Chapter 1

INTRODUCTION

The ATX SI20 mainboard is a high-performance personal computer mainboard. This mainboard supports Intel®Pentium®processor/Pentium® processor with MMX™ technology, Cyrix®6x86/6x86L/6x86MX, and AMD® K5/K6 processors. The mainboard also supports one AGP slot and three 32-bit PCI (Peripheral Component Interconnect) Local Bus standard slots.

The mainboard uses the highly integrated SiS®5591 chipset to support the AGP/PCI/ISA and Green standards, and to provide the Host/AGP bridge. The SiS®5591 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 SiS®5595 chipset also improves the IDE transfer rate by supporting Ultra DMA/33 IDE that transfer data at the rate of 33MB/s. In addition to this, it also offers hardware monitor function as an optional function.

1.1 Mainboard Features

CPU

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

Chipset

- SiS®5591 chipset. (North Bridge Controller)
- SiS®5595 chipset. (South Bridge Controller)

Cache Memory

- Supports 512K PB SRAM.

Main Memory

- Supports six memory banks using three 168-pin unbuffered DIMM
- Supports a maximum memory size of 768 for EDO and 384MB for SDRAM.
- Supports parity check and ECC function.
- Supports 3.3V Extended Data Output (EDO), and SDRAM DIMM.

Slots

- One AGP(Accelerated Graphics Port) slot.
  - AGP specification compliant
  - AGP 66/133MHz 3.3v device support
  - ASYM AGP support 75 & 83 MHz processor (reserved)
- Three 32-bit Master PCI Bus slots and three 16-bit ISA bus slots wherein one slot is shared.
- Supports 3.3v/5v PCI bus Interface.

On-Board IDE

- An IDE controller on the SiS®5595 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA/33 operation modes.
- Connect up to four IDE devices.

On-Board Peripherals

- On-Board Peripherals include:
  - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
  - 2 serial ports (COMA + COMB)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 2 USB ports
  - 1 IrDA connector for SIR.

Regulators

- Switching Regulator
  - provides CPU with voltage range from 2.0v to 3.52v.
- Linear Regulator (optional)
  - support power supply with 3.3v and power supply without 3.3v.

Sound (optional)

- Crystal®4235/4237B chipset .
  - 3D audio effects.
  - 16 bit full-duplex stereo.
  - 16 bit address decode.

BIOS

- The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.
- The mainboard provides a Desktop Management Interface(DMI) function which records your mainboard specifications.

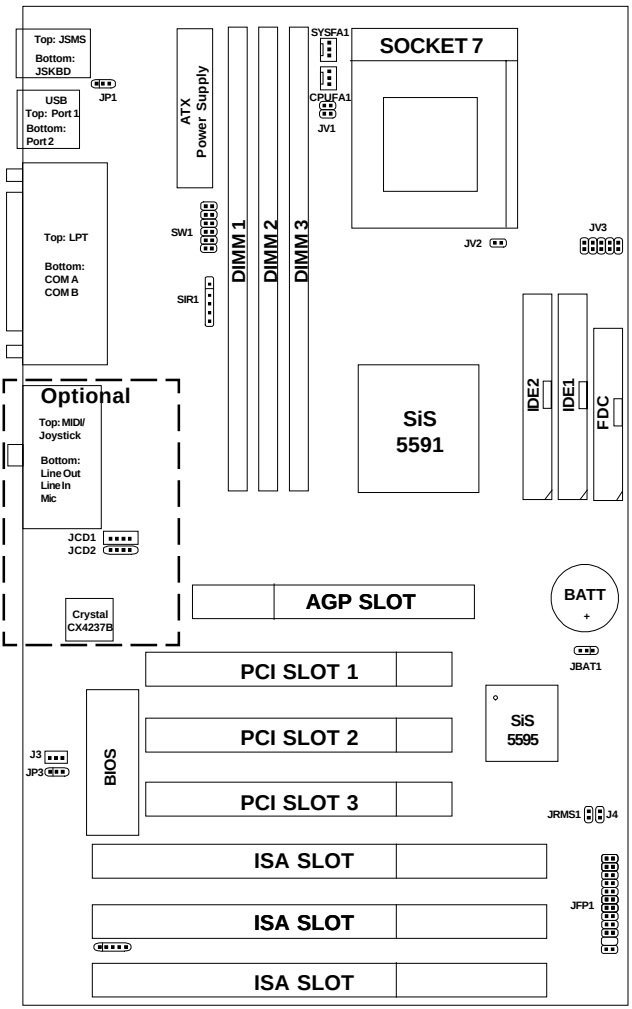
Dimension

- ATX Form Factor : 30cm(L) x 18.6cm(W) x 4 layers PCB

Mounting

- 7 mounting holes

1.2 Mainboard Layout



MS-5172

Chapter 2

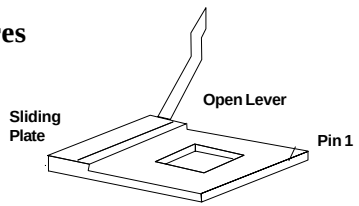
HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

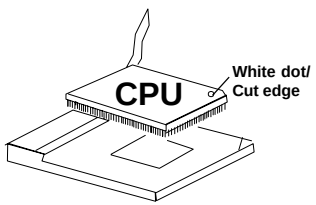
The **ATX SI20** mainboard operates with **Intel® Pentium® processor/ Pentium® processor with MMX™ technology**, **Cyrix® 6x86/6x86L/6x86MX** and **AMD® K5/K6** processors**.** It could operate with 2.1V to 3.5V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, and jumper (SW1 jumpers) to set the proper speed for the CPU. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedures

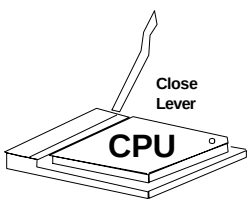
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



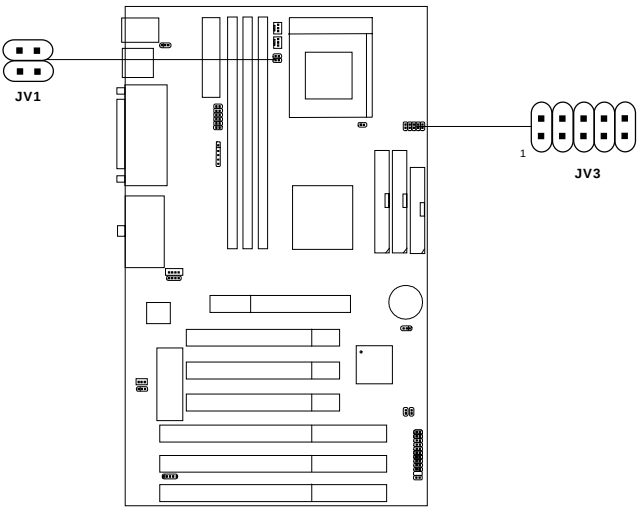
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.



3. Press the lever down to complete the installation.



2.1-2 CPU Voltage Setting: JV1 & JV3

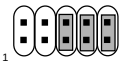
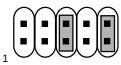
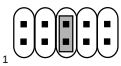
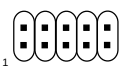


a. CPU Single or Dual Voltage Setting: JV1

CPU Voltage	JV1
Single	
Dual	

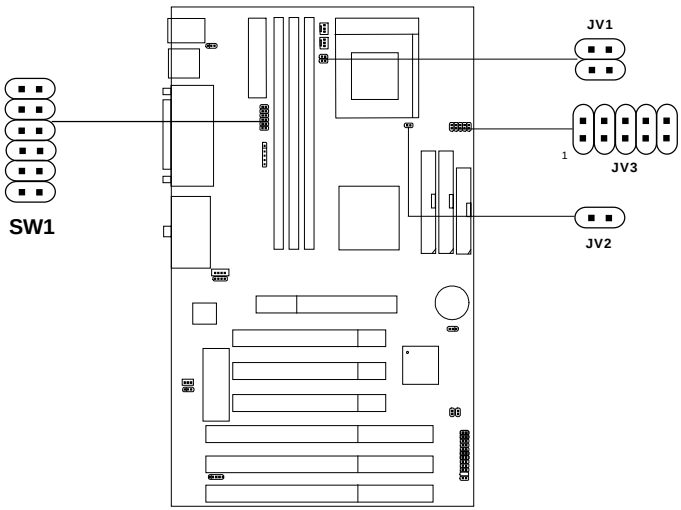
b. CPU Vcore Voltage Setting: JV3

V I/O	Vcore	JV3
3.5	3.5	
3.3	3.4	
3.3	3.3	
3.3	3.2	
3.3	3.1	
3.3	3.0	
3.3	2.9	
3.3	2.8	

V I/O	Vcore	JV3
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	
3.3	2.0	

2.1-3 CPU Speed and Voltage Setting: SW1, JV1 & JV3

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.



