

MS-5156

PCI Pentium® TX4 M/B (Intel® 430TX Chipset)

FLASH BIOS

AMI® / AWARD®
PnP BIOS

SLOTS

3 16-bit ISA
5 32-bit PCI
(1 shared)

PCI IDE

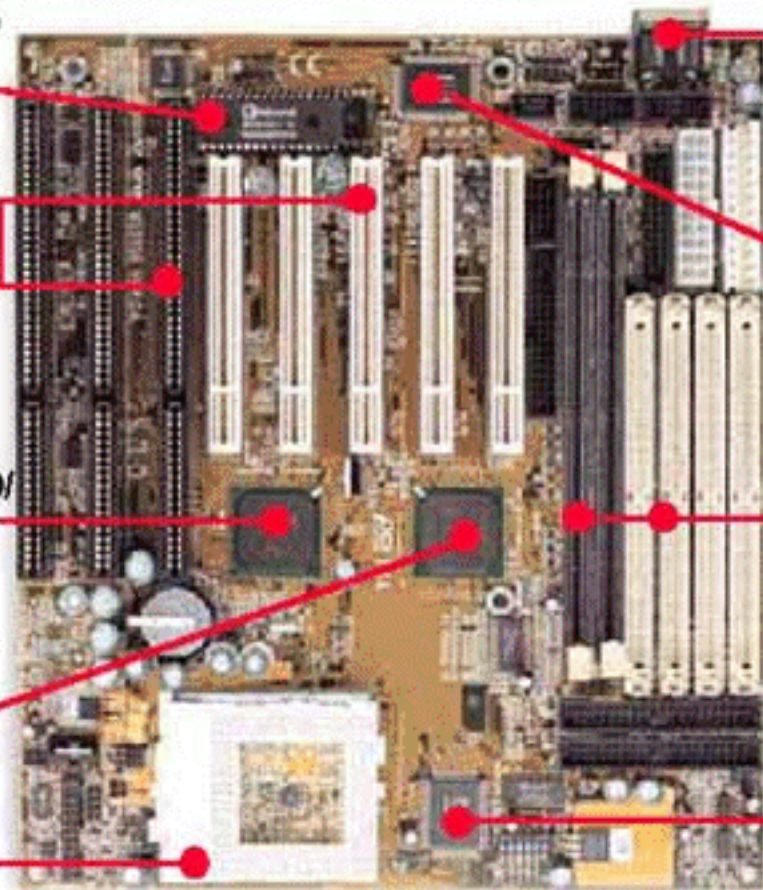
Dual channel,
Supports 4 HDD/
CD-ROM (Ultra,
DMA/33 & PIO
Mode)

CHIPSET

Intel® 430TX

CPU SOCKET

ZIF Socket 7,
Supports
Intel® Pentium®
90-233 MHz,
Pentium® with
MMX™, AMD®
K6 and Cyrix®
6x86MX CPU



CONNECTOR

AT KB or PS/2 KB
+ PS/2 Mouse

SUPER I/O

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

MEMORY

72-pin SIMM x 4,
168-pin DIMM x 2
Supports SDRAM,
EDO and FP DRAM,
Max. 256MB

L2 CACHE

512K PB cache

CPU VOLTAGE REGULATOR

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

SIZE & FORM FACTOR

25 x 22 cm
Baby AT

USB CONN.

Dual USB Ports

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MORE INFO](#)



Chapter 1

INTRODUCTION

The MS-5156 mainboard is a high-performance personal computer mainboard. The mainboard supports the Peripheral Component Interconnect (PCI) Local Bus standard and provides five 32-bit PCI bus 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.

1.1 System Board Features

CPU

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

Chipset

- Intel® 82430 TX chipset.

Cache Memory

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

Main Memory

- Supports four memory banks using four 72-pin SIMM sockets and two 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

- Five 32-bit PCI Bus slots (four 32-bit bus master PCI slots + one 32-bit slave PCI slot) + Three 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

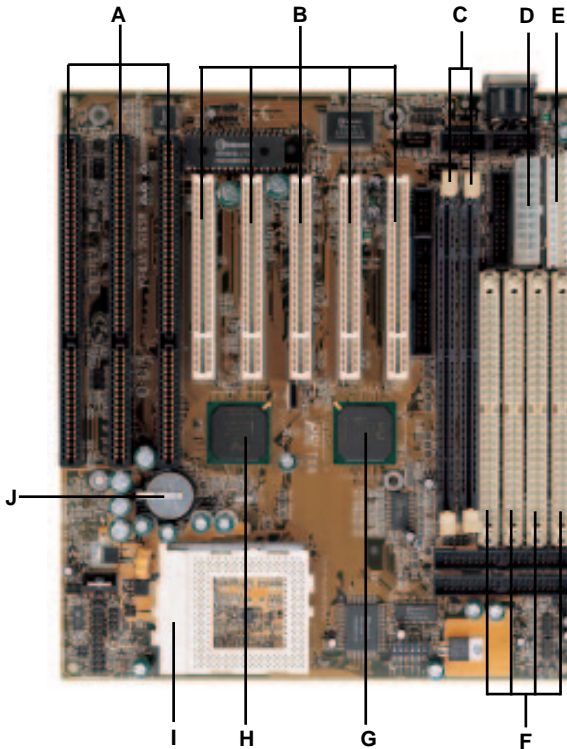
- On-Board Peripherals include:
 - 1 floppy port supports 2 FDD
 - 2 serial ports (COMA + COMB)
 - 1 parallel port supports ECP or EPP mode
 - USB
 - IR (SIR)

