BIOS Manual

for

HIPPO COM

(MR BIOS)

REVISION: 1.0

The system BIOS provides an interface for the software to control the hardware and is recorded in a ROM (Read Only Memory) chip. Upon power-up, it will also carry out a thorough diagnostic test to make sure the system is functional. It will initialize the chipset with setting stored in the CMOS RAM.

Then it proceeds to load the disk operating system and you can start to work with your applications.

In this supplementary, it mainly explains the BIOS Setup Utility, in which you can set up your system to suit your configuration and applications. In case you have any doubt, consult your dealer. Improper setting may cause reliability problem or system failure.

SETUP UTILITY DESCRIPTION

A Setup Utility is incorporated into the BIOS which allows the user to change the system configuration, and to select a variety of options.

You may enter the Setup Utility in three ways:

(1) A configuration change detected, or
(2) ESC is pressed during cold-boot, or
(3) CTRL+ALT+ESC is pressed to warm-boot into Setup.

The Setup Utility is an interactive program for the system setup. You can enter the system configuration, such as clock, hard disk type and floppy disk type. There are many advanced options available to you to improve the system performance. The settings for these options are preset to a proper value, such that the overall performance is optimal. In most case, you only need to setup the clock, hard disk type and floppy disk type.

The main screen format of setup utility consists of these four fields:

(1) Copyright/Version

On the top two lines on the screen, the BIOS version number is shown.

(2) Menu Line

A list of setup section names appears on this line, from which a specific section may be selected. Use 'Left' and 'Right' arrow key to change from one setup section to another and the corresponding Edit-Page (see below) is shown. Press ENTER key to enter the setup section.

(3) Edit Page

In the Edit page, setup options are listed. You can move the cursor to a particular field and change the setting. Press PgUp key to exit.

(4) Prompt Line

The Setup-Utility is designed to be usable without the aid of this manual. In the prompt line, acceptable key-strokes and corresponding explanation are listed.The main Setup Menu is shown as below when the Setup Utility is invoked.

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Summary	Clock	Video	Floppy	Fixed	Boot-Seq	Keyboard	More-->

CPU Type 486DX	wloppy 0 ..... 1.2M [5¼]
CPU Rev 0411	Floppy 1 ..... None
CPU MHz 40.0	Floppy 2 ..... None
Math Unit ..... Built-in	Floppy 3 ..... None
	Fixed 80 (C:) ..... Type 17
RAM Cache ..... enable	Fixed 81 (D:) ..... None
Shadow RAM ..... Enable	Boot Sequence ..... C: 1st
Memory-Base 640K	Anti-Virus ..... Disable
Memory-Extended 3328K	Security ..... Disable
Memory-System 128K	
Memory-Total 4096K	Keyboard ..... AT
	NumLock ..... On
COM1 ..... 3F8 | LPT1 378	Typematic 30.0
COM2 ..... n/a | LPT2 ..... n/a	
COM3 ..... n/a | LPT3 ..... n/a	Video-Primary ..... V/EGA-Color
COM4 ..... n/a | LPT4 ..... n/a	Video-Secondary ..... n/a

F10 to Record and Exit	Home End Moves Cursor

PROMPT-LINE TEXT

The purpose of this section is to further explain the meanings of the keystroke prompts. They are somewhat abbreviated due to screen space limitations.

F10 TO RECORD AND EXIT

Press F10 to record the new configuration to CMOS, and terminate the Setup session. The system will proceed to boot-up.

HOME END (LEFT/RIGHT ARROWS) MOVES CURSOR

The Menu-cursor can be moved respectively to the first entry, last entry, or next leftward/rightward entry.

(ENTER) TO SELECT

When the cursor is in Menu Line, you need to press enter key to enter the Edit Page for a particular setup section. The cursor will move from the Menu Line into the Edit Page, on the first field.

ESC FOR MENU

When the cursor is currently in the Edit-Page, press ESC (or PgUp) to return to Menu-Line.

(UP/DOWN/LEFT/RIGHT ARROWS) MOVES CURSOR3

The cursor is currently illuminating a field within an Edit-Page. It may be moved to another field via these cursor keys.

(ENTER) TO EDIT

The cursor is currently illuminating a field within Edit-Page. This particular field can be entered with numbers or letters. Press ENTER to enter the editing mode. The field remains illuminated, and a small blinking underline cursor will appear under the leftmost editable character in that field. In general, Left-Arrow, Right-Arrow, Space, Backspace, and AlphaNumerics are accepted in edit mode. ESC will restore the field to its initial state and the blinking underline will disappear. ENTER will finalize the editing mode and the blinking underline will disappear. All "edit-mode" keystrokes are prompted.

