HOT-539
Pentium PCI/ISA MAIN BOARD
User's Manual

NOTICE

Manual Rev 1.0

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Preface

539 mainboard is a highly integrated IBM PC/AT compatible system board designed to accommodate 75MHz to 132MHz Pentium processors, and features high-performance secondary cache memory architecture from 256KB up to 2048KB.

539 mainboard features four PCI (Perpherial Component Interconnect) local bus and four ISA (Industry Standard Architecture) bus expansion slots.

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

Note : *539 mainboard described on this manual includes two different version - ver 1.0 and ver 2.0.*

539 mainboard ver 2.0 is same with ver 1.0 except a more jumper JP17 beside CPU socket. (Please refer to 539 placement on page 11 and page 12)

539 ver 2.0 provides CPU clock multiplier adjustable by jumper while ver 1.0 need to add a component to the mainboard to achieve the same function. (Please refer to CPU clock multiplier setup on page 14 and page 15)

Chapter 1 Introduction

Specification

CPU Function

- ❑ CPU clock: 75/90/100/120/132 MHz
- ❑ System clock: 50/60/66 MHz

Chipset

- ❑ UMC 8891F/8892AF/8886AF and 8663AF
- ❑ Supports internal and external write back cache
- ❑ Supports PCI master and slave mode at 33MHz
- ❑ Supports PCI burst mode access to local memory

Memory

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

Cache Memory

- ❑ Supports 256KB, 512KB, 1MB (1024KB), and 2MB(2048KB) write-through or write-back external cache

Power Management Function

- ❑ Provides four power management modes : On, Doze, Standby, 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 devices

  Supports 32 and 16-bit data transfers

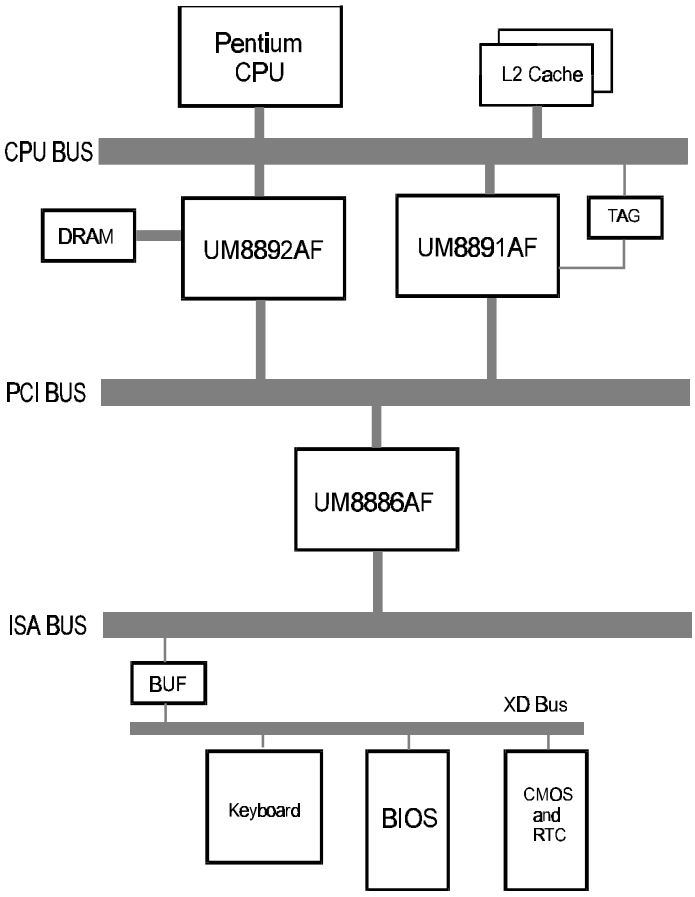
  Supports buffers that operate read prefresh and write port transactions

  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 mode.
- ❑ Two serial ports
  Supports 16C550 compatible UARTS.
- ❑ One PS/2 mouse port (optional)

Board Design

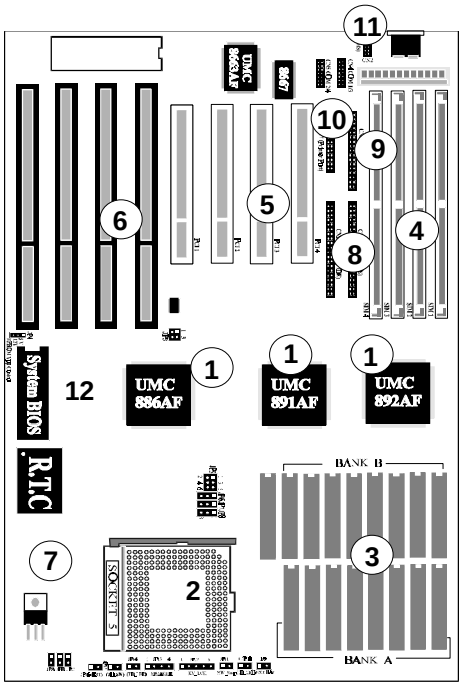
- ❑ Dimension 22cm x 33cm

Block Diagram



539 Mainboard Description

The major components of 539 mainboard are illustrated and described to the right and below. Please take a minute to become familiar with the board design.



1. Chipset ASIC

539 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

539 mainboard accept any member of the Pentium 75/90/100/120/132 of high performance 32-bit microprocessors in PGA package. The mainboard is designed to run at a clock speed from 50 to 66MHz on CPU bus clock, and 75 to 132MHz on CPU core clock.

3. External Cache

539 maniboard features a external cache memory, which complements the 16KB internal cache of the Pentium processor. It supports external cache with size of 256KB, 512KB, 1024KB, and 2048KB.

4. Main Memory

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

5. PCI Expansion Slots

539 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

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

7. 3.3/3.45/3.6V Voltage Regulator

For Intel various members of the Pentium processor family 539 mainbaord provides a voltage regulator to regulate voltage to 3.3V, 3.45V, and 3.6V.

8. On-board PCI IDE Controller

539 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

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

10. On-board Serial/Parallel Port

539 mainboard provides two serial ports supporting 16C550 serial mode and one parallel port supporting SPP, EPP, and ECP mode.

11. On-board optional PS/2 mouse Port

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

12. System BIOS

539 mainboard is equipped with AMI system WinBIOS. The NCR 53C810 and Adaptec AHA-7850 SCSI BIOS is built-in with a particularly 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

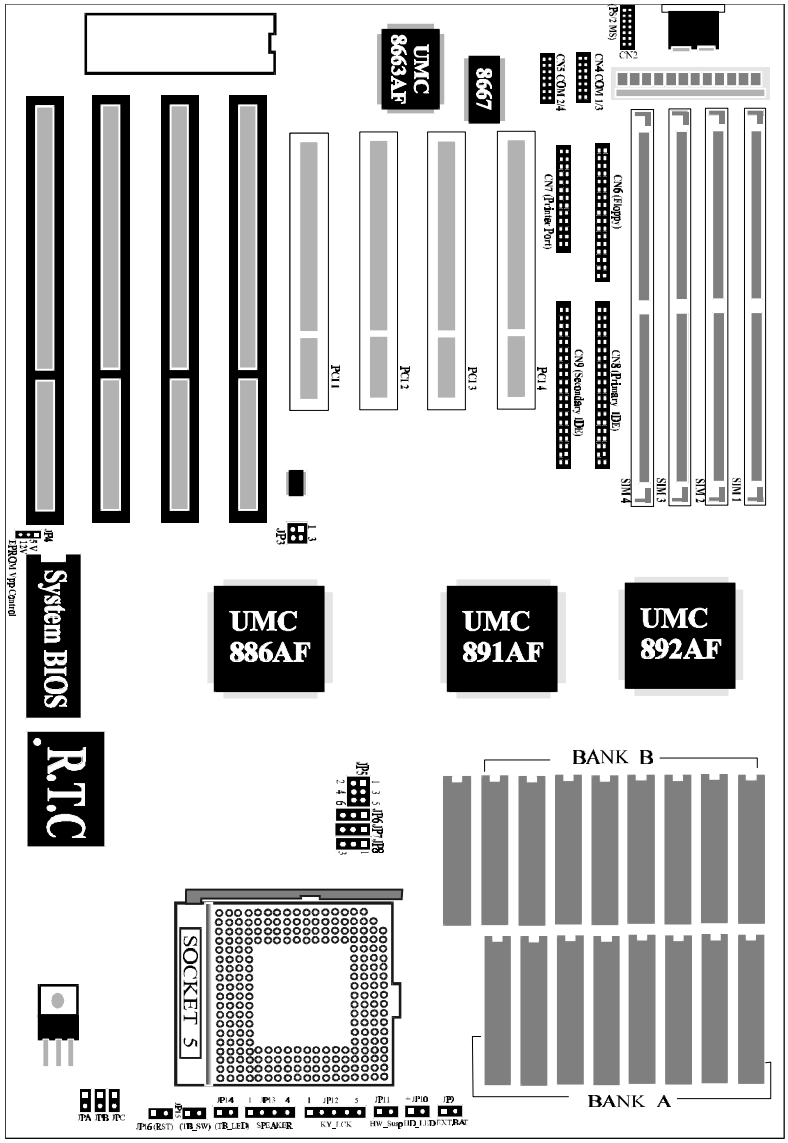
one 9-pin and one 25-pin serial port cable