Dimensions

- Baby-AT form factor
- 25cm(L) x 22cm(W) x 4 layer PCB

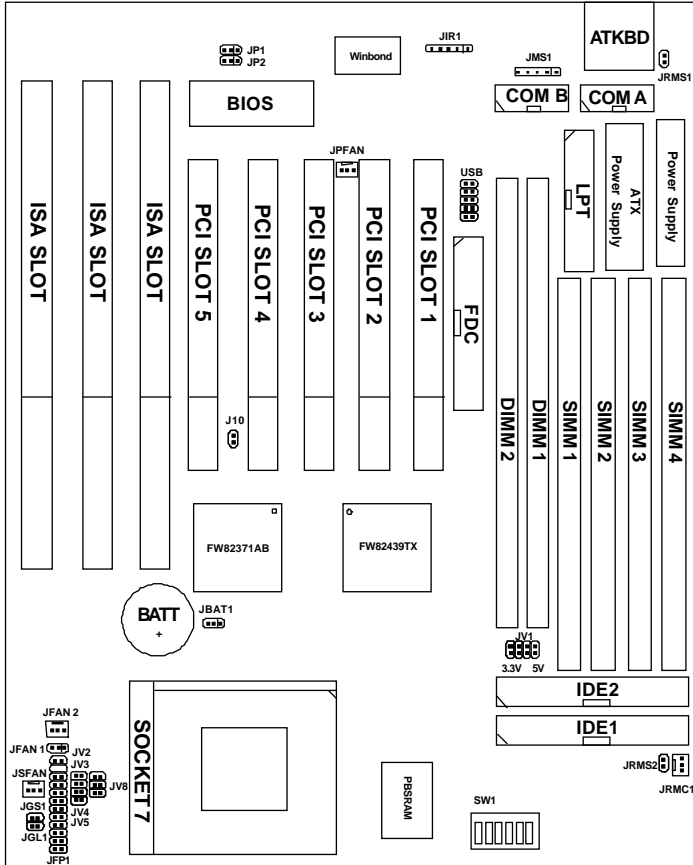
Mounting

- 5 mounting holes

1.2 Parts of the Mainboard

- A** Three 16-Bit ISA SLOTS
- B** Five 32-Bit PCI SLOTS
- C** Two 168-Pin DIMM SOCKETS
- D** ATX 20-Pin POWER CONNECTOR
- E** PS/2[®] POWER CONNECTOR
- F** Four 72-pin SIMM SOCKETS
- G** Intel[®] 82439TX
- H** Intel[®] 82371AB
- I** SOCKET 7
- J** 2032 LITHIUM BATTERY

1.3 Mainboard Layout



MS-5156

Chapter 2

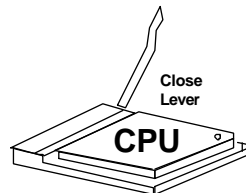
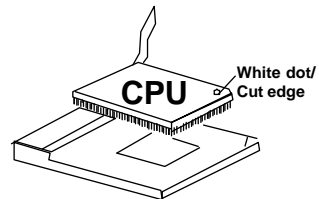
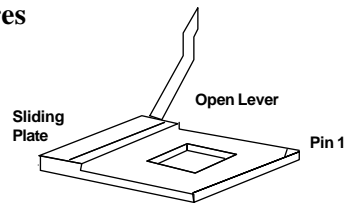
HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

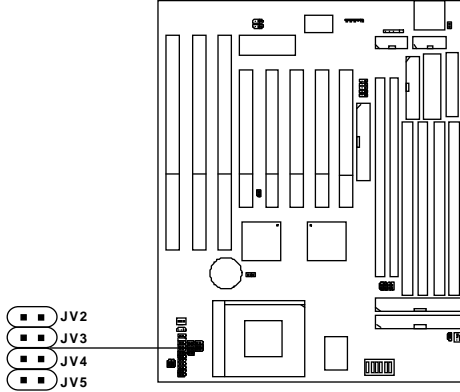
The MS-5156 mainboard operates with Intel® Pentium® processors/ Pentium® processors with MMX™ technology, Cyrix® 6x86/6x86L/ 6x86MX and AMD® K5/K6 processors. It could operate with 2.8V to 3.52V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW1) to set the proper speed for the CPU and a Jumper block (JV2 - JV5) for setting the CPU voltage. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedures








1. Pull the lever sideways away from the socket. Then raise the lever up to a 90-degree angle.
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.
3. Press the lever down to complete the installation.



2.1-2 CPU Voltage Setting: JV2-JV5



V I/O	Vcore	JV2~JV5
3.5	3.5	JV2 JV3 JV4 JV5
3.3	3.3	JV2 JV3 JV4 JV5
3.3	3.2	JV2 JV3 JV4 JV5
3.3	2.9	JV2 JV3 JV4 JV5
3.3	2.8	JV2 JV3 JV4 JV5

V I/O	Vcore	JV2~JV5
3.3	2.7	
3.3	2.6	
3.3	2.5	
3.3	2.4	
3.3	2.3	
3.3	2.2	
3.3	2.1	

2.1-3 CPU Speed and Voltage Setting: SW1 & JV2-JV5

To adjust the speed and voltage of the CPU, you must know the specifications of your CPU (*always ask the vendor for CPU specifications*). Then refer to **Table 2.1 (Intel® processors)**, **Table 2.2 (Cyrix® processors)** and **Table 2.3 (AMD® processors)** for proper setting.

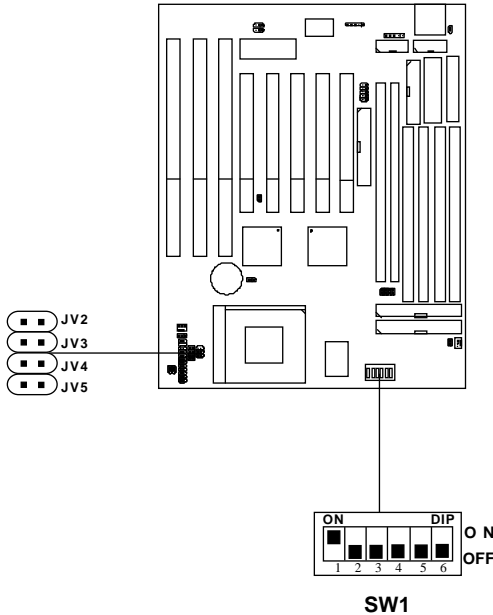


Table 2.1 Intel® processors

Intel® Pentium® processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
90MHz	3.38			
	3.52			
100MHz	3.38			
120MHz	3.38			
133MHz	3.52			
150MHz	3.52			
166MHz	3.52			
200MHz	3.52			

Intel® Pentium® processors with MMX™ technology





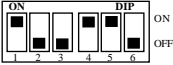




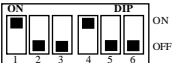




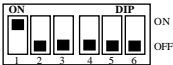




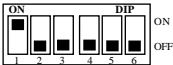
166MHz	3.3	2.8		
200MHz				
233MHz				

Note: If you encounter a CPU with different voltage, just go to page 2-2 and look for the proper voltage settings.




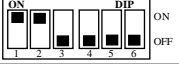





Table 2.2 Cyrix® 6x86/6x86L/6x86MX processors

Cyrix® 6x86 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed. For example PR150 (120MHz) has 150MHz core speed of Intel® Pentium® processor but has 120MHz core speed in Cyrix®. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).

