# FCC

# *Declaration of Conformity*

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

The following designated product:

## EQUIPMENT:  MAINBOARD
## MODEL NO.:  5RSA

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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**September 1998**

100% POST-CONSUMER RECYCLED PAPER

# Main Board
# User's  Manual

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*Memo*

# Chapter 1

# Introduction

## 1-1 Product Specifications

❏ **Processor**
- **-** Supports up to 200 MHz Intel **Pentium**® processors and up to 233 **MHz Pentium**® processors with MMX technology
- Supports Cyrix/IBM 6x86MX PR166+~PR233+and up to 333MHz MII processors
- Supports AMD K6 166 MHz~266 MHz processors and K6-2 266MHz to 350MHz processors
- Supports IDT 180 MHz to 225 MHz Winchip C6, 240MHz to 266MHz Winchip 3D processors
- High efficiency **Switching Power Module**
  **\* Supports 2.0~3.5v CPU core voltage in 0.1v increment**
- Supports 60/66/68/75/83/95/100 MHz system clock speeds

> Supports 68 (Turbo mode), 75/83 MHz system clock for over-clocking possibility. Refer to Section 2-3 for overclocking details.

❏ **Chipset**
- **- ALI Aladdin-5** (M1541/1543) two chip PCIset

❏ **L2 Cache**
- On board 512KB Pipelined Burst SRAM
- On board 32Kx8 Tag for 64MB Cacheable range with write-back policy

❏ **DRAM Memory**
- Two 3.3V 168-pin DIMM sockets support up to 256 MB
- Provides Parity/single-bit ECC capability

> Because 256MB unbuffered DIMM modules are not yet mainstream, their compatibility can not be 100% guaranteed. (See Section 2-5 for details.)

❏ **Expansion Slots**
- One 32-bit AGP slot (Rev 1.0 compliant)
- Two 32-bit PCI slots (Rev 2.1 compliant)
- Two 16-bit ISA slots (one PCI/ISA shared slot)

❒ **BIOS**
- Award System BIOS, supports PnP, APM, DMI & Multi-device booting features i.e. floppy, LS120, CD-ROM, 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-33 PCI IDE Ports**
- Supports up to PIO Mode 4, Multi-word Mode 2 and Ultra DMA-33 timings
- Bus Mastering software drivers for all well known multi-task operating systems

❒ **Embedded Ultra I/O**
- One Parallel (SPP/ECP/EPP) and two Serial (16550A compliant) ports
- One floppy disk drive connector supports up to 2.88MB, Japanese 3-Mode, and 1Mbps transfer rates
- IrDA IR function supports up to 115.2Kbps

❒ **On Board Audio Subsystem**
- ESS 1869 16-bit stereo audio controller
- Up to 44.1KHz programmable sample rate for simultaneous recording and play- back
- Built-in 20-voice music synthesizer (OPL3 compatible), Spatializer 3D audio effect processor
- Supports DLS(Downloadable Wavetable Sounds) wavetable synthesizer with limitless variety of instrument samples using PC RAM

❒ **Two Channel USB Ports**

   ⚠ Now under compatibility testing with different peripherals

❒ **Board Dimensions**
- Micro-ATX form factor, 244mm x190mm, 4 Layers
- Six mounting holes

❒ **Advanced Management Features**
- Software power off control, Over-ride power button, Power-on by modem, Power failure recovery, Blinking LED in Suspend etc.
- **Poly-fuse** over-current protection for USB and keyboard
- Supports **FAN78** (*SMART* technology cooling fan v1.0 compliant)

- Meets EPA Green PC standard: power consumption under 30W in Doze, Standby, and Suspend modes
- **ACPI** features ready when ACPI-enabled O/S is available
- Special PCI  Asynchronous mode to guaranty the operation on 75/83-MHz system frequency
- Complete Data Security
  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 (at least 200 Watts)**

| 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 IDE connector ribbon cable (Figure 1-1)

❒ 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
  - ALI Bus Master IDE drivers for Win95, WinNT3.5/4.0
  - ALI AGP VXD Driver
  - ALI 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)