one 25-pin parallel port cable

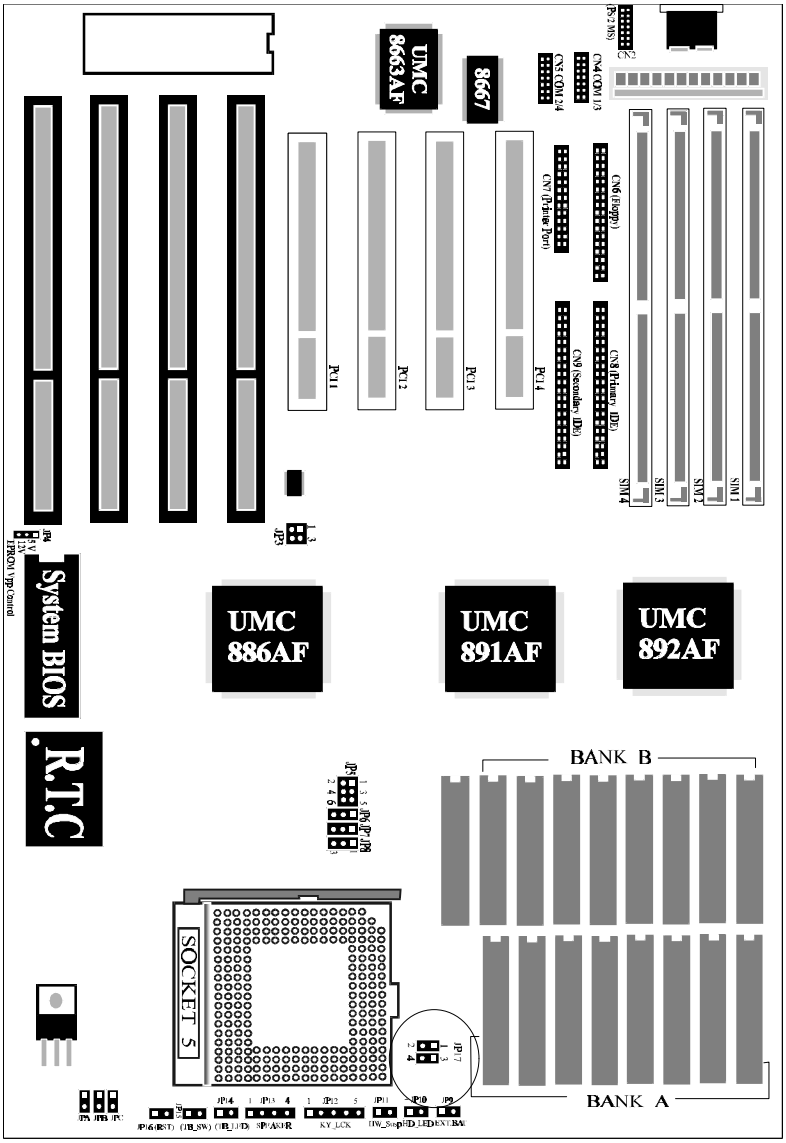
optional PS/2 5-pin DIN connector with cable

on-board enhanced IDE drivers on 3.5" floppy diskette

539 Ver 1.0 Mainboard Placement



539 Ver 2.0 Mainboard Placement

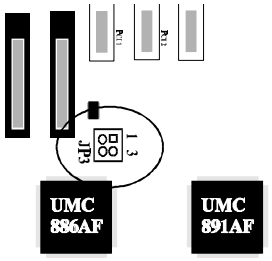


Chapter 2 Jumper Setting

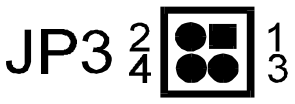
System Clock Selection

539 mainboard features a clock generator to provide adjustable system clock frequency. JP3 4-pin jumper which determine the clock frequency.

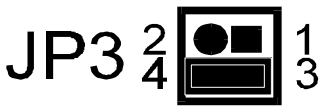
Proper jumper settings for generating 50MHz to 66MHz clock frequency for Pentium system are shown bellow.



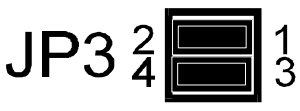
50MHz System Clock
(75/100MHz CPU Core Clock)



60MHz System Clock
(90/120MHz CPU Core Clock)
**** Default***

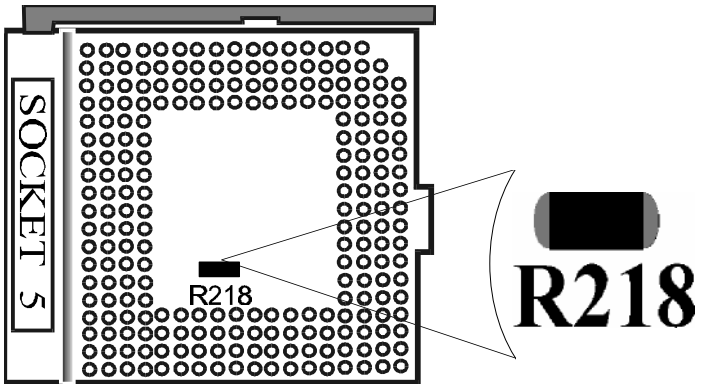


66MHz System Clock
(100/132MHz CPU Core Clock)



CPU Clock Multiplier Setup for 539 Ver 1.0

539 Ver 1.0 mainboard provides R218 position (locate at the middle of ZIF Socket 5) to figure up Pentium CPU core clock multiplier. By mounting or removing a SMT zero ohm resister, the user can change the **Host Bus Clock**/**CPU Core Clock** ratio of 1 : 1.5 and 1 : 2.

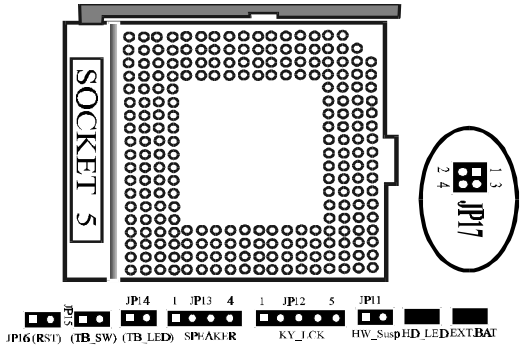


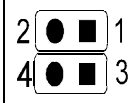
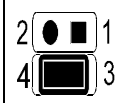
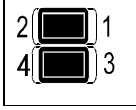
Location of R218		Host Clock (System Bus Clock)	CPU Core Clock
Empty (* Default) CPU Bus/Core Clock ratio - 1 : 1.5		50 MHz	75 MHz
		60 MHz	90 MHz
		66 MHz	100 MHz
Zero ohm SMT resister is mounted or shorted directly, CPU Bus/Core Clock ratio - 1 : 2		50 MHz	100 MHz
		60 MHz	120 MHz
		66 MHz	132 MHz

Note : Please consult your local service center for adding the resister. Do not try to add this option without the guidance of a trained technician.

CPU Clock Multiplier Setup for 539 Ver 2.0

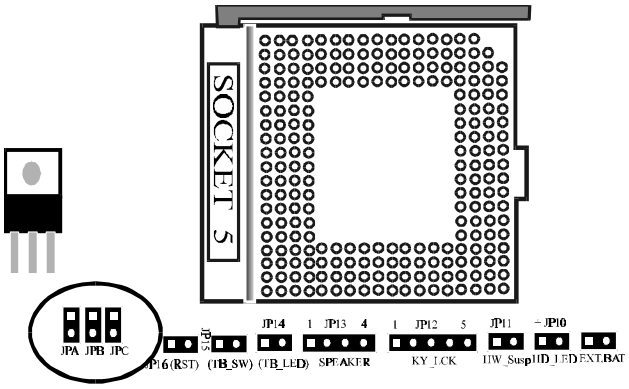
539 mainboard provides JP17 to figure up Pentium CPU core clock multiplier. By inserting or removing jumper caps on JP17, the user can change the **Host Bus Clock**/**CPU Core Clock** ratio from 1 : 1.5 to 1 : 4.



