AWARDBIOS CMOS SETUP UTILITY

Version 4.51G

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Introduction

This manual discusses Phoenix Technologies's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The Phoenix Technologies AwardBIOS installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means that it supports Intel/Cyrix/AMD processors in a standard IBM-AT compatible input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

The Phoenix Technologies AwardBIOS has been customized by adding important, but non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

The rest of this manual is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The Phoenix Technologies AwardBIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or

2. by pressing the <Del> key or by simultaneously pressing <Ctrl>, <Alt>, and <Esc> keys when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

   TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC OR DEL KEY

   If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

   PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

Using Setup

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

```
Up arrow        Move to previous item

Down arrow      Move to next item

Left arrow      Move to the item in the left hand

Right arrow     Move to the item in the right hand

Esc key         Main Menu -- Quit and not save changes into CMOS
                Status Page Setup Menu and Option Page Setup Menu
                -- Exit current page and return to Main Menu

PgUp key        Increase the numeric value or make changes

PgDn key        Decrease the numeric value or make changes

+ key           Increase the numberic value or make changes

- key           Decrease the numberic value or make changes

F1 key          General help, only for Status Page Setup Menu and
                Option Page Setup Menu

(Shift)F2       Change color from total 16 colors.  F2 to select
key             color forward, (Shift) F2 to select color backward

F3 key          Calendar, only for Status Page Setup Menu

F4 key          Reserved

F5 key          Restore the previous CMOS value from CMOS, only
                for Option Page Setup Menu

F6 key          Load the default CMOS value from BIOS default
                table, only for Option Page Setup Menu

F7 key          Load the default

F8 key          Reserved

F9 key          Reserved

F10 key         Save all the CMOS changes, only for Main Menu
```

Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the Phoenix Technologies AwardBIOS supports an override to the CMOS settings which resets your system to its defaults.

You can invoke this override by immediately pressing <Insert> when you restart your computer. You can restart by either using the ON/OFF switch, the RESET button or by pressing <Ctrl>, <Alt> and <Delete> at the same time.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Phoenix Technologies and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

A Final Note About Setup

Not all systems have the same Setup. While the basic look and function of the Setup program remains the same for all systems, individual motherboard and chipset combinations require custom configurations. For example, you may find that your Setup main menu has a different number of entries from the main menu displayed in this manual. These are simply features not supported (or not user configurable) on your system.

The final appearance of the Setup program also depends on the Original Equipment Manufacturer (OEM) who built your system. If your OEM has decided that certain items should only be available to their technicians, those items may very well be removed from the Setup program.

Section 1

Main Menu

Once you enter the Phoenix Technologies AwardBIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Setup

This setup page includes all the items in a standard, AT-compatible BIOS. See Section 2 for details.

BIOS Features Setup

This setup page includes all the items of Phoenix Technologies special enhanced features. See Section 3 for details.

Password Setting

Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup. See Section 4.

Load BIOS Defaults

The BIOS defaults have been set by the manufacturer and represent settings which provide the minimum requirements for your system to operate.

Load Setup Defaults

The chipset defaults are settings which provide for maximum system performance. While Phoenix Technologies has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.

IDE HDD Auto Detection

Automatically detect and configure hard disk parameters. The Phoenix Technologies AwardBIOS includes this ability in the event you are uncertain of your hard disk's paramenters. See also Section 2, "Standard CMOS Setup".

HDD Low Level Format

If supported by your system, this provides a hard disk low level format utility. See Appendix D for details.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Save

Abandon all CMOS value changes and exit setup.

Section 2

Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Date

The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

```
day        The day, from Sun to Sat, determined by the BIOS and
           is display-only

date       The date, from 1 to 31 (or the maximum allowed in the
           month)

month      The month, Jan through Dec

year       The year, from 1900 through 2099
```

Time

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

Daylight saving

The category adds one hour to the clock when daylight-saving time begins. It also subtracts one hour when standard time returns.

```
Enabled       Enable daylight-saving

Disabled      Disable daylight-saving
```

Drive C Type/Drive D Type

The categories identify the types of hard disk drive C or drive D that have been installed in the computer. There are 46 predefined types and a user definable type. Type 1 to Type 46 are predefined. Type "User" is user-definable.

Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type "User" to define your own drive type manually.

If you select Type "User", you will need to know the information listed below. Enter the information directly from the keyboard and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.

```
CYLS.          number of cylinders

HEADS          number of heads

PRECOMP        write precom

LANDZONE       landing zone

SECTORS        number of sectors
```

If a hard disk has not been installed select NONE and press <Enter>.

