# Chapter 4

# AMI® BIOS USER'S GUIDE

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

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

## 4.1 Enter BIOS Setup

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

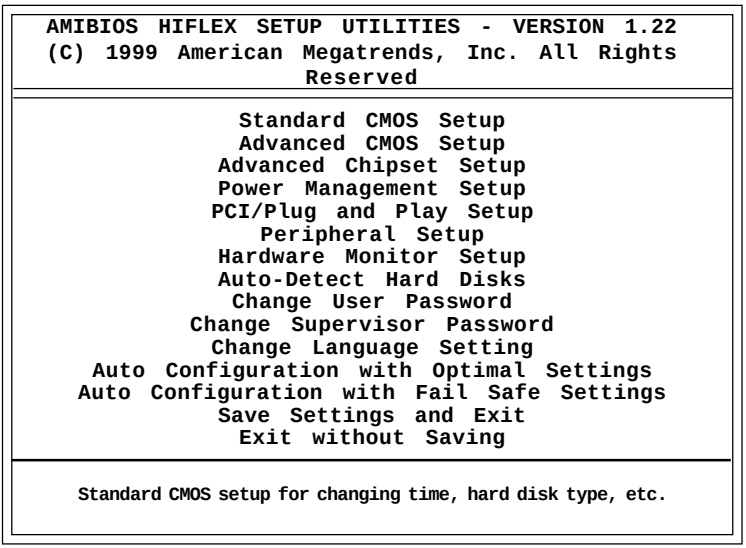
1. Turn on or reboot the system. The following screen appears with a series of diagnostic check.

```
AMIBIOS (C) 1999 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.*




4. Use the <Up> and <Down> key to move the highlight scroll up or down.

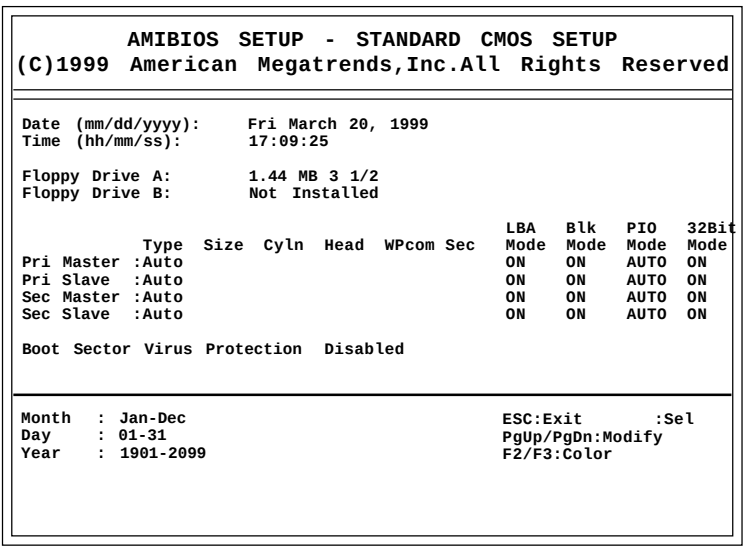
5. Use the <ENTER> key to select the option.

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

7. Section 3.2 to 3.7 will explain the option in more details.

## 4.2 Standard CMOS Setup

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




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

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

## 4.3 Advanced CMOS Setup

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

```
        AMIBIOS SETUP - ADVANCED CMOS SETUP
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Quick Boot                          Enabled     Available Options:
1st Boot Device                     Floppy      Disabled
2nd Boot Device                     IDE 0       Enabled
3rd Boot Device                     CD-ROM
Try Other Boot Devices              Yes
Initial Display Mode                BIOS
Display Mode at Add-On ROM Init     Force-BIOS
Floppy Access Control               Read-Write
S.M.A.R.T. For Hard Disk            Disabled
BootUp Num-Lock                     On
Floppy Drive Swap                   Disabled
Floppy Drive Seek                   Disabled
PS/2 Mouse Support                  Enabled
Primary Display                     VGA/EGA
Password Check                      Setup
Boot to OS/2 > 64M                  No
CPU Serial Number                   Disabled
Cache Bus ECC                       Enabled
System BIOS Cacheable               Disabled
C000, 64k Shadow                    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 CMOS Setup, press <ESC> to go back to the main menu.