IDE cable

**Figure 1-1**



**Figure 1-2a**    Standard Floppy cable
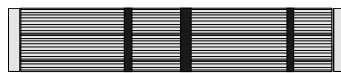


**Figure 1-2b**    Optional 5.25 in. floppy cable



Insert the stub if the mounting screw
is not supported by the ATX case

Socket 7
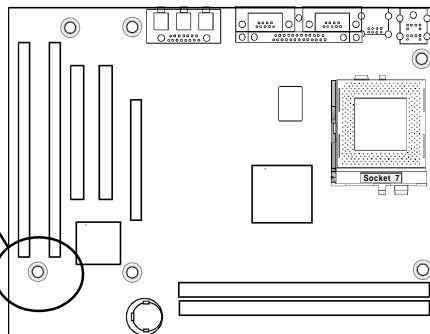
**Figure 1-3**

# 1-3 Mainboard Layout
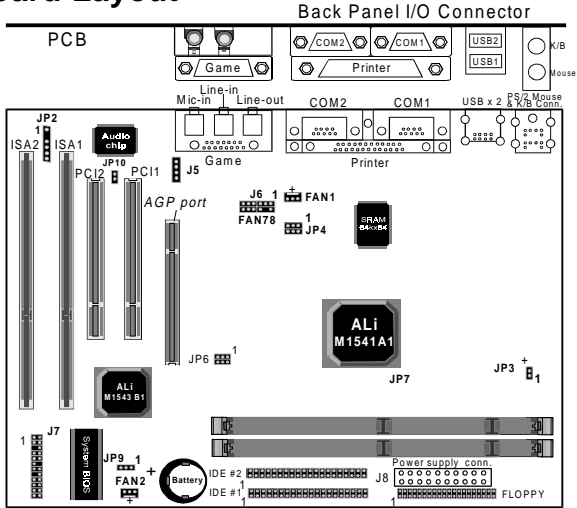


# 1-4 Connector and Jumper Reference Chart

| Jumper & Connector No. | Function | Page |
|---|---|---|
| J5 | CD-ROM audio in | 15 |
| J6 | FAN78 connector | 47 |
| J7 | Keyboard lock & Power indicator LED connector | 13 |
| | System reset switch connector | 14 |
| | Speaker connector | 14 |
| | Green switch / Green LED connector | 14 |
| | Turbo LED connector | 14 |
| | IDE activity LED connector | 14 |
| | Over-ride power button connector | 13 |
| J8 | ATX Power supply connector | 12 |
| FAN1 | CPU cooling fan connector | 15 |
| FAN2 | System cooling fan connector | 15 |
| JP2 | Infrared connector | 15 |
| JP3 | CPU V I/O Voltage setting jumper | 11 |
| JP4 | CPU frequency ratio setting jumper | 9 |
| JP6 | Host bus frequency setting jumper | 9 |
| JP7 | CPU Vcore voltage setting jumper | 10 |
| JP9 | Clear CMOS data jumper | 16 |
| JP10 | On-board audio chip jumper (Enabled/Disabled) | 15 |
| Ports | PS/2 mouse and keyboard ports | 16 |
| Ports | USB (Universal Serial Bus) ports | 17 |

*Memo*

# Chapter 2

# 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
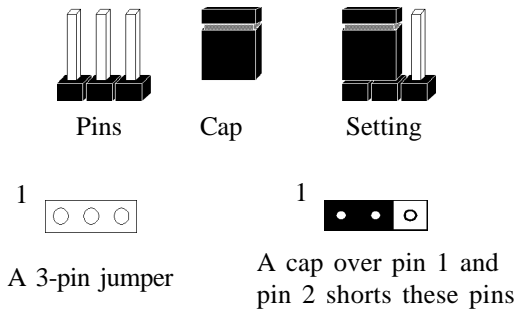
**Figure 2-1**

## 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.
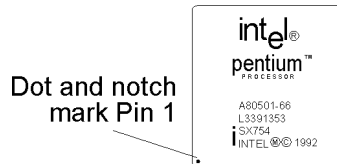


**Figure 2-2  The markings on top of a CPU**

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.
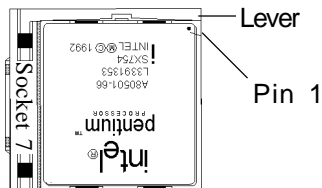


**Figure 2-3  Inserting a CPU into Socket 7**

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 **JP6** for **System Frequency** and **JP4** 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
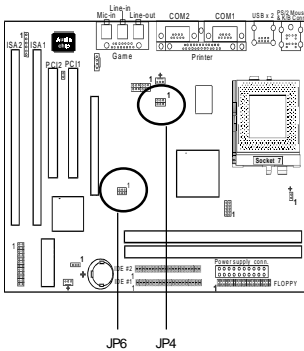
| System Freq. | JP6 |
|---|---|
| 60MHz | |
| 66MHz | |
| 68.5MHz | |
| 75MHz | |
| 83MHz | |
| 95MHz | |
| 100MHz | |

| Freq. Ratio | JP4 |
|---|---|
| x 2 | |
| x 2.5 | |
| x 3 | |
| x 3.5 | |
| x 4 | |
| x 4.5 | |
| x 5 | |
| x 5.5 | |

**Figure 2-4 System Frequency Jumper Settings**

**PCI Frequency & AGP Frequency**

| System Freq. (MHz) | PCI Freq. (MHz) | AGP Freq. (MHz) |
|---|---|---|
| 60 | 30 | 60 |
| 66 | 33 | 66 |
| 68.5 | 34 | 68.5 |
| 75 | 37.5 | 75 |
| 83 | 33 | 66 |
| 95 | 31.75 | 63.5 |
| 100 | 33 | 66 |

## 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 **JP7** according to the table on the next page. The voltage range supported by this mainboard is detailed in Figure 2-5 below.

