## Chapter 1

## INTRODUCTION

The MSI ATX TX5 mainboard is a high-performance personal computer mainboard. This mainboard supports Intel® Pentium® processor/Pentium® processor with MMX™ technology, Cyrix® 6x86/6x86L/6x86MX processor, and AMD® K5/K6 processor. The mainboard also supports four 32-bit PCI (Peripheral Component Interconnect) Local Bus standard slots.

The mainboard uses the highly integrated Intel® 83430TX chipset to support the PCI/ISA and Green standards, and to provide the Host/PCI bridge. The Intel® 82430TX chipset integrates all system control functions such as ACPI (Advanced Configuration and Power Interface). The ACPI provides more Energy Saving Features for the OSPM(OS Direct Power Management) function. The Intel® 82430TX chipset also improves the IDE transfer rate by supporting Ultra DMA/33 IDE that transfer data at the rate of 33MB/s.

The mainboard also supports the LM78 and LM75 Hardware Monitor Controller which are optional functions. The LM78 function includes: CPU chassis/power fan control, CPU temperature detect and protect, system voltage detect and chassis intrusion detect. The LM75 function includes: CPU overheat warning.

## 1.1 Mainboard Features

### CPU
- Socket 7 supports Intel® Pentium® processor /Pentium® processor   w/ MMX™ technolgy.
- The Cyrix® 6x86/6x86L/6x86MX and AMD® K5/K6 processor are also supported.

### Chipset
- Intel® 82430 TX chipset.

### Cache Memory
- Supports 512K  pipelined burst cache memory.
- Supports Direct Map Organization and Write-Back cache policy.

### Main Memory
- Supports five memory banks using two 72-pin SIMM sockets and three 168-pin DIMM sockets (for unbuffered DIMM).
- Up to 256 Mbytes main memory.
- Supports EDO Hyper Page Mode DRAM, Standard Fast Page mode DRAM and SDRAM(Synchronous DRAM).

### Slots
- Four 32-bit PCI Bus slots (four 32-bit bus master PCI slots  + four 16-bit ISA bus slots). One shared slot can be used as ISA or PCI.

### On-Board IDE
- Supports Bus Master and Ultra DMA/33 IDE.
- Supports up to 4 IDE drives.

### On-Board Peripherals
- On-Board Peripherals include:
    - 1 floppy port supports 2 FDD
    - 2 serial ports (COMA + COMB)
    - 1 parallel port supports ECP or EPP mode
    - USB Ports
    - IR (reserved)

## Dimensions
- Standard ATX form factor
- 30cm(L) x 18.6cm(W) x 4 layer PCB
- Double deck I/O connectors, compatibles with Intel® Venus mainboard

## Mounting
- 6 mounting holes

## LM78 System Hardware Monitor(optional)
- CPU fan Rotation Speed Control
- CPU Fan Control/Power Fan Control (the fan will automatically stop when the system enters suspend mode)
- System Voltage Detect
- CPU Overheat Warning (reserved)
- Chassis Intrusion Detect(reserved)
- Display Actual Current Voltage

## Other Features
- Poly Fuse used by keyboard and USB devices
- Keyboard password wake up system(reserved)
- CPU Vcore voltage protect
- Meets ACPI specifications
- Power ON/OFF switch connector on board
- Soft Power-Off
- Ring Wake-Up
- Alarm Wake-Up

## 1.2 Parts of the Mainboard
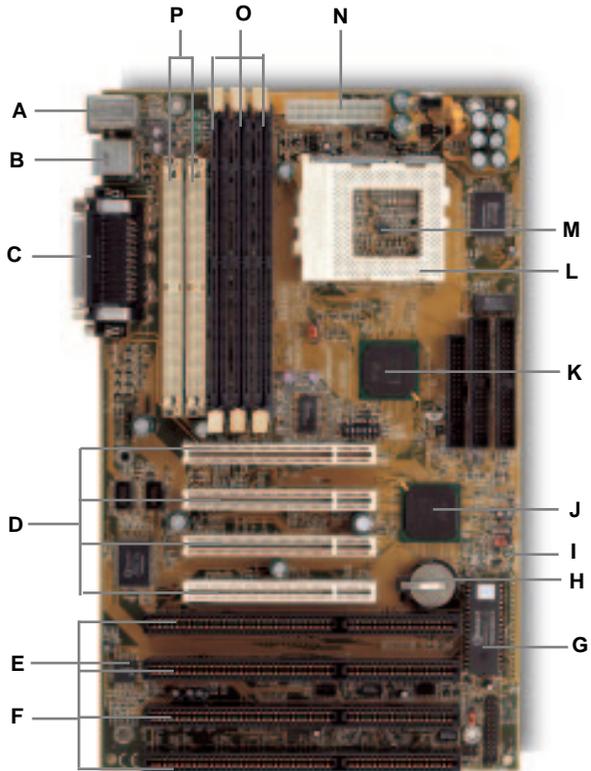
| | | |
|---|---|---|
| **A** | **PS/2 Ports** | **Top: Mouse** |
| | | **Bottom: Keyboard** |
| **B** | **USB Ports** | **Top: Port 1** |
| | | **Bottom: Port 2** |
| **C** | **COM/LPT Ports** | **Top: Parallel Port** |
| | | **Bottom: Two Serial Ports** |
| **D** | **Four 32-Bit PCI SLOTs** | |
| **E** | **LM78** | |
| **F** | **Four 16-Bit ISA SLOTs** | |
| **G** | **Flash BIOS** | |
| **H** | **Coin Type Battery** | |
| **I** | **Chassis Intrusion Sensor** | |
| **J** | **Intel® 82371AB (PIIX 4) chipset** | |
| **K** | **Intel® 82489TX chipset** | |
| **L** | **CPU Socket 7** | |
| **M** | **LM75** | |
| **N** | **ATX 20-Pin Power Connector** | |
| **O** | **Three 168-PIN DIMM SOCKETs** | |
| **P** | **Two 72-PIN SIMM SOCKETs** | |

# 1.3 Mainboard Layout
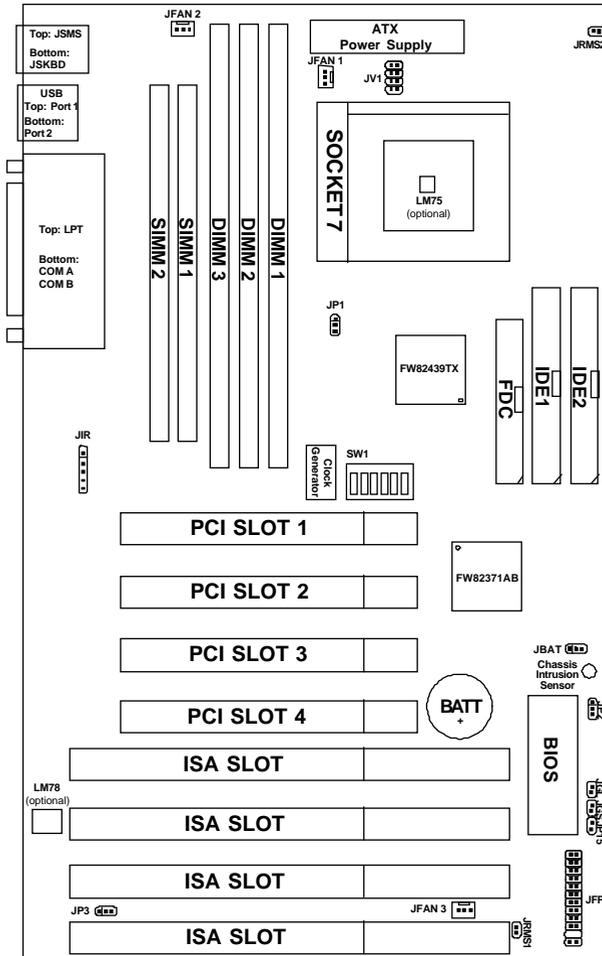
## MS-5158

## Chapter 2

## HARDWARE INSTALLATION

## 2.1 Central Processing Unit: CPU

The **MSI ATX TX5** mainboard operates with **Intel® Pentium® processor/ Pentium® processor with MMX™ technology**, **Cyrix® 6x86/6x86L/ 6x86MX** and **AMD® K5/K6** processors**.** It could operate with 2.1V to 3.5V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW1) to set the proper speed for the CPU and a Jumper block (JV1) for setting the CPU voltage. The CPU should always have a cooling fan attached to prevent overheating.

### 2.1-1 CPU Installation Procedures

1. Pull the lever sideways away from the socket. Then raise the lever up to a 90-degree angle.

2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.

3. Press the lever down to complete the installation.
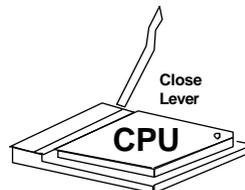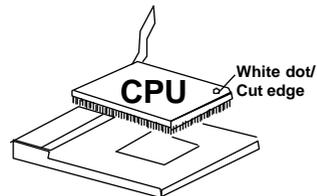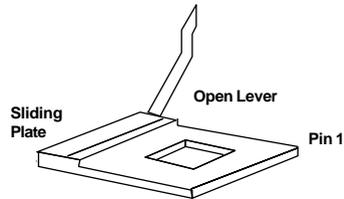
### 2.1-2  CPU Core Speed Derivation Procedure

The mainboard uses two kind of Clock generator:  ICS9148-04 and IMI643. These two clock generator have different clock frequency.

1. The DIP Switch SW1 (4, 5, and 6) is used to adjust the CPU clock frequency.

#### A.  Clock Generator:  ICS9148-04

| SW1 | | | CPU |
|-----|-----|-----|-----|
| **4** | **5** | **6** | **Clock** |
| ON | ON | ON | 50MHz |
| ON | OFF | OFF | 60MHz |
| OFF | OFF | OFF | 66.6MHz |
| OFF | ON | OFF | 75MHz |
| ON | OFF | ON | 83MHz |

#### B.  Clock Generator:  IMI643

| SW1 | | | CPU |
|-----|-----|-----|-----|
| **4** | **5** | **6** | **Clock** |
| OFF | OFF | ON | 50MHz |
| ON | ON | OFF | 55MHz |
| ON | OFF | OFF | 60MHz |
| OFF | OFF | OFF | 66.8MHz |
| OFF | ON | OFF | 75MHz |
| ON | ON | ON | 83MHz |

2. The DIP Switch SW1 (1, 2, and 3) is used to set the Core/Bus (Fraction) ratio of the CPU. The actual core speed of the CPU is the Host Clock Frequency multiplied by the Core/Bus ratio. For example:

| | | | |
|---|---|---|---|
| **If** | CPU Clock | = | 66MHz |
| | Core/Bus ratio | = | 3/2 |
| **then** | CPU core speed | = | Host Clock x Core/Bus ratio |
| | | = | 66MHz x 3/2 |
| | | = | 100MHz |

| SW1 | | | CPU |
|---|---|---|---|
| **1** | **2** | **3** | **Core/Bus Ratio** |
| OFF | OFF | OFF | 1.5 /3.5 |
| ON | OFF | OFF | 2 |
| ON | ON | OFF | 2.5 |
| OFF | ON | OFF | 3 |
| ON | OFF | ON | 4 |
| ON | ON | ON | 4.5 |

3. The PCI Bus Clock is the CPU Clock Frequency divided by 2.

## 2.1-3 CPU Voltage Setting: JV1
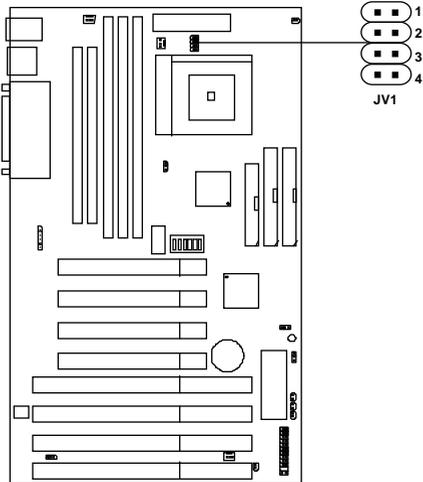


| V I/O | Vcore | JV1 |
|-------|-------|-----|
| 3.5 | 3.5 |  |
| 3.3 | 3.3 |  |
| 3.3 | 3.2 |  |
| 3.3 | 2.9 |  |

| V I/O | Vcore | JV1 |
|-------|-------|-----|
| 3.3 | 2.8 | 1<br>2<br>3<br>4 |
| 3.3 | 2.5 | 1<br>2<br>3<br>4 |
| 3.3 | 2.4 | 1<br>2<br>3<br>4 |
| 3.3 | 2.3 | 1<br>2<br>3<br>4 |
| 3.3 | 2.2 | 1<br>2<br>3<br>4 |
| 3.3 | 2.1 | 1<br>2<br>3<br>4 |
| 3.3 | 2.0 | 1<br>2<br>3<br>4 |

## 2.1-4  CPU Speed and Voltage Setting:  SW1 & JV1

To adjust the speed and voltage of  the CPU, you must know the specifica-
tions of your CPU (*always ask the vendor for CPU specifications*). This
mainboard uses two different Clock Generator, so before adjusting SW1,
check your clock generator.   Then refer to **Table 2.1 (Intel® Pentium®
processor/Pentium® processor with MMX™ technology)**, **Table 2.2
(Cyrix® 6x86/6x86L/6x86MX processor)** and **Table 2.3 (AMD® K5/K6
processor)** for proper setting.
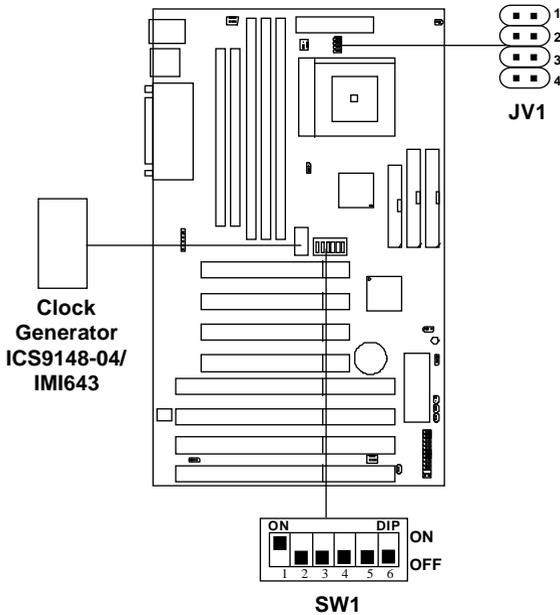


**Note:**  The table provided can be used by both clock generator. The only
difference with the **ICS9148-04** and **IMI643** Clock Generator is the
CPU clock frequency of 50, 55, 83 MHz.  Since these 3 frequencies
are not supported by the current CPUs, so the jumper settings for
both regulator are the same.

