MS-5158

Intel® 430TX Chipset

FLASH BIOS

AMI® / AWARD® PnP BIOS, PC 97

PCI IDE

Dual channel for 4 HDD/ CD-ROM, Supports PIO Mode & Ultra DMA/33 (up to 33MB/sec)

CHIPSET

Intel® 430TX

L2 CACHE

512K PB cache on board

CPU SOCKET

ZIF Socket 7, Supports Intel® Pentium® processors, AMD® & Cyrix® processor

USB CONN.

Double deck USB connectors

SLOTS

4 16-bit ISA
4 32-bit PCI
(1 PCI/ISA shared)

SUPER I/O

16550 Fast UART, EPP/ ECP Printer Port & SIR/FIR/CIR Options

MEMORY

72-pin SIMM x 2, 168-pin DIMM x 3, Supports SDRAM, EDO & FP DRAM, Max. 256MB

CONNECTOR

PS/2 K/B + PS/2 Mouse

SIZE & FORM FACTOR

30.5 x 18.6 cm, ATX double deck compatible with Intel® Venus mainboard

CPU VOLTAGE REGULATOR

Switching Mode DC to DC converter on board, supports AMD® K6 and Cyrix® 6x86MX processors
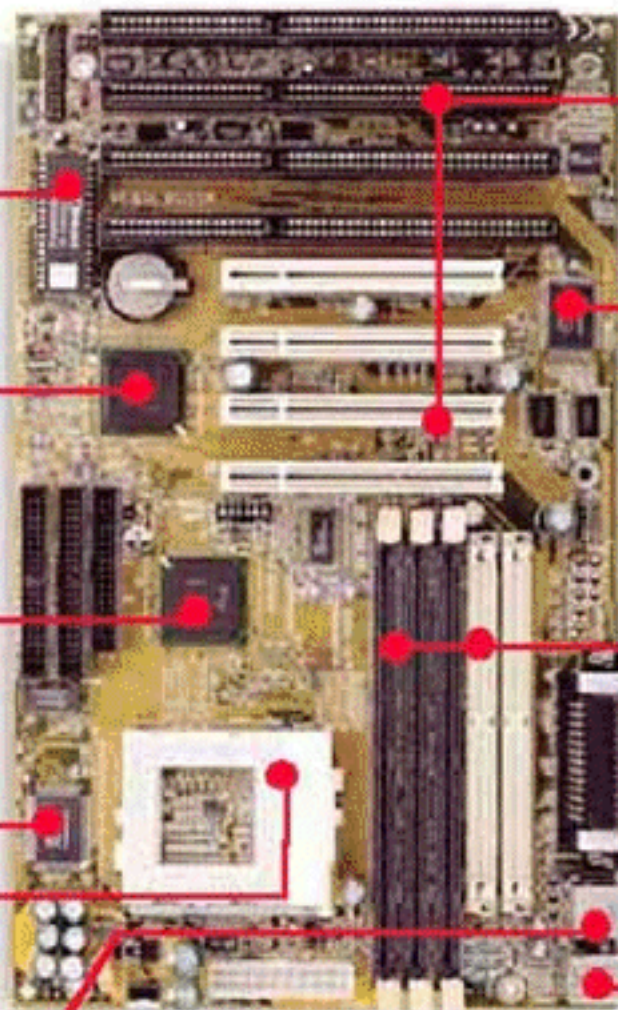
Chapter 1

INTRODUCTION

The MS-5158 is a high-performance personal computer mainboard. This mainboard supports Intel® Pentium®/Pentium® with MMX™ technology processors, Cyrix® 6x86/6x86L/6x86MX processors and AMD® K5/K6 processors.   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 Hardware Monitor Controller which are optional functions. The LM78 function includes: CPU chassis/power fan control, CPU temperature detect and system voltage detect.

1.1 Mainboard Features

CPU
- Socket 7 supports Intel® Pentium® and Pentium® with MMX™ technology processors
- The Cyrix® 6x86/6x86L/6x86MX and AMD® K5/K6 processors are also supported.