Cyrix® 6x86/6x86L processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
6x86 PR133	3.3		 JV2  JV3  JV4  JV5	
	3.52		 JV2  JV3  JV4  JV5	
6x86 PR166	3.3		 JV2  JV3  JV4  JV5	
6x86L PR166	3.3	2.8	 JV2  JV3  JV4  JV5	

Cyrix® 6x86MX processors







CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
PR166 (60x2.5) (66x2)	2.9		 JV2 JV3 JV4 JV5	
				
PR200 (66x2.5) (75x2)				
				
PR233 (66x3) (75x2.5)				
				
PR266 (66x3.5) (75x3)				
				

Note: PR200(75x2), PR233, and PR266 CPU are not yet tested, so we still don't guarantee the performances of this CPUs.


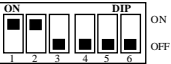


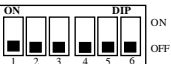
Table 2.3 AMD® K5/K6 processors

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

AMD® K5 processors

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV2~JV5	SW1
PR90	3.52			
PR100				
PR120				
PR133/PR150				
PR166				

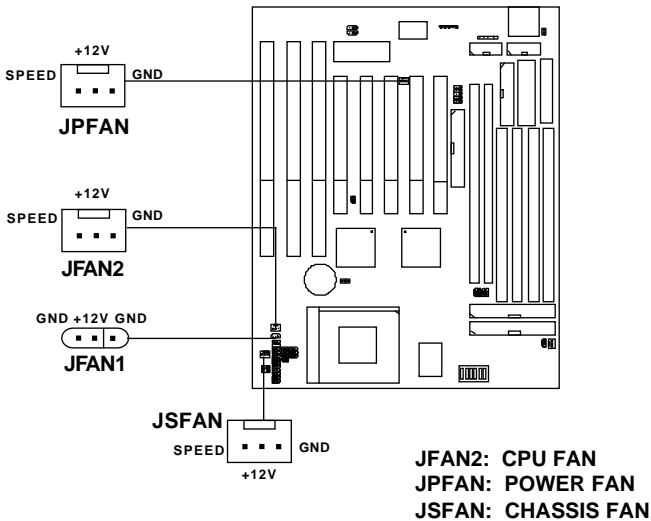
AMD® K6 processors

PR166	3.3	2.9		
PR200				
PR233	3.3	3.2		

Note: If you encounter a CPU with different voltage, just go to page 2-2 and look for the proper voltage settings.

**2.1-4 CPU Fan Power Connector: JFAN1/JFAN2/JSFAN/
JPFAN**

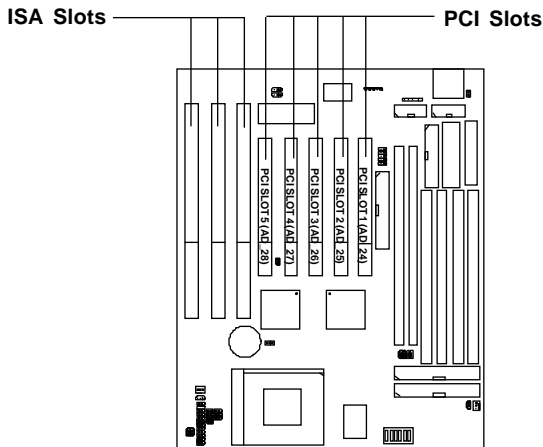
JFAN1 connector supports CPU cooling fan with +12V. It supports both two and three pin head connector. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V. While JFAN2, JSFAN, and JPFAN system cooling fan with +12V. It supports 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, the yellow is the speed sensor. 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.



- Note:**
- 1. JFAN2/JSFAN/JPFAN** is used for CPU Cooling Fan Speed Connectors.
(Reserved for LM78 System Hardware Monitor Option.)
 - 2. Always consult vendor for proper CPU cooling fan.**

2.2 PCI and ISA Slots

There are 5 PCI slots and 3 ISA slots. All PCI slots can be used as master. But since the 1st and 5th PCI slots share the same bus master signal, only one of these slots can be used as a master at a time; which means that if a bus master card is installed in PCI slot 1, PCI Slot 5 can only accommodate a slave card, and vice versa.

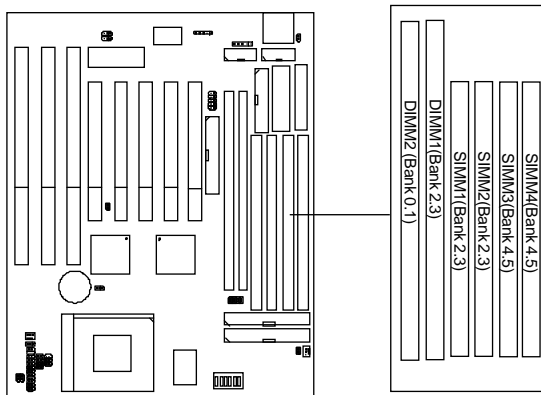


- Note:**
1. You can only use a **3.3 V PCI Card**, if the power supply you're using is an **ATX power supply w/ 3.3V**.
 2. PCI Slot 1 to PCI Slot 5 IDSEL is AD_24(Device Num = 0DM) to AD_28(Device Num = 11H) respectively.

2.3 Memory Installation

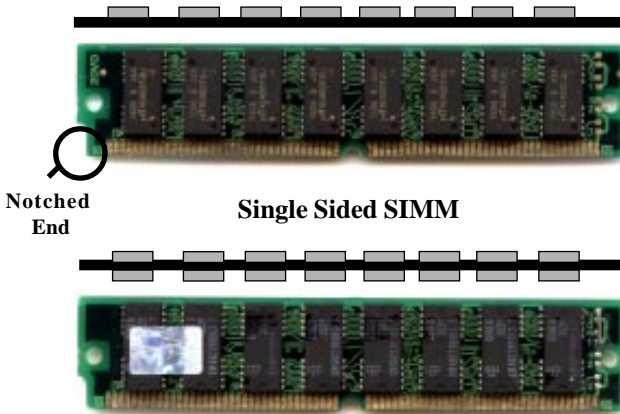
2.3-1 Memory Bank Configuration

The mainboard provides four 72-pin SIMMs (Single In-Line Memory Module) and two 168-pin DIMM(Double In-Line Memory) sockets. It supports six memory banks for a maximum of 256MB memory. Each bank supports up to 64MB memory. You can use SIMM from 4MB, 8MB, 16MB, 32MB, 64MB to 128MB, and DIMM from 8MB, 16MB, 32MB, 64MB to 128MB.



