

BIOS-GUIDE

For Thunderbird and Cool RoadRunner 4

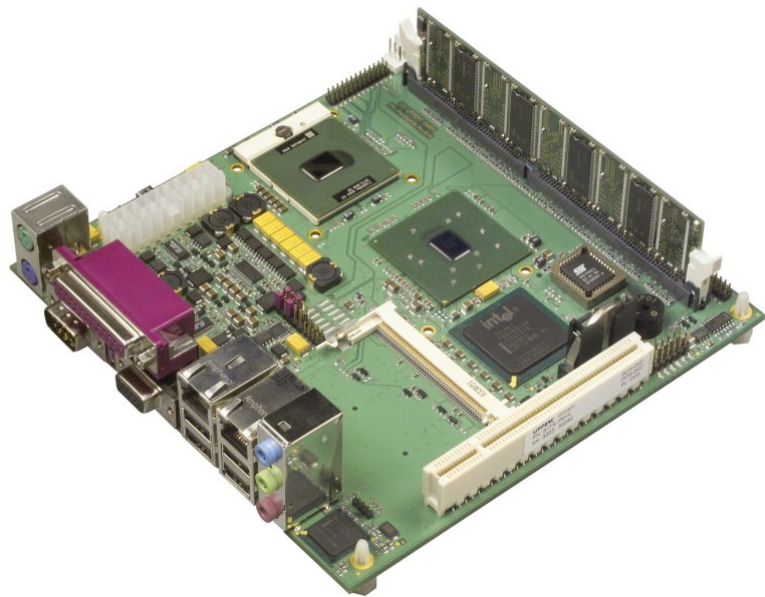


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1 OVERVIEW

This guide discusses the Phoenix FirstBIOS™ (Basic Input Output System) Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in an EEPROM so that it retains the Setup information when the power is turned off.

The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

2 STARTING SETUP

Press the **F2** or the **DEL** key at boot time to start the BIOS setup utility.

Please note that any previous changes made in the BIOS setup will be lost when the optimized settings are loaded. All changes made by the user will consequently be lost and need to be re-done later after the new graphics controller works as expected.

3 USING SETUP

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <ESC> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS (for this page)
F6 key	Load the fail-safe defaults from BIOS default table (for this page)
F7 key	Load the optimized defaults (for this page)
F10 key	Save all the CMOS changes and exit

4 SETUP MENU

Phoenix FirstBIOS™ Desktop CMOS Setup Utility	
Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Special Features	Set User Password
Power Management Setup	Save & Exit Setup
PnP/PCI Configurations	Exit Without Saving
Esc: Quit F10: Save & Exit Setup	↑ ↓ → ← : Select Item

4.1 Standard CMOS Features

Here you can setup the basic BIOS features such as date, time, type of floppy etc. Use the arrow keys to move around and press enter to select the required option. You can specify what IDE devices you have such as Hard drive, CD-ROM, ZIP drive etc. The easiest way to setup the IDE devices is by leaving it set to auto. This allows the BIOS to detect the devices automatically so you don't have to do it manually. At the bottom, it also displays the total memory in your system.

4.1.1 Date (mm:dd:yy)

The BIOS determines the day of the week from the other date information; this field is for information only.

Press the right or left arrow key to move to the desired field (date, month, year). Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Values : mm: Jan-Dec, dd: 1-31 , yy: 1999-2099

4.1.2 Time (hh:mm:ss)

The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

Press the left or right arrow key to move to desired field.

Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Values : hh: 0-23 hours, mm: 0-59 minutes , ss: 0-59 seconds

4.1.3 IDE Primary/Secondary Master/Slave

4.1.3.1 IDE HDD Auto-Detection

Press <Enter> to automatically detect and configure IDE hard disk parameters.

4.1.3.2 IDE Primary/Secondary Master/Slave

In Auto mode, the system automatically determines the best mode for each device.

Values : None, Auto, Manual

4.1.3.3 Access Mode

Choose the access mode for this hard disk. We recommend the "Auto" mode because a wrong setup could destroy your HDD datas.

Values : CHS, LBA, Large, Auto

4.1.4 Drive A

Select the correct specifications for the diskette drive(s) installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Values : None
 360K, 5.25 inch
 1.2M, 5.25 inch
 720K, 3.5 inch
 1.44M, 3.5 inch
 2.88M, 3.5 inch

4.1.5 Video

Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Values : EGA / VGA, CGA 40, CGA 80, MONO

4.1.6 *Halt On*

During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

No errors	The system boot will not be stopped for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

Values : All Errors,
No Errors,
All, But Keyboard,
All, But Diskette,
All, But Disk / Key

4.1.7 *Base Memory*

The POST will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

4.1.8 *Extended Memory*

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

4.1.9 *Total Memory*

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers in an effort to keep as much base memory free for application programs. The BIOS is the most frequent user of this RAM area since this is where it shadows RAM.

4.2 Advanced BIOS Features

For most cases leaving the default setting should be adequate. Here you can also change the boot device order.

4.2.1 CPU Feature

Choose special Pentium M features.

4.2.1.1 Thermal Management

Thermal Monitor 1 : On Die Throttling
Thermal Monitor 2 : Ratio & VID transition

Values : Thermal Monitor 1, Thermal Monitor 2

4.2.1.2 TM2 Bus Ratio

Represents the frequency. It is the bus ratio of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.