Chipset
- Intel® 82430TX 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
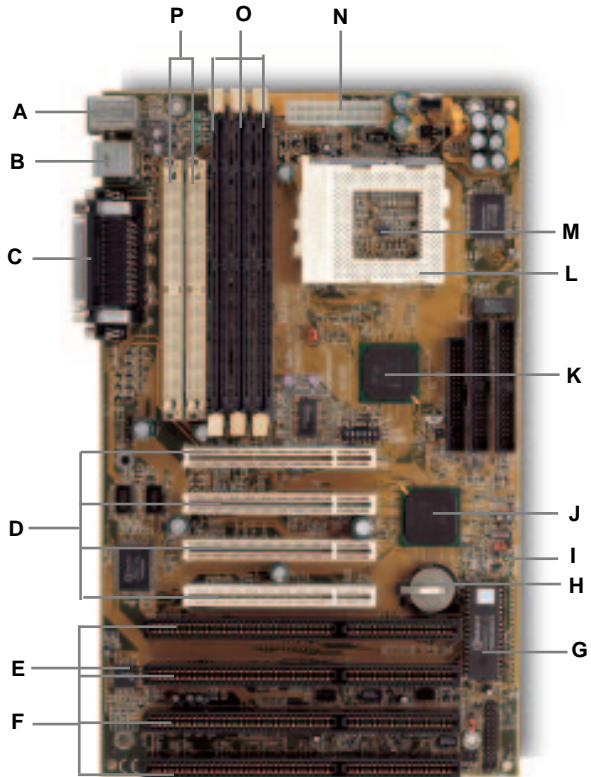
|		
A	**PS/2® Ports**	**Top: Mouse**
		Bottom: Keyboard
B	**USB Ports**	**Top: Port 1**
		Bottom: Port 2
C	**COM/LPT Ports**	**Top: Parallel Port**
		Bottom: Two Serial Ports
D	**Four 32-Bit PCI SLOTs**	
E	**LM78**	
F	**Four 16-Bit ISA SLOTs**	
G	**Flash BIOS**	
H	**Coin Type Battery**	
I	**Chassis Intrusion Sensor**	
J	**Intel® 82371AB (PIIX 4)**	
K	**Intel® 82489TX**	
L	**CPU Socket 7**	
M	**ATX 20-Pin Power Connector**	
N	**Three 168-PIN DIMM SOCKETs**	
O	**Two 72-PIN SIMM SOCKETs**	

1.3 Mainboard Layout
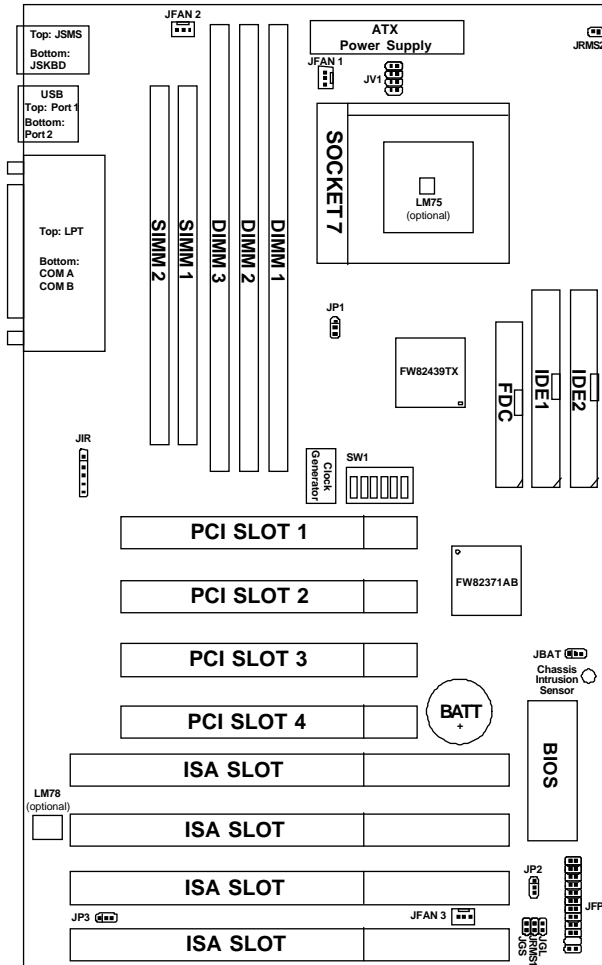
MS-5158

Chapter 2

HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

The MS-5158 system board operates with **Intel® Pentium®/Pentium® 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.

Open Lever

Sliding
Plate

Pin 1

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.

CPU

White dot/
Cut edge

3. Press the lever down to complete the installation.

Close
Lever

CPU
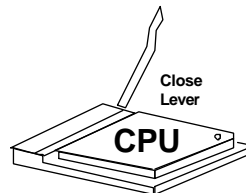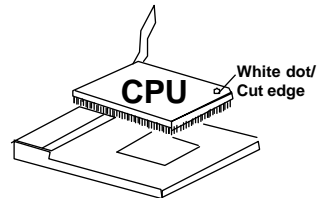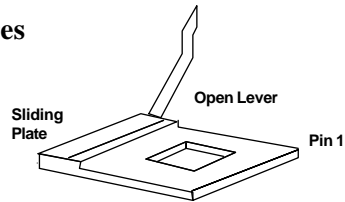
2.1-2 CPU Core Speed Derivation Procedure

