PAM-0055I

High Performance

Pentium PCI Mainboard

User's Guide

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High Performance Pentium PCI Mainboard

User's Manual

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CONTENTS

CHAPTER 1 INTRODUCTION

The motherboard is a 4-layer, 2/3 baby AT size high-performance mainboard. It includes Intel 82430HX system chipset, NS PC87306 Super I/O controller.

1.1 GENERAL SPECIFICATION

Processor

- Intel Pentium P54C series - P54C, P55C (MMX)
- Cyrix 6x86/6x86L series
- AMD-K5/K6 series
- The mainboard can run with following speeds:
  75, 90, 100, 110, 120, 133, 150, 166, 200 and 233 MHz

Chipset

- Intel 82439HX (Intel 82430HX System Controller)
- Intel 82371SB (PCI ISA IDE Xcelerator)
- NS PC87306 (Super I/O Controller)

Cache Size

- Sychronized Pipelined Burst Mode SRAM to achieve the high Pentium system performance.
- Cache size is 0/256/512KB.

Main Memory

- Memory configurations from 4MB to 256MB are possible using combination of 256K*36 to 16MB*36 SIMM module. (32Bits non-parity 72-pin SIMM Module also available).
- Support both Fast Page Mode and Extended Data Output (EDO) Mode DRAM Modules.
- Hidden DRAM Refresh for higher system performance.
- ECC (Error Checking and Correction) support.

Multi I/O

- On board Multi-I/O supports two serial, one parallel ports and floppy drive controller.
- Serial ports are 16550 Fast UART compatible.
- Parallel port has EPP and ECP capabilities.
- IrDA supported.
- USB (Universal Serial Bus) supported.

PCI IDE

- On board supports PCI Master IDE Controller, two connectors support up to four IDE devices such as HDD, CD ROM drive and Tape Back-up drives, etc.
- PCI Master IDE controller supports PIO Mode 3 and 4 devices, I/O data transfer rate can be up to 17Mb/s. DMA mode transfer rate can be up to 22Mb/s.

System BIOS

- AMI BIOS (128KB Flash EPROM).

Slots

- Four PCI slots
- Four ISA slots

Board

- 4 Layers

Form Factor

- 2/3 Baby AT Size (220 x 265mm)

1.2 MAINBOARD COMPONENTS

This section gives a brief description of key components on the mainboard. Please refer to Fig. 1 for components location.

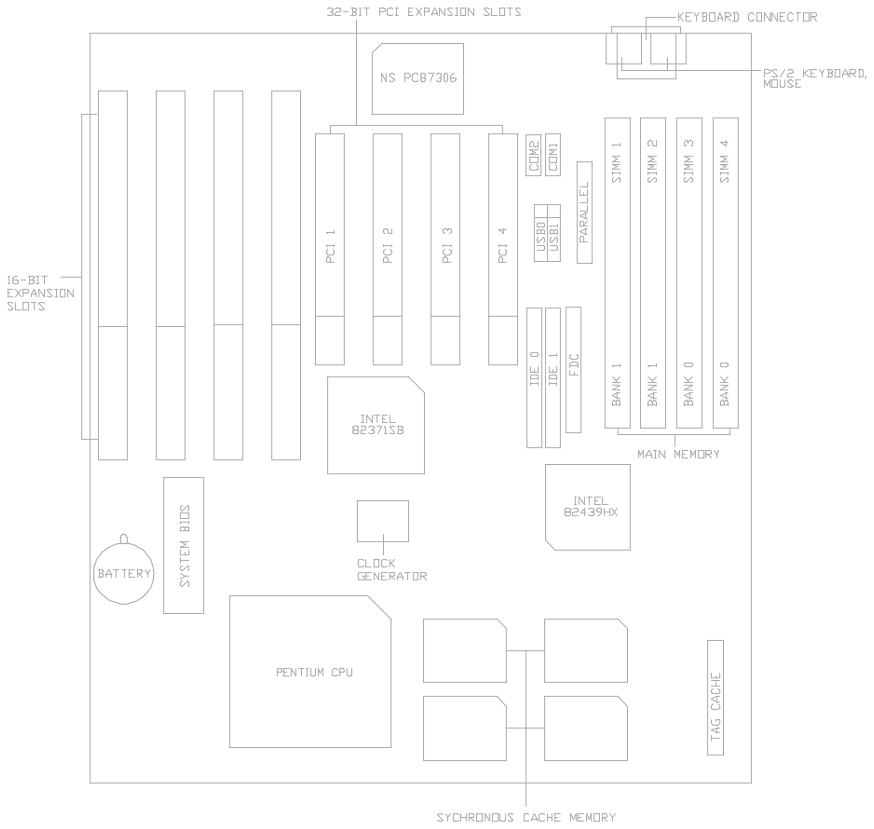

Fig. 1 Key Components of the Mainboard

CHAPTER 2 MEMORY CONFIGURATION

2.1 SYSTEM MEMORY

The Mainboard lets user upgrade system memory via SIMM sockets on the mainboard. On-board memory is located in two banks: Bank 0 and Bank 1.

Two SIMM sockets are provided in each bank. User can install either 1M, 4M, 8M, 16M, 32M or 64M SIMM in each bank.

Note: ***The type of SIMM1/SIMM2 must be same.***
The type of SIMM3/SIMM4 must be same.

Table 1 provides some typical DRAM configurations supported by the mainboard.

Bank 0 (SIMM3, 4)	Bank 1 (SIMM1, 2)	Total Size
1Mx36 Single	None	8M
1Mx36 Double	None	16M
4Mx36 Single	None	32M
4Mx36 Double	None	64M
16Mx36 Single	None	128M
To be continue...		

Table 1A: Memory Configuration

Bank 0 (SIMM3, 4)	Bank 1 (SIMM1, 2)	Total Size
1Mx36 Single	1Mx36 Single	16M
1Mx36 Single	1Mx36 Double	24M
1Mx36 Double	1Mx36 Single	24M
1Mx36 Double	1Mx36 Double	32M
1Mx36 Single	4Mx36 Single	40M
1Mx36 Single	4Mx36 Double	72M
4Mx36 Single	1Mx36 Single	40M
4Mx36 Double	1Mx36 Single	72M
1Mx36 Double	4Mx36 Single	48M
1Mx36 Double	4Mx36 Double	80M
4Mx36 Single	1Mx36 Double	48M
4Mx36 Double	1Mx36 Double	80M
4Mx36 Single	4Mx36 Single	64M
4Mx36 Single	4Mx36 Double	96M
4Mx36 Double	4Mx36 Single	96M
4Mx36 Double	4Mx36 Double	128M
1Mx36 Single	16Mx36 Single	136M
1Mx36 Double	16Mx36 Single	144M
To be continue...		

Table 1B: Memory Configuration

Bank 0 (SIMM3, 4)	Bank 1 (SIMM1, 2)	Total Size
16Mx36 Single	1Mx36 Single	136M
16Mx36 Single	1Mx36 Double	144M
4Mx36 Single	16Mx36 Single	160M
4Mx36 Double	16Mx36 Single	192M
16Mx36 Single	4Mx36 Single	160M
16Mx36 Single	4Mx36 Double	192M
16Mx36 Single	16Mx36 Single	256M

Table 1C: Memory Configuration

Note: based on above chart, the different types of SIMM can be in different bank, but within same bank, the two SIMM modules must be of same type and size.

2.2 CACHE MEMORY CONFIGURATION

The mainboard has a built-in cache controller. It requires external SRAM as tag and data memory.

Cache Tag RAM Location: U4
Synchronous Pipeline Burst SRAM Location: U1, U2, U7, U8

Cache Size	Tag RAM (U4)	Data RAM Group 1 (U1, U7)	Data RAM Group 2 (U2, U8)
256K8 Kx8	32Kx32	None	
512K	16Kx8/32Kx8	32Kx32	32Kx32
	16Kx8/32Kx8	64Kx32	None

Table 2: Secondary Cache Configuration

Note:** **Tag RAM are all 5V device, Pipeline Burst data RAM are 3.3V device e.g. Winbond W259010AF.

CHAPTER 3 JUMPER SETTINGS AND CONNECTORS

3.1 CPU TYPE

3.1.1 INTEL PENTIUM CPU

The pentium processors have different operation voltage. In order to using the CPU Voltage correctly, the following is the marking for identify the CPU type.

Fig. 2a CPU Description (Bottom Side)

Description :
X = Voltage Specification (S or V)
S = Standard Voltage (3.4V)
V = VRE 3.4 - 3.6V (3.5V)

Y = Timing Specification (S or M)
S = Standard EDS timings
M = Min Valid Delay Spec.

Z = Dual Processing Support (S or U)
S = Support DP/MP/UP
U = Not tested to support DP

3.1.2 INTEL PENTIUM w/ MMX™ TECH (P55C) CPU

The Intel Pentium w/ MMX™ Tech (P55C) CPU is offered with dual voltage supply - 2.8V for core and 3.3V for I/O interface. The following is the making for identify the CPU type. (The following diagram is provided as an example only. It does not necessarily indicate a valid product marking.)

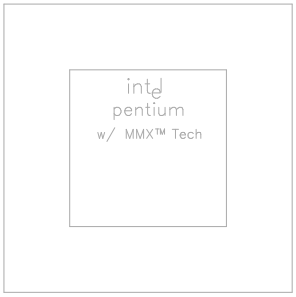

Fig. 2b CPU Description (Top Side)

	I/O Voltage	Core Voltage
Intel Pentium w/ MMX™ Tech (P55C)	3.3V	2.8V

3.1.3 AMD-K6 CPU

The AMD-K6 CPU family require dual voltage power for operation. The AMD-K6-PR166 and AMD-K6-PR200 require a voltage of 2.9V for the core and 3.3V for I/O. The AMD-K6-PR233 require a voltage of 3.2V for the core and 3.3V for the I/O. (The following diagram is provided as an example only. It does not necessarily indicate a valid product marking.)