### Table 2.1 Intel® Processor

**a. Intel® Pentium® Processor**

| CPU Type | CPU Voltage | | | CPU Speed |
|---|---|---|---|---|
| | VI/O | Vcore | JV1 | SW1 |
| 90MHz | | | | |
| 100MHz | | | | |
| 120MHz | 3.38/3.52 | | | |
| 133MHz | | | | |
| 150MHz | | | | |
| 166MHz | | | | |
| 200MHz | | | | |

**b. Intel® Pentium® Processor with MMX™ Technology**

| 166MHz | | | | |
|---|---|---|---|---|
| 200MHz | 3.3 | 2.8 | | |
| 233MHz | | | | |
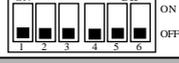
**Note:** If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

## Table 2.2 Cyrix® Processor

Cyrix® processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed. For example PR150 (120MHz) has 150MHz core speed of Intel® Pentium® processor but has 120MHz core speed in Cyrix® processor. Cyrix® processor should always uses a more powerful fan (ask vendor for proper cooling fan).

### a. Cyrix® 6x86/6x86L Processor

| CPU Type | CPU Voltage | | | CPU Speed |
|---|---|---|---|---|
| | VI/O | Vcore | JV1 | SW1 |
| 6x86 PR150 | 3.5 | | |  |
| 6x86 PR166 | | | |  |
| 6x86L PR166 | 3.3 | 2.8 | | |
| 6x86 PR200 | 3.5 | | |  |
| 6x86L PR200 | 3.3 | 2.8 | | |
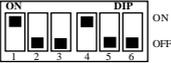
**b. Cyrix® 6x86MX Processor**

| CPU Type | CPU Voltage | | | | CPU Speed |
|---|---|---|---|---|---|
| | VI/O | Vcore | JV1 | | SW1 |
| 6x86MX PR166 | 3.3 | 2.9 | | 60 x 2.5 | |
| 6x86MX PR200 | | | | 66 x 2.5 | |
| 6x86MX PR233 | | | | 75 x 2.5 | |
| | | | | 66 x 3 | |
| 6x86MX PR266 | | | | 75 x 3 | |
| | | | | 66 x 3.5 | |
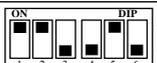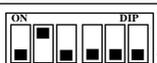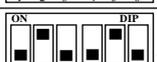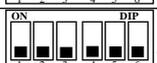
**Note:** If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

## Table 2.3 AMD® Processor

AMD® K5/K6 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed . For example PR133(100MHz) has 133MHz core speed of Intel® Pentium® processor but has 100MHz core speed in AMD® K5 processor.

### a. AMD® K5 Processor

| CPU Type | CPU Voltage | | | CPU Speed |
|---|---|---|---|---|
| | VI/O | Vcore | JV1 | SW1 |
| PR90 | 3.52 | | | (DIP switch) |
| PR100 | | | | (DIP switch) |
| PR120 | | | (JV1 1-2-3-4) | (DIP switch) |
| PR133/PR150 | | | | (DIP switch) |
| PR166 | | | | (DIP switch) |

### b. AMD® K6 Processor

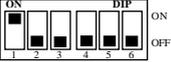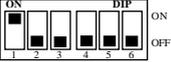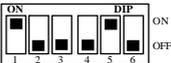| PR166 | 3.3 | 2.9 | (JV1 1-2-3-4) | (DIP switch) |
|---|---|---|---|---|
| PR200 | | | | (DIP switch) |
| PR233 | 3.3 | 3.2 | (JV1 1-2-3-4) | (DIP switch) |

**Note:** If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

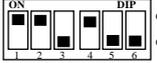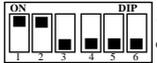## 2.1-5 CPU Fan Power Connector:  JFAN1 / JFAN2 & JFAN3 (Reserved)

These connectors support system cooling fan with +12V.  It supports three pin head connector.   When connecting  the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND.  If your mainboard has LM78 on board, you need to use a specially designed fan with speed sensor to take advantage of LM78's CPU fan control function.



JFAN1:  CPU FAN
JFAN2:  POWER FAN
JFAN3:  CHASSIS FAN
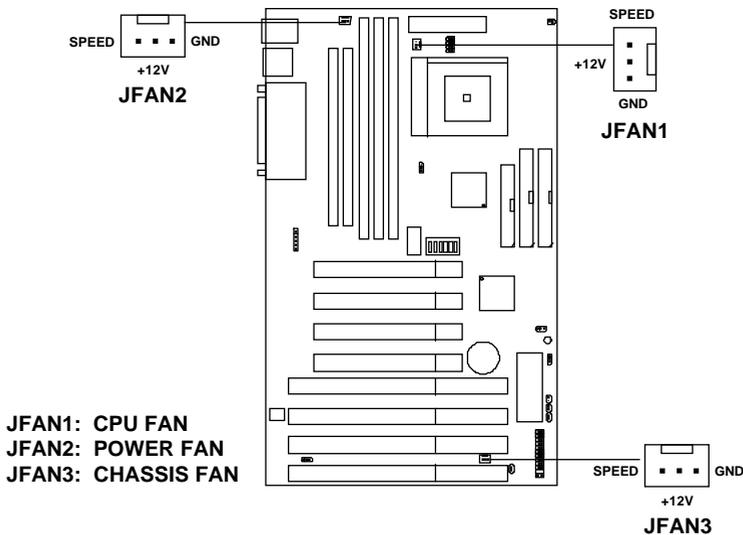
For fans with fan speed sensor, every rotation of the fan will send out 2 pulses.  LM78 will count and report the fan rotation speed.

**Note:  1. JFAN2 & JFAN3** are the Power and Chassis Cooling Fan Speed Connectors (reserved for LM78 System Hardware Monitor Option.)
**2.** Always consult vendor for proper CPU cooling fan.

## 2.2  BIOS Reflash Boot Block Feature:  JP2

This jumper is for setting the  Flash ROM BIOS.



JP2
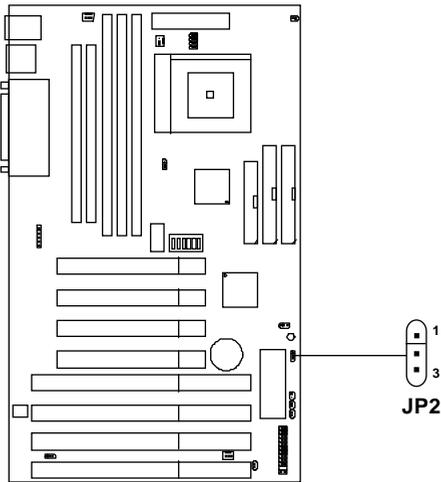
**JP2**

**PNP Setting**
**(cannot update new BIOS)**

**JP2**
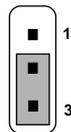
**Update NEW BIOS**

## 2.3  Internal Modem Ring Wake-up Connector: JP3

The JP3 connector is used for special internal modem that has 3 pins  that support the ring power on function.  The 3 pins of the internal modem should have the same pin definition with JP3.



**JP3**
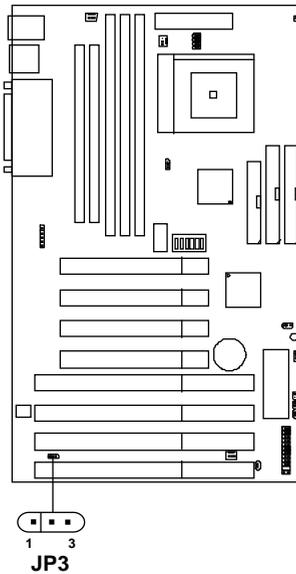
| Pin 1: | Standby 5V |
|--------|------------|
| Pin 2: | Ring Single Input |
| Pin 3: | Ground |

## 2.4 Battery Connector: JBAT

A battery must be used to retain the mainboard configuration in CMOS RAM.  To retain the on-board battery you must always short pins 1,2 of JBAT.
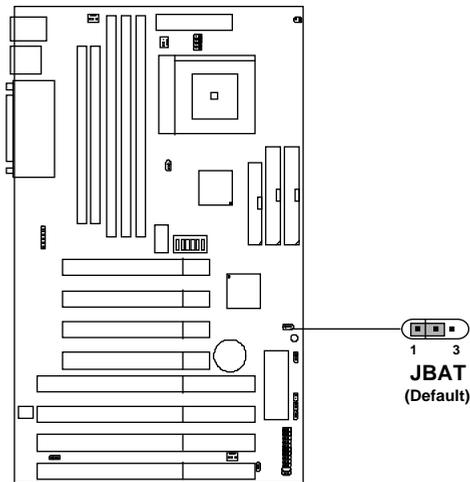


**Note:**      You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position.  Avoid clearing the CMOS while the system is on , it will damage the mainboard.

## 2.5  Power Saving Switch Connector:  JGS/ Power Saving LED Connector:  JGL

Attach a power saving switch to JGS.  When the switch is pressed, the system immediately goes into suspend mode.  Press any key and the system wakes up. JGL can be connected with LED to monitor the JGS. This will lit while the system is in suspend mode.
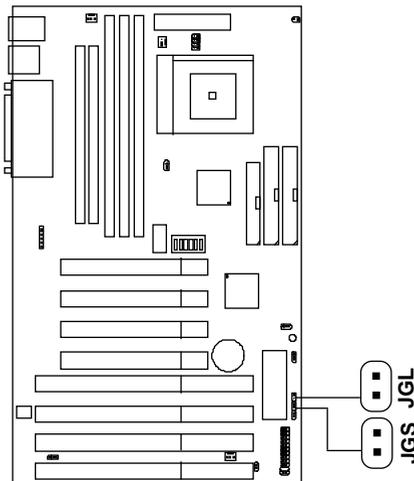
**Note:** To make JGS function, you must go to the BIOS power management and enable it there.

## 2.6  Memory Installation

### 2.6-1  Memory Bank Configuration

The mainboard provides two 72-pin SIMMs (Single In-Line Memory Module) and three 168-pin DIMM(Double In-Line Memory) sockets.  It supports five memory banks for a  maximum of 256MB memory.  You can use SIMM from 4MB, 8MB, 16MB, 32MB, 64MB to128MB, and DIMM from 8MB, 16MB, 32MB, 64MB, 128MB to 256MB.
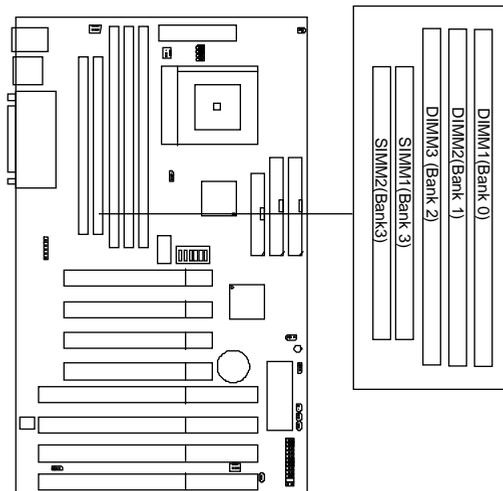
## 2.6-2 Memory Installation Procedures:

### A. How to install SIMM Module



**Notched End**

**Single Sided SIMM**



**Double Sided SIMM**
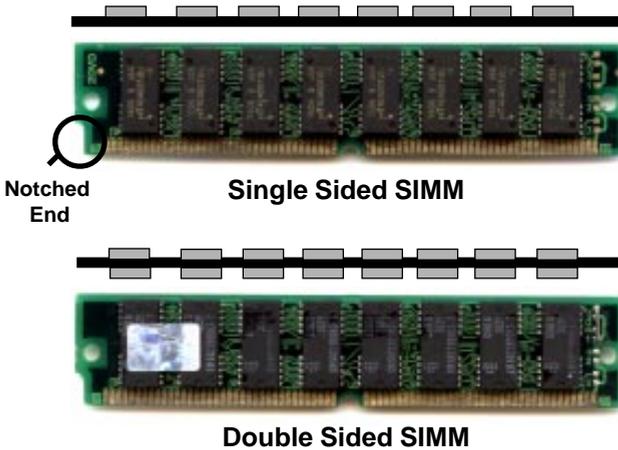
1. The SIMM slot has a "*Plastic Safety Tab*" and the SIMM memory module has a "Notched End", so the SIMM memory module can only fit in one direction.

2. Insert the SIMM memory modules into the socket at 45-degree angle. Then, push into a vertical position so that it will snap into place.

3. The Mounting Holes and Metal Clips should fit over the edge and hold the SIMM memory modules in place.
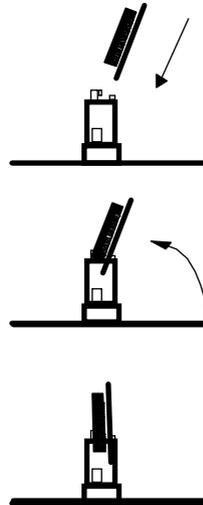
**B. How to install DIMM Module**
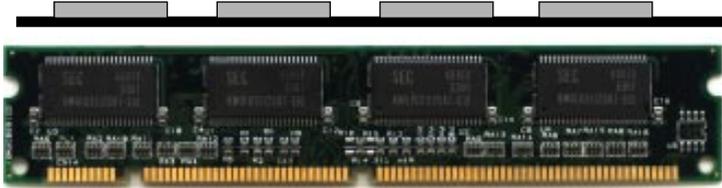


**Single Sided DIMM**
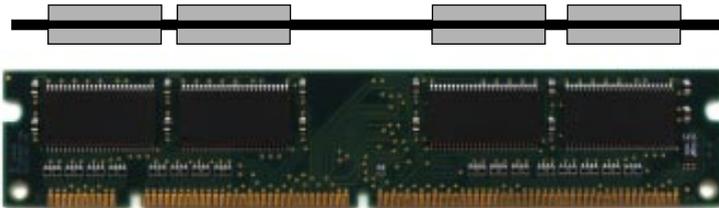


**Double Sided DIMM**

1. The DIMM slot has two keys marked "VOLT and DRAM" , so the DIMM memory module can only fit in one direction.

2. Insert the DIMM memory module vertically into the DIMM slot. Then, push  it in.



DRAM            VOLT
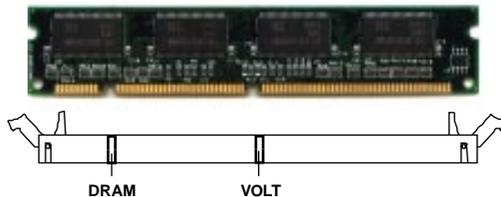
3. Close the plastic clip at the side of the DIMM slot.