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	<u>CPU Clock</u>	=	66MHz
	<u>Core/Bus ratio</u>	=	3/2
then	<u>CPU core speed</u>	=	<u>Host Clock</u> x <u>Core/ Bus ratio</u>
		=	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
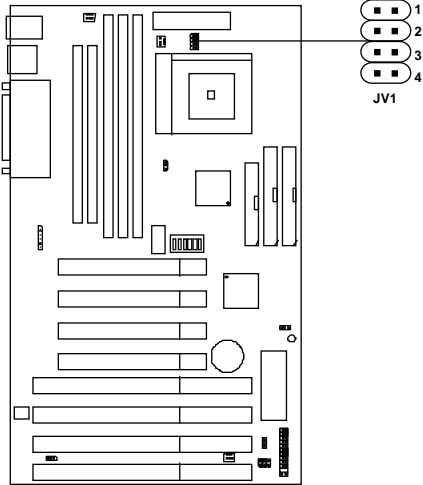
V I/O	Vcore	JV1
3.5	3.5	
3.3	3.3	
3.3	3.2	
3.3	2.9	

V I/O	Vcore	JV1
3.3	2.8	(1, 2, 3, 4 with jumper on 4)
3.3	2.5	(1, 2, 3, 4 with jumpers on 1, 3)
3.3	2.4	(1, 2, 3, 4 with jumper on 3)
3.3	2.3	(1, 2, 3, 4 with jumpers on 1, 2)
3.3	2.2	(1, 2, 3, 4 with jumper on 2)
3.3	2.1	(1, 2, 3, 4 with jumper on 1)
3.3	2.0	(1, 2, 3, 4 no jumper)

2.1-4 CPU Speed and Voltage Setting: SW1 & JV1
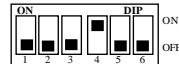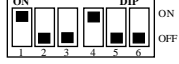
To adjust the speed and voltage of the CPU, you must know the specifications of your CPU (*always ask the vendor for CPU specifications*). This mainboard uses two different Clock Generator, so before adjusting SW1, check your clock generator. Then refer to **Table 2.1 (Intel® processors)**, **Table 2.2 (Cyrix® processors)** and **Table 2.3 (AMD® processors)** for proper setting.
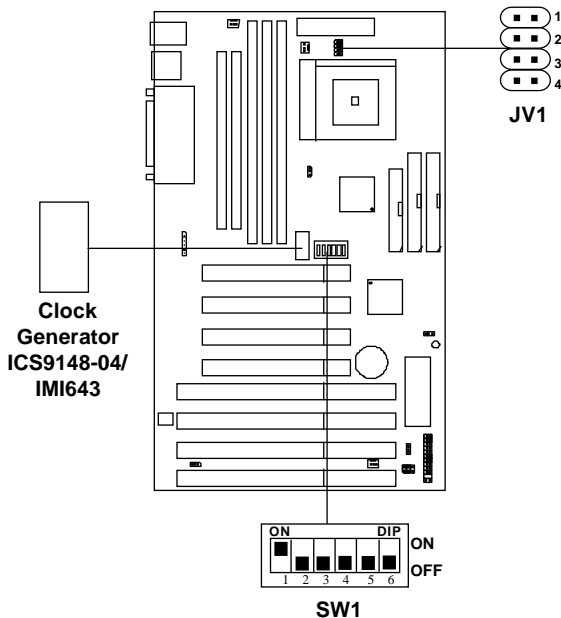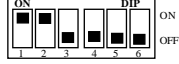
Note: The table provided can be used by both clock generator. The only difference with the **ICS9148-04** and **IMI643** Clock Generator is the CPU clock frequency of 50, 55, 83 MHz. Since these 3 frequencies are not supported by the current CPUs, so the jumper settings for both regulator are the same.

Table 2.1 Intel® processors

a. Intel® Pentium® processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
90 MHz	3.38/3.52		JV1 (1-2-3-4)	SW1 diagram
100 MHz				SW1 diagram
120 MHz				SW1 diagram
133 MHz				SW1 diagram
150 MHz				SW1 diagram
166 MHz				SW1 diagram
200 MHz				SW1 diagram

b. Intel® Pentium® processors with MMX™ technology
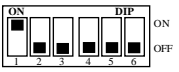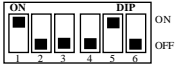
CPU Type	VI/O	Vcore	JV1	SW1
166 MHz	3.3	2.8	JV1 (1-2-3-4)	SW1 diagram
200 MHz				SW1 diagram
233 MHz				SW1 diagram

Note: If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.
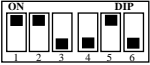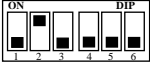
Table 2.2 Cyrix® 6x86/6x86L/6x86MX processors

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

a. Cyrix® 6x86/6x86L processors

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 processors

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	
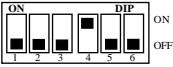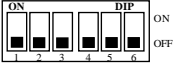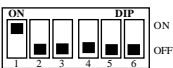
Note: If you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.
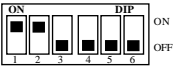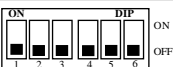
Table 2.3 AMD® processors

