FC

Declaration of Conformity

According to 47 CFR, Parts 2 and 15 of the FCC Rules

The following designated product:

EQUIPMENT: MAINBOARD
MODEL NO.: 5SSV

is a Class B digital device that complies with 47 CFR Parts 2 and 15 of the FCC Rules. Operation is subject to the following two conditions:

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

This declaration is given to the manufacturer:

CHAINTECH COMPUTER U.S., INC

509 Valley Way, Milpitas, CA 95035, U.S.A.

Tel: 1-408-935-6988

Fax: 1-408-935-6989

Chaintech President: Raff Tung

Signature:

Federal Communications Commission Statement

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

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

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

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

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

Canadian Department of Communications Statement

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

Manufacturer's Disclaimer Statement

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March 1999

Printed in Taiwan

100% POST-CONSUMER RECYCLED PAPER

Table of Contents

Feature Explanations

Appendices

Introduction

1-1 Product Specifications

❏ **Processor**
  - Supports up to 200 MHz Intel **Pentium**® processors and up to 233MHz **Pentium**® processors with MMX technology
  - Supports Cyrix/IBM 6x86MX PR166⁺~PR233⁺ and up to 380 MHz MII processors
  - Supports AMD K6 166 MHz~266 MHz processors, K6-2 ,K6-2 CXT and K6-III up to 450 MHz processors
  - Supports IDT180 MHz to 225 MHz Winchip C6, 240 MHz to 300MHz Winchip 3D processors
  - 321-Pin ZIF Socket 7
  - High efficiency Switching Power Module
  - Supports 66/75/83/90/95/100 MHz system clock speeds

❏ **Chipset**
  - **SiS** 530/5595 two chip AGPset with integreted **2D/3D** graphics controller

❏ **L2 Cache**
  - On board 512KB Pipelined Burst SRAM and up to 1MB (optional)

❏ **DRAM Memory**
  - Three 3.3V 168-pin DIMM sockets support up to 384MB

  ⚠ Because 256MB unbuffered DIMM modules are not yet mainstream, their compatibility can not be guaranteed. (See Section 2-5 for details.)

❏ **Expansion Slots**
  - Four 32-bit PCI slots
  - One 16-bit ISA slot (one PCI/ISA shared slot)

❏ **BIOS**
  - Award System BIOS, supports PnP, APM, DMI, ACPI & Multi-device booting features i.e. floppy, LS120, HDD(IDE/SCSI), ZIP-ATAPI etc.
  - Includes Trend **ChipAway Virus** protection for virus-free boot and virus free operating system

    ✎ The Trend ChipAway Virus is a rule-based anti-virus technology and does not require periodical updates of virus code

❏ **Two Ultra DMA-66 PCI IDE Ports**
- Supports up to PIO Mode 4, Multi-word Mode 4 and Ultra DMA-33/66 timings
- Complete Bus Mastering software drivers for all well known multi-task operating systems

❏ **Embedded Ultra I/O**
- ITE 8661 I/O chip
- One Parallel (SPP/ECP/EPP) and one Serial (16550A compliant) ports
- One floppy disk drive connector supports up to 2.88MB, Japanese 3-Mode, and 1Mbps transfer rates

❏ **Back-Panel I/O Connectors**
- PS/2 Mini-DIN keyboard and mouse ports
- Two Channel USB ports
- One D-Sub 9-pin male serial port
- One D-Sub 15-pin female VGA port
- One D-Sub 25-pin female Printer port
- One D-Sub 15-pin female Game/MIDI port
- Audio Line-out, Line-in, Mic-in jacks

❏ **Integreted Super AGP 2D/3D Video/graphics controller**
- Built-in high performance 3D engine has a peak polygon rate of 800K polygons/second at 50 pixels/polygon and has a peak fill rate at 40M pixels/second.
- Built-in programmable 24-bit true color RAMDAC upto 230MHz pixel clock
- Integrated Direct Draw Accelerator, with a 64-bit BITBLT engine
- Supports 42 double-word hardware command queue
- Supports programmable 8MB memory configuration

❏ **On Board Audio Subsystem**
- ESS Solo-1 (1938S) 16-bit stereo audio controller
- Programmable independent sample rate from 4KHz to 48KHz for recording and play-back with Full-duplex DSVD capability
- Built-in high quality ESFM music synthesizer
- Supports DLS(Downloadable Wavetable Sounds) wavetable synthesizer with limitless variety of samples using PC RAM.

❏ **Two Channel USB Ports**

⚠ Now under compatibility testing with different peripherals

❏ **Board Dimensions**
- Micro-ATX form factor, 244mm x220mm, 4 Layers
- Six mounting holes

❏ **Advanced Management Features**
- Software power off control, Over-ride power button, Power-on by modem, Power-on by keyboard, Power-on by alarm,Power failure recovery, Blinking LED in Suspend etc.
- Integrated LDCM compliant System Monitor Hardware for electrical security
- **Poly-fuse** over-current protection for USB and keyboard
- Supports PC/PCI to Creative S-link
- **ACPI** features ready when ACPI-enabled O/S is available
- Special PCI Asynchronous mode for maximum performance betweenCPU and memory configuration
- First industrial mainboard to combine Trend ChipAway Virus and PC-cillin for a 100% virus free system boot-up in one

❏ **Switching Power Supply Requirement**

Output Voltage	Max. Regulation Requirement	Min. Current Requirement (Amps)
+12V	+/- 5%	0
+5V	+/- 5%	1
+3.3V	+/- 5%	10*
-5V	+/- 10%	0
-12V	+/- 10%	0
+5VSB	**+/- 5%**	**0.75**

Table 1-1

⚠ 3.3V at 10Amps is necessary to guarantee full loading operation because some AGP cards and memory modules have high current consumption.

1-2 Package Contents

This product comes with the following components:

❏ One mainboard

❏ One 40-pin Ultra DMA-66 IDE connector ribbon cable (Figure 1-1)
 * Color coded connection for UDMA/66 cable
  Blue to mainboard, Ground in blue, Gray to Master and Black to slave

❏ One 34-pin floppy disk drive ribbon cable (Figure 1-2a) or (Figure 1-2b)

❏ One plastic stub for standard ATX installation (Figure 1-3)

❏ One User's Manual

❏ One CD-ROM that includes

 - Acrobat Reader
 - Award System BIOS Flash Utility and Award DMI Utility for DOS
 - SiS Bus Master IDE drivers for Win95, WinNT3.5/4.0
 - SiS AGP VXD Driver
 - SiS USB Supplement
 - ESS Audio Driver for DOS/Win95/NT
 - ESS AudioRack Utility for Win95/NT
 - ESS 1MB WaveData for Win95
 - System Health Monitoring Software with DMI Browser
 - Trend **PC-cillin** Anti-virus v3.1Utility (eight different languages)

Figure 1-1   UDMA/66 IDE cable

Figure 1-2a   Standard Floppy cable

Figure 1-2b   Optional 5.25 in. floppy cable

Insert the stub if the mounting screw is not supported by the ATX case
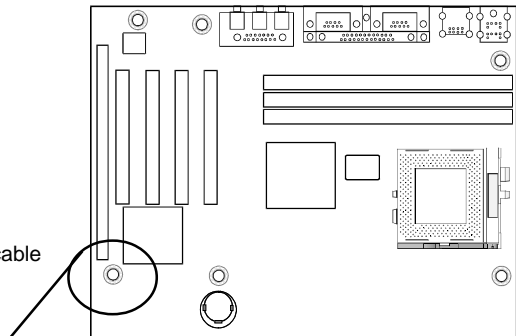
Figure 1-3

1-3 Mainboard Layout

Back Panel I/O Connector

PCB

VGA1 COM1 USB2 USB1 K/B Mouse Game Printer

Line-in
Mic-in Line-out VGA1 COM1 USB x 2 PS/2 Mouse & K/B Conn.

ISA1

JP1 Game Printer

JP2 JP3

PCI1 PCI2 PCI3 PCI4

IR1

DIMM1
DIMM2
DIMM3

JP4
JP5
JP6

JP7

CPU FAN

SiS
530

Socket 7

SiS
5595

JP11
JP13
JP14
JP15 JP16
JP17
JP18
JP19
JP20

JP9 Power supply conn. JP8

J8

JP12

Battery

IDE #1
IDE #2

System FAN

J5 FLOPPY1
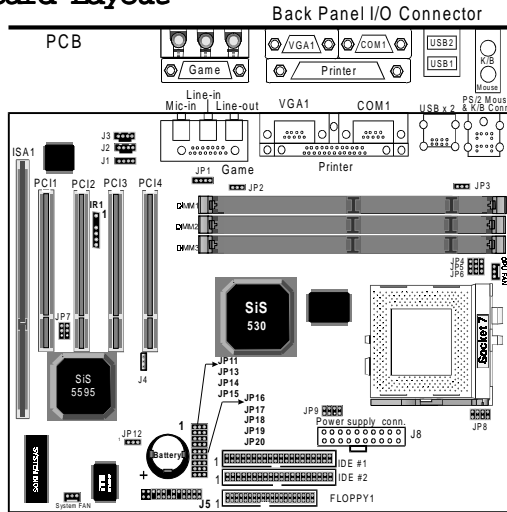
1-4 Connector and Jumper Reference Chart

Jumper & Connector No.	Function	Page
	Keyboard lock & Power indicator LED connector	13
	System reset switch connector	14
	Speaker connector	14
J5	Green switch / Green LED connector	14
	Turbo LED connector	14
	IDE activity LED connector	14
	Over-ride power button connector	13
J1	Modem Telephony connector	16
J2	AUX-IN connector	16
J3	CD-ROM Audio-in	15
J4	WOL (wake-on-lan) connector	17
J8	ATX Power supply connector	12
JP1	Volume Control connector	16
JP2	On-board VGA jumper	15
JP3	Power-on by keyboard jumper	18
JP7	Creative SB-LINK Sound connector	16
JP12	Clear CMOS Data jumper	17
CPUFAN	CPU cooling fan connector	15
SYSFAN	System cooling fan connector	15
IR1	Infrared connector	15
Ports	PS/2 mouse and keyboard ports	18
Ports	USB (Universal Serial Bus) ports	19

Memo

Hardware Setup

If your mainboard has already been installed in your computer you may still need to refer to this chapter if you plan to upgrade your system's hardware.

⚠ **Be sure to disconnect the power cable from the power source before performing any work on your mainboard, i. e. installing a CPU, memory module, changing a jumper setting, etc. Not doing so may result in electrical shock!**

2-1 Introduction to Jumpers

Jumpers are used to select between various operating modes. A jumper consists of a row of gold colored pins that protrude from the surface of the mainboard. It is important not to confuse jumpers with connectors or headers.