## 2.6-3  Memory Population Rules

1. Make sure that the SIMM banks are using the same type and equal size density memory.

2. To operate properly, at least two 72-pin SIMM module must be installed in the same bank or one 168-pin DIMM module must be installed.  The system cannot operate with only one 72-pin SIMM module.

3. Before using SIMM and DIMM modules, look at the chart below and the chart on the next page.

A.  32MB SDRAM Configuration

| DIMM1 | DIMM2 | DIMM3 | SIMM1/SIMM2 |
|-------|-------|-------|-------------|
| D/S | D/S | D | N |
| D/S | D/S | S | S |
| D/S | D/S | N | D/S |

B.  64MB SDRAM Configuration

| DIMM1 | DIMM2 | DIMM3 | SIMM1/SIMM2 |
|-------|-------|-------|-------------|
| D/S | D/S | N | N |

**D-Double          S-Single          N-None**

4. Each RAS can not exceed 16 pcs of DRAM.

5. It is not recommended to mix 3V SDRAM with 5V EDO/FP, for it may cause unreliability.

**Table 2.6-1      Minimum (upgradeable) and Maximum
Memory Size for each configuration for SIMM**

| DRAM Tech. | DRAM Density & Width | DRAM Addressing | Address Size | | MB/SIMM | |
|---|---|---|---|---|---|---|
| | | | Row | Column | Single no. Side(S) pcs. | Double no. Side(D) pcs. |
| 4M | 1Mx4 | SYMM | 10 | 10 | 4MBx8 | 8MBx16 |
| 16M | 1Mx16 | SYMM | 10 | 10 | 4MBx2 | 8MBx4 |
| | 1Mx16 | ASYM | 12 | 8 | 4MBx2 | 8MBx4 |
| | 2Mx8 | ASYM | 11 | 10 | 8MBx4 | 16MBx8 |
| | 4Mx4 | SYMM | 11 | 11 | 16MBx8 | 32MBx16 |
| | 4Mx4 | ASYM | 12 | 10 | 16MBx8 | 32MBx16 |
| 64M | 2Mx32 | ASYM | 12 | 9 | 8MBx1 | 16MBx2 |
| | 4Mx16 | SYMM | 11 | 11 | 16MBx2 | 32MBx4 |
| | 4Mx16 | ASYM | 12 | 10 | 16MBx2 | 32MBx4 |
| | 8Mx8 | ASYM | 12 | 11 | 32MBx4 | 64MBx8 |
| | 16Mx4 | SYMM | 12 | 12 | 64MBx8 | 128MBx16 |

**Table 2.6-2      Minimum (upgradeable) and Maximum
Memory Size for each configuration for DIMM**

| DRAM Tech. | DRAM Density & Width | DRAM Addressing | Address Size | | MB/DIMM | |
|---|---|---|---|---|---|---|
| | | | Row | Column | Single no. Side(S) pcs. | Double no. Side(D) pcs. |
| 16M | 1Mx16 | ASYM | 12 | 8 | 8MBx4 | 16MBx8 |
| | 2Mx8 | ASYM | 12 | 9 | 16MBx8 | 32MBx16 |
| | 4Mx4 | ASYM | 12 | 10 | 32MB | 64MB |
| 64M | 2Mx32 | ASYM | 12 | 10 | 32MBx2 | 64MBx4 |
| | 2Mx32 | ASYM | 13 | 8 | 16MBx2 | 32MBx4 |
| | 4Mx16 | ASYM | 14 | 8 | 32MB | 64MB |
| | 8Mx8 | ASYM | 14 | 9 | 64MB | 128MB |
| | 16Mx4 | ASYM | 14 | 10 | 128MB | 256MB |

## 2.7 Case Connector: JFP

The Turbo LED, Hardware Reset, Key Lock, Power LED, Power Saving LED, Sleep Switch, Speaker and HDD LED are all grouped in JFP connector block for easy installation.
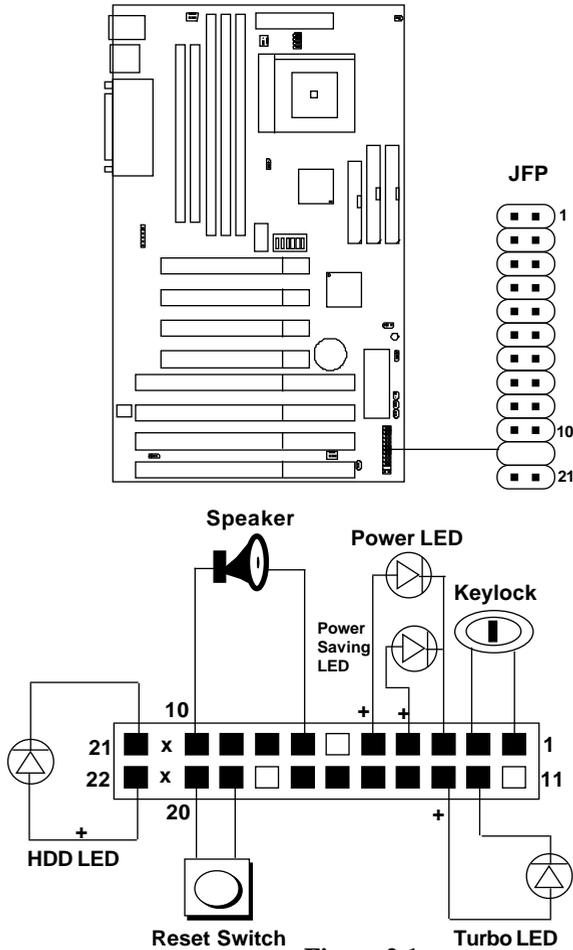


**Figure 2.1**

### 2.7-1 Turbo LED

This mainboard is always on Turbo speed. Connecting a Turbo LED will just lit the LED. (See Figure 2.1)

### 2.7-2  Hardware Reset

Reset switch are used to reboot the system rather than turning the power ON/OFF.  Avoid rebooting the system when the HDD LED is lit.  You can connect the Reset switch from the system case to this pin. (See Figure 2.1)

### 2.7-3  Keylock

Keylock allows you to disable the keyboard for security purposes.  You can connect the keylock to this pin. (See Figure 2.1)

### 2.7-4  Power LED

The Power LED is always lit while the system power is on.  You can connect the Power LED from the system case to this pin. (See Figure 2.1)

### 2.7-5  Speaker

Speaker from the system case are connected to this pin. (See Figure 2.1)

### 2.7-6  HDD LED

HDD LED shows the activity of a hard disk drive.  Avoid turning the power off while the HDD led is lit.  You can connect the HDD LED from the system case to this pin. (See Figure 2.1).

## 2.8  Floppy Disk Connector:  FDC

The mainboard also provides a standard floppy disk connector, FDC that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.  You can attach a floppy disk cable directly to this connector.
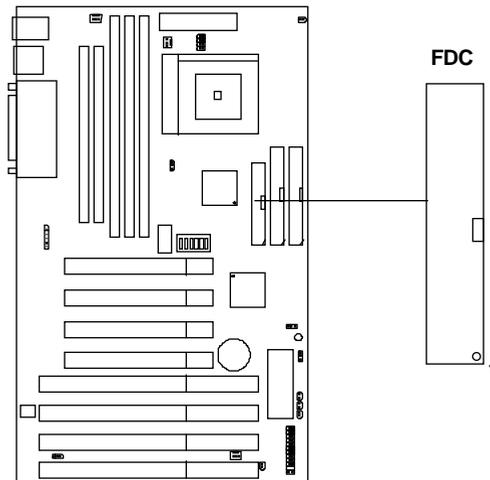
## 2.9  Hard Disk Connectors:  IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides for two HDD connectors IDE1 (primary) and IDE2 (secondary).  You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices  to IDE1 and IDE2.
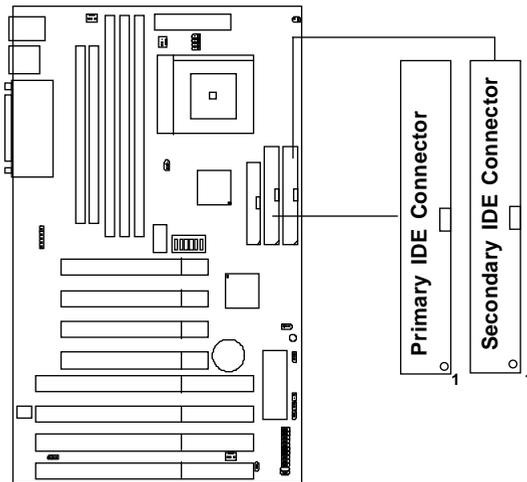


**IDE1**(primary IDE connector)

   The first hard disk should always be connected to IDE1.  IDE1 can connect a Master and a Slave drive.

**IDE2**(secondary IDE connector)

   IDE2 can connect a Master and a Slave drive.

## 2.10  ATX 20-pin Power Connector:  JWR1

This type of connector already supports the remote ON/OFF function. However, you need to connect the **Remote Power On/OFF switch (JRMS1 or JRMS2)**.



**ATX
Power Connector**
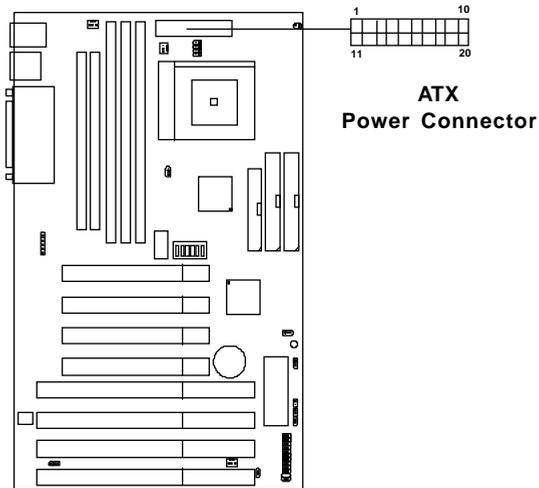
## ATX Power Connector Pin Description

| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |
|----|----|----|----|----|----|----|----|----|----|
| 5V | 5V | -5V | GND | GND | GND | PS_ON | GND | -12V | 3.3V |
| 12V | 5V_SB | PW_OK | GND | 5V | GND | 5V | GND | 3.3V | 3.3V |
| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

## 2.11  Remote Power On/Off Switch:  JRMS1/JRMS2

Connect to a 2-pin push button switch to JRMS1 or JRMS2.  Every time the switch is shorted by pushing it once, the power supply will change its status from OFF to ON.  During ON stage: push once and the system goes to sleep mode, push it more than 4 seconds will change its status from ON to OFF. This is used for ATX type power supply.  You can program this through BIOS.  Refer to Soft-Off by PWR-BTTN in BIOS.
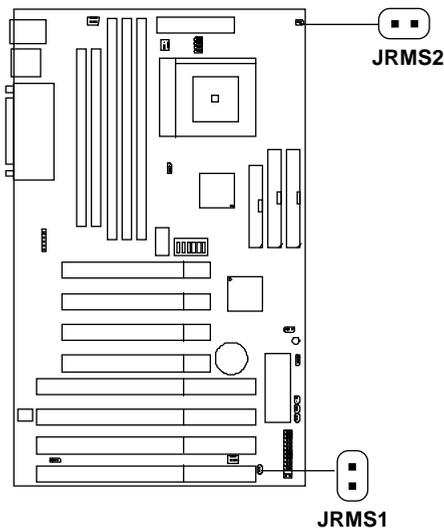
## 2.12  Infrared Module Connector:  JIR

The mainboard provides a 5-pin infrared connector(IR) for IR module or 2 x 5-pin module (use only for W83977ATF).  This connector is for optional wireless transmitting and receiving infrared module.  If you want to use this function, you must configure the setting through BIOS setup.
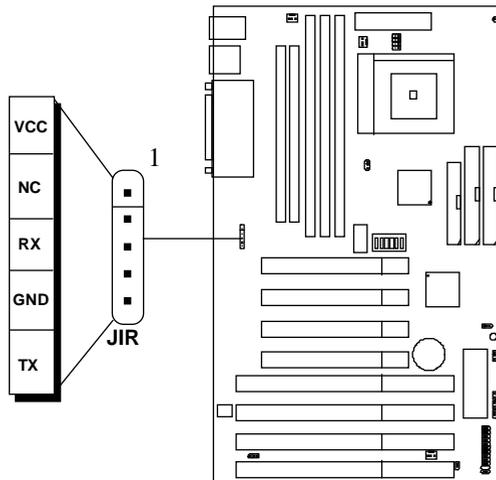


**Reserved for W83977ATF**
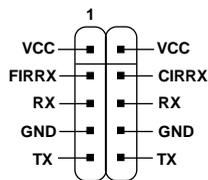
## 2.13 Serial Port Connectors:  COM A & COM B

The mainboard has two serial ports COMA and COMB.  These two ports are 16550A  high speed communication ports that send/receive 16 bytes FIFOs.  You can attach a mouse or a modem cable directly into these connectors.



**COM A          COM B**
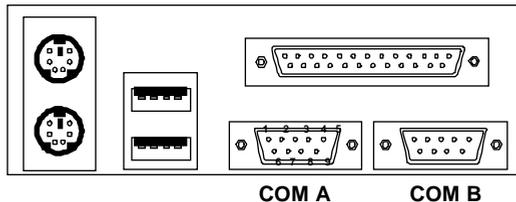
**Serial Ports (9-pin Male)**

## PIN  DEFINITION

| Pin # | Definition |
|:---:|:---|
| 1 | **DCD**(Data Carry Detect) |
| 2 | **SIN**(Serial In or Receive Data) |
| 3 | **SOUT**(Serial Out or Transmit Data) |
| 4 | **DTR**(Data Terminal Ready) |
| 5 | **GND** |
| 6 | **DSR**(Data Set Ready) |
| 7 | **RTS**(Request To Send) |
| 8 | **CTS**(Clear To Send) |
| 9 | **RI**(Ring Indicate) |

## 2.14  Parallel Port Connector: LPT

The mainboard provides a connector for LPT.  A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended capabilities Parallel Port(ECP).

**Parallel Port (25-pin Female)**
**LPT**
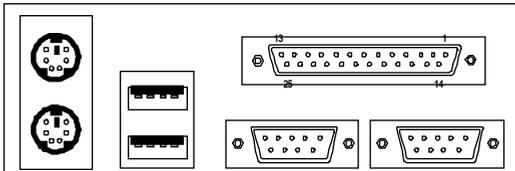


# PIN  DEFINITION

| PIN # | DEFINITION | PIN # | DEFINITION |
|-------|------------|-------|------------|
| 1 | STROBE | 14 | AUTO FEED# |
| 2 | DATA0 | 15 | ERR# |
| 3 | DATA1 | 16 | INIT# |
| 4 | DATA2 | 17 | SLIN# |
| 5 | DATA3 | 18 | GND |
| 6 | DATA4 | 19 | GND |
| 7 | DATA5 | 20 | GND |
| 8 | DATA6 | 21 | GND |
| 9 | DATA7 | 22 | GND |
| 10 | ACK# | 23 | GND |
| 11 | BUSY | 24 | GND |
| 12 | PE | 25 | GND |
| 13 | SELECT | | |

## 2.15  Keyboard Connector:  PSKBC
##        Mouse Connector:  PSMSC

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a keyboard.  You can plug a keyboard cable directly to this connector.

