

TI6NFK
Pentium Pro (MMX)
PCI Motherboard
User's Manual
Version 1.0

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Chapter 1 Introduction

This manual is designed to give you information on the TI6NFK Motherboard. It is divided into the following six sections:

- **Introduction**
- **Specifications**
- **Hardware Description**
- **Configuring the Motherboard**
- **Installation**
- **BIOS and Setup Program**

Checklist

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- ø The TI6NFK Motherboard
- ø This user's manual
- ø 1 IDE ribbon cable
- ø 1 floppy ribbon cable
- ø 1 diskette containing Intel PCI Driver and Flash Memory utility

Chapter 2 Specifications

The TI6NFK is a high-performance PCI motherboard with a □LOT1 connector for next-generation processors. It offers flexibility in terms of CPU frequency, and main memory type and size. The main features of the motherboard consist of the following:

Main Processor CPU Module Card for □LOT1 Connector”

The motherboard supports two types of CPU modules, Pentium Pro on KP6 socket-card and MMX technology Pentium Pro based processor (Klamath). Users may install a Pentium Pro running 150-200MHz on the KP6 socket-card with built-in ZIF Socket 8, or Klamath processor running 233-266MHz. Klamath provides best performance for 32-bit Windows NT and Windows 95 environment, PLUS enhanced performance for media & communications. Both CPUs implements a Dynamic Execution micro-architecture – a unique combination of multiple branch prediction, data flow analysis, and speculative execution..

The flexibility of installing either one of the two types of processor, Pentium Pro and Klamath, provides system integrators and users a wider choice-range of CPU frequencies - from 150-200MHz to 233-266MHz.

L2 Cache

Supports integrated 256KB or 512KB, non-blocking level two cache (depending on the CPU). No external SRAM chips are needed.

Main Memory

Features six 72-pin SIMMs of 4MB, 8MB, 16MB, 32MB, 64MB to form a memory size between 8MB to 384MB. Supports both Fast Page Mode (FPM), Extended Data Output (EDO) SIMMs, and Burst Extended Data Output (BEDO).

Chipset

Incorporates Intel 82440FX PCIsset with built-in PCI-IDE

Expansion Slots

Hosts four 32-bit PCI slots and four 16-bit ISA slots.

BIOS

Comes with a firmware that supports a licensed BIOS with ISA Plug and Play (PnP) extension and power-management features.

PCI Bus Master IDE Controller

Includes on-board PCI Bus Master IDE controller with two connectors that support four IDE devices in two channels.

Provides faster data transfer rates and supports Enhanced IDE devices such as Tape Backup and CD-ROM drives.

Supports PIO Modes 3 and 4 and Bus Master IDE DMA Mode 2. BIOS supports IDE CD-ROM boot-up.

Super I/O

Onboard super I/O is a SMC 37C669 SIP that provides:

Two 16550 UART compatible serial ports

One parallel port (ECP/EPP compatible)

One floppy controller (2.88MB compatible)

One IrDA port (manufacturing option)

PS/2 Mouse Connector and Optional IrDA

Provides PS/2 mouse connector and an optional infrared port module for wireless interface.

Chapter 3 Hardware Description

This chapter briefly describes each of the major features of the TI6NFK motherboard. The layout of the board in Figure 1 shows the location of key components. The topics covered in this chapter are as follows:

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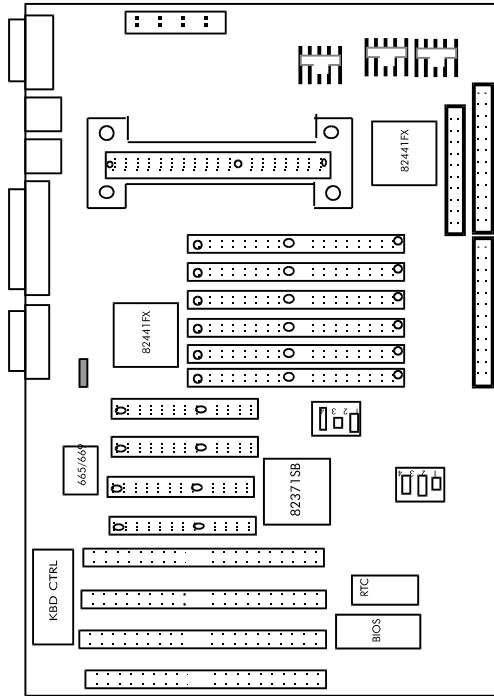


Figure 1: Layout of the TI6NFK motherboard, Klamath processor and KP6

3.1 Processor and VRM

The TI6NFK motherboard is designed to take a Pentium Pro on KP6 socket-card or a MMX technology Pentium Pro based (Klamath) processor with a bus speed of 60 and 66MHz. Since the internal clock of the CPU can be multiples from 2.5 to 4 ratio of the internal bus clock, the CPU frequency can be 150-200MHz for Pentium Pro and 233-266MHz for Klamath processor. The TI6NFK provides an onboard voltage regulator to automatically detect the voltage from 1.8 to 3.5V and supply the necessary voltage to the CPU.

The Klamath processor, unlike earlier generation processors, uses Single Edge Contact (SEC) cartridge packaging technology. The SEC cartridge utilizes surface mounted core components and a printed circuit board with an edge finger connector. See figure 1.

3.2 L2 Cache

The L2 cache, 256KB or 512KB, is integrated into the Pentium Pro CPU and Klamath processor.

The private L2 cache bus is not connected to package pins, rather its signals are routed between the two cavities using standard package techniques. It can be driven at full CPU core speed .

The high-performance bandwidth is used by the CPU to serve all L1 cache misses, the characteristic of a CPU-cache bus, and is utilized 90-95 percent of the time.

3.3 Main Memory

The TI6NFK provides three 64-bit memory banks for up to 384MB of main memory. Each bank consists of two SIMMs, **SIMM1/SIMM2**, **SIMM3/SIMM4** and **SIMM5/SIMM6**. Burst Extended Data Output (BEDO), Extended Data Output (EDO) and Fast Page Mode DRAM are supported. The size of the SIMM can be 4MB, 8MB, 16MB, 32MB, and 64MB, and can be configured to support ECC (Error Checking and Correction) or parity.

The following are to be noted in populating the SIMM sockets:

1. Either SIMM1/SIMM2 or SIMM3/SIMM4 or SIMM5/SIMM6 bank can be populated first.
2. Each bank should consist of the same size of SIMMs
3. Each bank should consist of the same type of SIMMs.
ex: SIMM1 and SIMM2 should be BEDO, EDO or page mode.

