Quality

Main-board

HOT-433
486 PCI/ISA MAIN BOARD

User's Manual

BEST FOR BYTES

NOTICE

Manual Version Rev 0.1

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Preface

HOT-433 mainboard is a highly integrated IBM PC/AT compatible system board designed to accommodate 25MHz to 100MHz 486 processors, and features high-performance secondary cache memory architecture from 128KB up to 1024KB.

HOT-433 mainboard features four PCI (Pherpherial Component Interconnect) local bus and four ISA (Industry Standard Architecture) bus expansion slots.

HOT-433 mainboard also integrate one 2-channel PCI enhanced IDE controller, one floppy controller, one parallel port, two serial ports, and one optional PS/2 mouse port.

Chapter 1 Introduction

Specification

CPU Function

- CPU clock: 25/33/40/50/66/80/100 MHz
- Supports Intel 486SX/DX/2DX2/DX4, AMD Am486DX/DX2/DX4, Cyrix Cx486S/DX/DX2, and UMC U5 CPU
- Supports S-Series CPU

Chipset

- UMC 8881F/8886AF and 8663AF
- Supports internal and external write back cache
- Supports PCI master and slave up to 33MHz
- Supports PCI burst mode access to local memory

Memory

- Supports four banks of local DRAM system ranging from 1MB to 256MB of host memory
- Supports 256K x 36/32 (1MB), 512K x 36/32 (2MB), 1M x 36/32 (4MB), 2M x 36/32 (8MB), 4 M x 36/32 (16MB), 8M x 36/32 (32MB), and 16M x 36/32 (64MB), 72-pins SIMM

Cache Memory

- Supports 128KB, 256KB, 512KB, and 1MB write-through or write-back external cache.

Power Management Function

- ❑ Provides four power management modes : On, Doze, Sleep, and Suspend
- ❑ Supports Microsoft APM
- ❑ Provides EPMI (External Power Management Interrupt) pin

Expansions

- ❑ 32-bit PCI bus x 4
- ❑ 16-bit ISA bus x 4
- ❑ 2-channel PCI enhanced IDE port

  Supports up to 4 IDE drives

  Supports 32 and 16-bit data transfers

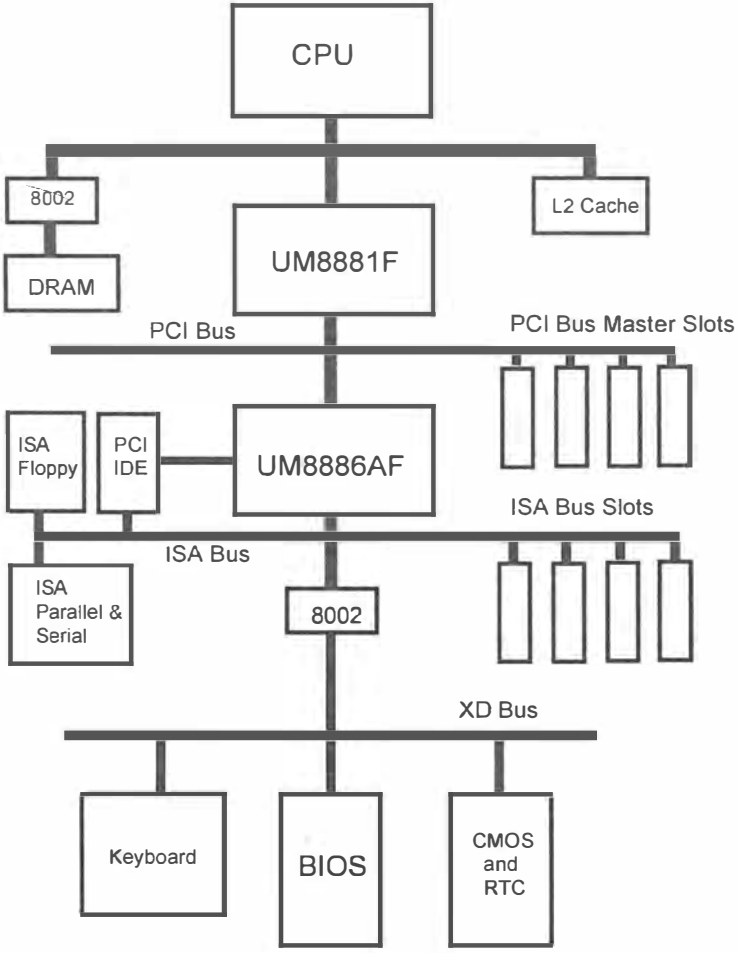
  Supports buffers that operate read prefresh and write port transactions

  Fully ANSI ATA spec. 3.X compatible
- ❑ One floppy port
- ❑ One parallel port
  Supports **SPP** (Standard Parallel Port), **EPP** (Enhanced Parallel Port), and **ECP** (Extended Capabilities Port) high performance parallel modes.
- ❑ Two serial ports
  Supports 16C550 compatible UARTS.
- ❑ One PS/2 mouse port (optional)

Board Design

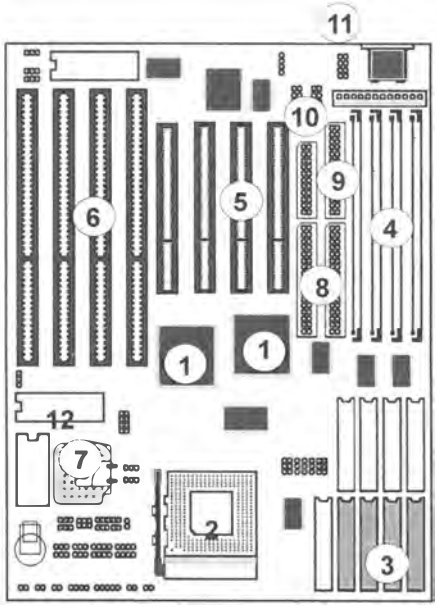
- ❑ Dimension 22cm x 26cm

Block Diagram



433 Mainboard Description

The major components of 433 maniboard are illustrated and described to the right and below. Please take a minute to become familiar with the board design.



1. Chipset ASIC

433 mainboard is designed around a set of highly integrated UMC ASIC, which offers optimum performance on PCI and ISA base system with a cache controller, a local DRAM controller, and an integrated Peripherals controller.

2. System Microprocessor

433 mainboard accept any member of the 486 family of high performance 32-bit microprocessors in PGA package. The mainboard is designed to run at a clock speed from 25 to 50MHz on CPU bus clock, and 25 to 100MHz on CPU core clock.

3. External Cache

433 maniboard features a external cache memory, which complements the 8KB or 16KB internal cache of the 486 family. It support secondary cache with size of 128KB, 256KB, 512KB, and 1MB.

4. Main Memory

433 mainboard features four 72-pin SIMM (Single In-line Memory Module) sockets organized into four banks, which allow flexible memory configuration and expansion. It may use 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, and 64MB SIMM to expand memory from 1MB to 256MB.

5. PCI Expansion Slots

433 mainboard provides four 32-bit PCI expansion slots, which may accommodate many third-party expansion cards and increase flexibility in designing custom platforms.

6. ISA Expansion Slots

433 mainboard provides four 16-bit ISA expansion slots, which may accommodate many third-party expansion cards and enormous flexibility in designing custom platforms.

7. 5V- 3.3/3.45/3.6/4.0V Voltage Selection

For Intel 486DX4 (P24C), AMD Am486DX2-80/DX4-100, and Cyrix 486DX2-66/DX2-80 CPU, 433 mainbaord provides a wide selection of voltages support of 3.3/3.45/3.6/4.0V.

8. On-board PCI IDE Controller

433 mainboard provides a on-board 2-channel IDE controller with high speed data transfer rate. It support up to four IDE devices.

9. On-board Floppy Controller

433 mainboard provides a on-board floppy controller that supports 360KB, 1.2MB, 720KB, 1.44MB, and 2.88MB type floppy disk drives.

10. On-board Serial/Parallel Port

433 mainboard provides two serial (COM) ports and one parallel port.

11. On-board optional PS/2 mouse Port

433 main board provides an optional PS/2 mouse port for future expansion.

12. System BIOS

433 mainboard is equipped with AMI system WinBIOS. The NCR 53C810 and Adaptec AHA-7850 SCSI BIOS is built-in with a particulary designed to offer optimum performance of the mainboard.

13. Attached Accessories

one 40-pin hard disk drive flat cable

one 34-pin floppy disk drive flat cable

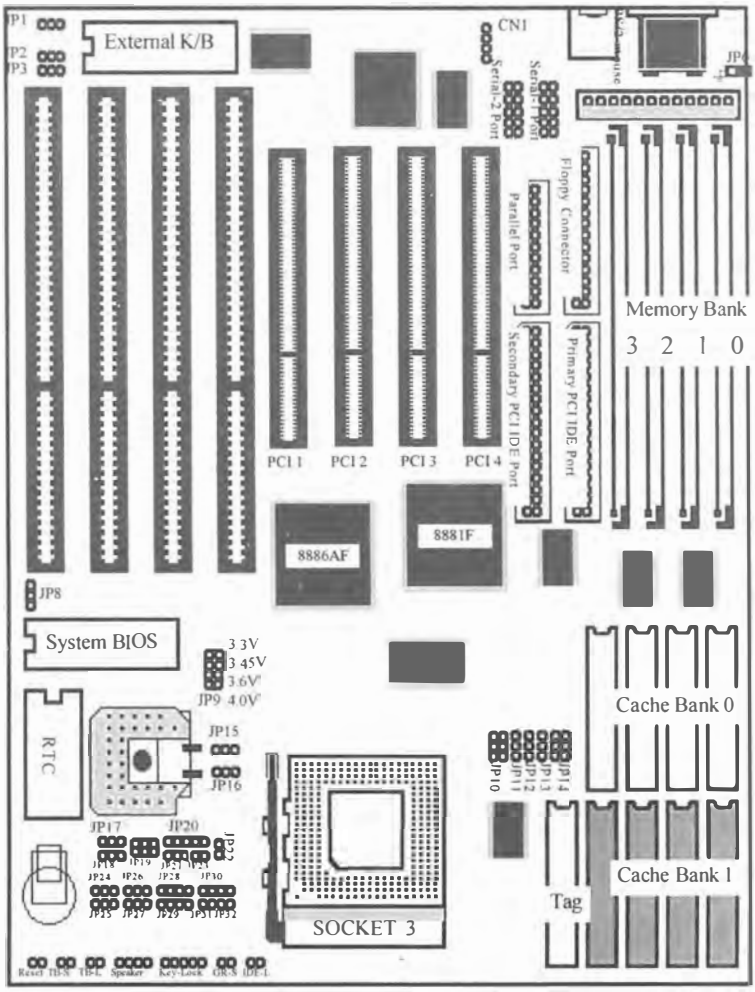
one 9-pin and 25-pin serial connectors with cables