+-SCROLLS CHOICES
SPACEBAR +- TO CHANGE
SPACEBAR +- SCROLLS CHOICES

The cursor is currently illuminating a field within the Edit-Page which may be changed. Press SpaceBar or "+" to change to other available options. The options are rolled through a list in the forward direction. BackSpace and "-" roll the options in reverse order.

ESOTERIC PROMPTS

A few special-case prompts also exist. Generally, they specify a range of numbers or a particular set of AlphaNumeric characters that will be accepted in the field. For example, the CLOCK Time-Of-Day subfield accepts Alphabetic "a" and "p" to indicate am and pm.

The SECURITY utility requires pressing ENTER after selecting a new configuration. This additional step is not consistent with behaviour of the other utilities, but is necessary so that a new password can be prompted when appropriate, and so the current password is not dismissed if the user simply scroll through available options.

The LOW-LEVEL-FORMAT field column within the FIXED disk configuration utility cannot be accessed until CTRL-F is pressed. Pressing ESC while the cursor is in that column will move it to a non-Format column on the screen. While the format is in progress, ESC will immediately terminate the process.

SETUP SECTION

There are currently 13 sections contained in BIOS Setup. As the cursor is moved across the Menu Line, Page for the respective Setup Section appears in the Edit. A quick summary of the utilities is given below.

(1) SUMMARY UTILITY PAGE

In the Summary Section, the basic configurations and characteristic of your system can be viewed here. Each of the fields are explained below with an example of how they might appear:

CPU

The type and revision number of the CPU is shown.

CPU 486DX	indicates a 486DX processor chip

MATH UNIT

Numeric-Coprocessor-Extension type found in the system.

Math Unit	Description
Built-in	486DX/486DX2 intall

RAM CACHE

It indicates status of cache size.

RAM CACHE	
Enable	8K Cache Enable
Disable	No Cache Install

SHADOW RAM

Indicates if any part of the (384K) ROM space is mapped to shadow RAM.

For example, Shadow RAM ..... n/a
Shadow RAM ..... Enable
Shadow RAM ..... Disable

MEMORY-BASE

Indicates the amount of base memory (below 1 Megabyte boundary). Possible range is 64K to 640K.

MEMORY-EXTENDED

Indicates the amount of extended memory (above 1 Megabyte boundary). Possible range is 0K to 15360K.

For example, Memory-Extended 1024K

MEMORY-SYSTEM

Indicates the amount of special OEM memory found to be in working order. Typically, this field will be un-implemented (0K), or will represent the 384K available for shadow RAM or relocation to the Extended Memory pool.

For example, Memory-System 384K

MEMORY-TOTAL

This is simply a sum of the three preceding quantities.

For example, Memory-Total 2048K

COM1, COM2, COM3, COM4

Indicates if RS232 serial port COM1 is present, and its I/O address.

For example, COM1 ..... n/a
COM1 ..... 3F8
COM1 ..... 2F8

LPT1, LPT2, LPT3 and LPT4

Indicates if parallel (printer) port LPT1 is present, and its I/O address.

For example, LPT1 ..... n/a
LPT1 ..... 3BC
LPT1 378
LPT1 278

FLOPPY 0, FLOPPY 1, FLOPPY 2 AND FLOPPY 3

Indicates floppy drive type and step rate. The "type" can be 5¼ 360K, 5¼ 1.2M, 3½ 720K, 3½ 1.4M AND 3¼ 2.8M. The "step rate" is given as two options : fast or slow required for the read/write head to be moved to an adjacent cylinder.

Floppy 0	Description
None	Card present but no drive
5¼ 1.2M	5¼ inch

FIXED 80 (C:), FIXED 81 (D:)

Indicates fixed disk type, step rate encoding and if "Translation Mode" is in effect. If the "Translation Mode" is enabled for this disk a letter "T" will be shown. the step rate will be shown if set to non-zero.

Fixed 80 (C:)	Description
N/A	Fixed controller card not present
None	Drive type "0", no drive present
2	Drive type "2", no special features
47T	Drive type "47T", Translation Mode
8 {F}	Drive type "8", special Step rate
46T {E}	Drive type "46", Translate+Step rate

BOOT SEQUENCE

Specifies the selected order in which the disk will be booted.