4. SIMMs can be mixed by the bank.

ex: SIMM1/SIMM2 are page mode and SIMM3/SIMM4 are EDO.

- SIMMs can be with or without parity. If you need ECC or parity support, you need to use SIMMs with parity bits.

Install Memory in any or all of the banks in any combination as follows:

Bank	Memory Module		Total Memory
Bank 0 SIMM SLOTS 1 & 2	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM, EDO, BEDO, SIMM	x2	
Bank 1 SIMM SLOTS 3 & 4	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM, EDO, BEDO, SIMM	x2	
Bank 2 SIMM SLOTS 5 & 6	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM, EDO, BEDO, SIMM	x2	
Total System Memory		=	

Available memory configurations are shown in the following table:

Bank 0 (SIMM1, SIMM2)	Bank 1 (SIMM3, SIMM4)	Bank 2 (SIMM5, SIMM6)	Total Memory
4MB×2	----	----	8MB
8MB×2	----	----	16MB
16MB×2	----	----	32MB
32MB×2	----	----	64MB
4MB×2	4MB×2	----	16MB
4MB×2	4MB×2	4MB×2	24MB
4MB×2	8MB×2	----	24MB
4MB×2	8MB×2	8MB×2	40MB
4MB×2	16MB×2	----	40MB
4MB×2	16MB×2	16MB×2	72MB
4MB×2	32MB×2	----	72MB
4MB×2	32MB×2	32MB×2	136MB
8MB×2	8MB×2	----	32MB
8MB×2	8MB×2	8MB×2	48MB
8MB×2	16MB×2	----	48MB
8MB×2	16MB×2	16MB×2	80MB
8MB×2	32MB×2	----	80MB
8MB×2	32MB×2	32MB×2	144MB
16MB×2	16MB×2	----	64MB
16MB×2	16MB×2	16MB×2	96MB
16MB×2	32MB×2	----	96MB
16MB×2	32MB×2	32MB×2	160MB
32MB×2	32MB×2	----	128MB
32MB×2	32MB×2	32MB×2	192MB
64MB×2	64MB×2	----	256MB
64MB×2	64MB×2	64MB×2	384MB

**Note: Bank 0 designates the memory bank populated first:
SIMM1/SIMM2 or SIMM3/SIMM4 or SIMM5/SIMM6.**

3.4 BIOS

The BIOS on the TI6NFK motherboard provides the standard BIOS functions plus the following additional features:

1. ISA Plug and Play (PnP) Extension

Unlike PCI cards that are Plug and Play, ISA cards require setting jumpers to resolve hardware conflicts. To make a computer system PnP, an ISA PnP standard is established and supported by new operating systems, such as Windows 95. Under Windows 95, the motherboard BIOS must have an ISA PnP extension to support new ISA PnP cards.

2. Power Management

The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen, and stopping the HDD spindle motor. The BIOS fully conforms to APM 1.2 specifications.

3.5 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There are a total of 1K port address space available. The following table lists the I/O port addresses used on the motherboard.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock,, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
378h - 3FFh	Parallel Port #1(LPT1)
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

3.6 DMA Channels

There are seven DMA channels available on the motherboard. Only DRQ2 is used by the floppy controller. In the case that ECP mode on the parallel port is utilized, DRQ1 or DRQ3 will be used.

3.7 Interrupt Request (IRQ)

There are a total of 15 IRQ lines available on the motherboard. Peripheral devices use an interrupt request to notify the CPU for the service required. The following table shows the IRQ lines used by the devices on the motherboard:

<u>Level</u>	<u>Function</u>
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	Co-Processor
IRQ14	Primary IDE
IRQ15	Secondary IDE
IRQ3	INTERRUPT
IRQ4	Serial Port #1
IRQ5	INTERRUPT
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1

3.8 Onboard PCI-IDE

The PCI-IDE controller is a part of the 82440FX PCIset. It supports PIO mode 3/4 and bus mastering. The peak transfer rate of PIO mode 3/4 can be as high as 17MB/sec. Using HDDs that support bus mastering, the peak transfer rate can reach 22MB/sec. There are two IDE connectors - primary IDE and secondary IDE. With two devices per connector, up to four IDE devices can be supported.

3.9 Onboard Multi-I/O

The onboard multi-I/O chip, SMC37C66X, provides two serial ports, one parallel port, and one floppy controller. The serial ports are 16550 UART compatible. The parallel port supports high-speed EPP/ECP mode. The floppy controller supports up to 2.88 MB format.

Chapter 4 Configuring the Motherboard

The following sections describe the necessary procedures and proper jumper settings to configure the TI6NFK motherboard. For the locations of the jumpers, refer to Figure 2.

- ø 4.1.....CPU Frequency: DSW1, DSW2
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- ø 4.2.....Clear CMOS Selection
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Figure 2: Jumper location on the TI6NFK

4.1 CPU Frequency: DSW1, DSW2

DSW1: sets the clock generator frequency to 50, 60, or 66MHz, which is the frequency of the CPU, to the bus clock. **DSW2:** sets the ratio of the bus clock to the CPU internal clock.

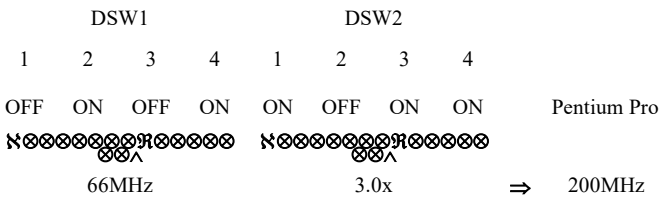
Refer to the following table for the correct setting to match the CPU frequency.

DSW1 (1)	DSW1 (2)	DSW1 (3)	DSW1 (4)	Clock Gen.
ON	OFF	ON	OFF	60MHz
OFF	ON	OFF	ON	66MHz

DSW2 (1)	DSW2 (2)	DSW2 (3)	DSW2 (4)	Multiplier
ON	ON	ON	ON	2.0x
OFF	ON	ON	ON	2.5x
ON	OFF	ON	ON	3.0x
OFF	OFF	ON	ON	3.5x
ON	ON	OFF	ON	4.0x
OFF	ON	OFF	ON	4.5x
ON	OFF	OFF	ON	5.0x
OFF	OFF	OFF	ON	5.5x
ON	ON	ON	OFF	6.0x

Set the DSWX by the internal speed of the Intel CPU.