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

a. AMD® K5 processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
PR90				
PR100				
PR120	3.52			
PR133/PR150				
PR166				

b. AMD® K6 processors

PR166	3.3	2.9		
PR200				
PR233	3.3	3.2		

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
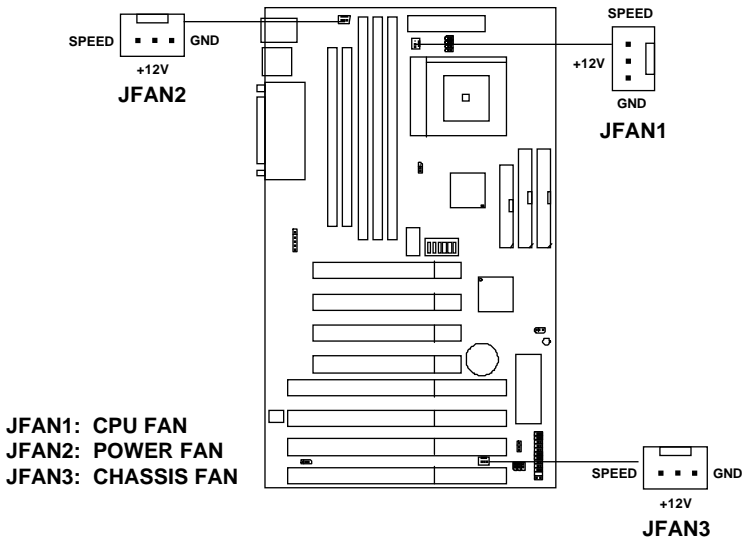
For fans with fan speed sensor, every rotation of the fan will send out 2 pulses. LM78 will count and report the fan rotation speed.

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
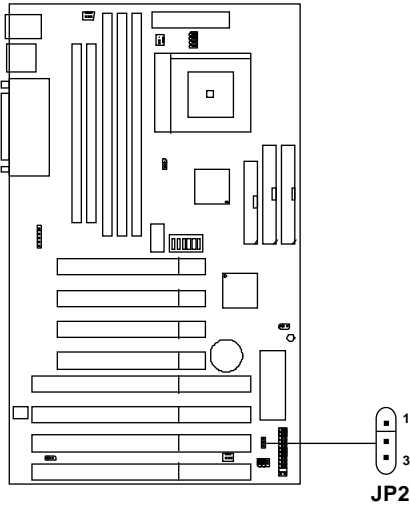
JP2
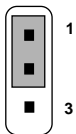
**PNP Setting
(cannot update new BIOS)**

JP2
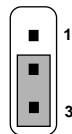
Update NEW BIOS

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
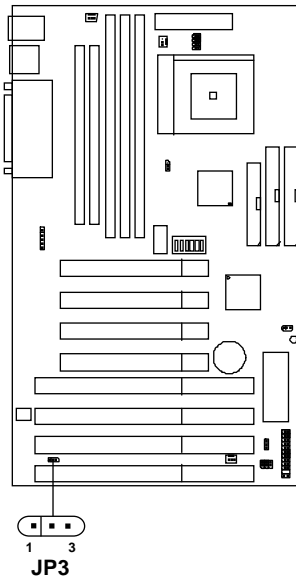
Pin 1:	Standby 5V
Pin 2:	Ring Single Input
Pin 3:	Ground

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.

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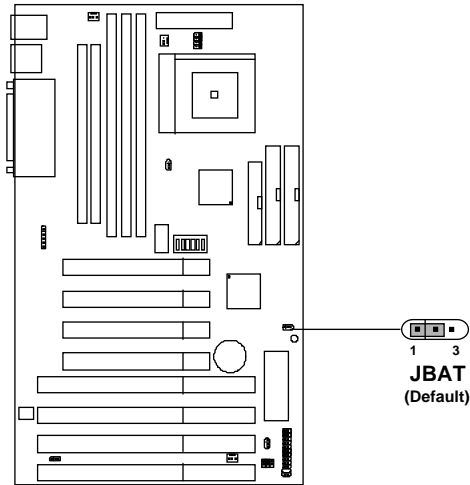
Note: You can clear CMOS by shorting 2-3 pin, while the system is off.
Then, return to 1-2 pin position. Avoid clearing the CMOS while
the system is on , it will damage the mainboard.

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.
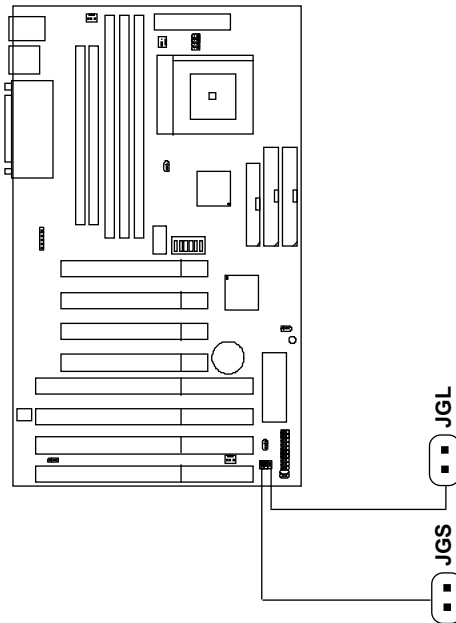
Note: To make JGS function, you must go to the BIOS power management and enable it there.