It also provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse.  You can plug a PS/2® mouse directly into this connector. The connector location and are shown below:

**PS/2® Mouse (6-pin Female)**
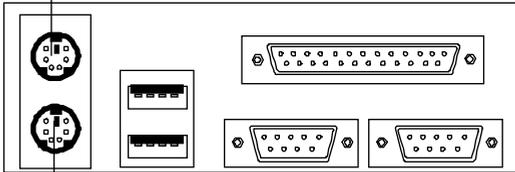


**PS/2® Keyboard (6-pin Female)**

## 2.16  USB Connectors:  USB

The mainboard provide **USB(Universal Serial Bus)** connectors for attaching USB devices like keyboard, mouse or etc. You can plug it directly to this connector.

**USB port 1**
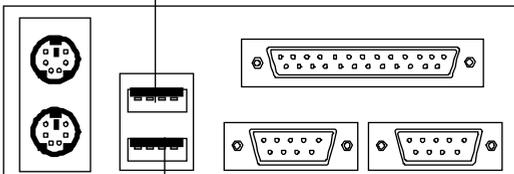


**USB port 2**

## 2.17  Instant-On Jumper:  JP15

When JP15 is open, if you plug the power cord of your system  into a
power outlet.  The system will automatically power on.  But when JP3 is
shorted, then this function will not work.
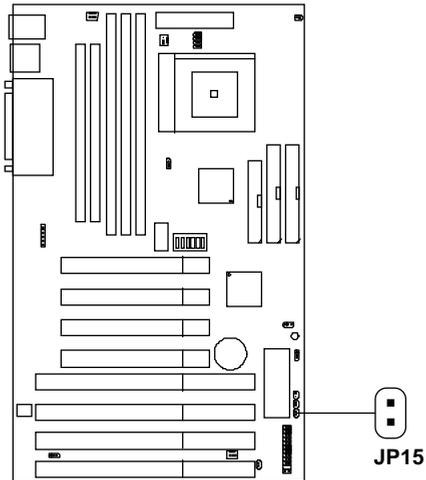


**JP15**

| FUNCTION | JP15 |
|----------|------|
| Instant-On | |
| Standard | |

## Chapter 3

## AWARD® BIOS SETUP

Award® BIOS ROM has a built-in Setup program that allows users to modify
the basic system configuration.  This type of information is stored in
battery-backed RAM (CMOS RAM), so that it retains the Setup information
when the power is turned off.

## 3.1 Entering Setup

Power on the computer and press <Del> or <Ctrl><Alt><Esc> keys immediately to allow you to enter Setup.

TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC>
OR <DEL> KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC>
OR <DEL> TO ENTER SETUP

## 3.2 Getting Help

**Main Menu**

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

**Status Page Setup Menu/Option Page Setup Menu**

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <F1> or <Esc>.

## 3.3 The Main Menu

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from eleven setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
           ROM  PCI/ISA  BIOS  (2A59IM4C)
                CMOS  SETUP  UTILITY
              AWARD  SOFTWARE,  INC.

  ┌─────────────────────────────────────────────────────┐
  │                          │                          │
  │  STANDARD  CMOS  SETUP   │  SPECIAL  FEATURES  SETUP │
  │                          │                          │
  │  BIOS  FEATURES  SETUP   │  INTEGRATED  PERIPHERALS  │
  │                          │                          │
  │  CHIPSET  FEATURES  SETUP│  SUPERVISOR  PASSWORD     │
  │                          │                          │
  │  POWER  MANAGEMENT  SETUP│  USER  PASSWORD           │
  │                          │                          │
  │  PNP/PCI  CONFIGURATION  │  IDE  HDD  AUTO  DETECTION│
  │                          │                          │
  │  LOAD  SETUP  DEFAULTS   │  SAVE  &  EXIT  SETUP     │
  │                          │                          │
  │                          │  EXIT  WITHOUT  SAVING    │
  ├──────────────────────────┴──────────────────────────┤
  │  Esc : Quit              ↑↓→←     : Select Item     │
  │  F10 : Save & Exit Setup  (Shift)F2 : Change Color  │
  ├─────────────────────────────────────────────────────┤
  │                                                     │
  │         Time,  Date,  Hard  Disk  Type...           │
  │                                                     │
  └─────────────────────────────────────────────────────┘
```

### Standard CMOS Setup
This setup page includes all the items in a standard compatible BIOS.

### BIOS Features Setup
This setup page includes all the items of Award® special enhanced features.

## Chipset Features Setup

This setup page includes all the items of chipset special features.

## Power Management Setup

This category determines the power consumption for system after setting the specified items. Default value is Disable.

## PCI Configuration Setup

This category specifies the IRQ level for PCI and ISA devices.

## Supervisor Password/User Password

Change, set or disable password. This function allows the user access to the system and setup or just setup.

## Load Setup Defaults

Chipset defaults indicates the values required by the system for the maximum performance.

## Special Features Setup

This function is reserved for LM78 system hardware monitor function.

## IDE HDD Auto Detection

Automatically configure hard disk parameters.

## Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

## Exit Without Saving

Abandon all CMOS value changes and exit setup.

## 3.4 Standard CMOS Setup

        The items in Standard CMOS Setup Menu are divided into 10
categories.  Each category includes no, one or more than one setup items.
Use the arrow keys to highlight the item and then use the <PgUp> or
<PgDn> keys to select the value you want in each item.

```
                   ROM  PCI/ISA  BIOS  (2A59IM4A)
                       STANDARD  CMOS  SETUP
                       AWARD  SOFTWARE,  INC.
 ┌─────────────────────────────────────────────────────────────────────┐
 │ Date(mm:dd:yy): Fri, Feb 28,1997                                      │
 │ Time(hh:mm:ss): 00:00:00                                             │
 │                                                                       │
 │   HARD DISKS      TYPE SIZE CYLS HEADS PRECOMP LANDZONE  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,3.5in.  ┌─────────────────────────────────────┐     │
 │ Drive  B : None          │ Base  Memory:              640K      │     │
 │                          │  Extended  Base  Memory:15360K       │     │
 │                          │   Other  Memory:           384K      │     │
 │ Video    : EGA/VGA       ├─────────────────────────────────────┤     │
 │ Halt  On : All, but Keyboard│ Total  Memory:         16384K     │     │
 │                          └─────────────────────────────────────┘     │
 │                                                                       │
 │ ESC : Quit      ↑↓→←  : Select Item    PU/PD/+/- : Modify            │
 │ F1  : Help      (Shift)F2 : Change Color                             │
 └─────────────────────────────────────────────────────────────────────┘
```

## Date

The date format is <day><month> <date> <year>.

| | |
|---|---|
| **Day** | Day of the week, from Sun to Sat, determined by BIOS. Read-only. |
| **month** | The month from Jan. through Dec. |
| **date** | The date from 1 to 31 can be keyed by numeric function keys. |
| **year** | The year, depends on the year of the BIOS |

## Time

The time format is <hour> <minute> <second>.

## PrimaryMaster/PrimarySlave
## SecondaryMaster/Secondary Slave

These categories identify the types of 2 channels that have been installed in the computer. There are 45 pre-defined types and 4 user definable types for Enhanced IDE BIOS. Type 1 to Type 45 are pre-defined. Type User is user-definable.

Press PgUp/<+> or PgDn/<-> to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be
"Type 1".
If the controller of HDD interface is SCSI, the selection shall be
"None".
If the controller of HDD interface is CD-ROM, the selection shall be
"None".

| | |
|---|---|
| **CYLS**. | number of cylinders |
| **HEADS** | number of heads |
| **PRECOMP** | write precom |
| **LANDZONE** | landing zone |
| **SECTORS** | number of sectors |
| **MODE HDD** | access mode |

## 3.5 BIOS Features Setup

```
                    ROM PCI/ISA BIOS (2A59IM4A)
                        BIOS FEATURES SETUP
                        AWARD SOFTWARE, INC.

┌─────────────────────────────────────┬──────────────────────────────────┐
│ Virus Warning          : Disabled   │ Video BIOS Shadow     :Enabled   │
│ CPU Internal Cache     : Enabled    │ C8000-CBFFF Shadow    :Disabled  │
│ External Cache         : Enabled    │ CC000-CFFFF Shadow    :Disabled  │
│ Quick Power on Self Test : Disabled │ D0000-D3FFF Shadow    :Disabled  │
│ Boot Sequence          : A,C,SCSI   │ D4000-D7FFF Shadow    :Disabled  │
│ Swap Floppy Drive      : Disabled   │ D8000-DBFFF Shadow    :Disabled  │
│ Boot up NumLock status : On         │ DC000-DFFFF Shadow    :Disabled  │
│ Security Option        : Setup      │                                  │
│ PCI/VGA palette snoop  : Disabled   │                                  │
│ OS select for DRAM>64MB : Non-OS2   │                                  │
│ Report No FDD For WIN 95 : Yes      │                                  │
│                                     │                                  │
│                                     │                                  │
│                                     │                                  │
│                                     ├──────────────────────────────────┤
│                                     │ Esc : Quit   ↑↓→←: Select item   │
│                                     │ F1 : Help PU/PD/+/- : modify     │
│                                     │ F5 : Old Value(Shift) F2 : Color │
│                                     │ F6 : Load BIOS Defaults          │
│                                     │ F7 : Load Setup Defaults         │
└─────────────────────────────────────┴──────────────────────────────────┘
```

### Virus Warning

During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and the following error message will appear.  For the meantime,  you can run an anti-virus program to locate the problem.

---

**!WARNING!**
Disk Boot Sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.

---

        **Disabled** (default)  No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

        **Enabled**          Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector of hard disk partition table.

**Note:**    *This function is available only for DOS and other OS that do not trap INT13.*

## CPU Internal Cache

        The default value is Enabled.  If your CPU is without Internal Cache then this item "CPU Internal Cache" will not be shown.

        **Enabled** (default)  Enable cache
        **Disabled**          Disable cache

**Note:** The internal cache is built in the processor.

## CPU External Cache

        Choose Enabled or Disabled.  This option enables the level 2 cache memory.

## Quick Power On Self Test

        This category speeds up Power On Self Test (POST) after you power on the computer.  If this is set to Enabled, BIOS will shorten or skip some check items during POST.

        **Enabled**          Enable quick POST
        **Disabled** (default) Normal POST

## Boot Sequence

This category determines which drive the computer searches first for the disk operating system (i.e., DOS). The settings are A,C,SCSI/ LS/ZIP,C/C,A,SCSI/C,CD-ROM,A/CD-ROM,C,A/D,A,SCSI/E,A,SCSI/ F,A,SCSI/SCSI,A,C/SCSI,C,A/C only. Default value is A,C,SCSI.

## Swap Floppy Drive

Switches the floppy disk drives between being designated as A and B. Default is Disabled.

## Boot Up NumLock Status

The default value is On.

| | |
|---|---|
| **On** (default) | Keypad is numeric keys. |
| **Off** | Keypad is arrow keys. |

## Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

| | |
|---|---|
| **System** | The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt. |
| **Setup** (default) | The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt. |

## PCI VGA Palette Snooping

Choose Disabled or Enabled.  Some graphic controllers which are not VGA compatible, take the output from a VGA controller and map it to their display as a way to provide the boot information and the VGA compatibility.

However, the color information coming from the VGA controller is drawn from the palette table inside the VGA controller to generate the proper colors, and the graphic controller needs to know what is in the palette of the VGA controller.  To do this, the non-VGA graphic controller watches for the Write access to the VGA palette and registers the snoop data.  In PCI based systems, where the VGA controller is on the PCI bus and a non-VGA graphic controller is on an ISA bus, the Write Access to the palette will not show up on the ISA bus if the PCI VGA controller responds to the Writes.

In this case, the PCI VGA controller should not respond to the Write. It should only snoop the data and permit the access to be forwarded to the ISA bus.  The non-VGA ISA graphic controller can then snoop the data on the ISA bus.  Unless you have the above situation, you should disable this option.

> **Disabled** (default)          Disables the function
> **Enabled**                     Enables the function

## OS Selection for DRAM > 64MB

Allows OS2® to be used with > 64 MB of DRAM. Settings are Non-OS/2  (default) and OS2.  Set to OS/2 if using more than 64MB and running OS/2®.

## Report No FDD For WIN 95

When set to yes, BIOS will not report any IRQ for FDD when FDD is disabled in Windows® 95.  This function is only used when you are testing SCT for Windows® 95 Logo.

**Video BIOS Shadow**

Determines whether video BIOS will be copied to RAM for faster execution. Video shadow will increase the video performance.

|  |  |
|---|---|
| **Enabled** (default) | Video shadow is enabled |
| **Disabled** | Video shadow is disabled |

**C8000 - CFFFF Shadow/E8000 - EFFFF Shadow**

Determines whether the optional ROM will be copied to RAM for faster execution.

|  |  |
|---|---|
| **Enabled** | Optional shadow is enabled |
| **Disabled** (default) | Optional shadow is disabled |

**Note:** For C8000-DFFFF optional-ROM on PCI BIOS , BIOS will automatically enable the  shadow RAM.  User does not have to select the item.

## 3.6 Chipset Features Setup

The Chipset Features Setup option is used to change the values of the chipset registers.  These registers control most of the system options in the computer.

Choose the "CHIPSET FEATURES SETUP" from the Main Menu and the following screen will appear.