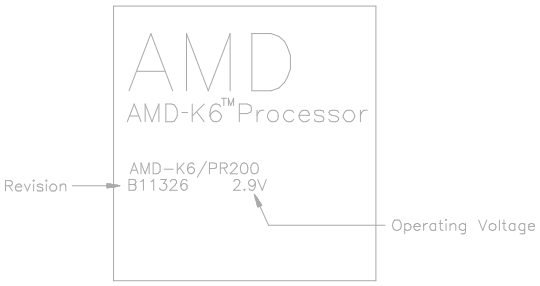

Fig. 2c CPU Description
(Top Side)

Operating Voltage	I/O Voltage	Core Voltage
2.9V	3.3V	2.9V
3.2V	3.3V	3.2V

3.1.4 AMD-K5 CPU

The AMD-K5 family CPU is operated on different operation voltage depending on the CPU Type. The operating voltage can be known through the marking on the surface of the CPU. (The following diagram is provided as an example only. It does not necessarily indicate a valid product marking.)

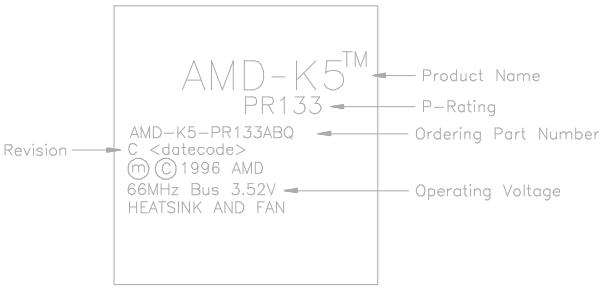

Fig. 2d CPU Description
(Top Side)

3.1.5 CYRIX 6x86 CPU

The Cyrix 6x86 has different nominal voltage depends on different lot. Please refer to the CPU marking.

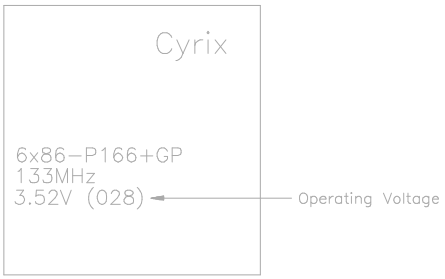

Fig. 2e CPU Description
(Top Side)

Marketing	Recommended Nominal Voltage
3.3V or 3.52V	3.52V
028	3.52V
016	3.3V
Blank	3.52V

3.1.6 CYRIX 6x86L CPU

The Cyrix 6x86L has different I/O and core voltage. Please refer to the CPU marking.

Fig. 2f CPU Description (Top Side)

	I/O Voltage	Core Voltage
Cyrix 6x86L CPU	3.3V	2.8V

3.2 SETTING THE JUMPERS

The table below summaries the functions and settings of each jumper of the motherboard.

Function		Jumper Settings
CPU Voltage Selection	3.3V Single Voltage CPU For P54C series	JP9: open JP10: short JP12: open JP16: open JP14: short
	3.5V Single Voltage CPU For P54C-VRE, AMD-K5, Cyrix 6x86	JP9: short JP10: open JP12: open JP16: open JP14: short
	3.3V (I/O)/2.8V (core) Dual Voltage CPU For P55C, Cyrix 6x86L	JP9: open JP10: short JP12: short JP16: open JP14: open
	3.3V (I/O)/2.9V (core) Dual Voltage CPU For AMD-K6-PR166/PR200	JP9: open JP10: short JP12: open JP16: short JP14: open
	3.3V (I/O)/3.2V (core) Dual Voltage CPU For AMD-K6-PR233	JP9: open JP10: short JP12: open JP16: open JP14: open
To be continued...		

Table 3A: Jumper Setting

Function		Jumper Settings	
CPU Speed Selection	For 75MHz Intel Pentium, AMD-K5-PR75 CPU	JP1: JP2: JP18:	open open 1-2 short 3-4 short 5-6 open
	For 90MHz Intel Pentium, AMD-K5-PR90 and AMD-K5-PR120 CPU	JP1: JP2: JP18:	open open 1-2 open 3-4 short 5-6 open
	For 100MHz and 233MHz Intel Pentium; AMD-K6-PR233, AMD-K5-PR100 and AMD-K5-PR150 CPU	JP1: JP2: JP18:	open open 1-2 short 3-4 open 5-6 open
	For 100MHz Cyrix 6x86-P120+ CPU	JP1: JP2: JP18:	short open 1-2 short 3-4 short 5-6 open
	For 110MHz Cyrix 6x86-P133+ CPU	JP1: JP2: JP18:	short open 1-2 open 3-4 open 5-6 open
	For 120MHz Intel Pentium and Cyrix 6x86-P150+ CPU	JP1: JP2: JP18:	short open 1-2 open 3-4 short 5-6 open
	For 133MHz Intel Pentium, AMD-K5-PR133 (REV C) and Cyrix 6x86-P166+ CPU	JP1: JP2: JP18:	short open 1-2 short 3-4 open 5-6 open
To be continued...			

Table 3B: Jumper Setting

Function		Jumper Settings	
CPU Speed Selection	For 150MHz Intel Pentium CPU	JP1: JP2: JP18:	short short 1-2 open 3-4 short 5-6 open
	For 150MHz Cyrix 6x86-P200+ CPU (for future support only)	JP1: JP2: JP18:	short open 1-2 open 3-4 open 5-6 short
	For 166MHz Intel Pentium, AMD-K6-PR166 and AMD-K5-PR166 CPU	JP1: JP2: JP18:	short short 1-2 short 3-4 open 5-6 open
	For 200MHz Intel Pentium and AMD-K6-PR200 CPU	JP1: JP2: JP18:	open short 1-2 short 3-4 open 5-6 open
System ROM Selection	5V Flash EPROM	JP20:	2-3 short
	12V Flash EPROM	JP20:	1-2 short

Table 3C: Jumper Setting

3.3 CONNECTION THE MOTHERBOARD

Once the mainboard have been fastened into the system case, the next step is to connect the internal cables. The internal cables are wire leads with plastic female connectors that attach to the connectors. The mainboard connectors have varying numbers of pins and are the points of contact between the mainboard and other parts of the computer.

A description of each connector and its connector pins follows. See Fig. 3 for the location of the connectors on the mainboard.

Note: Before making connectors on the board, make sure that power to the system is turned off.

3.3.1 JUMPER PRESENTATION

Pins 1 and 2 are shorted with a jumper cap.

Pins 2 and 3 are shorted with a jumper cap.

The jumper is shorted when the jumper cap is placed over the two pins of the jumper.

The jumper is open when the jumper cap is removed from jumper.

3.3.2 JUMPER CONVENTION OF THE MOTHERBOARD

Different colour of jumper caps (mini-jumpers) are used on the board to represent different usage of the jumpers:

Red : CPU Clock setting
Black: Other

3.3.3 CONNECTOR LOCATIONS

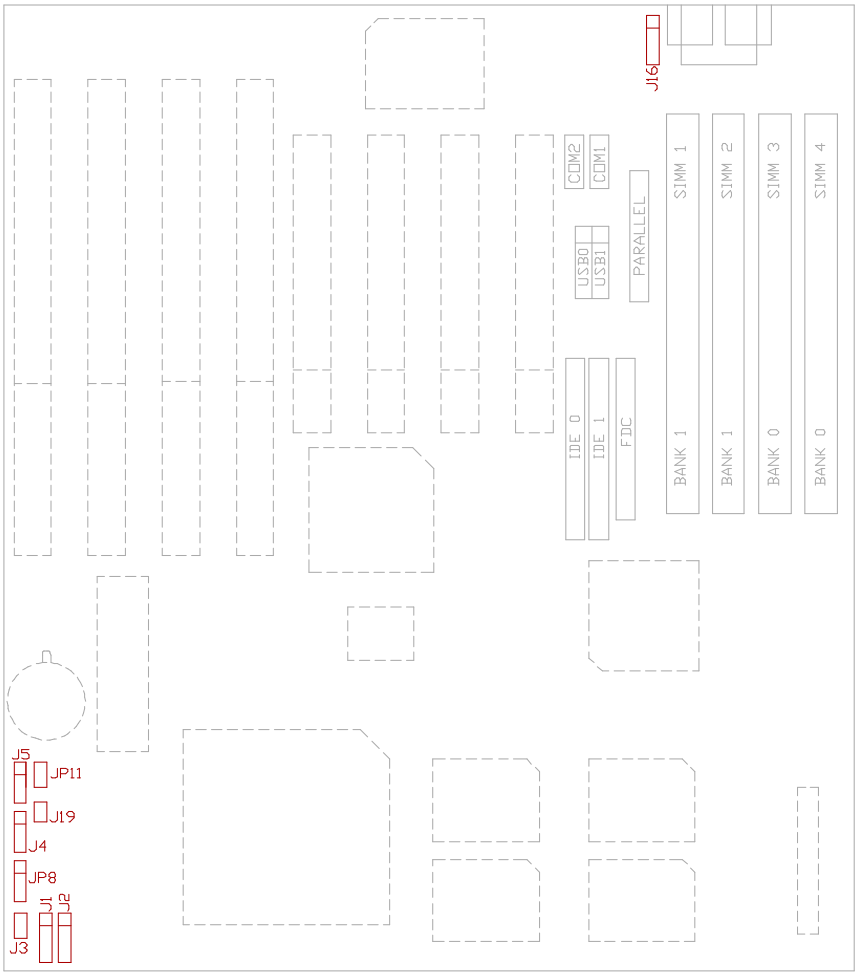

Fig. 3 Connector Location

3.4 CONNECTORS

3.4.1 J14 - POWER SUPPLY CONNECTOR

The power supply connector has two six-pin male header connectors. Plug the dual connectors from the power directly onto the board connector.