Example:



DSW1				DSW2				Pentium Pro (KP6) CPU FREQ.
1	2	3	4	1	2	3	4	
ON	OFF	ON	OFF	OFF	ON	ON	ON	Pentium Pro 150MHz
OFF	ON	OFF	ON	OFF	ON	ON	ON	Pentium Pro 166MHz
ON	OFF	ON	OFF	ON	OFF	ON	ON	Pentium Pro 180MHz
OFF	ON	OFF	ON	ON	OFF	ON	ON	Pentium Pro 200MHz

DSW1				DSW2				Pentium Pro MMX CPU FREQ.
1	2	3	4	1	2	3	4	
OFF	ON	OFF	ON	OFF	OFF	ON	ON	Pentium Pro MMX 233MHz
OFF	ON	OFF	ON	ON	ON	OFF	ON	Pentium Pro MMX 266MHz

4.2 Clear CMOS Selection

Use JP19, a 2-pin header, to clear the contents of the CMOS RAM. Do not clear the CMOS RAM unless it is absolutely necessary. You will lose your password, etc.

JP19	Function
OFF	Normal
ON	Clear CMOS

Chapter 5 Installation

This chapter describes the interface that the TI6NFK provides for creating a working system. Refer to Figure 3 for the location of the connectors.

The following items are covered in this chapter:

0	5.1 Slot 1 Connector.....	17
0	5.2 Power Supply Connector: J2	18
0	Power On/Switch: JP17	
0	5.3 Keyboard/Mouse Connectors: J4, J5	18
0	5.4 I/O Connectors:	19
1	Primary IDE: J12	
2	Secondary IDE: J11	
3	Floppy: J8	
4	Parallel port: J6	
5	Serial port (COM1): J1	
6	Serial port (COM2): J7	
7	Universal Serial Bus connector: J9, J10 (Option)	
0	5.5 Front Bezel Connectors: J21	22
8	SMI/Hardware switch: J21	
9	Fan: JP27	
10	Infrared Module Connector: J22 (Option)	

Figure 3: Connector location on the TI6NFK

5.1 Installing a Klamath or KP6 Module Into Slot 1

Install a Klamath or KP6 module into Slot 1, by referring to the following procedures:

Slot 1 is a 242-pin low-profile edge connector marked as □X. The TI6NFK is provided with a □ retention mechanism that securely holds the Klamath or KP6 module in place.

Figure 4: Slot 1 with a retention mechanism

Note: Slot 1 of your TI6NFK may appear different due to revisions. The Klamath processor which is a SEC (Single Edge Connector) cartridge may also appear different than the figure shown here.

2. Install the Klamath or KP6 by aligning the Klamath or KP6 module notch with the notch of Slot 1 and by applying firm and even pressure. Secure the Klamath processor (or KP6 module) with the retention mechanism. See figure.

Figure 5: Installing and securing a Klamath or KP6 module

3. Configure the TI6NFK CPU frequency DIP switches by referring to Section 4.1 of this manual.

5.2 Power Supply Connector: J2

When using an ATX mode (20-pin) power supply, plug both power supply connectors into J2. The following table specifies the pin-out assignments of the power supply connectors.

Signal Name	J2 Pin#	J2 Pin#	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-On	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

ATX Power-ON/OFF Switch: JP17

5.3 Keyboard/Mouse Connector: J4, J5

There are two configurations available on TI6NFK, an AT keyboard or PS/2 keyboard and mouse.

J5 Pin#	Function
1	Data
2	N.C.
3	GND
4	5V
5	Clock
6	N.C.

PS/2 Mouse Connector: J4

J4 Pin#	Function
1	Data
2	N.C.
3	GND
4	5V
5	Clock
6	GND

5.4 I/O Connectors

The I/O connectors connect the TI6NFK to the most common peripherals. To attach cables to these connectors, carefully align Pin 1 of the cables to that of the connectors. Refer to Figure 4 for the location and orientation of the connectors.

Figure 6: Orientation of the I/O connector

1. Primary (J12)/Secondary (J11) IDE connectors (two 40-pin Block)

This connector supports the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Refer to the documentation of your hard disk for the jumper settings. You may also configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.

2. Floppy drive connector (34-pin block): J8

This connector supports the provided floppy drive ribbon cable. After connecting the single end to the board, connect the other two plugs on the other end to the floppy drive(s).

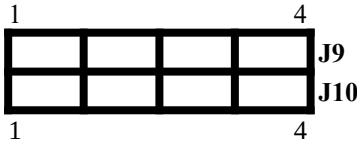
3. Parallel Printer Connector (25-pin D-Type connector): J6

The on-board Parallel port of the TI6NFK is a DB-25 connector.

4. Serial port COM1 (J1) and COM2 (J7) connectors (Two 9-pin D-Type connector)

The onboard serial ports of the TI6NFK are DB-9 connectors. **J1** is **COM1** and **J7** is **COM2**.

5. Universal Serial Bus Connector: J9, J10 (Option)



PIN1: Vcc (5V) (**Red**)

PIN2: USBP0-

PIN3: USEP0+

PIN4: GND (**Black**)

WARNING:

Make sure the USB cable connector is connected in the right orientation, PIN 1 mapping to (Red wire) Vcc.

Universal Serial Bus Features

Ease of Use: Plug and Play capabilities for □outside the Boxperipherals. Optimized for high-integration to support up to 127 logical connections

6. ATX Power ON-OFF Switch: JP17

This connector is for the □ower Supply ON/OFF Switch, on the board. When the switch is pressed, it will force the motherboard to power on. When pressed again, it will force the system board to power off.

7. ATX Power-On remote control via an external modem

When the system is in the Power-Off status, you can use an external **MODEM** connected to **COM1** or **COM2** to turn it **ON** from remote.

5.5 Front Bezel Connectors: J21

The front bezel of the case has a control panel which provides light indicators of the computer activities and switches for users to change the computer status.

1. SMI/Hardware Switch: J21 (Pin 6-16)

This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system board into the power-saving mode immediately.

2. CPU cooling fan connector: JP27

This connector is for a CPU cooling fan of 500mAMP (6 watts) or less. Depending on the fan manufacturer, the wiring may be different. The red wire should be positive, while the black should be ground. Connect the fan to the board, taking into consideration the polarity of the connector.

WARNING: Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used.