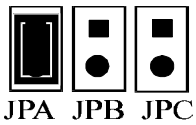
JP17	Bus/Core Ratio	P54C/CQA/CS Fractions(MHz	Bus/Core Ratio	P54CS C-Step Fractions(MHz
	1 : 1.5	50 / 75	**1 : 1.5**	**50 / 75**
		60 / 90		**60 / 90**
		66 / 100		**66 / 100**
	1 : 2	50 / 100	**1 : 2**	**50 / 100**
		60 / 120		**60 / 120**
		66 / 132		**66 / 132**
	1 : 3		**1 : 3**	**33 / 100**
		50 / 150		**50 / 150**
		60 / 180		**60 / 180**
			**1 : 2.5**	**60 / 150**

CPU Voltage Supply Selection

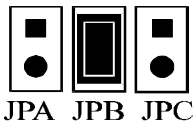
539 mainboard is designed to offer several CPU voltages level for different CPU requirements. Pentium processor family such as 3.3V for standard 75/90/100/120/132MHz Pentium processor, 3.45 for Pentium processor 90/100MHz VR s-spec (3.3V +5% -0%), and 3.6V for Pentium processor 90/100MHz VRE/MD s-spec (3.45V to 3.6V)



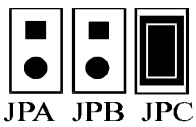
Jumper Setting for 3.3V (*Default)



Jumper Setting for 3.45V

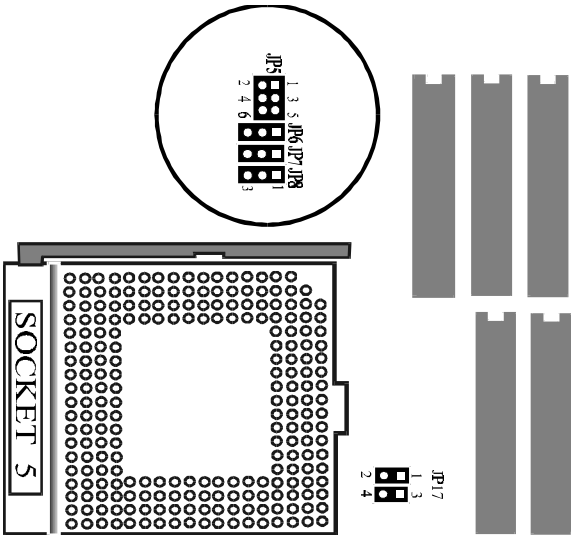


Jumper Setting for 3.6V



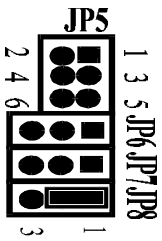
Cache Size Selection

539 mainboard supports external cache memory sizes of 256KB, 512KB, 1024KB and 2048KB. Cache memory is populated by sixteen Data SRAM and one Tag SRAM. Cache memory is organized into two banks, with eight SRAM assigne to each bank. The Data SRAM supported on 539 mainboard is 32Kx8, 64Kx8, and 128Kx8, Tag SRAM can be 8Kx8, 32Kx8, 64Kx8 and 128Kx8.



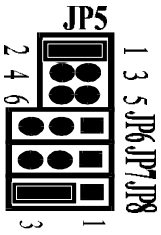
256 KB Cache Memory (Single Bank)

Cache Size	Bank 0 Data RAM U35 ~ U42	Bank 1 Data RAM U22 ~ U29	Tag RAM U30
256KB	32K x 8	Empty	8K x 8



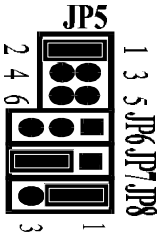
512 KB Cache Memory (Double Bank)

Cache Size	Bank 0 Data RAM U35 ~ U42	Bank 1 Data RAM U22 ~ U29	Tag RAM U30
512KB	32K x 8	32K x 8	32K x 8



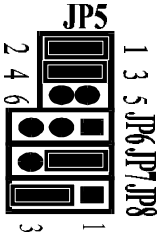
512 KB Cache Memory (Single Bank)

Cache Size	Bank 0 Data RAM U35 ~ U42	Bank 1 Data RAM U22 ~ U29	Tag RAM U30
512KB	64K x 8	Empty	32K x 8



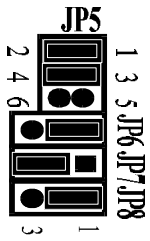
1024 KB Cache Memory (Double Bank)

Cache Size	Bank 0 Data RAM U35 ~ U42	Bank 1 Data RAM U22 ~ U29	Tag RAM U30
1024KB	64K x 8	64K x 8	64K x 8



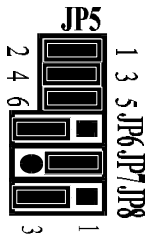
1024 KB Cache Memory (Single Bank)

Cache Size	Bank 0 Data RAM U35 ~ U42	Bank 1 Data RAM U22 ~ U29	Tag RAM U30
1024KB	128K x 8	Empty	64K x 8



2048 KB Cache Memory (Double Bank)

Cache Size	Bank 0 Data RAM U35 ~ U42	Bank 1 Data RAM U22 ~ U29	Tag RAM U30
2048KB	128K x 8	128K x 8	128K x 8

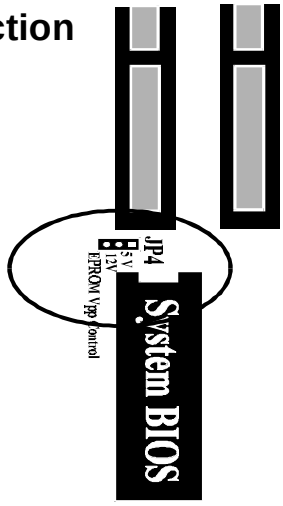


Flash EEPROM Vpp Selection

539 mainboard supports both 12V and 5V programming voltage flash EEPROM for system BIOS. JP4 is provided to accommodate these two types of flash EEPROM.

Pin 1 - 2 Close (or all Open) for 5V

Pin 2 - 3 Close for 12V



Connectors

ITEM	FUNCTION
CN8	On-board PCI Primary IDE Connector
CN9	On-board PCI Secondary IDE Connector
CN6	On-board Floppy Controller Connector
CN7	On-board Parallel Port Connector
CN4	On-board Serial port-1 Connector
CN5	On-board Serial Port-2 Connector
CN2	PS/2 Mouse Connector
JP12	Power LED and Keylock Connector
JP13	PC Speaker Connector
JP16	Hardware Reset Switch Connector
JP15	Hardware Turbo Switch Connector, 539 mainboard also support Software Turbo Switch by depress <Ctrl><Alt><+> and <-> for turbo mode and normal mode.
JP14	Turbo LED Connector
JP10	On-board IDE Read/Write LED Connector
JP9	External Battery Connector
JP11	EPMI Connector

Chapter 3 Memory Configuration

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

The memory SIMM sockets are organized into two banks, with two SIMM sockets assigned to each memory bank. 539 mainboard supports 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, and 64MB 72-pin SIMM modules.

The following tables show the supported memory configuration of 539 mainboard.

539 Memory Configuration Reference Table				
BANK 0	BANK 0	BANK 1	BANK 1	TOTAL
1MB	1MB	NONE	NONE	2MB
1MB	1MB	1MB	1MB	4MB
2MB	2MB	NONE	NONE	4MB
2MB	2MB	2MB	2MB	8MB
4MB	4MB	NONE	NONE	8MB
4MB	4MB	4MB	4MB	16MB
8MB	8MB	NONE	NONE	16MB
8MB	8MB	8MB	8MB	32MB
16MB	16MB	NONE	NONE	32MB
16MB	16MB	16MB	16MB	64MB
32MB	32MB	NONE	NONE	64MB
32MB	32MB	32MB	32MB	128MB
64MB	64MB	NONE	NONE	128MB
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
1MB	1MB	64MB	64MB	130MB

539 Memory Configuration Reference Table (Cont'd)				
BANK 0	BANK 0	BANK 1	BANK 1	TOTAL
2MB	2MB	4MB	4MB	12MB
2MB	2MB	8MB	8MB	20MB
2MB	2MB	16MB	16MB	36MB
2MB	2MB	32MB	32MB	68MB
2MB	2MB	64MB	64MB	132MB
4MB	4MB	8MB	8MB	24MB
4MB	4MB	16MB	16MB	40MB
4MB	4MB	32MB	32MB	72MB
4MB	4MB	64MB	64MB	136MB
8MB	8MB	16MB	16MB	48MB
8MB	8MB	32MB	32MB	80MB
8MB	8MB	64MB	64MB	144MB
16MB	16MB	32MB	32MB	96MB
16MB	16MB	64MB	64MB	160MB
32MB	32MB	64MB	64MB	192MB

Chapter 4 Power Management

539 mainboard provides four power management modes for reducing power consumption : **On**, **Doze**, **Standby**, and **Suspend**.

539 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 if no activity is taking place and the programmable time-out period has expired. The system will enter to doze mode. The types of activities monitored include Keyboard Controller, VGA, IDE, COM port, LPT port, Floppy, PCI master, ISA master, DMA, and one programmable memory region and one programable I/O region.

DOZE mode. In this mode, CPU frequency is slowed to 1/2 of normal frequency and the ***STANDBY*** timer (2 min to 512 min) starts counting if no activities is taking place. The activities monitored are the same as in ***ON*** mode.