one 25-pin parallel port connector with cable

optional PS/2 5-pin DIN connector with cable

on-board enhanced IDE drivers on a 3.5" floppy diskette

433 Mainboard Placement

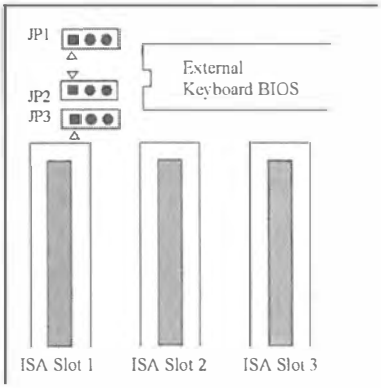


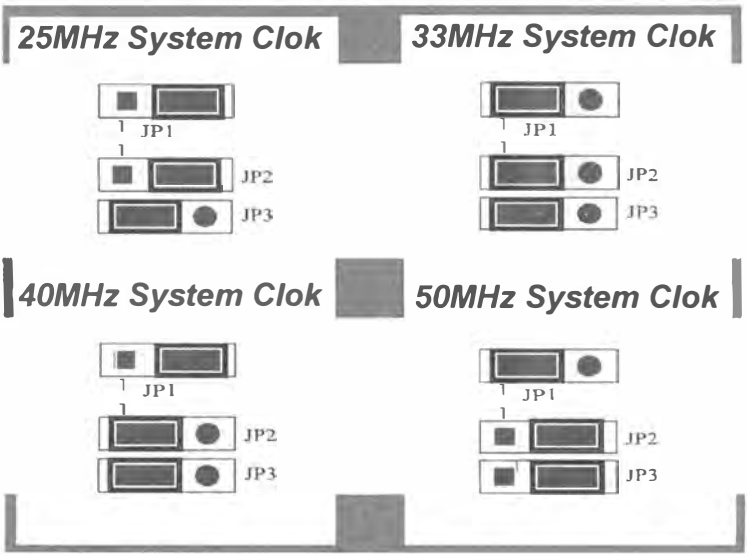
Chapter 2 Jumper Setting

System Clock Selection

433 mainboard features a clock generator to provide adjustable system clock frequency. JP1, JP2, and JP3 are all 3-pin jumper which determine the clock frequency.

Proper jumper settings for generating 25MHz to 50MHz clock frequency for 486 system are shown bellow.

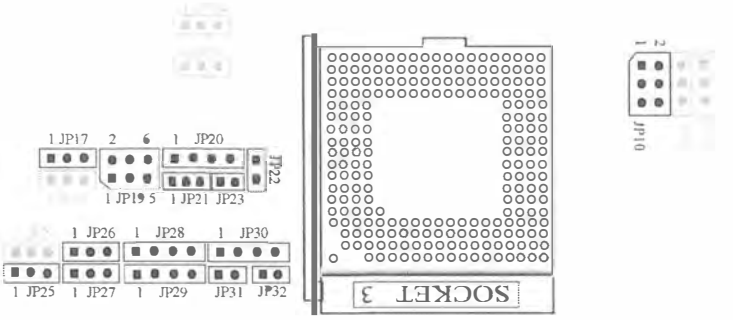




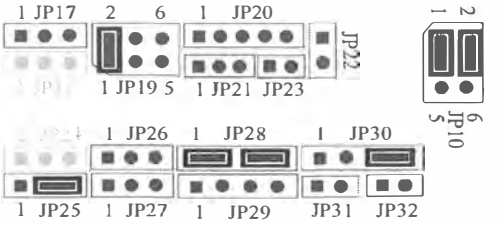
CPU Type Selection

433 mainboard accepts any member of the 486 series microprocessors. If you try to install or upgrade the CPU, you must set the CPU type jumpers accordingly.

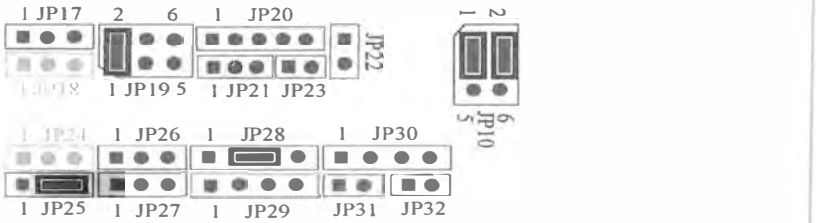
Note : It is highly recommended that a CPU cooling fan is attached to the CPU to ensure system stability.



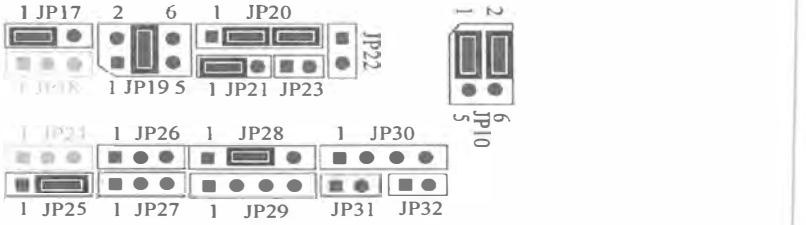
Intel 486DX/DX2



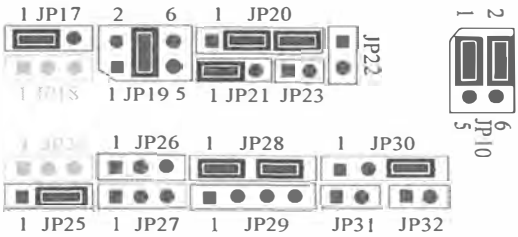
Intel 486SX



Intel 486SX S-Series

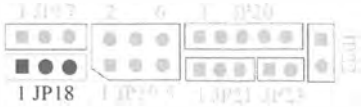


Intel 486DX/DX2/DX4 S-Series AMD Enhanced Am486



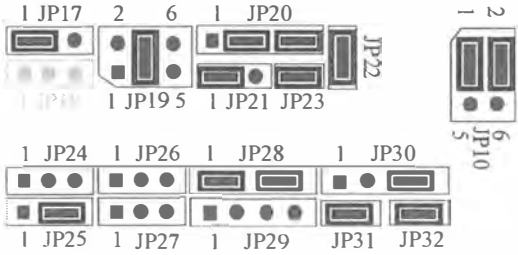
Intel 486DX4 (P24C) & AMD Enhanced Am486 Clock Multiplier - JP18

For 3.3V Intel 486DX4 (P24C) and AMD Enhanced Am486 CPU, 433 mainboard offers a jumper JP18 to adjust CPU internal clock multiplier to 2 or 3 times of external clock frequency.



CPU Type	Core/Bus Clock Ratio	JP18	Internal Core Clock	External Bus Clock
DX4-100	3 : 1		100MHz	33MHz
DX4-100	2 : 1		100MHz	50MHz
DX4-75	3 : 1		75MHz	25MHz
Other CPU				

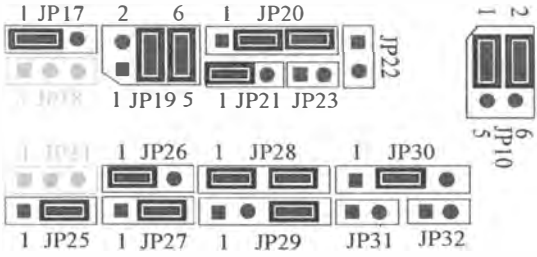
Intel P24D



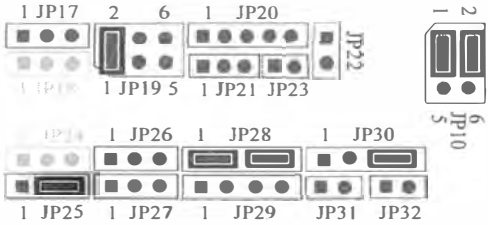
Intel P24D Internal Cache Line - JP24

Intel P24D CPU Cache Line	
Cache Scheme	JP24
Write - Back	
Write - Thru	
Other CPU	

Intel P24T



AMD 486DX/DX2/DX4

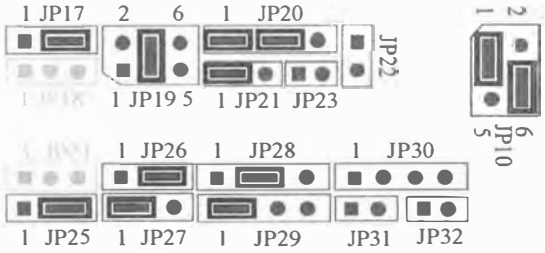


AMD Am486DX4-100/DX2-80 Clock Multiplier - JP24

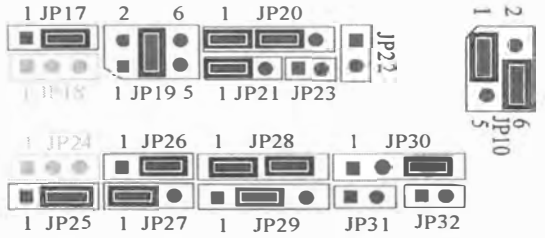
For AMD 3.3V Am486DX4-100 and Am486DX-80 CPU, 433 mainboard offers a jumper JP24 to adjust CPU internal clock multiplier to 2 or 3 times of external clock frequency.