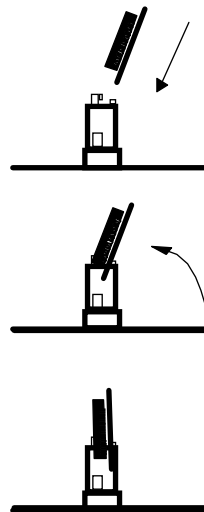
2.3-2 Memory Installation Procedures:

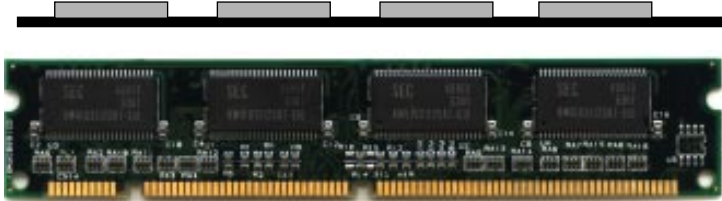
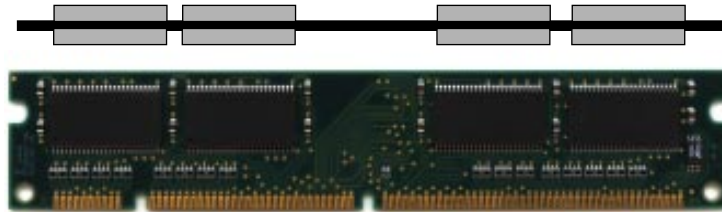
A. How to install SIMM Module



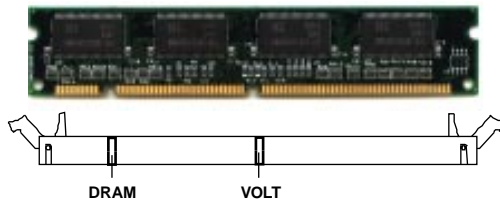
Double Sided SIMM

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.



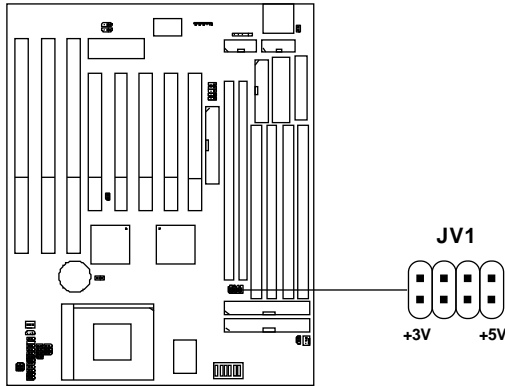
B. How to install DIMM Module**Single Sided DIMM****Double Sided DIMM**

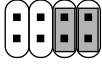

1. The DIMM slot has two keys marked “VOLT and DRAM” , so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot. Then, push it in.



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

B.1 DIMM Power Voltage Selector: JV1



DIMM Voltage	JV1
5V	+3V  +5V
3.3V	+3V  +5V

SIMM Power Level : 5 Volts
DIMM Power Level : 3.3V or 5V

NOTE: DIMM and SIMM cannot be used at the same time. Only one kind can be used at a time. If you want to use both of them at the same time, you must use 5V DIMM.

2.3-3 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. This mainboard supports Table Free memory, so memory can be installed on (SIMM1 + SIMM2),(SIMM3 + SIMM4), (DIMM1), or (DIMM 2), in any order.
4. If you use DIMM with 64Mbit SDRAM, then Bank2.3 (SIMM1+SIMM2) can not be use.
5. DIMM and SIMM cannot be used at the same time. Only one kind can be used at a time. If you want to use both of them you must use a 5V DIMM.

2.4 Case Connector: JFP1

The Turbo LED, Turbo Switch, Hardware Reset, Key Lock, Power LED, Power Saving LED, Sleep Switch, Speaker and HDD LED are all grouped in JFP1 connector block for easy installation.

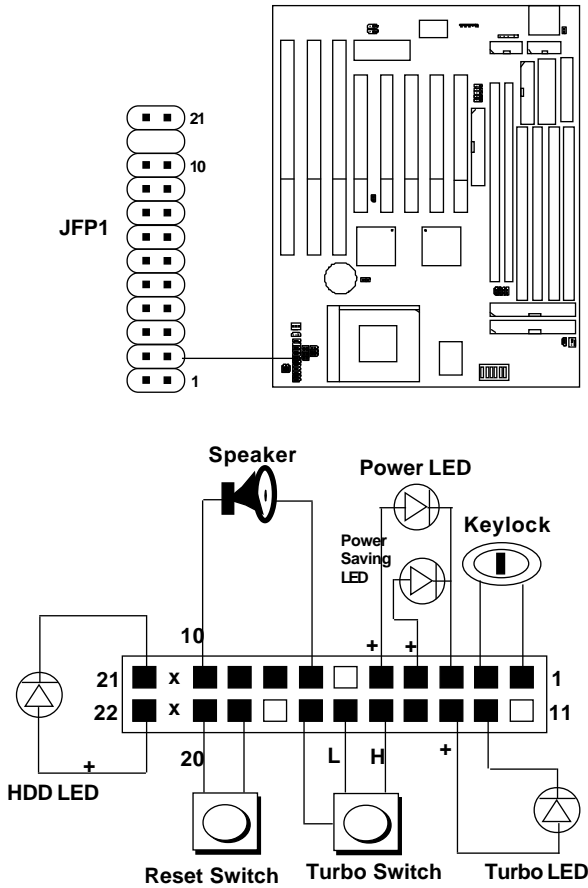


Figure 2.1

2.4-1 Turbo LED

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

2.4-2 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)

2.4-3 Keylock

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

2.4-4 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)

2.4-5 Turbo Switch

This mainboard is always on Turbo Speed. So the Turbo Switch is non-functional. (See Figure 2.1)

2.4-6 Speaker

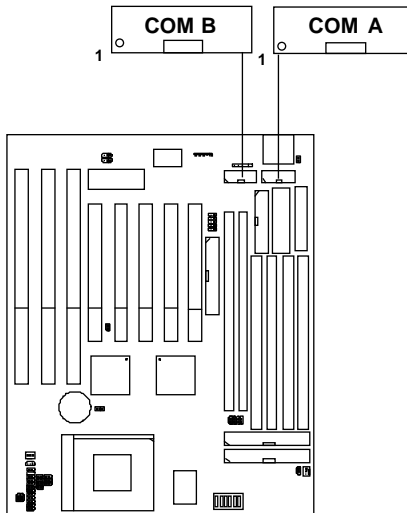
Speaker from the system case are connected to this pin. (See Figure 2.1)

2.4-7 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).