⚠ **Putting jumper caps on anything that is not a jumper may result in damaging your mainboard. Please refer to Section 1-3, Mainboard Layout, for the location of jumpers on your mainboard.**

As indicated in Figure 2-1 below, a cap is used to cover the pins of a jumper, resulting in shorting those pins that it covers. If the cap is removed from the top of the pins, the jumper is left "open." The number 1 shown both in the diagram below and in all multiple pin jumper and header diagrams in this manual indicates the pin designated with the number 1. The numbering of the remaining pins follows in sequence.

Pins   Cap   Setting

1   1
○ ○ ○   ● ● ○

A 3-pin jumper   A cap over pin 1 and
                    pin 2 shorts these pins
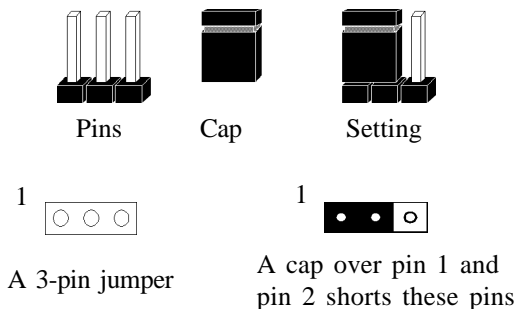
Figure 2-1

2-2 Installing a PGA type CPU in a ZIF Socket

The Intel Socket 7, designed for the Pentium processor, has been incorporated as a standard mainboard specification and is compatible with AMD and Cyrix CPUs. To insert your CPU into Socket 7 please do the following:

1. Locate a small dot marked on the top surface of the CPU close to one if it's corners. The same corner will also be cut off, leaving a noticeable notch in the CPU's corner. These markings indicate Pin 1 of the CPU. See Figure 2-2.
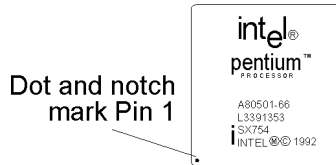
Figure 2-2   The markings on top of a CPU

2. Pull up the lever of Socket 7 so that it is perpendicular with the surface of the mainboard. Gently insert the CPU with Pin 1 at the same corner of Socket 7 that contains the end of the lever. Allow the the weight of the CPU to push itself into place. Do not apply extra pressure as doing so may result in damaging your CPU. Snap the lever back into place. See Figure 2-3.
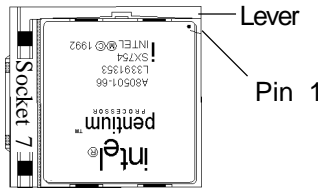
Figure 2-3   Inserting a CPU into Socket 7

Installing a heat sink and cooling fan on top of your CPU is necessary for proper heat dissipation. Failing to install these items may result in overheating and possible burn-out of your CPU.
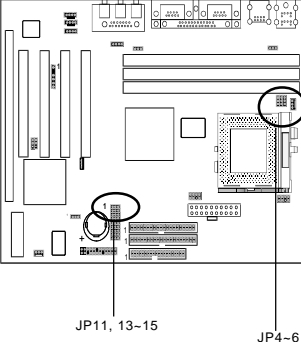
2-3 CPU Jumper Configuration

Frequency Configuration

If you install a CPU on this mainboard, you must set JP11, 13~15 for **System Frequency** and JP4~6 for **CPU Bus Frequency Ratio.** See Figure 2-4 CPU/System Frequency Jumper Settings.

CPU Bus Frequency & Frequency Ratio Configuration

* CPU Speed = Frequency ratio x System Frequency

SYS. Freq	JP1	JP13	JP14	JP15		Freq. Ratio	JP4~JP6
66/Async						x1.5/x3.5	
66/Sync						x2.0	
75						x2.5	
83						x3.0	
90						x4.0	
95						x4.5	
100						x5.0	
						x5.5	

JP11, 13~15

JP4~6

Figure 2-4 System Frequency Jumper Settings

PCI Frequency & SDRAM Frequency

CPU Freq. (MHz)	SDRAM Freq. (MHz)	PCI Freq. (MHz)
66	100	33
66	66	33
75	75	30
83	83	33
90	90	30
95	95	32
100	100	33

Overclocking

Operating a CPU at a higher frequency than its specification allows is called overclocking. If the CPU frequency is set at a higher frequency than its specification allows, it may or may not run at that freqency, depending on the quality of your CPU and the extent to which the frequency has been overset. The mainboard manufacturer highly discourages overclocking as it may result in data loss, CPU burn-out, system failure, etc.

Many processors are frequency locked processors and are not able to perform overclocking. Regardless of whether the processor is a frequency locked, overclocking may cause some processors to hang when turning on the system. When the processor hangs, the screen remains blank and the system does not boot. To solve this problem, do the following:

1. Turn off the computer and then press the Home key on your keyboard
2. Turn on your computer, wait for five seconds and then release the Home key. (Pressing the Home key allows the computer to boot at a low system speed. For example, 66MHz external clock CPUs boot-up at 133MHz.)
3. Enter BIOS and reconfigure your CPU parameters as described in this section.

Voltage Configuration

There are two major processor types in general use--single and dual voltage processors. Most single voltage processors such as Pentium, AMD-K5, and Cyrix 6x86 processors use a single voltage value of 3.5v for both core and I/O voltage settings. Most dual voltage processors such as Pentium processors with MMX technology and Cyrix 6x86L processors use a dual voltage value of 2.8v for core and 3.3v for I/O voltage settings. To make the voltage setting for single and dual voltage processors, simply set **JP16~20** according to the table on the next page. The voltage range supported by this mainboard is detailed in Figure 2-5 below.

Vcore	JP16~20	Vcore	JP16~20
1.8V		2.9V	
2V		3.1V	
2.2V		3.2V	
2.4V		3.3V	
2.5V		3.5V	
2.8V			

Figure 2-5 Voltage Jumper Settings

CPU-type		CPU Power Voltage					System freq.		Freq. ratio	
		I/O Vcc	Core Vcc	JP8	JP9	JP16~20	MHz	JP11, 13~15	Speed rate	JP4~
Intel	P54C-166	3.5					66		x2.5	
	P54C-200								x3	
	Pentium w/MMX @166MHz	3.3	2.8				66		x2.5	
	Pentium w/MMX @200MHz								x3	
	Pentium w/MMX @233MHz								x3.5	
Cyrix /IBM	6x86L-PR166 @133MHz	3.3	2.8				66		x2	
	6x86L-PR200 @150MHz						75			
	6x86MX-PR166		2.9				66			
	6x86MX-PR200								x2.5	
	6x86MX-PR200						75		x2	
									x2.5	
	6x86MX-PR233						83		x2	
	MII-300						66		x3.5	
							75		x3	
AMD	K6/166	3.3	2.9				66		x2.5	
	K6/200								x3	
	K6/233		3.2						x3.5	
	K6/266		2.2						x4	
	K6-2/266									
	K6-2/300						100		x3	
	K6-2/333						95		x3.5	
	K6-2/350						100			
	K6-2/366						66		x5.5	
	K6-2/380						95			

2-4 Connector and Jumper Settings

Connectors are used to link the system board with other parts of the system, including the power supply, the keyboard, and the various controllers on the front panel of the system case.

⚠ **The power supply connector is the last connection to be made while installing a mainboard. Before connecting the power supply, please make sure it is not connected to the power source.**

ATX Power Supply Connector (J8)
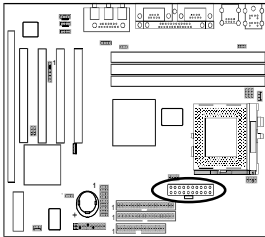
This mainboard requires a power supply of at least 200 watts. **The power cord leading from the system's power supply to the external power source must be the very last part connected when assembling a system.**
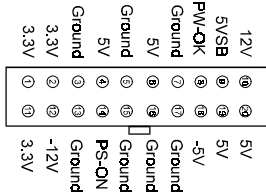
The ATX power supply provides a single 20-pin connector interface which incorporates standard +/-5V, +/-12V, optional 3.3V and Soft-power signals. The Soft-power signal, a 5V trickle supply is continuously supplied when AC power is available.   When the system is in the Soft-Off mode, this trickle supply maintains the system in it's minimum power state.

Software Power-Off Control

This mainboard can be powered down using theWindows 95 Software Power-Off function. To power down your computer, click the START button on the Windows 95 Task Bar. Select "Shut Down The Computer" and the system turns off. The message "It is now safe to turn off your computer" will not be shown when using this function.

Power-On By Modem

While in Soft-off state, if an external modem ring-up signal occurs, the system wakes up and can be remotely accessed. Enable this function in BIOS's Power Management Setup menu. (See section 3-4)

Front Panel Connector Set (J5) A through G
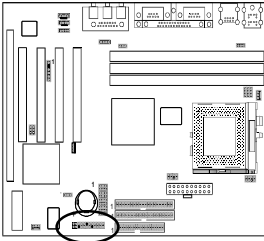
A. Over-ride Power Button Connector

The power button on the ATX chassis can be used as a normal power switch as well as a button to activate Advanced Power Management Suspend mode. This mode is used for saving electricity when the computer is not in use for long periods of time. The Power Button Over Ride function in BIOS's Power Management Setup menu must be set to "Delay 4 Sec." to activate this function. (See section 3-4)
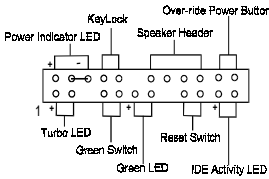
When the Power Button Over Ride function is enabled, pushing the power button rapidly will switch the system to Suspend mode. Any occurence of external activity such as pressing a key on the keyboard or moving the mouse will bring the system back to Full-On. Pushing the button while in Full-On mode for more than 4 seconds will switch the system completely off. See Over-ride Power Button Operation diagram.
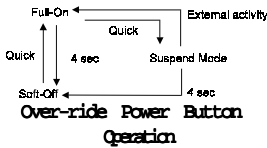
B. Keyboard Lock & Power Indicator LED Connector

Plugging this connector into the lock on the front panel of the system case allows the lock to enable or disable the keyboard. This function provides limited security against casual intruders. The power indicator LED shows the system's power status. It is important to pay attention to the correct cable and pin orientation (i.e., not to reverse the order of these two connectors.)