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.
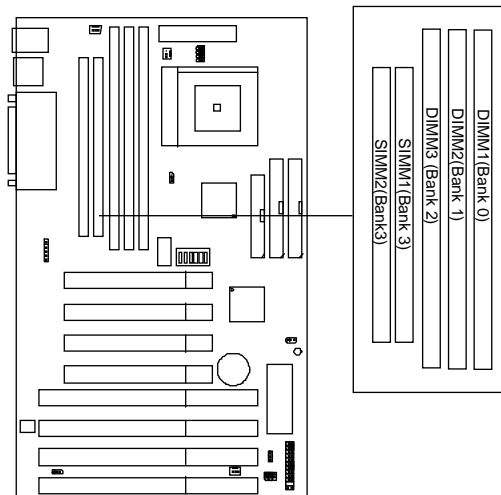
2.6-2 Memory Installation Procedures:

A. How to install SIMM Module

**Notched
End**   **Single Sided SIMM**

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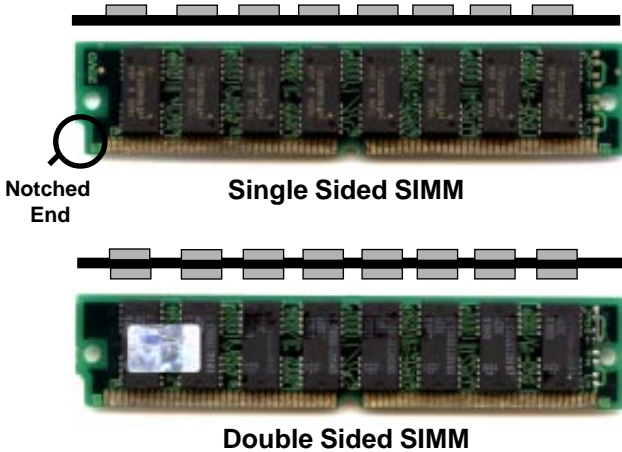
1. The SIMM slot has a "*Plastic Safety
    Tab*" and the SIMM memory module
    has a "Notched End", so the SIMM
    memory module can only fit in one
    direction.

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.
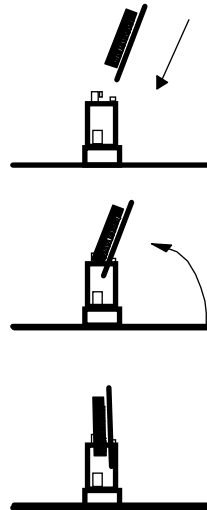
B. How to install DIMM Module
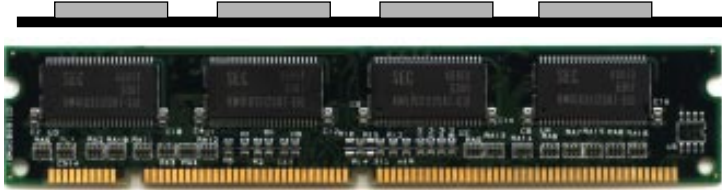
Single Sided DIMM
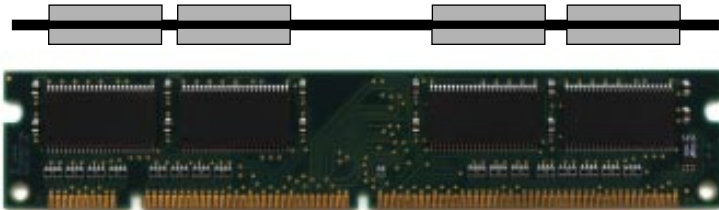
Double Sided DIMM

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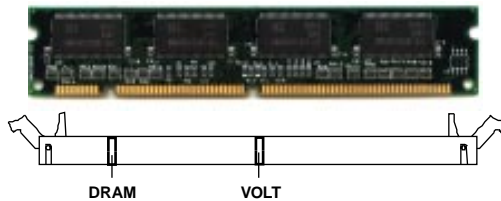
3. Close the plastic clip at the side of the DIMM slot.