```
                    ROM  PCI/ISA  BIOS(2A59IM4A)
                        CMOS  SETUP  UTILITY
                      CHIPSET  FEATURES  SETUP

 ┌─────────────────────────────────────────────────────────────────────┐
 │ Auto Configuration      :Enabled                                      │
 │ DRAM Timing             :70ns                                         │
 │ DRAM Leadoff Timing     :10/6/4                                       │
 │ DRAM Read Burst (EDO/FP) :x333/x444                                   │
 │ DRAM Write Burst Timing :x333                                         │
 │ Fast EDO Lead Off       :Disabled                                     │
 │ Refresh RAS# Assertion  :5 Clks                                       │
 │ Fast RAS to CAS Delay   :3                                            │
 │ DRAM Page IDLE Timer    :2                                            │
 │ DRAM Enhanced Paging    :Enabled                                      │
 │ Fast MA to RAS# Delay   :2 Clks                                       │
 │ SDRAM (CAS Lat/RAS-to-CAS):3/3                                        │
 │ SDRAM Speculative Read  :Disabled                                     │
 │ System BIOS Cacheable   :Disabled                                     │
 │ Video BIOS Cacheable    :Disabled   ┌─────────────────────────────── │
 │ 8 Bit I/O Recovery Time :1          │ Esc : Quit    ↑↓→←: Select item │
 │ 16 Bit I/O Recovery Time :2         │ F1 : Help PU/PD/+/- : modify    │
 │ Memory Hole at 15M-16M  :Disabled   │ F5 : Old Value(Shift) F2 : Color│
 │ PCI 2.1 compliance      :Disabled   │ F6 : Load BIOS Defaults          │
 │                                     │ F7 : Load Setup Defaults         │
 └─────────────────────────────────────────────────────────────────────┘
```

**Note:** Change these settings only if you are familiar with the chipset.

### Auto Configuration

Choosing Enabled (default) will automatically configure chipset features using default settings. Choose Disable to customize setup.

### DRAM Timing

Sets the DRAM speed at 70ns (default) or 60ns. It will set the speed of the EDO/FP DRAM.

### DRAM Leadoff Timing

To be able to change the setting, Auto configuration must be disable. If the Bus Clock is 75MHz, set it to 11/7/4. If the Bus Clock is 66/60/55 MHz set it to 10/6/4. Default setting is 10/6/4.

### DRAM Read Burst (EDO/FP)

Under Auto config. the BIOS will identify which type of DRAM is being used. Choose the setting accordingly. To customize, use this option which sets the Read Burst time for accessing the DRAM. The timing used depends on the type of DRAM and access time being used. The settings are x222/x333, x333/x444, or x444/x444.

**Note:** If the user chooses DRAM Read Burst (EDO/FP): x333/x444, it signifies that:
  **a.** 60ns EDO with 75 MHz Bus Clock is set at x333, if the Bus Clock is 66/60/55 MHz, then it is set at x222.
  **b.** 60ns FP with 75 MHz  is set at x444, if the Bus Clock is 66/60/55, then it is set at x333.
  **c.** 70ns EDO and FP DRAM must increase the burst time. So you must set x222 to x333 and x333 to x444.

### DRAM Write Burst Timing

This option chooses the Write Burst Timing for accessing DRAM. See: DRAM Read Burst Option. Choose x222/x333/x444.

### Fast EDO Lead Off
Under Auto config., the BIOS will identify which type of DRAM is being used. Choose the setting accordingly. To customize, use this option. Choose Enable or Disable. If the system is using EDO DRAM, choose enable. But if the system is using both EDO and FP DRAM, choose Disable.

### Refresh RAS# Assertion
The settings are 4 Clks or 5 Clks. Using 60 ns DRAM at 75 Mhz Bus Clock must be set to 5 Clks, while 66/60/55 Mhz Bus Clock must be set to 4 Clks. But if you use 70 ns DRAM, it must be set to 5 Clks.

### Fast RAS to CAS Delay
The settings are 2 or 3. 2 RAS to CAS delay is set to 2 clock, while 3 RAS to CAS delay is set to 3 clock. The clock is dependent with the DRAM Timing and Bus Clock.

### DRAM Page IDLE Timer
The settings are 2 Clks, 4 Clks, 6Clks, or 8 Clks. Default settings is 2 Clks.

### DRAM Enhanced Paging
Choose Enable(default) or Disable.

### Fast MA to RAS# Delay
The settings are 1 Clks or 2 Clks(default). During 1T, one bus clock is allowed, while 2T allows two bus clock for MA address setup time to RAS assertion. This is also dependent on DRAM Timing.

### SDRAM (CAS Lat/RAS-to-CAS)
The settings are 3/3 or 2/2. This option is for SDRAM CAS latency time and RAS# to CAS# delay time. The default setting is 3/3.

### SDRAM Speculative Read
The settings are enable or disable.  If you only use One Bank for SDRAM and there's no EDO or FP mix together, the setting is Enable. If two banks are used by SDRAM, it will automatically be set to disable. The default setting is enable.

### System BIOS Cacheable
By choosing Disabled (default) the system BIOS will be shadowed into DRAM only. Enabled will have the system BIOS shadowed and cacheable.

### Video RAM Cacheable
Same as system BIOS Cacheable

### 8-bit I/O recovery time: 1/2/3/4/5/6/7/NA
### 16-bit I/O recovery time: 1/2/3/NA
Choose the recovery time for 8-bit and 16-bit I/O cycles respectively.

**Note:**  NA is not available and so the recovery time of 3.5 SYSCLK will be inserted.

### Memory Hole At 15M-16M
Choosing Enabled will enable a memory hole in the DRAM space. The CPU cycle matching the enabled hole will be passed on to the PCI.  PCI cycles matching an enabled hole are ignored.  Disabled (default) will disable this function.

**Note:**  A selected (Enabled) hole is not remapped.

### PCI 2.1 Compliance
The Settings are Enable or Disable.  During Enable, those PCI add-on cards with PCI 2.1 compliance will perform better.  But some PCI card does not meet PCI 2.1 compliance,  so the default setting is Disabled.

## 3.7 Power Management Setup

The Power Management Setup will appear on your screen like this:

```
            ROM  PCI/ISA  BIOS  (2A59IM4A)
               POWER  MANAGEMENT  SETUP
                 AWARD  SOFTWARE,  INC.
┌─────────────────────────────────────────────────────────────────┐
│ Power Management      :User Define ** Reload Global Timer Events **│
│ PM Control by APM     :Yes         IRQ [3-7,9-15],NMI : Enabled    │
│ Video Off Method      :DPMS        Primary IDE 0    : Enabled      │
│ Video Off After       :Standby     Primary IDE 1    : Disabled     │
│                                    Secondary IDE 0  : Disabled     │
│ Doze Mode             :Disabled    Secondary IDE 1  : Disabled     │
│ Standby Mode          :Disabled    Floppy Disk      : Enabled      │
│ Suspend Mode          :Disabled    Serial Port      : Enabled      │
│ HDD Power Down        :Disabled    Parallel Port    : Enabled      │
│ Throttle Duty Cycle   :62.5%                                       │
│ VGA Active Monitor    :Disabled                                    │
│ Soft-Off by PWR-BTTN  :Instant-Off                                 │
│ CPUFAN Off In Suspend :Enabled                                     │
│ Resume by Ring        :Disabled                                    │
│ Resume by Alarm       :Disabled                                    │
│                                                                    │
│                                                                    │
│ ** Break Event From Suspend **    Esc : Quit   ↑↓→← : Select item  │
│ IRQ 8  Clock Event : Disabled     F1 : Help PU/PD/+/- : modify     │
│                                   F5 : Old Value(Shift) F2 : Color │
│                                   F6 : Load BIOS Defaults          │
│                                   F7 : Load Setup Defaults         │
└─────────────────────────────────────────────────────────────────┘
```

### Power Management
         This category determines the power consumption for system after selecting below items.  Default value is Disable.  The following pages tell you the options of each item & describe the meanings of each options.

## Power Management

| | |
|---|---|
| **Disable** | Global Power Management will be disabled. |
| **User Define** | Users can configure their own power management. |
| **Min Saving** | Pre-defined timer values are used such that all timers are in their MAX value. |
| **Max Saving** | Pre-defined timer values are used such that all timers are in their MIN value. |

## PM Control by APM

| | |
|---|---|
| **No** | System BIOS will ignore APM when power managing the system. |
| **Yes** | System BIOS will wait for APM's prompt before it enter any PM mode |

**Note :** Enable this for O.S. with APM like Windows® 95, Windows® NT, etc.

## Video Off Method

| | |
|---|---|
| **Blank Screen** | The system BIOS will only blank off the screen when disabling video. |
| **V/H SYN C+Blank** | In addition to (1), BIOS will also turn off the V-SYNC & H-SYNC signals from VGA card to monitor. |
| **DPMS** | This function is enabled only for VGA card supporting DPMS. |

**Note:**   Green monitors detect the V/H SYNC signals to turn off its electron gun.

## Video Off After

The settings are N/A, Standby, Doze, or Suspend. This option is for choosing the setting in which the monitor will turn off.

**N/A**       Always turn on.
**Doze**      During Doze mode, the monitor will be turned off.
**Standby**   During Standby mode, the monitor will be turned off.
**Suspend**   During Suspend mode, the monitor will be turned off.
The default setting is Standby.

## Doze Mode

**Disable**         System will never enter DOZE mode.

**1 Min/2 Min/**    Defines the continuous idle time before the
**4 Min/6 Min/**    system enters DOZE mode.
**8 Min/10 Min/**   If any item defined in the options of "Power
**20 Min/30 Min/**  Down and Resume events" is enabled & active,
**40 Min/1 Hr**     DOZE timer will be reloaded.  When the system
                    have entered Doze mode, any of the items
                    enabled in "Wake Up Events in Doze and
                    Standby" will trigger the system to wake up.

## Standby Mode

**Disable**         System will never enter STANDBY mode.

**1 Min/2 Min/**    Defines the continuous idle time before the
**4 Min/6 Min/**    system enters STANDBY mode.
**8 Min/10 Min/**   If any item defined in the options of "Power
**20 Min/30 Min/**  Down and Resume events" is enabled & active,
**40 Min/1 Hr**     STANDBY timer will be reloaded. When the
                    system has entered Standby mode , any of the
                    items that are enabled in "Wake Up Events of
                    Doze and Standby" will trigger the system to
                    wake up.

**Suspend   Mode**

| | |
|---|---|
| **Disable** | System will never enter SUSPEND mode. |

**1 Min/2 Min/**
**4 Min/6 Min/**
**8 Min/10 Min/**
**20 Min/30 Min/**
**40 Min/1 Hr**

Defines the continuous idle time before the system enters SUSPEND mode. If any item defined in the options of "Power Down & Resume Events" is enabled & active, SUSPEND timer will be reloaded. When the system has entered SUSPEND mode, any of the items enabled in the "Power Down & Resume Events" will trigger the system to wake up.

**HDD Power Down**

| | |
|---|---|
| **Disable** | HDD's motor will not shut off. |

**1 Min/2 Min/**
**3 Min/4 Min/**
**5 Min/6 Min/**
**7 Min/8 Min/**
 **9 Min/10 Min/**
**11 Min/12 Min/**
**13 Min/14 Min/**
**15 Min**

Defines the continuous HDD idle time before the HDD enters the power saving mode (motor off). BIOS will turn off the HDD's motor when time is out.

**Throttle  Duty  Cycle**

This option will determine how much power will be used by the CPU , if the system goes into suspend mode.

**VGA  Active  Monitor**

During Enabled, if there's no activity in the  monitor screen the system will go into Power Saving Mode.  During Disabled, the system will go into Power Saving Mode, whether there is activity in the monitor screen or not.  The settings are Disabled and Enabled.

**Soft-Off by PWR-BTTN**

The settings are Delay 4 sec or Instant-off.  During Delay 4 sec, if you push the switch one time, the system goes into suspend mode and if you push it more than 4 second, the system will be turned off.  During instant-off, the system will turn off once you push the switch.

**CPUFAN Off In Suspend**

During Enabled, if the system goes into suspend mode, the CPU fan will stop.  During Disabled, if the system goes into suspend mode the CPU fan will not stop.

**Note:** Only JFAN1 has this function.

**Resume by Ring**

During Disabled, the system will ignore any incoming call from the modem.  During Enabled, the system will boot up if there's an incoming call from the modem.

**Note:** If you have change the setting, you must let the system boot up until it goes to the operating system. Then, power off the system.  This function will work the next time you power on.

**Resume by Alarm**

This function is for setting date and time for your computer to boot up.  During Disabled, you cannot use this function.  During Enabled, choose the Date and Time Alarm:

|  |  |
|---|---|
| **Date(of month) Alarm** | You can choose which month the system will boot up. |
| **Time(hh:mm:ss) Alarm** | You can choose what hour, minute and second the system will boot up. |

**Note:** If you have change the setting, you must let the system boot up until it goes to the operating system. Then, power off the system.  This function will work the next time you power on.

**IRQ 8 Clock Event**
  **IRQ[3-7,9-15], NMI**          **: Enabled**
  **Primary IDE 0**               **: Enabled**
  **Primary IDE 1**               **: Disabled**
  **Secondary IDE 0**             **: Disabled**
  **Secondary IDE 1**             **: Disabled**
  **Floppy Disk**                 **: Enabled**
  **Serial Port**                 **: Enabled**
  **Parallel Port**               **: Enabled**

   During Enabled, if any interrupt event occurs, the system will wake-up from suspend mode.  During Disabled, the system will not monitor any interrupt event.

# 3.8 PNP/PCI Configuration Setup

You can manually configure the PCI Device's IRQ. The following pages tell you the options of each item & describe the meanings of each options.