Note: Short JV2, if you're using Intel®Pentium®Overdrive™ Processor. Otherwise, leave it open.

Table 2.1 Intel® processors

Intel® Pentium® processors

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	JV3	SW1
90MHz	3.3				
	3.5				
100MHz	3.3				
120MHz					
133MHz	3.5				
150MHz					
166MHz					
200MHz					

Intel® Pentium® processors with MMX™ technology

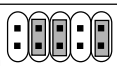
166MHz	3.3	2.8			
200MHz					
233MHz					

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

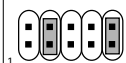
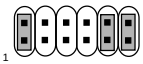
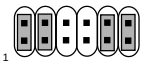
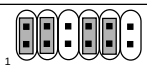
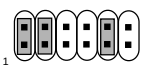
Table 2.2 Cyrix® Processor

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

a. Cyrix® 6x86/6x86L Processor

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	JV3	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	JV3		SW1
6x86MX PR166	3.3	2.9			60 x 2.5	
					66 x 2	
6x86MX PR200					66 x 2.5	
					75 x 2	
6x86MX PR233					*66 x 3	
					75 x 2.5	
					**83x2	
6x86MX PR266					*66 x 3.5	
					*75 x 3	
					**83x2.5	

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

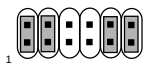
* This type of CPU is for future support.

** We do not guarantee that 75MHz and 83MHz clock CPU will work properly. The SiS® 5591/5595 chipset specification only supports up to 66/75MHz clock.

Table 2.3 AMD® Processor

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

a. AMD® K5 Processor

CPU Type	CPU Voltage				CPU Speed
	VI/O	Vcore	JV1	JV3	SW1
PR90	3.5				
PR100					
PR120					
PR133/PR150					
PR166					

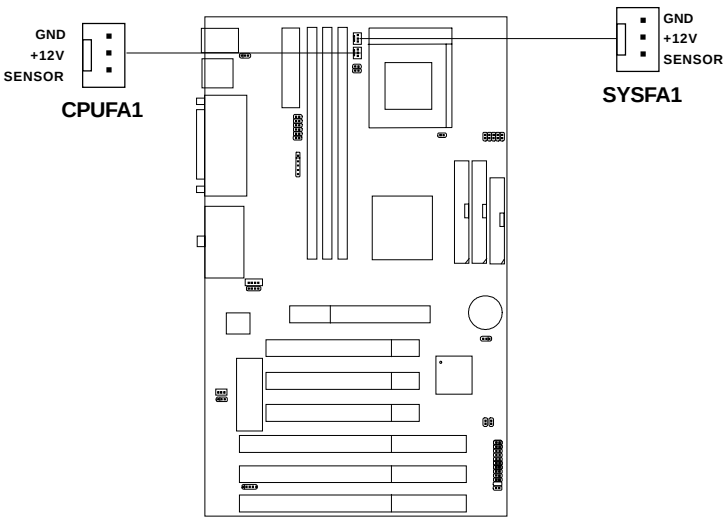
b. AMD® K6 Processor

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.

2.1-2 Fan Power Connectors: CPUFA1/ SYSFA1

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 have a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan speed detect feature.



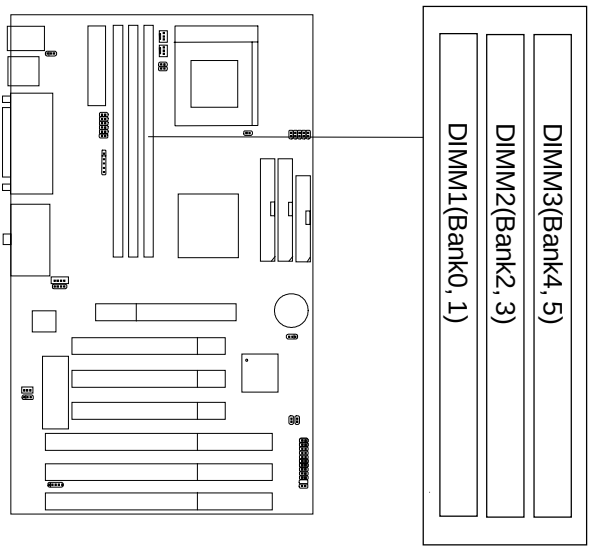
CPUFA1 : processor fan
SYSFA1 : system fan

Note: For fans with speed sensor, every rotation of the fan will send out 2 pulses. System Hardware monitor will count and report the fan rotation speed.

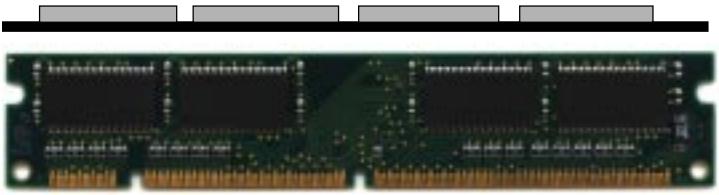
2.2 Memory Installation

2.2-1 Memory Bank Configuration

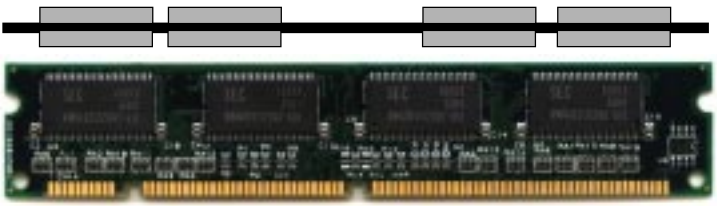
The mainboard supports a maximum of 768MB of memory for EDO and 384MB for SDRAM: It provides three 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) sockets. You can use DIMM from 8MB, 16MB, 32MB, 64MB to 128MB. It supports 8 MB to 256 Mbytes DIMM memory module. The memory module can be either SDRAM or EDO (Extended Data Output) Mode DRAM.



2.2-2 Memory Installation Procedures:



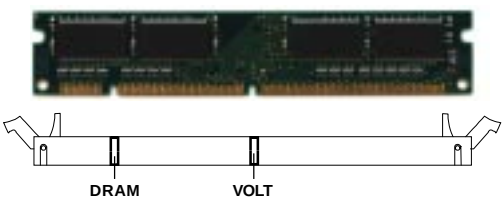
Single Sided DIMM



Double Sided DIMM

1. The DIMM slot has a two Notch Key “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. The plastic clip at the side of the DIMM slot will automatically close.

2.2-3 Memory Population Rules

1. This mainboard supports Table Free memory, so memory can be installed in DIMM1, DIMM2, or DIMM 3 in any order.

2. Use only 3.3v unbuffered DIMM.

3. The DRAM addressing and the size supported by the mainboard is shown next page.

WARNING!

There are some SDRAM DIMM's that will not function properly with this mainboard. Please refer to Chapter 5: Memory Compatibility Test for more information.

Table 2.2-1 EDO DRAM Memory Addressing

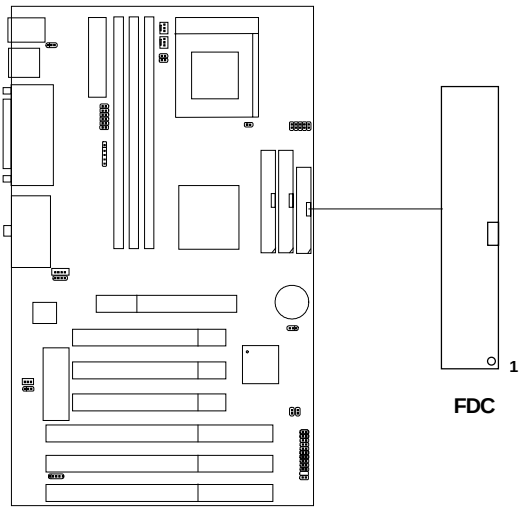
DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	SYMM	10	10	8MBx4	16MBx8
	1Mx16	ASYM	12	8	8MBx4	16MBx8
	2Mx8	ASYM	11	10	16MBx8	32MBx16
	2Mx8	ASYM	12	9	16MBx8	32MBx16
	4Mx4	SYMM	11	11	32MBx16	64MBx32
	4Mx4	ASYM	12	10	32MBx16	64MBx32
64M	2Mx32	ASYM	11	10	16MBx2	32MBx4
	2Mx32	ASYM	12	9	16MBx2	32MBx4
	2Mx32	ASYM	13	8	16MBx2	32MBx4
	4Mx16	SYMM	11	11	32MBx4	64MBx8
	4Mx16	ASYM	12	10	32MBx4	64MBx8
	8Mx8	ASYM	12	11	64MBx8	128MBx16