Pin	Description
1	Power Good (Orange)
2	+5 VDC (Red)
3	+12 VDC (Yellow)
4	-12 VDC (Blue)
5	Ground (Black)
6	Ground (Black)
7	Ground (Black)
8	Ground (Black)
9	-5 VDC (White)
10	+5 VDC (Red)
11	+5 VDC (Red)
12	+5 VDC (Red)

Table 4: J14 - Power Supply Connector

3.4.2 J1 - IrDA CONNECTOR

J1 is a IrDA connector that for using UART2 as interface of IrDA Infrared and HP SIR.

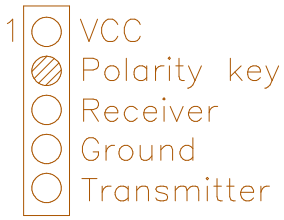

Fig. 4 J1 - IrDA Connector

3.4.3 J2 - KEYLOCK CONNECTOR

J2 is a keylock connector that enables and disables the keyboard.

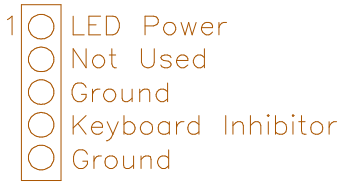

Fig. 5 J2 - Keylock Connector

3.4.4 J19 - TURBO LED CONNECTOR

J19 is usually connected to a Turbo LED on front of the system case. If the system board select is in Turbo mode, the indicator lights during high-speed operation. This motherboard always operate at high-speed.

Fig. 6 J19 - Turbo LED

3.4.5 J4 - SPEAKER CONNECTOR

Following is the system speaker to connector J4.

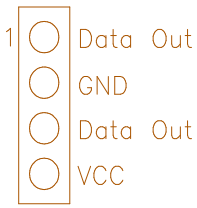

Fig. 7 J4 - Speaker Connector

3.4.6 J5 - HDD LED CONNECTOR

J5 is usually connected to a HDD LED on front of the system case. If the HDD is in operation, the indicator lights during operation.

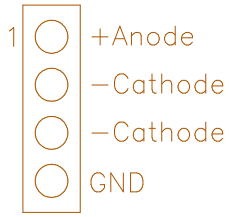

Fig. 8 J5 - HDD LED

3.4.7 JP11 - RESET SWITCH CONNECTOR

Attach the Reset switch cable to this connector. The Reset switch restarts the system.

JP11	Description
	Reset
	Normal (default)

Table 5: JP11 - Reset Switch Connector

3.4.8 J15 - KEYBOARD CONNECTOR

A standard five-pin female DIM keyboard connector is located at the rear of the keyboard. Plug the jack on the keyboard cable into this connector.

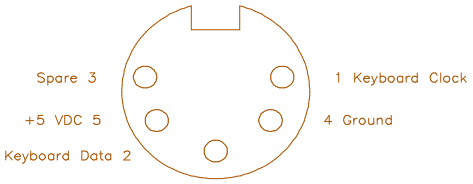

Fig. 9 J15 - Keyboard Connector

3.4.9 J13 - SERIAL PORT 1

Both COM1 and 2 are 16550 fast UART compatible. J15 is located right beneath beside J14 Power Connector. Pin 1 is on the up left hand side.

3.4.10 J12 - SERIAL PORT 2

J12 is left to J13. Pin 1 is on the up left hand side.

3.4.11 J11 - PARALLEL PORT

J11 is left to DRAM SIMM Module connectors. Pin 1 is on the up left hand side.

3.4.12 J8 - FLOPPY DRIVE CONTROLLER

J8 locates left to DRAM SIMM Module connectors. This Floppy drive controller also supports 2.88M FDD format.

3.4.13 J6 - PRIMARY IDE CONNECTOR

The bootable Hard Disk must connect to this Primary IDE Connector, it locates right beneath J11 parallel port connector.

3.4.14 J7 - SECONDARY IDE CONNECTOR

J7 locates right to J6, the primary IDE connector

3.4.15 J17 - PS/2 STYLE MOUSE CONNECTOR (OPTIONAL)

A PS/2 Standard six-pin female DIM connector for mouse is located at right the J18.

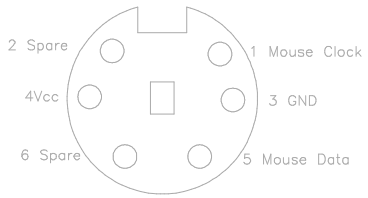

Fig. 10 J17 - PS/2 Mouse Connector

3.4.16 J18 - PS/2 STYLE KEYBOARD CONNECTOR (OPTIONAL)

A PS/2 Standard six-pin female DIM connector for keyboard is located at left to J15.

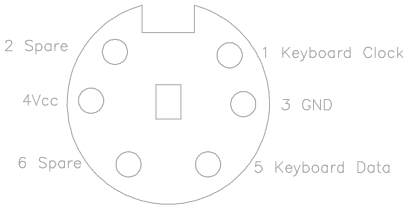

Fig. 11 J18 - PS/2 Keyboard Connector

3.4.17 JP8 - SMI SWITCH

JP8 is for SMI Break Switch Setting. When JP8 is trigger from OPEN to CLOSE and back to OPEN, the system would suspend immediately.

3.4.18 J16 - EXTENSION PS/2 MOUSE CONNECTOR

J16 is a five-pin connector with polarity key is located at left side of keyboard connector. It is connected with the PS/2 mouse connector cable to extend the PS/2 mouse connector to the rear of the system case.

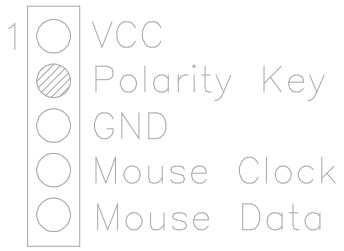

Fig. 12 J16 - Extension PS/2 Mouse Connector

3.4.19 J9 - USB0 CONNECTOR

A five-pin connector, located right side of PCI slot 4 is used to connect with the USB (Universal Serial Bus) cable. It is defined as USB0.

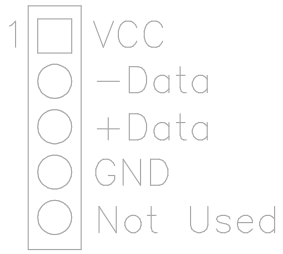

Fig. 13 J9 - USB0 Connector

3.4.20 J10 - USB1 CONNECTOR

A five-pin connector, located right side of J9, is used to connect with the USB cable. It is defined as USB1, and it's pin assignment is same as J9.