STANDBY mode. CPU and system future more reduce to a lower frequency. In this mode, the ***SUSPEND*** timer (2 min to 512 min) starts counting if no activities is taking place. The activities monitored are the same as in ***ON*** mode.

SUSPEND mode. In this mode,539 mainboard will stop the CPU clock (0MHz), slow down the system clock, power down the secondary cache. Auto-wake-up, including keyboard, mouse, EPMI button, and modem, and so forth, is programmable.

EPMI Connector --- HW-Susp (JP11)

EPMI (External Power Management Interrupt) pin is provided for special purposes, such as suspend/resume button. When pushing this button will force system into power management mode instantly, and the system will resume if the button is pushed again.

Chapter 5 IDE Drivers Installation

Preface

539 On-Board IDE Device Drivers are saved in this diskette. These drivers are designed especially for 539 mainboard to improve the IDE I/O data transfer rate between IDE hard disk(s) and your system. They are designed to optimize the performance and supports of up to four IDE devices.

The following files are included :

1. README	
2. INSTALL4.EXE	(Auto install utility)
3. UM8673.SYS	(DOS device driver)
4. UM8673.386	(Windows device driver for V3.1x)
5. INT13.386	(Windows device driver for V3.1x)
6. UMC1S506.ADD	(OS/2 device driver for V2.x, 3.0)
7. UMC310.DSK	(NetWare device driver for V3.10)
8. UMC311.DSK	(NetWare device driver for V3.11, 3.12)
9. UMC401.DSK	(NetWare device driver for V4.0x)
10.ATDISK.SYS	(Windows NT device driver for V3.x)
11.INSTALL.EXE	(Install Utility for Windows NT)
12.RESTORE.EXE	(Restore Utility for Windows NT)
13.UNIX.UMC	(SCO UNIX device drive for 3.2V4.1)
14.RELEASE.TXT	(Latest release Note for Diskette V2.1)

Install Utility for PCI-Bus IDE Controller

The ***INSTALL4.EXE*** utility can detect the speeds of the hard disks which are attached on the controller automatically, and it also can install drivers for you. Please follow the steps below to excute the program first.

1 Insert the diskette in a floppy disk drive, and close the drive door.

2 At the command prompt, type the drive letter of the floppy drive you are using, followed by colon(:), and then press ENTER.

3 Type INSTALL4, and then press ENTER.

4 Follow the instructions on the screen to detect hard disk(s) speed and install driver(s).

This program may get an incorrect speed in some few cases. At that time, please install the drivers manually to reduce the drive speed step by step until the system boots or becomes stable. Please remember the current speed, and minus 2 if FIFO is enabled; or minus 4 if FIFO is disabled. This way, you can find the optimized performance speed of your system. If it is possible, please burn-in your system with IDE operations to make sure the stability of your system.

Install DOS Device Driver

The ***INSTALL4.EXE*** utility can install DOS device driver automatically. If you want to install DOS device driver manually or change the drive speed, please follow the steps below.

1. Copy the ***DOS\UM8673.SYS*** into the appropriate path.

2. Add following statement to your CONFIG.SYS file to auto load the driver during bootup.

DEVICE=[drive:][\path\]UM8673.SYS[/D<n:m>][/F<n>]
[/NF<n>][/Cyl<n:m>][/Hd<n:m>][/Sec<n:m>][/SIRQ:<m>]

where

drive: Hard Disk Drive C: or D:
D<n:m> Drive n speed m(0-17) (0 the lowest)
F<n> Enable FIFO for drive n
NF<n> Disable FIFO for drive n
Cyl<n:m>Drive n(2-3) cylinder number m
Hd<n:m> Drive n(2-3) head number m
Sec<n:m>Drive n(2-3) sector number m
SIRQ:<m>Secondary channel IRQ (10,12, or 15)

For instance, the user wants to load ***UM8673.SYS*** with drive 0, speed = 6, FIFO enabled, and the DOS driver resides in the root directory of the drive C:. Add the following statement to your CONFIG.SYS file.

DEVICE = C:\UM8673.SYS /D0:6 /F0

You don't need to specify drive speed parameters usually, because the device driver is reconfigured for the optimal speed setting.

3. Reboot your system.

Install Windows Device Driver V3.x

The ***INSTALL4.EXE*** utility can install Windows device driver automatically. If you want to install Windows device driver for your system manually or change the drive speed, please follow the steps below.

1. Copy the Windows\UM8673.386 and windows\INT13.386 into the designated path.

2. Check if the following lines exist in the [386Enh] section of your SYSTEM.INI file.

   [386Enh]
   32BitDiskAccess=ON
   device=*int13
   device=*wdctrl

a) Set the 32BitDiskAccess to "ON". If the statement does not exist, please add it in.

b) If "device=*int13" and "device=*wdctrl" do not exist, proceed tosStep 3. If the statement exist, please comment them out by adding ";" to the front of the statement as follows :

   ; device=*int13
   ; device=*wdctrl

If any statement does not exist, please proceed to step 3 of section.

3. Add these following statements to the [386Enh] section in your \WINDOWS\SYSTEM.INI file.

   device = [drive:][\path\] UM8673.386
   device = [drive:][\path\] INT13.386
   DriveSpeed = [/D<n:m>][/F<n>][/NF<n>]

   where
   drive: Hard Disk Drive C: or D:
   D<n:m> Drive n speed m(0-17) (0 the lowest)
   F<n> Enable FIFO for drive n
   NF<n> Disable FIFO for drive n

For instance, the user wants to load Windows drivers with drive 1, speed = 11, FIFO disabled, and the Windows drivers reside in the WINDOWS\SYSTEM directory of the drive C:. Then add the following statements to your SYSTEM.INI file.

```
[386Enh]
32BitDiskAccess=ON
;device=*int13
;device=*wdctrl
DriveSpeed = /D1:11 /NF1
device=c:\windows\system\UM8673.386
device=c:\windows\system\INT13.386
```

You don’t need to specify drive speed parameters usually, because the device driver is reconfigured for the optimal speed setting.

4. Reenter your Windows.

Install OS/2 Device Driver V2.x/V3.x

If you want to install OS/2 device driver for your system, please follow the steps below.

1. Copy the OS2\UMC1S506.ADD into the OS2 directory of your system for OS/2 V2.x or copy the OS2\UMC1S506.ADD into the OS2\BOOT sub-directory of your system for OS/2 V3.0.

2. Check if the following line exists in the CONFIG.SYS file.

   BaseDev = IBM1S506.ADD

   If the statement exists, please delete it or add “REM” in front of it.

3. Add the following statement to your CONFIG.SYS file.

BaseDev = UMC1S506.ADD [/A:<0 or 1> /IRQ:<irq> /U:<0 or 1> /S:<speed> /F /NF]

where

speed : drive speed setting from 0 to 17 (0 the lowest)
F : enable FIFO for drive
NF : disable FIFO for drive
IRQ : 10 or 12 or 15

Note : The user MUST NOT specify either drive or path name for the location of the drivers.

For instance, the user wants to load ***UMC1S506.ADD*** with drive 0, speed 6, FIFO disabled, and drive 1, speed 11, FIFO enabled which are attached on Adapter 0. Add the following statement to your CONFIG.SYS file.

BaseDev = UMC1S506.ADD /A:0 /U:0 /S:6 /NF /U:1 /S:11 /F

You don’t need to specify drive speed parameters usually, because the device driver is reconfigured for the optimal speed setting.

4. Reboot your system.

Install Netware Device Driver V2.x/V3.x

If you want to install NetWare device driver for your system, please follow the steps below.

1. Copy the NetWare\UMCxxx.DSK into the appropriate path.
2. Bring up the NetWare server of your system.
3. Type the following statement after the ":" prompt

:load UMCxxx PORT=<x> INT=<y> [/D<n:m>] [/F<n>] [/NF<n>]

where

x	1F0 or 170
y	E or F
D<n:m>	Drive n speed m(0-11) (0 the lowest)
F<n>	Enable FIFO for drive n
NF<n>	Disable FIFO for drive n

Note : You MUST NOT load the ISADISK.DSK when you are installing UMCxxx.DSK Netware driver.

For instance, the user wants to load ***UMC310.DSK*** with drive 0 speed 6 and drive 1 speed 11 which are attached on the primary controller. Add the following statement after the ":" prompt.

:LOAD UMC310 /D0:6 /D1:11 PORT=1F0 INT=E

You don't need to specify drive speed and Cylinder, Head, Sector parameters usually, because the device driver is reconfigured for the optimal speed setting and detect the Cylinder, Head, Sector automatically.

Install Windows NT Device Driver

1. Insert this diskette in a floppy disk drive, and close thedrive door.
2. At the DOS command prompt, type the drive letter of the floppy disk drive you are using, followed by a colon(:), type INSTALL, and then press ENTER. For example,

   C:\WINNT>a:\winnt\install
3. The Installation Utility will install the Windows NT Device Driver automatically.