	Pin	Definition
Power Good LED ⌐	1	+5V DC
	2	No Connect
	3	Ground
Keyboard Lock ⌐	4	Keylock
	5	Ground

Blinking LED in Suspend Mode(optional)

While in Suspend mode, the LED light on the front panel of your computer will flash. Suspend mode is entered by pressing the Override Power Button, pushing the Green button on your ATX case, or enabling the Power Management and Suspend Mode options in BIOS's Power Management menu. (See section 3-4)
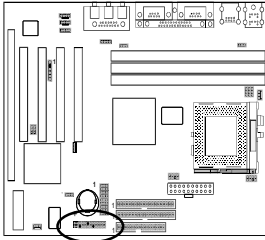
C. Green Switch/Green LED Connector

Some ATX cases provide a Green switch which is used to put the system in Suspend mode. In Suspend mode, the power supply to the system is reduced to a trickle, the CPU clock is stopped, and the CPU core is in its minimum power state. The system is woken up whenever the keyboard or mouse is touched. The system resumes in different ways as defined by Power Management Setup screen in BIOS.
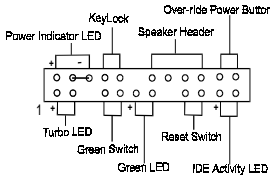
D. System Reset Switch Connector

This connector should be connected to the reset switch on the front panel of the system case. The reset switch allows you to restart the system without turning the power off.

Pin	Definition
1	System
2	GND

E. Speaker Connector

PIN	Definition
1	Speaker Signal
2	NC
3	NC
4	+5V DC

F. IDE Activity LED Connector

The IDE activity LED lights up whenever the system reads/writes to the IDE devices.

G. Turbo LED Connector

This mainboard does not have a Turbo/De-turbo speed modes. Even though this function does not exist, the turbo LED will light when the LED is connected and turbo button pressed.

Infrared Connector
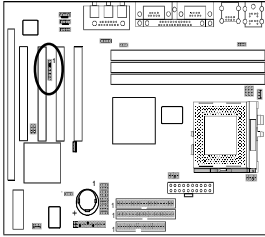
If you enable the IR Address Select in BIOS's Integrated Peripherals menu the IR port will let you select the IRQ and IR Mode to support IR functions. (See section 3-8)

```
Vcc   ─┬─ ○
Ir-Rx ─── ○
GND   ─── ○
Ir-Tx ─── ○
Vcc   ─── ○
```
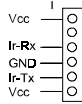
CPU/System Cooling Fan Connectors
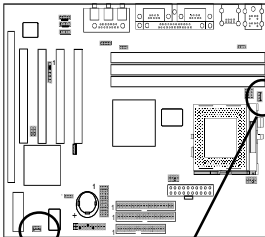
These added connectors allow the fan to draw their power from the mainboard instead of the disk drive connector. The mainboard's management extension hardware is able to detect the CPU and system fan speed in rpm (revolutions per minute). These connectors supports 3-pin cooling fans with minimum of 3500 RPM. The wiring and plug may vary depending on the manufacturer. On standard fans, the red is positive (+12V), the black is ground, and the yellow wire is the rotation signal.

SYS FAN   CPU FAN

```
○ ─ GND
○ ─ +12V
○ ─ Rotation
```

On-board VGA Jumper (JP2)

1 ▣▣▢ Enabled   1 ▢▣▣ Disabled
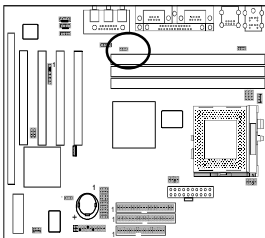
Short pin 1-2 to enabled the on-board VGA and short pin 2-3 to disabled.

CD-ROM Audio-in (J3)
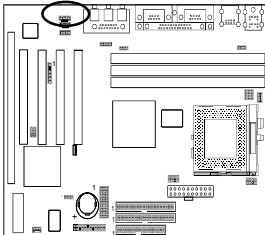
Use the cable enclosed with your CD-ROM disk drive to connect the CD-ROM to your mainboard. This will enable your CD-ROM's audio function.

```
     GND  GND
1  ○ ○ ○ ○
   L       R
```
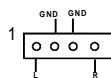
Modem Telephony Connector (J1)
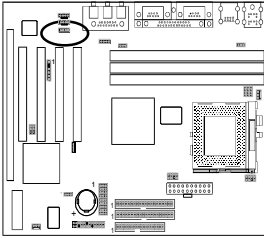
This connector must be connected to the cable from the voice modem card to support modem audio signals.

```
        GND  GND

  1   ┌─────────────┐
      │ o  o  o  o  │
      └─────────────┘
     MONO IN   MONO OUT
```
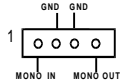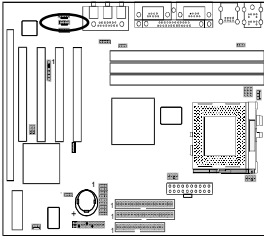
AUX- IN Connector (J2)

This connector supports Aux-input for connecting DVD or other audio devices.

```
        GND  GND

  1   ┌─────────────┐
      │ o  o  o  o  │
      └─────────────┘
        L        R
```
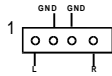
Creative SB-LINK Sound Connector (JP7)
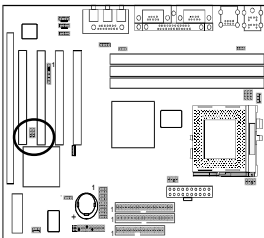
The SB-LINK serves as a bridge between the mainboard and Creative's PCI sound card. This connector delivers Sound Blaster 16 compatility for real-mode DOS games.

```
(PC/PCI) 1
  GNT#  ─── o  o ─── GND
           o  o ─── (PC/PCI)
                     REQ#
   GND  ─── o  o ─── SERIAL
                     IRQ
```

Volume Control Connector (JP1)

1 ▐ ●● oo ▌ Volume up   1 ▐ oo ●● ▌ Volume down
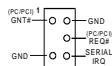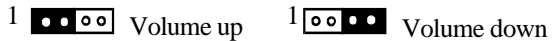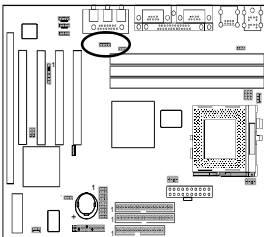
This function, enable you to select volume up or down option. You must set this jumper's cap to pins 1-2 to turn the volume up and to 3-4 to turn the volume down.

WOL (Wake-on-LAN) Connector (J4)
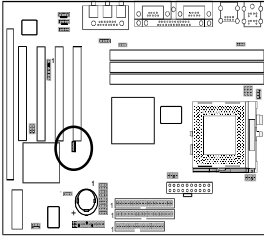
Enable the Wake Up On LAN selection in BIOS's Power Management Menu to use this function. The capability to remotely manage PCs on a network is a significant factor in reducing administrative and ownership costs. Magic Packet technology is designed to give WOL (Wake-on-LAN) capability to the LAN controller. When a PC capable of receiving wake up command goes to sleep, the Magic Packet mode in the LAN controller is enabled. When the LAN controller receives a Magic Packet frame, the LAN controller will wake up the PC. This header is used to connect an add-in NIC (Network Interface Card) which gives WOL capability to the mainboard.

To support this function, a switching power supply with a minimum of **750mA** 5VSB is required.

Clear CMOS Data Jumper (JP12)
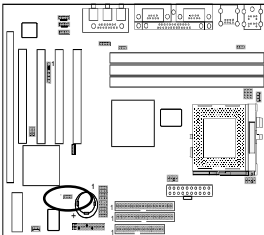
1 ⊙ ▪ ▪ Normal (default)   1 ▪ ▪ ⊙ Clear CMOS data

To clear the contents of the CMOS, please follow the steps below.
1. Disconnect the system power supply from the power source.
2. Set the jumper cap at location 2~3 for 5 seconds, then set it back to the default position.
3. Connect the system's power and then start the system.
4. Enter BIOS's CMOS Setup Utility and choose Load Setup Defaults. Type Y and press enter.
5. Set the system configuration in the Standard CMOS Setup menu.

Power-on by Keyboard Jumper (JP3)
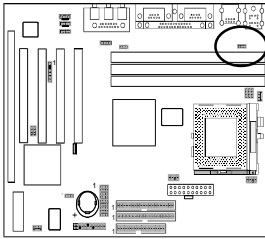
1 ▢▪▪▫ Default   1 ▫▪▪ Enable

This board is able to be turned on by the keyboard. To use this function, enable the Power On By Keyboard option in BIOS Power Management Setup screen . You must also set this jumper cap to pins 2-3 to use this function. Some out-of-date keyboards may require larger current than supplied by the Suspend 5V of modern power supplies. When using older keyboards disable this function.

PS/2 Mouse and Keyboard Ports
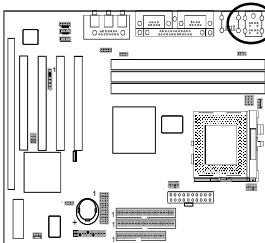
If a PS/2 mouse is used, BIOS will automatically detect and assign IRQ12 to the PS/2 mouse.

Pin	Definition
1	Data
2	No Connect
3	Ground
4	+5V (fused)
5	Clock
6	No Connect

Poly-fuse Over Current Protection

The poly-fuse protects the system from dangerous voltages the system might be exposed to via the keyboard or USB connectors. In case of such exposure, the poly-fuse will immediately be disconnected from the circuit, just like a normal fuse. After being disconnected for a short period of time, the poly-fuse will return to its normal state, after which the keyboard or USB can function properly. Unlike conventional fuses, the poly-fuse does not have to be replaced, relieving the user of wasted time and inconvenience.

USB(Universal Serial Bus) Ports
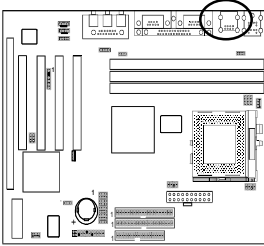
If you want to use a USB keyboard, you must enable the USB keyboard support function in BIOS's Integrated Peripherals menu (See Section 3-8). USB is an open industry standard, providing a simple and inexpensive way to connect up to 125 devices to a single computer port. Keyboards, mice, tablets, digitizers, scanners, bar-code readers, modems, printers and many more can all be used at the same time.

USB is a dynamically reconfigurable serial bus with an elementary data rate of 12Mbps. Based on off the shelf, low cost micro-controller technology, its modular layered software protocol supports sophisticated devices and application programs.

This board contains a USB Host controller and includes a root hub with two USB ports (meets USB Rev 1.0 spec.). Two USB peripherals or hub devices are able to be connected.

⚠ Compatibility with different USB peripherals is still being tested.