Table 2.2-2 SDRAM Memory Addressing

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	11	8	8MBx4	16MBx8
	2Mx8	ASYM	11	9	16MBx8	32MBx16
	4Mx4	ASYM	11	10	32MB	64MB
64M	2Mx32	ASYM	11	9	32MBx2	64MBx4
	2Mx32	ASYM	12	8	16MBx2	32MBx4
	4Mx16	ASYM	11	10	32MB	64MB
	4Mx16	ASYM	13	8	32MB	64MB
	8Mx8	ASYM	13	9	64MB	128MB
	16Mx4	ASYM	13	10	128MB	256MB
64M	2Mx32	ASYM	11	8		
	4Mx16	ASYM	12	8		
	8Mx8	ASYM	12	9		
	16Mx4	ASYM	12	10		

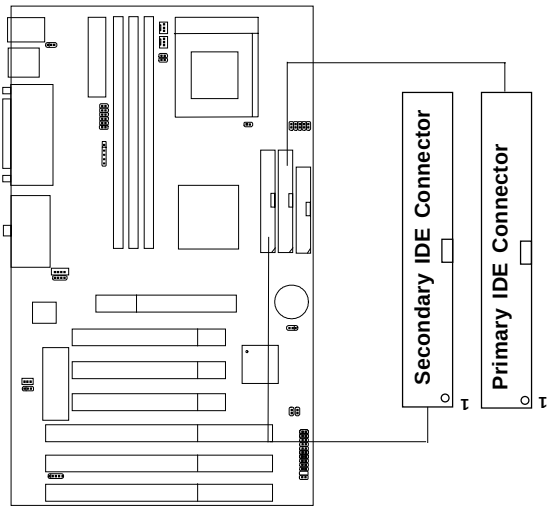
2.3 Floppy Disk Connector: FDC

The mainboard also provides a standard floppy disk connector FDC that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector support the provided floppy drive ribbon cables.



2.4 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33 function. It has 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. These connectors support the provided IDE hard disk cable.



IDE1(Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

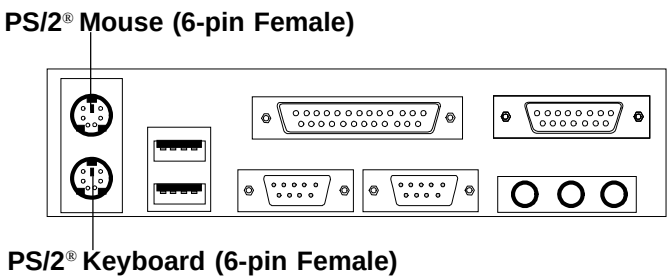
IDE2(Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

2.5 Keyboard Connector: JSKBD
Mouse Connector: JSMS

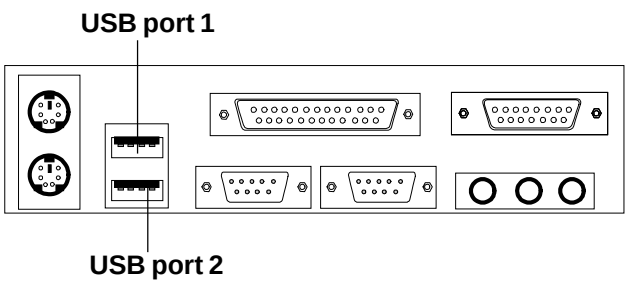
The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a keyboard. You can plug a keyboard cable directly to this connector.

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:



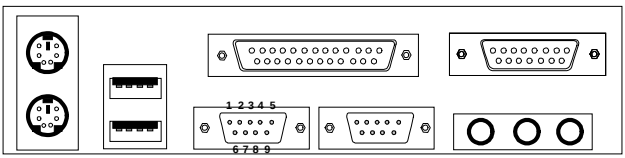
2.6 USB Connectors: USB

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.



2.7 Serial Port Connectors: COM A & COM B

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



COM A COM B

Serial Ports (9-pin Male)

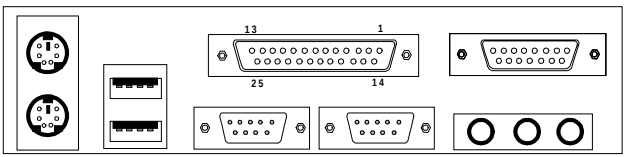
PIN DEFINITION

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

2.8 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

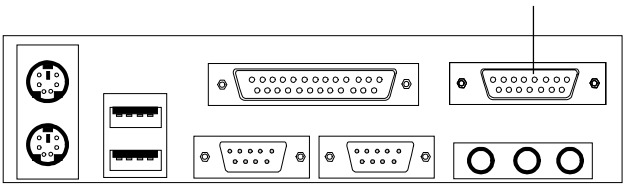


PIN DEFINITION

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		

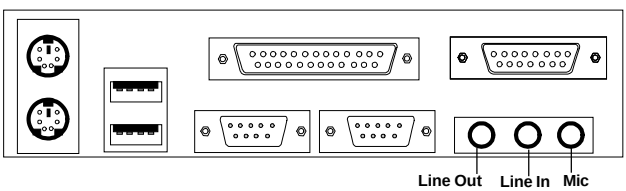
2.9 Joystick/Midi Connectors

You can connect joystick or game pads to this connector.



2.10 Audio Port Connectors

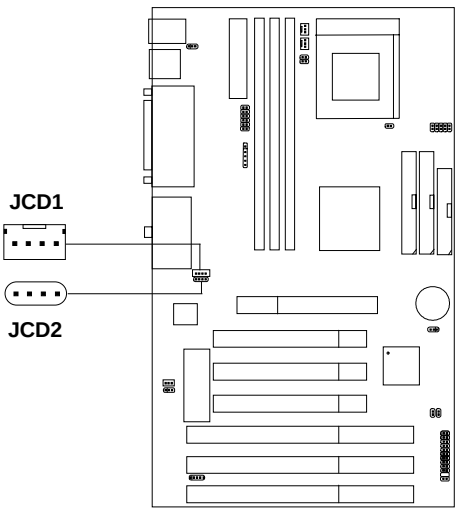
Line Out are connectors for Speakers or Headphones. **Line In** are used for outside CD player, Tape layer, or other audio devices. And **Mic** are connector for the microphones.



1/8" Stereo Audio Connectors

2.11 CD Line-In: JCD1 or JCD2

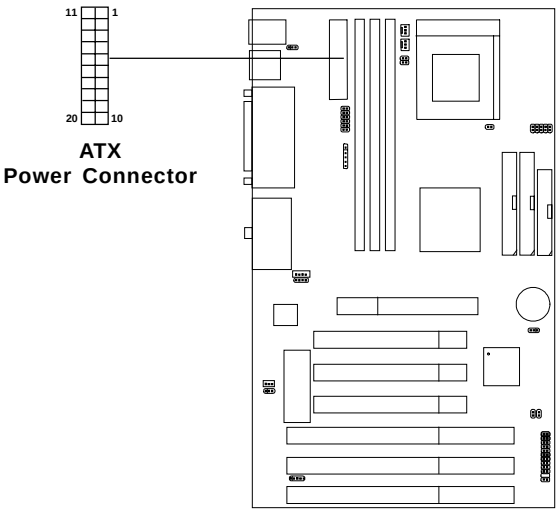
The mainboard provides two different CD Line-in connectors to let you connect two different kinds of cables whichever is provided by the CD-ROM.



2.12 Power Supply

2.12-1 ATX 20-pin Power Connector: JPWR1

This connector supports the power button on-board. Using the ATX power supply, functions such as Modem Ring Wake-Up and Soft Power Off are supported by this mainboard.

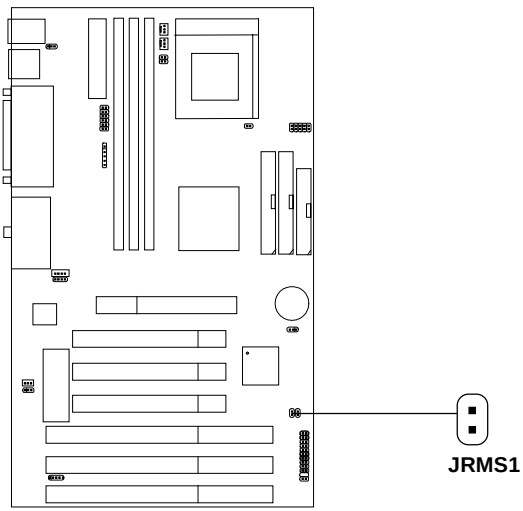


PIN DEFINITION

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

2.12-2 Remote Power On/Off Switch: JRMS1

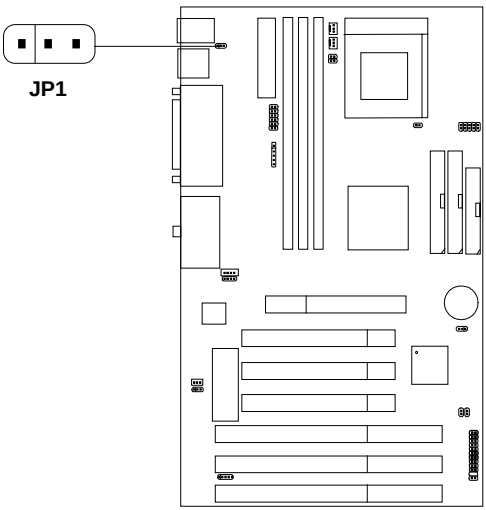
Connect to a 2-pin push button switch. If Instant-on is Enabled, every time the switch is shorted by pushing it once, the power supply will change its status from OFF to ON. **If Instant-on is Disabled: During ON stage, push once and the system goes to sleep mode: pushing it more than 6 seconds will change its status from ON to OFF**. If you want to change the setup, you could go to the BIOS Integrated Peripherals Setup.