AMD 486DX2-80/DX4-100 Clock Multiplier				
CPU Type	Core/Bus Clock Ratio	JP24	Internal Core Clock	External Bus Clock
DX4-100	3 : 1		100MHz	33MHz
DX4-100	2 : 1		100MHz	50MHz
DX2-80	3 : 1		75MHz	25MHz
DX2-80	2 : 1		80MHz	40MHz
Other CPU				

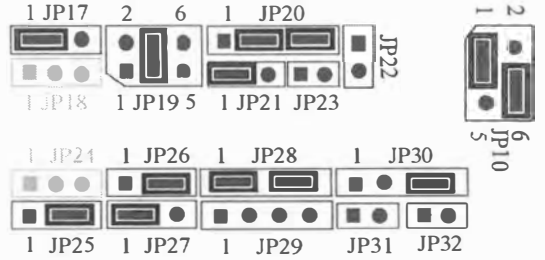
Cyrix Cx486S (M6)



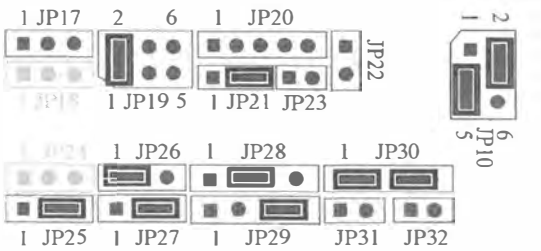
Cyrix Cx486DX/DX2 (M7)



Cyrix Cx486DX4-100

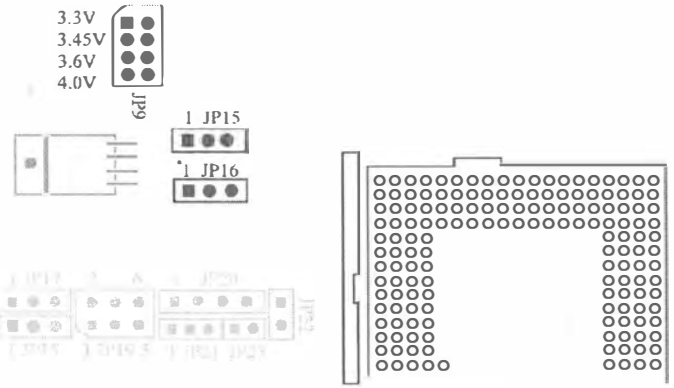


UMC 486S U5


1 JP17
2
6
1
JP20
JP22
1 JP19 5
1 JP21
JP23
1 JP26
1
JP28
1
JP30
1 JP25
1 JP27
1
JP29
JP31
JP32
1
2
6
5
JP10

CPU Voltage Selection

For Intel 486DX4, AMD Am486DX2-80/DX4-100, and Cyrix Cx486DX2-66/DX2-80 CPU, 433 mainboard features single voltage regulator to generate the voltage for CPU (Vcc) from 5V to 3.3/3.45/3.6/4.0V. JP9, JP15, and JP16 are provided for voltage setting between 5V and 3.3/3.45/3.6/4.0V.

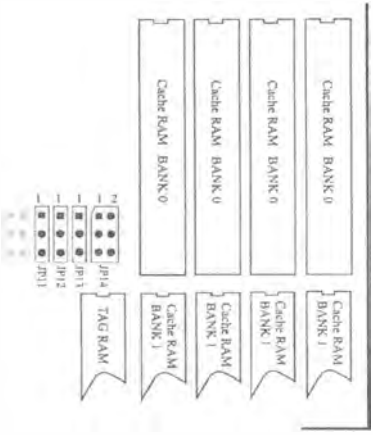


CPU Voltage Selection

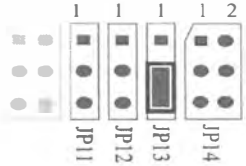
CPU Voltage	JP15	JP16	JP9
5 V			Don't Care
3.3 V			'1 - 2
3.45 V			'3 - 4
3.6 V			'5 - 6
4.0 V			'7 - 8

Cache Size Selection

433 mainboard supports external cache memory sizes of 128KB, 256KB, 512KB, and 1MB. Cache memory is populated by eight Data SRAM and one Tag SRAM. Cache memory is organized into two banks, with four SRAM assigned to each bank. The Data SRAM supported in 433 mainboard is 32Kx8, 64Kx8, and 128Kx8, the Tag SRAM can be 8Kx8, 32Kx8, and 64Kx8.

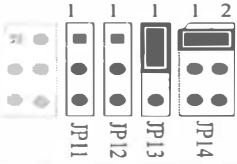


128 KB Cache Memory



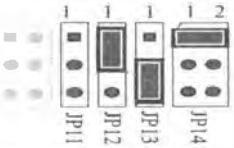
Cache Size	Bank 0 Data RAM U15, 16, 17, 18	Bank 1 Data RAM U27, 28, 29, 30	Tag RAM U26	Cacheable Range	
				Write-Through	Write-Back
128KB	32K x 8	Empty	8K x 8	32MB	16MB

256 KB Cache Memory



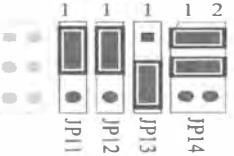
Cache Size	Bank 0 Data RAM U15, 16, 17, 18	Bank 1 Data RAM U27, 28, 29, 30	Tag RAM U26	Cacheable Range	
				Write-Through	Write-Back
256KB	32K x 8	32K x 8	32K x 8	64 MB	32 MB

256 KB Cache Memory



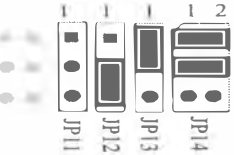
Cache Size	Bank 0 Data RAM U15, 16, 17, 18	Bank 1 Data RAM U27, 28, 29, 30	Tag RAM U26	Cacheable Range	
				Write-Through	Write-Back
256KB	64K x 8	Empty	32K x 8	64 MB	32 MB

512 KB Cache Memory



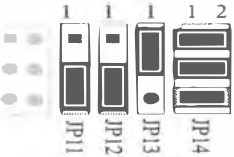
Cache Size	Bank 0 Data RAM U15, 16, 17, 18	Bank 1 Data RAM U27, 28, 29, 30	Tag RAM U26	Cacheable Range	
				Write-Through	Write-Back
512 KB	128K x 8	Empty	32K x 8	128MB	64 MB

512 KB Cache Memory



Cache Size	Bank 0 Data RAM U15, 16, 17, 18	Bank 1 Data RAM U27, 28, 29, 30	Tag RAM U26	Cacheable Range	
				Write-Through	Write-Back
512KB	64K x 8	64K x 8	32K x 8	128MB	64 MB

1024 KB Cache Memory



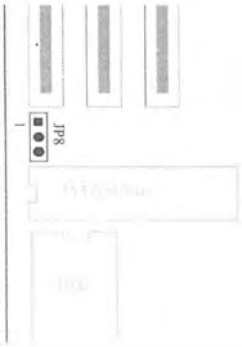
Cache Size	Bank 0 Data RAM U15, 16, 17, 18	Bank 1 Data RAM U27, 28, 29, 30	Tag RAM U26	Cacheable Range	
				Write-Through	Write-Back
1024 KB	128K x 8	128K x 8	64K x 8	256MB	128MB

Flash EEPROM Vpp Selection

433 mainboard supports both 12V and 5V programming voltage flash EEPROM for system BIOS. JP8 is provided to accommodate these two types of flash EEPROM.

OPEN, or **Pin 2 - 3 Close** for 5V

Pin 1 - 2 Close for 12V



Connectors

Connectors	
ITEM	FUNCTION
CN7	On-board PCI Primary IDE Connector
CN6	On-board PCI Secondary IDE Connector
CN5	On-board Floppy Controller Connector
CN4	On-board Parallel Port Connector
CN3	On-board Serial port-I Connector
CN2	On-board Serial Port-2 Connector
CN1	External Battery Connector
CN9	Power LED and Keylock Connector
CN8	PC Speaker Connector
MS1	PS/2 Mouse Connector
JP33(RESET)	Hardware Reset Switch Connector
JP34(TB-S)	Hardware Turbo Switch Connector
LED1(TB-L)	Turbo LED connector, Power Management Indicator
JP35(GR-S)	EPMI Connector
LED2(IDE-L)	On-board Enhanced IDE R/W LED Connector
JP6	Power Supply Power Down Control Connector

Chapter 3 Memory Configuration

433 mainboard provides great flexibility to support a number of different on-board memory configurations.

Memory SIMM sockets are organized into four banks, with one SIMM socket assigned to each memory banks. 433 mainboard supports 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, and 64MB 72-pin SIMM modules.

The following table shows the supported memory configuration of 433 mainboard.