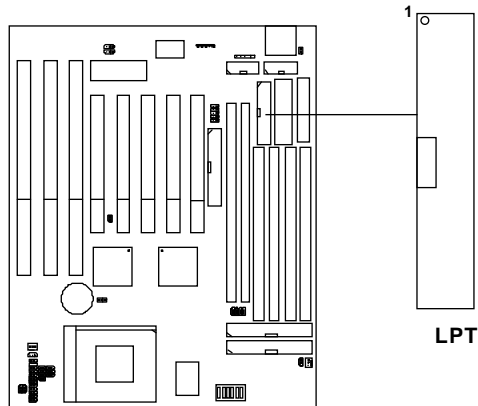
2.5 Serial Port Connectors: COM A & COM B

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



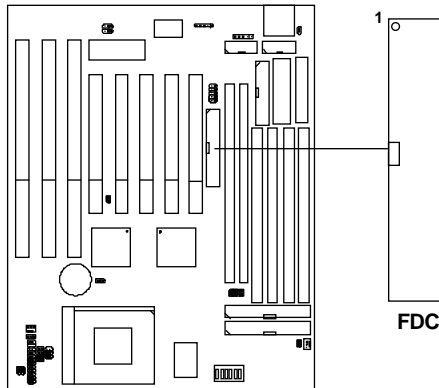
2.6 Parallel Port Connector: LPT

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).



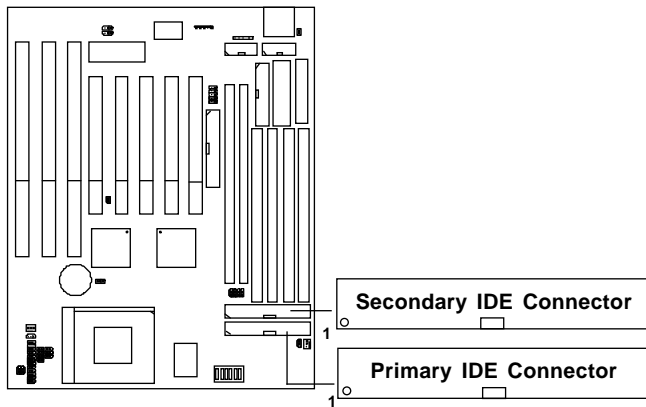
2.7 Floppy Disk Connector: FDC

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.



2.8 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)

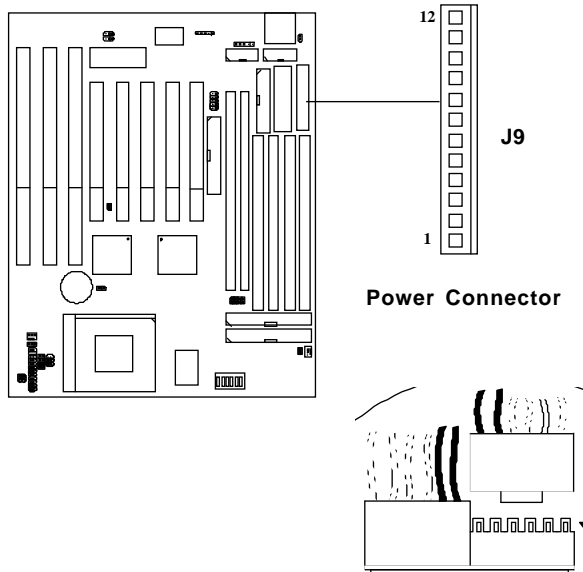
The first hard disk should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

IDE2(secondary IDE connector)

IDE2 can connect a Master and a Slave drive.

2.9 Power Supply Connector: J9

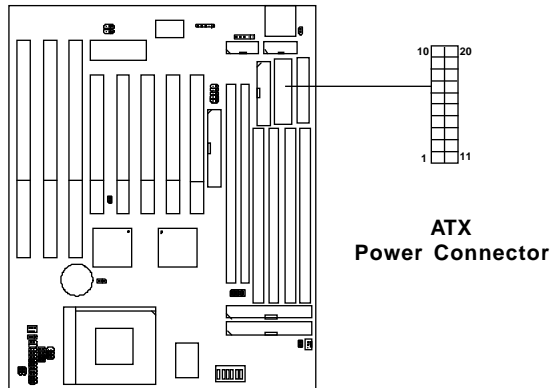
J9 is a standard 12-pin AT® or PS/2® connector. Be sure to attach the connectors with the two black wires at the center.



Pin	Description	Pin	Description
1	Power Good	7	Ground
2	+5V DC	8	Ground
3	+12V DC	9	-5V DC
4	-12V DC	10	+5V DC
5	Ground	11	+5V DC
6	Ground	12	+5V DC

2.10 ATX 20-pin Power Connector: JWR1

This type of connector already supports the remote ON/OFF function. You don't need to connect the JRMC1. However, you need to connect the **Remote Power On/OFF switch (JRMS1 or JRMS2)**.

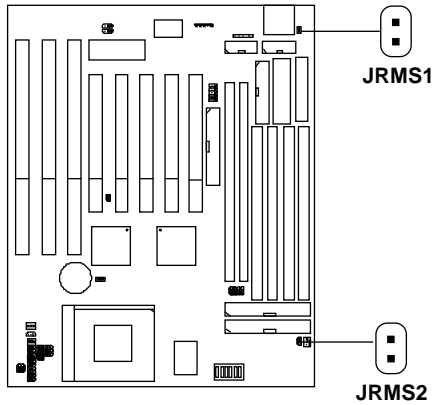


ATX Power Connector Pin Description

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

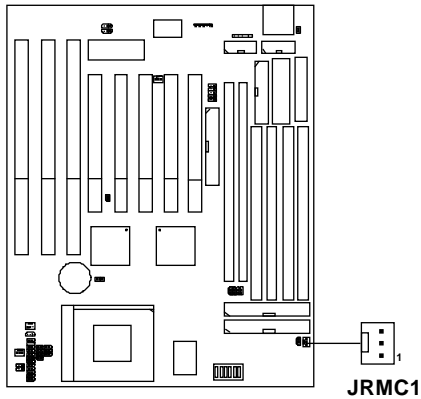
2.11 Remote Power On/Off Switch: JRMS1/JRMS2

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 and 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 Remote Power Connector: JRMC1

Some PS/2® power supply support 3-pin remote power connector. This 3-pin connector should be connected to JRMC1, then use JRMS1 or JRMS2 to switch ON/OFF the system.