3.5 GRAPHICAL DESCRIPTIONS OF JUMPER SETTINGS

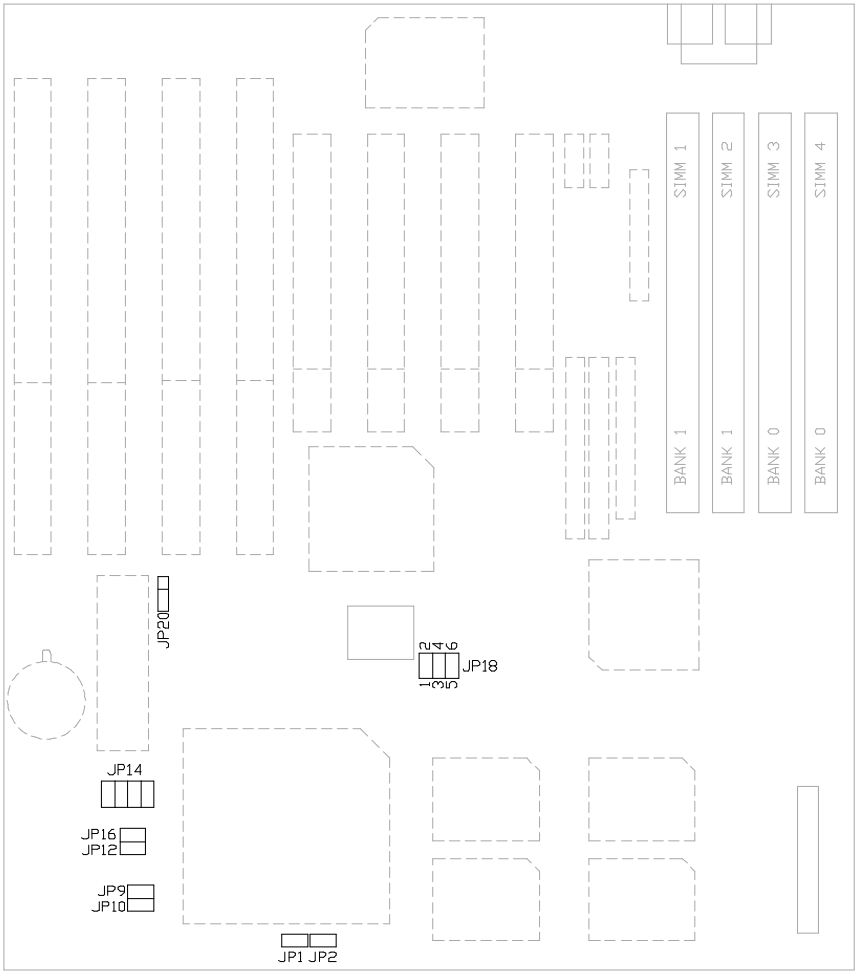

Fig. 14 Jumper Location

3.5.1 CPU VOLTAGE SELECTION

1. For 3.3V Single Voltage CPU: P54C series

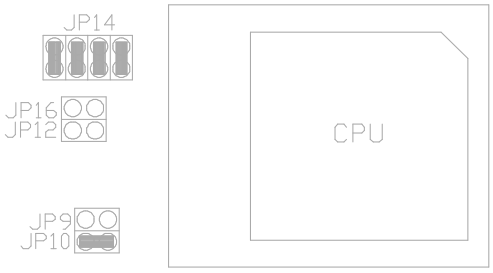

Fig. 15a CPU Type - 3.3V

2. For 3.5V Single Voltage CPU: P54C-VRE, AMD-K5, Cyrix 6x86

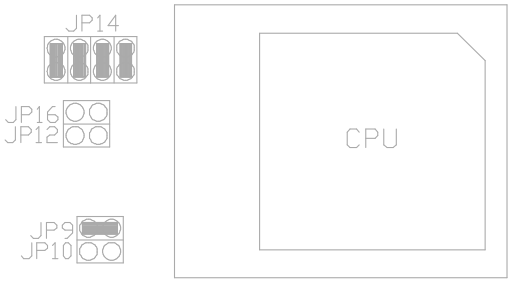

Fig. 15b CPU Type - 3.5V

3. For 3.3V (I/O)/2.8V (core) Dual Voltage CPU: P55C, Cyrix 6x86L

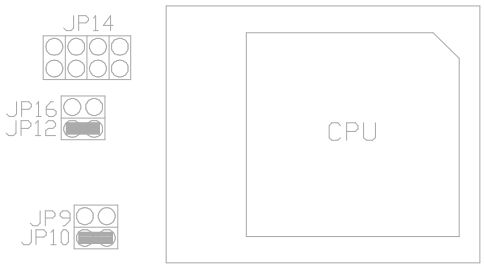

Fig. 15c CPU Type - 3.4V/2.8V

4. For 3.3V (I/O)/2.9V (core) Dual Voltage CPU: AMD-K6-PR166/PR200

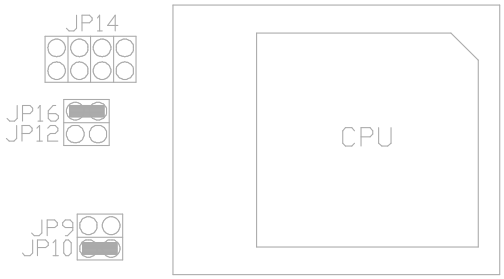

Fig. 15d CPU Type - 3.3V/2.9V

5. For 3.3V (I/O)/3.2V (core) Dual Voltage CPU: AMD-K6-PR233

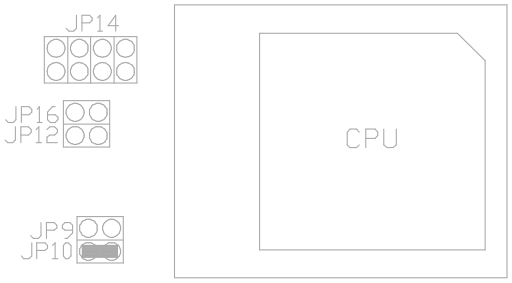

Fig. 15e CPU Type - 3.3V/3.2V

3.5.2 CPU SPEED

1. For 75MHz Intel Pentium, AMD-K5-PR75 CPU

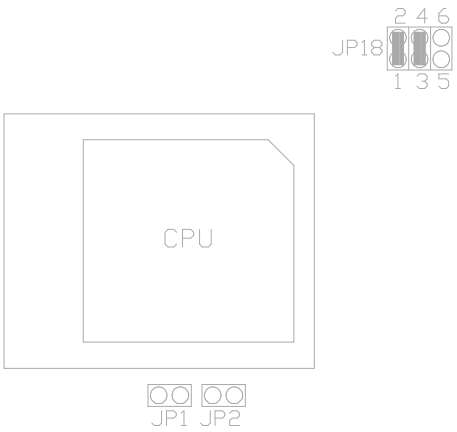

Fig. 16a CPU Speed

2. For 90MHz Intel Pentium, AMD-K5-PR90 and AMD-K5-PR120 CPU

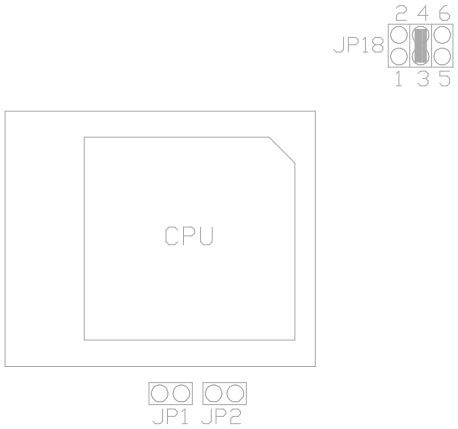

Fig. 16b CPU Speed

3. For 100MHz and 233MHz Intel Pentium, AMD-K6-PR233, AMD-K5-PR100 and AMD-K5-PR150 CPU

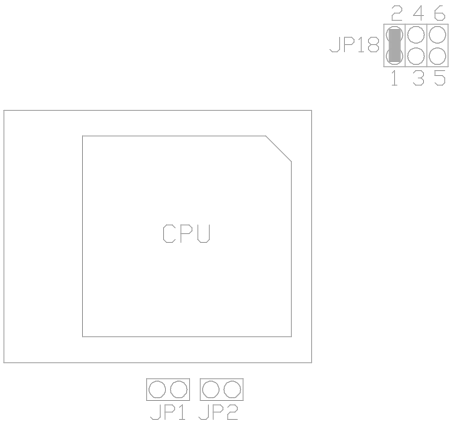

Fig. 16c CPU Speed

4. For 100MHz Cyrix 6x86-P120+ CPU

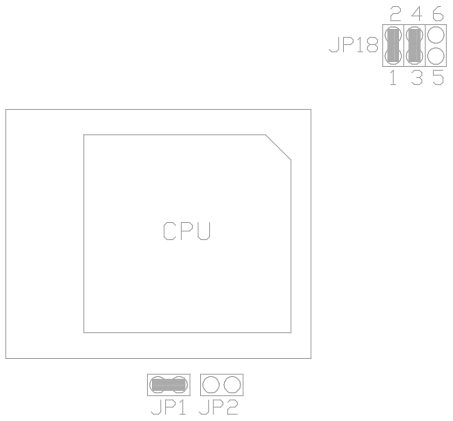

Fig. 16d CPU Speed

5. For 110MHz Cyrix 6x86-P133+ CPU

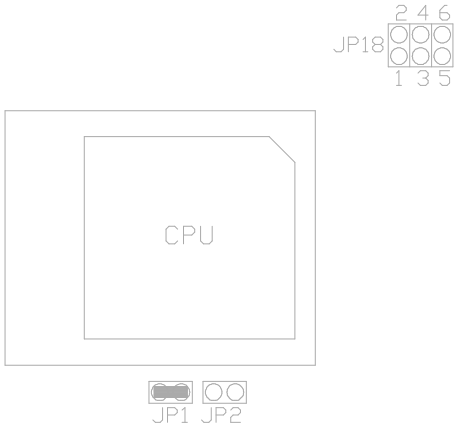

Fig. 16e CPU Speed

6. For 120MHz Intel Pentium and Cyrix 6x86-P150+ CPU

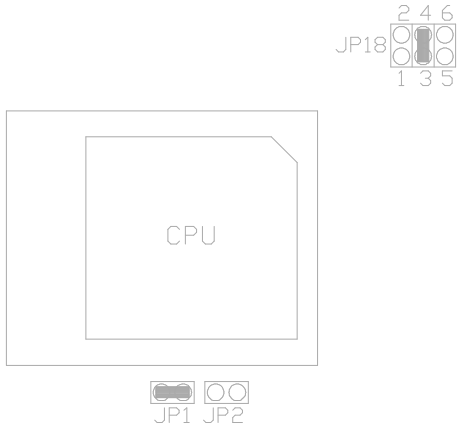

Fig. 16f CPU Speed

7. For 133MHz Intel Pentium, AMD-K5-PR133 (REV C) and Cyrix 6x86-P166+ CPU

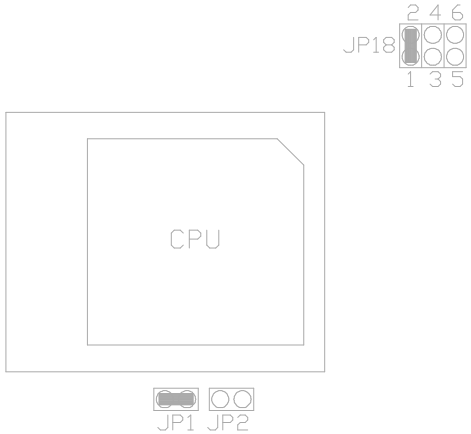

Fig. 16g CPU Speed

8. For 150MHz Intel Pentium CPU

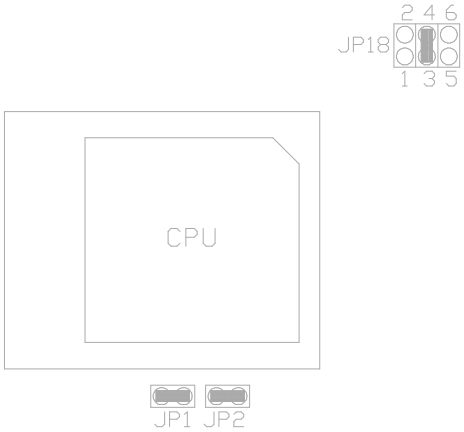

Fig. 16h CPU Speed

9. For 150MHz Cyrix 6x86-P200+ CPU (for future support only)

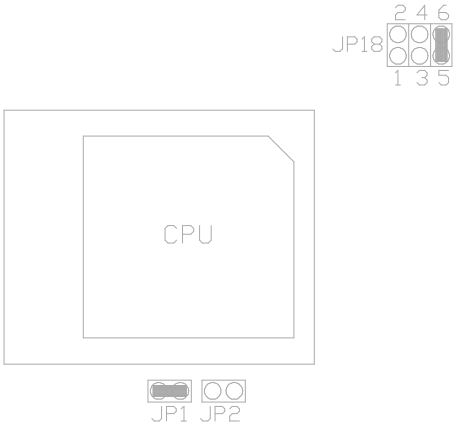

Fig. 16i CPU Speed

10. For 166MHz Intel Pentium, AMD-K6-PR166 and AMD-K5-PR166 CPU

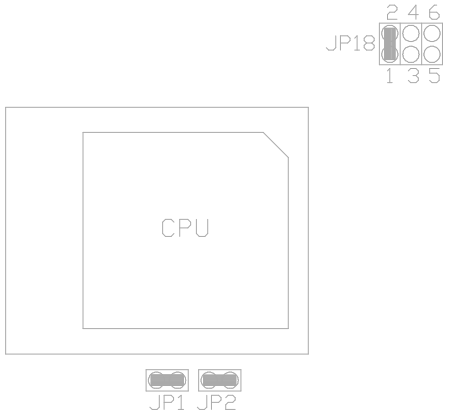

Fig. 16j CPU Speed

11. For 200MHz Intel Pentium and AMD-K6-PR200 CPU

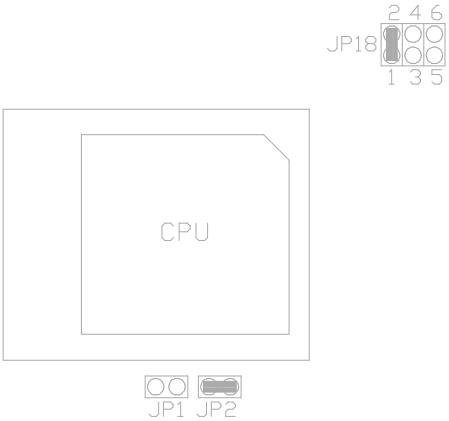

Fig. 16k CPU Speed

CHAPTER 4 AMI WinBIOS SETUP

WinBIOS Setup has an easy-to-use graphical user interface that makes system configuration easy and simple. The configuration options in WinBIOS Setup are all icon-based. All settings for each option are displayed for easy access. All WinBIOS Setup functions can be accessed by mouse, keyboard, or pen. Pen access must be customized for each hardware platform.

4.1 MOUSE SUPPORT

The following types of mouse devices are supported:

- PS/2-type mouses,
- bus mouses that use IRQs 3, 4, or 5 (IRQ2 is not supported),
- Microsoft-compatible mouses (the M, V, W Series using the M and M+ protocols), and
- Logitech C-series-compatible mouses using the MM protocol.

4.2 POINT & CLICK INTERFACE

WinBIOS Setup uses the familiar point and click navigation technique. The end user can point with the mouse anywhere on the screen, click the left mouse button, and WinBIOS Setup control is transferred to the new location. The previous window is closed.

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