433 Memory Configuration Reference Table				
BANK 0	BANK 1	BANK 2	BANK 3	TOTAL
1MB	NONE	NONE	NONE	1MB
1MB	1MB	NONE	NONE	2MB
1MB	1MB	1MB	NONE	3MB
1MB	1MB	1MB	1MB	4MB
2MB	NONE	NONE	NONE	2MB
2MB	2MB	NONE	NONE	4MB
2MB	2MB	2MB	NONE	6MB
2MB	2MB	2MB	2MB	8MB
4MB	NONE	NONE	NONE	4MB
4MB	4MB	NONE	NONE	8MB
4MB	4MB	4MB	NONE	12MB
4MB	4MB	4MB	4MB	16MB
8MB	NONE	NONE	NONE	8MB
8MB	8MB	NONE	NONE	16MB
8MB	8MB	8MB	NONE	24MB
8MB	8MB	8MB	8MB	32MB
16MB	NONE	NONE	NONE	16MB
16MB	16MB	NONE	NONE	32MB
16MB	16MB	16MB	NONE	48MB
16MB	16MB	16MB	16MB	64MB

433 Memory Configuration Reference Table (Cont'd)				
BANK 0	BANK 1	BANK 2	BANK 3	TOTAL
32MB	NONE	NONE	NONE	32MB
32MB	32MB	NONE	NONE	64MB
32MB	32MB	32MB	NONE	96MB
32MB	32MB	32MB	32MB	128MB
64MB	NONE	NONE	NONE	64MB
64MB	64MB	NONE	NONE	128MB
64MB	64MB	64MB	NONE	192MB
64MB	64MB	64MB	64MB	256MB
1MB	1MB	2MB	2MB	6MB
1MB	1MB	4MB	4MB	10MB
1MB	1MB	8MB	8MB	18MB
1MB	1MB	16MB	16MB	34MB
1MB	1MB	32MB	32MB	66MB
2MB	2MB	4MB	4MB	12MB
2MB	2MB	8MB	8MB	20MB
2MB	2MB	16MB	16MB	36MB
2MB	2MB	32MB	32MB	68MB
4MB	4MB	8MB	8MB	24MB
4MB	4MB	16MB	16MB	40MB
4MB	4MB	32MB	32MB	72MB
8MB	8MB	16MB	16MB	48MB
8MB	8MB	32MB	32MB	80MB
16MB	16MB	32MB	32MB	96MB
16MB	16MB	64MB	64MB	160MB
32MB	32MB	64MB	64MB	192MB

Chapter 4 Power Management

433 mainboard provides four power management modes for reducing power consumption : On, Doze, Sleep, and Suspend. When entering each power management mode, 433 mainboard generate a distinguishable flashes via the turbo-LED.

433 mainboard also provide EPMI and power supply power down connector to enchanced power management.

Power Management Modes Description

ON mode. The ***ON*** mode is the normal operating mode of the PC system. In this mode, the doze timer (15 sec to 512 min) starts counting when there is no activity. When the timer expire, the system will enter into ***DOZE*** mode. The type of activities monitored include Keyboard, VGA, IDE, COM port, LPT port, Floppy, PCI master, ISA master, DMA, one programmable memory region, and one programable I/O region.

DOZE mode. In this mode, CPU frequency is reduce to 1/2 of normal frequency and the ***SLEEP*** timer (2 min to 512 min) starts counting when there is no activity. When the timer expire, the system will enter into ***SLEEP*** mode. The activities monitored are the same as in ***ON*** mode.

SLEEP mode. In this mode, CPU frequency is reduce to 8MHz. The ***SUSPEND*** timer (2 min to 512 min) starts counting if there is no activity, **and the CPU is a S-Series CPU**. When the timer expire, the system will enter into ***SUSPEND*** mode. The activities monitored are the same as in ***ON*** mode.

SUSPEND mode. In this mode, the CPU frequency is stop at 0MHz, external cache is power down. The CPU will Auto-Wake-Up by keyboard, mouse, modem, EPMI button, etc... The type of activities for Auto-Wake-Up are programmable.

Power Management Modes Indicator

Normally the "**LED1**" (Turbo-LED) act as the turbo LED. But when system goes into power management mode, the LED will flashes to indicate the status of the power management modes.

a. In **ON** (Normal) mode, turbo-LED act as a turbo/normal indicator.

b. In **DOZE** mode, turbo-LED flashes every second.

c. In **SLEEP** mode, turbo-LED flashes every two seconds.

d. In **SUSPEND** mode, turbo-LED is turn off.

EPMI Connector --- GR-S (JP35)

EPMI (External Power Management Interrupt) pin is provided for special platform, which offer a sleep(suspend)/resume button. Pushing the button will force 433 mainboard to go into ***SLEEP*** or ***SUSPEND*** mode, depending on the type of the CPU. The mainboard will restart when the button is push again.

Power Supply Power Down Connector-JP6

433 mainboard also provides a power supply power down connector to control the external A.C. output on the system power supply. If the power supply has signal connection to control the A.C. output, then connect it to JP6. When 433 goes into ***SLEEP*** or ***SUSPEND*** mode, the A.C. output will be turn off. By this way, you can turn off other devices' power such as monitor.

Chapter 5 BIOS Setup

BIOS Setup configures system information that is stored in CMOS RAM. WinBIOS Setup offers an easy to use graphical user interface that is similar to Microsoft Windows GUI. WinBIOS Setup sets a new standard in BIOS user interfaces.

Starting WinBIOS Setup

As POST executes, the following message appears :

Hit <DEL> if you want to run SETUP

Press <Del> to run WinBIOS Setup.

Mouse Supports in WinBIOS Setup :

The following types of mouse devices are supported:

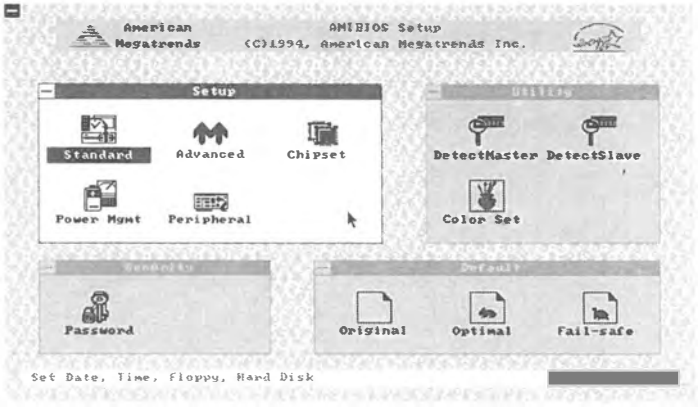
* PS/2- type mouse.
* Bus mouse that use IRQs 3, 4, or 5 (IRQ2 is not supported).
* Microsoft-compatible mouse.
* Logitech C-series-compatible mouse using the MM protocol.

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 field, double click to perform an operation in the selected field.

BIOS Setup Feature

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



Each section contains several icons. Clicking on each icon activates a specific function. The WinBIOS Setup icons and functions are described in this chapter. The sections are :

Setup

This section has five icons that permit you to set system configuration options such as date, time, hard disk type, floppy type, chipset parameter, power management, and peripheral I/O setup.

Utilities

This section has two icons that perform system functions.

Security

This section has one icon that control WinBIOS security features.

Default

This section has three icons that permit you to select a group of settings for all WinBIOS Setup options.

Each WinBIOS Setup option has two default settings. These settings can be applied to all WinBIOS Setup options when you select the Default section on the WinBIOS Setup main menu. The types of default are:

Original This option restore the original setting that was recorded in the CMOS RAM.

Optimal This option will set the mainboard with the best performance parameters.

Fail-Safe This option set the mainboard with minimum startup parameters. If you 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.

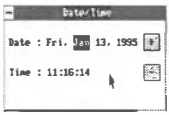
Using the Keyboard with WinBIOS Setup

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.
+	Increments a value.
-	Decrements a value.
<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 casesensitive.
Numeric Keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

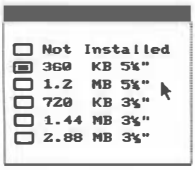
Standard Setup

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



Date and 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 and select the floppy type. The settings are *360KB 51/4 inch, 1.2MB 51/4 inch, 720KB 31/2 inch, 1.44MB inch, or 2.88MB 31/2 inch.*

Master Disk Type, Slave Disk Type

Select one of these hard disk drive icons to configure the drive named in the option. A scrollable screen

Slave Disk

that lists all valid disk drive types is displayed. Select the correct type and press <Enter>. If the hard disk drive is an IDE drive, select **Detect Master** and **Detect Slave** from the Utility section of the WinBIOS Setup main menu to allow WinBIOS to automatically detect the IDE drive parameters and report them on this screen.

DetectMaster

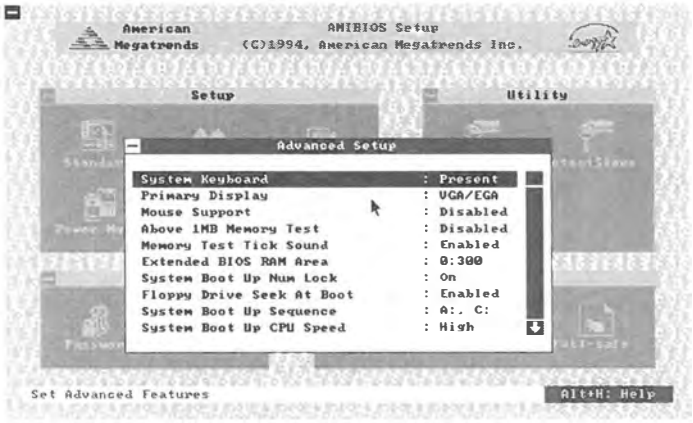
DetectSlave

Using Auto Detect Hard Disk (Only for IDE drives)

If you select **Detect Master** and **Detect Slave** from the Utility section of the WinBIOS Setup main menu, WinBIOS automatically finds the IDE hard disk drive parameters. WinBIOS places the hard disk drive parameters that it finds in the Drive Type fields in Standard Setup.

Advanced Setup

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



System Keyboard

This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboard. The settings are ***Present*** or ***Absent***

Primary Display

Select this icon to configure the type of monitor attached to the computer. The settings are ***Monochrome, Color 40 x 25, Color 80 x 25, VGA/PGA/EGA***, or ***Not Installed***.