Values : 6, 7, 8,...31 (Min-value, ...,Max-value of used CPU in MHz)

4.2.1.3 TM2 Bus VID

Represents the voltage of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.

Values : 0.956, ..., 1.484 (Min-value, ...,Max-value of used CPU in Volt)

4.2.2 Virus Warning

This BIOS feature provides rudimentary anti-virus protection by monitoring writes to the boot sector and partition table.

If this feature is **enabled**, the BIOS will halt the system and flash a warning message whenever it detects an attempt to write to the boot sector or the partition table.

If this feature is **disabled**, the BIOS will not monitor writes to the boot sector and partition table.

This feature can cause problems with software that need to access the boot sector. One good example is the installation routine of all versions of Microsoft Windows from Windows 95 onwards. When **enabled**, this feature causes the installation routine to fail. You should **disable** this feature before running such software.

Values : Enabled, Disabled

4.2.3 CPU L1 & L2 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are Enabled.

Values : Disabled, Enabled

4.2.4 Quick Power On Self Test

This BIOS feature allows you to decrease the time it takes to boot up the computer by shortening or skipping certain standard booting procedures.

If **enabled**, the BIOS will shorten the booting process by skipping some tests and shortening others.

If **disabled**, the BIOS will run the whole gamut of boot-up tests.

It is recommended that you **disable** this feature when you boot up a new computer for the first time or whenever you install a new piece of hardware. This allows the BIOS to run full diagnostic tests to detect any problems that may slip past the abbreviated testing scheme.

After a few error-free test runs, you should **enable** this feature for much faster booting.

Values : Enabled, Disabled

4.2.5 First Boot Device

This BIOS feature allows you to select the **first** device from which the BIOS will attempt to load an operating system. If the BIOS finds and loads an operating system from the device selected through this feature, it won't load another operating system, even if you have one on a different device.

By default, **Floppy** is the first boot device in practically all motherboards. But, unless you boot often from the floppy drive, it is better to set your hard disk (usually **HDD-0**) as the first boot device. This will shorten the booting process because the BIOS no longer needs to check the floppy drive for a bootable operating system.

To install operating systems that come on bootable CD-ROMs (*i.e. Microsoft Windows XP*) in a new hard disk, you will need to select **CDROM** as the first boot device. This enables you to boot directly from the CD-ROM and load the operating system's installation routine.

Values : Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2, HDD-3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled

4.2.6 **Second Boot Device**

This BIOS feature allows you to select the **second** device from which the BIOS will attempt to load an operating system. If the BIOS finds and loads an operating system from the device selected through this feature, it won't load another operating system, even if you have one on a different device.

By default, **HDD-0** is the second boot device in practically all motherboards. But, unless you boot often from the floppy drive (*which is often the first boot device*), it is better to set your hard disk (**HDD-0**) as the first boot device. This will shorten the boot process because the BIOS no longer needs to check the floppy drive for a bootable operating system.

More importantly, doing so prevents the BIOS from loading the wrong operating system in case you forgot to remove the boot disk from the floppy drive! This also indirectly prevents the loading of any virus-infected floppy disk that was left in the drive during booting.

Values : Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2, HDD-3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled

4.2.7 **Third Boot Device**

This BIOS feature allows you to select the **third** device from which the BIOS will attempt to load an operating system. If the BIOS finds and loads an operating system from the device selected through this feature, it won't load another operating system, even if you have one on a different device.

By default, **LS/ZIP** is the third boot device in practically all motherboards. As the third boot device is only tried after no bootable operating system can be found in the first two boot devices, it is of little consequence what you set here. Therefore, the choice of boot device for this BIOS feature is entirely up to your personal preference.

Values : Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2, HDD-3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled

4.2.8 **Boot Other Device**

This BIOS feature determines whether the BIOS will attempt to load an operating system from the **Second Boot Device** or **Third Boot Device** if it fails to load one from the **First Boot Device**.

This feature is **enabled** by default and it is recommended that you leave it as such.

Values : Enabled, Disabled

4.2.9 *Boot Up Floppy Seek*

This BIOS feature determines whether the BIOS checks for a floppy drive during boot-up or not. If **enabled**, the BIOS will attempt to detect and initialize the floppy drive. If it cannot detect one, it will flash an error message. However, the system will still be allowed to continue the boot process. If this feature is **disabled**, the BIOS will skip the floppy drive check. This speeds up the booting process by several seconds.

Since a floppy drive check is really pointless, it is recommended that you **disable** this feature for a faster booting process.

Values : Enabled, Disabled

4.2.10 *Boot Up NumLock Status*

This BIOS feature sets the input mode of the numeric keypad at boot up.

If you turn this feature **on**, the BIOS will set the numeric keypad to function in the **numeric mode**. If you set it to **Off**, the numeric keypad will function in the **cursor control mode** instead.

The numeric keypad's input mode can be switched to either numeric or cursor control mode and back again at any time after boot up.

The choice of initial keypad input mode is entirely up to your preference.

Values : On, Off

4.2.11 *Typematic Rate Setting*

This BIOS feature allows you to gain manual control of the keystroke repeat feature. When **enabled**, you will be given access to these two typematic controls

Typematic Rate
Typematic Rate Delay

They will allow you to manually adjust the **Typematic Rate** and the **Typematic Rate Delay**. If you **disable** this feature, the two typematic controls will be disabled and grayed out. The keyboard controller will thereby use the default typematic rate and typematic rate delay.