Restore Windows NT Device Driver

1. At the DOS command prompt, type the drive letter of the floppy disk drive you are using, followed by a colon(:), type RESTORE, and then press ENTER. For example,

   C:\WINNT>a:\winnt\restore
2. The Restore Utility will restore the Windows NT Device Driver automatically.

Install SCO UNIX Device Driver

If you want to install SCO UNIX device driver for your system, please follow the steps below.

Type the following statements under UNIX system.

1. mkdir /UM8673.bin
2. cd /UM8673.bin
3. doscp a:unix.umc .
4. tar xf - < unix.umc
5. cd /UM8673.bin
6. ./istl.UM8673

If you want to remove SCO UNIX device driver from your system, please follow the steps below.

Type the following statements under UNIX system.

1. cd /UM8673.bin
2. ./rm.um8673

Chapter 6 BIOS Setup

BIOS Setup configures system information that is stored in CMOS RAM. WINBIOS Setup has an easy-to-use graphical user interface that will be immediately recognizable to anyone who has ever used Microsoft Windows. 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.

Bus Mouse and Microsoft Mouse Support on BIOS Setup :

The following types of mouse devices are supported.

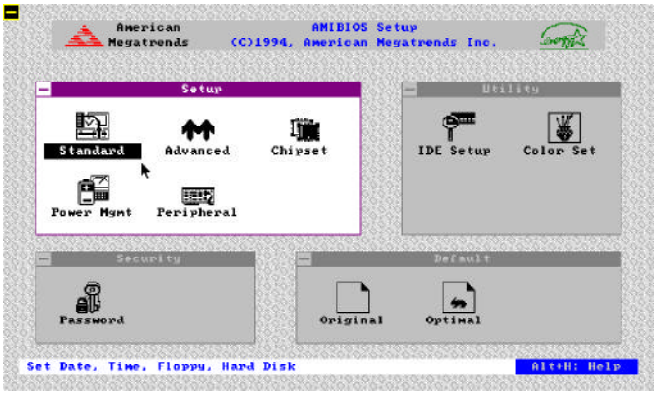
* PS/2- type mouse.
* Bus mouse that use IRQs 3, 4, or 5 (IRQ2 is not supported).
* Microsoft-compatible mouse.
* Logitech C-series-compatible mouses using the MM protocol.

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 and 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 two 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 These settings restore old setup values.

Optimal These settings provide that best performance characteristics.

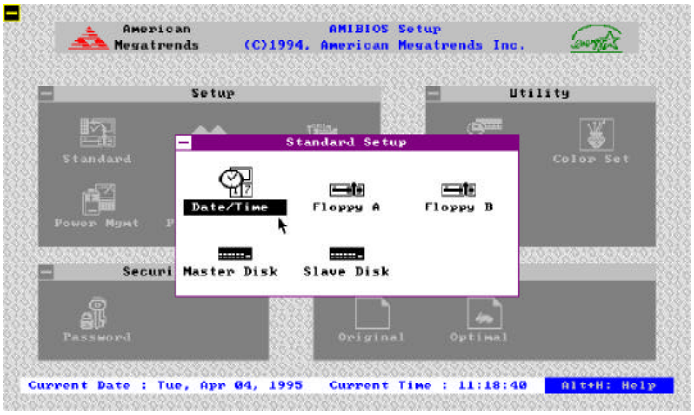
Navigating with the Keyboard in WinBIOS Setup

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.

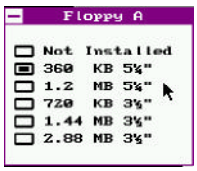
Standard Setup

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:

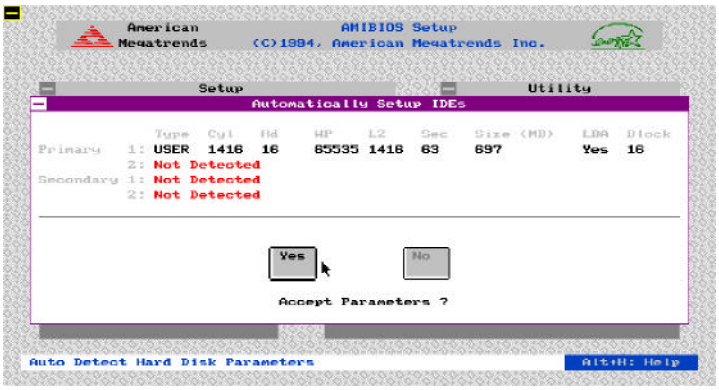
Move the cursor to these fields via and select the floppy type. The settings are *360KB 51/4 inch, 1.2MB 51/4 inch, 720KB 31/2 inch, 1.44MB inch, or 2.88MB 31/2 inch.*

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 that lists all valid disk drive types is displayed. Select the corrent type and press <Enter>. If the hard disk drive is an IDE drive, select **IDE Setup** 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.

Using IDE Setup (Only for IDE drivers)

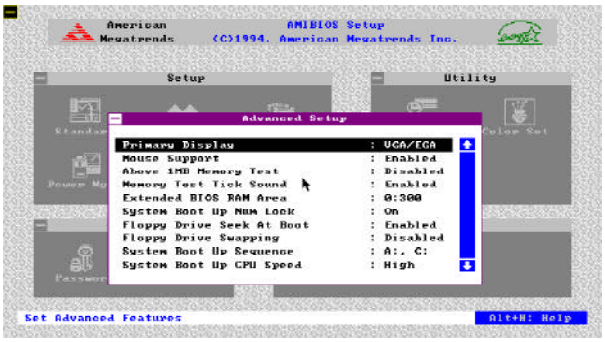
If you select **IDE Setup** from the Utility section of the WinBIOS Setup main menu, WinBIOS automatically finds all IDE hard disk drive parameters. WinBIOS places the hard disk drive parameters that it finds in the Drive Type fields in Standard Setup.



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.

Note : *Thest items listed below might have a little bit distinct from your BIOS setting for different BIOS versions.*



Primary Display

Select this icon to configure the type of monitor attached to the computer. The settings are ***Mono, CGA 40 x 25, CGA 80 x 25, VGA/EGA***, or ***Absent***.

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

This option specify where the hard disk information is stored. In the ***Top 1KB***, begining at 639K of the system programing area or in the system BIOS area in low memory beginning at ***0:300***.

System Boot Up Num Lock

When ***On***, this option turns on ***Num Lock*** when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. 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***.

Floppy Drive Swapping

When this feature enabled, the BIOS will swap floppy drive assignments so that Drive A: will function as Drive B: and Drive B: as Drive A:. 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 time. The settings are ***High*** or ***Low***.

External Cache

This option enabled or disabled secondary cache (L2) memory. The settings are ***Enabled*** or ***Disabled***.

Internal Cache

This option enable or disable the internal cache memory in Pentium processor. The settings are ***Enabled*** or ***Disabled***.

Password Checking

This option enables the password check option every time the system boots or the end user runs Setup. If ***Always*** is chosen a user password prompt appears every time the computer is tuned on. If ***Setup*** is chosen, the password prompt appears if WinBIOS is executed.

Video Shadow C000, 32K

When this option is set to Enabled, the video ROM area from C0000h ~ C7FFFh is copied (shadowed) to RAM for faster execution. The settings are ***Enabled*** or ***Disabled***.

Shadow xxxx, 16K,

These options enable shadowing of the contents of the ROM area xxxx in the option title. The settings are ***Enabled*** or ***Disabled***. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

IDE Block Mode

If your IDE hard disk drive supports block transfer mode. This feature enable multiple sector reads and writes for IDE drives to enhance data transfer rate. The options are ***4, 8, 16, 32, 64, Auto, optimal, Auto,*** and ***Disabled***.

IDE 32 Bit Transfers

This feature allows 32-bit data transfer between the system and the IDE hard disks if the hard disk controller supports 32-bit transfer. The on-board PCI enhanced IDE controller supports 32-bit transfer, so if you use it, you can enabled this feature to improve disk transfering performance. The settings are ***Enabled*** or ***Disabled***.

Primary Master LBA Mode

If your primary master IDE hard disk over 528MB, please enables this LBA (Large Block Addressing) mode feature. The settings are ***Enabled*** or ***Disabled***.

Primary Slave LBA Mode

If your primary slave IDE hard disk over 528MB, please enables this LBA (Large Block Addressing) mode feature. The settings are ***Enabled*** or ***Disabled***.

Secondary Ctrl Drives Present

This feature specifies how many IDE hard disk drive connect to secondary channel port. The options are ***1, 2,*** and ***Disabled***.

Secondary Master LBA Mode

If your secondary master IDE hard disk over 528MB, please enables this LBA (Large Block Addressing) mode feature. The settings are ***Enabled*** or ***Disabled***.