3. IrDA-compliant infrared module connector (IR) (Option) (JP22)

This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure the setting through BIOS setup to select whether UART2 is directed for use with COM2 or IrDA. Use the five pins (as defined by Intel) as shown on the figure below and connect a ribbon cable from the module to the motherboard according to the pin definitions.

Chapter 6 BIOS and System Setup

This chapter describes the different settings available in the BIOS. The TI6NFK motherboard comes with AMIBIOS. The topics covered in this chapter are as follows:

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- Primary Display
- Password Check
- Parity Check
- OS/2 Compatible Mode
- Internal Cache
- System BIOS Shadow cacheable

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- Auto Configure DRAM Timing
- DRAM Speed
- Fixed Memory Hole
- CPU-to-PCI IDE Posting
- USWC Write Posting
- CPU-to-PCI Write Post
- PCI-to DRAM Pipeline
- PCI Burst Write Combining
- Read-Around-Write
- 8-bit I/O Recovery Time (SYSCLK)
- 16-Bit I/O Recovery Time (SYSCLK)

ð **6.7 Power Management Setup40**

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- Instant-On Support
- Green PC Monitor Power State
- Video Power-Down Mode
- Hard Disk Power-Down Mode
- Hard Disk Timeout (Min)
- Full-On to Standby Timeout
- Standby to Suspend Timeout
- Slow Clock Ratio
- Display Activity

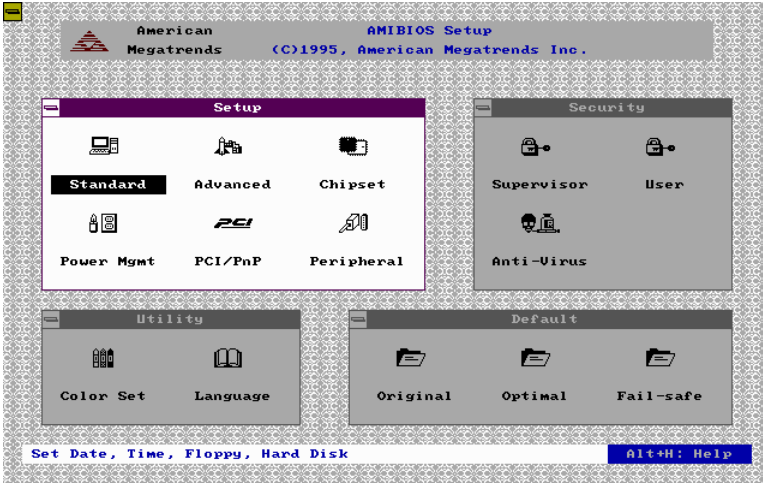
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6.1 Invoking the System Setup Program

Power on the system and the screen will display:

Hit to enter Setup

Hit the key and screen will display the main Setup screen.



6.2 Running the Setup

Point and Click Interface

The Setup uses the familiar point and click navigation technique. You can point with your mouse anywhere on the screen, click the left mouse button, and Setup control is transferred to the new location. The previous window is closed. All parameters that have been changed will automatically be saved, pending the selection on the exit screen.

Using a Mouse with Setup

Setup can be accessed via a keyboard, mouse or pen. The mouse click functions are:

- Single click to change or select both global and current fields, and
- Double-click to perform an operation in the selected field.

Using the Keyboard with Setup

Use the following keys to modify and move around in the Setup:

Keystroke	Function
<Tab>	Move to the next window or field.
→, ←, ↑, ↓	Move to the next field to the right, left, above, or below.
<Enter>	Select in the current field.
+	Increases a value.
-	Decreases a value.
<Esc>	Close the current operation and return to the previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt><H>	Access a help window.
<Alt><Spacebar>	Exit WINBIOS Setup.
Alphabetic Keys	A to Z are used in the Virtual Keyboard, and are not case-sensitive.
Numeric Keys	0 to 9 are used in the virtual Keyboard and Numeric Keypad.

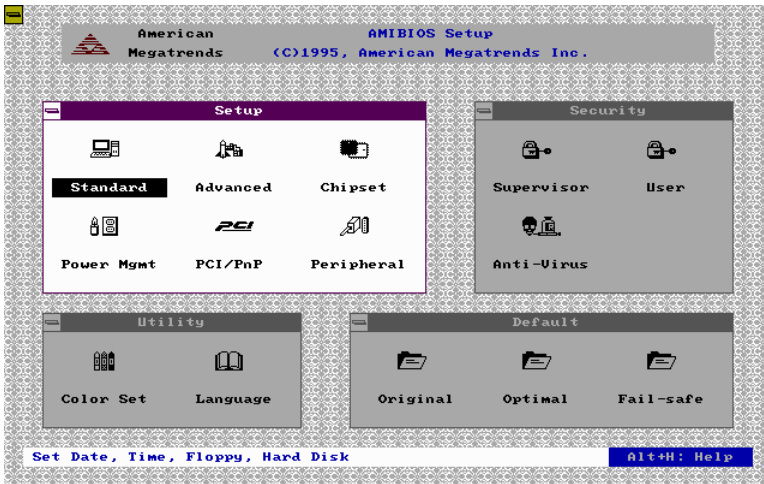
6.3 Setup Main Menu

Default Values

The icons in this section permit you to select a group of settings for all the Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

Original

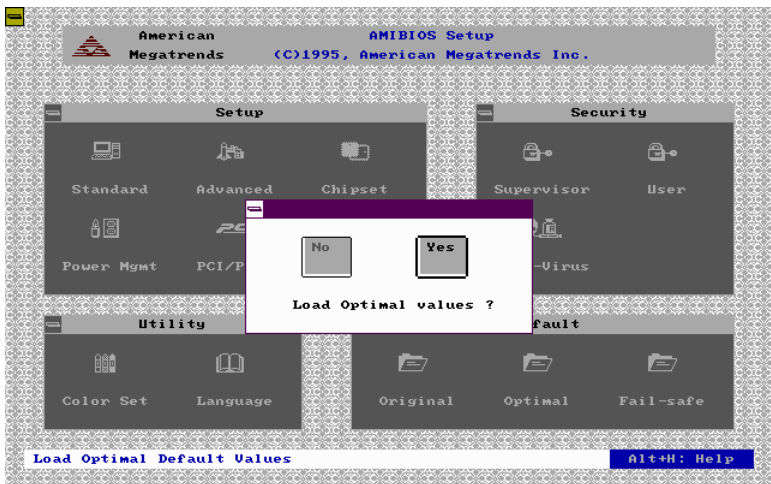
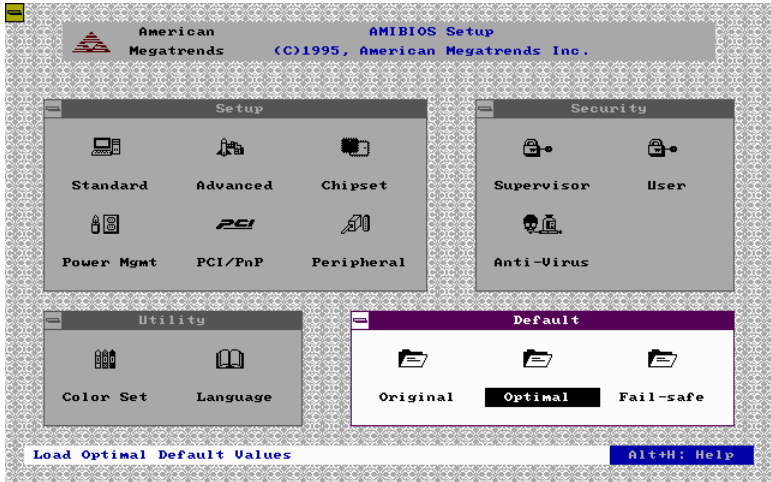
Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.