Values : Enabled, Disabled

4.2.12 Typematic Rate (Chars/Sec)

This BIOS feature will only work if the **Typematic Rate Setting** feature has been **enabled**. This feature determines the rate at which the keyboard will repeat a keystroke if you press it continuously.

The available settings are in characters per second. Therefore, a typematic rate of **30** will cause the keyboard to repeat the keystroke at a rate of 30 characters per second if you press a particular key continuously. The higher the typematic rate, the faster the keyboard will repeat the keystroke. The choice of what setting to use is entirely up to your personal preference. But note that this typematic rate is only applicable in operating systems that communicate with the hardware through the BIOS, like **MS-DOS**. The typematic rate in operating systems like Windows XP are controlled by the keyboard driver's settings.

Values : 6, 8, 10, 12, 15, 20, 24, 30

4.2.13 Typematic Delay (Msec)

This BIOS setting will only work if the **Typematic Rate Setting** feature has been enabled. This feature determines how long, in **milliseconds** (*thousandths of a second*), the keyboard controller will wait before it starts repeating the keystroke that you have pressed continuously. The longer the delay, the longer the keyboard controller will wait before it starts repeating the keystroke.

Generally, using a short delay is useful for people who type quickly and don't like to wait long for a keystroke to be repeated. On the other hand, a long delay is useful for users who tend to press the keys longer while typing. This prevents the keyboard controller from unnecessarily repeating keystrokes with such users.

Values : 250, 500, 750, 1000

4.2.14 Security Option

Select whether the password is required every time the system boots or only when you enter 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:

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

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

Values : Setup, System

4.2.15 Authentication Level

Values : High, Medium, Low

4.2.16 APIC Mode

This BIOS feature is used to enable or disable the motherboard's APIC (**Advanced Programmable Interrupt Controller**). The APIC provides multiprocessor support, more IRQs and faster interrupt handling.

However, it is only supported by newer operating systems like Microsoft Windows NT, Windows 2000 and Windows XP. Older operating systems like DOS or Windows 95/98 do not support this feature.

It is recommended that you **enable** this feature if you are using a newer operating system like Windows XP. **Disable** it only if you are using an older operating system like DOS or Windows 95/98.

Values : Disabled, Enabled

4.2.17 MPS Version Control for OS

This feature is only applicable to multiprocessor motherboards as it specifies the version of the Multi-Processor Specification (MPS) that the motherboard will use.

The BIOS supports versions 1.1 and 1.4 of the Intel multiprocessor specification. Select the version supported by the operating system running on this computer.

Values : 1.1, 1.4

4.2.18 OS Select For DRAM > 64MB

This BIOS feature determines how systems with more than 64MB of memory are managed. A wrong setting can cause problems like erroneous memory detection.

Select OS2 only if you are running OS/2 operating system with greater than 64 MB of RAM on your system.

Values : OS/2, Non-OS/2

4.2.19 Report No FDD For Win95

Select Yes to release IRQ6 when the system contains no floppy drive, for compatibility with Windows 95 logo certification. In the Integrated Peripherals screen, select Disabled for the Onboard FDC Controller field.

Please note that this BIOS feature has no relevance in other operating systems. Only Windows 95 is affected. It does not matter what you set this BIOS option to if you are using other operating systems.

Values : On, Off

4.2.20 Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up.

Values : Disabled, Enabled

4.2.21 Summary Screen Show

This item allows you to enable/disable the summary screen. Summary screen means system configuration and PCI device listing.

Values : Disabled, Enabled
Advanced Chipset Features

4.3 Advanced Chipset Feature

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 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 your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

4.3.1 DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected.

Values : Manual, By SPD

4.3.1.1 CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

Values : 2.5, 2

4.3.1.2 Active to Precharge Delay

The default setting for the Active to Precharge Delay is 7.

Values : 7, 6, 5

4.3.1.3 DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

Values : 3, 2

4.3.1.4 DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes.

Values : 3, 2

4.3.2 DRAM Data Integrity Mode

This BIOS feature controls the **ECC** feature of the memory controller. ECC, which stands for **Error Checking and Correction**, enables the memory controller to detect and correct single-bit soft memory errors. The memory controller will also be able to detect double-bit errors although it will not be able to correct them. This provides increased data integrity and system stability. However, this feature can only be enabled if you are using special ECC memory modules.

Because the memory controller has to calculate the ECC code for every data word that is read or written, there will be some performance degradation, roughly in the region of **3-5%**. This is one of the reasons why ECC memory modules are not popular among desktop users. Throw in the fact that ECC memory modules are both expensive and hard to come by; and you have the top three reasons why ECC memory modules will never be mainstream solutions.

If you are using standard 64-bit memory modules, you must select the **Non-ECC** option. But if you have already forked out the the money for 72-bit ECC memory modules, you should enable the **ECC** feature. It doesn't make sense to buy expensive ECC memory modules and then disable ECC !
Remember, you are not really losing performance. You are just trading it for greater stability and data integrity.

Values : ECC, Non-ECC

4.3.3 MGM Core Frequency

This field sets the frequencies of the chipset.