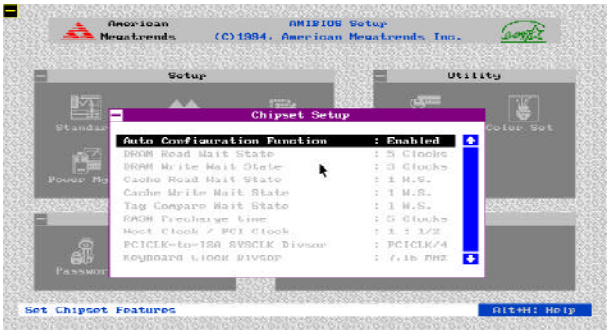
Secondary Slave LBA Mode

If your secondary slave IDE hard disk over 528MB, please enables this LBA (Large Block Addressing) mode feature. The settings are ***Enabled*** or ***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.

Note : *Thest items listed below might have a little bit distinct from your BIOS setting for different BIOS versions.*



Auto Configuration Function

When this option is *Enabled*, BIOS automatically configures listed features on the table based on detection of the CPU clock frequency. when this option is *Disabled*, BIOS leave these features manually adjust 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.*

Recommended Chip Setup for Different CPU Clock Speed					
	75 MHz	90 MHz	100 MHz	120 MHz	132 MHz
DRAM Read Wait States	2 Clocks	3 Clocks	5 Clocks	5 Clocks	5 Clocks
DRAM Write Wait States	0 Clock	1 Clock	3 Clocks	3 Clocks	3 Clocks
Cache Read Wait States	0 W. S.	1 W. S.	1 W.S.	1 W.S.	1 W. S.
Cache Write Wait States	0 W. S.	1 W. S.	1 W.S.	1 W.S.	1 W. S.
Tag Compare Wait States	0 W. S.	1 W. S.	1 W.S.	1 W.S.	1 W. S.
RAS# Precharge Time	2 Clocks	3 Clocks	4 Clocks	5 Clocks	5 Clocks
Host Clock / PCI Clock	1 : 1/2 or 1 : 2/3	1 : 1/2 or 1 : 2/3	1 : 1/2	1 : 1/2	1 : 1/2
PCICLK-to-ISA SYSCLK Divsor	PCICLK/3 or /4	PCICLK/4	PCICLK/4	PCICLK/4	PCICLK/4

DRAM Read Wait State

This feature allows the user to set the memory read wait state. The options are ***1, 2, 3, 4,*** and ***5 W.S***. The optimal setting depends on system clock speed.

DRAM Write Wait State

This feature allows the user to set the memory write wait state. The options are ***0, 1, 2***, and ***3 W.S***. The optimal setting depends on system clock speed.

Cache Read Wait State

This feature allows the user to set the cache read wait state. The options are ***0*** and ***1 W.S***. The optimal setting depends on system clock speed.

Cache Write Wait State

This feature allows the user to set the cache write wait state. The options are ***0*** and ***1 W.S***. The optimal setting depends on system clock speed.

Tag Compare Wait State

This feature allows the user to set the tag compare wait state. The options are ***0*** and ***1 W.S***. The default is 1 W.S.

RAS# Precharge time

This feature define the number of PCI clocks for RAS# signal precharge time, for PCI_DRAM controller accessing DRAM.

Host Clock / PCI Clock

This feature define the ratio of host clock (system bus clock) and PCI clock. The options are ***1 : 1***, ***1 : 1/2***, and ***1 : 2/3***. The optimal setting depends on host clock speed and PCI spec.1*: 1. 1 : 2/3 f1*

Host Clock	PCI Clock		
	1 : 1	1 : 1/2	1 : 2/3
50 MHz	50 MHz	25 MHz	33 MHz
60 MHz	60 MHz	30 MHz	40 MHz
66 MHz	66 MHz	33 MHz	44 MHz

Note : *1. 1: 2/3 feature may not available on some version of 539 mainboard.*

2. 30MHz or 33MHz PCI clock are recommended.

PCICLK-to-ISA SYSCLK Divsor

This feature allows the user to select the ISA clock that divide from PCI Clock. The options are ***PCICLKI/2***, ***PCICLKI/3***, and ***PCICLKI/4***.

Keyboard Clock Divsor

This feature allows the user to select the keyboard clock that divide from PCI Clock. The options are ***PCICLKI/2***, ***PCICLKI/3***, ***PCICLKI/4***, and ***7.16MHz***.

CPU to PCI Write Buffers

This feature allows the user to select the Host to PCI post write. The options are ***Enabled*** and ***Disabled***.

Tips : *If you have Trident PCI VGA card on you Pentium 75 MHz system, please disabled this feature.*

Main BIOS/Video BIOS Cacheable

This feature allows the user to set whether the main BIOS in F000~FFFF area and Video BIOS in C0000~C7FF areas are cacheable or non-cacheable.

I/O Recovery Time Control

This feature allows the user to set the I/O recovery time for AT bus. The options are 2 BCLKs to 12 BCLKs, default is 12 BCLKs.

Post Write Buffer

This feature allows the user to set the Post Memory Write Buffer enabled or disabled. Enabled this feature will enhance system performance.

Bus Park

This feature allows the user to set the Bus Park enabled or disabled. Enabled this feature will enhance PCI performance.

PCI Bus Stepping

This feature allows the user to set the PCI Bus Stepping enabled or disabled. Enabled this feature will enhance PCI devices compatibility.

Tips : *If you have Trident PCI VGA card on you Pentium 75 MHz system, please enabled this feature.*

NCR SCSI at AD17 Present in

This feature specifies PCI NCR 53C810 SCSI add-on card at AD17 are insert on which PCI slot. The options are ***Slot 1, Slot 2, Slot 3,***and ***Slot 4.*** If the card doesn't route at AD17, this item will not available.

PCI IDE IRQ

This feature specifies PCI IDE IRQ triggered mode, the options are ***Edge*** and ***Level***. (This feature only affect PCI IDE add-on card)

PCI IDE Card Present in

This feature specifies PCI IDE add-on card are insert on which PCI slot. The options are ***Slot 1, Slot 2, Slot 3, Slot 4***, or leave BIOS ***Auto*** detected. (If this feature is assigned, please disabled ***PCI OnBoard IDE***)

Primary/Secondary IDE IRQ Connected to

This feature specifies PCI primary/Secondary IDE IRQ. The options are ***INTA, INTB, INTC***, and ***INTD***. (This feature only affect PCI IDE add-on card)

1st Available IRQ

The BIOS will assign a system IRQ line you choose to the first PCI device that it detected. you can change the default to another setting. If you do, make sure there is no conflict with other IRQ already in use.

2nd Available IRQ

The BIOS will assign a system IRQ line you choose to the second PCI device that it detected. you can change the default to another setting. If you do, make sure there is no conflict with other IRQ already in use.

3rd Available IRQ

The BIOS will assign a system IRQ line you choose to the third PCI device that it detected. you can change the default to another setting. If you do, make sure there is no conflict with other IRQ already in use.

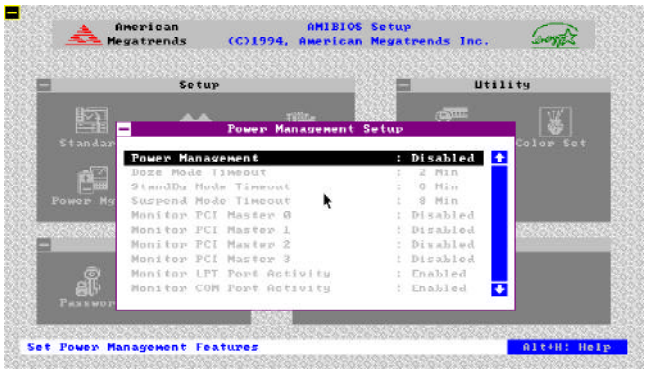
4th Available IRQ

The BIOS will assign a system IRQ line you choose to the forth PCI device that it detected. you can change the default to another setting. If you do, make sure there is no conflict with other IRQ already in use.

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.

Note : *Thest items listed below might have a little bit distinct from your BIOS setting for different BIOS versions.*



Power Management

This feature allows the user to enable or disable 539 mainboard power management.

Doze Mode Timeout

This feature specifies the length of timeout of system entering ***Doze*** mode. The timer options from 15 sec to 512 min.

Standby Mode Timeout

This feature specifies the length of timeout of system entering ***Standby*** mode. The timer option are from 2 min to 512 min or disabled.

Suspend Mode Timeout

This feature specifies the length of timeout of system entering ***Suspend*** mode. The timer option are from 2 min to 512 min or disabled.

Monitor PCI Master x

Enabling this features, the doze timer start counting if no PCI Master activity is taking place. Disabling this feature, system will not monitor PCI Master status.

Monitor LPT Port Activity

Enabling this features, the doze timer start counting if no **LPT** port activity is taking place. Disabling this feature, system will not monitor LPT port status.

Monitor COM Port Activity

Enabling this features, the doze timer start counting if no **COM** port activity is taking place. Disabling this feature, system will not monitor COM port status.