## Description of the item on screen follows:

### 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.

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

This option sets the sequence of boot drives.

The settings are:

| | |
|---|---|
| IDE0 | The system will boot from the first HDD. |
| IDE1 | The system will boot from the Second HDD. |
| IDE2 | The system will boot from the Third HDD. |
| IDE3 | The system will boot from the Fourth HDD. |
| F(optical) | The system will boot from LS-120(120M Floppy). |
| SCSI | The system will boot from the SCSI. |
| Network | The system will boot from the Network drive. |
| CD-ROM | The system will boot from the CD-ROM. |
| Disable | Disable this sequence. |

### Try other Boot Devices

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

### Initial Display Mode

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

### Display Mode at Add-On ROM Init

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

### Floppy Access Control

This option sets the Floppy to Read-only or Read-Write.

### S.M.A.R.T. for Hard Disks

This option sets the SMART Function for the hard disk. The hard disk need to have SMART function for this feature to work.

### 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.

### Floppy Drive Seek

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

### PS/2® Mouse Support

When this option is set to Enabled, AMI® BIOS supports a PS/2® 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® > 64MB

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.

### CPU Serial Number

This option is for Pentium III processor. During Enabled, this will check the CPU Serial number. Disabled this option if you don't want the system to know the Serial number.

### Cache Bus ECC

This option is for Pentium® II processor. During Enabled, this will affect the system performance. Disabled this option if you don't want to affect the system performance.

### 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, 64K 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.

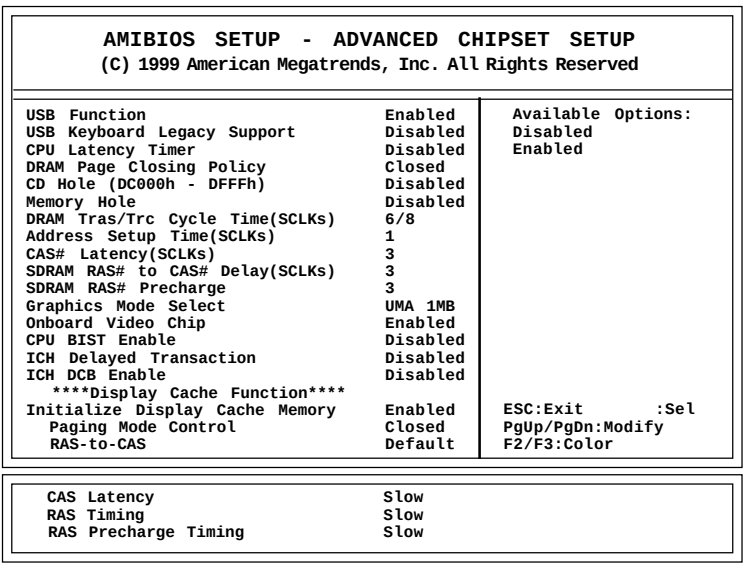
**Cached** - the contents of the video ROM from C0000h - C7FFFh are not only copied from ROM to RAM; it can also be written to or read from cache memory.

**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.

## 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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USB Function                          Enabled     Available Options:
USB Keyboard Legacy Support           Disabled    Disabled
CPU Latency Timer                     Disabled    Enabled
DRAM Page Closing Policy              Closed
CD Hole (DC000h - DFFFh)              Disabled
Memory Hole                           Disabled
DRAM Tras/Trc Cycle Time(SCLKs)       6/8
Address Setup Time(SCLKs)             1
CAS# Latency(SCLKs)                   3
SDRAM RAS# to CAS# Delay(SCLKs)       3
SDRAM RAS# Precharge                  3
Graphics Mode Select                  UMA 1MB
Onboard Video Chip                    Enabled
CPU BIST Enable                       Disabled
ICH Delayed Transaction               Disabled
ICH DCB Enable                        Disabled
   ****Display Cache Function****
Initialize Display Cache Memory       Enabled     ESC:Exit       :Sel
  Paging Mode Control                 Closed      PgUp/PgDn:Modify
  RAS-to-CAS                          Default     F2/F3:Color