- single click to change or select both global and current fields,
- double clicks to perform an operation in the selected field, and
- single click on the top left corner of any window would exit from it. When exit from the Main Setup window, WinBIOS will prompt the user to save all changes.

All parameters that have been changed will automatically be saved, pending the selection on the exit screen.

4.3 USING KEYBOARD WITH WinBIOS SETUP

WinBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations:

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.
<Esc>	Closes the current operation and return to 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.

Table 6

4.4 STARTING WinBIOS SETUP

As POST executes, press <Del> to run WinBIOS Setup. After that the hourglass icon tells the user to wait until a process completes.

4.5 WinBIOS SETUP MAIN MENU

The WinBIOS Setup main menu, shown below, is organized into four windows. Each window corresponds to a section.

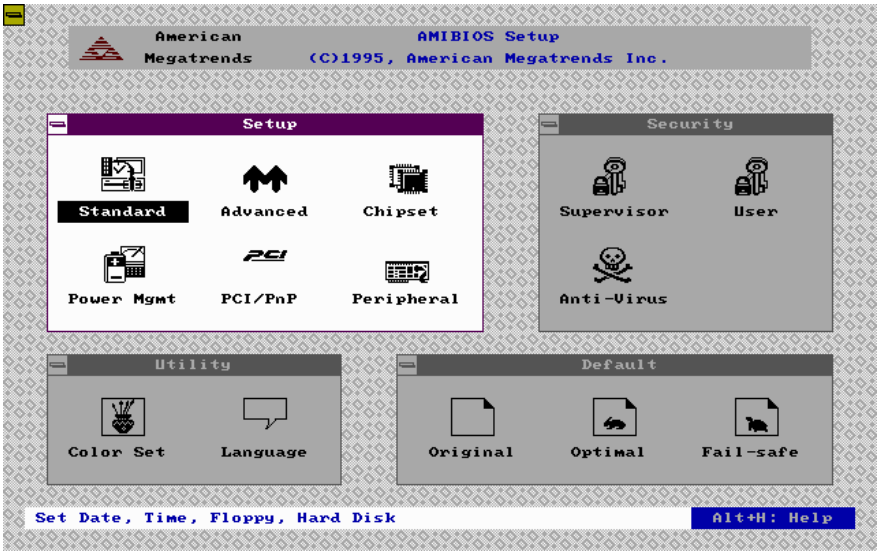

Fig. 17 Main Menu

Each section contains several icons. Clicking on each icon activates a specific function. The sections are:

Setup contains six icons that permit user to set system configuration options such as date, time, hard disk type, floppy type, and many others.

Security contains three icons that control WinBIOS security features.

Utility contains two icons that perform system functions.

Default contains three icons that permit user to select a group of settings for all WinBIOS Setup options.

Each WinBIOS Setup option has two default settings. The type of defaults are:

Optimal these settings provide the best performance characteristics.

Fail-Safe these settings are more likely to configure a workable computer when something is wrong. If user cannot boot the computer successfully, select the Fail-Safe WinBIOS setup options and try to diagnose the problem after the computer boots. These settings do not provide optimal performance.

4.6 SETUP

WinBIOS Setup 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 drive.
Advanced Setup	Configure basic system performance parameters.
Chipset Setup	Configure features specific to the chipset used in the computer.
To be continue...	

Table 7a : Setup Description

Type	Description
Power Management Setup	Configure power conservation

	feature.
PCI/PnP Setup	Configure PCI and Plung-and-Play feature.
Peripheral Setup	Configure I/O support

Table 7b : Setup Description

4.6.1 STANDARD SETUP

The WinBIOS Setup options described in this section are selected by choosing the appropriate high-level icon from the WinBIOS Setup main menu selection screen. The selection window follows.

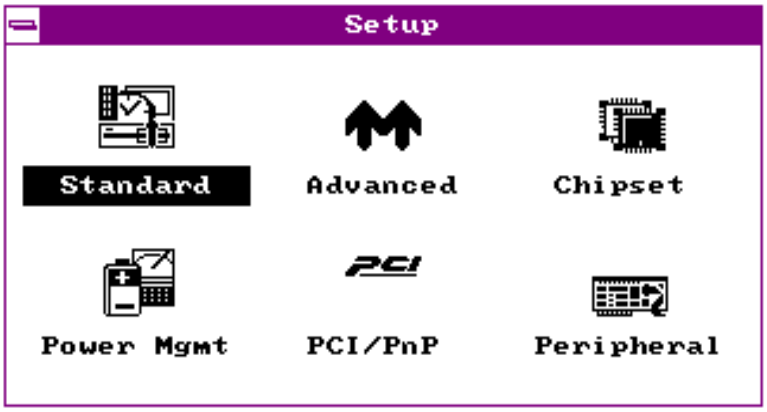

Fig. 18 Setup Menu

The Standard Setup screen follows.

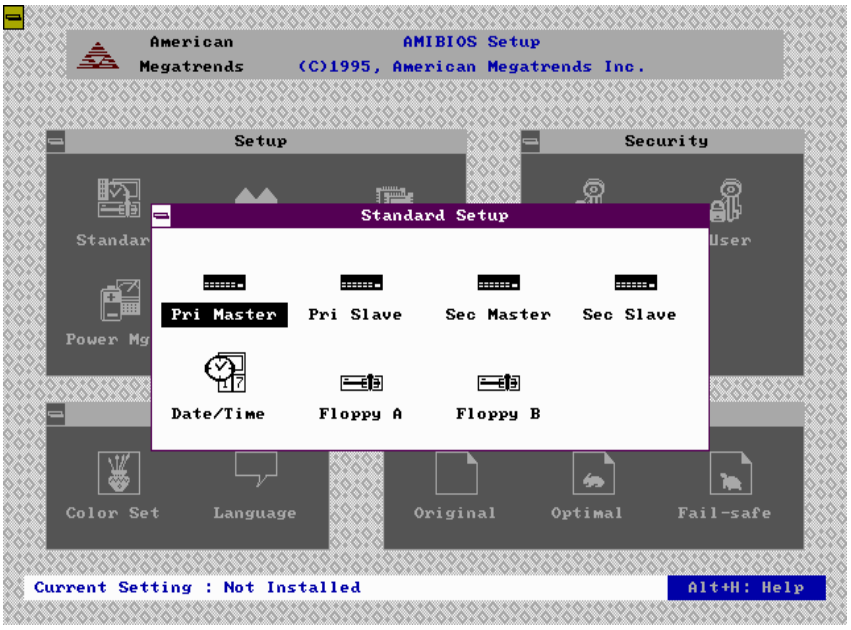

Fig. 19 Standard Setup Menu

The following are the description for the options located in the Standard Setup window.

Configuring IDE Drives
If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slaves, Sec Master, or Sec Slave). Choose the **Type** parameter and select Auto.