Note : Current version of 433 mainboard does not support monochrome display adapter.

Mouse Support

When this option is enabled, WinBIOS supports a PS/2-type mouse. The settings are ***Enabled*** or ***Disabled***.

Above 1 MB Memory Test

When this option is enabled, the WinBIOS memory test is performed on all system memory. When this option is disabled, the memory test is done only on the first 1 MB of system memory. The settings are ***Enabled*** or ***Disabled***.

Memory Test Tick Sound

This option enables or disables the ticking sound during the memory test. The settings are ***Enabled*** or ***Disabled***.

Extended BIOS RAM Area

Specify in this option if the top 1 KB of the system programming area beginning at 639K or 0:300 in the system BIOS area in low memory will be used to store hard disk information. The settings are Top ***DOS 1K*** or ***0:300***.

System Boot Up Num Lock

When *Off*, this option turns off *Num Lock function* at startup. So the numeric keypad can be use as the arrow keys. The settings are ***On*** or ***Off***.

Floppy Drive Seek At Boot

When this option enabled, WinBIOS performs a Seek command on floppy drive A: before booting the system. The settings are ***Enabled*** or ***Disabled***.

System Boot Up Sequence

This option sets the sequence of boot drive (either floppy drive A; or hard disk drive C:) that WinBIOS attempts to boot from, after POST completes. The settings are ***C:, A:*** or ***A:, C:***.

System Boot Up CPU Speed

This option sets the speed of the CPU at system boot up time. The settings are ***High*** or ***Low***.

External Cache

This option enables or disables the external cache (L2) memory. The settings are ***Enable*** or ***Disable***.

Internal Cache

This option enables or disables the internal cache memory in the 486 processor. The settings are ***Enable*** or ***Disable***.

Password Checking

This option enables the password checking option during the system boot up. If *Always* is chosen, the password prompt appears every time the computer is turn on. If *Setup* is chosen, the password prompt appears when WinBIOS is executed. The settings are ***Always*** or ***Setup***.

Video ROM Shadow C000, 32K

When these options are set to *Shadow*, the video ROM area from C0000h ~ C7FFFh is copied (shadowed) to the RAM for faster execution. The settings are ***Absent***, ***NoShadow***, or ***Shadow***.

Shadow xxxx, 16K,

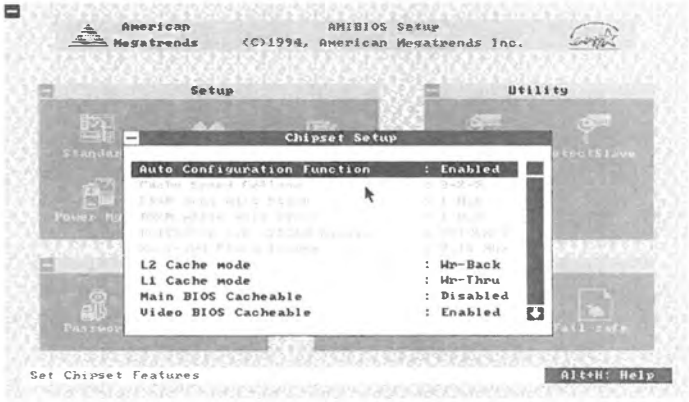
These options enable shadowing of the contents of the ROM area named in the option title. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. The settings are ***Absent***, ***NoShadow***, or ***Shadow***.

Advanced Setup Defaults

BIOS Default	Optimal	Fail-safe
System Keyboard	Present	Present
Primary Display	VGA/EGA	VGA/EGA
Mouse Support	Disabled	Disabled
Above 1MB Memory Test	Disabled	Disabled
Memory Test Tick Sound	Enabled	Enabled
Extended BIOS RAM Area	0:300	0:300
System Boot Up Num Lock	On	On
Floppy Drive Seek At Boot	Enabled	Disabled
System Boot Up Sequence	A:, C:	C:, A:
System Boot Up CPU Speed	High	High
External Cache	Enabled	Disabled
Internal Cache	Enabled	Enabled
Password Checking	Setup	Setup
Video Shadow C000, 32K	Enabled	Disabled
Shadow C800, 16K	Disabled	Disabled
Shadow CC00, 16K	Disabled	Disabled
Shadow D000, 16K	Disabled	Disabled
Shadow D400, 16K	Disabled	Disabled
Shadow D800, 16K	Disabled	Disabled
Shadow DC00, 16K	Disabled	Disabled

Chipset Setup

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



Auto Configuration Function

When this option is ***Enabled***, BIOS automatically configures listed features based on detection of the CPU clock frequency. when this option is ***Disabled***, BIOS leave these features to be manually adjusted by the user.

Note : Listed features on the table are fixed under auto configuration, generally, you should not change the settings. Otherwise the mainboard may not work properly.

Recommend Chip Setup for Different System Clock				
	25 MHz	33 MHz	40 MHz	50 MHz
Cache Speed Options	'2 - 1 - 2	'2 - 2 - 2	'3 - 1 - 3	'3 - 2 - 3
DRAM Read Wait States	1 W. S.	1 W. S.	2 W. S	3 W. S.
DRAM Write Wait States	1 W. S.	1 W. S	2 W. S.	3 W. S
PCICLK-to-ISA SYSCLK Divsor	PCICLK/3	PCICLK/4	PCICLK/4	PCICLK/3
Keyboard Clock Divsor	7.16 MHz	7.16 MHz	7.16 MHz	7 16 MHz

Cache Speed Options

This option sets the cache burst read/write cycle. The optimal setting depends on system clock speed. The settings are*2-1-2, 2-2-2, 3-1-3*, or *3-2-3*.

DRAM Read Wait State

This option sets the memory read wait state. The optimal setting depends on system clock speed. The settings are ***1, 2***, or ***3 W.S***.

DRAM Write Wait State

This option sets the memory write wait state. The optimal setting depends on system clock speed. The settings are ***0, 1, 2***, or ***3 W.S***.

PCICLK-to-ISA SYSCLK Divsor

This option sets the ISA clock that divide from PCI Clock. The settings are ***PCICLKI/2***, ***PCICLKI/3***, or ***PCICLKI/4***.

Keyboard Clock Divsor

This option sets the keyboard clock frequency, derive from PCI Clock. The settings are ***PCICLKI/2***, ***PCICLKI/3***, ***PCICLKI/4***, or ***7.16MHz***.

L2 Cache mode

This option sets the external cache scheme. The settings are ***Write-Through*** or ***Write-Back***.

L1 Cache mode

This option sets the internal cache scheme of the processor. The settings are ***Write-Through*** or ***Write-Back***.

Main BIOS Cacheable

This feature sets the main BIOS in the F000~FFFF area to be cacheable or non-cacheable. The settings are ***Enabled*** or ***Disabled***.

Video BIOS Cacheable

This options sets the video BIOS in the C000~C7FF area to be cacheable or non-cacheable. The settings are ***Enabled*** or ***Disabled***.

Host-to-PCI Post Write W/S

This option sets the Host to PCI post write (CPU bus) wait state of the mainboard. The settings are ***0*** and ***1 W.S.***

Host-to-PCI Burst Write

This option sets the Host to PCI Burst write (CPU bus) enabled or disabled. The settings are ***Enabled*** or ***Disabled***.

Host-to-DRAM Burst Write

This option sets the Host to DRAM Burst write (CPU bus) to enabled or disabled. The settings are ***Enabled*** or ***Disabled***.

Post Write Buffer

This option sets the Post Memory Write Buffer enabled or disabled. Enabling this option will enhance system performance. The settings are ***Enabled*** or ***Disabled***.

Bus Park

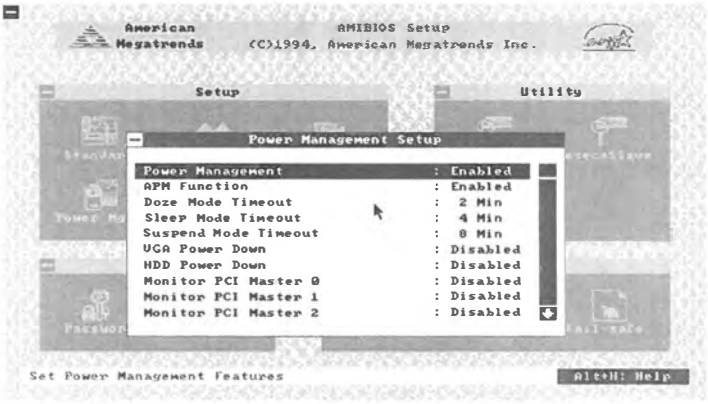
This option sets the Bus Park enabled or disabled. Enabling this option will enhance PCI performance. The settings are ***Enabled*** or ***Disabled***.

Chipset Setup Defaults

BIOS Default	Optimal	Fail-safe
Auto Configuration Function	Enabled	Disabled
Cache Speed Options	Not adjustable	2 - 2 - 2
DRAM Read Wait State	Not adjustable	2 W. S.
DRAM Write Wait State	Not adjustable	2 W. S.
PCICLK-to-ISA SYSCLK Divsor	Not adjustable	PCICLK/4
Keyboard CLOCK Divsor	7.16 MHz	7.16Mhz
L2 Cache mode	Wr-Back	Wr-Thru
L1 Cache mode	Wr-Thru	Wr-Thru
Main BIOS Cacheable	Disabled	Disabled
Video BIOS Cacheable	Enabled	Disabled
Host-to-PCI Post Write W/S	1 W. S.	1 W. S.
Host-to-PCI Burst Write	Disabled	Disabled
Host-to-DRAM Burst Write	Disabled	Disabled
Post Write Buffer	Enabled	Disabled
Bus Park	Enabled	Disabled

Power Management Setup

The WinBIOS Power Management Setup options described in this section are selected by choosing the appropriate high-level icon from the WinBIOS Setup main menu. The selection window is shown below.