  CAS Latency                         Slow
  RAS Timing                          Slow
  RAS Precharge Timing                Slow
```

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:

### USB Function

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

### USB Keyboard Legacy Support

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

### DRAM Page Closing Policy

This option controls whether the GMCH will precharge bank or precharge all, during the service of a page miss.

### Memory Hole

This option allows the end user to specify the location of a memory hole. The cycle matching the selected memory hole will be passed to the ISA bus. If Enabled, the selected hole is not remapped.

### DRAM Tras/Trc Cycle Time (SCLKs)

This option controls the number of SCLKs for an access cycle.

### CAS# Latency

This option determines the CAS latency time parameter of SDRAM. The settings are 2 clks or 3 clks. Under 66MHz CPU bus, set this option to either 2 or 3 but for 100MHz CPU, it is recommended that this be set to 3.

### SDRAM RAS# to CAS# Delay

This operation decide the delay in assertion of CAS#(SCAS#) from assertion of RAS#(SRAS#) in 66MHz. Under 66MHz CPU bus, set this option to either 2 or 3 but for 100MHz CPU, it is recommended that this be set to 3.

### SDRAM RAS Precharge

This option defines the RAS# precharge requirements for the SDRAM memory type in 66MHz clocks. Under 66MHz CPU bus, set this option to either 2 or 3 but for 100MHz CPU, it is recommended that this be set to 3.

### Graphics Mode Select

This option is used to enable/Disable the internal graphics device and select the amount of system memory that is used to support the internal graphics device.

### Onboard Video Chip

This option is used to enable/disabled the video onboard the chip.

### Initialize Display Cache Memory

This option will allow you to initialized the display cache memory.

### Paging Mode Control

This option decide the GMCH memory controller tends to leave pages open or closed.

### RAS-to-CAS

This option determine the display cache RAS#-toCAS# delay.

### CAS# Latency

This option decide the display cache CAS latency.

### RAS# Timing

This option controls RAS# active to precharge, and refresh to RAS# active delay.

### RAS# Precharge Timing

This option controls RAS# precharge clocks.

## 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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ACPI Standby State                  S1          Available Options:
Power Management/APM                Enabled     Disabled
Green PC LED Status                 Blinking    Enabled
Green PC Monitor Power State        Stand By
Video Power Down Mode               Suspend
Hard Disk power Down Mode           Stand By
Standby Time Out (Minute)           Disabled
Suspend Time Out (Minute)           Disabled
Throttle Slow Clock Ratio           50.0%
Keyboard & PS/2 Mouse Access        Monitor
FDC/LPT/COM Ports Access            Monitor
SB & MSS Audio Ports Access         Ignore
Midi Ports Access                   Ignore
ADLIB Ports Access                  Ignore
Primary Master IDE Access           Monitor
Primary Slave IDE Access            Ignore
Secondary Master IDE Access         Monitor
Secondary Slave IDE Access          Ignore
PIRQ[A] IRQ Active                  Ignore
PIRQ[B] IRQ Active                  Ignore
PIRQ[C] IRQ Active                  Ignore
PIRQ[D] IRQ Active                  Ignore
System Thermal                      Ignore
Thermal Slow Clock Ratio            50.0%
CPU Critical Temperature            650C/1490F
Power Button Function               On/Off
Restore on AC/Power Loss            Last State
Ring Resume from Soft Off           Disabled    ESC:Exit       :Sel
LAN Resume from Soft Off            Disabled    PgUp/PgDn:Modify
PME Function Support                Disabled    F2/F3:Color

RTC Alarm Resume from Soft Off      Disabled
RTC Alarm Date                      15
RTC Alarm Hour                      12
RTC ALarm Minute                    30
RTC Alarm Second                    30
```

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:

### ACPI Standby State

This option sets the ACPI Power Management Standby State.

**S1 Sleeping State**

The S1 sleeping state is low wake-up latency sleeping state. In this state, no system context is lost(CPU or chip set) and hardware maintains all system context.

**S3 Sleeping State**

The S3 state is a low wake-up latency sleeping sate where all system context is lost expect system memory. CPU, cache, and chipset context are lost in this state. Hardware maintains memory context and restores some CPU and L2 configuration context.

### Power Management/APM

Set this option to Enabled to enable the chipset's 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.

### Green PC LED Status

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.