```
              ROM  PCI/ISA BIOS (2A69HM4D)
              PNP/PCI  CONFIGURATION  SETUP
                  AWARD  SOFTWARE,  INC.
```

```
PnP OS Installed      :No      PCI IDE IRQ Map To : PCI-Auto
Resources Controlled By :Manual  Primary IDE INT#  : A
Reset Configuration Data :Disabled  Secondary IDE INT#: B

IRQ-3 assigned to     :Legacy ISA  Assign IRQ for VGA    : Enabled
IRQ-4 assigned to     :Legacy ISA  Used MEM base addr    : N/A
IRQ-5 assigned to     :PCI/ISA PnP
IRQ-7 assigned to     :PCI/ISA PnP
IRQ-9 assigned to     :PCI/ISA PnP
IRQ-10assigned to     :PCI/ISA PnP
IRQ-11assigned to     :PCI/ISA PnP
IRQ-12assigned to     :PCI/ISA PnP
IRQ-14assigned to     :PCI/ISA PnP
IRQ-15assigned to     :PCI/ISA PnP
DMA-0assigned to      :PCI/ISA PnP
DMA-1assigned to      :PCI/ISA PnP  Esc : Quit   ↑↓→←: Select item
DMA-3assigned to      :PCI/ISA PnP  F1 : Help PU/PD/+/- : modify
DMA-5assigned to      :PCI/ISA PnP  F5 : Old Value(Shift) F2 : Color
DMA-6assigned to      :PCI/ISA PnP  F6 : Load BIOS Defaults
DMA-7assigned to      :PCI/ISA PnP  F7 : Load Setup Defaults
```

## PnP OS Installed

When set to YES, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 95. When set to NO, BIOS will initialize all the PnP cards. So, for non-PnP operating system (DOS®, Netware™), this option must set to NO.

## Resources Controlled By

By Choosing "Auto", the system BIOS will detect the system resource and automatically assign the relative IRQ and DMA Channel for each peripheral.

By Choosing "Manual"(default), the user will need to assign IRQ & DMA for add-on cards. Be sure that there is no conflict for IRQ/DMA and I/O ports.

**Note:**    When choosing "Auto" you must be sure that all of the system add-on cards are PnP type.

## Reset Configuration Data

The system BIOS supports the PnP feature so the system needs to record which resource is assigned and protect resources from conflict. Every peripheral device has a node which is called ESCD. This node records which resources are assigned to it. The system needs to record and update ESCD to the memory locations. These locations (4K) are reserved at the system BIOS.

If Disabled (default) is chosen, the system's ESCD will update only when the new configuration varies from the last one.

If Enabled is chosen, the system will be forced to update the system's ESCD. Then, this option will be auto-set to Disable.

IRQ-3      assigned to : Legacy  ISA
IRQ-4      assigned to : Legacy  ISA
IRQ-5      assigned to : PCI/ISA  PnP
IRQ-7      assigned to : Legacy  ISA
IRQ-9      assigned to : PCI/ISA  PnP
IRQ-10    assigned to : PCI/ISA  PnP
IRQ-11    assigned to : PCI/ISA  PnP
IRQ-12    assigned to : PCI/ISA  PnP
IRQ-14    assigned to : PCI/ISA  PnP

IRQ-15   assigned to : PCI/ISA  PnP
DMA-0 assigned to : PCI/ISA  PnP
DMA-1 assigned to : PCI/ISA  PnP
DMA-3 assigned to : PCI/ISA  PnP
DMA-5 assigned to : PCI/ISA  PnP
DMA-6 assigned to : PCI/ISA  PnP
DMA-7 assigned to : PCI/ISA  PnP

The above settings will be shown on the screen only if "Manual" is chosen for the *Resources Controlled By* function.

Legacy is the term which signifies that a resource is assigned to the ISA Bus and provides for non PnP ISA add-on card.  PCI/ISA PnP signifies that a resource is assigned to the PCI Bus or provides for ISA PnP add-on cards and peripherals.

## PCI IDE IRQ Map To

**PCI-Auto:**        This setting is for off-board PCI IDE card and is fully compatible with PCI specifications.

**PCI-Slot 1-4:**   This setting is used if off-board PCI IDE card is not fully compatible with PCI specifications. You must specify which PCI slot the PCI IDE Card is installed in.

**ISA:**               This setting is used if the off-board PCI IDE card uses an edge trigger and IRQ routes directly to the ISA Bus.

**Note:**   The user will need to disable the on-board on-chipset PCI IDE controller when installing off-board PCI IDE add-on cards.  (See the INTEGRATED PERIPHERALS SETUP)  These two options choose the primary and secondary IDE Channel interrupts when the user installs off-board PCI IDE add-on cards.

**Assign IRQ for VGA**
          Lets the user choose which IRQ to assign for VGA card.

**Used MEM base addr**
          Lets the user choose the Legacy ISA addr.  The settings are NA#, C800, CC00, D000, D400, D800 OR DC00.

## 3.9 Load BIOS/Setup Defaults

          This Main Menu item loads the default system values. If the CMOS is corrupted the defaults are loaded automatically. Choose this item and the following message appears:

<div align="center">" Load Setup Defaults (Y / N) ? N "</div>

To use the Setup defaults, change the prompt to "Y" and press < Enter >

**Note:**    The Setup defaults can be customized to increase performance.
          However the BIOS defaults can always be used as a back up if
          there is some problem with the mainboard operation.

## 3.10 Special Features Setup

This Special Features Setup are use by LM78 chipset.  You can manually change the value of each option.

```
                    ROM  PCI/ISA  BIOS  (2A69HM4C)
                        INTEGRATED  PERIPHERALS
                         AWARD  SOFTWARE,  INC.
 ┌─────────────────────────────────┬────────────────────────────────┐
 │    CPU Type:  Intel Pentium      │ ********* SYSTEM MONITOR ********* │
 │ Power Fan Detected    :Disabled  │ Power Fan RPM          :0        │
 │ CPU Fan Detected      :Enabled   │ CPU Fan RPM            :5818     │
 │ Chassis Fan Detected  :Disabled  │ Chassis Fan RPM        :0        │
 │                                  │ System Temperature     :30ºC/86ºF│
 │ Voltage Detected      :Enabled   │                                 │
 │ CPU Vcore Voltage     :Auto      │                                 │
 │ Vcore Voltage Detected  :Enabled │                                 │
 │ Vio Voltage           :Enabled   │                                 │
 │ +3.3V Voltage Detected  :Enabled │                                 │
 │ +5.0V Voltage Detected  :Enabled │                                 │
 │ +12V Voltage Detected   :Enabled │                                 │
 │ -12V Voltage Detected   :Enabled │                                 │
 │ -5.0V Voltage Detected  :Enabled │                                 │
 │                                  ├────────────────────────────────┤
 │                                  │ Esc : Quit   ↑↓→← : Select item │
 │                                  │ F1 : Help PU/PD/+/- : modify    │
 │                                  │ F5 : Old Value(Shift) F2 : Color│
 │                                  │ F6 : Load BIOS Defaults         │
 │                                  │ F7 : Load Setup Defaults        │
 └─────────────────────────────────┴────────────────────────────────┘
```

**CPU Type**
        This shows which kind of CPU the system uses.

**Power Fan Detected/CPU Fan Detected/Chassis Fan Detected CPU Voltage**
        During Enabled, this will monitor the RPM of your CPU fan.  Power/ CPU Fan minimum of 1000 RPM, and Chassis Fan minimum of 2750 RPM.  If you're not using the special fan with speed sensor, you must disabled this function.

### Voltage Detected
During Enabled, this will show the CPU voltage chart during boot up.  And during Disabled, this will not show the CPU voltage chart.

### CPU Vcore Voltage
This is for setting the voltage of the CPU you're using.  So that LANDesk CLient manager can monitor your CPU voltage.

### Vcore Voltage Detected/Vio Voltage Detected/+3.3V Voltage Detected/+5.0 Voltage Detected/+12V Voltage Detected/-12V Voltage Detected/-5.0 Voltage Detected
During Enabled, this will show the voltage detected during boot up. And during Disabled, this will not show during boot up.

### Power Fan RPM/CPU Fan RPM/Chassis Fan RPM
If you enabled the Power/CPU/Chassis Fan Detected.  Then, this will show the RPM of every fan.

### System Temperature
This will show the System temperature.

## 3.11 Integrated Peripherals

```
             ROM  PCI/ISA  BIOS  (2A69HM4D)
                INTEGRATED  PERIPHERALS
                 AWARD  SOFTWARE,  INC.
```

```
┌──────────────────────────────────────────────────────────────────┐
│ IDE HDD Block Mode      :Enabled   Onboard Parallel Mode   :378/IRQ7 │
│ IDE Primary Master PIO  :Auto      Parallel Port Mode      :SPP      │
│ IDE Primary Slave PIO   :Auto      ECP Mode Use DMA        :1,3      │
│ IDE Secondary Master PIO :Auto     EPP Mode Select         :EPP1     │
│ IDE Secondary Slave PIO  :Auto                                       │
│ IDE Primary Master UDMA  :Auto                                       │
│ IDE Primary Slave UDMA   :Auto                                       │
│ IDE Secondary Master UDMA:Auto                                       │
│ IDE Secondary Slave UDMA :Auto                                       │
│ On-Chip Primary PCI IDE :Enabled                                     │
│ On-Chip Primary PCI IDE :Enabled                                     │
│ USB Keyboard Controller :Disabled                                    │
│                                                                      │
│ Onboard FDD controller  :Enabled                                     │
│ Onboard Serial Port 1   :3F8/IRQ4  Esc : Quit   ↑↓→← : Select item   │
│ Onboard Serial Port 2   :2F8/IRQ3  F1 : Help PU/PD/+/- : modify      │
│ Onboard IR Controller   :Disabled  F5 : Old Value(Shift) F2 : Color  │
│                                    F6 : Load BIOS Defaults           │
│                                    F7 : Load Setup Defaults          │
└──────────────────────────────────────────────────────────────────┘
```

**IDE HDD Block Mode**

> **Enabled/Disabled** Enabled allows the Block mode access for the
> IDE HDD.

**IDE Primary Master PIO**
> **Auto/Mode0/Mode1-4**

**IDE Primary Slave PIO**
> **Auto/Mode0/Mode1-4**

**IDE Secondary Master PIO**
> **Auto/Mode0/Mode1-4**

## IDE Secondary Slave PIO
### Auto/Mode0/Mode1-4

For these 4 IDE options, choose "Auto" to have the system BIOS auto detect the IDE HDD operation mode for PIO access.

**Note:**   Some IDE HDD cannot operate at the responding HDD's mode. When the user has selected "Auto" and the system BIOS has accepted the HDD response mode, the user may degrade the HDD's operation mode. Ex: IF the HDD reported it can operate in mode 4 but it is not operating properly, the user will have to manually change the operation mode to mode 3.

Choosing Mode 1-4 will have the system ignore the HDD's reported operation mode and use the selected mode instead.

**Note:** According to ATA specs. Mode 4 transfer rate is > Mode 3 > Mode 2 > Mode 1 > Mode 0. If the user's HDD can operate at Mode 3 the user can also select a slower Mode (i.e. Mode 0-2) but not a faster Mode (ie Mode 4).

## On-Chip Primary PCI IDE
### Enabled/Disabled

## On-Chip Secondary PCI IDE
### Enabled/Disabled

The system provides for a On-Board On-Chipset PCI IDE controller that supports Dual Channel IDE (Primary and Secondary). A maximum of 4 IDE devices can be supported. If the user install the Off-Board PCI IDE controller (i.e. add-on cards), the user must choose which channels will be disabled. This will depend on which channel will be used for the Off-Board PCI IDE add-on card.

## USB Keyboard Support
**Enabled/Disabled**                    Choosing Enabled will allow the system
                                        to use USB keyboard without a device
                                        driver.

## Onboard FDC Controller
**Enabled/Disabled**                    The system has an on-board Super I/O
                                        chip with a FDD controller that supports
                                        2 FDDs for 360K/720K/1.2M/1.44M/
                                        2.8M.  Choose  "Enabled" to use the on-
                                        board FDD controller for accessing the
                                        FDD. Otherwise choose "Disabled" to
                                        use the off-board FDD controller.

## Onboard Serial Port 1
**Disabled/(3F8/IRQ4)/(2F8/IRQ3)/ (3E8/IRQ4)/(2E8/IRQ3)**

## Onboard Serial Port 2
**Disabled/(3F8/IRQ4)/(2F8/IRQ3)/(3E8/IRQ4)/(2E8/IRQ3)**

The system has an On-board Super I/O chipset with 2 serial ports.
The On-board serial ports can be selected as:

                **Disabled**
                3F8/IRQ4        COM 1 uses IRQ4
                2F8/IRQ3        COM 2 uses IRQ3
                3E8/IRQ4        COM 3 uses IRQ4
                2E8/IRQ3        COM 4 uses IRQ4

**Note:** Because the ISA Bus Interrupt accepts low to high edge trigger, the
        interrupt request line cannot be shared by multiple sources.  If an off-
        board ISA add-on card with a serial port is installed the user may have
        to disable the on-board serial port because it will conflict with IRQ
        request line for the off-board serial port.

## Onboard IR Controller

**Enabled/Disabled**    The system has an on-board Super I/O chip with an IR controller. Choose "Enabled" to use the on-board IR controller for accessing the IR devices. Otherwise choose "Disabled" to use the off-board IR controller.

## IR Mode

This function is for choosing which IR mode to use. Leave this on the default setting of Irda.

## Onboard Parallel Port

**Disabled**
**(3BCH/IRQ7)/**
**(278H/IRQ5)/**
**(378H/IRQ5)**

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

**Disable**
3BCH/IRQ7    Line Printer port 0
278H/IRQ5    Line Printer port 2
378H/IRQ5    Line Printer port 1

## Onboard Parallel Mode

SPP : Standard Parallel Port
EPP : Enhanced Parallel Port
ECP : Extended Capability Port

**SPP/(EPP/SPP)/**
**ECP(ECP/EPP)**

To operate the onboard parallel port as StandardParallel Port only, choose "SPP." To operate the onboard parallel port in the ECP and SPP modes simultaneously choose "ECP/SPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP/EPP" will allow the onboard parallel port to support both

the ECP and EPP modes simultaneously. The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA" At this time the user can choose between DMA channels 3 or 1. The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: "EPP Mode Select." At this time either EPP 1.7 spec. or EPP 1.9 spec. can be chosen.

## 3.11 Supervisor/User Password Setting

This Main Menu item lets you configure the system so that a password is required each time the system boots or an attempt is made to enter the Setup program. Supervisor Password allows you to change all CMOS settings but the User Password setting doesn't have this function. The way to set up the passwords for both Supervisor and User are as follow:

1. Choose "Change Password" in the Main Menu and press <Enter>. The following message appears:

<div align="center">"Enter Password:"</div>

2. The first time you run this option, enter your password up to only 8 characters and press <Enter>. The screen does not display the entered characters. For no password just press <Enter>.

3. After you enter the password, the following message appears prompting you to confirm the password:

<div align="center">"Confirm Password:"</div>

4. Enter exactly the same password you just typed in to confirm the password and press <Enter>.

5. Move the cursor to Save & Exit Setup to save the password.

6. If you need to delete the password you entered before, choose the Supervisor Password and press <Enter>. It will delete the password that you had before.

7. Move the cursor to Save & Exit Setup to save the option you did. Otherwise, the old password will still be there when you turn on your machine next time.

## 3.12 IDE HDD Auto Detection

You can use this utility to automatically detect the characteristics of most hard drives.

When you enter this utility, the screen asks you to select a specific hard disk for Primary Master. If you accept a hard disk detected by the BIOS, you can enter "Y" to confirm and then press <Enter> to check next hard disk. This function allows you to check four hard disks and you may press the <Esc> after the <Enter> to skip this function and go back to the Main Menu.

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

| HARD DISKS | TYPE | SIZE | CYLS | HEADS | PRECOMP | LANDZONE | 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 |

Select Primary Master    Option (N=Skip) : N

| OPTIONS | SIZE | CYLS | HEAD | PRECOMP | LANDZ | SECTOR | MODE |
|---|---|---|---|---|---|---|---|
| 2 | 2112 | 1023 | 64 | 0 | 4094 | 63 | LBA |
| 1 | 2113 | 4095 | 16 | 65535 | 4094 | 63 | NORMAL |
| 3 | 2113 | 2047 | 32 | 65535 | 4094 | 63 | LARGE |

[ESC: Skip]

## Chapter 4

## AMI® BIOS USER's GUIDE

The system configuration information and chipset register information is stored in the CMOS RAM. This information is retained by a battery when the power is off. Enter the BIOS setup (if needed) to modify this information.

The following pages will describe how to enter BIOS setup, and all about options.

## 4.1 Enter BIOS Setup

**Enter the AMI® Setup Program's Main Menu as follows:**

1. Turn on  or reboot the system.  The following screen appears with
   a series of diagnostic check.