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 connec-
tor block for easy installation.
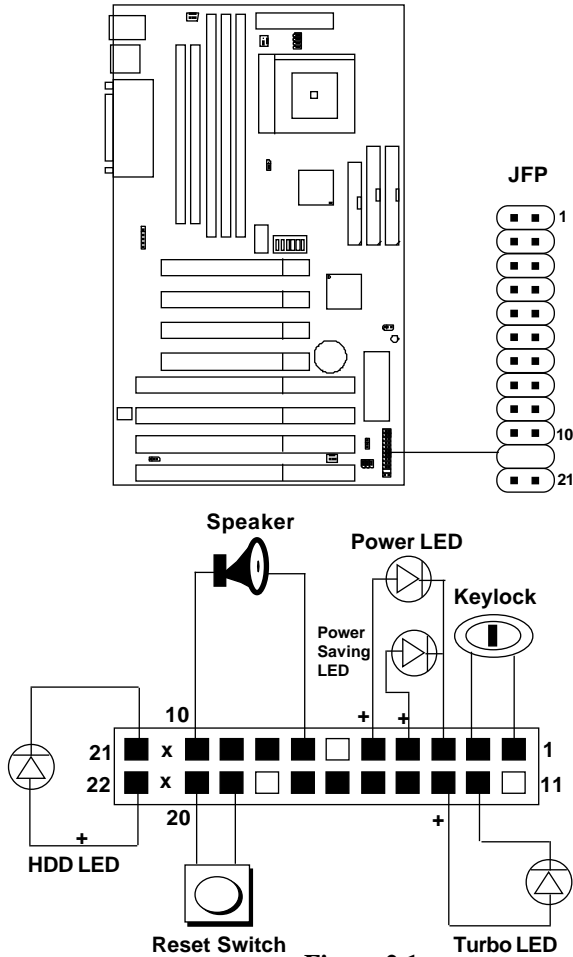
Figure 2.1

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.
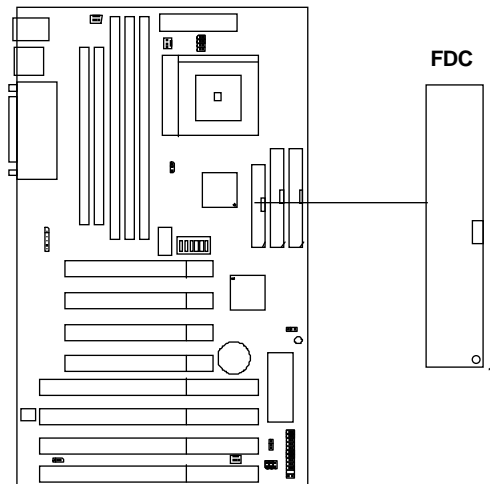
2.9 Hard Disk Connectors: IDE1 & IDE2

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.
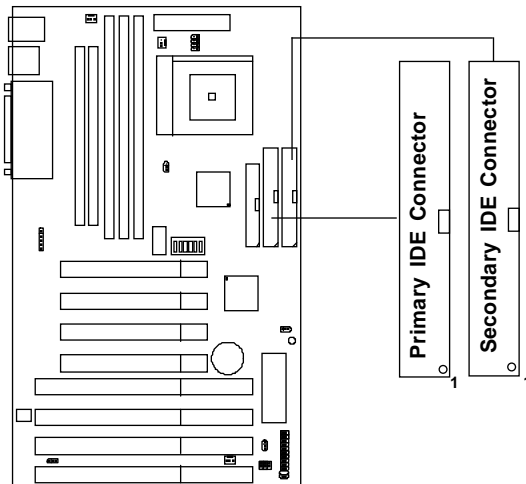
IDE1(primary IDE connector)

    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**
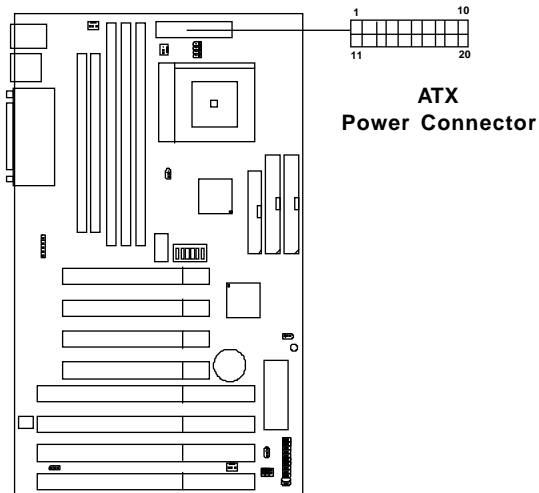
ATX Power Connector Pin Description

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.
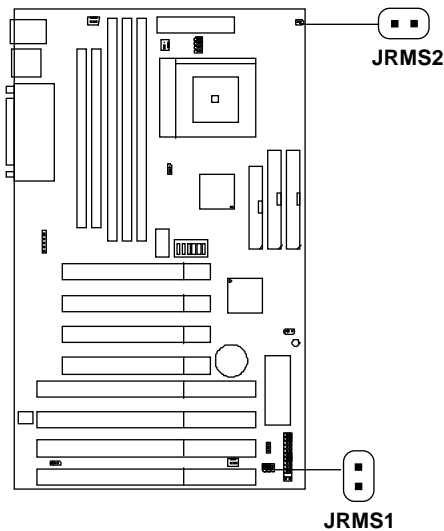
2.12 Infrared Module Connector: JIR