Drive A Type / Drive B Type

The category identifies the types of floppy disk drive A or drive B that have been installed in the computer.

```
None           No floppy drive installed

360K, 5.25 in  5-1/4 inch PC-type standard drive; 360 kilobyte
               capacity

1.2M, 5.25 in  5-1/4 inch AT-type high-density drive; 1.2
               megabyte capacity

720K, 3.5 in   3-1/2 inch double-sided drive; 720 kilobyte
               capacity

1.44M, 3.5 in  3-1/2 inch double-sided drive; 1.44 megabyte
               capacity

2.88M, 3.5 in  3-1/2 inch double-sided drive; 2.88 megabyte
               capacity
```

Video

The category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

```
EGA/VGA       Enhanced Graphics Adapter/Video Graphics Array.
              For EGA, VGA, SEGA, SVGA or PGA monitor adapters.

CGA 40        Color Graphics Adapter, power up in 40 column mode

CGA 80        Color Graphics Adapter, power up in 80 column mode

MONO          Monochrome adapter, includes high resolution
              monochrome adapters
```

Error Halt

The category determines whether the computer will stop if an error is detected during power up.

```
No errors     Whenever the BIOS detects a non-fatal error the
              system will be stopped and you will be
              prompted.

All errors    The system boot will not be stopped for any
              error that may be detected.

All,          The system boot will not stop for a keyboard
But Keyboard  error; it will stop for all other errors.

All, But      The system boot will not stop for a disk error;
Diskette      it will stop for all other errors.

All, But      The system boot will not stop for a keyboard or
Disk/Key      disk error; it will stop for all other errors.
```

Memory

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

Base Memory

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

Extended Memory

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

Expanded Memory

Expanded Memory is memory defined by the Lotus/Intel/Microsoft (LIM) standard as EMS. While most standard DOS applications cannot access memory above 640K, the Expanded Memory Specification (EMS) provides an interface allowing access to all system memory. While still in use by some DOS applications, EMS is rapidly declining in importance since new processors and operating systems prefer extended memory.

A special, expanded memory device driver is required to use memory as Expanded Memory.

Other Memory

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

Section 3

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Virus Warning

When this item is enabled, the Phoenix Technologies AwardBIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

```
                ! WARNING !
  Disk boot sector is to be modified
  Type "Y" to accept write or "N" to
              abort write
         Phoenix Technologies, Ltd.
```

Enabled   Activates automatically when the system boots up
           causing a warning message to appear when anything
           attempts to access the boot sector or hard disk
           partition table.

Disabled   No warning message will appear when anything attempts
           to access the boot sector or hard disk partition
           table.

NOTE: Many disk diagnostic programs which attempt to access the boot sector table can cause the above warning message. If you will be running such a program, we recommend that you first disable Virus Protection beforehand.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is disable.

Enabled   Enable cache

Disabled   Disable cache

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

```
Enabled     Enable quick POST

Disabled    Normal POST
```

Boot Sequence

This category determines which drive to search first for the disk operating system (i.e., DOS). Default value is A,C.

```
C,A     System will first search for hard disk drive then
        floppy disk drive.

A,C     System will first search for floppy disk drive then
        hard disk drive.
```

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

```
Enabled    BIOS searches for floppy disk drive to determine
           if it is 40 or 80 tracks.  Note that BIOS can not
           tell from 720K, 1.2M or 1.44M drive type as they
           are all 80 tracks.

Disabled   BIOS will not search for the type of floppy disk
           drive by track number.   Note that there will not
           be any warning message if the drive installed is
           360K.
```

Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on.

```
On          Keypad is number keys

Off         Keypad is arrow keys
```

Boot Up System Speed

Selects the default system speed -- the normal operating speed at power up.

```
High        Set the speed to high

Low         Set the speed to low
```

IDE HDD Block Mode

By enabling block mode for your IDE hard disk drive (HDD), you allow your system to read and write to the drive using large blocks of data instead of individual bytes.

```
Enabled     Enable IDE HDD Block Mode

Disabled    Disable IDE HDD Block Mode
```

Gate A20 Option

This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbyte. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

```
Normal      keyboard

Fast        chipset
```

Memory Parity Check

Parity is a measure of the consistency of your system's RAM, memory chips. Plus, there is both parity and non-parity memory. At boot, the Phoenix Technologies AwardBIOS both sizes and tests all memory. Normally, when a parity error is detected, the BIOS will display a message describing the problem as well as the problem's location, if possible. The boot process will then terminate and you will not be able to continue until the bad chip or SIMM is located and replaced.