Note: If the system hang and you're unable to shut it down, try pressing the Power button switch more than five second or pushing the power button switch together with the reset switch.

2.13 Keyboard Power-On Enabled: JP1

This is used to enable the keyboard power on feature. This mainboard supports keyboard power-on feature. The keyboard needs to have a power supply which can provide sufficient 5V standby power for both the keyboard and the mainboard.

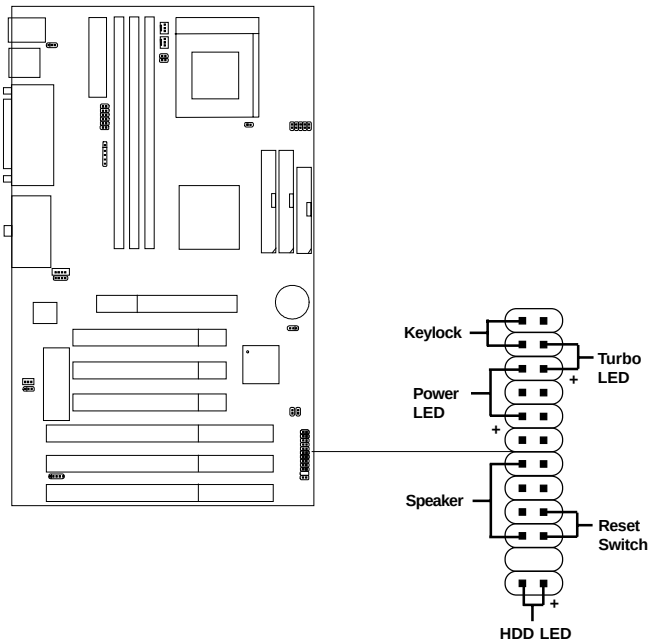


JP1	Feature
	Enable Keyboard Wake-up System Power Feature
	Disable Keyboard Wake-up System Power Feature

Note: a. To be able to use this function, you need a power supply that can provide enough power for the keyboard power on feature. (200mA for 5V Stand-by)
b. Consult power supply vendor about the 5V stand-by for your keyboard power consumption.

2.14 Case Connector: JFP1

The Turbo LED, Reset Switch, Key Lock, Power LED, Speaker and HDD LED are all connected to the JFP1 connector block.



JFP1

2.14-1 Turbo LED

The Turbo LED is always ON. You can connect the Turbo LED from the system case to this pin.

2.14-2 Reset Switch

Reset switch is used to reboot the system rather than turning the power ON/ OFF.

2.14-3 Keylock

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock to this pin.

2.14-4 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.

2.14-5 Speaker

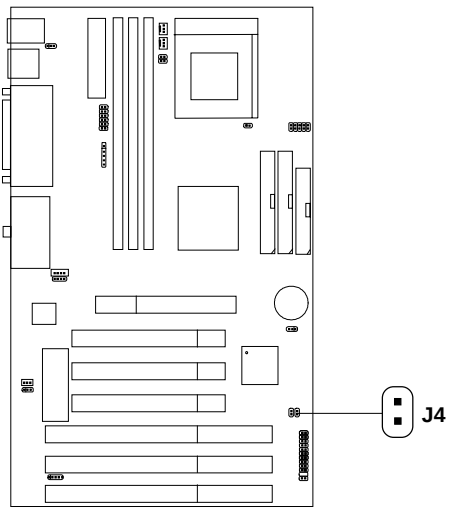
Speaker from the system case is connected to this pin.

2.14-6 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.

2.15 Power Saving LED Connector: J4

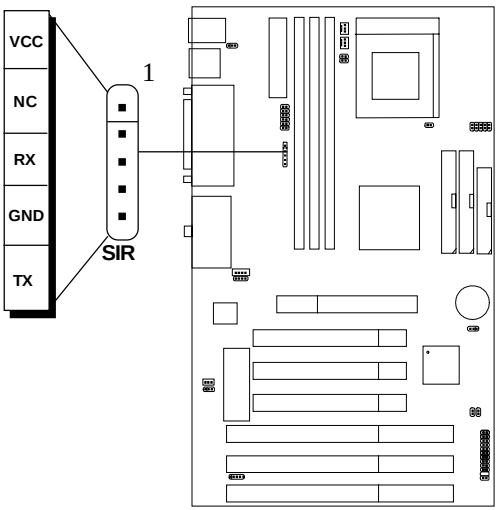
J4 can be connected with LED to monitor the Power saving state. This LED will lit while the system is in suspend mode.



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

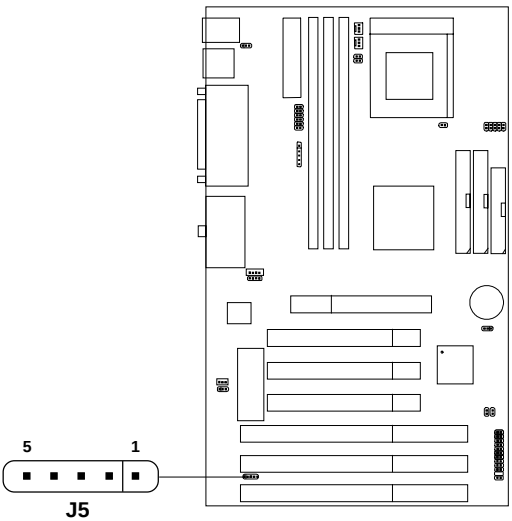
2.16 Infrared Module Connector: JIR

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.



2.17 Modem Wake Up Connector: J5

The J5 connector is for used with Modem add-on card that supports the Modem Wake Up function.



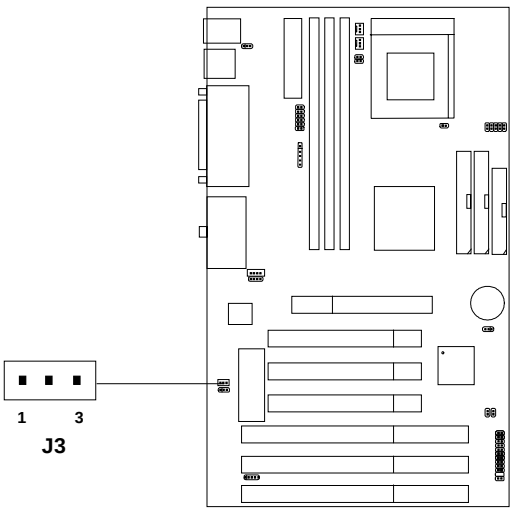
PIN	SIGNAL
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

Note: Modem wake-up signal is active "low".

Note: To be able to use this function, you need a power supply that provide enough power for this feature.
(750 ma power supply with 5V Stand-by)

2.18 Wake-Up on LAN Connector: J3

The J3 connector is for use with LAN add-on cards that supports Wake Up on LAN function.



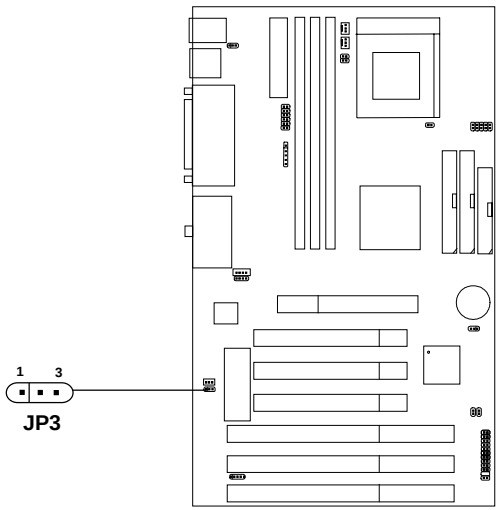
PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

Note: LAN wake-up signal is active "high".