### Green PC Monitor Power State

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

### Video Power Down Mode

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

### Hard Disk Power Down Mode

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

### Standby Time Out (Minute)

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

### Suspend Time Out (Minute)

This option specifies the length of a period of system inactivity while in Suspend 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.

### Throttle 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.

### Thermal Slow Clock Ratio

When set to Monitor, then you can choose the throttle ratio. This option is connected with the **CPU Critical Temperature** Option.

### CPU Critical Temperature

This option is for setting the CPU temperature that would be critical enough, so that it would use the Thermal Slow Clock Ratio to cool down the CPU.

### Power Button Function

During Suspend, if you push the switch once, the system goes into suspend mode and if you push it more than 4 seconds, the system will be turned off. During On/Off, the system will turn off once you push the switch.

### Restore on 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.

### Ring Resume from Soft-Off

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

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

### LAN Resume from Soft-Off

During Disabled, the system will ignore any incoming signal from the LAN network card. During Enabled, the system will boot up if there's an incoming signal from the LAN network card.

**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.

### RTC Alarm Resume From Soft-Off

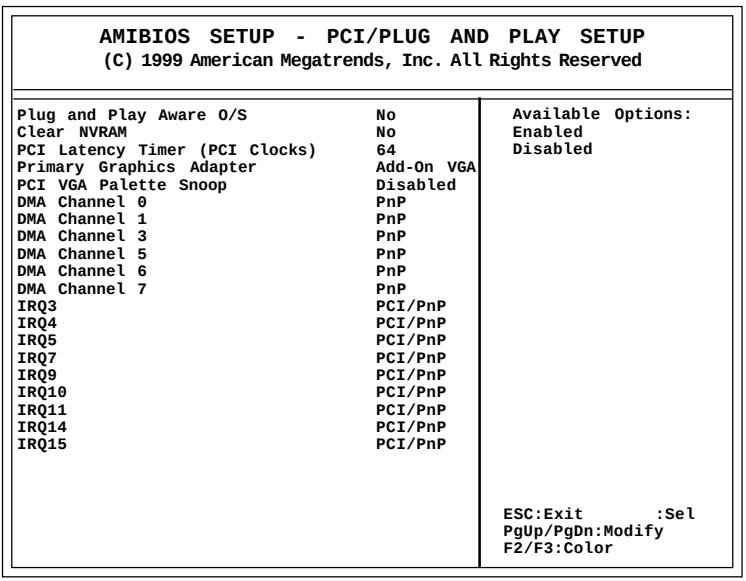
This function is for setting the Date, Hour, Minute, and Second for your computer to boot up. During Disabled, you cannot use this function. During Enabled, Choose the Date, Hour, Minute, and Second:

| | |
|---|---|
| **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.

## 4.6 PCI/Plug and Play Setup

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




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 will clear NVRAM data 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.

### Primary Graphics Adapter

This option is for selecting which VGA card is to be your primary display graphics adapter.

### 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.

### 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.

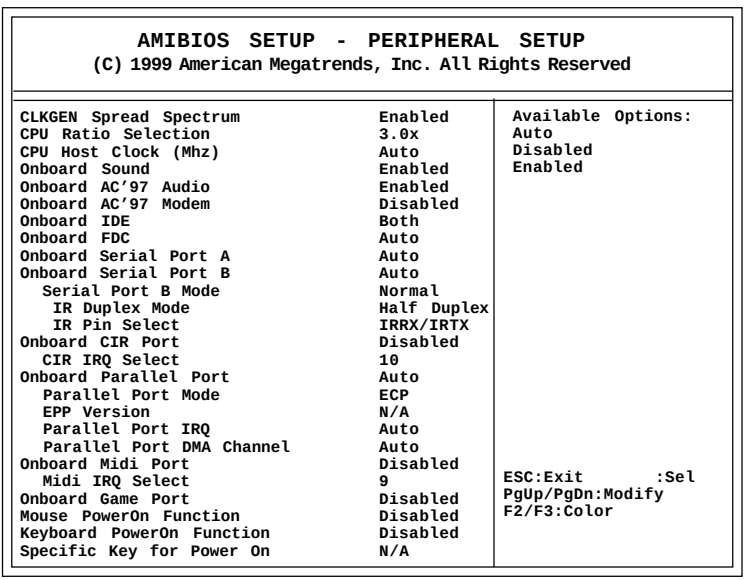
### IRQ3/IRQ4/IRQ5/RQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15

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.