Disabling the Memory Parity Check allows the system to by-pass the test and allow your system to boot. You then have a choice of continuing to operate your system or attempting the remedying the problem.

```
Enabled     Normal memory parity check

Disabled    Ignore memory parity check
```

Typematic Rate Setting

This determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin the report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys.

```
Enabled     Enable typematic rate

Disabled    Disable typematic rate
```

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, this selection allows you select the rate at which the keys are accelerated.

```
6           6 characters per second

8           8 characters per second

10          10 characters per second

12          12 characters per second

15          15 characters per second
```

```
20          20 characters per second

24          24 characters per second

30          30 characters per second
```

Typematic Delay (Msec)

When the typematic rate is enabled, this selection allows you to select the delay between when the key was first depressed and when the acceleration begins.

```
250         250 msec

500         500 msec

750         750 msec

1000        1000 msec
```

Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

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

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

System BIOS Shadow

It determines whether the system BIOS will be copied to RAM, for faster access. However, it is optional depending on chipset design. System Shadow will improve system performance.

```
Enabled     System shadow is enabled
```

```
Disabled   System shadow is disabled
```

Video BIOS Shadow

Determines whether video BIOS will be copied to RAM. However, it is optional depending on chipset design. Video Shadow will increase the video speed.

```
Enabled    Video shadow is enabled
Disabled   Video shadow is disabled
```

C8000 - CFFFF Shadow/E8000 - EFFFF Shadow

These categories determine whether option ROMs will be copied to RAM. An example of such option ROM would be support of on-board SCSI.

```
Enabled    Optional shadow is enabled
Disabled   Optional shadow is disabled
```

Section 4

Password Setting

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 4). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

Appendix A

POST Messages

During the Power On Self Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.

If a message is displayed, it will be accompanied by:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there is only one beep code in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA Configuration Checksum Error
PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA Configuration Is Not Complete
PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration
PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory Address Error at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory Verify Error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found
PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

NOTE; When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should Have EISA Board But Not Found
PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong Board In Slot
PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Appendix B

POST Codes

NOTE: EISA POST codes are typically output to port address 300h.
ISA POST codes are output to port address 80h.

POST (hex)	Name	Description
C0	Turn Off Chipset Cache	OEM Specific-Cache control
1	Processor Test 1	Processor Status (1FLAGS) Verification. Tests the following processor status flags carry, zero, sign, overflow, The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SQWV Disable video, parity checking, DMA Reset math coprocessor Clear all page registers, CMOS shutdown byte Initialize timer 0, 1, and 2, including set EISA timer to a known state Initialize DMA controllers 0 and 1 Initialize interrupt controllers 0 and 1 Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed inorder to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default	Program chipset registers with power

	Initialization	on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory
C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection
8	Setup low memory	Early chip set initialization Memory presence test OEM chip set routines Clear low 64K of memory Test first 64K memory.
9	Early Cache Initialization	Cyrix CPU initialization Cache initialization
A	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional) Set NUM_LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and initialization
10	Test DMA Controller 1	
11	Test DMA Page Registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.

17	Test Stuck 8259's Interrupt Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity/IO Check)	Verify NMI can be cleared.
1A		Display CPU clock
1B-1E	Reserved	
1F	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests an clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).
20	Enable Slot 0	Initialize slot 0 (System Board).
21-2F	Enable Slts 1-15	Initialize slots 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256K to 640K and extended memory above 1MB.
31	Test Base and Extended Memory	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. NOTE: This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode.
32	Test EISA Extended Memory	If EISA Mode flag is set then test EISA memory found in slots initialization. NOTE: This will be skipped in ISA mode and can be "skipped" with ESC key in EISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values
40		Display virus protect disable or

```
                       enable

41      Initialize         Initialize floppy disk drive
        Floppy Drive &     controller and any drives.
        Controller

42      Initialize Hard    initialize hard drive controller and
        Drive &            any drives.
        Controller

43      Detect &           Initialize any serial and parallel
        Initialize         ports (also game port).
        Serial/Parallel
        Ports

44      Reserved

45      Detect &           Initialize math coprocessor.
        Initialize Math
        Coprocessor

46      Reserved

47      Reserved

48-4D   Reserved

4E      Manufacturing      Reboot if Manufacturing POST Loop pin
        POST Loop or       is set.  Otherwise display any
        Display Messages   messages (i.e., any non-fatal errors
                           that were detected during POST) and
                           enter Setup.

4F      Security Check     Ask password security (optional).

50      Write CMOS         Write all CMOS values back to RAM and
                           clear screen.

51      Pre-boot Enable    Enable parity checker
                           Enable NMI, Enable cache before boot.

52      Initialize         Initialize any option ROMs present
        Option ROMs        from C8000h to EFFFFh.
                           NOTE:  When FSCAN option is enabled,
                           will initialize from C8000h to
                           F7FFFh.

53      Initialize Time    Initialize time value in 40h: BIOS
        Value              area.

60      Setup Virus        Setup virus protect according to
        Protect            Setup

61      Set Boot Speed     Set system speed for boot

62      Setup NumLock      Setup NumLock status according to
                           Setup

63      Boot Attempt       Set low stack
                           Boot  via INT 19h.

B0      Spurious           If interrupt occurs in protected
                           mode.
```
27

```
   B1      Unclaimed NMI       If unmasked NMI occurs, display
                               Press F1 to disable NMI, F2 reboot.

 E1-EF     Setup Pages         E1- Page 1, E2 - Page 2, etc.

FF         Boot
```