Note: To be able to use this function, you need a power supply that provide enough power for this feature.
(750 ma power supply with 5V Stand-by)

2.19 Flash ROM Programming Voltage: JP3

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

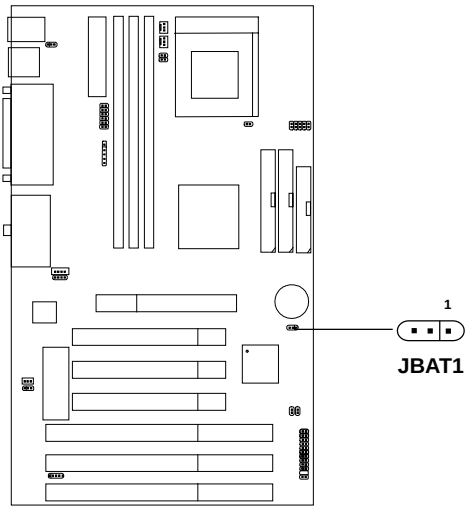


Voltage Setting

Note: Short 1-2 pin, if you're using Intel® flash ROM or if you want to flash the ROM data.

2.20 External Battery Connector: JBAT1

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



JBAT1	Function
3 1	Keep Data
3 1	Clear Data

Note: You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. To be able to clear the CMOS, you need to unplug the power plug of the system, because there's a 3V standby power for the chipset which is provided by the power supply. Otherwise, the CMOS will not be cleared.

Chapter 3

AWARD® BIOS SETUP

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

3.1 Entering Setup

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

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

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

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

3.2 Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3.3 The Main Menu

Once you enter Award®BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from 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 (2A5IKM49)
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.

PNP/PCI Configuration Setup

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

Load Setup Defaults

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

Integrated Peripherals

This category specifies the I/O used by your system.

Supervisor Password

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

User Password

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

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): Mon, Jan 12,1998
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

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
MODE HDD	access mode

3.5 BIOS Features Setup

```
ROM PCI/ISA BIOS (2A5IKM49)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Protection By       : Disabled      Video BIOS Shadow     : Enabled
CPU Internal Cache        : Enabled
External Cache            : Enabled
Quick Power on Self Test  : Disabled
Boot Sequence             : A,C,SCSI
Swap Floppy Drive         : Disabled
Boot Up Floppy Seek       : Enabled
Floppy FIFO Control       : Disabled
Boot Up NumLock status    : On
Security Option           : Setup
PCI/VGA palette snoop     : Disabled
OS select For DRAM>64MB   : Non-OS2
Report No FDD For WIN95   : Yes

                                  Esc : Quit    ↑↓→←: Select item
                                  F1 : Help PU/PD/+/- : modify
                                  F5 : Old Value(Shift) F2 : Color
                                  F6 : Load BIOS Defaults
                                  F7 : Load Setup Defaults
```

Virus Protection By

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. The settings are None, Both, Trend, or Award.

!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.

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 760K, 1.2M and 1.44M are all 80 tracks.

Floppy FIFO Control

During Enabled, the FDD disk will perform better.

Boot Up NumLock Status

The default value is On.

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

Security Option

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

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

PCI VGA Palette Snoop

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

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

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

Disabled (default)	Disables the function
Enabled	Enables the function

OS Selection for DRAM > 64MB

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

Report No FDD For WIN95

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

Video BIOS Shadow

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

Enabled (default)	Video shadow is enabled
Disabled	Video shadow is disabled

3.6 Chipset Features Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for you system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

ROM PCI/ISA BIOS (2A5IKM49)
CHIPSET FEATURE SETUP
AWARD SOFTWARE, INC.

```
Auto Configuration        : Enabled      DRAM Integrity Mode       : ECC
Refresh Cycle Time        : 1040clks     AGP Aperture Size         : 64MB
RAS Pulse Width Refresh   : 6T           System BIOS Cacheable     : Enabled
RAS Precharge Time        : 4T           Video BIOS Cacheable      : Enabled
RAS to CAS Delay          : 4T           Memory Hole at 15M-16M    : Disabled
CPU to PCI Post Write     : 4T           Spread Spectrum           : Disabled
ISA Bus Clock Frequency   : PCICLK/4
Starting Point of Paging  : 1T           Shutdown Temperature      : Disabled
NA# Enabled               : Enabled      Current System Temp       : 52ºC/125ºF
SDRAM CAS Latency         : 3T           Current CPU Fan           : 4987 rpm
SDRAM WR Retire Rate      : X-2-2-2      Current System Fan        : 0 rpm
SDRAM Wait State Control  : 1WS          Vcore: 3.19v  Vio: 3.40v
RAMW# Assertion Timing    : 3T           +5v  : 4.98v  +12v: 11.93v
CAS Precharge Time (EDO)  : 2T
CAS# Pulse Width for EDO  : 1T
CAS Precharge Time (FP)   : 2T
CAS# Pulse Width for FP   : 2T           Esc : Quit    ↑↓→←: Select item
Enhanced Memory Write     : Disabled     F1 : Help PU/PD/+/- : modify
Read Prefetch Memory RD   : Enabled      F5 : Old Value(Shift) F2 : Color
CPU to PCI Burst Mem. WR  : Enabled      F6 : Load BIOS Defaults
                                         F7 : Load Setup Defaults
```

Auto Configuration

This item allows you to select pre-determined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled. The settings are Enabled or Disabled.

Note: When this item is enabled, the pre-defined items will become SHOW-ONLY.

Refesh Cycle Time

DRAM needs data refresh; otherwise the data will be lost. The normal refresh rate is 15.6us. However the progress of DRAM technology makes the DRAM be able to suffer longer refresh time, such as 15.6 x 1, 15.6 x 2, 15.6 x 3, and so on. The settings are 15.6, 62.4, 124.8, or 187.2.

RAS Pulse Width Refresh

Select the number of CPU clock cycles for RAS DRAM refresh. Fewer clock cycles give faster performance, and more cycles give more stable performance. The settings are 4T, 5T, 6T, or 7T.

RAS Precharge Time

Defines the length of time the Row Address Strobe is allowed to precharge. The settings are 2T, 3T, 4T, or 5T.

RAS to CAS Delay

This sets the relative delay between the row and column address strobes. The settings are 2T, 3T, 4T, or 5T.

CPU to PCI Post Write

Select enabled to use a fast buffer for posting writes to memory. Using a fast buffer releases the CPU before completion of a write cycle to DRAM.

Starting Point of Paging

This item allows you to select the “Starting Point of Paging” function cycle of DRAM. The settings are 1T, 2T, 4T, or 8T.

SDRAM CAS Latency

This item allows you to select the SDRAM Latency Time. The setting are 2T or 3T.

SDRAM WR Retire Rate

Chipset has a post write buffer. The buffer will store the data of all CPU write cycle first, and then forward the data to DRAM. "Retire rate" is the speed of buffer to DRAM. The settings are X-1-1-1 or X-2-2-2.

SDRAM Wait State Control

This item allows you to select SDRAM wait state control function during Precharge command. The settings are 1WS or 0WS.

RAMW# Assertion Timing

This item allows you to select the RAMW# assertion timing. RAMW# is internal DRAM control signal of chipset. The settings are 3T or 2T.

CAS Precharge Time (EDO)

This item allows you to select CAS precharge time for EDO RAM. The settings are 1T, 1T/2T, or 2T.

CAS Precharge Time (FP)

This item allows you to select CAS precharge time for FP RAM. The settings are 1T, 1T/2T, or 2T.

CAS # Pulse Width (EDO)

Determines number of CPU clock cycles the CAS signal pulses during EDO DRAM reads and writes, when memory is not interleaved. The settings are 2T or 1T.

CAS # Pulse Width (FP)

Determines the number of CPU clock cycles allocated for the CAS to accumulate its charge before Fast Page mode DRAM is allowed to precharge. If insufficient time is allowed, refresh may be incomplete and data may be lost. The settings are 2T or 1T.

Enhanced Memory Write

This item allows you to enable/disable the enhanced memory write. This function must be disabled if using 512K cache size and TAG address is set to 8 bits. The settings are Enabled or Disabled.

Read Prefetch Memory RD

Chipset has a prefetch buffer. It will prefetch the DRAM data of next address in buffer. Then when next access hits this address, CPU can get the data from this buffer instead of DRAM. It will shorten the cycle time. The settings are Enabled or Disabled.

CPU to PCI Burst Mem. WR

Select enabled permits PCI burst memory write cycles, for faster performance. When disabled, performance is slightly slower, but more reliable. The settings are 3T or 2T.

DRAM Integrity Mode

Set this option to ECC, if your using a DIMM that support ECC (1-bit Error Code Correct). The setting are ECC or NON-ECC.