Monitor ISA Master&DMA Actvity

Enabling this features, the doze timer start counting if no **ISA Master** and **DMA** activity is taking place. Disabling this feature, system will not monitor ISA Master and DMA status.

Monitor IDE Activity

Enabling this features, the doze timer start counting if no **IDE** activity is taking place. Disabling this feature, system will not monitor IDE status.

Monitor FLP Activity

Enabling this features, the doze timer start counting if no **FLP** (Floppy controller) activity is taking place. Disabling this feature, system will not monitor Floppy status.

Monitor VGA Activity

Enabling this features, the doze timer start counting if no **VGA** activity is taking place. Disabling this feature, system will not monitor VGA port status.

Monitor KBD Activity

Enabling this features, the doze timer start counting if no **KBD** (Keyboard) activity is taking place. Disabling this feature, system will not monitor Keyboard status.

Monitor IRQXX

This feature specifies whether the IRQxx (xx: 1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, and 15) will be monitored or not. When system gets into power management mode, any IRQ activities will resume system to ***On*** mode.

Power Down VGA In Standby Mode

This feature specifies the display screen whether blanking or not when standby timer is expired.

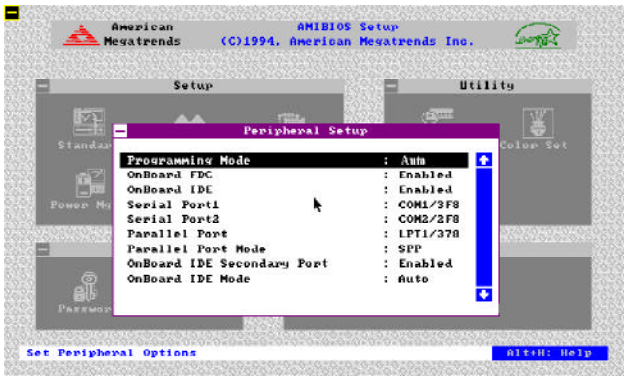
Power Down HD In Standby mode

This feature specifies the IDE hard disk drive whether power down or not when standby timer is expired.

Peripheral Setup

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.

Note : *Thest items listed below might have a little bit distinct from your BIOS setting for different BIOS versions.*



Programming Mode

The options are ***Auto*** or ***Manual***.

On ***Auto*** mode, first the BIOS checks for the present of other ISA add-on IDE controller, floppy drive controller, serial port, and parallel port.

If ISA add-on IDE or floppy drive controller present, the BIOS will disable onboard IDE or floppy drive controller.

If ISA add-on serial ports present and use COM1 & COM2, then the on-board serial ports will be set to COM3 & COM4.

If ISA add-on serial ports absent, or if ISA add-on serial ports use COM3 & COM4, then the on-board serial ports will be set to COM1 & COM2.

If ISA add-on serial ports present and use COM1, 2, 3, and 4, then the on-board serial ports will be set to Disabled.

For the parallel port, if ISA add-on parallel ports present and use LPT1, then the on-board parallel port will be set to LPT2.

If ISA add-on parallel port absent, or if ISA add-on parallel port use LPT2, then the on-board parallel port will be set to LPT1.

If ISA add-on parallel present and occupied LPT1 and LPT2, then the on-board parallel port will be set to Disabled.

Choose ***Manual*** to set these items manually.

Onboard FDC

This option enables the onboard floppy drive controller. The options are ***Enabled*** and ***Disabled***.

OnBoard IDE

This option enables the onboard PCI Enhanced IDE controller. If you are not using the on-board IDE feature, you can set this option to ***Disabled*** to free IRQ14, which the on-board IDE controller uses when enabled. The options are ***Enabled*** and ***Disabled***.

Serial Port1

This option enables the use and setting the address of the first serial port on mainboard. The options are ***COM1/3F8, COM3/3E8H***, and ***Disabled***.

Serial Port2

This option enables the use and setting the address of the secondary serial port on mainboard. The options are ***COM2/2F8, COM4/2E8***, and ***Disabled***.

Parallel Port

This option enables the use and setting the address of the parallel port on mainboard. The options are ***LPT1/378, LPT2/278***, and ***Disabled***.

Parallel Port Mode

This feature specifies on-board parallel port mode. The options are ***SPP*** (Standard Parallel Port), ***EPP*** (Enhanced Parallel Port), and ***ECP*** (Extended Capabilities Port).

OnBoard IDE Secondary Port

This feature specifies PCI on-board secondary channel IDE controller be enabled or disabled. If you are not useing the on-board secondary IDE port, you can set this entry to ***Disabled*** to free IRQ15, which the on-board secondary IDE port uses when enabled.

OnBoard IDE Mode

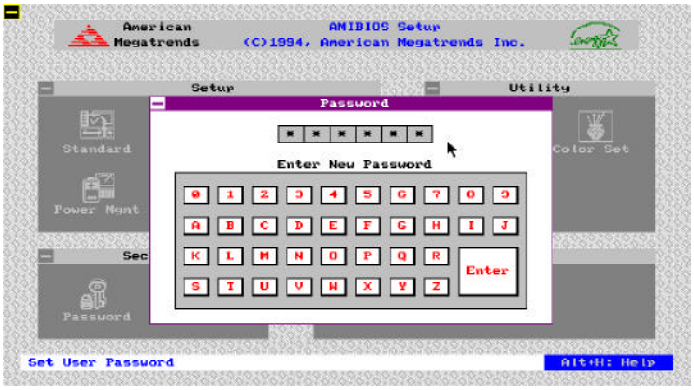
This feature specifies PCI on-board IDE controller's PIO speed mode. The options are ***Mode 0, Mode 1, Mode 2, Mode 3,*** and ***Auto***.

BIOS default for Serials and Parallel port

ITEM	IRQ	Address
COM 1	4	3F8H
COM 2	3	2F8H
COM 3	4	3E8H
COM 4	3	2E8H
LPT 1	7	378H
LPT 2	5	278H

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. The following screen appears when you select the password icon.



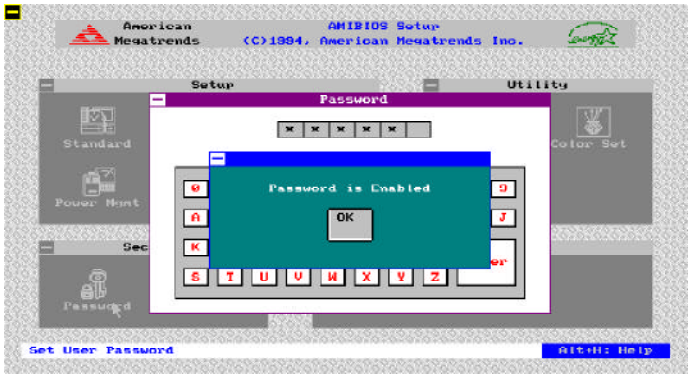
You can enter a password by:

- ❒ 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 refigure them. 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 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, you are prompted for the password if the password function is present and is enabled.

Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, you must drain CMOS RAM and reconfigure the system.

Appendix A

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 539 mainboard's WinBIOS.

UNCOMPRESSED CODE CHECKPOINTS

C2	NMI is Disabled. Power on delay starting.
C5	Power on delay completely.
	Going to enable ROM. i.e. disable Cache if any.
C6	Calculating ROM BIOS checksum.
C7	ROM BIOS checksum passed.
	CMOS shutdown register test to be done next.
C8	CMOS shutdown register test done.
	CMOS checksum calculation to be done next.
CA	CMOS checksum calculation is done, CMOS Diag byte written.
	CMOS status register about to init for Date and Time.
CB	CMOS status register init done.
	Any initialization before keyboard BAT to be done next.
CD	BAT command to keyboard controller is to be issued.
CE	Keyboard controller BAT result verified.
	Any initislisation after KB controller BAT to be done next.
CF	Initislisation after KB controller BAT done.
	Keyboard command byte to be written next.

D1 Keyboard controller command byte is written.

Going to check pressing of <INS> key during power-on.

D2 Checking for pressing of <INS> key during power-on done.

Going to disable DMA and Interrupt controllers.

D3 DMA controller #1,#2, interrupt controller #1,#2 disabled.

Video display is disabled and port-B is initialized.

Chipset init/ auto memory detection about to begin.

D4 Chipset initialization/ auto memory detection over.

To uncompress the RUNTIME code.

D5 RUNTIME code is uncompressed.

DD Transfer coontrol to uncompressed code in shadow RAM at F000:FFF0.

RUNTIME CODE IS UNCOMPRESSED

01 Processor register test about to start, and NMI to be disabled.

02 NMI is Disabled. Power on delay starting.

03 Power on delay complete. To check soft reset/power-on.

05 Soft reset/power-on determined. Going to disable Cache if any.

06 POST code to be uncompressed.

08 POST code is uncompressed.

CMOS checksum calculation to be done next.

09 CMOS checksum calculation is done, CMOS Diag byte written.

CMOS init. to begin.