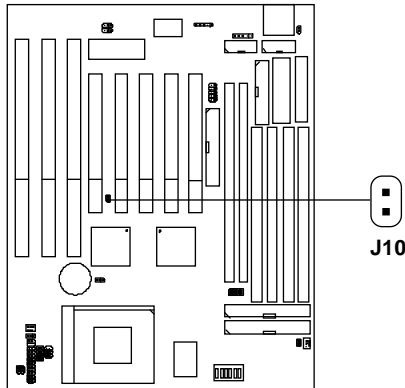




PIN#	Description
1	PS-
2	5V Standby
3	GND

Note: The pin definition of the PS/2® power supply remote power connector should be the same as shown above.

2.13 ATX Power Supply 3.3V : J10

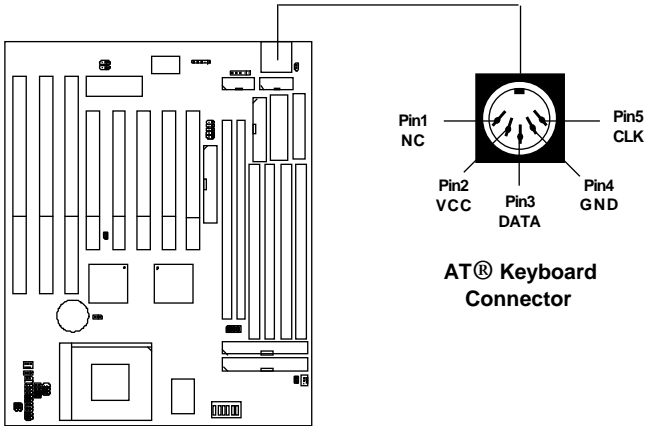
This jumper setting is used by ATX power supply without 3.3V, using ATX power supply with 3.3V or AT® power supply should keep J10 open.



POWER SUPPLY	J10
ATX w/o 3.3V	
ATX or AT®	

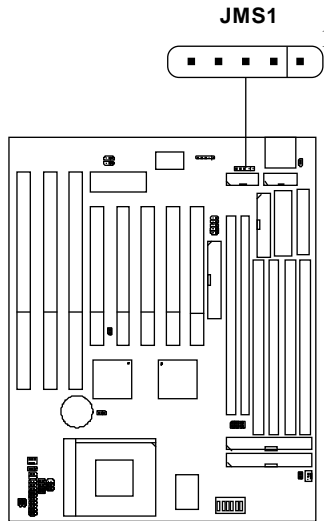
2.14 Keyboard Connector: ATKBC

The mainboard provides a standard AT® keyboard DIN connector for attaching a keyboard. You can plug a keyboard cable directly to this connector.



2.14 Mouse Connector: JMS1

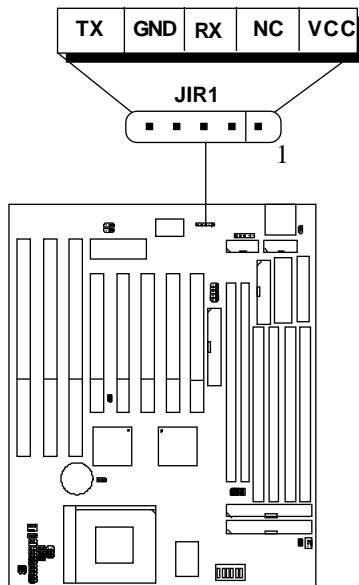
The mainboard provides a 5-pin connector for PS/2[®] mouse cable (optional). You can plug a PS/2[®] mouse to PS/2[®] mouse cable. The connector location as shown below.



Pin 1	VCC
Pin 2	-
Pin 3	GND
Pin 4	CLK
Pin 5	DATA

2.15 Infrared Module Connector: JIR1

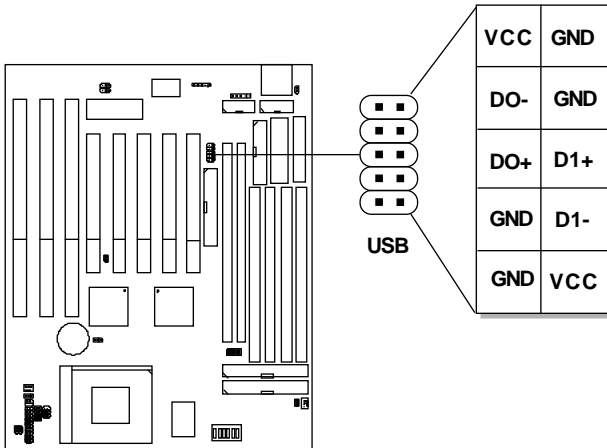
The mainboard provides a 5-pin infrared connector (IR) for IR module. This connector is for optional wireless transmitting and receiving infrared module. If you want to use this function, you must configure the setting through BIOS setup.



Note: This mainboard support SIR.

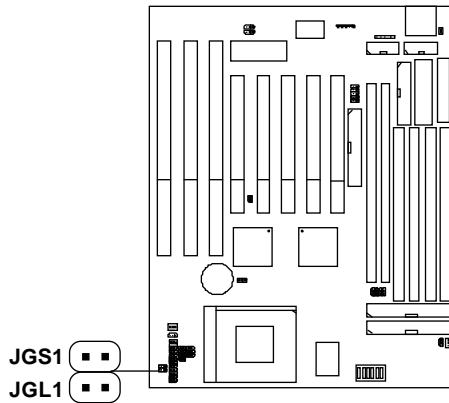
2.16 USB Connector: USB

Connect a USB cable to support USB device, such as keyboard and mouse.



2.17 Power Saving Switch Connector: JGS1/ Power Saving LED Connector: JGL1

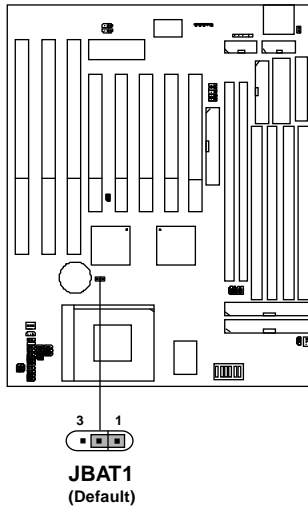
Attach a power saving switch to JGS1. When the switch is pressed, the system immediately goes into suspend mode. Press any key and the system wakes up. JGL1 can be connected with LED to monitor the JGS1. This will lit while the system is in suspend mode.