Optimal

You can load the optimal default settings for the BIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

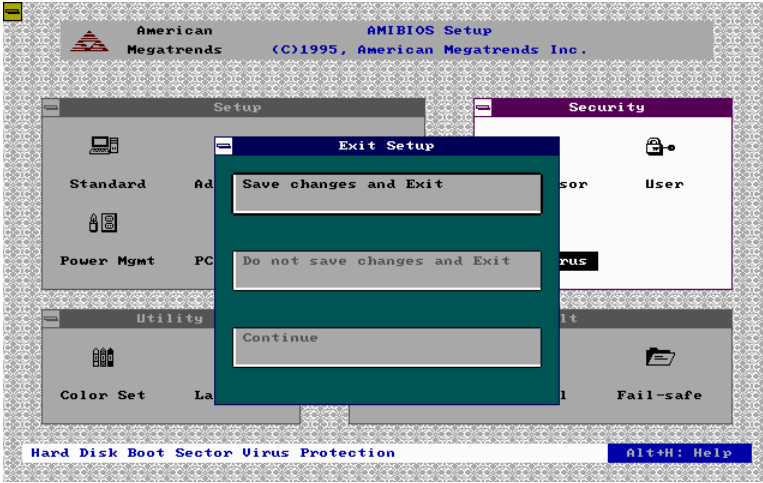
Note: *The optimal values are for regular use.*



Fail safe

You can load the Fail-Safe BIOS Setup option setting by selecting the Fail-Safe icon from the Default section of the Setup main menu.

The Fail-Safe settings provide far-from-optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

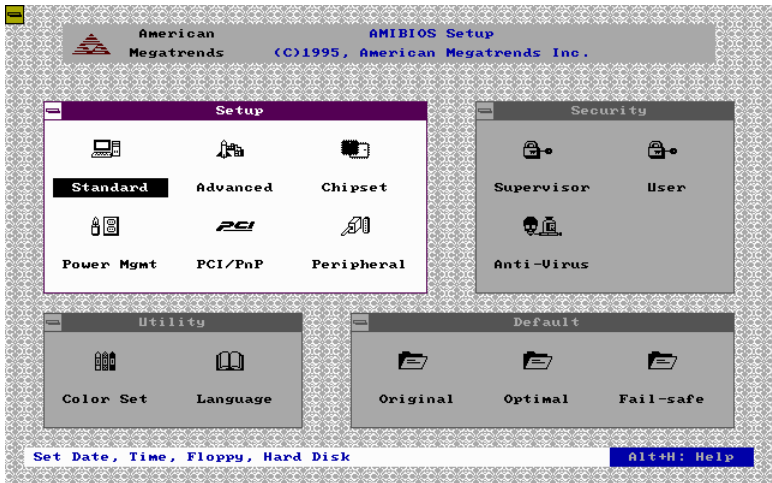


Save Changes and Exit

Select this option to save into the CMOS RAM all the modifications you have specified during the current session.

Note: If you would like to review or modify the configuration in more detail, you could select the Continue option to go to the next page before you decide to choose the Save Changes and Exit option.

Setup Menu Categories



Your Setup program can have up to six separate screens. Different types of system configuration parameters are set on each screen.

Type	Description
Standard Setup	Set the time and date. Configure disk drives.
Advanced Setup	Configure basic system performance parameters.
Chipset Setup	Configure features specific to the chipset used in the computer.
Power Management Setup	Configure power conservation features.
PCI/PnP Setup	Configure PCI and Plug-and-Play features.
Peripheral Setup	Configure I/O support.

6.4 Standard Setup Menu

Standard Setup options are displayed by choosing the Standard icon from the Setup menu. All Standard Setup options are described below.

Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

Floppy Drive A, B

Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *360KB 5 1/4"*, *1.2MB 5 1/4 720KB 3 1/2"*, *1.44MB 3 1/2"*, and *2.88MB 3 1/2"*

Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the *Type* parameter and select *Auto*. The BIOS automatically detects the IDE drive parameters and displays them. Click on the OK button to accept these parameters.

Configuring an MFM Drive

In configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose *Type* and choose the appropriate hard disk drive type (1-46).

User-Defined Drive

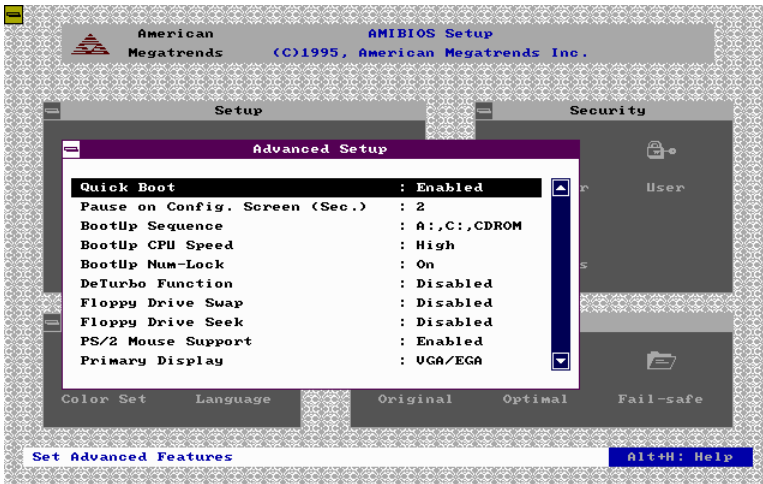
If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with drive parameters that do not match drive types 1-46, you must select *User* in the *Type* field and enter the drive parameters on the screen that appears. The drive parameters include:

- Cylinder (number of cylinders),
- Hd (number of heads),
- WP (starting write precompensation cylinder),
- Sec (number of sectors), and
- Size (drive capacity).

Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the *Type* parameter and select CDROM. You can boot the computer from a CD-ROM drive.

6.5 Advanced Setup Menu



Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. This option replaces the old **Above 1 MB Memory Test** Advanced Setup option.

BootUp Sequence

This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are C:, A:, CDROM; CDROM, C:, A:, and A:, C:, CDROM. The default settings are **A:, C:, CDROM**.

Boot From SCSI

This option sets the boot driver from SCSI primary, then sequenced by bootup sequence ITEM. The default setting is *Disabled*.

Bootup CPU Speed

This option lets you specify the CPU speed at system boot. The settings are *Low* and *High*. The Optimal and Fail-Safe default setting is **High**.

BootUp NumLock

Set this option to *Off* to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* and *Off*. The default setting is ***On***.

Deturbo Function

Set this option to control the Deturbo Function. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default setting is ***Disabled***.

Floppy Drive Swap

Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* and *Disabled*. The default setting is ***Disabled***.

Floppy Drive Seek

Set this option to *Enabled* to specify that floppy drive A: will perform a Seek operation at system boot. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default setting is ***Disabled***.

Mouse Support

When this option is set to *Enabled*, AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* and *Disabled*. The default setting is ***Enabled***.

Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Mono*, *CGA40*, *CGA80*, *EGA/VGA*, and *Absent*. The Optimal and Fail-Safe default setting is ***EGA/VGA***.

Password Check

This option enables password checking every time the computer is powered on or every time BIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if BIOS is executed. The Optimal and Power-On defaults are ***Setup***.

Parity Check

Set this option to *Enabled* to check the parity of all system memory. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default setting is ***Disabled***.

OS/2 Compatible Mode

Set this option to *Enabled* to permit AMIBIOS to run with IBM OS/2. The settings are *Enabled* and *Disabled*. The default setting is ***Disabled***.

Internal Cache

This option specifies the caching algorithm used for L1 internal cache memory. The settings are:

Setting	Description
<i>Disabled</i>	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
<i>Write Back (default)</i>	Use the write-back caching algorithm.
<i>Write Thru</i>	Use the write-through caching algorithm.

System BIOS Shadow cacheable

When this option is set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to the system RAM for faster execution.

The settings are *Enabled* and *Disabled*. The Optimal default setting is ***Enabled***. The Fail-Safe default setting is ***Disabled***.

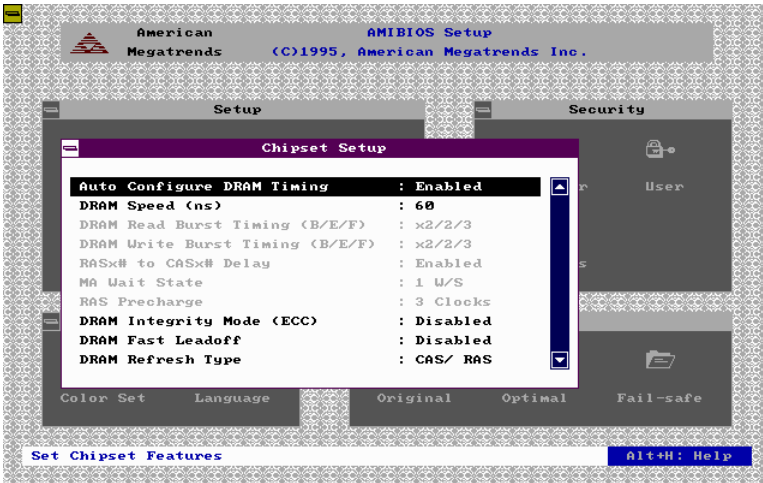
C000, 16K Shadow
C400, 16K Shadow
C800, 16K Shadow
CC00, 16K Shadow
D000, 16K Shadow
D400, 16K Shadow
D800, 16K Shadow
C000, 16K Shadow

These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. The settings are:

Setting	Description
<i>Shadow</i>	The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster execution.
<i>Cache</i>	The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adapter ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.
<i>Disable</i>	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The C000~C7FF 32K default setting is **Enabled**; for other segments it is **Disabled**.

6.6 Chipset Setup Menu



Auto Configure DRAM Timing

Use this option to specify the timing on the memory Bus. The default setting is *Enabled*.

DRAM Speed

This specifies the RAS access speed of the SIMMs installed in the motherboard as system memory. The settings are *60ns* and *70ns*. The default is *70ns*.

Fixed Memory Hole

Enabling this feature reserves (15MB to 16MB or 512KB to 640KB) memory address space to ISA expansion cards that specifically require this setting. This makes the memory from (15MB or 512KB) and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default is *Disabled*.

CPU-to-PCI IDE Posting

Leave the default setting of *Enabled* as is, so that the CPU to PCI IDE posting cycles are treated as normal I/O write transactions.

USWC Write Posting

Leave the default setting of *Enabled* as is, to allow USWC write posting during I/O bridge access.

CPU-to-PCI Write Post

The default setting of *Enabled* will increase the efficiency of the PCI bus and speed up the execution in the processor.

PCI-to DRAM Pipeline

The default setting of *Enabled* will increase the bandwidth of the path between the PCI and the DRAM to enhance the PCI bus efficiency and DRAM accessing.

PCI Burst Write Combining

The default setting of *Enabled* will increase the efficiency of PCI bus by combining several CPU to PCI write cycles into one. VGA performance is increased by this action.

Read-Around-Write

The default setting of *Enabled* will increase the execution efficiency of the processor. It allows the processor to execute read commands out of order if there is no dependence between these read and other write commands.