Power Management

This option sets the mainboard power management function. The settings are ***Enabled*** or ***Disabled***.

APM Function

This option sets the mainboard *APM* (Advanced Power Management) function. The settings are ***Enabled*** or ***Disabled***.

Doze Mode Timeout

This option sets the timeout length of when the mainboard enters the *Doze* mode. The settings range from ***15 sec*** to ***512 min***.

Sleep Mode Timeout

This option sets the timeout length when the mainboard enters the *Sleep* mode. The settings range from ***2 min*** to ***512 min*** or ***disabled***.

Suspend Mode Timeout

This option sets the timeout length when the mainboard enters the *SUSPEND* mode. The settings range from ***2 min*** to ***512 min*** or ***Disabled***.

VGA Power Down

This option sets the blanking of the display screen when the mainboard enters the *Sleep* or *Suspend* mode. The settings are ***Enabled*** or ***Disabled***.

HDD Power Down

This option sets the timeout length of hard disk inactivity. When the timer expire, the hard disk is placed in power down mode. HDD Power Down is a stand along option, it does not affect or be affected by the standard power management function. The settings are from ***1 min*** to ***14 min*** or ***Disabled***.

Monitor PCI Master x

This option calls for monitoring of the activity of the **PCI Master x**. The timer will start counting, if *Enabled*, when there is no activity detected. This option works in conjunction with the other monitoring functions belows. The settings are ***Enabled*** or ***Disabled***.

Monitor LPT Port Activity

This option calls for monitoring of the activity of the **LPT** port. The settings are ***Enabled*** or ***Disabled***.

Monitor COM Port Activity

This option calls for monitoring of the activity of the **COM** port. The settings are ***Enabled*** or ***Disabled***.

Monitor ISA Master&DMA Actvity

This option calls for monitoring of the activity of the **ISA Master** and **DMAs**. The settings are ***Enabled*** or ***Disabled***.

Monitor IDE Activity

This option calls for monitoring of the activity of the **IDE**. The timer will start counting, if *Enabled*, when there is no activity. The settings are ***Enabled*** or ***Disabled***.

Monitor FLP Activity

This option calls for monitoring of the activity of the **FLP** (Floppy controller). The settings are ***Enabled*** or ***Disabled***.

Monitor VGA Activity

This option calls for monitoring of the activity of the **VGA**. The settings are ***Enabled*** or ***Disabled***.

Monitor KBD Activity

This option calls for monitoring of the activity of the **KBD** (Keyboard). The settings are ***Enabled*** or ***Disabled***.

Monitor I/O Region Activity

This option calls for monitoring of the activity of the **programmable I/O port region**. The settings are ***Enabled*** or ***Disabled***.

Monitor I/O Address

This option calls for monitoring of the activity of the **I/O port address**. The settings range from ***100h*** to ***3FFh***.

Monitor IRQXX

This option calls for monitoring of the activity of the **IRQxx** (xx: 1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, and 15). The settings are ***Enabled*** or ***Disabled***.

Note: All the monitoring functions work in conjunction with each others. All the specified options have to be met before the power management mode is activated. Then these monitoring function act as the Wakeup activities. If activity found on any of the specified option, then the mainboard will exit the power management mode.

Power Management Setup Defaults

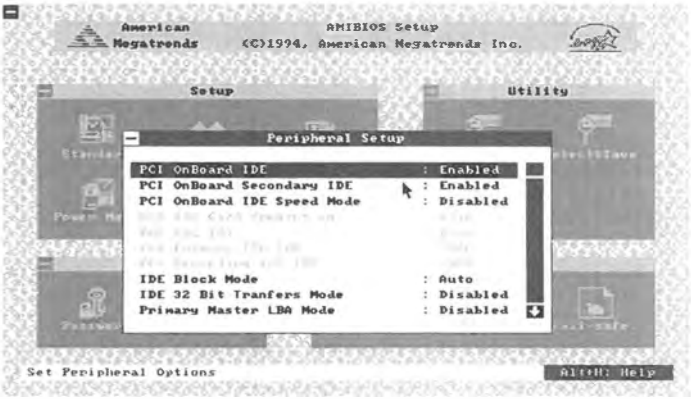
BIOS Default	 Optimal	 Fail-safe
Power Management	Disabled	Disabled
APM Function	Enabled	Disabled
Doze Mode Timeout	2Min	15sec
Sleep Mode Timeout	4Min	Disabled
Suspend Mode Timeout	8Min	Disabled
VGA Power Down	Disabled	Disabled
HDD Power Down	Disabled	Disabled
Monitor PCI Master x	Disabled	Disabled
Monitor LPT Port Activity	Disabled	Disabled
Monitor COM Port Activity	Disabled	Disabled
Monitor ISA Master&DMA Activity	Enabled	Disabled
Monitor IDE Activity	Enabled	Disabled
Monitor FLP Activity	Enabled	Disabled
Monitor VGA Activity	Disabled	Disabled
Monitor KBD Activity	Enabled	Disabled
Monitored I/O Region Activity	Disabled	Disabled
Monitor I/O Address	0	0
Monitor IRQ15	Disabled	Disabled
Monitor IRQ14	Disabled	Disabled
Monitor IRQ12	Disabled	Disabled
Monitor IRQ11	Disabled	Disabled

BIOS Default	Optimal	Fail-safe
Monitor IRQ10	Disabled	Disabled
Monitor IRQ9	Disabled	Disabled
Monitor IRQ8	Disabled	Disabled
Monitor IRQ7	Disabled	Disabled
Monitor IRQ6	Disabled	Disabled
Monitor IRQ5	Disabled	Disabled
Monitor IRQ4	Disabled	Disabled
Monitor IRQ3	Enabled	Disabled
Monitor IRQ1	Enabled	Disabled

Peripheral Setup

Peripheral

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



PCI OnBoard IDE

This option sets the PCI on-board 2-channel IDE controller to be enabled or disabled. The settings are ***Enabled*** or ***Disabled***.

PCI Onboard Secondary IDE

This option sets the PCI on-board secondary IDE controller to be enabled or disabled. The settings are ***Enabled*** or ***Disabled***.

PCI OnBoard IDE Speed Mode

This option sets PCI on-board IDE controller's PIO speed mode. The options are ***Mode 1, Mode 2, Mode 3***, and ***Disabled***.

PCI IDE Card Present on

This option sets the PCI IDE Add-on card location on the PCI slot. The settings are ***Slot 1, Slot 2, Slot 3, Slot 4***, or BIOS ***Auto*** detecte. (If this feature is assigned, please ***Disable PCI OnBoard IDE***)

PCI IDE IRQ

This option sets the PCI IDE IRQ triggered mode. The settings are ***Edge*** or ***Level***. (This feature only affect PCI IDE add-on card)

PCI Primary IDE IRQ

This option sets the PCI Primary IDE IRQ. The settings are ***INTA, INTB, INTC,*** or ***INTD***. (This feature only affect PCI IDE add-on card)

PCI Secondary IDE IRQ

This option sets the PCI Secondary IDE IRQ. The settings are ***INTA, INTB, INTC,*** and ***INTD.*** (This feature only affect PCI IDE add-on card)

IDE Block Mode

This option sets the IDE Block mode. Enabling this option only if the IDE hard disk installed supports block transfer mode. This option will enhance the data transfer rate. The settings are ***2, 4, 8, 16, 32, 64, Auto,*** or ***Disabled***.

IDE 32 Bit Transfers Mode

This option set the IDE 32-bit transfers mode. Enabling will enhance data transfer rate. But only 32 bit PCI IDE controller is supported on this mainboard. The settings are ***Enabled*** or ***Disabled***.

Primary Master LBA Mode

This option sets the LBA mode for primary master IDE hard disk over 528MB. If the installed hard disk is over 528MB, this option must be enabled. The settings are ***Enabled*** or ***Disabled***.

Primary Slave LBA Mode

This option sets the LBA mode for primary slave IDE hard disk over 528MB. The settings are ***Enabled*** or ***Disabled***.

Secondary Ctrl Drives Present

This option sets the number of the IDE hard disk that is connected to secondary channel port. *If the IDE device connected to this port is other than the hard disk, please do not enter the number in this option.* The options are ***1, 2,*** and ***Disabled***.

Secondary Master LBA Mode

This option sets the LBA mode for secondary master IDE hard disk over 528MB. The settings are ***Enabled*** or ***Disabled***.

Secondary Slave LBA Mode

This option sets the LBA mode for secondary slave IDE hard disk over 528MB. The settings are ***Enabled*** or ***Disabled***.

FDC Controller

This option sets the use and address of the on-board floppy drive controller. The settings are ***3F1H, 371H,*** or ***Disabled***.

Primary Serial Port

This option sets the use and address of the on-board primary serial port. The settings are ***3F8H, 3E8H***, or ***Disabled***.

Secondary Serial Port

This option sets the use and address of the on-board secondary serial port. The settings are ***2F8H, 2E8H***, or ***Disabled***.

Parallel Port

This option sets the use and address of the on-board parallel port. The settings are ***378H, 278H***, or ***Disabled***.

Parallel Mode

This option sets the on-board parallel port mode. The settings are ***SPP*** (Standard Parallel Port), ***EPP*** (Enhanced Parallel Port), or ***ECP*** (Extended Capabilities Port).