Note: To make JGS1 function, you must go to the BIOS power management and enable it there.

2.18 Battery Connector: JBAT1

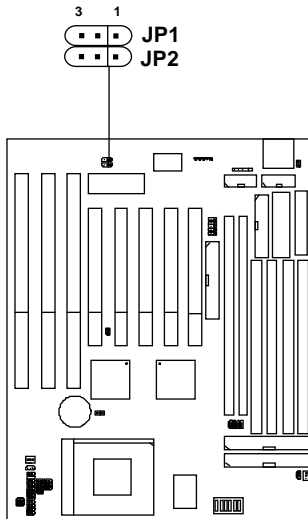
A battery must be used to retain the mainboard configuration in CMOS RAM. To retain the on-board battery you must always short pins 1,2 of JBAT1.



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.

2.19 Flash ROM Programming Voltage: JP1/JP2

This jumper is for setting the voltage of the Flash ROM BIOS.



<p>+12V (Default)</p>	
<p>+5V (Reserved)</p>	

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 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 key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys.

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

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	AUTO
Primary Slave :	Auto	0	0	0	0	0	AUTO
Secondary Master :	Auto	0	0	0	0	0	AUTO
Secondary Slave :	Auto	0	0	0	0	0	AUTO
Drive A :	1.44M,3.5in.						
Drive B :	None						
Video :	EGA/VGA						
Halt On :	All, but Keyboard						
				Base Memory:		640K	
				Extended Base Memory:		15360K	
				Other Memory:		384K	
				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
MODEHDD	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 signifies that:

- a. 60ns EDO with 75 MHz Bus Clock is set at x333, if the Bus Clock is 66/60/55 MHz, then it is set at x222.
- b. 60ns FP with 75 MHz is set at x444, if the Bus Clock is 66/60/55, then it is set at x333.
- c. 70ns EDO and FP DRAM must increase the burst time. So you must set x222 to x333 and x333 to x444.

DRAM Write Burst Timing

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

Fast EDO Lead Off

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

Refresh RAS# Assertion

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

Fast RAS to CAS Delay

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

DRAM Page IDLE Timer

The settings are 2 Clks, 4 Clks, 6Clks, or 8 Clks. Default settings is 2 Clks.

DRAM Enhanced Paging

Choose Enable(default) or Disable.

Fast MA to RAS# Delay

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

SDRAM (CAS Lat/RAS-to-CAS)

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

SDRAM Speculative Read

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

System BIOS Cacheable

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

Video RAM Cacheable

Same as system BIOS Cacheable

8-bit I/O recovery time: 1/2/3/4/5/6/7/NA

16-bit I/O recovery time: 1/2/3/NA

Choose the recovery time for 8-bit and 16-bit I/O cycles respectively.

Note: NA is not available and so the recovery time of 3.5 SYSCLOCK 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	
** Break Event From Suspend **		Esc : Quit ↑↓→← : Select item
IRQ 8 Clock Event : Disabled		F1 : Help PU/PD/+/- : modify
		F5 : Old Value(Shift) F2 : Color
		F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

Power Management

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

Power Management

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

PM Control by APM

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

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

Video Off Method

Blank Screen	The system BIOS will only blank off the screen when disabling video.
V/H SYNC+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/	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.
4 Min/6 Min/	
8 Min/10 Min/	
20 Min/30 Min/	
40 Min/1 Hr	

HDD Power Down

Disable	HDD’s motor will not shut off.
1 Min/2 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.
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	

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 Resources Controlled By :Auto Reset Configuration Data :Disabled IRQ-3 assigned to :Legacy ISA IRQ-4 assigned to :Legacy ISA IRQ-5 assigned to :PCI/ISA PnP IRQ-7 assigned to :PCI/ISA PnP 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	PCI IDE IRQ Map To : PCI-Auto Primary IDE INT# : A Secondary IDE INT# : B Assign IRQ for VGA : Disabled Used MEM base addr : C800 Used MEM Length : 8K Esc : Quit ↑↓→← : Select item F1 : Help PU/PD/+/- : modify F5 : Old Value(Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults
--	---

PnP OS Installed

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

Resources Controlled By

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

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

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

Reset Configuration Data

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

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

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

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

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

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

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

PCI IDE IRQ Map To

- PCI-Auto:** This setting is for off-board PCI IDE card and is fully compatible with PCI specifications.
- PCI-Slot 1-5:** 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	
UART 2 Mode :ASKIR	Esc : Quit ↑↓→← : Select item
IR Function Duplex :Half	F1 : Help PU/PD/+/- : modify
RxD , TxD Active :Hi , Hi	F5 : Old Value(Shift) F2 : Color
Onboard Parallel Port :378H/IRQ7	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

IDE HDD Block Mode

Enabled/Disabled Enabled allows the Block mode access for the IDEHDD.

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)/
(278H/IRQ5)/
(378H/IRQ5)**

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

Disable**3BCH/IRQ7**

Line Printer port 0

278H/IRQ5

Line Printer port 2

378H/IRQ5

Line Printer port 1

Onboard Parallel Mode

SPP : Standard Parallel Port

EPP : Enhanced Parallel Port

ECP : Extended Capability Port

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

To operate the onboard parallel port as StandardParallel Port only, choose “SPP.” To operate the onboard parallel port in the ECP and SPP modes simultaneously choose “ECP/SPP.” By choosing “ECP”, the onboard parallel port will operate in ECP mode only. Choosing “ECP/EPP” will allow the onboard parallel port to support both the ECP and EPP modes simultaneously. The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: “ECP Mode Use DMA” At this time the user can choose between DMA channels 3 or 1. The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: “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 on-board 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 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 need) 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.
```

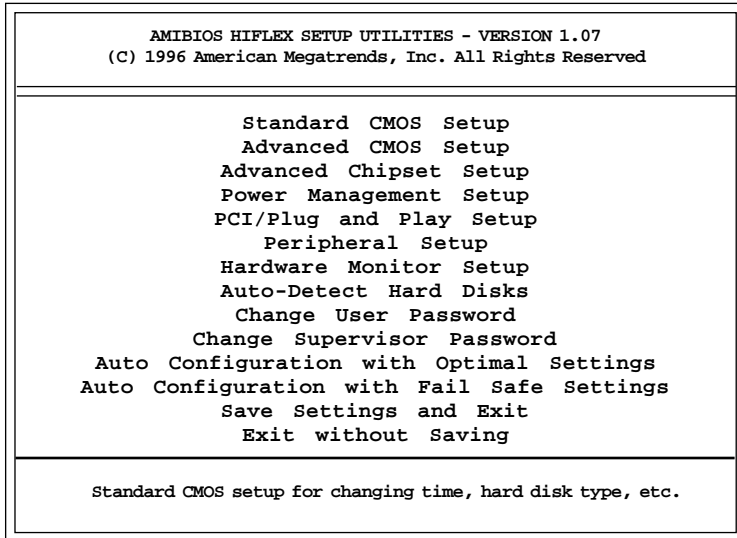
```
Hit <DEL> if you want to run setup
```

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