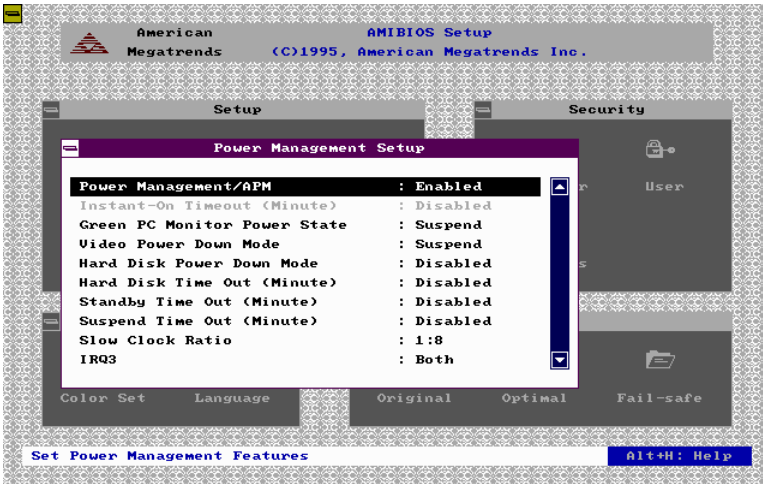
8-bit I/O Recovery Time (SYSCLK)

This option specifies the length of the delay (in SYSCLKs) inserted between consecutive 8-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7 and 8. The Optimal and Fail-Safe default setting is 3.

16-Bit I/O Recovery Time (SYSCLK)

This Option specifies the length of the delay (in SYSCLKs) inserted between consecutive 16-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, and 8. The Optimal and Fail-Safe default setting is 3.

6.7 Power Management Setup



Power Management/ APM

Set this option to *Enabled* to enable the power-management and APM (Advanced Power Management) features.

The settings are *Enabled* and *Disabled*. The default setting is *Enabled*.

Instant-On Support

Set this option to *Enabled* to allow the computer to go to full power-on mode when leaving a power-conserving state. *This option is only available if supported by the computer hardware.* AMIBIOS uses the RTC Alarm function to wake the computer at a pre-specified time. The settings are *Enabled* and *Disabled*. The default setting is *Disabled*.

Green PC Monitor Power State

This option specifies the power-management state that the Green PC-compliant video monitor enters after the specified period of display inactivity has expired. The settings are *Disabled*, *off Standby*, and *Suspend*. The default setting is *Suspend*.

Video Power-Down Mode

This option specifies the power-management state that the video subsystem enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, and *Suspend*. The default is *Suspend*.

Hard Disk Power-Down Mode

This option specifies the power-management state that the hard disk drive enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, and *Suspend*. The default setting is *Disabled*.

Hard Disk Timeout (Min)

This option specifies the length of a period of hard disk inactivity. When this period expires, the hard disk drive enters the power-conserving mode specified in the Hard Disk Power Down Mode option described on the previous page. The settings are *Disabled*, *1Min (minutes)*, and *all one minute intervals up to and including 15 Min*. The default setting is *Disabled*.

Full-On to Standby Timeout

This option specifies the length of the period of system inactivity when the computer is in Full On mode before the computer is placed in Standby mode. In Standby mode, some power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and *all one minute intervals up to and including 15 Min*. The default setting is *Disabled*.

Standby to Suspend Timeout

This option specifies the length of the period of system inactivity when the computer is already in Standby mode before the computer is placed in Suspend mode. In Suspend mode, nearly all power use is curtailed. The settings are *Disabled*, *1 Min*, *2 Min*, and *all one minute intervals up to and including 15 Min*. The default setting is *Disabled*.

Slow Clock Ratio

This option specifies the speed at which the system clock runs in power-saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed. The settings are *1:1*, *1:2* (half as fast as normal), *1:4* (the normal clock speed), *1:8*, *1:16*, *1:32*, *1:64*, and *1:128*. The default setting is *1:8*.

Display Activity

This option specifies if AMIBIOS is to monitor activity on the display monitor for power-conservation purposes. When this option is set to *Monitor* and there is no display activity for the length of time specified in the value in the *Full On to Standby Timeout (Min)* option, the computer enters a power-saving state. The settings are *Monitor*, *Wake up*, *Ignore*, and *Both*. The default setting is *Ignore*.

IRQ3

IRQ4

IRQ5

IRQ7

IRQ9

IRQ10

IRQ11

IRQ12

IRQ13

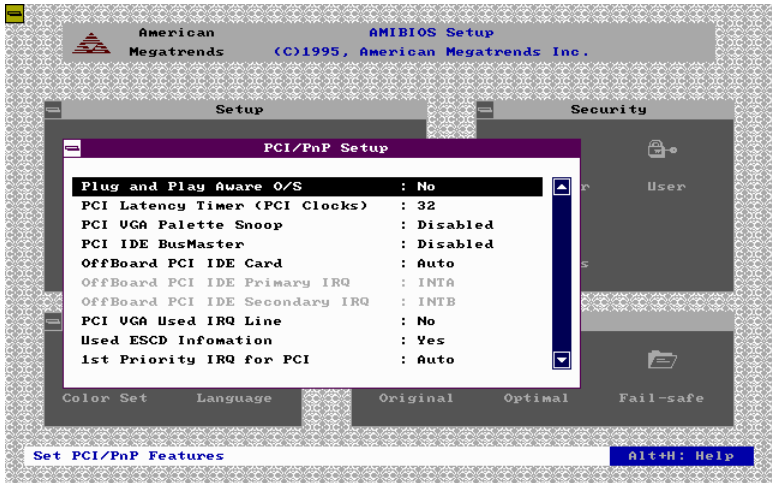
IRQ14

IRQ15

These options enable event monitoring. When the computer is in a power-saving mode, activity on the named interrupt request line is monitored by AMIBIOS. When any activity occurs, the computer enters the Full On mode.

Each of these options can be set to *Monitor* or *Ignore*. The default setting for all options is *Ignore*, except IRQ3, IRQ4, IRQ14, IRQ15, which is *Both*.

6.8 PCI/PnP Setup Menu



Plug and Play Aware OS

Set this option to *Yes* if the operating system installed in the computer is Plug and Play-aware. AMIBIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware.

Set this option to *No* if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly. The settings are *No* and *Yes*. The Optimal and Fail-Safe default settings are *No*.

PCI Latency Timer (in PCI Clocks)

This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. The settings are *32, 64, 96, 128, 160, 192, 244, and 248*. The Optimal and Fail-Safe default settings are *32*.

PCI VGA Palette Snoop

This option must be set to *Enabled* if any ISA adapter card installed in the computer requires VGA palette snooping. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default settings are ***Disabled***.

