedures.

1. In the "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.

Note:

The power saver's timer settings will be effective when exiting Windows and going to DOS.

6-8.1 Video Operations

DCI Function

SiS 5597/5598 supports DCI drivers for software MPEG playback and other media player programs, which can take advantage of DCI. The SiS 5597/5598 DCI driver is automatically loaded during "Windows Driver Unpack & Copy" process. It should be transparent to the end-user and any media players can take advantage of it.

6-9 IBM OS/2 Warp 3.0 (Double Byte Character)

OS/2 Version Notes

1. The following description applies to "Double Byte Character IBM OS/2 Warp 3.0" only. (i.e. Chinese, Japanese, Korean etc.)
2. For Single Byte Character Versions IBM OS/2 Warp 3.0 installation, please refer to the next section.

Driver Files

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

> **SETUP.CMD**   Program to install SiS drivers
> **SVGA.EXE**   SiS PMI generator
> **S768256.DL@**   SiS IBMDEV32.DLL display driver
> **OTHERS**   Other files required for installation.

Installation

For Double Byte OS/2 Warp limitation, the installation process is a two-phase installation. The installation cannot be completed in one step 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 installing SiS 5597/5598 OS/2 drivers, make sure you:

1. Install an 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 according to the 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, D:\>SOYO_CD\REV_10\UTILITY\SIS_VGA\OS2\DBCS30\SETUP.

3. All the Driver Files will be copied to a sub-directory C:\SISDRV and an "SiS Install" icon will 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. The "SiS Install" icon would be executed automatically and "Select Screen parameters for SiS SVGA" screen will appeared on the screen.

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

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

6-10 IBM OS/2 Warp 3.0 (Single Byte Character)

OS/2 Version Notes

1. All the OS/2 Warp Versions up to SiS 5597/5598 driver Rev. 1.03 can be installed as described in this section except for Double Byte Character IBM OS/2 Warp 3.0 (i.e. Chinese, Japanese, Korean etc.).

2. For IBM OS/2 Warp 3.0 Double Byte installation, please refer to the previous section.

Driver Files

The enclosed SiS 5597/5598 OS/23.0 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 for installation.

Installation

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

1. Install an 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 that which holds the SiS 5597/5598 OS/23.0 display drivers and type **SISINST <Enter>**. For example,
   D:\>SOYO_CD\REV_10\UTILITY\SIS_VGA\OS2\SBCS30\SISINST.

3. All the Driver Files will be copied to a sub-directory C:\SISDRV and the "Select Screen parameters for SiS SVGA" menu will appear. All the resolution (and color) and frame rates supported would be shown on the screen.

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

5. The installation program has completed all installation processes and has created a "SiS Setup" for future change mode usage.

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

6-11 Video Modes

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)

Standard VGA Modes (continued)

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

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)

Enhanced Video Modes (continued)

MODE	DISPLAY SIZE	COLORS SHADES	FRAME RATE	H-SYNC	VIDEO FREQ
22	1056x352	16	70	30.5 K	0.0 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	320x200	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	80.0 M
38i	1024x768	256	87	35.5 K	44.9 M
38n	1024x768	256	60	48.4 K	65.0 M

Enhanced Video Modes (continued)

MODE	DISPLAY SIZE	COLORS SHADES	FRAME RATE	H-SYNC	VIDEO FREQ
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
3Ao	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
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

Enhanced Video Modes (continued)

MODE	DISPLAY SIZE	COLORS SHADES	FRAME RATE	H-SYNC	VIDEO FREQ
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
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 are not supported in 1MB configuration: modes 45*, 45+,46+, 46#, 47+, and 47#.