| Vcore | JP7 | Vcore | JP7 |
|-------|-----|-------|-----|
| 1.7V | (jumper setting) | 2.7V | (jumper setting) |
| 1.8V | (jumper setting) | 2.8V | (jumper setting) |
| 1.9V | (jumper setting) | 2.9V | (jumper setting) |
| 2.0V | (jumper setting) | 3.0V | (jumper setting) |
| 2.1V | (jumper setting) | 3.1V | (jumper setting) |
| 2.2V | (jumper setting) | 3.2V | (jumper setting) |
| 2.3V | (jumper setting) | 3.3V | (jumper setting) |
| 2.4V | (jumper setting) | 3.4V | (jumper setting) |
| 2.5V | (jumper setting) | 3.5V | (jumper setting) |
| 2.6V | (jumper setting) | | |

**Figure 2-5 Voltage Jumper Settings**

| CPU-type | | CPU Power Voltage | | | | System freq. | | Freq. ratio | |
|---|---|---|---|---|---|---|---|---|---|
| | | I/O Vcc | Core Vcc | JP3 | JP7 | MHz | JP6 | Speed rate | JP |
| Intel | P54C-133 | 3.5 | | | | 66 | | x2 | |
| | P54C-166 | | | | | | | x2.5 | |
| | P54C-200 | | | | | | | x3 | |
| | Pentium w/MMX @166MHz | 3.3 | 2.8 | | | | | x2.5 | |
| | Pentium w/MMX @200MHz | | | | | | | x3 | |
| | Pentium w/MMX @233MHz | | | | | | | x3.5 | |
| Cyrix /IBM | 6x86-PR166 @133MHz | 3.5 | | | | 66 | | x2 | |
| | 6x86-PR200 @150MHz | | | | | 75 | | | |
| | 6x86L-PR166 @133MHz | 3.3 | 2.8 | | | 66 | | | |
| | 6x86L-PR200 @150MHz | | | | | 75 | | | |
| | 6x86MX-PR166 | | 2.9 | | | 66 | | | |
| | 6x86MX-PR200 | | | | | | | x2.5 | |
| | 6x86MX-PR200 | | | | | 75 | | x2 | |
| | | | | | | | | x2.5 | |
| | 6x86MX-PR233 | | | | | 83 | | x2 | |
| | 6x86MX-PR266 | | | | | | | x2.5 | |
| | MII-300 | | | | | 66 | | x3.5 | |
| | | | | | | 75 | | x3 | |
| AMD | K5-PR166 @116.7MHz | 3.5 | | | | | | x2.5 | |
| | K6/166 | | 2.9 | | | | | | |
| | K6/200 | | | | | | | x3 | |
| | K6/233 | | 3.2 | | | 66 | | x3.5 | |
| | K6/266 | 3.3 | | | | | | | |

# 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 (J7) A through G
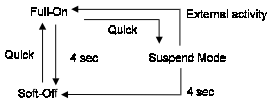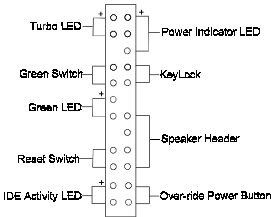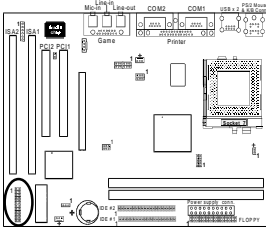






**Over-ride Power Button Operation**

### 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 Soft-OFF by PWR-BTTN 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 Soft-OFF by PWR-BTTN 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)
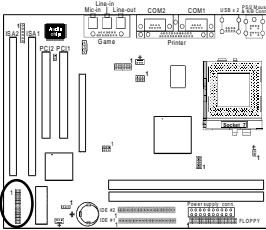
## C. Green Switch/Green LED Connector

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.
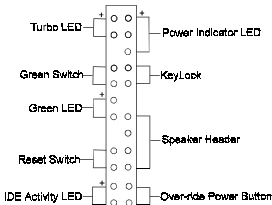
## D. System Reset Switch Connector

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 (JP2)
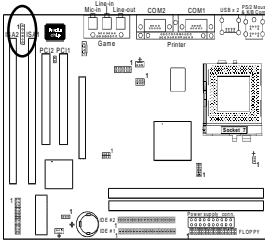
If you enable the COM2 Mode in BIOS's Integrated Peripherals menu the COM2 port will support IR functions. (See section 3-7)

Vcc
Ir-Rx
GND
Ir-Tx
Vcc
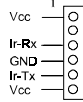
## CPU/System Cooling Fan Connectors (FAN1/FAN2)
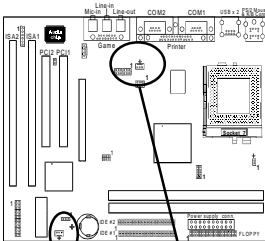
These added connectors allow the fan to draw their power from the mainboard instead of the disk drive connector. The mainboard's management extension hardware is able to detect the CPU and system fan speed in rpm (revolutions per minute). These connectors supports 3-pin cooling fans with minimum of 3500 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

## CD-ROM Audio-in (J5)
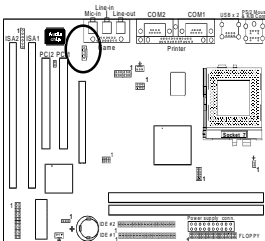
Use the cable enclosed with your CD-ROM disk drive to connect the CD-ROM to your mainboard. This will enable your CD-ROM's audio function.