2-5 Main Memory Configuration

The DRAM memory system consists three banks and the memory size ranges from **16~384 MBytes**. If you only use one bank it does not matter which one you use and if you use two or more banks, it does not matter which bank you install first.

DIMM 1	Bank0
DIMM 2	Bank1
DIMM 3	Bank2

1   128
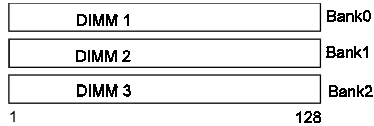
DRAM Specifications

DIMM type: 3.3V, 64/72-bit Synchronous DRAM

Module size: Single/double-sided 16/32/64/128 MBytes

DRAM speed: 10/12ns for Synchronous DRAM

Parity: Either parity or non-parity

Note : The ECC parity check function is not supported yet in SiS 530/5595 Chipset

⚠ The compatibility of 256MB DIMM is still under testing and cannot be 100% guaranteed.

⚠ This mainboard supports 3.3v, unbuffered, 4-clock, SDRAM DIMM only. Buffered, 5V, or 2-clock SDRAM DIMMs should not be used.

⚠ Install the first DIMM in DIMM3 socket due to shared memory architecture limitation

⚠ "VGA Memory clock (MHz)" in BIOS's Integrated peripherals page needs to be set to the same frequency as " SDRAM frequency"

Chapter 3

Award BIOS Setup Program

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in CMOS RAM so that it can retain the setup information, even when the power is turned off. When you turn on or reboot the system, press the F10 key to enter the Award BIOS setup program. The primary screen as shown in Figure 3-1 is a list of the menus and functions available in the setup program. Select the desired item and press enter to make changes. Operating commands are located at the bottom of this and all other BIOS screens. When a field is highlighted, on-line help information is displayed on the left bottom edge of the screen.

```
            ROM PCI / ISA BIOS (2A5IMC39)
                 CMOS SETUP UTILITY
               AWARD SOFTWARE, INC.

  STANDARD  CMOS  SETUP          HARDWARE MONITOR SETUP

  BIOS FEATURES SETUP            INTEGRATED PERIPHERALS

  CHIPSET FEATURES SETUP         PASSWORD SETTING

  POWER MANAGEMENT SETUP         IDE HDD AUTO DETECTION

  PNP/PCI CONFIGURATION          SAVE & EXIT SETUP

  LOAD SETUP DEFAULTS            EXIT WITHOUT SAVING

  ESC      : Quit                ↑↓→←     : Select Item
  F10      : Save & Exit Setup   (Shift) F2    : Change Color

              Time, Date, Hard Disk Type...
```

Figure 3-1 Setup Program Initial Screen

3-1 Standard CMOS Setup

The Standard CMOS Setup allows users to configure system components such as hard disk drive, floppy disk drive and video display as well as date, time and boot-up error signaling. This configuration menu should be changed when installing a mainboard for the first time, changing hardware in your system such as the HDD, FDD, video display, or when the CMOS data has been lost or contaminated. Choose the Standard CMOS Setup option from the CMOS Setup Utility menu (Figure 3-1) to display the following screen. When a field is highlighted, on-line help information is displayed on the left bottom edge of the screen.

```
               ROM PCI / ISA BIOS (2A5IMC39)
                    STANDARD CMOS SETUP
                    AWARD SOFTWARE, INC.

  Date (mm : dd : yy : Fri, Sep 19 1998
  Time (hh : mm : ss) : 9: 14: 43

  HARD DISKS         TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE
  Primary Master   :  Auto   0     0     0      0        0      0     Auto
  Primary Slave    :  Auto   0     0     0      0        0      0     Auto
  Secondary Master :  Auto   0     0     0      0        0      0     Auto
  Secondary Slave  :  Auto   0     0     0      0        0      0     Auto

  Drive A  : 1.44M, 3.5 in.
  Drive B : None                    ┌─────────────────────────────────┐
  Floppy 3 Mode Support : Disabled      Base Memory :     640K
                                     Extended Memory : 64512K
                                        Other Memory :    384K
  Video   : EGA/VGA                  ─────────────────────────────
  Halt On : All Errors                  Total Memory : 65536K

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

Figure 3-2 Standard CMOS Setup Screen

Date/Time
Set the date and time. Do not skip this function as all of your timed events such as power management, saving files, etc. are based on this timer.

Hard Disk Setup (Primary/Secondary; Master/Slave)
This category identifies up to four IDE hard disk drives that have been installed in the computer. This section does not show information on other IDE devices such as CD-ROM drives or other hard drive types such as SCSI drives.

Type (Auto/User/None): Use the fields under the Type column to determine the method you will use to configure the IDE devices. If you choose Auto, BIOS will automatically detect and make optimal settings for most IDE hard drives.

⚠ The mainboard manufacturer recommends that you choose Auto for all drives.

Choose User to define your own drive type manually. You must enter values indicated in the table below into each drive parameter field. This information should be included in the documentation from your hard disk vendor or system manufacturer:

TYPE	Setting method
CYLS	Number of cylinders
HEAD	Number of heads
PRECOMP	Write precompensation cylinder
LANDZ	Landing zone
SECTOR	Number of sectors
MODE	Mode type

Table 3-1 Hard Disk Drive Parameters

Cyls/Head/Sector: The number of Cylinders, Heads, and Sectors can usually be found written on the top of the hard disk. If you have a relatively new hard drive, entering this information alone is usually sufficient for normal hard disk operation. The hard disk will not work properly if you enter improper information for these categories.

Precomp: Older hard drives (i.e., MFM or RLL drives) have the same number of sectors per track at the innermost tracks as at the outermost tracks. Thus, the data density at the innermost tracks is higher and the bits are lying closer together. Even though the physical size of a sector gets progressively smaller as the track diameter diminishes, each sector must still hold 512 bytes. Write precompensation circuitry compensates for the difference in sector size by boosting the write current for inner track sectors.

Landz: This defines the address of the landing zone and is only used for older hard drives which do not have an auto-parking feature.

Mode: If the Type value is not None for any device, you must set the Mode value for that device. There are four different Mode values: Auto, Normal, Large, and LBA.

Auto - BIOS detects and enters the IDE drive type during bootup.

Normal - for IDE drives that meet the old IDE specification which support a maximum capacity of 528MB (1024 cylinders, 16 heads, and 63 sectors).

Large - for IDE drives that do not support LBA and have more than 1024 cylinders. Try this setting if your hard disk does not operate properly with the LBA setting. Large mode is not supported by all operating systems, i.e., only certain versions of DOS support large mode.

LBA - (Large/Logical Block Addressing) With LBA, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. This mode is for drives with greater than 1024 cylinders and between 528MB and 8.4GB in size. This protocol is the current common standard.

Choose None for Type if there are no IDE HDD devices in your system.

✎ You can use the IDE HDD Auto Detection function to auto detect your hard drive parameters. Using this function will automatically insert the parameters discussed under Hard Disk Setup and will indicate User for the Field value. Please see Section 3-9 for more information.

Floppy Disk Drives

Choose the memory capacity and disk size that corresponds with that of your floppy disk drive(s).

Video

Select the type of video adapter present in your system. You can ignore this setting if you are using a VGA monitor since VGA BIOS automatically configures this setting.

Halt

When the system is powered on, BIOS performs a series of diagnostic tests called POST (Power On Self Test). This function stops the computer if BIOS detects a hardware error. You can tell BIOS to halt on all errors, no errors, or not to halt on specific errors.

3-2 BIOS Features Setup

By choosing the BIOS Features Setup option from the CMOS Setup Utility menu (Figure 3-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard**.**

```
                  ROM PCI / ISA BIOS (2A5IMC39)
                       BIOS FEATURES SETUP
                      AWARD SOFTWARE, INC.