AMIBIOS automatically detects the IDE drive parameters and displays them. Click on the OK button to accept these parameters.

Click on **LBA/Large Mode** and choose *On* to enable support for IDE drives with capacities greater than 528 MB.

Click on **Block Mode** and choose *On* to support IDE drives that use Block Mode.

Click on **32Bit Mode** and click on *On* to support IDE drives that permit 32-bit accesses.

Click on **PIO Mode** to select the IDE Programmed I/O mode. The setting are *Auto, 0, 1, 2, 3, 4, or 5*. Click on *Auto* to allow AMIBIOS to automatically choose the PIO mode that the IDE drive being configured uses. If you select *0-5* you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured.

Date/Time Configuration
Select the Standard option. Select the Date and Time icon. The current values for each category are displayed. Enter new values through the keyboard.

Floppy Drive A:/Floppy Drive B:
Move the cursor to these fields via ↑ and ↓ and select the floppy type. The settings are *360KB 5¼", 1.2MB 5¼", 720KB 3½", 1.44MB 3½", 2.88MB 3½"* or *Not Installed.*

4.6.2 ADVANCED SETUP

The Advanced Setup options described in this section are the standard options as shown on the following screen.

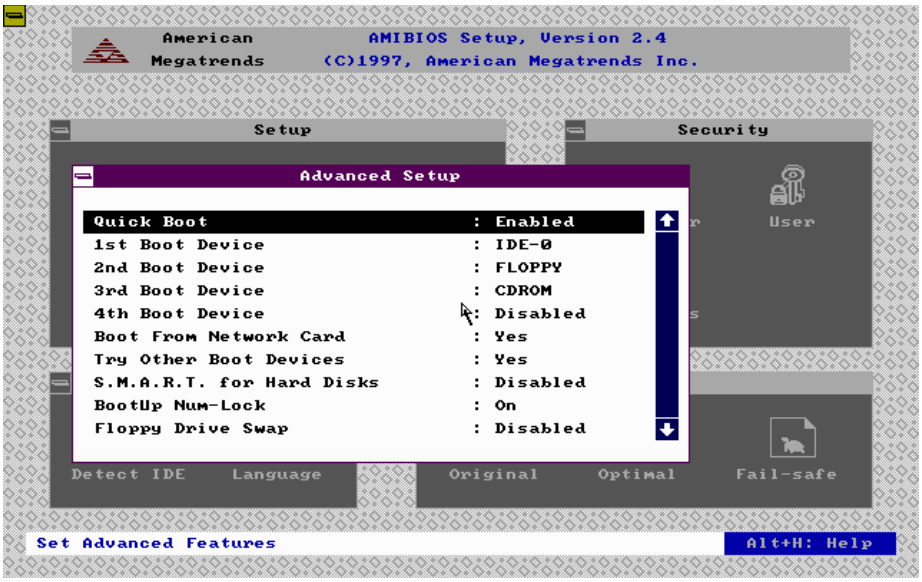

Fig. 20 Advanced Setup Menu

Quick Boot
Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. The settings are:

Setting	Description
Disabled	AMIBIOS test all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hare disk drive. AMIBIOS waits for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a <Del> key press and runs WINBIOS Setup if the key has been pressed.
Enabled	AMIBIOS does not test system memory above 1 MB. AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. You cannot run WINBIOS Setup at system boot, because there is no delay for the *Hit <Del> to run Setup* message.

Table 8

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

1st Boot Device
This option specifies the first boot up devices. The settings are *Disabled*, *IDE-0*, *IDE-1*, *IDE-2*, *IDE-3*, *FLOPPY*, *FLOPTICAL* and *CDROM*. The default setting is *IDE-0*.

2nd Boot Device
This option specifies the second boot up device. The settings are *Disabled*, *IDE-0*, *FLOPPY*, *FLOPTICAL* and *CDROM*. The default setting is *FLOPPY*.

3rd Boot Device
This option specifies the third boot up device. The settings are *Disabled*, *IDE-0*, *FLOPPY*, *FLOPTICAL* and *CDROM*. The default setting is *CDROM*.

4th Boot Device
This option specifies the fourth boot up device. The settings are *Disabled*, *FLOPPY*, *FLOPTICAL* and *CDROM*. The default setting is *Disabled*.

Boot From Network Card
The option enable the system boot from network card. The settings are *Yes* or *No*. The default setting is *Yes*.

Try Other Boot Devices
This option enable the system boot from other bootable devices. The settings are *Yes* or *No*. The default setting is *Yes*.

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* or *Off*. The default settings are *On*.

Floppy Drive Swap
Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

Floppy Access Control
This option specifies the access method of Floppy. The settings are *Read Only* or *Normal*. The default setting is *Normal*.

HDD Access Control
This option specifies the access method of HDD. The settings are *Read Only* or *Normal*. The default setting is *Normal*.

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

Primary Display
This option specifies the type of display monitor and adapter in the computer. The settings are *Mono, CGA40x25, CGA80x25, EGA/VGA,* or *Absent.* The Optimal and Fail-Safe default settings are *EGA/VGA*.

Password Check
This option enables password checking every time the computer is powered o or every time WINBIOS 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 WINBIOS is executed.

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

Boot to OS/2, DRAM 64MB or Above
Set this option to permit AMIBIOS to run with IBM OS/2. The settings are *Yes* or *No*. The default settings are *No*.

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

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
WriteBack (default)	Use the write-back caching algorithm.
WriteThru	Use the write-through caching algorithm.

Table 9

External Cache
This option specifies the caching algorithm used for L2 secondary (external) cache memory. The settings are:

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
Enabled	Use the write-back caching algorithm.

Table 10

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

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 system RAM for faster execution.

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

C000,16K Shadow/C400,16K Shadow/C800,16K Shadow/CC00,16K Shadow/ D000,16K Shadow/D400,16K Shadow/D800,16K Shadow/DC00,16K Shadow
These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, this area is made available to the local bus. The settings are:

Setting	Description
Enabled	The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster execution.
Cached	The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adaptor ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

Table 11

The default setting is *Disabled*.

4.6.3 CHIPSET SETUP

The Chipset Setup options described in this section are the standard options as shown on the following screen.

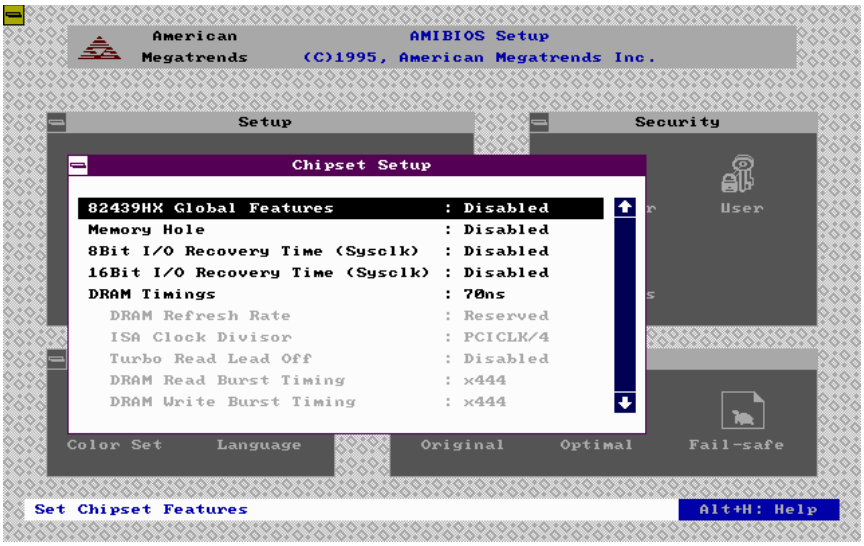

Fig. 21 Chipset Setup Menu

Memory Hole
Use this option to specify an area in memory that cannot be addressed on the ISA bus. The settings are *Disabled, 512-640K,* or *15-16MB*. The default setting is *Disabled*.

DRAM Speed
Specify the RAS access speed of the SIMMs installed in the motherboard as system memory. The settings are *60ns, 70ns,* or *Manual*. The default is *70ns*.

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,* or *8*. The Optimal and Fail-Safe default settings are *1*.

16-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,* or *8*. The Optimal and Fail-Safe default settings are *1*.

External Cacheability
This option determines the size of the External Cache Cacheability. The setting are *64MB* and *512MB*. The Optimal and Fail-Safe default settings are *64MB*.

Note: If the memory size is above 64MB and 512MB Cacheability size is selected, an extra SRAM (16Kx8, 32Kx8) should be added at position U3 where is a 28 pin socket.

Peer Concurrancy
Peer Concurrancy means that more than one PCI device can be active at a time. Set this option to *Enabled* to permit multiple PCI device can be active. The setting are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

DRAM Parity Check
This option allows you to select two methods of DRAM error checking, *ECC* or *Parity*. The setting are *Disabled*, *Parity* and *ECC*. The Optimal and Fail-Safe default settings are *Disabled*.

USB Function Enable
Set this option to *Enabled* to enable the USB function. The settings are *Enabled* or *Disabled*. The default setting is *Disabled*.

4.6.4 POWER MANAGEMENT SETUP

The Power Management Setup options described in this section are the standard options as shown on the following screen.