R  GND GND  L

## On-board Audio Chip Jumper (JP10)
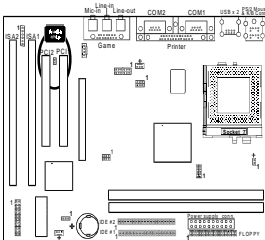
Enabled   Disabled

Short pin 1-2 to enabled the on-board audio and open pin 1-2 to disabled.

## Clear CMOS Data Jumper (JP9)
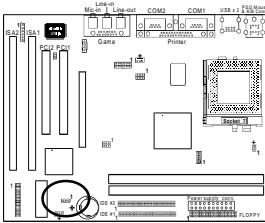
1 [■ ■ □] Normal (default)    1 [□ ■ ■] Clear CMOS data

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.

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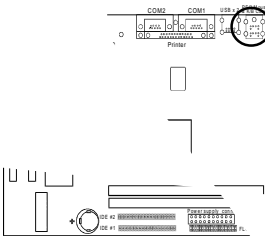
If a PS/2 mouse is used, BIOS will automatically detect and assign IRQ12 to the PS/2 mouse.

| 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
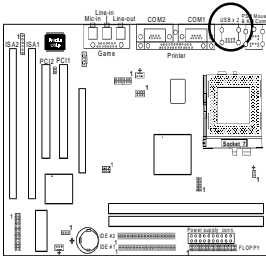


If you want to use a USB keyboard, you must enable the USB keyboard support function in BIOS's Integrated Peripherals menu (See Section 3-7). USB is an open industry standard, providing a simple and inexpensive way to connect up to 125 devices to a single computer port. Keyboards, mice, tablets, digitizers, 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 four banks and the memory size ranges from **16~256 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 | Bank1 |
|--------|-------|
| DIMM 2 | Bank2 |

1                               128
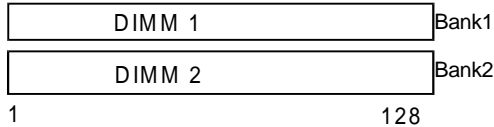
### *DRAM Specifications*

| | |
|---|---|
| DIMM type: | 3.3V, 64/72-bit EDO(Extended Data Output) Synchronous DRAM |
| Module size: | Single/double-sided 16/32/64/128 MBytes |
| DRAM speed: | 60-ns or faster for EDO DRAM 10/12ns for Synchronous DRAM |
| Parity: | Either parity or non-parity |

⚠ The compatibility of 128MB 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.

# 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 Delete 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 (2A69JC39)
               CMOS SETUP UTILITY
             AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP           INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP           SUPERVISOR PASSWORD

   SeePU & CHIPSET SETUP         USER PASSWORD

   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...
```
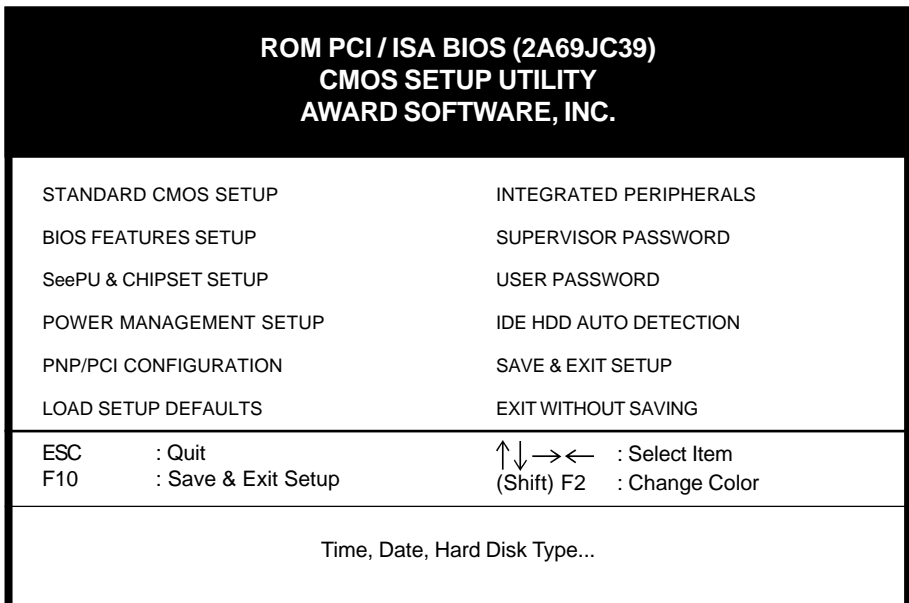
**Figure 3-1 Setup Program Initial Screen**

# 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 (2A69JC39)
                     STANDARD CMOS SETUP
                     AWARD SOFTWARE, INC.


  Date (mm : dd : yy): Mon, Aug 24 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                    Base Memory :     640K
                                     Extended Memory :  15360K
  Video        : EGA/VGA                 Other Memory :    384K
  Halt On      : All Errors
                                        Total Memory :  16384K

  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 (2A69JC39)
            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 Sequence              : A,C,SCSI    D4000 - D7FFF Shadow  : Disabled
 Swap Floppy Drive          : Disabled    D8000 - DBFFF Shadow  : Disabled
 Boot Up Floppy Seek        : Enabled     DC000- DFFFF Shadow   : Disabled
 Boot Up NumLock Status     : On
 Boot Up System Speed       : High
 Typematic Rate Setting     : Disabled
 Typematic Rate (Chars/Sec) :  6
 Typematic Delay (Msec)     : 250
 Security Option            : Setup
 PCI/VGA Palette Snoop      : Disabled
 OS Select (For DRAM>64MB)  : Non-OS2     ESC : Quit              ↑↓ → ←    :Select Item
                                          F1    : Help            PU/PD/+/-  : Modify
                                          F5    : Old Values      (Shift) F2 : Color
                                          F7    : Load Setup Defaults
```