Boot-Sequence	Description
A: 1st	Try A:first, if failure, try C:
C: 1st	Try C:first, if failure, try A:
Prompt	Screen prompt for drive A: - D:

ANTI-VIRUS

The Anti-Virus is provided in two options:

enable
disable

SECURITY

The state of password-Security is shown in this field.

For example, Security ..... Enable
Security ..... Disable

KEYBOARD

The keyboard type is shown in this field.

Eg, Keyboard ... AT PC/AT type keyboard
Keyboard ... XT PC/XT type keyboard

NUMLOCK

The programmable powerup NumLock state is shown in this field.

Note: This is only meaningful for AT-type keyboards.

For example, NumLock ..... Off
NumLock ..... On

TYPEMATIC

The programmable powerup "typematic" repeat rate is shown here.

Note: This is only meaningful for AT-type keyboards.

Typematic	Description
Default	No rate programmed, speed approx 10 cps
30.0	30 cps rate is programmed

VIDEO-PRIMARY

Indicates the video adaptor which will be in use when the system boots.

Video-Primary	Description
None	Special Support, see VIDEO menu
Monochrome	B/W card
CGA - Snow	CGA, slow access due to "snow"
CGA - Fast	CGA, "snow" isn't problem
V/EGA-Mono	Advanced Graphics, B/W monitor
V/EGA-Color	Advanced Graphics, Color monitor

VIDEO-SECONDARY

Indicates if a second video card is present in the system. This will be displayed:

Video-Secondary ..... n/a

Otherwise, refer to VIDEO-PRIMARY above.

(2) CLOCK CONFIGURATION

The battery backed Real-Time-Clock (RTC) time, date, and daylight savings feature are programmed through this utility.

TIME

The time field is shown in 12 hour format, followed by a time-of-day indicator "a" or "p" (am/pm). Enter the time directly. After entering the second, the cursor moves the right most of the field, press `a' for am or`p' for pm.

Time hh/mm/ss t	Military
12:00:00 a	00:00:00
09:10:11 p	21:10:11

DATE

The date field is shown in mm/dd/yyyy format.

Date (mm/dd/yyyy)	
01/23/1990	January 23, 1990

DAYLIGHT SAVINGS

The RTC has a built-in capability to automatically adjust the time on the two daylight savings days of the year. If enable, on the last Sunday in April, the time increments from 1:59:59 am to 3:00:00 am. On the last Sunday in October, when the time reaches 1:59:59 am, it is rolled-back to 1:00:00 am. This feature is only useful in those countries using this scheme, such as United States. Otherwise, set the field to "Disable".

For example, Daylight Savings ..... Enable
Daylight Savings ..... Disable

(3) KEYBOARD CONFIGURATION

NUMLOCK

In 84-key AT-style keyboards, it lacks a dedicated cursor-control keypad. The NumLock control key is used on these keyboards to toggle the Numeric Keypad from numeric operation to cursor functions. In the original AT system, Numlock is always on after booting and thus the keypad is in numeric mode. You need to press the Numlock key once so as to use the cursor keys. 101/2 key keyboards have a dedicated Cursor Keypad in addition to the Numeric Keypad. The NumLock key is not necessary.

Through this utility, the boot-time default state of NumLock can be set. Select "Disable" or "Enable" accordingly.

TYPEMATIC RATE

When a key is pressed on the keyboard for a period of time, the keystroke will begin repeating at a predefined rate. The delay is by default 0.5 seconds and the repeat rate is 10 characters per second. This typematic repeat rate feature is a function of the keyboard and is not produced by the system BIOS. However, most of AT-style keyboards permit overriding the initial delay and subsequent repeat rate.

The BIOS can be configured to issue override typematic parameters to the keyboard at boot-time. Both the "Delay before repeat" and "typematic Repeat Rate" parameters can be selected. To accomplish this, "Enable" the "Typematic Override" field, and select the Delay and Rate in the other fields. We suggest a Delay of 0.5 seconds, and a Repeat Rate of 30.0 cps.

If the keyboard fails to function properly when overriding the default typematic state, disable the "Typematic Override" field. The Delay and Rate fields will display "Default" in response to this selection. In this way, no typematic parameters will be issued to the keyboard.

(4) FLOPPY DISK CONFIGURATION

This utility setups the floppy drive subsystem, drives A:, B:, C: and D:.