 Anti-Virus Protection      : 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 From LAN First        : Enabled    D4000 - D7FFF Shadow   : Disabled
 Boot Sequence              : A,C,SCSI   D8000 - DBFFF Shadow   : Disabled
 Swap Floppy Drive          : Disabled   DC000 - DFFFF Shadow   : Disabled
 Boot Up Floppy Seek        : Enabled
 Boot Up NumLock Status     : On
 Typematic Rate Setting     : Disabled
 Typematic Rate (Chars/Sec) : 6
 Typematic Delay (Msec)     : 250
 Security Option            : Setup
 PCI/VGA Palette Snoop      : Disabled   ESC : Quit            ↑↓→←      :Select Item
 OS Select (For DRAM>64MB)  : Non-OS2    F1   : Help           PU/PD/+/- : Modify
                                         F5   : Old Values     (Shift) F2 : Color
                                         F7   : Load Setup Defaults
```

Figure 3-3 BIOS Feature Setup Screen

A. Anti-Virus Protection

Trend *ChipAway* Virus

Trend ChipAway Virus is a code incorporated in the mainboard's BIOS firmware. During the boot-up sequence, BIOS loads before loading of the partition table or boot sector. ChipAway Virus loads with BIOS and is able to detect boot-up viruses before they have a chance to infect the hard drive. ChipAway Virus employs rule-based logic that doesn't look for specific viruses but rather detects patterns found in every virus, eliminating the need to perform periodical version updates after new viruses have been found.

B. Cache Control

CPU Internal Cache/External Cache

Cache memory is much faster than conventional DRAM system memory. These fields allow you to enable or disable the CPUs Level 1 built-in cache and Level 2 external cache. Both settings are left enabled to significantly increase the performance of your computer.

CPU L2 Cache ECC Checking

Enable this function to perform ECC (Error Check and Correct) on the CPU's L2 SRAM. ECC detects and corrects single-bit errors while it only detects double bit errors. Certain SDRAM modules also have ECC capability. For more information on SDRAM, see section 2-5. If you are using a 333MHz or higher CPU, this function must be enabled.

C. Boot Up Features

After turning on the system, BIOS will perform a series of device initializations and diagnostic tests discussed below.

Boot From LAN First

Enabling this function the BIOS will attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

Quick Power On Self Test (POST)

Enable this function to reduce the amount of time required to run the POST (Power On Self Test). BIOS saves time by skipping some items during POST. It is recommended that you disable this setting. Discovering a problem during bootup is better than loosing data during your work.

Boot Sequence

This option sets the sequence of drives BIOS attempts to boot from after POST completes. BIOS will search these drives for an operating system.

Swap Floppy Drive

Enabling this function will swap the floppy drive assignment so that drive A will function as drive B, and drive B will function as drive A. Note that the boot sequence assignment mentioned directly above does not inlcude booting from floppy drive B. This function is useful if floppy drives B and A are of a different format and you want to boot from floppy drive B.

Boot up Floppy Seek

During POST, BIOS will determine if the installed floppy disk drive has 40 or 80 tracks. A 360K drive has 40 tracks and 720K, 1.2M and 1.44M drives have 80 tracks. All modern floppy disk drives have 80 tracks.

Boot Up NumLock Status

This function defines the keyboard's numberpad as number keys or arrow keys.

D. Keyboard Interface

Typematic Rate Setting

When enabled, you can set the following two typematic control items. When disabled, keystrokes are determined arbitrarily by the keyboard controller in your system.

Typematic Rate (Chars/Sec)

The typematic rate sets the rate at which characters on the screen repeat when a key is pressed and held down.

Typematic Delay (Msec)

The typematic delay sets how long after you press a key that a character begins repeating.

E. Security Option

The Supervisor and/or User Password functions shown in Figure 3-1 must be set to take advantage of this function. See Section 3-8 for password setting information. When the Security Option is set to System, a password must be entered to boot the system or enter the BIOS setup program. When the Security Option is set to Setup, a password is required to enter the BIOS setup program.

F. PCI/VGA Palette Snoop

Some non-standard VGA cards or MPEG video cards may not show colors properly. Setting this function to Enabled can correct this problem.

G. OS Select (For DRAM > 64MB)

If your system's DRAM is larger than 64MB and you are running OS/2, select OS/2 as the item value. Otherwise, set the item value to Non-OS/2 for all other operating systems.

H. Shadow Memory

Software such as system BIOS, video BIOS, SCSI BIOS, etc that resides in ROM (Read Only Memory) chips is called firmware. Shadowing of firmware occurs when BIOS is copied to RAM address C0000h through DFFFFh. Video BIOS loads into the C0000-C7FFF memory area when video shadowing is enabled. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

Shadowing improves the firmware's performance because the firmware can be read by the CPU through the 16- or 32-bit DRAM bus as opposed to the 8-bit XT bus. However, shadowing also results in reducing the amount of high memory (640 KB to 1 MB) for loading device drivers. Shadowing is used mostly for ROM chips on ISA cards and not for PCI cards. Shadowing and playing games at the same time may result in system instability as some games access the RAM memory area being shadowed.

3-3 Chipset Features Setup

By choosing the Chipset Features Setup option from the CMOS SETUP UTILITY menu(Figure 3-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard**.**
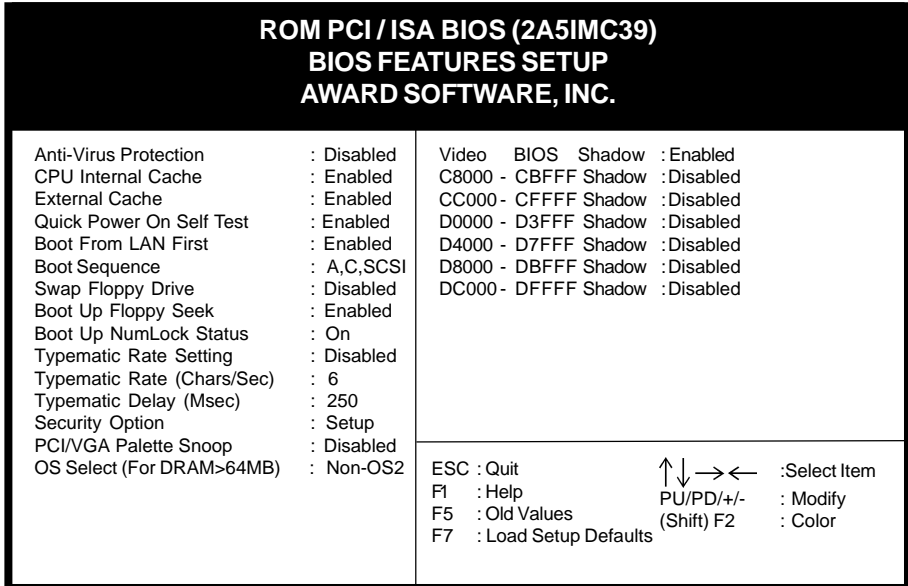
```
┌─────────────────────────────────────────────────────────────────────────┐
│                   ROM PCI / ISA BIOS (2A5IMC39)                           │
│                     CHIPSET FEATURES SETUP                                │
│                      AWARD SOFTWARE, INC.                                 │
│                                                                           │
│  Refresh Rate Control      : 15.6us    System BIOS Cacheable    : Enabled │
│  Ref/Act Command Delay      : 6T        Video  BIOS Cacheable     : Disabled│
│  Refresh Queue Depth        : 12        Memory Hole at 15M-16M    : Disabled│
│  RAS Precharge Time         : 3T        DRAM Controller 1 T WR    : Disabled│
│  RAS to CAS Delay           : 3T        DRAM Controller 1 T RD    : Enabled │
│  ISA Bus Clock Frequency    : PCICLK/4  PCI Post Write Buffer     : Disabled│
│  Starting Point of Paging   : 1T        PCI Delayed Transaction   : Disabled│
│  NA# Enable                 : Enabled   Auto Detect DIMM/PCI Clk  : Disabled│
│  L2 Cache Burst RD Cycle    : Delay 1 T Spectrum Spread           : Disabled│
│  IO Cycle NA#               : Enabled   Flash BIOS Protection     : Disabled│
│  Asyn/Sync ModeCPU/DRAM : Asynchronous  Hardware Reset Protect    : Disabled│
│  SDRAM CAS Latency          : 3T                                          │
│  SDRAM WR Retire Rate       : X-1-1-1                                     │
│  PCI Peer Concurrency       : Enabled                                     │
│  Read Prefetch Memory RD    : Enabled                                     │
│  Assert TRDY After Prefet   : 2 QWs                                       │
│  CPU to PCI Burst Mem. WR   : Enabled   ESC : Quit          ↑↓→←  :Select Item│
│  CPU to PCI Post Write      : Enabled   F1   : Help                        │
│                                         F5   : Old Values  PU/PD/+/- : Modify│
│  AGP Aperture Size          : 64MB      (Shift) F2         : Color        │
│                                         F7   : Load Setup Defaults         │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 3-4 Chipset Features Setup Screen

⚠ All of the above settings have been determined by the mainboard manufacturer and should not be changed unless you are absolutely sure of what you are doing. Explanation of the DRAM timing and chipset features setup is lengthy, highly technical and beyond the scope of this manual. Below are abbreviated descriptions of the functions in this setup menu. You can look on the world wide web for helpful chipset and RAM configuration information including AWARD's web site at http://www.award.com.

A. SDRAM CAS Latency

When set to Auto this feature will use "default" option to read CAS Latency from the SPD of the DIMMs, with this mechanism the user's need only to reboot the system to get a set of proper value of CAS Latency.

B. AGP Aperture Size (MB)

This function determines the amount of system memory that is given to the AGP card. Options range from 4MB to 256MB. This is a dynamic memory allotment in that the AGP card will only use the amount of memory that it needs. The remaining memory not in use will be available for the system to use. For example, if 16MB are alloted to the AGP card and the card only needs 8MB, the remaining 8MB will be available for system use.

C. System BIOS Cacheable

Enabling this function allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Caching the system BIOS results in better performance than shadowing the system BIOS as discussed in Section 3-2.

D. Video BIOS Cacheable

Enabling this function allows caching of the video BIOS ROM at C0000h-C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. Caching the video BIOS results in better performance than shadowing the video BIOS as discussed in Section 3-2.

E. Memory Hole at 15M-16M

Enabling this function will reserve the memory address space between 15MB and 16MB for ISA expansion cards. However, enabling this function will result in not allowing the system to have access to memory above 16MB. Please note that some expansion cards require this setting to be enabled.

F. PCI Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

G. Spectrum Spread

When Enabled this function will cause lower EMI by spreading the system frequency spectrum. While this function decreases EMI, system stability may be slightly compromised. Choosing Smart Clock will turn off the AGP, PCI, and SDRAM clocks when not in use. Smart Clock does not perform a spectum spreading function.

H. Flash BIOS Protection

The mainboard manufacturer developed BIOS protection technology that protects the System BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update BIOS with the the FLASH utility. When disabled, the BIOS data can be updated by using the FLASH utility.

To Pass the Windows 95 SCT testing, this item should be disabled.

Please note that when disabling this setting, the system BIOS is vulnerable by intrusion of computer viruses. It is recommended to disable this setting only temporarily while updating your system's BIOS.

The Flash utility that come with this CD is specially designed to this MB BIOS. Using others Flash utility might resulted to BIOS update failure and cause damage to the BIOS.

3-4 Power Management Setup

This section provides information on the Green PC power management funtcions. By choosing the Power Management Setup option from the CMOS Setup Utility menu (Figure 3-1), the screen below is displayed. This sample screen contains the manufacturer's defaultbvalues for the mainboard.

```
              ROM PCI / ISA BIOS (2A5IMC39)
                POWER MANAGEMENT SETUP
                  AWARD SOFTWARE, INC.

 ACPI Function          : Enabled      VGA  Activity          : Disabled
 Power Management       : User Define  IRQ 8 [3-7,9-15],NMI   : Enabled
 Video Off Option       : Susp,Stby->Off  IRQ 8 Break Suspend : Disabled
 Video Off Method       : DPMS         Power Button Over Ride : Delay 4 Sec
 Switch Function        : Break/Wake   Wake Up On LAN         : Disabled
 Doze Speed (div by)    : 2/8          Power On ByKeyboard    : Disabled
 Stby Speed (div by)    : 1/8          Power On By Modem      : Disabled
 MODEM Use IRQ          : 4            Power On By Alarm      : Disabled
        ** PM Timers **
 HDDOff  After          : Disabled
 Doze Mode              : Disabled
 Standby Mode           : Disabled
 Suspend Mode           : Disabled
        ** PM Events **
 HDD Port A ctivity     : Enabled      ESC : Quit        ↑↓→←      :Select Item
 COM Port A ctivity     : Enabled      F1  : Help        PU/PD/+/- : Modify
 LPT Port A ctivity     : Enabled      F5  : Old Values  (Shift) F2 : Color
                                       F7  : Load Setup Defaults
```

Figure 3-5 Power Management Setup Screen

A. Advanced Configuration Power Interface (ACPI)

ACPI management enables the operating system to control the amount of power given to each device attached to the computer. With ACPI, the operating system can turn off peripherals devices, such as CD-ROM players, when they are not in use.

B. Power Management

Power management allows the computer to save electricity when it is not in use by entering increasingly deep power saving modes as shown by the diagram below.