```
AMIBIOS (C) 1996 American Megatrends Inc.


Hit <DEL> if you want to run setup






(C) American Megatrends Inc.
61-XXXX-001169-00111111-071592-i82440FX-H
```

2. When the "Hit <DEL>" message appears, press <DEL> key to
   enter the BIOS setup screen.

3. After pressing <DEL> key, the BIOS setup screen will appear.

**Note:** *If you don't want to modify CMOS original setting, then don't press any
key during the system boot.*

```
┌─────────────────────────────────────────────────────────┐
│        AMIBIOS HIFLEX SETUP UTILITIES - VERSION 1.07      │
│      (C) 1996 American Megatrends, Inc. All Rights Reserved│
├─────────────────────────────────────────────────────────┤
│                                                           │
│                 Standard  CMOS  Setup                     │
│                 Advanced  CMOS  Setup                     │
│              Advanced  Chipset  Setup                     │
│              Power  Management  Setup                     │
│              PCI/Plug and Play Setup                      │
│                  Peripheral  Setup                        │
│              Hardware  Monitor  Setup                     │
│               Auto-Detect Hard Disks                      │
│                Change  User  Password                     │
│             Change  Supervisor  Password                  │
│       Auto  Configuration  with  Optimal  Settings        │
│     Auto  Configuration  with  Fail  Safe  Settings       │
│               Save  Settings  and  Exit                   │
│                 Exit  without  Saving                     │
├─────────────────────────────────────────────────────────┤
│     Standard CMOS setup for changing time, hard disk type, etc.│
│                                                           │
└─────────────────────────────────────────────────────────┘
```

4.  Use the <UP> and <DOWN> key to move the highlight scroll up or down.

5.  Use the <ENTER> key to select the option.

6.  To exit, press <ESC>.  To save and exit, press <F10>.

7.  Section 4.2 to 4.8 will explain the option in more details.

## 4.2 Standard CMOS Setup

1.  Press <ENTER> on "Standard CMOS Setup" of the main menu screen .

```
          AMIBIOS  SETUP  -  STANDARD  CMOS  SETUP
(C)1996 American Megatrends,Inc.All Rights Reserved

Date (mm/dd/yyyy): Fri June 20, 1997
Time (hh/mm/ss):   17:09:25

Floppy Drive A:             1.44 MB 3 1/2
Floppy Drive B:             Not  Installed
                                             LBA   Blk   PIO   32Bit
            Type  Size  Cyln  Head  WPcom Sec Mode  Mode  Mode  Mode
Pri Master :Auto                             ON    ON    AUTO  ON
Pri Slave  :Auto                             ON    ON    AUTO  ON
Sec Master :Auto                             ON    ON    AUTO  ON
Sec Slave  :Auto                             ON    ON    AUTO  ON

Boot Sector Virus Protection Disabled


Time is 24 hour format:              ESC:Exit  :Sel
Hour: 00-23 Minute: 00-59 Second: 00-59   PgUp/PgDn:Modify
(1:30AM = 01:30:00, 1:30PM = 13:30:00)   F2/F3:Color
```

2.  Use <UP> and <DOWN> to choose the item and <PGUP> and <PGDN> keys to modify the highlighted item.

3.  After you have finished with the Standard CMOS Setup,    press <ESC> to go back to the main menu.

## 4.3 Advanced CMOS Setup

1. Press <ENTER> on "Advanced CMOS Setup" of the main menu

```
             AMIBIOS SETUP - ADVANCED CMOS SETUP
       (C) 1996 American Megatrends, Inc. All Rights Reserved

Ist Boot Device         FLOPPY        Available  Options:
2nd Boot Device         IDE-0         Enabled
3rd Boot Device         CD-ROM        Disabled
4th Boot Device         Disabled
Try Other Boot Devices  Yes
Quick Boot              Enabled
BootUp Num-Lock         On
Floppy Drive Seek       Enabled
Floppy Access Control   Normal
HDD Access Control      Normal
PS/2 Mouse Support      Enabled
System Keyboard         Absent
Primary Display         VGA/EGA
Password Check          Setup
Boot to OS/2            No
Internal Cache          Writeback
External Cache          Writeback
System BIOS Cacheable   Enabled
C000, 32k Shadow        Enabled
C800, 16k Shadow        Disabled
CC00, 16k Shadow        Disabled
D000, 16k Shadow        Disabled
D400, 16k Shadow        Disabled    ESC:Exit  :Sel
D800, 16k Shadow        Disabled    PgUp/PgDn:Modify
DC00, 16k Shadow        Disabled    F2/F3:Color
```

2. Use <UP> and <DOWN> to choose the item and <PGUP> and
   <PGDN> keys to modify the highlighted item.

3. After you have finished with the Advanced CMOS Setup, press
   <ESC> to go back to the main menu.

## Description of the item on screen follows:

### 1st Boot Device/2nd Boot Device/3rd Boot Device/ 4th Boot Device

> This option sets the sequence of boot drives.
>
> The settings are:
>
> | | |
> |---|---|
> | IDE0 | The system will boot from the first HDD. |
> | IDE1 | The system will boot from the Second HDD. |
> | IDE2 | The system will boot from the Third HDD. |
> | IDE3 | The system will boot from the Fourth HDD. |
> | F(optical) | The system will boot from LS-120(120M Floppy). |
> | SCSI | The system will boot from the SCSI. |
> | Network | The system will boot from the Network drive. |
> | CD-ROM | The system will boot from the CD-ROM. |
> | Disable | Disable this sequence. |

### Try other Boot Devices

> This option sets the device boot, if all the Four Boot Devices failed.

### Quick Boot

> Set this option to Enabled to permit AMI® BIOS to boot within 5 seconds. This option replaces the old ABOVE 1 MB Memory Test option. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

### Boot up Num Lock

> When this option is set to Off, AMI® BIOS turns off the Num Lock key when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. The settings are On or Off. The optimal default and Fail-Safe default settings are On.

### Floppy Drive Seek

> When this option is set to Enabled, AMI® BIOS performs a Seek command on floppy drive A: before booting the system. The settings are Enabled and Disabled. The Optimal and Fail-Safe default settings are Disabled.

**Floppy Access Control**
            This option sets the Floppy to Read-only or Normal(Full Access).

**HDD Access Control**
            This option sets the HDD to Read-only or Normal(Full Access).
During Read-only, if you try to write on the HDD, the system will halt.

**PS/2® Mouse Support**
            When this option is set to Enabled, AMI® BIOS will auto-detect the
presence of a PS/2® mouse and reserved an IRQ for the mouse.  The settings
are Enabled and Disabled.  The Optimal and Fail-Safe default settings are
Enabled.

**System Keyboard** (leave on the default setting of Absent)

**Primary Display**
            This option configures the primary display subsytem in the
computer.  The settings are Mono(monochrome), 40CGA, 80CGA or VGA/
EGA.  The optimal and Fail-Safe default settings are VGA/EGA.

**Password Check**
            This option specifies the type of AMI® BIOS password protection
that is implemented.  The Optimal and Fail-Safe default settings are Setup.

**Boot to OS/2®**
            Set this option to Enabled only if your using an OS/2® and the
memory size is 64MB.

**Internal Cache/External Cache**
            This option Enabled or Disabled the Internal and the External
Cache.

## System BIOS Cacheable

AMI® BIOS always copies the system BIOS from ROM to RAM for faster execution. Set this option to Enabled to permit the contents of the F0000h RAM memory segment to be written to and read from cache memory. The settings are Enabled or Disabled. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

## C000, 32K Shadow

These options specify how the contents of the video ROM are handled. The settings are:

**Disabled** - the Video ROM is not copied to RAM.

**Cached** - the contents of the video ROM are from C0000h - C7FFFh are not only copied from ROM to RAM; it can also be written to or read from cache memory.

**Shadow** - the Contents of the video ROM are from C0000h - C7FFFh are copied(shadowed) from ROM to RAM for faster execution.

The Optimal and Fail-Safe default setting is Cached.

## C800, 16k Shadow/CC00, 16k Shadow/D000, 16K Shadow/ D400, 16k Shadow/D800, 16k Shadow/DC00, 16K Shadow

These options specify how the contents of the adaptor ROM named in the option title are handled. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. The settings are;

**Disabled** - The specified ROM is not copied to RAM.

**Cache** - The contents of the ROM area are not only copied from ROM to RAM for faster execution, it can also be written to or read from cache memory.

**Shadow** - The contents of the ROM area are copied from ROM to RAM for faster execution.

The Optimal and Fail-Safe default settings are Disabled.

## 4.4 Advanced Chipset Setup

1. Press <ENTER> on "Advanced Chipset Setup" of the main menu screen.

```
              AMIBIOS SETUP - ADVANCED CHIPSET SETUP
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 Memory Hole                       Disabled      Available  Options:
 DRAM Speed                        60ns          Enabled
 DRAM Read Burst Timing            x2EDO X3FPM   Disabled
 DRAM Write Burst Timing           x3EDO X3FPM
 DRAM Lead off Timing              10/6/3
 Memory Address Drive Strength     10mA, 10mA
 SDRAM CAS Latency/RAS to CAS      3/3
 Speculative Lead Off Timing       Disabled
 DRAM Page Idle Timeout (HCLK's)   2
 Fast EDO Read Cycle Timing        Enabled
 SDRAM Speculative Read LOgic      Disabled
 Enhanced Paging                   Enabled
 DRAM Refresh RAS Cycles (HCLK's)  4
 DRAM Refresh Rate                 31.2 us
 8-Bit I/O Recovery Time           Disabled
 16-Bit I/O Recovery Time          Disabled
 CD-ROM Option                     0
 USB Keyboard/Mouse Support        Disabled




                                                 ESC:Exit :Sel
                                                 PgUp/PgDn:Modify
                                                 F2/F3:Color
```

2. Use <UP> and <DOWN> to choose the item and <PGUP> and <PGDN> keys to modify the highlighted item.

3. After you have finished with the Advanced Chipset Setup, press <ESC> to go back to the main menu.

## Description of the item on screen follows:

### Memory Hole

Choosing Enabled, will enable a memory hole in the DRAM space. The CPU cycle matching the enabled hole will be passed on the PCI. PCI cycles matching an Enabled hole are ignored. Disabled(default) will disable this function.

### DRAM Speed

This option specifies the speed for the DRAM used in the computer for system memory. Sets the DRAM speed at 70ns (default) or 60ns. It will set the speed of the EDO/FP DRAM.

### DRAM Read Burst Timing

Under Auto config. the BIOS will identify which type of DRAM is being used. Choose the setting accordingly. To customize, use this option which sets the Read Burst time for accessing the DRAM. The timing used depends on the type of DRAM and access time being used.

### DRAM Write Burst Timing

This option chooses the Write Burst Timing for accessing DRAM.

### DRAM Lead off Timing

To be able to change the setting, Auto configuration must be disable. If the Bus Clock is 75MHz set it to 11/7/4, and if the Bus Clock is 66/60/55 MHz set it to 10/6/4. Default setting is 10/6/3.

### Memory Address Drive Strength

Leave on the default setting of 10mA, 10mA.

### SDRAM CAS Latency/RAS to CAS

The settings are 3/3 or 2/2. This option is for SDRAM CAS latency time and RAS# to CAS# delay time. The default setting is 3/3.

**Speculative Lead Off Timing**
> Leave on the default setting of Disabled.

**DRAM Page Idle Timeout (HCLK's)**
> The settings are 2 , 4 , 6, or 8 Clks. Default settings is 2 Clks.

**Fast EDO Read Cycle Timing**
> The BIOS will identify which type of DRAM is being used.
Choose the setting accordingly.  To customize, use this option. Choose
Enable or Disable. If the system is using EDO DRAM,  choose Enabled. But
if the system is using both EDO and FP DRAM, choose Disabled.

**SDRAM Speculative Read Logic**
> The settings are Enabled or Disabled.  The default setting is enable.

**Enhanced Paging**
> Leave on the default setting of Enabled.

**DRAM Refresh RAS Cycles (HCLS's)**
> Leave on the default setting of 5.

**DRAM Refresh Rate**
> Leave on the default setting of 15.6 us.

**8-Bit I/O Recovery Time / 16-Bit I/O Recovery Time**
> Choose the recovery time for 8-bit and 16-bit I/O cycles respec-
tively.

**CD-ROM Option**
> Leave on the default setting of 0.

**USB Keyboard/Mouse Support**
> Set this option to Enabled or Disabled USB keyboard/mouse.
The Optional and Fail-Safe default settings are Disabled.

## 4.5 Power Management Setup

1. Press <ENTER> on "Power Management Setup" of the main menu screen.