Values : Auto Max 266MHz
400/266/133/200 MHz
400/200/100/200 MHz
400/200/100/133 MHz
400/266/133/267 MHz
400/333/166/250 MHz
Auto Max 400/333MHz

4.3.4 System BIOS Cacheable

The setting of Enabled allows caching of the system BIOS ROM at F000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Values : Enabled, Disabled

4.3.5 *Video BIOS Cacheable*

This BIOS feature aims to further boost the performance of a shadowed video BIOS by caching it using the processor's Level 2 cache.

Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

It is recommended that you **disable** Video BIOS Caching, even if you play a lot of real-mode DOS games or work with operating systems running in fail-safe mode.

Values : Enabled, Disabled

4.3.6 *Memory Hole At 15M-16M*

Certain ISA cards require exclusive access to the 1MB block of memory, from the 15th to the 16th megabyte, to work properly. This BIOS feature allows you to reserve that 1MB block of memory for such cards to use.

When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Values : Enabled, Disabled

4.3.7 *Delayed Transaction*

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

Values : Enabled, Disabled

4.3.8 *Delay Prior to Thermal*

This field activates the CPU thermal function after the systems boots for the set number of minutes.

Values : 4 Min, 8 Min, 16 Min, 32 Min

4.3.9 AGP Aperture Size (MB)

Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for AGP information.

It is recommended that you keep the AGP aperture around **64MB** to **128MB** in size, even if your graphics card has a lot of onboard memory. This allows flexibility in the event that you actually need extra memory for texture storage. It will also keep the GART (Graphics Address Relocation Table) within a reasonable size.

Values : 4, 8, 16, 32, 64, 128, 256

4.3.10 **** On Chip VGA Setting ****

4.3.10.1 On-Chip VGA

This item activates the on-chip VGA.

Values : Enabled, Disabled

4.3.10.2 On-Chip Frame Buffer Size

This item configures the size of the on-chip frame buffer.

Values : 1MB, 4MB, 8MB, 16MB, 32MB

4.3.10.3 Boot Display

This item defines the activated display at boottime.

CRT: output at VGA connector

LFP: activates the LVDS interface

Values : VBIOS Default, CRT, LFP, CRT+LFP

4.3.10.4 Panel Scaling

The default setting is Auto. The options available include On and Off.

Values : Auto, On, Off

4.3.10.5 Panel Number

These fields allow you to select the LVDS Panel type. The default values for these ports are:

1	640x480	18 Bit, single channel
2	800x600	18 Bit, single channel
3	1024x768	18 Bit, single channel
4	1280x1024	2x18 Bit, dual channel
5	1400x1050	2x18 Bit, dual channel
6	1400x1050	2x18 Bit, dual channel
7	1600x1200	2x18 Bit, dual channel
8	1280x768	18 Bit, single channel
9	1600x1050	2x18 Bit, dual channel
10	1920x1200	2x18 Bit, dual channel
11	1024x768	24 Bit, single channel
12	Reserved	
13	Reserved	
14	Reserved	
15	Reserved	
16	Reserved	

This are only some predefined standard LVDS settings.
Customer specific setups are also valid.

Values : 1,2,3,...15, 16

4.3.10.6 TV Standard

Choose one of the standards.

Values : Off, NTSC, PAL, SECAM

4.3.10.7 Video Connector

Choose one of the standards.

Values : Automatic, Composite, Component, Both

4.3.10.8 TV Format

Choose one of the standards.

Values : Auto, NTSC_x, PAL_x, SECAM_x

4.4 Integrated Peripherals

This menu allows you to change the various I/O devices such as IDE controllers, serial ports, parallel port, keyboard etc. You can make changes as necessary.

4.4.1 On-Chip Primary PCI IDE

When **enabled**, the IDE channel will be able to provide support for up to two IDE drives. When **disabled**, the IDE channel will be disabled. Any attached IDE drives will not be accessible. However, this frees up an IRQ, which can be used by other devices. Disabling this IDE channel will also speed up the booting sequence a little as the BIOS will not need to query this channel for IDE devices when it boots up.

You should leave this **enabled** if you are using this IDE channel. Disabling it will prevent any IDE devices attached to this channel from being accessed.

If you are not attaching any IDE devices to this IDE channel (*or if you are using a SCSI / an add-on IDE card*), you can **disable** this IDE channel to free an IRQ and speed up the booting sequence.

Values : Disabled, Enabled

4.4.2 IDE Primary Master PIO

This BIOS feature allows you to set the **PIO (Programmed Input/Output)** mode for the IDE drive.

Setting this BIOS feature to **Auto** lets the BIOS auto-detect the IDE drive's maximum supported PIO mode at boot-up.

Setting this BIOS feature to **0** forces the BIOS to use **PIO Mode 0** for the IDE drive.

Setting this BIOS feature to **1** forces the BIOS to use **PIO Mode 1** for the IDE drive.

Setting this BIOS feature to **2** forces the BIOS to use **PIO Mode 2** for the IDE drive.

Setting this BIOS feature to **3** forces the BIOS to use **PIO Mode 3** for the IDE drive.

Setting this BIOS feature to **4** forces the BIOS to use **PIO Mode 4** for the IDE drive.

Normally, you should leave it as **Auto** and let the BIOS auto-detect the IDE drive's PIO mode. You should only set it manually for the following reasons :-

if the BIOS cannot detect the correct PIO mode.

if you want to try forcing the IDE device to use a faster PIO mode than it was designed for.

if you want to force the IDE device to use a slower PIO mode if it cannot work properly with the current PIO mode (*i.e. when the PCI bus is overclocked*)

Values : Auto, 0, 1, 2, 3, 4

4.4.3 IDE Primary Slave PIO

Like "IDE Primary Master PIO".