AGP Aperture Size

This option determines the effective size of the graphics aperture used in the particular PAC configuration. The AGP aperture is memory-mapped, while graphics data structure can reside in a graphics aperture. The aperture range should be programmed as not cacheable in the processor cache, accesses with the aperture range are forwarded to the main memory, then PAC will translate the original issued address via a translation table that is maintained on the main memory. The option allows the selection of an aperture size of 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256MB.

System BIOS Cacheable

Choose Enabled or Disabled. Enabling this will cause the system BIOS to be shadowed in both the DRAM and the Cache memory, otherwise, it's only shadowed in the DRAM.

Video BIOS Cacheable

Same as system BIOS cacheable.

Memory Hole at 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it can be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Enabled	Memory hole supported.
Disabled	Memory hole not supported.

Spread Spectrum

This function is used to get the best outcome for EMI testing. During Enabled, this will support the EMI testing.

Shutdown Temperature

This support the ACPI specification. Whenever the system temperature reach a critical level. During Enabled, the system will automatically shutdown.

Current System Temp/Current CPU Fan/Current System Fan/ Vcore/Vio/+5v/+12v

These items will show the current system temp, CPU/system Fan rotation & sytem voltage, if the System Hardware Monitor is present.

3.7 Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy while operating in a manner consistent with your own style of computer use.

ROM PCI/ISA BIOS (2A5IKM49)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

```
ACPI Function       : Enable
Power Management    : User Define
PM Control by APM   : Yes
Video Off Option    : Susp,Stby Off
Video Off Method    : DPMS Supported
Switch Function     : Break/Wake
Doze Speed(div by)  : 2/8
Stdby Speed(div by): 1/8
Modem Use IRQ       : 3
(Ctrl-ALt-Backspace): Power Off
Soft-off by PWR-BTTN: Instant Off
Ring Power UP       : Enable
LAN Power Up        : Enable
Power Up by Alarm   : Disable
Restore AC/Power Loss: Last State
```

```
** PM Timers **
HDD Off After       : Disable
Doze Mode           : Disable
Standby Mode        : Disable
Suspend Mode        : Disable

  ** PM Events **
Primary Activity    : Enabled
Secondary Activity  : Disabled
COM Ports Activity  : Enabled
LPT Ports Activity  : Enabled
VGA Activity        : Disabled
IRQ [3-7, 9-15],NMI : Disabled
IRQ8 Break Suspend  : Disabled
```

```
Esc : Quit     ↑↓→←: Select item
F1 : Help PU/PD/+/- : modify
F5 : Old Value(Shift) F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults
```

ACPI Function

During Enabled, this will support ACPI function.

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Doze Mode
2. Standby Mode
3. Suspend Mode
4. HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings.

Disable(default)	No power management. Disables all four modes.
Min. Power Saving	Minimum power management. Doze Mode = 20 min., Standby Mode = 20 min., Suspend Mode = 20 min., and HDD Power Down = Disabled.
Max Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL(Green Mode) CPU'S**. Doze Mode = 20 sec., Standby Mode = 20 sec., Suspend Mode = 20sec., and HDD Power Down = Disabled.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

PM Control by APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If Advance Power Management (APM) is installed on your system, selecting Yes gives better power savings.

If the Max. Power Saving is not enabled, this will be preset to NO.

Video Off Option

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

Always On	Monitor will remain on during power saving modes.
Suspend-->Off	Monitor blanked when the system enters the Suspend mode.
Susp,Stby-->Off	Monitor blanked when the system enters either Suspend or Standby modes.
All Modes-->Off	Monitor blanked when the system enters any power saving mode.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blank to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

Switch Function

Choose Break/Wake to use the TURBO button as a Suspend switch. Choose Deturbo to use it as Turbo Switch.

Doze Speed (div by)

Sets the CPU's speed during Doze mode. The speed is reduced to a fraction of the CPU's normal speed. The divisors range from 1 to 8. The settings are from 1 to 8.

Stdby Speed (div by)

Sets the CPU's speed during Doze mode. The speed is reduced to a fraction of the CPU's normal speed. The divisors range from 1 to 8. The settings are from 1 to 8.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use. The settings are 3, 4, 5, 7, 9, 10, 11, or NA.

(Ctrl-Alt-Backspace)

During Power off, whenever the Ctrl-Alt-Back Space key is press simultaneously, this will turned off the system. During Suspend, whenever the Ctrl-Alt-Back Space key is press simultaneously, to suspend the system. During Disabled, this key will not function.

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 shuts down. During Instant-off, the system will shut down once you push the switch.

Ring Power Up

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.

LAN Power Up

To use this function, you need a LAN add-on card which support power on functions. It should also support the wake-up on LAN jumper(JWOL).

Power up by Alarm

This function is for setting the Date, Hour, Minute, and Second for your computer to boot up. During Disabled, you cannot use this function. During Enabled, Choose the Date, Hour, Minute, and Second:

RTC Alarm Date	Choose which day the system will boot up.
RTC Alarm Hour	Choose which hour the system will boot up.
RTC Alarm Minute	Choose which minute the system will boot up.
RTC Alarm Second	Choose which second the system will boot up.

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

Restore AC/Power Loss

The settings are power on or last status. During power on, after every AC power loss, the system will be turned on. During last status, after every AC power loss, whatever the system status, it will be the same when the AC power returns.

Note: a. If you set this option to last status, the Power Button Function must be set to On/Off, or this function will not work.
b. Jumper JP1 must always be open, for this function to work properly.

PM Timers

The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected. See Above for available selections.

HDD Off After

By default, this item is Disabled, meaning that no matter the mode the rest of the system, the hard drive will remain ready. Otherwise, you have a range of choices from 1 to 15 minutes or Suspend. This means that you can select to have your hard disk drive be turned off after a selected number of minutes or when the rest of the system goes into a Suspend mode.

Doze Mode

When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

Standby Mode

When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

PM Events

Power Down Activities events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as On, even when the system is in a power down mode.

Primary Activity/Secondary Activity

When set to On (default), any event occuring at the Primary or Secondary drive port will awaken a system which has been powered down.

COM Ports Activity

When set to On (default), any event occuring at a COM (serial) port will awaken a system which has been powered down.

LPT Ports Activity

When set to On (default), any event occurring at LPT (printer) port wil awaken a system which has been powered down.

VGA Activity

When set to On (default), any event occurring at VGA will awaken a system which has been powered down.

IRQ [3-7, 9-15], NMI/IRQ 8 Break Suspend

The following is a list of IRQ's(**I**nterrupt **R**e**Q**uests), which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

As above, the choices are On and Off.

When set On, activity will neither prevent the system from going into a power management mode nor awaken it.

3.8 PNP/PCI Configuration Setup

This section describes configuring the Plug & play and IRQ functions of the system.