PCI IDE BusMaster

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. The settings are *Disabled* and *Enabled*. The Optimal and Fail-Safe default setting is ***Disabled***.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is used in the computer. You must also specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller card is installed. If an offboard PCI IDE controller is used, the onboard IDE controller on the motherboard is automatically disabled. The settings are *Disabled*, *Auto*, *Slot1*, *Slot2*, *Slot3*, and ***Slot4***.

If *Auto* is selected, AMIBIOS automatically determines the correct setting for this option. The Optimal and Fail-Safe default setting is ***Auto***.

Offboard PCI IDE Primary IRQ

The Optimal and Fail-Safe default setting is ***INTA***.

Offboard PCI IDE Secondary IRQ

The Optimal and Fail-Safe default setting is ***INTB***.

IRQ3

IRQ4

IRQ5

IRQ7

IRQ9

IRQ10

IRQ11

IRQ12

IRQ14

IRQ15

These options specify the bus that the named interrupt request lines (IRQs) are used on. These options allow you to specify IRQs for use by legacy ISA adapter cards.

These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQs pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the ISA/EISA setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured *PCI/PnP*.

The settings are *PCI/PnP* and *ISA/EISA*. The Optimal and Fail-Safe default setting is ***PCI/PnP***.

Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards.

The settings are *Disabled*, *16K*, *32K*, and *64K*. The Optimal and Fail-Safe default setting is ***Disabled***.

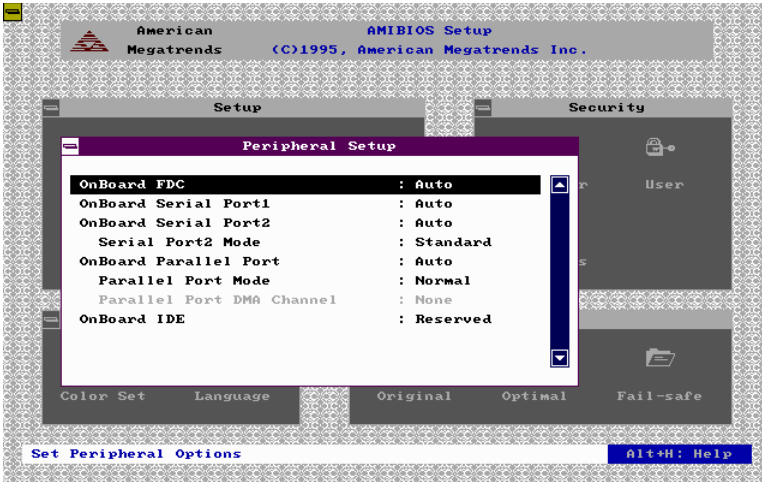
Reserved Memory Address

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards.

The settings are *C0000*, *C4000*, *C8000*, *CC000*, *D0000*, *D4000*, *D8000*, and *DC000*. The Optimal and Fail-Safe default setting is ***C0000***.

6.9 Peripheral Setup Menu

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the Setup main menu. All Peripheral Setup options are described in this section.



Onboard FDC

This option enables the floppy drive controller on the motherboard. The settings are *Enabled* and *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

Onboard Serial Port 1

This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1.

The settings are *3F8h*, *3E8h*, *Auto*, and *Disabled*. The Optimal default setting is *Auto*. The Fail-Safe default setting is *Disabled*.

Onboard Serial Port 2

This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

The settings are *2F8h*, *2E8h*, *Auto*, and *Disabled*. The Optimal default setting is *Auto*. The Fail-Safe default setting is *Disabled*.

Onboard Parallel Port

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *378h*, *278h*, *Auto*, and *Disabled*.

The Optimal default setting is *Auto*. The Fail-Safe default setting is *Disabled*.

Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are:

Setting	Description
<i>Normal</i>	The normal parallel port mode is used. This is the default setting.
<i>Bi-Dir</i>	Use this setting to support bi-directional transfers on the parallel port.
<i>EPP</i>	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
<i>ECP</i>	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5MBs. ECP provides symmetric bi-directional communications.

Parallel Port DMA

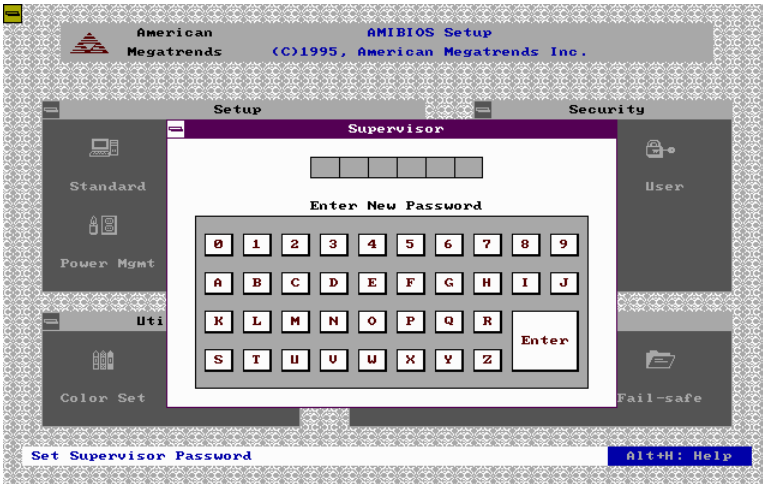
This option is only available if the setting for the **Parallel Port Mode** option is ECP.

The settings are *Disabled*, *DMA CH (channel) 0*, *DMA CH 1*, and *DMA CH 3*. The default setting is *Disabled*.

Onboard IDE

This option specifies the onboard IDE controller channels that will be used. The settings are *Primary*, *Secondary*, *Both*, and *Disabled*. The Optimal and Fail-Safe default settings are *Both*.

6.10 Password



If You Do Not Want to Use a Password

Just press <Enter> when the password prompt appears.

Setting a Password

The password check option is enabled in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when BIOS is run). The password is stored in the CMOS RAM.

You can enter a password by:

- typing the password on the keyboard,
- selecting each letter with the mouse, or
- selecting each letter with the pen stylus.

Pen access must be customized for each specific hardware platform.

When you select *Supervisor* or *User*, AMIBIOS prompts for a password. You must set the *Supervisor* password before you can set the *User* password. Enter a 1-6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain the CMOS RAM and reconfigure the system.

6.11 Anti-Virus

When this icon is selected from the Security section of the Setup main menu, AMIBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* and *Disabled*. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write.

Boot Sector Write!!!
Possible VIRUS: Continue (Y/N)? _

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

Format!!!
Possible VIRUS: Continue (Y/N)? _