Values : Auto, 0, 1, 2, 3, 4

4.4.4 IDE Primary Master UDMA

This BIOS feature allows you to enable or disable **DMA (Direct Memory Access)** support for the IDE device.

Setting this BIOS feature to **Disabled** forces the BIOS to disable DMA transfers for the IDE drive. Setting this BIOS feature to **Auto** lets the BIOS auto-detect the IDE drive's maximum supported DMA mode at boot-up.

Normally, you should leave it as **Auto** and let the BIOS auto-detect the drive's DMA support. If the drive supports DMA transfers, the proper DMA transfer mode will be enabled for that drive, allowing it to burst data at anywhere from 33MB/s to 100MB/s (*depending on the transfer mode supported*).

You should only **disable** it for troubleshooting purposes. For example, certain IDE devices may not run properly using DMA transfers when the PCI bus is overclocked. Disabling DMA support will force the drive to use the slower PIO transfer mode. This may allow the drive to work properly with the higher PCI bus speed.

Values : Disabled, Auto

4.4.5 IDE Primary Slave UDMA

Like "IDE Secondary Master UDMA".

Values : Disabled, Auto

4.4.6 On-Chip Secondary PCI IDE

When **enabled**, the IDE channel will be able to provide support for up to two IDE drives. When **disabled**, the IDE channel will be disabled. Any attached IDE drives will not be accessible. However, this frees up an IRQ, which can be used by other devices. Disabling this IDE channel will also speed up the booting sequence a little as the BIOS will not need to query this channel for IDE devices when it boots up.

You should leave this **enabled** if you are using this IDE channel. Disabling it will prevent any IDE devices attached to this channel from being accessed.

If you are not attaching any IDE devices to this IDE channel (*or if you are using a SCSI / an add-on IDE card*), you can **disable** this IDE channel to free an IRQ and speed up the booting sequence.

Values : Disabled, Enabled

4.4.7 IDE Secondary Master PIO

Like "IDE Primary Master PIO".

Values : Auto, 0, 1, 2, 3, 4

4.4.8 IDE Secondary Slave PIO

Like "IDE Primary Master PIO".

Values : Auto, 0, 1, 2, 3 , 4

4.4.9 IDE Secondary Master UDMA

Like "IDE Secondary Master UDMA".

Values : Disabled, Auto

4.4.10 IDE Secondary Slave UDMA

Like "IDE Secondary Master UDMA".

Values : Disabled, Auto

4.4.11 IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

This BIOS feature speeds up hard disk access by transferring multiple sectors of data per interrupt instead of using the usual single-sector transfer mode. This mode of transferring data is known as block transfers.

When you enable this feature, the BIOS will automatically detect if your hard disk supports block transfers and set the proper block transfer settings for it. Depending on the IDE controller, up to **64KB** of data can be transferred per interrupt when block transfers are enabled. Since all current hard disks support block transfers, there is usually no reason why IDE HDD Block Mode should be disabled.

Please note that if you **disable** IDE HDD Block Mode, only **512 bytes** of data can transferred per interrupt. Needless to say, this will significantly degrade performance.

Therefore, you should **disable** IDE HDD Block Mode only if you actually face the possibility of data corruption (*with an unpatched version of Windows NT 4.0*). Otherwise, it is highly recommended that you **enable** this BIOS feature for significantly better hard disk performance!

Values : Enabled, Disabled

4.4.12 Onboard Device

4.4.12.1 USB Controller

This BIOS feature enables or disables the motherboard's onboard USB controller.

It is recommended that you **enable** this feature so that you can use the onboard USB controller to communicate with your USB devices.

If you **disable** this feature, the USB controller will be disabled and you will not be able to use it to communicate with any USB device. This frees up an IRQ for other devices to use. This is useful when you have many devices that cannot share IRQs.

However, it is recommended that you do **not** disable this BIOS feature unless you do not use any USB device or if you are using a different USB controller for your USB needs.

Values : Enabled, Disabled

4.4.12.2 USB 2.0 Controller

Enable this item if you want to use the USB 2.0 Controller instead of USB 1.1.

In order to use USB 2.0, necessary OS drivers must be also installed.

Windows 2000: SP4 necessary for USB2.0

Windows XP: SP1 necessary for USB2.0

Values : Enabled, Disabled

4.4.12.3 USB Keyboard Support

This BIOS feature determines if support for the USB keyboard should be provided by the operating system or the BIOS. Therefore, it will only affect those who are using USB keyboards.

If your operating system offers native support for USB keyboards, you should select the **OS** option. This will provide much greater functionality. However, if you are using DOS or operating systems that do not offer support for USB keyboards, then using the OS option will essentially disable the keyboard as these operating systems cannot 'detect' or work with USB keyboards. This is where the **BIOS** option comes in. When selected, the BIOS will provide support for the USB keyboard. You will be able to use the keyboard with both operating systems that don't support USB keyboards and those that do.

However, the BIOS option offers only rudimentary support for the USB keyboard so using it will strip the keyboard of all except basic functions. Therefore, you should **not** select this option if you are using an operating system that supports USB keyboards. It is recommended that you select the **OS** option if you are using a current operating system like Windows XP.