The BIOS supports the following types of floppy disk drives:

a. 5.25 inch, 360K bytes drive;
b. 5.25 inch, 1.2M bytes drive;
c. 3.5 inch, 720k bytes drive;
d. 3.5 inch, 1.4M bytes drive;
e. 3.5 inch, 2.8M bytes drive;

The "step-rate" parameter controls the speed which the drive head moves from track to track. Usually the fast rate is selected. In case that your disk drive cannot work with fast rate or your application depends on the timing of the drive, select the slower speed.

(5) FIXED DISK CONFIGURATION / LOW LEVEL FORMAT

This utility configures the fixed disk subsystem, drives C: and D:

The type of fixed disks may be selected from standard fixed disk table or defined as user-defined type 46 and 47. The drive parameter tables are comprised of these entries:

(1) Number of Cylinders
(2) Number of Heads
(3) Starting Precompensation Cylinder
(4) Landing Zone Cylinder
(5) Number of Sectors per Track

Make sure you choose the correct type. Otherwise, the system will have problem with the fixed disk. If the type of your fixed disk is not included in the standard table, define it in type 46 and 47. Move the cursor to the "Type" field and select 46 or 47. Then move the cursor down to the next field, "Cylinders", and press ENTER. Enter the number of cylinders, and press ENTER when done. Continue in this fashion, editing the "Heads", "Precomp", "Landing", and "Sector" fields.

Larger capacity fixed disk drives with higher track density may have more than 1024 cylinders, but the standard BIOS only supports upto 1024 tracks. There is a translation mode to surpass the 1024 cylinders limitation. up to 16384 (16K) cylinders can be addressed via the translation mode. The Translation Mode implementation is designed to be compatible both with programs which exclusively use the BIOS interface, and programs which interpret the fixed disk tables and run the drives directly. If Translate Mode is not selected, only the first 1024 cylinders will be accessible through the BIOS interface.

To support the translate mode, a Low-level-Format utility is supported by the BIOS. Press CTRL-F to enter Low-level Format utility. Enter the range of cylinders to be formatted. The sequence may be increasing or decreasing order. If the final cylinder is greater than the start cylinder, it is in increasing order. Otherwise, it is in deceasing order. Also, the "interleave" is programable. The default setting is "3". But most of the fixed disks and controllers nowadays, such as IDE hard disk, support interleave factor of "1". Consult the manual of hard disk and hard disk controller for detail.

Many advanced fixed disks are already formatted in the factory and low level format should not be done. Consult your dealer for detail.

Anti-Virus is provided as a user selectable option. It offers a measure of protection against malicious programs by trapping writes to the main boot sector. It also traps attempts to low-level-format any region of the fixed disk.

(6) BOOT SEQUENCE CONFIGURATION

BOOT SEQUENCE

In a typical BIOS implementation, whenever CTRL ALT DEL is pressed or cold-boot, an attempt to boot from drive A: always occurs first. If the drive is found to be empty, drive C: is booted. However, hard disk is always used as the boot device in the computer system, and drive A: is only used to transfer files. So booting directly from drive C: is more convenient and takes less time.

The boot sequence is now selectable. In addition to the usual "A: first, then C:" sequence, the order may be reversed so that drive C: is accessed first.

To override the boot sequence established in this utility, a special "hot-key" warm-boot sequence CTRL ALT ENTER is available. The effect is identical to CTRL ALT DEL, except a prompt appears on the screen asking which drive should be booted. For cold-boot, press ENTER during the memory test. A prompt will be shown to ask which drive is the boot device.

When "Screen-Prompt" is selected, the BIOS will always ask you to choose which drive to boot.

MEMORY PRIMING

Memory test will be carried out after cold-boot. When there is a lot of memory installed, the test will take some time. To speed up the test, you may change from "Full test" to "Quick scan". The BIOS will only perform a simple memory test which will just need a few seconds.

COLD-BOOT DELAY

Since power-up diagnostics only take a few second, some hard disks may not even complete their setup process and can not be accessed by the BIOS. In this case, the BIOS has to wait before the hard disk is ready. Otherwise, hard disk error will be reported. Maximum cold-boot delay is 30 seconds. Select a proper time delay to suit your hard disk. Set to "none" for no delay. `None' or a short delay is appropriate for most IDE hard disks.

(7) SECURITY CONFIGURATION

This utility is used to enable or disable Password Security.