ROM PCI/ISA BIOS (2A5IISZ9)
PNP/PCI CONFIGURATION SETUP
AWARD SOFTWARE, INC.

```
PNP OS Installed          :No
Resources Controlled By   :Manual
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      :Legacy ISA
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      :Legacy ISA
IRQ-15assigned to      :Legacy ISA
DMA-0assigned to       :PCI/ISA PnP
DMA-1assigned to       :PCI/ISA PnP
DMA-3assigned to       :PCI/ISA PnP
DMA-5assigned to       :PCI/ISA PnP
DMA-6assigned to       :PCI/ISA PnP
DMA-7assigned to       :PCI/ISA PnP
```

```
PCI IRQ Actived By  : Level
PCI IDE IRQ Map To  : PCI-Auto
 Primary IDE INT#   : A
 Secondary IDE INT#: B
```

```
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 PnP cards. So, for non-PnP operating system (DOS, Netware), this option must set to No.

Resources Controlled By

The Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95. The settings are Auto or Manual.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. The settings are Enabled or Disabled.

IRQ 3/4/5/7/9/10/11/12/14/15

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture. The settings are Legacy ISA or PCI/ISA PnP.

DMA 0/1/3/5/6/7 assigned to

When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture. The settings are Legacy ISA or PCI/ISA PnP.

PCI IRQ Activated by

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system's manufacturer. The settings are Level or Edge.

PCI IDE 2nd Channel

The IDE standard supports two channels (interfaces) with two devices on each channel. Enable the second channel if your system has two PCI IDE connectors in use, either on the system board or on expansion boards. Disable the second channel if a second IDE connector is not present or not in use. The settings are Enabled or Disabled.

PCI IDE IRQ Map to

This allows you to configure your system to the type of IDE disk controller in use. By default, Setup assumes that your controller is an ISA (Industry Standard Architecture) device rather than a PCI controller. The more apparent difference is the type of slot being used.

If you have equipped your system with a PCI controller, changing this allows you to specify which slot has the controller and which PCI interrupt (A, B, C, or D) is associated with the connected hard drives.

Remember that this settings refers to the hard disk drive itself, rather than individual partitions. Since each IDE controller supports two separate hard drives, you can select the INT# for each.

Selecting "PCI Auto" allows the system to automatically determine how your IDE disk system is configured.

3.9 Load 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.

Internal PCI/IDE	:Both	Onboard Parallel Mode	:SPP
IDE Primary Master PIO	:Auto		
IDE Primary Slave PIO	:Auto		
IDE Secondary Master PIO	:Auto	USB Controller	:Enabled
IDE Secondary Slave PIO	:Auto	USB Keyboard Support	:Disabled
Primary Master UltraDMA	:Auto	KB Power ON Password	:Enter
Primary Slave UltraDMA	:Auto		
Secondary Master UltraDMA	:Auto		
Secondary Slave UltraDMA	:Auto		
IDE Burst Mode	:Enabled		
IDE Data Port Post Write	:Disabled		
IDE HDD Block Mode	:Enabled		
Onboard FDD controller	:Enabled		
Onboard Serial Port 1	:Auto		
Onboard Serial Port 2	:Auto	Esc : Quit	↑↓→← : Select item
UART 2 Mode	:Standard	F1 : Help PU/PD/+/- : modify	
		F5 : Old Value(Shift) F2 : Color	
Onboard Parallel Port	:378H/IRQ7	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Internal PCI/IDE

This chipset contains an internal PCI IDE interface which supports two IDE channels. The settings are Primary, Secondary, Both, or Disabled.

IDE PIO

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship which are determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary --so you have to ability to install up to four separate had disks.
PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. This is simpler and more efficient (and faster).
Your system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode. This is true for the next four setup items:

1. IDE Primary Master PIO
2. IDE Primary Slave PIO
3. IDE Secondary Master PIO
4. IDE Secondary Slave PIO

Ultra DMA 33

IDE hard drive controllers can support Ultra DMA 33 Hard Drive. If you use Ultra DMA hard drive, then you will get a better performance. The settings are Auto, Enabled, and Disabled.

1. Primary Master UltraDMA
2. Primary Slave UltraDMA
3. Secondary Master UltraDMA
4. Secondary Slave UltraDMa

IDE Data Port Post Write

PCI speed is faster than the speed of a physical hard disk or CD-ROM. With post write, a buffer is used to store the PCI data first before forwarding the data to the hard disk. The settings are Enabled or Disabled.

IDE HDD Block Mode

This item allows you to increase IDE HDD performance, which is dependent on HDD block size. The settings are Enabled or Disabled.

Onboard FDD Controller

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature. The settings are Enabled or Disabled.

Onboard Serial Port 1/Port 2

This item allows you to determine access onboard serial port 1/port 2 controller with I/O address. The settings are 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, or Auto.

UART 2 Mode

This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The settings are Standard, ASKIR, or HPSIR.

Onboard Parallel Port

This item allows you to determine access onboard parallel port controller with I/O address. The settings are 378H/IRQ7, 278H/IRQ5, 3BCH/IRQ7, or Disabled.

Onboard Parallel Mode

Select an operating mode for the onboard parallel (printer) port as Normal EPP (Extended Parallel Port) ECP (Extended Capabilities Port) CEP+EPP PC AT parallel port Bidirectional port Fast, buffered port Fast, buffered, bidirectional port.

Select Normal unless you are certain your hardware and software both support EPP or ECP mode. The settings are SPP, ECP/EPP, ECP, or EPP/ SPP.

USB Controller

This items allows you to determine, whether to enable the USB(Universal Serial Bus) function or not. The settings are Enabled or Disabled.

USB Keyboard Support

This items allows you to use USB Keyboard without installing any driver on some OS. If you want to use this function, you must enable USB Controller function. The settings are Enabled or Disabled.

KB Power ON Password

To use this function, you need a keyboard which support this power on functions. During Enter, if you push the ENTER key , the system will change from ON to OFF, and OFF to ON. During Disabled, this function will not work.

Power Up 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.

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 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.
AGIOMS VXXX XXXXXX

Hit <DEL> if you want to run setup









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

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

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

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

```
AMIBIOS HIFLEX SETUP UTILITIES - VERSION 1.07
(C) 1996 American Megatrends, Inc. All Rights
Reserved

Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI/Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Change Language Setting
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 4.7 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): Sat Jan 17, 1998
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

Month     : Jan-Dec                             ESC:Exit  :Sel
Day       : 01-31                               PgUp/PgDn:Modify
Year      : 1901-2099                           F2/F3:Color
```

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.

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

4.3 Advanced CMOS Setup

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

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

Ist Boot Device                    Floppy        Available Options:
2nd Boot Device                    IDE 0         Enabled
3rd Boot Device                    CD-ROM        Disabled
4th Boot Device                    Disabled
Boot From Card BIOS                Yes
Try Other Boot Devices             Yes
Quick Boot                         Disabled
BootUp Num-Lock                    On
Floppy Drive Swap                  Disabled
PS/2 Mouse Support                 Enabled
Primary Display                    VGA/EGA
Password Check                     Setup
Boot to OS/2, DRAM 64MB or Above   No
Internal Cache                     WriteBack
External Cache                     Enabled
System BIOS Cacheable              Enabled
C000, 16k Shadow                   Enabled
C400, 16k 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.

Boot From Card BIOS

This option support boot ROM under DOS mode.

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. The end user can then 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 Swap

Set this option to Enabled to specify that floppy drives A: and B: are swapped. The setting are Enabled and Disabled. The Optimal and Fail-Safe default settings are Disabled.

PS/2® Mouse Support

When this option is set to Enabled, AMI® BIOS supports a PS/2®-type mouse. The settings are Enabled and Disabled. The Optimal and Fail-Safe default settings are Enabled.

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®, DRAM 64MB or Above

Set this option to Enabled to permit the BIOS to run properly, if OS/2® is to be used with > 64MB of DRAM. The settings are Enabled or Disabled. The Optimal and Fail-safe default settings are Disabled.

Internal Cache/External Cache

This option selects the type of caching algorithm used by AMI® BIOS and the CPU for L1 cache memory(internal/external to the CPU). The settings are Writeback - a writeback algorithm is used, Write-through - a write-through algorithm is used or Disabled - AMI® BIOS does not specify the type of caching algorithm. The algorithm is set by the CPU. The Optimal and Fail-Safe default settings are Writeback.

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, 16K Shadow/C400, 16k 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 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 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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Automatic Configuration              Disabled     Available Options:
***** DRAM Setting *****                          Enabled
RAS Pulse Width for EDO/FP/SDRAM     6T/5T        Disabled
Refresh Queue Depth                  12
Read Lead-off Time Delay             Normal
Back-Back Read Timing Delay          Normal
***** SDRAM Timing *****
Fast Read                            Disabled
Back-Back Read Timing                51112111
Write Retire Rate                    x-1-1-1
CAS Latency                          2T
Read Delay 1T After W-Cycle          Disabled
RAS#/CAS# Assert Time                1T Pulse
Wait State                           1 Wait
*****CACHE Setting*****
**** ISA & Control Setting ****
ISA Bus Clock                        PCICLK/4
16Bit  I/O Cycle Recovery Time       5 BUSCLK
8BIT I/O Cycle Recovery Time         8 BUSCLK
Memory Hole                          Disabled
Graphic Window Control               64Mbyte
********* USB Setting **********
USB Function                         Enabled
USB Keyboard Legacy Support          Enabled      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:

Automatic Configuration

Choose Enabled(default) will automatically configure the DRAM timing depending on the "DRAM Speed" selection. Choose Disabled to customize setup.

DRAM Setting

RAS Pulse Width For EDO/FP/SDRAM

Select the number of CPU clock cycles for RAS DRAM refresh. Fewer clock cycles give faster performance, and more cycles give more stable performance. The settings are 6T/5T, 5T/4T, 7T/6T, or 8T/7T.

Refresh Queue Depth

This option is for minimizing the performance penalty caused by refresh cycles. Refresh request is arbitrated with other DRAM request. If a refresh request does not get served, it enters refresh queue. The priority of refresh request is highest when the refresh request is full.

Read Lead-off Time Delay/Back-Back Read Timing

This option controls whether to delay the Read command or not.

SDRAM Setting

Fast Read

Leave on the default setting of Disabled.

Back-Back Read Timing

This is for non-cache system. If this is a page-hit cycle, it can return data 1T earlier than normal case.

Write Retire Rate

The chipset has a post write buffer. The buffer will store the data of all CPU write cycle first, and then forward the data to DRAM. "Retire Rate" is the speed of the buffer to DRAM. The settings are X-1-1-1 or X-2-2-2.

CAS Latency

This item allows you to select the SDRAM Latency Time. The settings are 2T or 3T.

Read Delay 1T After W-Cycle

This option read command timing control, when Read Cycle follows after Write Cycle. The setting is 0 wait and 1 wait state.

RAS#/CAS# Assert Time

This option is for SDRAM CAS Latency Time and RAS# to CAS# delay time. The Settings are 1T pulse and 2T pulse.

Wait State

This item allows you to select SDRAM wait state control function during Precharge command. The settings are 1 wait or 0 wait.

Cache Setting

ISA Bus Clock

This option is for selecting ISA Bus Clock 8MHz when PCI bus clock /3/4/5. For example: 33MHz/4 = 8.33 ISA Bus Clock
30MHz/3 = 10 ISA Bus Clock

16Bit I/O Cycle Recovery Time/8Bit I/O Cycle Recovery Time

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

Memory Hole

You can reserve this area of the system memory for ISA adapter ROM. When this area is reserved, it can be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Enabled	Memory hole supported.
Disabled	Memory hole not supported.

Graphic Window Control

This option determines the effective size of the graphics aperture used in the particular PAC configuration. This is a memory-mapped, while graphics data structure can reside in a graphics aperture. The option allows the selection of 4, 8, 16, 32, 64, 128, and 256 Mbytes.

USB Function

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

USB KB/Mouse Legacy 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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Keyboard Power ON                    Disabled     Available Options:
Power Management/APM                 Enabled      Enabled
GPC Monitor Power State              Standby      Disabled
Video Power Down Mode                Standby
Hard Disk Power Down Mode            Standby
HardDisk Time Out(minute)            Disabled
Standby Time Out                     10 Min
Suspend Time Out                     15 Min
Slow Clock Ratio                     50%
Primary IDE                          Both
Secondary IDE                        Both
Floppy Port                          Both
Serial Port 1                        Both
Serial Port 2                        Both
Parallel Port                        Both
DMA/USB Master                       WakeUp
IRQ 0,1,3-15/NMI                     WakeUp
Ring In                              Ignore
Display Activity                     Ignore
PCI/AGP/IDE Master                   Ignore
Power Off By Power Button            InstantOff
Curren CPUFAN1 Speed                 0 RPM        ESC:Exit :Sel
IN0 (V)                              3.376        PgUp/PgDn:Modify
IN1 (V)                              3.088        F2/F3:Color
```

```
IN2 (V)                              5.053
IN3 (V)                              12.416
```