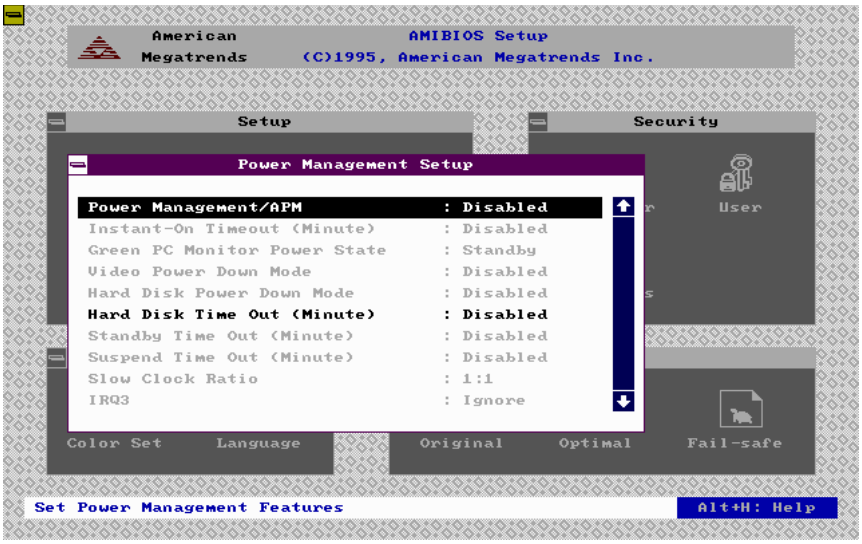

Fig. 22 Power Management Setup Menu

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

The settings are *Enabled, Inst-On* or *Disabled*. The default settings are *Disabled*.

Instant-on Timeout
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 prespecified time. The settings are *Disabled, 1 Min*, and all one minute intervals up to and including *15 Min*. The default settings are *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 *Off, Standby,* or *Suspend*. The default settings are *Standby*.

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,* or *Suspend*. The default settings are *Standby*.

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*, or *Suspend*. The default settings are *Disabled*.

Hard Disk Timeout (Minute)
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, 1 Min(minutes)*, and all one minute intervals up to and including 15 *Min*. The default settings are *Disabled*.

Standby Timeout (Minute)
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 settings are *Disabled*.

Suspend Timeout (Minute)
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 settings are *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,* or *1:128*. The default setting is *1:8*.

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 Full On mode.

Each of these options can be set to *Ignore, Monitor, Wakeup* or *Both*. The default setting for all options is *Ignore* except IRQ12 is *Both* and IRQ 14/15 are *Monitor*.

4.6.5 PCI/PnP SETUP

PCI/PnP Setup options are displayed by choosing the PCI/PnP Setup Icon from the Setup Menu. The standard option is shown on the following screen.

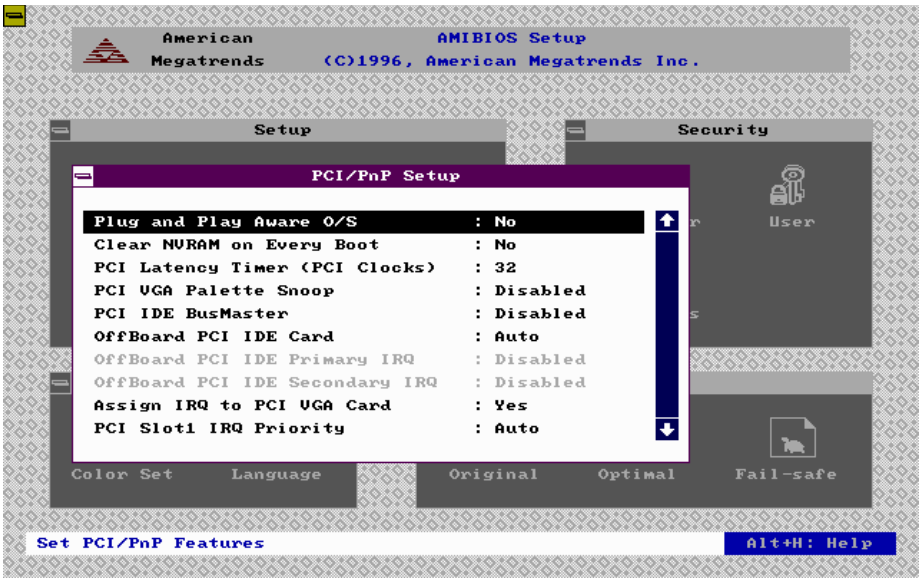

Fig. 23 PCI/PnP Setup Menu

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* or *Yes*. The Optimal and Fail-Safe default settings are *No*.

Clear NVRAM on Every Boot
Normally, you leave this field *No*. Select *Yes* to reset ESCD NVRAM 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 can not boot. The settings are *Yes* or *No*. The Optimal and Fail-Safe default settings are *No*.

PCI Latency Timer (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, 224,* or *248*. The Optimal and Fail-Safe default settings are *64*.

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

OffBoard PCI IDE Card
This option specifies if an offboard PCI IDE controller adapter card is used in the computer. You must also specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller card is installer. If an offboard PCI IDE controller is used, the onboard IDE controller on the motherboard is automatically disabled. The settings are *Auto, Slot1, Slot2, Slot3, Slot4, Slot5* or *Slot6*.

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

OffBoard PCI IDE Primary IRQ
This option specifies the PI interrupt used by the primary IDE channel on the offboard PCI IDE controller. The settings are *Disabled, INTA, INTB, INTC, INTD,* or *Hardwired*. The Optimal and Fail-Safe default settings are *Disabled*.

OffBoard PCI IDE Secondary IRQ

This option specifies the PCI interrupt used by the secondary IDE channel on the offboard PCI IDE controller. The settings are *Disabled, INTA, INTB, INTC, INTD,* or *Hardwired*. The Optimal and Fail-Safe default settings are *Disabled*.

Assign IRQ to PCI VGA Card
Set this option to *Yes* if the PCI VGA used IRQs. AMIBIOS will assign an IRQ to PCI VGA adapter cards. Set this option to *No* if the PCI VGA card do not use IRQ. The settings are *Yes* or *No*. The Optimal and Fail-Safe default settings are *Yes*.

DMA Channel 0/1/3/5/6/7
These options specify the DMA Channels are used on. These optins allow you to specify DMA Channels for use by legacy ISA adapter cards.

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

The settings are *PnP* or *ISA/EISA*. The Optimal and Fail-Safe default settings are *PnP*.

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 IRQ pool is determined by reading the ESCD NVRA. 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 as *PCI/PnP*.

The settings are *PCI/PnP* or *ISA/EISA*. The Optimal and Fail-Safe default settings are *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,* or *64K*. The Optimal and Fail-Safe default settings are *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,* or *DC000*. The Optimal and Fail-Safe Default settings are *C0000*.

4.6.6 PERIPHERAL SETUP

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

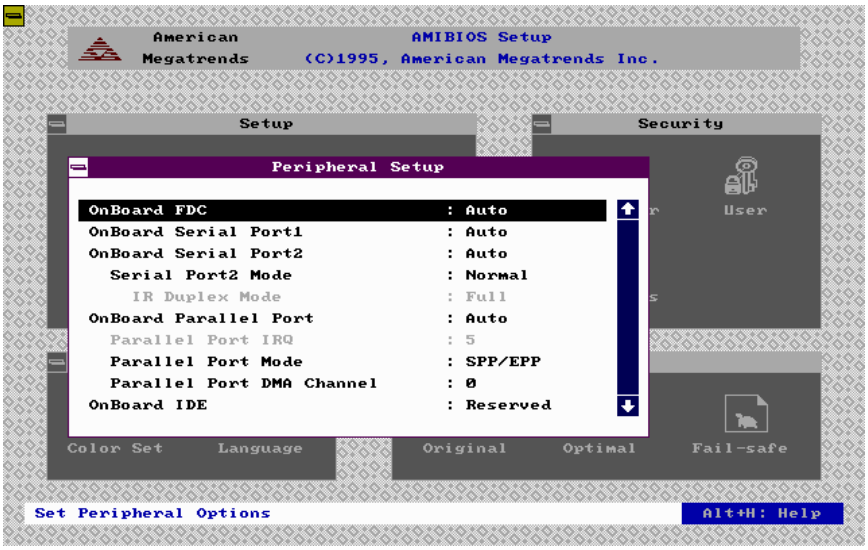

Fig. 24 Peripheral Setup Menu

Onboard FDC

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

Onboard Serial Port1
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, 2F8h, 3E8h, 2E8h, Disabled* or *Auto*. The Optimal and Fail-Safe default settings are *Auto*.

Onboard Serial Port2
This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

The settings are *3F8h, 2F8h, 3E8h, 2E8h, Disabled* or *Auto*. The Optimal and Fail-Safe default settings are *Auto*.

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, 3BCh, Disabled* or *Auto*.

The Optimal and Fail-Safe default settings are *Auto*.

Parallel Port Mode
This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are:

Setting	Description
Normal	The normal parallel port mode is used. This is the default setting.
Bi-Dir	Use this setting to support bidirectional transfers on the parallel port.
EPP	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 bidirectional data transfer driven by the host device.
ECP	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 2.5 Mbs. ECP provides symmetric bidirectional communications.

Table 13

Parallel Port IRQ
This option is only available if the setting for the Onboard Parallel Port option is a *378h, 278h* or *3BCh*. The settings are *5* or *7*.

Parallel Port DMA Channel
This option is only available if the setting for the **Parallel Port Mode** option is *ECP*. The settings are *0, 1,* or *3*.

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

4.7 SECURITY

4.7.1 WINBIOS PASSWORD SUPPORT

WINBIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed. You can set either a Supervisor password or a User password.

If You Do Not Want to Use a Password
Just press <Enter> when the password prompt appears.