But don't forget to switch from the **OS** option to the **BIOS** option whenever you want to boot up using a DOS boot disk. Even if the boot disk was created by a USB-aware operating system like Windows XP, it will **not** support the USB keyboard.

Values : Enabled, Disabled

4.4.12.4 USB Mouse Support

This BIOS feature determines if support for the USB mouse should be provided by the operating system or the BIOS. Therefore, it will only affect those who are using USB mice.

If your operating system offers native support for USB mice, you should select the **OS** option. This will provide much greater functionality. However, if you are using DOS or operating systems that do not offer support for USB mice, then using the OS option will essentially disable the mouse as these operating systems cannot 'detect' or work with USB mice.

This is where the **BIOS** option comes in. When selected, the BIOS will provide support for the USB mouse. You will be able to use the mouse with both operating systems that don't support USB mice and those that do.

However, the BIOS option offers only rudimentary support for the USB mouse so using it will strip the mouse of all except basic functions. Therefore, you should **not** select this option if you are using an operating system that supports USB mice. It is recommended that you select the **OS** option if you are using a current operating system like Windows XP.

But don't forget to switch from the **OS** option to the **BIOS** option whenever you want to boot up using a DOS boot disk. Even if the boot disk was created by a USB-aware operating system like Windows XP, it will **not** support the USB mouse.

Values : Enabled, Disabled

4.4.12.5 AC97 Audio

Enables and disables the onboard audio chip. Disable this item if you are going to install a PCI audio add-on card.

Values : Auto, Disabled

4.4.12.6 Init Display First

Use this item to specify whether your graphics adapter is installed in one of the PCI slots or is integrated on the mainboard.

Values : PCI Slot, Onboard/AGP

4.4.13 SuperIO Device

4.4.13.1 Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Values : Disabled, Enabled

4.4.13.2 Onboard Serial Port 1

This BIOS feature allows you to manually select the I/O address and IRQ for the first serial port. It is recommended that you leave it as **Auto** so that the BIOS can select the best settings for it. But if you need a particular I/O port or IRQ that has been taken up by this serial port, you can manually select an alternative I/O port or IRQ for it.

Please note that any I/O port or IRQ can be used for the serial port. There is no advantage or disadvantage in any of the options. As long as you do not select an I/O port or IRQ that has already been allocated to another device, any option will do.

You can also **disable** this serial port if you do not need to use it. Doing so frees up the I/O port and IRQ used by this serial port. Those resources can then be reallocated for other devices to use.

Values : Disabled, 3F8h/IRQ4 , 2F8h/IRQ3, 3E8h/IRQ4, 2E8h/IRQ3, Auto

4.4.13.3 Onboard Serial Port 2

This BIOS feature allows you to manually select the I/O address and IRQ for the first serial port. It is recommended that you leave it as Auto so that the BIOS can select the best settings for it. But if you need a particular I/O port or IRQ that has been taken up by this serial port, you can manually select an alternative I/O port or IRQ for it.

Please note that any I/O port or IRQ can be used for the serial port. There is no advantage or disadvantage in any of the options. As long as you do not select an I/O port or IRQ that has already been allocated to another device, any option will do.

You can also disable this serial port if you do not need to use it. Doing so frees up the I/O port and IRQ used by this serial port. Those resources can then be reallocated for other devices to use.

Values : Disabled, 3F8h/IRQ4 , 2F8h/IRQ3, 3E8h/IRQ4, 2E8h/IRQ3, Auto

4.4.13.4 UART Mode Select

Infrared interface configuration.

Values : Standard, Sharp IR, IrDA SIR

4.4.13.5 Onboard Parallel Port

This BIOS feature allows you to select the I/O address and IRQ for the onboard parallel port. The default I/O address of **378h** and IRQ of **7** should work well in most cases. Unless you have a problem with the parallel port, you should leave it at the default settings.

You should only select an alternative I/O address or IRQ if the default settings are causing a conflict with other devices.

You can also **disable** the onboard parallel port if you do not need to use it. Doing so frees up the I/O port and IRQ used by the parallel port. Those resources can then be reallocated for other devices to use.

Values : Disabled, 378h / IRQ7, 278h / IRQ5, 3BCh / IRQ7

4.4.13.6 Parallel Port Mode

By default, the parallel port is usually set to the **Normal (SPP)** mode. **SPP** stands for **Standard Parallel Port**. It is the original transfer protocol for the parallel port. Therefore, it will work with all parallel port devices.

The **ECP (Extended Capabilities Port)** transfer mode uses the DMA protocol to achieve data transfer rates of up to **2MB/s** and provides symmetric bidirectional communication.

On the other hand, **EPP (Enhanced Parallel Port)**, now known as **IEEE 1284**, uses existing parallel port signals to provide asymmetric bidirectional communication. It was also designed for high-speed communications, offering transfer rates of up to **2MB/s**.

As you can see, SPP is a very slow transfer mode. It should only be selected when faster transfer modes cannot be used (*i.e. with old printers or scanners*). With modern parallel port devices, the ECP and EPP modes are the transfer modes of choice.

Generally, because of its FIFOs and the DMA channel it uses, **ECP** is good at large data transfers. Therefore, it is the transfer mode that works best with scanners and printers. **EPP** is better with devices that switch between reads and writes frequently (like ZIP drives and hard disks).