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:

Keyboard Power ON

During Enabled, if there is any activity on the keyboard, the system will change from OFF to ON. During Disabled, this function will not work.

Power Management/APM

Set this option to Enabled to enable the 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.

GPC 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.

HardDisk Time Out (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.

Standby Time Out

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 Time Out

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.

Primary IDE/Secondary IDE/Floppy Port/Serial Port 1/Serial Port 2/Parallel Port/DMA/USB Master/IRQ 0,1,3-15/NMI/ Ring/Display Activity/PCI/AGP/IDE Master

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.

Power Off By Power Button

The setting are Delay 4 sec or Instant Off. During Delay 4 sec, if you push the switch once, the system goes into suspend mode and if you push it more than 4 seconds, the system turn off. During Instant Off, the system will turn off once you push the switch.

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:
Clear NVRAM on Every Boot            No          Enabled
PCI Latency Timer (PCI Clocks)       64          Disabled
PCI VGA Palette Snoop                Disabled
OffBoard PCI IDE Card                Auto
OffBoard PCI IDE Primary IRQ         Disabled
OffBoard PCI IDE Secondary IRQ       Disabled
Assign IRQ to PCI VGA Card           Yes
PCI IDE Busmaster                    Disabled
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                                 PCI/PnP
IRQ4                                 PCI/PnP
IRQ5                                 PCI/PnP     ESC:Exit  :Sel
IRQ7                                 PCI/PnP     PgUp/PgDn:Modify
IRQ8                                 PCI/PnP     F2/F3:Color
IRQ9                                 PCI/PnP
```

```
IRQ10                                PCI/PnP
IRQ11                                PCI/PnP
IRQ12                                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 on Every Boot

During Yes, 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 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.

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 Card

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

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

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/Reserved Memory Address

Some ISA cards have ROM at 0C000h~0D000h segments, but in a non-standard format. So Plug & Play BIOS can't detect it. The end user needs to set it up manually. Setting these options under this condition, will inform the BIOS which location and how many location is occupied.

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                          Auto        Available Options:
OnBoard Serial Port1                 Auto        Enabled
OnBoard Serial Port2                 Auto        Disabled
  Serial Port2 Mode                  Normal
   IR Duplex Mode                    Full
   IrDA Protocol                     1.6us
OnBoard Parallel Port                Auto
  Parallel Port Mode                 Normal
  EPP Version                        N/A
  Parallel Port IRQ                  Auto
  Parallel Port DMA Channel          N/A
Onboard PCI IDE                      Both
  Primary Master Prefetch            Enable
  Primary Slave Prefetch             Enable
  Secondary Master Prefetch          Enable
  Secondary SLave Prefetch           Enable

                                     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 1/Onboard Serial Port 2

Choose 3F8, 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.*

Serial Port2 Mode

Choose onboard Serial Port2 operation mode as standard UART or as IR/Infrared. The default setting is Normal.

IR Duplex Mode

Choose full duplex or half duplex operation mode when the onboard Serial Port2 operation mode is selected as IR.

IrDA Protocol

If onboard Serial Port2 is selected as IrDA mode, the user has to set the IR transmit active pulse time according to the specification of IR module. Based on different IR module, the user can select active pulse time as 1.6us or 3/16 bit.

Onboard Parallel Port

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

If the ISA add-on card has			Onboard parallel port to be set as	
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.*

EPP Version

This option is for setting which EPP version will be used. The settings are 1.7 and 1.9.

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.

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.

Chapter 5

MEMORY COMPATIBILITY TEST

Memory Modules Tested

Manufacturer	Model Number	Type	Size	Result
LG	GM72V16821BT10K (ECC)	SDRAM	16MB	OK
LG	GM72V16821BT10K	SDRAM	32MB	OK
LG	GM72V16821CT10K	SDRAM	32MB	Fail
Mitusbishi	M5M4V16S30CTP-12	SDRAM	16	OK
Mitsubishi	M5M4V64S40ATP	SDRAM	64	OK
NEC	D4516161G5-A12-7JF	SDRAM	8	OK
NEC	D4516161G5-A12-7JF	SDRAM	16	OK
NEC	D4516821G5-A12-7JF	SDRAM	16	OK
NEC	D4516821G5-A12-7JF	SDRAM	32	Fail
NEC	D4516821AG5	SDRAM	32MB	OK
SEC	KM44V4104BS-L6	EDO	64MB	OK
SEC	KM416S1120AT-G10(2*8)	SDRAM	16MB	OK
SEC	KM416S1120AT-G10(1*16)	SDRAM	16MB	OK
SEC	KM48S2020AT-G10	SDRAM	16MB	OK
SEC	KM48S2020AT-G12	SDRAM	32MB	OK
SEC	KM48S2020BT-G10	SDRAM	32MB	OK
SEC	KM44S4020AT-G10(4*4)	SDRAM	32MB	OK
SEC	KM44S4020AT-G12(4*4)	SDRAM	32MB	OK
TI	TMX626812BDGECC	SDRAM	16MB	OK
Toshiba	TC59S1608AFT-10 (ECC)	SDRAM	32MB	OK
Vanguard	VG26V17405CJ-6	EDO	32MB	OK

Manufacturer	Model Number	Type	Size	Result
Fujitsu	81117822A-100	SDRAM	8MB	OK
Fujitsu	81117822A-100	SDRAM	16MB	OK
Hitachi	51W18165TT6	EDO	32MB	OK
Hitachi	HM5216805TT10	SDRAM	32MB	OK
Hitachi	HM5216805TT10H	SDRAM	32MB	Fail
Hyundai	HYM5V64804 TFG	EDO	64MB	OK
Hyundai	HY57V168010A	SDRAM	16MB	OK
Hyundai	HYM7072A801-TFG	SDRAM	64MB	OK
LG	GM71VS17803BLT6	EDO	16MB	OK
LG	GM72V16821BT10K	SDRAM	16MB	OK

Note: Hitachi (HM5216805TT10H) and LG (GM72V16821CT10K) will be unstable. Toshiba (TC5951616AFT-10/TC5951608AFT-10) generates garbage. NEC 16-bit SDRAM (D4516821G5 part number and 97xxLxxxx lot number have many data conflict with the chipset.) NEC announced a new 4th generation 16M-bit SDRAM (D4516821AG5) that don't have this problem .