**Figure 3-3 BIOS Feature Setup Screen**

## A. 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.

**Boot Sector Intrusion Alert**

When Enabled, BIOS activates a warning message to the user when any program (i.e., a virus) attempts to write to the boot sector or hard disk partition table. The user is able to intervene by running an anti-virus program. This function only protects the boot sector and not the entire hard drive.

## 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.

## C. BOOT UP FEATURES

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

**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.

**Boot Up System Speed**
This function determines the CPU speed while in non-protected mode under DOS. Set to High for regular CPU speed and low for decreased CPU speed.  This function is used for applications such as games that require decreased CPU speed.

## 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 (2A69JC39)
            CHIPSET FEATURES SETUP
            AWARD SOFTWARE, INC.


AUTO Configuration      : Enabled      Auto Detect DIMM/PCI Clk   : Enabled
L2 TAG RAM Size         : 8            Spread Spectrum            : Disabled
AT Bus Clock            : CLK2/3
DRAM Timing             : Normal        **** System Monitoring & Alerting ****
SDRAM CAS Latency       : 3            CPU Warning Temperature    : Disabled
Pipelined Function      : Enabled      Current CPU Temperature    : 25 °C/77 °F
Graphics Aperture Size  : 64 MB        Current CPUFAN1 Speed      : 3600 RPM
SDRAM Burst x-1-1-1-1-1-1-1 : Enabled  Current CPUFAN2 Speed      : 3600 RPM
DRAM Data Intergrity Mode : Disabled   Current Vdd (V)            : 2.49V
Memory Hole At 15M-16M    : Disabled
Host Read DRAM Command Mode : Bypass
AGP Read Burst          : Enabled
ISA Line Buffer         : Enabled
Passive Release         : Enabled      ESC : Quit              ↑↓→←        :Select Item
Delayed Transaction     : Disabled     F1  : Help              PU/PD/+/-   : Modify
Primary Frame Buffer    : All          F5  : Old Values        (Shift) F2  : Color
VGA  Frame Buffer       : Enabled      F7  : Load Setup Defaults
Data Merge              : Disabled
IO Recovery Period      : 2 us
```

**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. Auto Configuration*

When Auto Configuration is enabled, BIOS autodetects the DRAM module type (i.e. EDO, FP) and determines the relevant DRAM settings.  Note that these DRAM settings become background print (unchangeable) once the Auto Configuration is enabled.  If Auto Configuration is enabled, you must set the DRAM timing function to 60ns or 70ns, depeding on the type of DRAM you install.

## B. L2 TAG RAM Size

The system uses tag bits to determine the status of data in the L2 cache. Set this field to match the specifications (8 or 10 bits) of the installed tag RAM chip.

## C. AT Bus Clock

This function allows you to set the speed of the AT bus in terms of a fraction of the CPU clock speed,(PCKL2) or at the fixed speed of 7.16KHz.

## D. DRAM Timing

The value in this field depends on performance parameters of the installed memory chips. (DRAM) Do not change the value from the factory setting unless you install a new memory that has a different performance rating than the original DRAM.

## E. SDRAM CAS Latency

When syschronous DRAM is installed, the number of the clock cycles of CAS latency depends on the DRAM timing.

## F. Pipeline Function

When Enabled, the controller signals the CPU for a new memory address before all data transfers fot hte current cycles are complete, resulting in faster performance.

## G. Graphics Aperture Size

This function determines the amount of system memory that is given to the Graphics card. Options range from 16MB to 256MB. This is a dynamic memory allotment in that the Graphics 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 is alloted to the AGP card and the card only needs 8MB, the remaining 8MB will be available for system use.

## H. DRAM Data Integrity Mode

This function enable you to select Parity or ECC, (Error Correcting Code) according to the type the installed DRAM.

## I. 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. The default setting is Disabled.

## J. ISA Line Buffer

The PCI to ISA Bridge has 8-byte bi-directional line buffer for ISA or DMA bus master memory reads from or writes to the PCI bus. When Enabled, an ISA or DMA bus master can prefetch two double words to theline buffer for a read cycle.

## K. Passive Release

When Enabled, CPU to PCI bus access is allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

## L. Delay Transaction

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

## M. Primary Frame Buffer

This function allows you to select a size for the frame buffer. The size of the buffer should not impinge on local memory.

## N. VGA Frame Buffer

When Enabled, a fixed VGA frame buffer from A000h to BFFFh and a CPU to PCI write buffer are implemented

## O. Data Merge

This function controls the word-merge feature for frame buffer cycles. When Enabled, the controller checks the eight CPU Byte Enable signal to determine if the words read from the PCI bus by the CPU can be merge.

## P. Spectrum Spread

When Enabled, this function will cause lower EMI by spreading the system frequency spectrum. For normal operation, Disable this function.

## 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 default values for the mainboard.