Normal ⟶ Doze ⟶ Standby ⟶ Suspend (Green Mode)
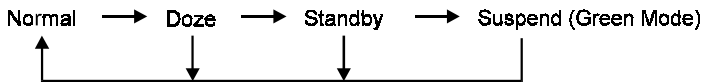
Figure 3-6 Power Saving Mode Flow Chart

The computer runs in Normal operation mode until the Doze timer expires, at which point the computer enters Doze mode. If no external activity occurs, the computer will go into Standby and Suspend modes when their respective timers expire. If external activity occurs, the computer will wake up from Power Management and return to Normal mode. To activate the function, set Power Management to Maximum Saving, User Define, or Minimum Saving described below. For a description of the power saving modes (Doze, Standby, and Suspend) see their descriptions below.

Disabled - Turns off the Power Management functions.

Max. Saving - All timers are set at the minimum value of one minute to maximize power saving.

Min. Saving - All timers are set at the maximum value of one hour for minimal power saving.

User Define - User can configure the timer to a desired time according to the values available.

✎ Note that enabling the Power Management function will result in enabling the HDD Power Down function (Max Saving = 15 min, Min Saving = 1 min). The HDD Power Down function is not part of the Power Management scheme as indicated in Figure 3-6 Refer to the Standby Mode, Suspend Mode, and HDD Power Down descriptions below for more informaiton on hard drive power management.

C. Video Off Option

This setting determines when the monitor enters power saving mode. As the function name indicates, the monitor enters the power saving mode after the chosen event expires. The Power Management function must be enabled to use this function.

D. Video Off Method

This function serves as both a screen saver and power saver for monitors. See the next function, Video Off After, for setting the video timer.

Blank - BIOS will only blank the monitor's screen. The electricity saved in this mode is negligible and this function is only used as a screen saver to prevent screen damage while the screen is on but not in use.

V/H SYNC+Blank - The system turns off the vertical and horizontal synchronization ports, writes blanks to the VGA buffer and the monitor's electron gun turns off. This function requires a monitor with Green features in order to take advantage of the power saving function. If you enable this function and do not have a Green monitor, the result will be the same as if you had selected Blank. This function serves as both a screen saver and an electricity saver.

DPMS Supported - Select this option if your video card supports the Display Power Management Signaling (DPMS) standard (i.e., you have a monitor that supports Green features). Use software supplied by your your video subsystem to set video power management options.

E. Switch Function

When this option is set to Break/Wake, the system enters the suspend mode; press the power button again to return to full power.

F. Modem Use IRQ

If your computer has an modem, use this function to tell BIOS which IRQ is being occupied by the modem card. When the system is in Green mode, the modem requires an IRQ assignment to wake up the system and perform tasks. This assignment is compliant with the APM 1.2 specification and is to be used in coordination with APM 1.2 compliant operating systems.

G. HDD Off After

After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active. Selecting Suspend tells the drive to power down immediately.

H. Doze Mode

The Power Management function must not be set to disabled to enable this function. If no interrupts have occured and the Doze timer expires, system will enter Doze mode. In Doze mode, the CPU clock runs at a lower speed while all other devices operate normaly.

✎ Power saving modes achieved in lower power saving states will either be maintained or enter higher power saving modes when switching to higher power saving states. For example, the CPU clock will not switch back to normal in Standby mode. It will maintain a decreased rate in Standby Mode and turn off in Suspend Mode.

I. Standby Mode

The Power Management function must not be set to disabled to enable this function. If the system runs in Doze mode and the Standby timer expires, the system will enter Standby mode. In Standby mode, the hard disk drive and the monitor shut off while all other devices still operate at full speed. Note that the Video Off and HDD Power Down functions in Figure 3-5 provide the same power saving options found in Standby mode. The priority for determining which function controls power saving for the monitor and hard drive is determined by which timer expires first.

J. Suspend Mode

The Power Management function must not be set to disabled to enable this function. If the system runs in Standby mode and the Suspend timer expires, all devices regulated by power management will shut off and the CPU speed will be 0 MHz.

K. PM Events

The HDD/COM/LPT/VGA Acitvity and IRQ[3-7,9-15], NMI. When Enabled any activity from one of the listed system peripheral or devices, IRQs wakes up the system.

✍ A power-management (PM) event awakens the system from, or resets activity timers for, Suspend mode. You can disable monitoring of common interrupt requests so they do not generate PM events.

L. IRQ8 Break Suspend

Enabling this setting turns the monitoring of IRQ8 (the Real Time Clock) On so it does not awaken the system from Suspend mode.

M. Power Button Over Ride

When set to Delay 4 Sec., this function allows the power button to put the system in Suspend, a power saving mode. See Section 2-4 for operation instructions of the over-ride power button operation wich puts the system in Suspend mode. When set to Instant-Off the Power Button Over Ride function is disabled and the computer turns completely off when the power button is pressed.

N. Wake Up On LAN

Enable this selection to use the Wake Up On LAN function discussed in Section 2-4 of this manual.

O. Power On By Keyboard

Set to Disabled to control your computer's power by the button on your system case. Set this function to Any Key to turn on the computer by touching any key on the keyboard. If you set this function to Hot Key or Password you must designate the keystrokes that will turn on the computer. Note that the power button is always able to turn on the computer regardless of how this function is set.

  ✎   If you have forgotten your passord, you must remove the power cable from the ATX power supply connector and clear the CMOS data as discussed in Section 2-4 to clear the password.

P. Power On By Modem

When enabled, a modem that receives a call will wake up the system from soft off and green mode. You should connect the modem to the COM port and turn on the resume event in green mode.

Q. Power On By Alarm

When enabled, this setting allows the system to turn back on at a designated time of the month. User must designate date of month and time of day. This function is only available when using an ATX power supply and the Software Power-Off function to turn off the computer. See the Software Power-Off feature in Section 2-4 of this manual for instructions.

3-5 PnP/PCI Configuration

This section provides IRQ and DMA setting information. By choosing the PnP/PCI Configuration option from the CMOS Setup Utility menu (Figure 3-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

```
              ROM PCI / ISA BIOS (2A5IMC39)
                  PNP/PCI CONFIGURATION
                   AWARD SOFTWARE, INC.

PnP OS Installed          : No        PCI IRQ Actived By    : Level
Resources Controlled By   : Manual    Slot 1 Use IRQ No.    : Auto
Reset Configuration Data  : Disabled  Slot 2 Use IRQ No.    : Auto
                                      Slot 3 Use IRQ No.    : Auto
IRQ-3 assigned to    : PCI/ISA PnP    Slot 4 Use IRQ No.    : Auto
IRQ-4 assigned to    : PCI/ISA PnP    Audio IRQ No.         : 5
IRQ-5 assigned to    : PCI/ISA PnP    Assign IRQ For VGA    : Disabled
IRQ-7 assigned to    : PCI/ISA PnP    FDD IRQ Can Be Free   : Yes
IRQ-9 assigned to    : PCI/ISA PnP
IRQ-10 assigned to   : PCI/ISA PnP    Used MEM base addr    : N/A
IRQ-11 assigned to   : PCI/ISA PnP
IRQ-12 assigned to   : PCI/ISA PnP
IRQ-14 assigned to   : PCI/ISA PnP
IRQ-15 assigned to   : PCI/ISA PnP
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    F7   : Load Setup Defaults
DMA-6 assigned to    : PCI/ISA PnP
DMA-7 assigned to    : PCI/ISA PnP
```

Figure 3-6 PCI & ONBOARD I/O Setup Screen

A. PnP OS Installed

If you want to install a PnP compatible OS (such as Windows 95) set to Yes.

B. Resources Controlled By

When set to Manual the system BIOS will not refer to the ESCD for IRQ & DMA information. Instead, it will refer to the items in the setup menu for assigning IRQ & DMA. When set to Auto the system BIOS will refer to the ESCD for all legacy information.

⚠ ESCD(Extended System Configuration Data) provides a detailed format of the configuration data structures stored in flash memory. Each data structure defines the resources used by a device or a card in the system. This includes legacy and PCI/ISA PnP devices.

C. Reset Configuration Data

When enabled the system BIOS will clear/reset the ESCD during POST. After clearing the ESCD, the BIOS will then change this item's value to Disabled. Otherwise, the ESCD data will become useless.

D. IRQ#/DMA# assign to

When resources are controlled manually, you can assign each system interrupt & DMA channel for "Legacy ISA" or "PCI/ISA PnP" card used.

While using **Legacy ISA Card**(non-PnP ISA card), please set it's necessary corresponding resources (INT#, DMA#) from "PCI/ISA PnP" to "Legacy ISA."

✍   All ISA non-PnP devices are legacy devices that select resources (I/O Addr., INT# or DMA#) by using hardware jumpers.

✍   IRQ-3/4/7/12/14/15 have been set as default for on board devices (COM2, COM1, Printer port, PS/2 mouse, IDE1 and IDE2).

E. PCI IRQ Actived By

Leave the IRQ trigger set at Level unless the PCI device assigned to the interrupt specifies Edge-triggered interrupts.

F. Assign IRQ For VGA

This function allows BIOS to make an IRQ available to VGA cards. Most current VGA card models do not require this function to be enabled.

G. FDD IRQ Can Be Free

This function allows user to choose if the FDD IRQ is able to be freed up. The default setting is Yes and this does not allow the IRQ to be free.

H. Used MEM base addr

This function devotes a space of memory (8K, 16K, 32K, 64K) for any peripheral that has a high memory requirement. This is also used to designate memory space for legacy ISA cards. The settings C800~DC00 are used to to designate point at which the memory will start being used. The default setting is N/A (disabled.)