## 4.7 Peripheral Setup

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



```
          AMIBIOS SETUP - PERIPHERAL SETUP
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CLKGEN Spread Spectrum              Enabled     Available Options:
CPU Ratio Selection                 3.0x        Auto
CPU Host Clock (Mhz)                Auto        Disabled
Onboard Sound                       Enabled     Enabled
Onboard AC'97 Audio                 Enabled
Onboard AC'97 Modem                 Disabled
Onboard IDE                         Both
Onboard FDC                         Auto
Onboard Serial Port A               Auto
Onboard Serial Port B               Auto
  Serial Port B Mode                Normal
   IR Duplex Mode                   Half Duplex
   IR Pin Select                    IRRX/IRTX
Onboard CIR Port                    Disabled
  CIR IRQ Select                    10
Onboard Parallel Port               Auto
  Parallel Port Mode                ECP
  EPP Version                       N/A
  Parallel Port IRQ                 Auto
  Parallel Port DMA Channel         Auto
Onboard Midi Port                   Disabled
  Midi IRQ Select                   9           ESC:Exit       :Sel
Onboard Game Port                   Disabled    PgUp/PgDn:Modify
Mouse PowerOn Function              Disabled    F2/F3:Color
Keyboard PowerOn Function           Disabled
Specific Key for Power On           N/A
```

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

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

## Description of the item on screen follows:

### CLKGEN Spread Spectrum

This item allows you to set the CPU clock generator spread spectrum.

### CPU Ratio Selection

This item allows you to set the CPU ratio.

### CPU Host Clock (MHz)

This item allows you to set the CPU host clock.

### Onboard Sound

This item allows you to enable/disable the onboard Aureal audio chipset. The settings are Enabled, Disabled.

### Onboard AC'97 Audio/Onboard AC'97 Modem

This item allows you to decide to enable/disable the 810 chipset family to support AC97 Audio/Modem. The settings are Enabled, Disabled.

### Onboard IDE

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

## Onboard FDC

Choose Auto, for the BIOS to automatically detect the device

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

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

## Onboard Serial Port A/Onboard Serial Port B

Choose 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 PortB Mode

Choosing Normal will set the Serial Port B for normal use, not for IR device. Choosing IrDA or Ask IR will set it for use with IR device using these protocols.

### IR Duplex Mode

Can be set as either Half or Full duplex.

### IR Pin Select

Set this option to IRRX/IRTX when using an internal IR device which is connected to IR1 connector.

### 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.*

### Parallel Port Mode

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

### EPP Version

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

### 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 |

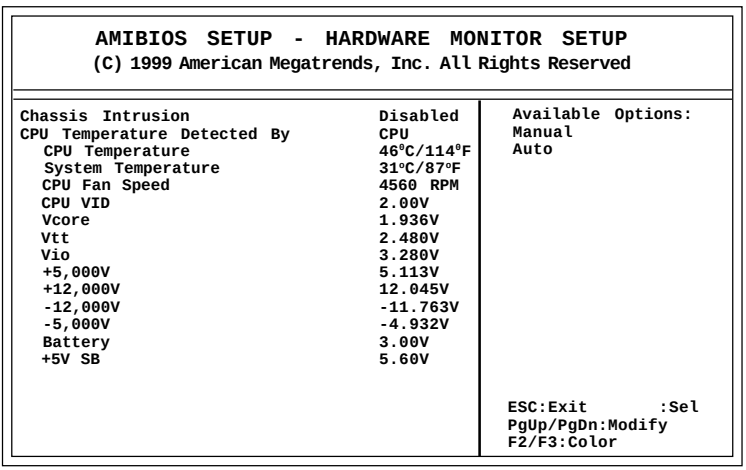
### Parallel Port DMA Channel

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

## 4.8 Hardware Monitor Setup (optional)

The Hardware Monitor Setup is used to set the CPU speed and monitor the current CPU Temperature, CPU Fan speed, Chassis Fan Speed, Power fan speed, Vcore, etc.

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




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.