```
ROM PCI / ISA BIOS (2A69JC39)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management    : User Define          ** External Switch **
PM Control by APM   : Yes          Power Button        :  Power Off
MODEM Use IRQ       : 3            DOCK I/O SMI        :  Disabled
Video Off Method    : Susp.Stby->Off   AC Power SMI        :  Disabled
Video Off Option    : DPMS

      ** PM Monitor **
HDD Power Down      : Disabled
Doze Mode           : Disabled
Standby Mode        : Disabled
Suspend Mode        : Disabled
      ** PM Events **
Primary HDD         : Disabled
Floppy              : Disabled
COM Ports           : Enabled      ESC : Quit           ↑↓→←        :Select Item
Keyboard            : Enabled      F1    : Help           PU/PD/+/-    : Modify
LPT Ports           : Disabled     F5    : Old Values     (Shift) F2   : Color
                                   F7    : Load Setup Defaults
```

**Figure 3-5 Power Management Setup Screen**

### A. 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.
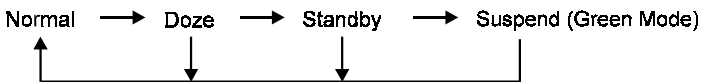


**Figure 3-6 Power Saving Mode Flow Chart**

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.

### B. PM Control by APM

This function allows software other than BIOS to control Power Management
features Enable this function in BIOS and make sure APM (Advanced Power
Management) is present.  For example, run the Power utility program located in
the DOS directory, C:\DOS\POWER.EXE to use Power Management features under
DOS.  For Windows 3.1x and Windows 95, you need to install Windows with
the APM feature.

### C. Modem Use IRQ

This function determines  the IRQ in which the modem can use.

### D. 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.

### E. 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.

## F. HDD Power Down

The Power Management function must not be set to disabled to enable this function. When the HDD idle time has elapsed, BIOS sends a command to the hard disk to turn off the motor. Set a time between 1 and 15 to indicate time required to wait before the hard drive enters a power saving mode. Some old hard drives may not support this function.

## G. 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.

## H. 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.

## I. 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.

## J. Power Button

This item allows you to select the function of the power button.

## 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 (2A69JC39)
                       PnP/PCI CONFIGURATION
                       AWARD SOFTWARE, INC.


PnP OS Installed           : No          PCI IRQ Actived By   : Level
Resources Controlled By    : Manual      PCI IDE IRQ Map To   : ISA
Reset Configuration Data   : Disabled
                                         Assign IRQ For VGA      : Enabled
IRQ-3 assigned to     : PCI/ISA PnP      FDD IRQ Can Be Free     : No
IRQ-4 assigned to     : PCI/ISA PnP
IRQ-5 assigned to     : PCI/ISA PnP
IRQ-7 assigned to     : LegacyISA
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    : LegacyISA
IRQ-15 assigned to    : LegacyISA
DMA-0 assigned to     : PCI/ISA PnP   ┌─────────────────────────────────────────
DMA-1 assigned to     : PCI/ISA PnP   ESC : Quit         ↑↓→←        :Select Item
DMA-3 assigned to     : PCI/ISA PnP   F1   : Help        PU/PD/+/-   : Modify
DMA-5 assigned to     : PCI/ISA PnP   F5   : Old Values  (Shift) F2  : Color
DMA-6 assigned to     : PCI/ISA PnP   F7   : Load Setup Defaults
DMA-7 assigned to     : PCI/ISA PnP
```

**Figure 3-7 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 IDE IRQ Map to

This function allows user to select PC AT (ISA) interrupts or PCI IDE IRQ mapping.

ISA:  BIOS does not designate any IRQ signal to the PCI slot. This is the default setting.

PCI-SLOT 1-4:  User can designate which PCI slot (1-4) the IDE card is inserted into. This setting is suitable for use with older PCI IDE cards that BIOS is not able to recognize.

PCI-AUTO:  BIOS automatically detects which PCI slot the PCI IDE card is inserted into.

## F. Assign IRQ For VGA

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

## G. FDD IRQ Can Be Free

This function allows users to choose if the FDD IRQ is able to be freed for use with other processes that require IRQ.

## 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 (2A69JC39)
        CMOS SETUP UTILITY
       AWARD SOFTWARE, INC.

STANDARD CMOS SETUP              INTERGRATED PERIPHERALS

BIOS FEATURES SETUP             SUPERVISOR PASSWORD

CHIPSET FEA
                  Load SETUP Defaults <Y/N>? N
POWER  MAN

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 3-8 Load Setup Defaults Screen**

# 3-7 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 (2A69KC39)
                     INTEGRATED PERIPHERALS
                     AWARD SOFTWARE, INC.