3-6 Load Setup Defaults

Load Setup Defaults loads the default system values directly from the CMOS Setup Utility menu (Figure3-1). If the stored record created by the setup program becomes corrupted and therefore unusable, these defaults will be loaded automatically when you turn on the computer.

```
ROM PCI / ISA BIOS (2A5IMC39)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP              HARDWARE MONITOR SETUP

BIOS FEATURES SETUP             INTERGRATED PERIPHERALS

CHIPSET FE
                  Load SETUP Defaults <Y/N>? N
POWER MA

PNP/PCI CONFIGURATION           SAVE & EXIT SETUP

LOAD SETUP DEFAULTS             EXIT WITHOUT SAVING

ESC      : Quit                 ↑↓ → ←     : Select Item
F10: Save & Exit Setup          (Shift) F2   : Color

Load SETUP Defaults except Standard CMOS SETUP
```

Figure 3-7 Load Setup Defaults Screen

3-7 Hardware Monitor Setup

By choosing the Hardware Monitor Setup option from the CMOS Setup Utility menu (Figure 3-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard**.**
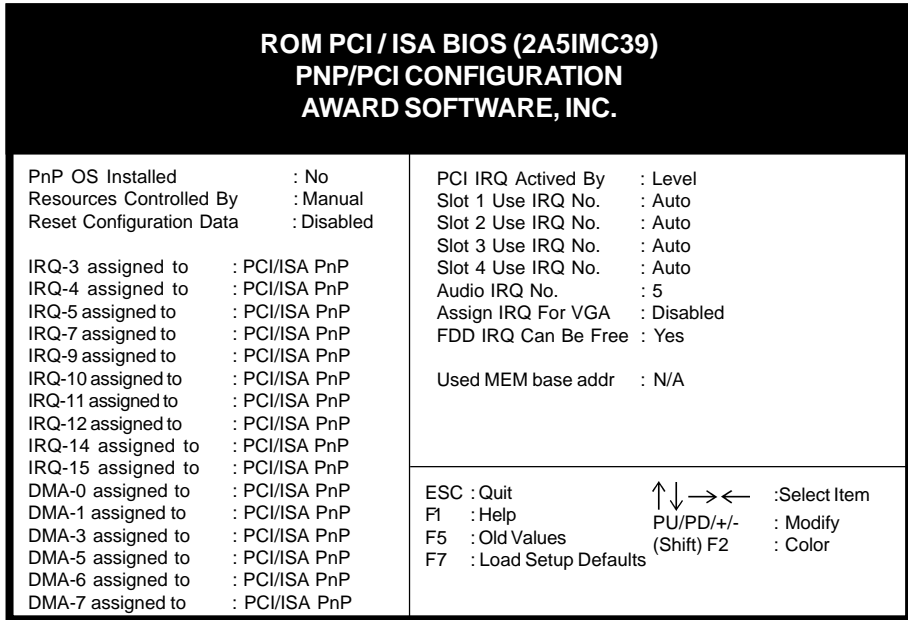
```
            ROM PCI / ISA BIOS (2A5IMC39)
              HARDWARE MONITOR SETUP
              AWARD SOFTWARE, INC.

 Current CPU Temperature   : 25 ºC/77 ºF
 Current CPUFAN  Speed     : 3600 RPM
 Current SYSFAN  Speed     : 3600 RPM
  12V : 12.09V        5V  : 5.19V
  3.3V :  3.34V       Vcore : 2.08V




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

Figure 3-8 Hardware Monitor Setup Screen

3-8 Integrated Peripherals

This section provides information on setting peripheral devices. By choosing the Integrated Peripherals option from the CMOS Setup Utility menu (Figure 3-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

```
          ROM PCI / ISA BIOS (2A5IMC39)
               INTEGRATED PERIPHERALS
               AWARD SOFTWARE, INC.

Internal PCI/IDE          : Both      Onboard Parallel Port      : 378/IRQ7
IDE Primary Master PIO    : Auto      Parallel Port Mode         : SPP
IDE Primary Slave PIO     : Auto      PS/2 mouse function        : Enabled
IDE Secondary Master PIO  : Auto      USB Controller             : Enabled
IDE Secondary Slave PIO   : Auto      USB Keyboard Support       : Disabled
Primary Master UDMA       : Auto      Init Display First         : PCI Slot
Primary Slave UDMA        : Auto      VGA Shared Memory Size     : 4MB
Secondary Master UDMA     : Auto      VGA Memory Clock (MHz)     : 66
Secondary Slave UDMA      : Auto      Onboard Sound Chip         : Enabled
IDE Burst Mode            : Enabled   Power Failure Recovery     : Disabled
IDE data Port Post Write  : Disabled
IDE HDD Block Mode        : Enabled