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 WINBIOS is run). The password is stored in CMOS RAM. The following screen appears when you select the password icon from the WINBIOS Setup main menu:
You can enter a password by:

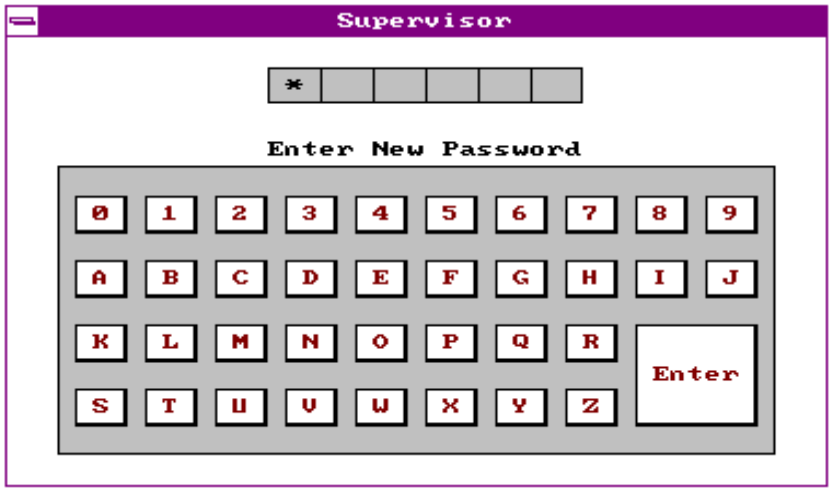

Fig 25 Password Input Menu

- typing the password on the keyboard,
- selecting each letter via the mouse, or
- selecting each letter via 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 CMOS RAM and reconfigure the system.

4.7.2 CHANGING A PASSWORD

Select the Password icon (Supervisor or User) from the Security section of the WinBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WinBIOS Setup Main Menu. The password is stored in CMOS RAM after WinBIOS Setup completes. The next time the system boots, user is prompted for password if the password function is present and is enabled.

4.7.3 ANTI-VIRUS

When the Anti-Virus icon is selected from the Security section of the WinBIOS Setup main menu, WinBIOS 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 following screen appears when user select the Anti-Virus icon:

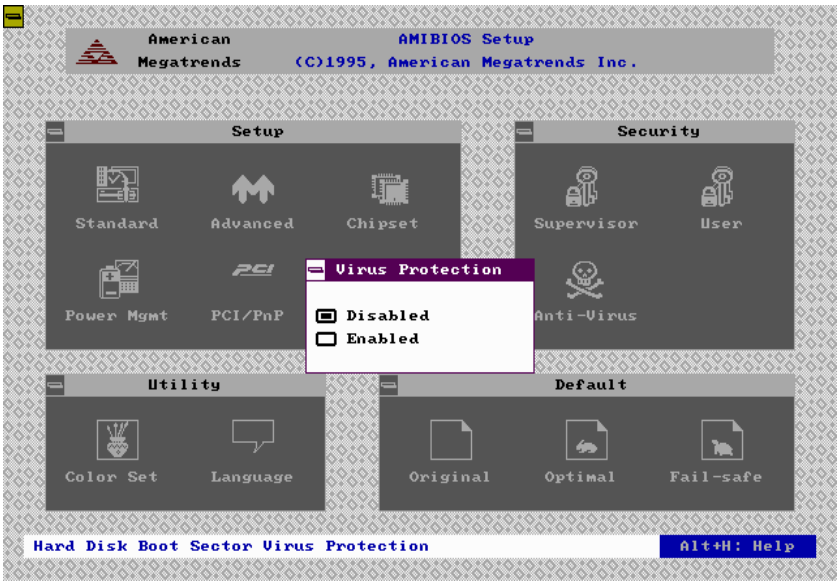

Fig. 26 Anti Virus Menu

The settings are *Enabled* or *Disabled*. If enabled, the following appears when a write is attempted to the boot sector. User may have to type **N** several times to prevent the boot sector write.

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

The following is displayed 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)? _
```

If the anti-virus feature is *Enabled*, a virus warning message will be displayed when user attempt to format the hard disk drive.

If user select **Continue**, formatting proceeds as normal.

4.8 UTILITY

The following icons appear in this section:

- color set, and
- Language.

Color Set
Color Set sets the WINBIOS Setup screen colors.

Language
Language allows you to select English, German, or French language screen prompts and messages. This BIOS is a English version.

4.9 DEFAULT

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

4.9.1 ORIGINAL

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

4.9.2 OPTIMAL

User can load the optimal default settings for the WinBIOS Setup options 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.

4.9.3 FAIL-SAFE

User can load the Fail-Safe WinBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WinBIOS 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.

CHAPTER 5 WinBIOS POWER-ON SELF TEST

WinBIOS provides all IBM standard Power-On Self Test (POST) routines as well as enhanced WinBIOS POST routines. WinBIOS POST supports CPU internal diagnostics.

Everytime the system is powered on, WinBIOS executes two types of POST routines:

- **System Test and Initialization** (test and initialize WinBIOS for normal operations), and
- **System Configuration Verification** (compare defined configuration with hardware actually installed).

BIOS error are reported in one of two ways:

If...	then...
the error occurs before the display device is initialized,	a series of beeps sound. Beep codes indicate that a fatal error has occurred. WinBIOS Beep Codes are described on the nest page.
the error occurs after the display device is initialized,	the error message is displayed. WinBIOS error messages are explained in "WinBIOS Displayed Error Message" section. A prompt to press <F1> can appear with displayed error messages.

Table 14

5.1 BEEP CODES

Fatal errors. which halt the boot process, are communicated through a series of audible beeps. If WinBIOS POST can initialize the system video display, it displays the error message. Displayed error messages, in most cases, allow the system to continue to boot.

Beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry is faulty.
2	Parity Error	Parity error in the base memory (the first 64KB block) of memory.
3	Base 64MB Memory Failure	Memory failure in first 64KB.
4	Timer Not Operational	A memory failure in the first 64KB of memory, or Timer 1 is not functioning.
5	Processor error	The CPU generated an error.
6	8042 - Gate A20 Failure	Cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU on the CPU Card generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM checksum Error	The ROM checksum value does not match the value encoded in WinBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed.
11	Cache Memory bad - do not enable cache	The cache memory test failed. Cache memory is disabled. *Do not press <Ctrl> <Alt> <Shift> <+> to enable cache memory*.

Table 15: WinBIOS Beep Codes

5.2 TROUBLESHOOTING SYSTEM PROBLEMS

The following table shows what is needed to do when the computer has a WinBIOS and it starts beeping:

If the system beeps...	then...
1, 2, or 3 times...	reseat the memory SIMMs or DIPs. If the system still beeps, replace the memory.
6 times...	reseat the keyboard controller chip. If it still beeps, replace the keyboard controller. If it still beeps, try a different keyboard, or replace the keyboard fuse, if the keyboard has one.
8 times...	there is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS ROM chip is bad. The system probably needs a new BIOS ROM chip.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	the motherboard must be replaced.

Table 16

5.3 WinBIOS DISPLAYED ERROR MESSAGES

If an error occurs after the system display has been initialized, the error message are displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to continue
```

and the system halts. The system does not halt if "Wait For <F1> If Any Error" in Advanced Setup is "Disabled".

```
RUN SETUP UTILITY.
```

may also appear. Press <F1> to run WinBIOS Setup if this message appears.

Error Message	Explanation
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry.
C: Drive Error	No response from drive C:. Run the AMIDiag Hard Disk Utility. Check the C: hard disk type in Standard Setup.
C: Drive Failure	No response from hard disk drive C:. Replace the drive.
Cache Memory Bad, Do Not Enable Cache!	Cache memory is defective. Run AMIDiag.
CH-2 Timer Error	An AT system has two timers. There is an error in timer2.
To be continue ...	

Table 17a

Error Message	Explanation
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	CMOS RAM checksum is different than the previous value. Run WinBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run WinBIOS Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected. Run WinBIOS Setup.
CMOS Memory Size Mismatch	The amount of memory found by WinBIOS is different than the amount in CMOS RAM. Run WinBIOS Setup.
CMOS Time & Date Not Set	Run Standard setup to set the date and time.
D: Drive Error	No response from Drive D:. Run the AMIDiag Hard Disk Utility. Check the hard disk type in Standard Setup.
D: Drive Failure	No response from hard disk drive D:. Replace the drive.
Diskette Boot Failure	The boot diskette in drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch Not Proper	Some systems require a video switch be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
To be continue...	

Table 17b

Error Message	Explanation
DMA Error	Error in the DMA controller.
DMA 1 Error	Error in the first DMA channel.
DMA 2 Error	Error in the second DMA channel.
FDD Controller Failure	WinBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	WinBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR1 Error	Interrupt channel 1 failed POST.
INTR2 Error	Interrupt channel 2 failed POST.
Invalid Boot Diskette	WinBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked... Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue to boot.
Keyboard Error	The keyboard has a timing problem. Make sure a Keyboard Controller WinBIOS is installed. Set "Keyboard" in "Advanced Setup" to "Not Installed" to skip the keyboard POST routines.
KB/Interface Error	There is an error in the keyboard connector.
No ROM BASIC	Cannot find a proper bootable sector on either drive A: or C:. WinBIOS cannot find ROM Basic.
To be continue ...	

Table 17c

Error Message	Explanation
Off Board Parity Error	Parity error in memory installed on an adapter card in an expansion slot. Format is : `OFF BOARD PARITY ERROR ADDR = (XXXX)` XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
On Board Parity Error	Parity error in motherboard memory. Format is : `ON BOARD PARITY ERROR ADDR = (XXXX)` XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

Table 17d

5.4 ISA NMI HANDLER MESSAGES

ISA NMI Message	Explanation
Memory Parity Error at xxxxx	Memory failed. If the memory location can be determined, it is displayed as xxxxx. If not, the message is Memory Parity Error ????.
I/O Card Parity Error at xxxxx	An expansion card failed. If the address can be determined, it is displayed as xxxxx. If not, the message is I/O Card Parity Error ????.
DMA Bus Time-Out	A device has driven the bus signal for more than 7.8 microseconds.

Table 18