0A CMOS initialization done (if any).

CMOS status register about to init for Date and Time.

0B CMOS status register init done.

Any initialization before keyboard BAT to be done next.

0C	KB controller I/B free.
	Going to issue the BAT command to keyboard controller.
0D	BAT command to keyboard controller is issued.
	Going to verify the BAT command.
0E	Keyboard controller BAT result verified.
	Any initislisation after KB controller BAT to be done next.
0F	Initislisation after KB controller BAT done.
	Keyboard command byte to be written next.
10	Keyboard controller command byte is written.
	Going to issue Pin-23,24 blocking/unblocking command.
11	Pin-23,24 of keyboard controller is blocked/ unblocked.
	Going to check pressing of <INS> key during power-on.
12	Checking for pressing of <INS> key during power-on done.
	Going to disable DMA and Interrupt controllers.
13	DMA controller #1,#2, interrupt controller #1,#2 disabled.
	Video display is disabled and port-B is initialized.
	Chipset init about to begin.
14	Chipset initialization over. 8254 timer test about to start.
19	8254 timer test over. About to start memory refresh test.
1A	Memory Refresh line is toggling.
	Going to check 15 micro second ON/OFF time.
20	Memory Refresh period 30 micro second test complete.
	Base 64K test about to start.
23	Base 64k test passed.
	Going to set BIOS stack and to do any setup before Interrupt vector init.
24	Setup required before vector initialzation complete.
	Interrupt vector initialization about to begin.

25	Interrupt vector initialization done.
	Going to read Input port of 9042 for turbo switch (if any) and to clear password if post diag switch is on.
26	Input port of 8042 is read.
	Going to initialize global data for turbo switch.
27	Global data initialization for turbo switch is over.
	Any initialization before setting video mode to be done next.
28	Initialization before setting video mode is complete.
	Going for monochrome mode and color mode setting.
2A	Different BUSes init (system, static, output devices) to start if present.
2B	About to give control for any setup required before optional video ROM check.
2C	Processing before video ROM control is done.
	About to look for optional video ROM and give control.
2D	Optional video ROM control is done. About to give control
	to do any procesing after video ROM returns control.
2E	Return from processing after the video ROM control.
	If EGA/VGA not found then do display memory R/W test.
2F	EGA/VGA not found. Display memory R/W test about to begin.
30	Display memory R/W test passed. About to look for the retrace checking.
31	Display memory R/W test or retrace checking failed.
	About to do alternate Display memory R/W test.
32	Alternate Display memory R/W test passed.
	About to look for the alternate display retrace checking.
34	Video display checking over. Display mode to be set next.
37	Display mode set. Going to display the power on message.

38	Different BUSes init (input, IPL, general devices) to start if present.
39	Display different BUSes initialisation error messages.
3A	New cursor position read and saved.
	Going to display the Hit <DEL> message.
3B	Hit <DEL> message displayed.
	Virtual mode memory test about to start.
40	Going to prepare the descriptor tables.
42	Descriptor tables prepared.
	Going to enter in virtual mode for memory test.
43	Entered in the virtual mode.
	Going to enable interrupts for diagnostics mode.
44	Interrupts enabled (if diagnostics switch is on).
	Going to initialize data to check memory wrap around at 0:0.
45	Data initialized. Going to check for memory wrap around at 0:0
	and finding the total system memory size.
46	Memory wrap around test done. Memory size calculation over.
	About to go for writing patterns to test memory.
47	Pattern to be tested written in extended memory.
	Going to write patterns in base 640k memory.
48	Patterns written in base memory.
	Going to findout amount of memory below 1M memory.
49	Amount of memory below 1M found and verified.
	Going to findout amount of memory above 1M memory.
4B	Amount of memory above 1M found and verified.
	Check for soft reset and going to clear memory below 1M for soft reset. (If power on, go to check point# 4Eh).

4C	Memory below 1M cleared. (SOFT RESET)
	Going to clear memory above 1M.
4D	Memory above 1M cleared. (SOFT RESET)
	Going to save the memory size. (Goto check point# 52h).
4E	Memory test started. (NOT SOFT RESET)
	About to display the first 64k memory size.
4F	Memory size display started. This will be updated during
	memory test. Going for sequential and random memory test.
50	Memory testing/initilisation below 1M complete.
	Going to adjust displayed memory size for relocation/ shadow.
51	Memory size display adjusted due to relocation/ shadow.
	Memory test above 1M to follow.
52	Memory testing/initialisation above 1M complete.
	Going to save memory size information.
53	Memory size information is saved. CPU registers are saved.
	Going to enter in real mode.
54	Shutdown successfull, CPU in real mode. Going to disable gate A20 line.
57	A20 address line disable successful.
	Going to adjust memory size depending on relocation/shadow.
58	Memory size adjusted for relocation/shadow.
	Going to clear Hit <DEL> message.
59	Hit <DEL> message cleared. <WAIT...> message displayed.
	About to start DMA and interrupt controller test.
60	DMA page register test passed.
	About to go for DMA #1 base register test.
62	DMA #1 base register test passed.
	About to go for DMA #2 base register test.

65 DMA #2 base register test passed.
About to program DMA unit 1 and 2.

66 DMA unit 1 and 2 programming over.
About to initialize 8259 interrupt controller.

67 8259 initialization over. About to start keyboard test.

7F Extended NMI sources enabling is in progress.

80 Keyboard test started. clearing output buffer, checking for stuck key, About to issue keyboard reset command.

81 Keyboard reset error/stuck key found. About to issue keyboard controller interface test command.

82 Keyboard controller interface test over.
About to write command byte and init circular buffer.

83 Command byte written, Global data init done.
About to check for lock-key.

84 Lock-key checking over.
About to check for memory size mismatch with cmos.

85 Memory size check done. About to display soft error and check for password or bypass setup.

86 Password checked. About to do pogramming before setup.

87 Programming before setup complete.
Going to uncompresse SETUP code and execute cmos setup.

88 Returned from cmos setup program and screen is cleared.
About to do programming after setup.

89 Programming after setup complete.
Going to display power on screen message.

8B First screen message displayed. <WAIT...> message displayed.
About to do Main and Video BIOS shadow.

8C	Main and Video BIOS shadow successful.
	Setup options programming after cmos setup about to start.
8D	Setup options are programmed, mouse check and init to be done next.
8E	Mouse check and initialisation complete.
	Going for hard disk controller reset.
8F	Hard disk controller reset done. Floppy setup to be done next.
91	Floppy setup complete. Hard disk setup to be done next.
94	Hard disk setup complete.
	Going to set base and extended memory size.
95	Memory size adjusted due to mouse support, hard disk type-47.
	Init of different BUSes optional ROMs from C800 to start.
96	Going to do any init before C800 optional ROM control
97	Any init before C800 optional ROM control is over.
	Optional ROM check and control will be done next.
98	Optional ROM control is done. About to give control to do
	any required procesing after optional ROM returns control.
99	Any initialization required after optional ROM test over.
	Going to setup timer data area and printer base address.
9A	Return after setting timer and printer base address.
	Going to set the RS-232 base address.
9B	Returned after RS-232 base address.
	Going to do any initialization before Co-processor test.
9C	Required initialization before co-processor is over.
	Going to initialize the coprocessor next.
9D	Coprocesor initialized.
	Going to do any initialization after Co-processor test.

9E	Initialization after co-processor test is complete.
	Going to check extd keyboard, keyboard ID and num-lock.
9F	Extd keyboard check is done, ID flag set. num-lock on/off.
	Keyboard ID command to be issued.
A0	Keyboard ID command issued. Keyboard ID flag to be reset.
A1	Keyboard ID flag reset. Cache memory test to follow.
A2	Cache memory test over.
	Going to display any soft errors.
A3	Soft error display complete.
	Going to set the keyboard typematic rate.
A4	Keyboard typematic rate set.
	Goin to program memory wait states.
A5	Memory wait states programming over.
	Going to clear the screen and enable parity/NMI.
A7	NMI and parity enabled. Going to do any initialization
	required before giving control to optional ROM at E000.
A8	Initialization before E000 ROM control over.
	E000 ROM to get control next.
A9	Returned from E000 ROM control. Going to do any
	initialization required after E000 optional ROM control.
AA	Initialization after E000 optional ROM control is over.
	Going to display the system configuration.
B0	System configuration is displayed.
	Going to uncompress SETUP code for hot-key setup.
B1	Uncompressing of SETUP code is complete.
	Going to copy any code to specific area.

00 Copying of code to specific area done.

Going to give control to INT 19h boot loader.

The system BIOS gives control to the different BUSes at following checkpoints to do various tasks on the different BUSes.

2A Different BUSes init (system, static, output devices) to start if present.

38 Different BUSes init (input, IPL, general devices) to start if present.

39 Display different BUSes initialisation error messages.

95 Init of different BUSes optional ROMs from C800 to start.

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 circiut 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 perate 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.