Onboard FDC Controller    : Enabled
Onboard Serial Port       : 3F8/IRQ4  ESC : Quit          ↑↓→←      :Select Item
IR Adress Select          : Disabled  F1  : Help
                                      F5  : Old Values    PU/PD/+/-  : Modify
                                      F7  : Load Setup Defaults (Shift) F2  : Color
```
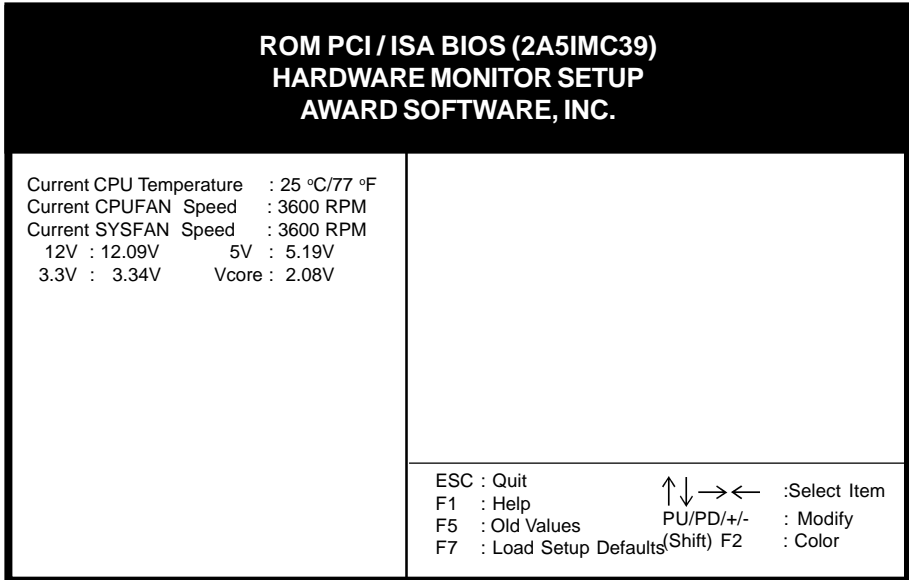
Figure 3-9 Integrated Peripherals Setup Screen

A. Internal PCI/IDE

The chipset contains a PCI IDE interface that supports two IDE channels: Primary (IRQ 14) and Secondary (IRQ 15). Each channel supports two IDE devices, so the system is capable of supporting a total of four IDE devices. Select Primary, Secondary, or Both to activate chipset IDE interface(s) installed on your system board.

B. IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (programmed Input/Output) fields let you set a PIO mode (0-4) for each IDE device that the internal PCI IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

C. Primary/Secondary/Master/Slave UltraDMA

UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 66 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

D. IDE Burst Mode

Selecting Enabled reduces latency between each drive read/write cycle, but may cause instability in IDE subsystems that cannot support such fast performance. If you are getting disk drive errors, try setting this value to Disabled. This field does not appear when the Internal PCI/IDE field is Disabled.

E. IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drivesdo), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

F. Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

G. Onboard Serial Port 1 and 2

Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.

H. IR Address Select

This function allows user to select the IR address/IR mode and IR IRQ.

I. Onboard Parallel Port

Select a logical LPT port address and corresponding interrupt for the physical parallel port.

J. Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software support one of the other available modes.

K. PS/2 mouse function

If your system has a PS/2 mouse port and you install a serial pointing device, select Disabled.

L. USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

M. Init Display First

This function allows user to choose between AGP slot or VGA slot to initialize Display first .

O. Power Failure Recovery

Computers using an ATX power supply do not turn back on after the power source to the computer unexpectedly fails (i.e. electricity outage). Enabling this setting will allow the system to always turn back on after a power failure. This is especially important for computers that must be on 24 hours per day.

3-9 Password Setting

There are three different variables that control password settings. The first two are located under the Security Option function in BIOS Features Setup Menu (Figure 3-3). When the Security Option function is set to Setup, a password is required to enter BIOS and change BIOS settings. When the Securitiy Option function is set to System, a password is required to to enter both BIOS and the the computer's operating system (for example Windows 95) found on the boot drive. This is shown in Figures 3-10.

The third variable is password setting selected in BIOS (Figure 3-1). The user is allowed to access the computer's operating system,change the user passorword and to have control over the settings in BIOS. (See Figure 3-10 below).
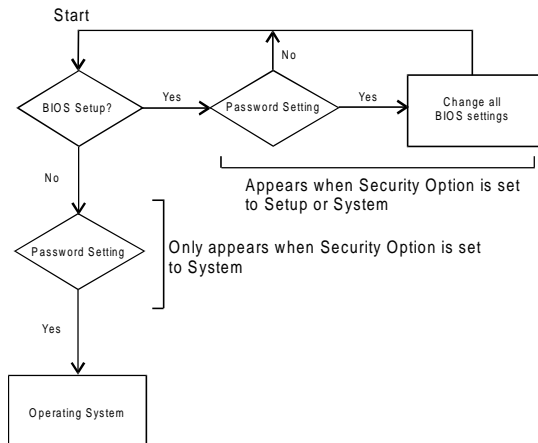
A. Setting Password

Figure 3-10   Set Either Supervisor or User Password

3-10 IDE HDD Auto Detection

This utility can automatically detect IDE hard disk type and parameters. The detection process take about 5 seconds for each physical drive. After the utility detects the disk drive, type Y and press [Enter] to automatically load the parameters in the Hard Disk section of the Standard CMOS Setup menu. Otherwise, leave the option set at N and press [Enter] or the [Esc] key to skip the detected drive. After detecting your hard drive(s), return to the Standard CMOS menu to check your settings.

ROM PCI / ISA BIOS (2A69KC39)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	:							

Select Primary Master Option (N=Skip) : N

OPTIONS	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
2 (Y)	547	530	32	0	1059	63	LBA
1	547	1060	16	65535	1059	63	NORMAL
3	547	530	32	65535	1059	63	LARGE

Note: Some OSes (like SCO-UNIX) must use "NORMAL" for installation

ESC: Skip

Figure 3-11 IDE HDD Auto Detection Screen
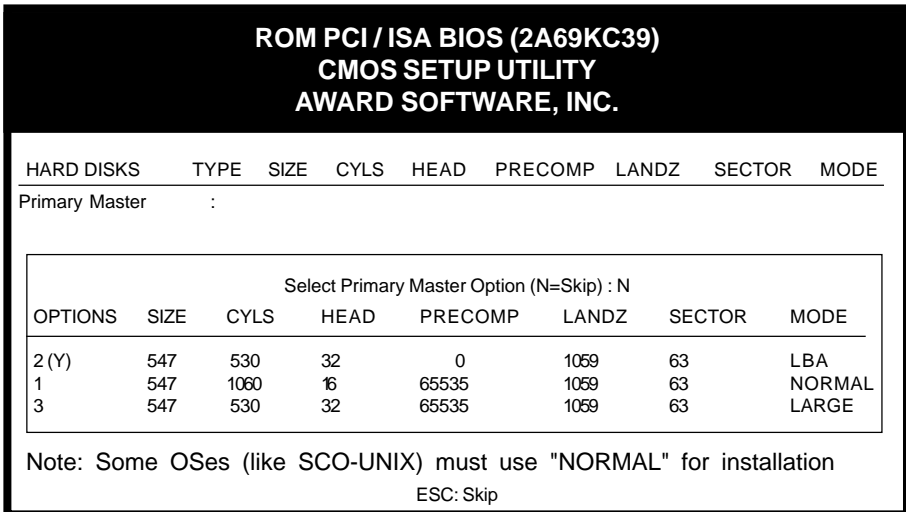
3-11 Save and Exit Setup

If you select this and type Y (for yes) followed by the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the BIOS chip.

3-12 Exit Without Saving

Selecting this option and pressing Y followed by the [Enter] key lets you exit the Setup program without recording any new values or changing old values.

Chapter 4

Brief Software Driver Guide

The Mainboard Software Guide is found on the CD-ROM that is enclosed with your mainboard and is a PDF file which must be viewed with Adobe's freeware called Acrobat® Reader. The Acrobat Reader software is also included on the same CD-ROM. See the Readme.txt file in the CD-ROM's root directory for installation instructions of the Acrobat Reader. The Mainboard software guide discusses the following items:

The following items are discussed in the PDF and TXT files:

- Bus Master/PIO IDE Driver Installation
- USB Driver Installation
- Removing the Exclamation and/or Question Marks From the Windows 95 Device Manager Menu
- Updating Your System BIOS
- Installing and Using a Desktop Management Interface (DMI) Utility for DOS
- Sound Driver and Utility Installation

⚠ The DMI utility is a DOS utility, operating under Windows or other operating system might cause damage to the BIOS.

⚠ The Flash utility that come with this CD is specially designed to this MB BIOS. Using others Flash utility might resulted to BIOS update failure and cause damage to the BIOS.

Memo

Chapter 5

Audio Subsystem

5-1 Feature

- - **ESS PCI audio Solo-1** (ES1938S-G) subsystem on a single chip.

- - Advance wavetable synthesizer using wavedata on the system memory.

- - Up to 48KHz programable sample rate for record and playback.

- - Intergrated Spatializer 3D effects Processor.

- - Advance power management meets ACPI standards.

- - Full duplex operation for simultaneous record and plaback.

5-2 Sound Driver and Utility (See Chapter 4)
5-3 CD-ROM Audio-in Connection (See Section 2-4)

Memo

Chapter 6

Integreted Super AGP 2D/3D Video/graphics controller

The SiS530 supports 100MHz CPU host bus, and incorporates the full function of SiS own popular 3D solution, SiS6326AGP, to allow 3D acceleration at 100MHz speed on a 64bit internal host bus. With this architecture, the video data transfer rate achieves 800MB/sec, farsuperior to the conventional 32bit bus at 66MHz.

6-1 Features
- Built-in high performance 3D engine has a peak polygon rate of 800K polygons/second at 50 pixels/polygon and has a peak fill rate at 40M pixels/second.
- Built-in programmable 24-bit true color RAMDAC upto 230MHz pixel clock
- Integrated Direct Draw Accelerator, with a 64-bit BITBLT engine
- Supports 42 double-word hardware command queue
- DDC1 and DDC2B(VESA DDC3.0)for display configuration and detection
- Power management for full VESA Display Power Management Signaling (DPMS), and EPA Energy Star compliance.
- Supports up to 1024x768@75MHz(VESA standard CRT timings)

6-2 Memory
- Supports programmable 8MB memory configuration

6-3 Operating Requirements
- To take advantage of the AGP 2x mode(133MHz), you must use Windows 95 version OSR2.1 or later. Make sure to install USBSUPP.EXE file from Microsoft

6-4 Driver and Utility Installation
- Graphics acceleretor driver and Utility Installation (See Chapter 4)

6-5 Jumper Setting

-   Onboard VGA (Enabled/Disabled) Jumper (See Section2-4)

6-6 Reference

Direct3D

-   Direct3D is the next generation of real-time, interactive 3D technology
    for mainstream computer user on internet. Direct 3D is a complete
    set of real-time 3D graphics services that delivers fast software-
    based rendering of the full 3D pipiline (transformations, lighting and
    rasterization) and transparent access to hardware acceleration. Direct
    3D is fully scalable, enabling all or part of the 3D rendering pipeline
    to be accelerated by hardware.

Appendix I

On Board I/O Addresses & IRQ Maps

System Resource	IRQ	I/O Address
1. Timer	IRQ0	040, 043
2. Keyboard	IRQ1	060, 064
3. Programmable INT	IRQ2	0020, 0021, 00A0, 00A1
4. COM2(B)	IRQ3	2F8, 2FF
5. COM1(A)	IRQ4	3F8, 3FF
6. Floppy	IRQ6	3F0, 3F7
7. LPT1	IRQ7	378, 37F
8. Real Time Clock	IRQ8	070, 071
9. PS/2 Mouse	IRQ12	060, 064
10. Math coprocessor	IRQ13	0F0, 0FF
11. IDE 1	IRQ14	1F0, 1F7
12. IDE 2	IRQ15	170, 177

☞ IRQ 5, 9, 10 and 11 are available for interface cards.
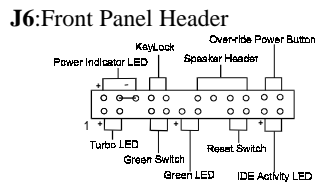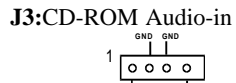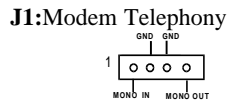
Memo

1999.03

JP1: 1-2 : Volumn up
    3-4 : Volumn down

JP2: 1-2 : On board VGA Enable (Default)
    2-3 : On board VGA Disable

JP3: Power on keyboard
    1-2 : Default
    2-3 : Enable

JP7: SB-Link

(PC/PCI) GNT# — GND
    (PC/PCI) REQ#
GND — SERIAL IRQ
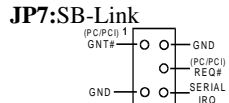
JP12: 1-2 : Clear CMOS
    2-3 : Default

J1: Modem Telephony
MONO IN   MONO OUT

J2: AUX-in
GND GND

J3: CD-ROM Audio-in
GND GND

J6: Front Panel Header

KeyLock — Override Power Button
Power Indicator LED — Speaker Header
Turbo LED — Green Switch — Reset Switch
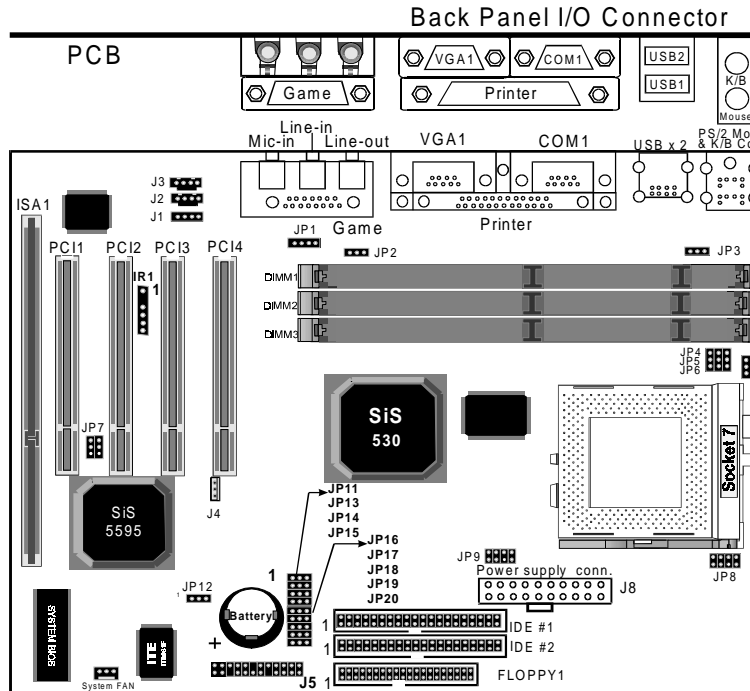Green LED — IDE Activity LED

JP8: Open Vcore≠V I/O (Default)
    Short Vcore=V I/O

JP9: Open V I/O≠ATX Power Source
    Short V I/O=ATX Power Source

⚠ **1.** Install the first DIMM in DIMM3 socket due to shared memory architecture limitation

2. "VGA Memory clock (MHz)" in BIOS's Integrated peripherals page needs to be set to the same frequency as " SDRAM frequency"

V.1

Back Panel I/O Connector

PCB

VGA1 COM1 USB2 / USB1
Game Printer K/B Mouse

Line-in
Mic-in Line-out VGA1 COM1 USB x 2 PS/2 Mou & K/B Co

Game Printer

SiS 530

SiS 5595

Socket 7

Power supply conn. J8

IDE #1
IDE #2
FLOPPY1

Vcore	JP16~20	Vcore	JP16~20
1.8V		2.9V	
2V		3.1V	
2.2V		3.2V	
2.4V		3.3V	
2.5V		3.5V	
2.8V			

Freq. Ratio	JP4~JP6
x1.5/x3.5	
x2.0	
x2.5	
x3.0	
x4.0	
x4.5	
x5.0	
x5.5	

SYS. Freq	JP1	JP13	JP14	JP15
66/Async				
66/Sync				
75				
83				
90				
95				
100				

CPU-type		CPU Power Voltage				System freq.		Freq. ratio	
		I/O Vcc	Core Vcc	JP8	JP9	JP16~20	MHz	JP11, 13~15	Speed rate	JP4~
Intel	P54C-166	3.5					66		x2.5	
	P54C-200								x3	
	Pentium w/MMX @166MHz	3.3	2.8				66		x2.5	
	Pentium w/MMX @200MHz								x3	
	Pentium w/MMX @233MHz								x3.5	
Cyrix /IBM	6x86L-PR166 @133MHz	3.3	2.8				66		x2	
	6x86L-PR200 @150MHz						75			
	6x86MX-PR166		2.9				66		x2.5	
	6x86MX-PR200								x2	
	6x86MX-PR200						75		x2.5	
	6x86MX-PR233						83		x2	
	MII-300						66		x3.5	
							75		x3	
AMD	K6/166	3.3	2.9				66		x2.5	
	K6/200								x3	
	K6/233		3.2				66		x3.5	
	K6/266								x4	
	K6-2/266									
	K6-2/300						100		x3	
	K6-2/333		2.2				95		x3.5	
	K6-2/350						100			
	K6-2/366						66		x5.5	
	K6-2/380						95			