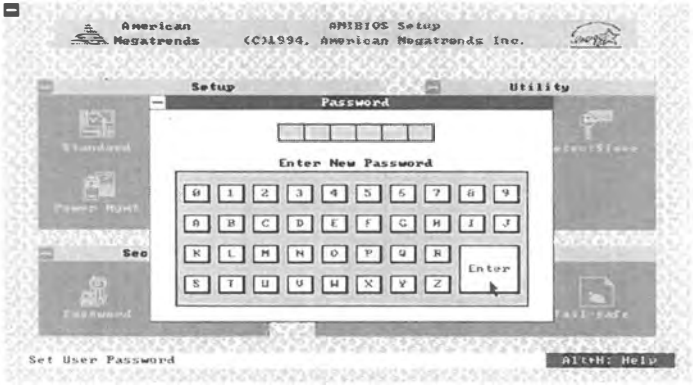
Peripheral Setup Defaults

BIOS Default	Optimal	Fail-safe
PCI OnBoard IDE	Enabled	Disabled
PCI Onboard Secondary IDE	Enabled	Disabled
PCI OnBoard IDE Speed Mode	Disabled	Disabled
PCI IDE Card Present on	Auto	Auto
PCI IDE IRQ	Edge	Level
PCI Primary IDE IRQ	INT A	INT A
PCI Secondary IDE IRQ	INT B	INT B
IDE Block Mode	Disabled	Disabled
IDE 32 Bit Transfers Mode	Disabled	Disabled
Primary Master LBA Mode	Disabled	Disabled
Primary Slave LBA Mode	Disabled	Disabled
Secondary Ctrl Drives Present	None	None
Secondary Master LBA Mode	Disabled	Disabled
Secondary Slave LBA Mode	Disabled	Disabled
FDC Controller	3F1H	Disabled
Primary Serial Port	3F8H	Disabled
Secondary Serial Port	2F8H	Disabled
Parallel Port	378H	Disabled
Parallel Mode	Disabled	Disabled

WinBIOS Password Support

Password

WinBIOS Setup has an optional password feature. The system can be configured so that the users must enter a password every time the system boots or when WinBIOS Setup is executed. The following screen appears when you select the password icon.



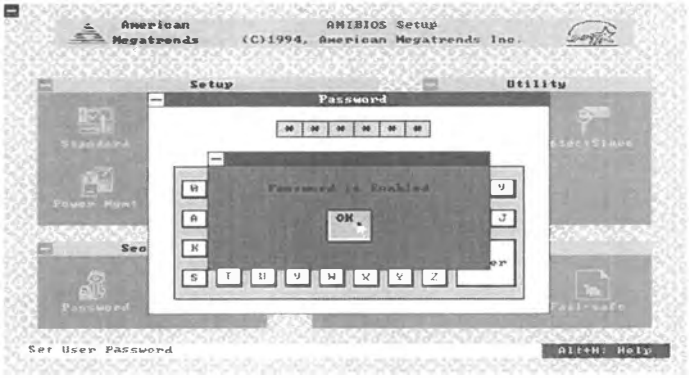
You can enter a password by:

- ❒ 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.

The password check option is enabled in **Advanced Setup** by choosing either *Always* or *Setup*. The password is stored in CMOS RAM.

The password can be from 1 to 6 alphanumeric word. Please make sure the password is noted down. If password is forgotten, the CMOS RAM must be drain and system must be reconfigure. WinBIOS will then display the following :



Select the Password icon from the Security section of WinBIOS main menu. Enter the password and press <Enter>. The screen will not display the characters entered. After the new password is entered, you will be ask to retype the new password again for confirmation.

If the password confirmation is incorrect, an error message appears. Then please repeat the step above. If the new password is entered without error, press <Esc> to return to the WinBIOS Setup Main Menu. The password is now stored in CMOS RAM after WinBIOS Setup completes. The next time the system boots, you will be prompted for the password then.

Remember the Password

Keep a record of the new password when the password is changed. If the password is forgotten, you must drain CMOS RAM and reconfigure the system again in order to regain access to the system. .

Appendix A

MEMORY MAP

The following table shows the use of the fiirst megabyte of memory.

Codes	Length	Description
000000 - 0002FFh	768 bytes	BIOS Interrupt Vector Table
000300 - 0003FFh	256 bytes	BIOS Stack Area
000400 - 0004FFh	256 bytes	BIOS Data Area
000500 - 09FFFFh	640 KB	Applications Memory, used by the operating system, device drivers, TSRs, and all DOS applications.
0A0000 - 0BFFFFh	128 KB	Video Buffer (EGA and VGA)
0B0000 - 0B7FFFFh	32 KB	Video Buffer (for Monochrome, CGA color, and VGA monochrome).
0B8000 - 0BFFFFh	32 KB	Video Buffer (for CGA, EGA color, and VGA color).
0C0000 - 0C7FFFh	32 KB	Video ROM (EGA and VGA)
0C8000 - 0CFFFFh	32 KB	Unused. Reserved for Adaptor ROMs (other devices requiring ROMs).
0D0000 - 0DFFFFh	64 KB	Used by Adaptor ROMs, such as Network Controllers, Hard Disk Controllers, and SCSI Host Adaptors.
0E0000 - 0EFFFFh	64 KB	Used by System ROM, which can include Network Controllers with boot-up capabilities, and other devices. If the system BIOS is 128KB in length (an EISA BIOS), the first 64KB of ROM is here.
0F0000 - 0FFFFFh	64 KB	System BIOS , which includes the BIOS Setup utility and hard disk utilities.

I/O MAP

[000-01F]	DMA controller (Master)
[020-021]	INTERRUPT controller (Master)
[022-023]	CHIPSET control registers I/O Ports
[040-05F]	TIMER control registers
[060-06F]	KEYBOARD interface controller (8042)
[070-07F]	RTC ports and CMOS I/O ports
[080-09F]	DMA register
[0A0-0BF]	INTERRUPT controller (Slave)
[0C0-0DF]	DMA controller (Slave)
[0F0-0FF]	MATH CORPROCESSOR
[1F0-1F8]	HARD DISK controller
[278-27F]	PARALLEL port-2
[2B0-2DF]	GRAPHICS adapter controller
[2F8-2FF]	SERIAL ports-2
[378-37F]	PARALLEL port-1
[3B0-3BF]	MONOCHROME and PRINTER adapter
[3C0-3CF]	EGA adapter
[3D0-3DF]	CGA adapter
[3F0-3F7]	FLOPPY DISK controller
[3F8-3FF]	SERIAL port-1

TIMER MAP

TIMER Channel - 0	System timer interrupt
TIMER Channel - 1	DRAM REFRESH request
TIMER Channel - 2	SPEAKER tone generator

DMA CHANNEL MAP

DMA Channel - 0	Available
DMA Channel - 1	IBM SDLC
DMA Channel - 2	FLOPPY DISK adapter
DMA Channel - 3	Available
DMA Channel - 4	Cascade for DMA controller 1
DMA Channel - 5	Available
DMA Channel - 6	Available
DMA Channel - 7	Available

INTERRUPT MAP

NMI		Parity check
IRQ	0	System TIMER interrupt from TIMER-0
	1	KEYBOARD controller
	2	Cascade for IRQ 8-15
	3	SERIAL port 2
	4	SERIAL port 1
	5	PARALLEL port 2
	6	FLOPPY DISK adapter
	7	PARALLEL port 1
	8	RTC clock
	9	Available
	10	Available
	11	Available
	12	Available
	13	MATH coprocessor
	14	HARD DISK adpater
	15	Available

Appendix B

Error Beeps and Message

Error can occur during POST (Power On Self Test), which is performed every time the system is powered on. Fatal errors are communicated through a series of audible beeps. All errors except Beep Code 8 are fatal errors. Fatal errors do not allow the system to continue the boot process. Most displayed errors allow the system to continue the boot process.

Beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry on the mainboard is faulty.
2	Parity Error	Parity error in the first 64KB of memory.
3	Base 64KB Memory Failure	Memory failure in first 64KB.
4	Timer Not Operational	Memory failure in the first 64KB of memory, or Timer 1 on the mainboard is not functioning.
5	Processor error	The CPU on the mainboard generated an error.
6	8042 - Gate A20 Failure	The keyboard controller (8042) may be bad. The BIOS cannot switch to protected mode.
7	Processor Exception interrupt Error	The CPU generated an exception interrupt.
8	Display Memory Read/ Write Error	The system video adapter is either missing or its memory is fault error.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in the BIOS
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed.
11	Cache Error/External Cache Bad	The external cache is faulty.

AMIBIOS POST Checkpoint Codes

POST is performed by the BIOS when the system is reset or rebooted. POST performs diagnostics tests on system parts and initialized key system components. When a POST routine completes, a code is written to I/O port address 80h. Display this code by attaching diagnostic equipment to port 80h.

The following POST checkpoint codes are valid for 433 mainboard's WinBIOS.

Codes	Description
01h	Processor register test starting and NMI will be disabled.
02h	NMI is Disabled. Power on delay starting.
03h	Power on delay complete. Checking soft reset and power-on next.
05h	Soft reset and power determined. Enabling ROM next and disabling shadow RAM and cache memory, if any.
06h	ROM is enabled. Calculating ROM BIOS checksum.
07h	ROM BIOS checksum passed. CMOS shutdown register test to be done next.
08h	CMOS shutdown register test done. CMOS checksum calculation to be done next.
09h	The CMOS checksum calculation is done and the CMOS RAM Diagnostic byte has been written. CMOS RAM initialization is next if the *Initialized CMOS At Every Boot* option is set.
0Ah	CMOS RAM is initialized. The CMOS RAM status register will be initialized for Date and Time next.
0Bh	The CMOS RAM status register has been initialized. Any initialization before the keyboard BAT test will be done next.
0Ch	The keyboard controller I/B is free. Issuing the BAT command to the keyboard controller next.
0Dh	The BAT command was issued to the keyboard controller. Verifying the BAT command next.
0Eh	The keyboard controller BAT result has been verified. Any initialization after the keybaord controller BAT command will be done next.