Appendix C

BIOS Default Drive Table

This is a current list of the drive type table contained in Setup.

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
1	10	306	4	17	128	305	TEAC SD510, MMI 112, 5412
2	20	615	4	17	300	615	Seagate ST225, ST4026
3	30	615	6	17	300	615	
4	62	940	8	17	512	940	
5	46	940	6	17	512	940	
6	20	615	4	17	None	615	Seagate ST125, Tandon TM262
7	30	462	8	17	256	511	
8	30	733	5	17	None	733	Tandon TM 703
9	112	900	15	17	None	901	
10	20	820	3	17	None	820	
11	35	855	5	17	None	855	
12	49	855	7	17	None	855	
13	20	306	8	17	128	319	Disctron 526, MMI M125
14	42	733	7	17	None	733	
15		Reserved					
16	20	612	4	17	0	663	Microscience HH725, Syquest 3250, 3425
17	40	977	5	17	300	977	
18	56	977	7	17	None	977	
19	59	1024	7	17	512	1023	
20	30	733	5	17	300	732	

21	42	733	7	17	300	732	
22	30	306	5	17	300	733	Seagate ST4038
23	10	977	4	17	0	336	
24	40	1024	5	17	None	976	Seagate ST4051
25	76	1224	9	17	None	1023	Seagate ST4096
26	71	1224	7	17	None	1223	Maxtor 2085
27	111	1224	11	17	None	1223	Maxtor 2140, Priam S14
28	152	1024	15	17	None	1223	Maxtor 2190, Priam S19
29	68	1024	8	17	None	1023	Maxtor 1085, Micropolis 1325
30	93	918	11	17	None	1023	Maxtor 1105 1120, 4780
31	83	925	11	17	None	1023	Maxtor 1170
32	69	1024	9	17	None	926	CDC 9415
33	85	1024	10	17	None	1023	
34	102	1024	12	17	None	1023	
35	110	1024	13	17	None	1023	
36	119	1024	14	17	None	1023	
37	17	1024	2	17	None	1023	
38	136	1024	16	17	None	1023	
39	114	918	15	17	None	1023	Maxtor 1140, 4380
40	40	820	6	17	None	820	Seagate ST251
41	42	1024	5	17	None	1023	Seagate 4053 Miniscribe 3053/6053
42	65	1024	5	26	None	1023	Miniscribe 3053/6053 RLL
43	40	809	6	17	None	852	Miniscribe 3650
44	61	809	6	26	None	852	Miniscribe 3675 RLL

```
45    100     776     8     33     None    775 Conner CP3104
46    203     684     16    38     None    685 Conner CP3204
```

User

Appendix D

Low-Level Format Utility

This Phoenix Technologies Low-Level-Format Utility is designed as a tool to save your time formatting your hard disk. The Utility automatically looks for the necessary information of the drive you selected. The Utility also searches for bad tracks and lists them for your reference.

Shown below is the Main Menu after you enter into the Phoenix Technologies Low-Level-Format Utility.

Control Keys

Use the Up and Down arrow keys to move around the selections displayed on the upper screen. Press [Enter] to accept the selection. Press Esc to abort the selection or exit the Utility.

SELECT DRIVE

Select from installed hard disk drive C or D. Listed at the bottom of the screen is the drive automatically detected by the utility.

BAD TRACK LIST

Auto Scan Bad Track

The utility will automatically scan bad tracks and list the bad tracks in the window at the right side of the screen.

Add Bad Track

Directly type in any information about known bad tracks in the window at the right side of the screen.

Modify Bad Track

Modify information about the added bad tracks in the window at the right side of the screen.

Delete Bad Track

Delete the added bad tracks in the window at the right side of the screen.

Clear Bad Track Table

Clear the whole bad track list in the window at the right side of the screen.

PREFORMAT

Interleave

Select the interleave number of the hard disk drive you wish to perform low level format. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for utility automatic detection.

Auto Scan Bad Track

This allows the utility to scan for bad sectors first then format by each track.

Start

Press <Y> to start low level format.