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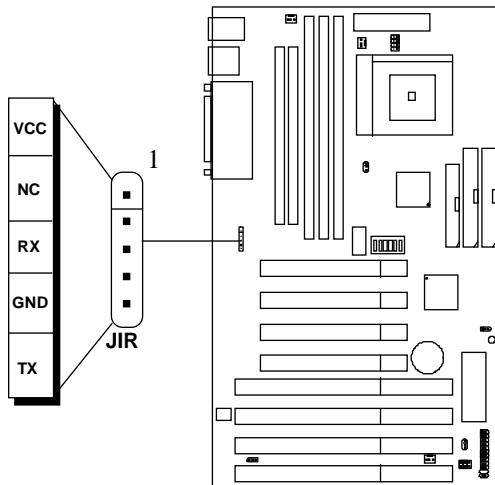
Reserved for W83977ATF
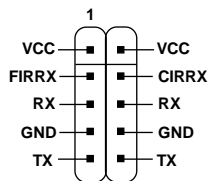
2.13 Serial Port Connectors: COM A & COM B

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.
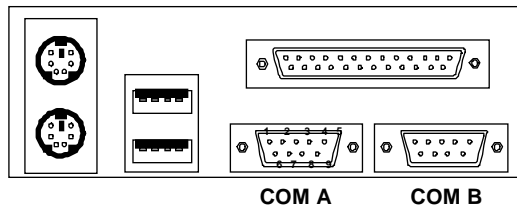
Serial Ports (9-pin Male)

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
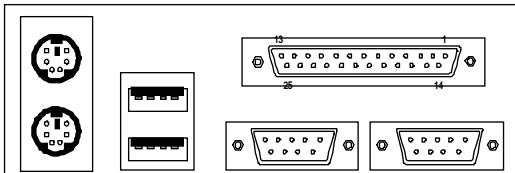
PIN DEFINITION

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)
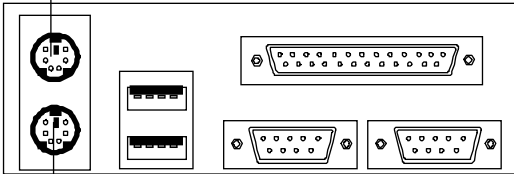
PS/2® Keyboard (6-pin Female)

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
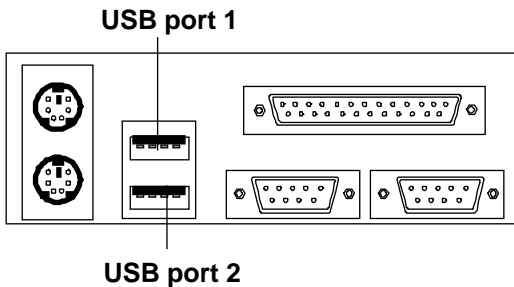
Chapter 3

AWARD® BIOS SETUP

Award's® 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> immediately to allow you to enter Setup. The other way to enter Setup is to power on the computer. When the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Del> key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys.

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 ten 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  (2A59IM4A)
                      CMOS  SETUP  UTILITY
                      AWARD  SOFTWARE,  INC.
 ┌─────────────────────────────────────────────────────────────┐
 │ ┌───────────────────────────┬─────────────────────────────┐ │
 │ │                           │                             │ │
 │ │  STANDARD  CMOS  SETUP     │  INTEGRATED  PERIPHERALS     │ │
 │ │                           │                             │ │
 │ │  BIOS  FEATURES  SETUP     │  SUPERVISOR  PASSWORD        │ │
 │ │                           │                             │ │
 │ │  CHIPSET  FEATURES  SETUP  │  USER  PASSWORD              │ │
 │ │                           │                             │ │
 │ │  POWER  MANAGEMENT  SETUP  │  IDE  HDD  AUTO  DETECTION   │ │
 │ │                           │                             │ │
 │ │  PNP/PCI  CONFIGURATION    │  SAVE  &  EXIT  SETUP        │ │
 │ │                           │                             │ │
 │ │  LOAD  SETUP  DEFAULTS     │  EXIT  WITHOUT  SAVING       │ │
 │ │                           │                             │ │
 │ ├───────────────────────────┴─────────────────────────────┤ │
 │ │ 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.

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  Floppy Seek    : Enabled   DC000-DFFFF Shadow   :Disabled
 Boot up NumLock status  : On
 Boot up System Speed    : High
 Typematic Rate Setting  : Disabled
 Typematic Rate(char/sec) : 6
 Typematic Delay(Msec)   : 250
 Security Option         : Setup
 PCI/VGA palette snoop   : Disabled
 OS select for DRAM>64MB : Non-OS2

                                    Esc : Quit    ↑↓→←: Select item
                                    F1 : Help      PU/PD/+/- : modify
                                    F5 : Old 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/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 Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 720K, 1.2M and 1.44M are all 80 tracks.

Enabled(default)	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

Boot Up NumLock Status

The default value is On.

On (default)	Keypad is numeric keys.
Off	Keypad is arrow keys.

Boot Up System Speed

This selects the speed that the system will run at immediately after power up.

High (default)	Sets the speed to high.
Low	Sets the speed to low.

Gate A20 Option

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast(default)	Default : Fast. The A20 signal is controlled by Port 92 or chipset specific method.

Typematic Rate Setting

This determines the typematic rate.