```
61-XXXX-001169-00111111-071592-i82440FX-H
```

2. When the "Hit " message appears, press key to enter the BIOS setup screen.
3. After pressing 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.*



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 4.7 will explain the option in more details.

4.2 Standard CMOS Setup

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

```

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

```

```

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

```

```

Floppy Drive A:          1.44 MB 3 1/2
Floppy Drive B:          Not Installed

```

	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit 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:
Hour: 00-23 Minute: 00-59 Second: 00-59
(1:30AM = 01:30:00, 1:30PM = 13:30:00)
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 Standard CMOS Setup, press <ESC> to go back to the main menu.

4.3 Advanced CMOS Setup

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

AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C) 1996 American Megatrends, Inc. All Rights Reserved		
Ist Boot Device	FLOPPY	Available Options: Enabled Disabled
2nd Boot Device	IDE-0	
3rd Boot Device	CD-ROM	
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	
Parity Check	Disabled	
Boot to OS/2	No	
Internal Cache	Writeback	
External Cache	Writeback	
System BIOS Cacheable	Enabled	
C000, 32k Shadow	Disabled	
C800, 16k Shadow	Disabled	
CC00, 16k Shadow	Disabled	
D000, 16k Shadow	Disabled	
D400, 16k Shadow	Disabled	
D800, 16k Shadow	Disabled	
DC00, 16k Shadow	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 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 autodetect the present 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 subsystem 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 264MB.

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		
(C) 1996 American Megatrends, Inc. All Rights Reserved		
Memory Hole	Disabled	Available Options:
DRAM Speed	Auto	Enabled
Fast MA to RAS# Delay (HCLK's)	2	Disabled
DRAM Read Burst Timing	x2EDO X3FPM	
DRAM Write Burst Timing	x3EDO X3FPM	
Fast RAS to CAS Delay	3	
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	Disabled	
SDRAM Speculative Read Logic	Disabled	
Enhanced Paging	Enabled	
DRAM Refresh RAS Cycles (HCLK's)	5	
DRAM Refresh Rate	15.6 us	
8-Bit I/O Recovery Time	Disabled	
16-Bit I/O Recovery Time	Disabled	
CD-ROM Option	0	
USB Function	Disabled	
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. The default settings are Disabled.

Fast MA to RAS# Delay (HCLK's)

Leave on the default setting of 2.

DRAM Read Burst Timing

This option chooses the Read Burst time for accessing DRAM.

DRAM Write Burst Timing

This option chooses the Write Burst Timing for accessing DRAM.

Fast RAS to CAS Delay

Leave on the default setting of 3.

DRAM Lead off Timing

Leave on the default setting 10/6/3.

Memory Address Drive Strength

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

SDRAM CAS Latency/RAS to CAS

Leave on the default setting 3/3.

Speculative Lead Off Timing

Leave on the default setting of Disabled.

DRAM Page Idle Timeout (HCLK's)

Leave on the default setting of 2.

Fast EDO Read Cycle Timing

Leave on the default setting of Disabled.

SDRAM Speculative Read Logic

Leave on the default setting of Disabled.

Enhanced Paging

Leave on the default setting of Enabled.

DRAM Refresh RAS Cycles (HCLK'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.

USB Function

Set this option to Enabled or Disabled the on-chip USB controller. The Optional and Fail-Safe default settings are Disabled.

USB Keyboard/Mouse Support

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

USWC Write Posting

Set this option to Enabled to use USWC(Uncacheable, Speculatable, Write-Combined) memory. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disable.

CPU To PCI Posting

Set this option to Enabled to give priority to posted messages from the CPU to the PCI bus. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

PCI to DRAM Pipeline

Set this option to Enabled the pipeline from the PCI bus to system memory. The settings are Enabled or Disabled. The Optimal and Fail-Safe Default settings are Enabled.

PCI Burst Write Combine

Set this option to Enabled to allow write instructions to be combined in PCI Burst mode. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

Read Around Write

Set this option to Enabled to allow read operations to bypass write operations in the memory controller. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

4.5 Power Management Setup

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

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C) 1996 American Megatrends, Inc. All Rights Reserved		
Power Management / APM	Disabled	Available Options: Enabled Disabled
Instant On Support	Disabled	
Green PC Monitor Power State	Stand By	
Video Power Down Mode	Suspend	
Hard Disk Power Down Mode	Disabled	
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	Disabled	
Secondary IDE 1	Disabled	
Modem Use IRQ	N/A	
ATX Power Support	No	
Soft-Off by PWR-BTTN	Instant-off	
RTC Alarm Resume From Soft Off	Disabled	ESC:Exit :Sel
RTC Alarm Date	N/A	PgUp/PgDn:Modify
RTC Alarm Hour	N/A	F2/F3:Color

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.

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 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, the system will boot up.
RTC Alarm Hour	You can choose the hour of the day, the system will boot up
RTC Alarm Minute	You can choose the Minute, the system will boot up.
RTC Alarm Second	You can choose th Second, 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 (C) 1996 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options:
Clear NVRAM	Disabled	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	
PCI Slot5 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	ESC:Exit :Sel
IRQ5	PCI/PnP	PgUp/PgDn:Modify
IRQ7	ISA	F2/F3:Color

IRQ9	PCI/PnP
IRQ10	PCI/PnP
IRQ11	PCI/PnP
IRQ14	PCI/PnP
IRQ15	PCI/PnP

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 directed 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 adapter 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.

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	Enabled	Enabled
OnBoard Serial PortB	Enabled	Disabled
IR Port Support	Disabled	
IR Base Address Select	2E8	
IR IRQ Select	10	
IR DMA Select	Disabled	
OnBoard Parallel Port	Auto	
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port IRQ	Auto	
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, the BIOS 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 onboard 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 used by LM78 chipset which is an optional function. To enable the best performance, leave all the setting on the default mode.