On-Chip Primary IDE        : Enabled     Onboard FDC Controller    : Enabled
  Master PIO               : Auto        Onboard Serial Port 1     : Auto
  Slave PIO                : Auto        Onboard Serial Port 2     : Auto
  Master Ultra DMA         : Auto        COM2 Mode                 : Normal
  Slave Ultra DMA          : Auto
On-Chip Secondary IDE      : Enabled     Onboard Parallel Port     : 378/IRQ7
  Master PIO               : Auto        Parallel Port Mode        : ECP
  Slave PIO                : Auto
  Master Ultra DMA         : Auto
  Slave Ultra DMA          : Auto
IDE HDD Block Mode         : Enabled
On-Chip USB Controller     : Disabled

Init Display First         : PCI Slot
Power on by Modem          : Disabled    ESC : Quit                ↑↓→←      :Select Item
Power on by Alarm          : Disabled    F1  : Help
                                         F5  : Old Values          PU/PD/+/-  : Modify
                                         F7  : Load Setup Defaults (Shift) F2 : Color
```
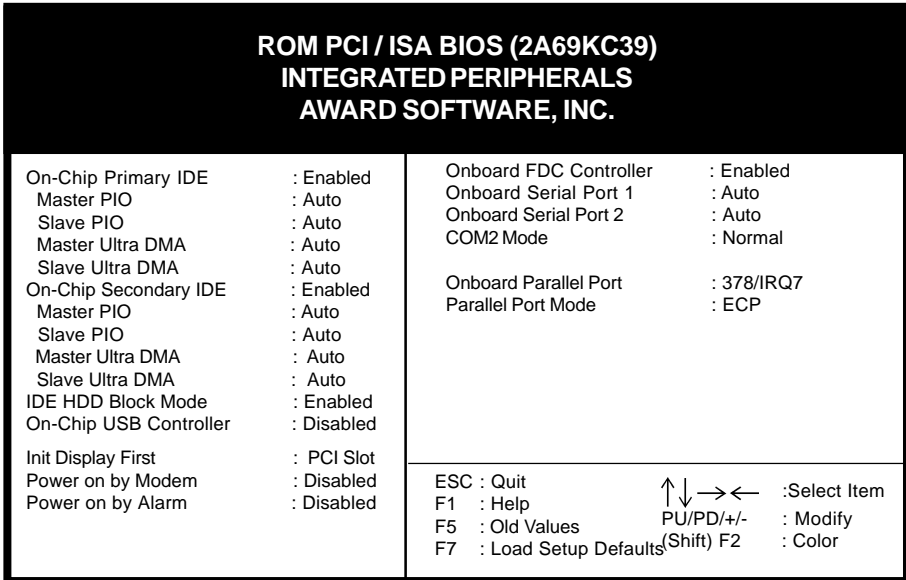
**Figure 3-9 Integrated Peripherals Setup Screen**

### A. On-chip Primary/Secondary PCI IDE

You can set this to disable the On-chip IDE controller if you are going to add a higher performance IDE board.

### B. On-Chip Primary/Secondary Master/slave PIO

The four IDE PIO (programmed Input/Output) filed 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. On-Chip Primary/Secondary Master/slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. (Windows OSR2 or a third party IDE bus master driver) Select Auto to enable BIOS support .

## D. IDE HDD Block Mode

Specify the maximum number of sectors that can be transferred at a time.

## E. On-Chip USB Controller

If your current operating system support USB controller, this function must be enable.

## F. Init Display First

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

## G. 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.

## H. 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.

## I. Onboard FDC Controller

Select Enabled if your system  has a floppy disk controller installed .

## J. Onboard Serial Port 1/Port2 Controller

This function allows user to determine access onboard serial port 1/port2 controller with which I/O address.

## K. COM2 Mode

When this function is Enabled, then the COM port will be redirected to support IR function.

## L. Onboard Parallel Port

This function allows user to determine access onboard serial  parallel port controller with which I/O address.

# 3-8 Supervisor Password & User Password Setting

There are four 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 3-9 and 3-10.