Enabled	Enable typematic rate and typematic delay programming.
Disabled(default)	Disable typematic rate and typematic delay programming. The system BIOS will use default value of this 2 items and the default is controlled by keyboard.

Typematic Rate (Chars/Sec)

6 (default)	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

Typematic Delay

Choose the length of delay from the time you press a key and the character starts repeating.   (Units are mil-secs)

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

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 :3                                             │
 │ 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, and 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 signi-
fies 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 │
│ Doze Mode           :Disabled │ Secondary IDE 0      : Disabled │
│ Standby Mode        :Disabled │ Secondary IDE 1      : Disabled │
│ Suspend Mode        :Disabled │ Floppy Disk          : Enabled  │
│ HDD Power Down      :Disabled │ Serial Port          : Enabled  │
│ Throttle Duty Cycle :62.5%    │ Parallel Port        : Enabled  │
│ VGA Active Monitor  :Enabled  │                                  │
│ Soft-Off by PWR-BTTN :Delay 4sec │                               │
│ CPUFAN Off In Suspend :Enabled │                                 │
│ Resume by Ring      :Disabled │                                  │
│ Resume by Alarm     :Disalbed │                                  │
│ Date(of Month) Alarm :5       │                                  │
│ Time(hh:mm:ss) Alarm :11:00:00 │                                 │
│                               │                                  │
│                               ├──────────────────────────────────│
│                               │ Esc : Quit    ↑↓→← : Select item │
│ ** Break Event From Suspend ** │ F1 : Help     PU/PD/+/- : modify │
│ IRQ 8  Clock Event : Disabled │ 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, before this function will work.

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, before this function will work.

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 :Auto   │  Primary IDE INT#      : A        │
 │ Reset Configuration Data :Disabled│ Secondary IDE INT#    : B        │
 │                                 │                                  │
 │ IRQ-3 assigned to     :Legacy ISA│ Assign IRQ for VGA     : Disabled │
 │ IRQ-4 assigned to     :Legacy ISA│                                  │
 │ IRQ-5 assigned to     :PCI/ISA PnP│ Used MEM base addr    : C800     │
 │ IRQ-7 assigned to     :PCI/ISA PnP│ Used MEM Length       : 8K       │
 │ 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 willbe 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 1-5:   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.

Used MEM Length

Choose 8K, 16K, 32K, or 64K MEM length for the MEM used by the Legacy ISA address.

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:

" Load Setup Defaults (Y / N) ? N "

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 Integrated Peripherals

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

```
┌────────────────────────────────────┬───────────────────────────────────┐
│ IDE HDD Block Mode      : Enabled   │ Onboard Parallel Mode    :ECP/EPP  │
│ IDE Primary Master PIO  : Auto      │ ECP Mode Use DMA         :3        │
│ IDE Primary Slave PIO   : Auto      │ Parallel Port EPP Type   :EPP1     │
│ IDE Secondary Master PIO : Auto     │                                    │
│ 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 ├───────────────────────────────────┤
│ Onboard Serial Port 2    : 2F8/IRQ3 │ Esc : Quit    ↑↓→← : Select item   │
│ UART  2  Mode            : ASKIR    │ F1 : Help       PU/PD/+/- : modify │
│ IR Function Duplex       : Half     │ F5 : Old Value(Shift) F2 : Color   │
│ RxD , TxD Active         : Hi , Hi  │ F6 : Load BIOS Defaults            │
│ Onboard Parallel Port    : 378H/IRQ7│ 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 can not 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.

PCI Slot IDE 2nd Channel

Enabled/Disabled   Choosing Enabled will allow the system
to access the 2nd IDE channel without a
device driver. If the Off-Board PCI IDE
add-on card is installed, the 2nd IDE
channel will need to be used.

Onboard FDD 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.

UART 2 MODE
    Standard/ASKIR/   The system's built-in IR (Infrared) is on the on-board Super I/O chipset and it shares serial port 2 with UART 2. Only one option can be selected for serial port 2, either the IR or UART. Selecting the IR mode will prompt the following message:

IR Function Duplex
    Half/Full   Users can choose between operating the IR in Half duplex or Full duplex mode. Half duplex designates one IR as a receiver and one as a transmitter. Full duplex mode designates that the two IRs receive and transmit data together simultaneously.

RxD , TxD Active
    Hi-Hi/Hi-Lo/
    Lo-Hi/Lo-Lo   The user can choose between the preceding RxD (Receive Data), TxD (Transmit Data) activity levels.

Onboard Parallel Port
    Disabled/
    (3BCH/IRQ7)/   There is a built-in parallel port on the
    (278H/IRQ5)/   on-board Super I/O chipset that
    (378H/IRQ5)   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: "Parallel Port EPP Type." At this time either EPP 1.7 spec. or EPP 1.9 spec. can be chosen.

USB Controller
Enabled/Disabled

Choosing Enabled, will enable the onboard USB port.

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:

"Enter Password:"

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:

"Confirm Password:"

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
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            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
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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
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 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 respectively.

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.