Codes	Description
0Fh	Initialization after the keyboard controller BAT command is done. The keyboard command byte will be written next.
10h	The keyboard contoller command byte has been written. Issuing the keyboard controller pin 23 and 24 blocking the unblocking command next.
11h	Keyboard controller pins 23 and 24 have been blocked and unblocked.
12h	Checked if <Ins> key was pressed during power-on. Disabling the DMA and Interrupt controllers.
13h	DMA controllers 1 and 2 and interrupt controllers 1 and 2 have been disabled. The video display is disabled and port B is initialized. Initializing the chipset and doing automatic memory detection next.
14h	Chipset initialization and automatic memory detection has completed. Next, uncompressing the POST code if the BIOS has been compressed.
15h	The POST code has been umcompressed. The 8254 timer test is next.
19h	The 8254 timer test has completed. Starting the memory refresh test.
1Ah	The memory refresh line has been toggled. Checking the 15u second ON/ OFF time next.
20h	The memory refresh period 30u second test has completed. Starting the base 64KB memory and address line test next.
21h	The address line test passed. Toggling parity next.
22h	Parity has been toggled. The sequential data Read/Write test on the base 64KB of system memory is next.
23h	The base 64KB sequential data Read/Write test passed. Next, setting the BIOS stack and doing any required configuration before the interrupt vector initialization.
24h	The configuration required before vector initialization has been completed. Interrupt vector initialization is next.
25h	Interrupt vector initialization is done. Reading the input port of the 8042 for turbo switch (if any) and clearing the password if the POST Diagnostic switch is on.
26h	The input port of the 8042 has been read. Initializing global data for the turbo switch.
27h	The global data initialization for the turbo switch is done . Any required initialization before setting the video more will be done next.
28h	Initialization before setting the video mode has completed. Setting the monochrome mode and color mode.

Codes	Description
2Ah	The monochrome and color modes have been set. Toggling parity before the optional video ROM test.
2Bh	Finished toggling parity. Passing control for required configuration before optional video ROM check.
2Ch	Processing before video ROM control is done. Searching for optional video ROM and passing control to this ROM, if present.
2Dh	Optional video ROM control is done. Passing control to do any processing after video ROM returns control to POST.
2Eh	Return from processing after the video ROM control. If EGA or VGA video is not found, will do the display memory Read/Write test.
2Fh	EGA/VGA not found. Next, displaying the memory Read/Write test.
30h	The memory Read/Write test passed. Searching for retrace checking next.
31h	Display memory R/W test or retrace checking failed. Performing the alternate display memory Read/Write test next.
32h	The alternate display memory Read/Write test passed. Searching for alternate display retrace checking next.
34h	Video display checking over. The display mode will be set next.
37h	Display mode set. Display the power on message.
39h	New cursor position read and saved. Displaying the *Hit <DEL>* message next.
3Bh	The *Hit <DEL>* message has been displayed. The virtual mode memory test is next.
40h	Preparing the descriptor tables next.
42h	The descriptor tables have been prepared. Entering virtual mode for the memory test next.
43h	Entered virtual mode. Enabling interrupts for diagnostics mode next.
44h	Interrupts enabled (if the diagnostics switch is no). Initializing data to check memory wrap at 0:0h.
45h	Data initialized. Checking for memory wraparound at 0:0h and finding the total system memory size.
46h	Memory wraparound test done. Memory size calculation over. Writing patterns in memory to test memory next.
47h	Pattern to be tested written in extended memory. Write patterns in base 640KB memory.

Codes	Description
48h	Pattern written in base memory. Determining the amount of memory below 1MB memory.
49h	Amount of memory below 1MB found and verified. Determining the amound of memory above 1MB next.
4Bh	Amount of memory above 1MB found and verfied. Checking for soft reset and clearing the memory below 1MB for a soft reset. (If at power on, go to checkpoint 4Eh).
4Ch	Memory below 1MB cleared. Next, doing a soft reset to clear memory above 1MB.
4Dh	Memory above 1MB cleared via a soft reset. Saved the memory size. Going to checkpoint 52h next.
4Eh	Memory test started. A soft reset was not done. Displaying the first 64KB memory size next.
4Fh	The memory size display has started and will be updated during the memory test. The sequential and random memory tests will be performed next.
50h	Memory testing the initialization of the memory below 1MB is complete. Adjust the displayed memory size for memory relocation and shadowing next.
51h	The memory size display was adjusted because of memory relocation and shadowing. The test of the memory above 1MB will be done next.
52h	The testing and initialization of the memory above 1MB has complete. Next, saving the memory size information.
53h	The memory size information has been saved. The CPU registers have been saved. Entering real mode next.
54h	The shutdown was successful and the CPU is in real mode. Disabling the Gate A20 line next.
57h	The Gate A20 address line is disabled. Adjusting the memory size depending on the memory relocation and/or shadowing parameters.
58h	The memory size has been adjusted for memory relocation and/or shadowing. Clearing the *Hit <DEL>* message next.
59h	The *Hit <DEL>* message has been cleared. The *Wait...* message is being displayed. Starting the DMA and interrupt controller tests next.
60h	DMA page register test passed. The DMA controller 1 base register test is next.
62h	The DMA controller 1 base register test passed. Starting the DMA controller 2 base register test next.

Codes	Description
65h	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66h	DMA controllers 1 and 2 have been programmed. Initializing the 8259 interrupt controllers next.
67h	8259 initialization has completed. Starting the keyboard test next.
80h	The keyboard test has started. Clearing the output buffer and checking for stuck keys. The keyboard reset command will be issued next.
81h	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83h	The keyboard commandbyte was written and global data initialization has completed. Checking for a locked keyboard next.
84h	Keyboard locked key checking has completed. Checking for a memory size mismatch with the data in CMOS RAM.
85h	The memory size check has completed. Displaying soft errors, checking for a password, or bypassing WINBIOS and AMIBIOS Setup next.
86h	The password as been checked. Doing programming before WINBIOS and AMIBIOS Setup runs next.
87h	Programming before WINBIOS and AMIBIOS Setup has completed. Uncompressing the WINBIOS and AMIBIOS Setup code and executing WINBIOS and AMIBIOS Setup next.
88h	Returned from WINBIOS and AMIBIOS Setup and screen is cleared. Doing programming after WINBIOS and AMIBIOS Setup next.
89h	Programming after WINBIOS and AMIBIOS Setup has completed. Display the power-on screen message next.
8Bh	First power-on screen message displayed. The Wait ... message is also displayed. Shadowing of the system BIOS and Video BIOS will be done next.
8Ch	The system and Video BIOS have been shadowed successfully. Programming system configuration options after WINBIOS and AMIBIOS Setup about to start.
8Dh	The WINBIOS and AMIBIOS Setup options have been programmed. The mouse check and initialization will be done next.
8Eh	The mouse check and initialization have completed. Resetting the hard disk controller next.

Codes	Description
8Fh	The hard disk controller has been reset. The floppy drive will be configured next.
91h	Floppy configuration is complete. Hard disk configuration will be done next.
94h	Hard disk configuration has complete. Setting the base and extended memory sizes next.
96h	The memory size was adjusted because of PS/2 mouse support and hard disk type 47. Next performing any initialization required before passing control to the adaptor ROM at C8000h.
97h	Initialization before C8000h adaptor ROM control has completed. Checking the C8000h adaptor ROM, then passing control to it next.
98h	C8000h adaptor ROM has passed control back to WINBIOS and AMIBIOS POST. Doing any required processing after C8000h adaptor ROM returns control next.
99h	The initialization required after the adaptor ROM test has completed. Configuring the timer data area and printer base address.
9Ah	The timer and printer base addresses have been configured. Configuring the RS-232 base I/O port address next.
9Bh	The RS-232 base I/O port address has been configured. Performing any initialization required before the coprocessor test next.
9Ch	The required initialization before the coprocessor test has completed. Initializing the coprocessor next.
9Dh	The coprocessor has been initialized. Doing any required initialization after the coprocessor test next.
9Eh	The required initialization after the coprocessor test has completed. Checking the extended keyboard, keyboard ID, and Num Lock key next.
9Fh	The exteded keyboard check is done and the keyboard ID flag is set. The Num Lock key has been turned On or Off as specified in WINBIOS and AMIBIOS Setup. The keyboard ID command will be issued next.
A0h	The keyboard ID command was issued. The keyboard ID flag will be reset next.
A1h	The keyboard ID flag has been reset. The cache memory test will be done next.
A2h	The cache memory test has completed. Displaying any soft errors next.
A3h	The soft errors have been displayed. Setting the keyboard typematic rate next.

Codes	Description
A4h	The keyboard typematic rate has been set. Programming the memory wait states next.
A5h	The memory wait states have been programmed. Clearing the screen and enabling parity and the NMI next.
A7h	The NMI and parity have been enabled. Performing any required initialization before passing control to the adaptor ROM at E0000h next.
A8h	Any required initialization before the E0000h adaptor ROM gains control has been completed. The E0000h adaptor ROM gets control next.
A9h	Control returned to WINBIOS and AMIBIOS POST from the E0000h adaptor ROM. Performing any required initialization after E0000h adaptor ROM control next.
AAh	Any required initialization after the E0000h adaptor ROM had control has completed. Displaying the WINBIOS and AMIBIOS system configuration screen next.
B0h	The WINBIOS and AMIBIOS system configuration is displayed. Uncompressing the WINBIOS and AMIBIOS Setup code for hotkey setup next, if required.
B1h	The WINBIOS and AMIBIOS Setup code for hotkey setup has been uncompressed. Copying any required code to a specific area.
00h	The code has been copied to a specific area done. Passing control to the INT 19h boot loader.

FCC Notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used properly. In strict accordance with the manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/television technician for help and for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office. Washington, DC 20402, Stock o. 004-000-00345-4

FCC Warning

The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's authority to repair this equipment.

Note : In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables and power cord must be used.