The third and fourth variables are user password and supervisor password selected in BIOS (Figure 3-1). The main purpose of separating user and supervisor is to allow only the supervisor to have control over the settings in BIOS. The user, on the other hand, is only allowed to access the computer's operating system and change the user passorword in BIOS (See Figure 3-10 below). Note that when there is no supervisor password set, the user password controls access to all BIOS settings (See Figure 3-9 below).
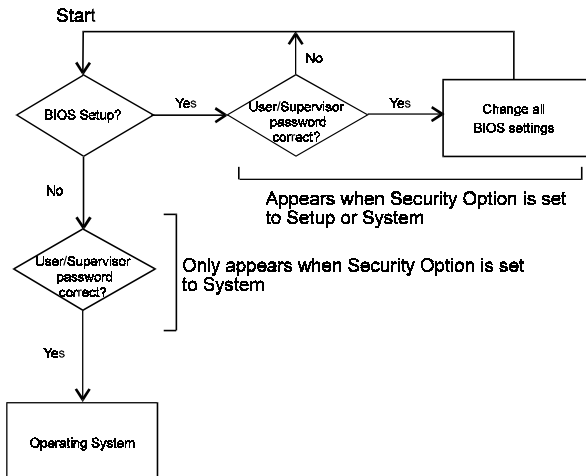
## *A. Set Either Supervisor Password or User Password*



**Figure 3-9 Set Either Supervisor or User Password**

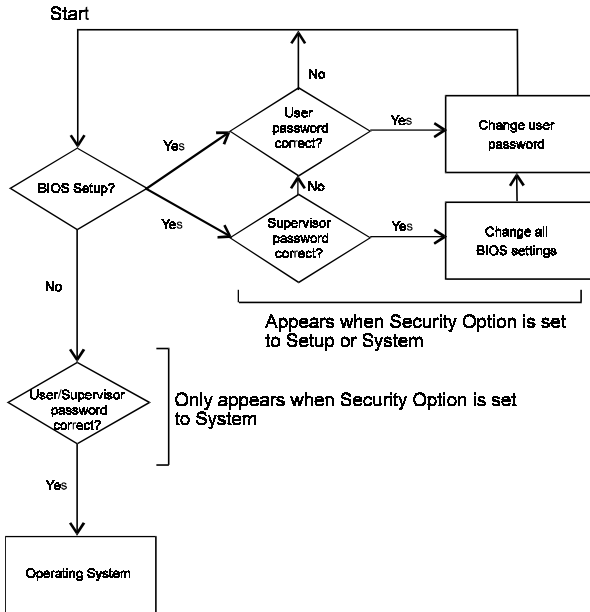## B. Set Both Supervisor Password and User Password



**Figure 3-10 Set Both Supervisor and User Password**

## 3-9 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.
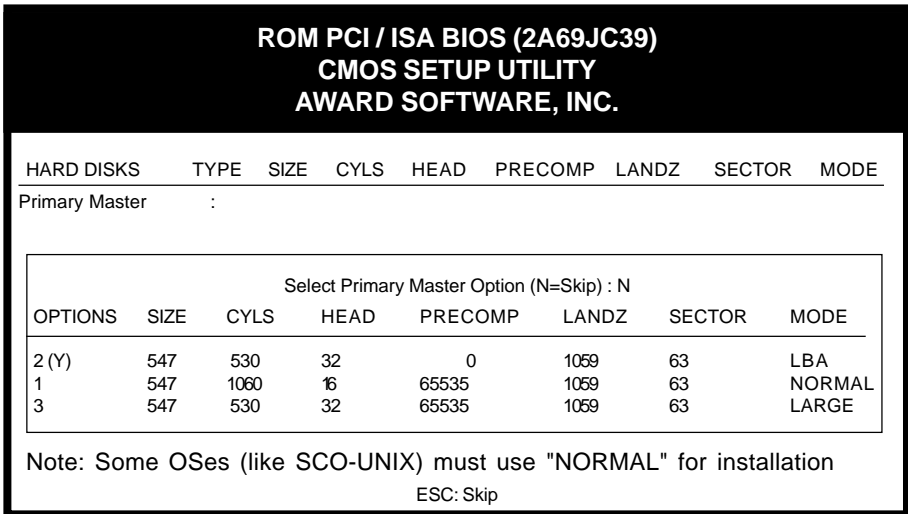
**ROM PCI / ISA BIOS (2A69JC39)**
**CMOS SETUP UTILITY**
**AWARD SOFTWARE, INC.**

| 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**

## 3-10 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.

## 3-11 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 ones.

# 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 files:

- Bus Master/PIO IDE Driver Installation
- Sound Driver and Utility 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

*Memo*

# Chapter 5

# ESS (ES1869) Audio Subsystem

## 5-1    Features

- **ESS** (ES1869) stereo audio controller

- 16 bit Full-Duplex Stereo *Audio***Drive** single chip PC audio solution

- Up to 44.1KHz programable sample rate for record and playback.

- Intergrated Spatializer 3D effects Processor.

- Advance power management meets ACPI standards.

- Built-in 20 voice music synthesizer, (OPL3  compatible)  MPU-401 compatible, MIDI UART and  7-channel mixer.


## 5-2    **Sound Driver and Utility** (See Chapter 4)

## 5-3    **CD-ROM Audio-in Connection** (See Chapter 2 Section 2-4)

# ✉ *Memo*

# 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*

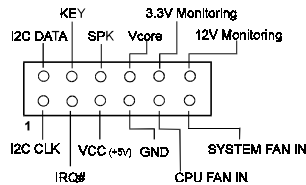# FAN78-*SMART* Technology Upgrade Kit



**FAN78**



**System Monitor Software for Win95**

The FAN78 upgrade kit provides a PC self-dialogistic capability called the *SMART* (System Monitoring and Alerting) technology.

**Features**
- Detects four on-board voltages (CPU Core Voltage, 3.3V, 5V, 12V)
- Two fan speed sensing
- One precise CPU temperature sensor and one chassis temperature sensor
- Four types of speaker-driver signal output
- Supports system monitor software and drivers for **LDCM™** utility V3.1
- EISCA v1.0 compliant

**FAN78 Connector**

# *Memo*