```
                AMIBIOS SETUP - POWER MANAGEMENT SETUP
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Power Management / APM          Enabled         Available  Options:
Instant On Support              Disabled        Enabled
Green PC Monitor Power State    Stand By        Disabled
Video Power Down Mode           Suspend
Hard Disk Power Down Mode       Stand By
Hard Disk Time Out (Minute)     Disabled
Standby Time Out (Minute)       10
Suspend Time Out (Minute)       10
Slow Clock Ratio                37.5-50%
Display Activity                Ignore
Serial port 1                   Monitor
Serial port 2                   Monitor
Parallel port                   Ignore
Floppy disk                     Ignore
Primary IDE 0                   Monitor
Primary IDE 1                   Monitor
Secondary IDE 0                 Ignore
Secondary IDE 1                 Ignore
Resume on Ring                  Disabled
Modem Use IO Port               N/A
Modem Use IRQ                   N/A             ESC:Exit  :Sel
Soft-Off by PWR-BTTN            Instant-off     PgUp/PgDn:Modify
RTC Alarm Resume From Soft Off  Disabled        F2/F3:Color
RTC Alarm Date                  N/A


RTC Alarm Hour                  N/A
RTC Alarm Minute                N/A
RTC Alarm Second                N/A
```

2. Use <UP> and <DOWN> to choose the item and <PGUP> and <PGDN> keys to modify the highlighted item.

3. After you have finished with the Power Management Setup, press <ESC> to go back to the main menu.

## Description of the item on screen follows:

### Power Management/APM

Set this option to Enabled to enable the Intel® 82371AB ISA power management features and APM(Advanced Power Management). The settings are Enabled, Inst-On(instant-on) or Disabled. The Optimal and Fail-Safe default settings are Disabled.

### Instant On Support (leave on the default setting of Disabled)

### Green PC Monitor Power State

This option specifies the power state that the green PC-compliant video monitor enters when AMI® BIOS places it in a power savings state after the specified period of display inactivity has expired. The settings are Off, Standby, Suspend or Disabled. The Optimal and Fail-Safe default settings are Standby.

### Video Power Down Mode

This option specifies the power conserving state that the VESA VGA video subsystem enters after the specified period of display inactivity has expired. The settings are Disabled, Standby or Suspend. The Optimal and Fail-Safe default settings are Standby.

### Hard Disk Power Down Mode

This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings are Disabled, Standby or Suspend. The Optimal and Fail-Safe default settings are Disabled.

### Hard Disk Timeout (Minute)

This option specifies the length of a period of hard disk drive inactivity. When this length of time expires, the computer enters power-conserving state specified in the Hard Disk Power Down mode option (see the previous page). The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

### Standby Timeout (Minute)

This option specifies the length of a period of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

### Suspend Timeout (Minute)

This option specifies the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

### Slow Clock Ratio

This option specifies the speed at which the system clock runs in power saving states. The settings are expressed as a ratio between the normal CPU clock speed and the CPU clock speed when the computer is in the power-conserving state. The settings are 1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64 or 1:128. The Optimal and Fail-Safe defaults are 1:8.

### Display Activity/Serial port 1/Serial port 2/Parallel port/Floppy disk/Primary IDE 0/Primary IDE 1/Secondary IDE 0/ Secondary IDE 1

When set to Monitor, these options enable event monitoring on the specified hardware interrupt request line. If set to Monitor and the computer is in a power saving state, AMI® BIOS watches for activity on the specified IRQ line. The computer enters the full on power state if any activity occurs.

AMI® BIOS reloads the Standby and Suspend timeout timers if activity occurs on the specified IRQ line.

The settings for each of these options are Monitor or Ignore. The Optimal and Fail-Safe default settings are Disabled for all the above options except IRQ3, IRQ4, IRQ7, IRQ12, IRQ14 or IRQ15. The Optimal default settings for these options is Monitor.

## Resume on Ring

This function is ring wake up system, from system OFF to ON. During Disabled, the system will not turn on from modem ring wake up. And during Enabled, the system will boot up if there's an incoming call from the modem.

## Modem Use IO Port

Leave on default setting of N/A.

## Modem Use IRQ

This indicates which IRQ no. will be used by the MODEM (if there is a MODEM). The settings are 3, 4, 5 ,7 ,9, 10, or N/A.

## Soft-Off by PWR-BTTN

The settings are Delay 4 sec or Instant-off. During Delay 4 sec, if you push the switch one time the system goes into suspend mode and if you push it more than 4 second, the system will turn off. And during Instant-off, the system will shut down once you push the switch.

## RTC Alarm Resume From Soft Off

This function is for setting Date, Hour, Minute , and Second for your system to boot up. During Disabled, you can not use this function. And during Enabled, Choose the Date, Hour, Minute, and Second:

| | |
|---|---|
| **RTC Alarm Date** | You can choose the date that the system will boot up. |
| **RTC Alarm Hour** | You can choose the hour of the day that the system will boot up |
| **RTC Alarm Minute** | You can choose the minute that the system will boot up. |
| **RTC Alarm Second** | You can choose the second that the system will boot up. |

## 4.6 PCI/Plug and Play Setup

1.  Press <ENTER> on "PCI/Plug and Play Setup" of the main menu screen.

```
                  AMIBIOS SETUP - PCI/PLUG AND PLAY SETUP
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Plug and Play Aware O/S          No        Available  Options:
Reset NVRAM                      No        Enabled
PCI Latency Timer (PCI Clocks)   64        Disabled
PCI VGA Palette Snoop            Disabled
PCI IDE Busmaster                Disabled
OffBoard PCI IDE Card            Auto
OffBoard PCI IDE Primary IRQ     Disabled
OffBoard PCI IDE Secondary IRQ   Disabled
Assign IRQ to PCI VGA            Yes
PCI Slot1 IRQ Priority           Auto
PCI Slot2 IRQ Priority           Auto
PCI Slot3 IRQ Priority           Auto
PCI Slot4 IRQ Priority           Auto
DMA Channel 0                    PnP
DMA Channel 1                    PnP
DMA Channel 3                    PnP
DMA Channel 5                    PnP
DMA Channel 6                    PnP
DMA Channel 7                    PnP
IRQ3                             ISA
IRQ4                             ISA
IRQ5                             PCI/PnP    ESC:Exit  :Sel
IRQ7                             ISA        PgUp/PgDn:Modify
IRQ9                             PCI/PnP    F2/F3:Color
```

```
IRQ10                            PCI/PnP
IRQ11                            PCI/PnP
IRQ14                            PCI/PnP
IRQ15                            PCI/PnP
Reserved Memory Size             Disabled
Reserved Memory Address          C8000
```

2.  Use <UP> and <DOWN> to choose the item and <PGUP> and <PGDN> keys to modify the highlighted item.

3.  After you have finished with the PCI/Plug and Play Setup, press <ESC> to go back to the main menu.

## Description of the item on screen follows:

### Plug and Play Aware O/S

Set this option to Yes if the operating system in this computer is aware of and follows the Plug and Play specification. Currently, only Windows® 95 is PnP-aware. The settings are Yes or No. The Optimal and Fail-Safe default settings No.

### Clear NVRAM

During Enabled, this option will clear the NVRAM on every boot.

### PCI Latency Timer (PCI Clocks)

This option specifies the latency timings (in PCI clocks) for all PCI devices on the PCI bus. The settings are 32, 64, 96, 128, 160, 192, 224 or 248. The Optimal and Fail-Safe default settings are 64.

### PCI VGA Palette Snoop

When this option is set to Enabled, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and ISA) and the Bit settings are:

**Disabled** - Data read and written by the CPU is only dircted to the PCI VGA device's palette registers.

**Enabled** - Data  read and written by the CPU is directed to the both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

This option must be set to Enabled if an ISA adapter card requires VGA palette snooping. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disabled.

### PCI IDE BusMaster

Set this option to Enabled to specify that the IDE controller on the PCI local bus includes a bus mastering capability. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disabled.

### Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is installed in the computer. You must specify the PCI expansion slot on the mainboard where the offboard PCI IDE controller is installed. If an offboard PCI IDE controller is used, the onboard IDE controller is automatically disabled. The settings are Auto (AMI® BIOS automatically determines where the offboard PCI IDE controller adaper card is installed), Slot1, Slot2, Slot3 or Slot4. The Optimal and Fail-Safe settings are Auto.

If an offboard PCI IDE controller adapter card is installed in the computer, you must also set the Offboard PCI IDE Primary IRQ and Offboard PCI IDE Secondary IRQ options.

### Offboard PCI IDE Primary IRQ/
### Offboard PCI IDE Secondary IRQ

These options specify the PCI interrupt used by the Primary (or Secondary) IDE channel on the offboard PCI IDE controller. The settings are Disabled, Hardwired, INTA, INTB, INTC or INTD. The Optimal and Fail-Safe default settings are Disabled.

### Assign IRQ to PCI VGA

Choose the IRQ to be assigned to the PCI VGA display adapter card. The Optimal and Fail-Safe default settings No.

## DMA Channel 0/DMA Channel 1/DMA Channel 3/DMA Channel 5/DMA Channel 6/DMA Channel 7

These options specify the bus that the specified DMA channel is used. These options allow you to reserve DMAs for legacy ISA adapter cards.

These options determine if AMI® BIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can use these options to reserve the DMA by assigning an ISA/EISA setting to it.

## IRQ3/IRQ4/IRQ5/RQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards.

These options determine if AMI® BIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these options to reserve the IRQ by assigning an ISA/EISA setting to it. Onboard I/O is configured by AMI® BIOS. All IRQs used by onboard I/O are configured as PCI/PnP. If all IRQs are set to ISA/EISA and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices. The settings are ISA/EISA or PCI/PnP. The Optimal and Fail-Safe default settings are IRQ3 through 7 are ISA/EISA. The Optimal and Fail-Safe default settings PCI/PnP.

## Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are Disabled, 16K, 32K, or 64K. The Optimal and Fail-Safe default settings are Disabled.

## Reserved Memory Address

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards.

## 4.7 Peripheral Setup

1. Press <ENTER> on "Peripheral Setup" of the main menu screen.

```
                    AMIBIOS SETUP - PERIPHERAL SETUP
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OnBoard FDC                     Enabled          Available  Options:
OnBoard Serial PortA            3F8h/COM1        Enabled
OnBoard Serial PortB            2F8h/COM2        Disabled
IR Port Support                 Disabled
  IR Base Address Select        2E8
  IR IRQ Select                 10
OnBoard Parallel Port           378
  Parallel Port Mode            Normal
  EPP Version                   N/A
  Parallel Port IRQ             7
  Parallel Port DMA Channel     N/A
Onboard IDE                     Both




                                                 ESC:Exit  :Sel
                                                 PgUp/PgDn:Modify
                                                 F2/F3:Color
```

2. Use <up> and <down> to choose the item and  <PgUp> and
   <PgDn> keys to modify the highlighted item.

3. After you have finished with the Peripheral Setup, press <ESC> to
   go back to the main menu.

## Description of the item on screen follows:

### Onboard FDC

Choose Auto, for the BIOS to automatically detect the device

| If the ISA add-on card has | Onboard FDC to be set  at |
|---|---|
| FDC exist | Disabled |
| none FDC exist | Enabled |

Choose Enabled, Enabling onboard FDC.
Choose Disabled, Disabling onboard FDC.
The Optimal and Fail-Safe default settings are Auto.

### Onboard Serial Port A/Onboard Serial Port B

Choose Enabled, for the BIOS to automatically detect the device.

| If the ISA add-on card has | | | | Onboard Serial port to be set  at | | | |
|---|---|---|---|---|---|---|---|
| COM1 (I/O:3F8H) | COM2 (I/O:3F8H) | COM3 (I/O:3E8H) | COM4 (I/O:2E8H) | PORT1 | IRQ ASSIGNED | PORT2 | IRQ ASSIGNED |
| ✓ | ✓ | ✓ | ✓ | DISABLED | X | DISABLED | X |
| ✓ | ✓ | X | X | COM3 | 4 | COM4 | 3 |
| X | X | ✓ | ✓ | COM1 | 4 | COM2 | 3 |
| ✓ | X | X | ✓ | COM2 | 3 | COM3 | 4 |
| X | ✓ | ✓ | X | COM1 | 4 | COM4 | 3 |
| ✓ | ✓ | ✓ | X | COM4 | 3 | DISABLED | X |
| ✓ | ✓ | X | ✓ | COM3 | 4 | DISABLED | X |
| ✓ | X | ✓ | ✓ | COM2 | 3 | DISABLED | X |
| X | ✓ | ✓ | ✓ | COM1 | 4 | DISABLED | X |
| X | X | X | X | COM1 | 4 | COM2 | 3 |
| ✓ | X | X | X | COM2 | 3 | COM3 | 4 |
| X | ✓ | X | X | COM1 | 4 | COM3 | 4 |
| X | X | ✓ | X | COM1 | 4 | COM2 | 3 |
| X | X | X | ✓ | COM1 | 4 | COM2 | 3 |

**Note:** *If the onboard serial port interrupt and ISA add-on card interrupt are in conflict, the serial  port will not work properly. Please disable one of the devices.*

**IR Port Support**(leave on the default setting of Disabled)

### Onboard Parallel Port

   Choose Auto,  for the BIOS to automatically assigned onboard parallel port to available parallel port or disabled

| If the ISA add-on card has | | | Onboard parallel port | |
|---|---|---|---|---|
| LPT1 I/O:378H | LPT2 I/O:278H | LPT3 I/O:3BCH | PORT ASSIGNED | IRQ ASSIGNED |
| ✓ | ✓ | ✓ | Disabled | X |
| ✓ | ✓ | X | LPT3 | 5 |
| ✓ | X | ✓ | LPT2 | 5 |
| X | ✓ | ✓ | LPT1 | 7 |
| ✓ | X | X | LPT2 | 5 |
| X | ✓ | X | LPT1 | 7 |
| X | X | ✓ | LPT1 | 7 |
| X | X | X | LPT1 | 7 |

> **Note:** *If the onboard parallel port interrupt and ISA add-on card interrupt are in conflict, the parallel port will not work properly. Please disable one of the devices.*

### Parallel Port Mode

   This option allows user to choose the operating mode of the onbaord parallel port.  The settings are Normal, SPP/EPP or ECP mode.

**EPP Version**(leave on the default setting of N/A)

## Parallel Port IRQ

If the onboard parallel mode is not on auto mode, the user can select the interrupt line for onboard parallel port.  We suggest that the user select the interrupt for the onboard parallel port as shown below:

| Onboard parallel port set at | Parallel Port IRQ |
|---|---|
| LPT1(378H) | 7 |
| LPT2(278H) | 5 |
| LPT3(3BCH) | 5 |

## Parallel Port DMA Channel

This option allows user to choose DMA channel 1 to 3 for the onboard parallel port on ECP mode.

## Onboard IDE

Set this option to enable or disable on board IDE controller.

## 4.8  Hardware Monitor Setup

This settings are use by LM78 chipset which is an optional function.  To enable the best performance, leave all the setting on the default mode.

```
                AMIBIOS SETUP - PERIPHERAL SETUP
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CPU Type                       Pentium     Available  Options:
CPU Current Voltage (V)        3.3

--- LM78 Setup  ---
CPU Thermal Setup (℃)          60
CPU Current Temperature (℃)    30
Thermal Slow Clock Ratio       75%
CPU Temperature Display        yes
System Temperature Set (℃)     50
System Current Temperature (℃) 29
Chassis Intrusion              Disabled
Power FAN Message Display      No
CPU FAN Message Display        Yes
System Temperature Display     Yes




                                           ESC:Exit :Sel
                                           PgUp/PgDn:Modify
                                           F2/F3:Color
```

## Description of the item on screen follows:

### CPU Thermal Setup
This is for setting the CPU temperature.  You must leave this on the default setting of 60.

### CPU Current Temperature
This will show the CPU Current temperature.

### Thermal Slow Clock Ratio
This will show the thermal slow clock ratio

### CPU Temperature Display
If set to yes, during boot-up this will show the CPU temperature.

### System Temperature Set
This is for setting the system temperature.  You must leave this on the default setting of 50.

### System Current Temperature
This wil show the current temperaure of the system.

### Chassis Intrusion
During Enabled, the on-board chassis intrusion sensor will monitor any intrusion on the chassis.

### Power FAN Message Display/CPU FAN Message Display
If set to yes, if any of the fan malfunction then it will show warning messages.

### System Temperature Display
If set to yes, if the temperature gets to high or to low, this will show warning messages.