However, you should check your parallel port device's documentation before you set the transfer mode. The manufacturer of your parallel port peripheral may have designated a preferred transfer mode for the device in question. In that case, it is best to follow their recommendation.

If the device documentation did not state any preferred transfer mode and you still do not know what mode to select, you can select the **ECP+EPP** mode. If you select this mode, the BIOS will automatically determine the transfer mode to use for your device.

Values : Standard, SPP, EPP1.7, EPP1.9, ECP, ECP+EPP

4.4.13.7 ECP Mode Use DMA

Choose which DMA channel the ECP should use.

Values : 1, 3

4.4.13.8 Current CPU FAN0 Speed

Shows the actual FAN speed in RPM.

4.5 Special Features

4.5.1 CoolRoadRunner 4

For CoolRoadRunner 4 is a extension board (B2I) available. To support the additional board features it is necessary to configure the "Special features".

4.5.1.1 DiskOnChip Address Base

Setup the address base for the DiskOnChip.

Values : Disabled, D800h, DA00h, DC00h, DE00h

4.5.1.2 Serial Port 1

This item activates or deactivates the first serial port on the extension board.
3F8h, IRQ4

Values : Disabled, Enabled

4.5.1.3 Serial Port 1 Mode

This item chooses the physical interface of the serial port 1.

Values : RS-232, RS-485

4.5.1.4 Serial Port 2

This item activates or deactivates the second serial port on the extension board.
2F8h, IRQ3

Values : Disabled, Enabled

4.5.1.5 Serial Port 2 Mode

This item chooses the physical interface of the serial port 2.

Values : RS-232, RS-485

4.5.1.6 Parallel Port

This item activates or deactivates the parallel port.
378h, IRQ7

Values : Disabled, Enabled

4.5.1.7 Program FPGA

This item activates the download of the FPGA programming binary at boottime.

Free Xilinx WebPack Software (FPGA programming package) is available at :
<http://www.xilinx.com/>

Values : Disabled, Enabled

4.5.2 Thunderbird

For CoolRoadRunner 4 is a extension board (Mini-PCI) available. To support the additional board features it is necessary to configure the "Special features".

4.5.2.1 DiskOnChip Address Base

Setup the address base for the DiskOnChip.

Values : Disabled, D800h, DA00h, DC00h, DE00h

4.6 Power Management Setup

The power management allows you to setup various power saving features, when the PC is in standby or suspend mode.

4.6.1 ACPI Function

ACPI: Advance Configuration and Power Interface

Select Enabled (default) only if your computer's operating system supports the Advanced Configuration and Power Interface (ACPI) specification.
Currently, Windows 98SE/ME, Windows 2000 and Windows XP supports ACPI.

Values : Enabled, Disabled

4.6.2 ACPI Suspend Type

This item allows you to select the ACPI Suspend type. You can select S3(STR) for Suspending To RAM if your system supports this mode. Or you can select S1(POS) for Power On Suspend under ACPI mode.

Values : S1(POS), S3(STR), **S1&S3**

4.6.3 Run VGABIOS if S3 Resume

This item allows the system to initialize the VGA BIOS from S3 (Suspend to RAM) sleep state.

Values : Auto, Yes, No

4.6.4 Power Management

This option allows you to select the type (or degree) of power saving for Doze, Standby and Suspend modes.

This table describes each power management mode:

User Define	: Set each mode individually.
Min Saving	: Minimum power savings.
Max Saving	: Maximum power savings. Only Available for SL CPUs.

Values : User Define, Min Saving, Max Saving

4.6.5 Video Off Method

Determines the manner in which the monitor is blanked.

EGA/VGA V/H SYNC+Blank	System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.
CGA 40 DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
CGA 80 Blank Screen	System only writes blanks to the video buffer.

Values : Blank Screen, V/H SYNC+Blank, DPMS

4.6.6 Video Off In Suspend

When enabled, the video is off in suspend mode.

Values : No, Yes

4.6.7 Suspend Type

The default setting for the Suspend Type field is Stop Grant.

Values : Stop Grant, PwrOn Suspend

4.6.8 Suspend Mode

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

Values : Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour

4.6.9 HDD Power Down

After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active.

Values : Disabled, 1 Min, 2 Min, 3 Min, ..., 14 Min, 15 Min

4.6.10 HDD Off When Suspend

This option allows the HDD's motor off when system is in Suspend mode.
When HDD is in power saving mode, any access to the HDD will wake the HDD up.

Values : Disabled, Enabled

4.6.11 Soft-Off by PWR-BTTN

When Enabled, turning the system off with the on/off button places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity.

Values : Instant-Off, Delay 4 Sec.

4.6.12 PWRON After PWR-Fail

This item enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

Values : On, Off

4.6.13 USB KB Wake-Up From S3

If you are using any USB device, use this item to enable USB device activity to wakeup the system from a power saving mode.

Values : Disabled, Enabled

4.6.14 Resume by Alarm

When Enabled, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

Values : Disabled, Enabled

4.6.14.1 Date (of Month) Alarm

Set the Alarm date.

Values : 0,1,2,3,....,30,31

4.6.14.2 Time (hh:mm:ss) Alarm

Set the Alarm time.

Values : hh: 0-23 hours, mm: 0-59 minutes , ss: 0-59 seconds

4.6.14.3 ** Reload Global Timer Events **

Global Timer (power management) 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 that occurs to a device that is configured as Enabled, even when the system is in a power-down mode.

4.6.14.3.1 Primary IDE 0

When these items is enabled, the system will restart the power-saving timeout counters when any activity is detected on the drive or device on this IDE channel.

Values : Disabled, Enabled

4.6.14.3.2 Primary IDE 1

When these items is enabled, the system will restart the power-saving timeout counters when any activity is detected on the drive or device on this IDE channel.

Values : Disabled, Enabled

4.6.14.3.3 Secondary IDE 0

When these items is enabled, the system will restart the power-saving timeout counters when any activity is detected on the drive or device on this IDE channel.

Values : Disabled, Enabled

4.6.14.3.4 Secondary IDE 1

When these items is enabled, the system will restart the power-saving timeout counters when any activity is detected on the drive or device on this IDE channel.

Values : Disabled, Enabled

4.6.14.3.5 FDD, COM, LPT Port

When this item is enabled, the system will restart the power-saving timeout counters when any activity is detected on the floppy disk drive, serial ports, or the parallel port.

Values : Disabled, Enabled

4.6.14.3.6 PCI PIRQ[A-D]#

When disabled, any PCI device set as the Master will not power on the system.

Values : Disabled, Enabled

4.7 PnP/PCI Configurations

This menu allows you to configure your PCI slots. You can assign IRQ's for various PCI slots. It is recommended that you leave the default settings as it can get a bit complicated messing around with IRQ's.

4.7.1 *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.

Values : Enabled, Disabled

4.7.2 *Resource Controlled By*

The Plug and Play **FirstBIOS** can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

Values : Enabled, Disabled

4.7.3 *IRQ Resources*

4.7.3.1 *IRQ-n assigned to*

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

PCI Device: Devices compliant with the Plug and Play standard, whether designed for PCI bus architecture.

Values : PCI Device, Reserved

4.7.4 *PCI/VGA Palette Snoop*

This BIOS feature determines if your graphics card should allow VGA palette snooping by a fixed function display card. It is only useful if you use a fixed-function display card that requires a VGA-compatible graphics card to be present (*i.e. MPEG decoder card*). Such fixed-function display cards generally do not have their own VGA palette. So, they have to "*snoop*" VGA palette data from the graphics card to generate the proper colours. Normally, the graphics card's Feature Connector is used for this purpose.

When this feature is **enabled**, the graphics card will not respond to framebuffer writes. It will forward them to the fixed-function display card via its Feature Connector. The fixed-function display card will then snoop the palette data and generate the proper colours. When this feature is **disabled**, the graphics card will display all framebuffer writes. It is recommended that you **disable** this feature if you do not use any fixed-function display card like a MPEG decoder card. But if you are using a fixed-function display card that requires palette snooping, enable this feature. Otherwise, the colours displayed may not be accurate and the monitor will blank out once you stop using the fixed-function display card.

Values : Enabled, Disabled

4.8 Maximum Frequency/Voltage

To set the upper Frequency / Voltage limit you have to configure both values according to the CPU datasheet.

4.8.1 CPU Clock Ratio

Represents highest possible frequency. It is the bus ratio that will be initiated when the on-die sensor goes from hot to non hot.

Values : 6, 7, 8,...31 (Min-value, ...,Max-value of used CPU in MHz)

4.8.1.1 CPU VID

Represents the highest possible voltage that will be initiated when the on-die sensor goes from hot to non hot.

Values : 0.956, ..., 1.484 (Min-value, ...,Max-value of used CPU in Volt)

4.9 Load Fail-Safe Defaults

If you made changes to the BIOS and your system becomes unstable as a result, you can change it back to default. However if you made many changes and don't know which one is causing the problem, your best bet is to choose the option "Load Fail Safe Mode Defaults" from the BIOS menu. This uses a minimal performance setting, but the system would run in a stable way. From the dialog box Choose "Y" followed by enter to load Fail-Safe Defaults.

4.10 Load Optimized Defaults

Like the Fail-Safe mode above, this option loads the BIOS default settings, but runs the system at optimal performance. From the dialog box Choose "Y" followed by enter to load Optimized Defaults.

4.11 Set Supervisory Password

To password protect your system and Setup utility you can specify a password. Make sure you don't forget the password or you can not access the BIOS.

4.12 Set User Password

User Password sets a password that will be used exclusively on the system. Make sure you don't forget the password or you can not access the BIOS.

4.13 Save & Exit Setup

Highlight this item and press <Enter> to save the changes that you have made in the Setup Utility and exit the Setup Utility. When the Save and Exit dialog box appears, press <Y> to save and exit, or press <N> to return to the main menu.

Shortcut: <F10>

4.14 Exit Without Saving

Highlight this item and press <Enter> to discard any changes that you have made in the Setup Utility and exit the Setup Utility. When the Exit Without Saving dialog box appears, press <Y> to discard changes and exit, or press <N> to return to the main menu.

Note: If you have made settings that you do not want to save, use the "Exit Without Saving" item and press <Y> to discard any changes you have made.

5 RELATED LINKS

www.award.com
www.phoenix.com

6 DOCUMENT HISTORY

<i>File name</i>	<i>Date</i>	<i>Author</i>	<i>Changes</i>
BIOS-GUIDE-PM-001.doc	2005/02/16	Alfred Glass	created