This Security feature offers a measure of protection against unauthorized use of the computer, by requiring a password when the computer is first being powered up. Three opportunities are given to enter the correct password. If three unsuccessful attempts are made, the system will be halted and an alarm will be sounded. The alarm will persist until the power is turned off. After the correct password is entered, the computer will proceed to boot-up. Security feature is not applied to warm-boot, pressing CTRL-ALT-DEL.

The Setup-Utility is also password protected when Security feature is enabled. When entering the BIOS setup via CTRL ALT ESC, the SUMMARY page will be displayed as usual, but the user will be prompted to press "F10 to Exit", or "ENTER for Security Clearance".

When you select to enable the Security feature, a second field will appear on the screen for you to enter a password. A password consisting of zero to ten characters must be typed in. Asterisks are echoed to the screen, instead of the character typed, and the only keystroke available for editing is BackSpace. The password cannot be viewed. Press ENTER when you have entered the password. Then a prompt will appear requiring the same password to be entered again. The BIOS will compare the

entries and the process will repeat if the latter entry does not match the initial one.

All keystrokes recognized by BIOS can be used in the password. So, function keys such as F1 and combinations of keys, such as ALT F1 and SHIFT F1, are valid and considered different. Also Alphabetic characters are case-sensitive, which means "a" and "A" are different.

Once the password has been defined, it may subsequently be changed using this utility. To accomplish this, toggle the "Security" field entry from "Enable" to "Change Code", and press ENTER. The procedure is identical to initially installing the password.

(8) FIRST AID

The setup utility "First Aid" provides some measures to solve many problems in AT design.

The first one is the keyboard problem with Novell environment in high speed system. Keyboard may not be respond very well because Novell program is running at very fast speed but the keyboard is a slow speed device. The BIOS allows you to adjust a parameter to make the keyboard work properly. You need to test your selection. Set to the lowest value that can solve the problem.

The A20-GATE option is aimed at solving the problem with some applications using protected mode. The A20-GATE signal is generated from slow speen device. Sometimes the application crashes when toggling this signal. Setting this sigal. Setting this signal to "ON" can eliminate the problem.

(9) SPEED

This option selects the system boot up speed, normally, the system speed is high.

(10) SHADOW RAM CONFIGURATION

In this section, the BIOS allows you to select "shadow RAM" function for the address in 640K to 1M region. The BIOS will detect which address is occupied by adapter ROM and video ROM. The address range of C0000H to CFFFFH, which is usually used by VGA and EGA BIOS, is divided into four 16K blocks. The memory space from D0000H to DEEEEH is also divided into four 16K blocks. The last memory block is E0000H to EFFFFH. The BIOS ROM is resident at F0000H and is always shadowed.

When no memory block is selected to be shadowed in the range from D0000H to DFFFFH and E0000H to EFFFFH, these memory blocks may be mapped to the top of memory and served as extended memory. In this case, the memory block originally locates at A0000H to BFFFFH where is already occupied by display memory will also be remapped to the top of memory. There is additional 256KB available in the extended memory.

Each adapter ROM and video ROM will be

assigned a number. If a ROM occupies more than one block, the BIOS will show the same ROM number for each block.

To set a ROM to be shadowed, move the cursor to a particular block and change to the "WP-Shadow". If the ROM occupies more than one block, just set one block to be shadowed and then other blocks will be set accordingly. It avoids the mistake that you just enable the shadow RAM function for part of a ROM.

The address range that is not used may be available to software by setting to "RW-Shadow". This feature is useful to many memory management utilities and advanced operation systems. These utilities can move the memory resident files and device drivers to these address ranges and hence there are more spaces available in the 640KB range. If a particular memory block in D0000H to DFFFFH and E0000H to EFFFFH are set to "RW-Shadow", 256KB remapped function is not enabled.

(11) CHIPSET

This section provides a mean to define some parameters for the system, such as speed rating of memory and the AT-bus speed. The default settings are proper for normal usage. Changing the settings may lead to better performance, but make sure your system is still reliable and compatible with the peripherals.

MEMORY TYPE

The number of wait state for read and write operation depends on the clock speed of CPU and the speed rating of the DRAM. Improper setting can make the system unstable. Since the specification of DRAM for different manufacturers may vary, you would better consult your local dealer for the detailed information. In general, select 70ns for normal DRAM.

AT BUS CLOCK

Bus clock is used by peripherals on the motherboard and slot, such display and DMA Bus clock is generated from CPU clock-in and the speed of Bus clock is shown below.

CPU Speed (MHz)	
AT CLK	33MHz
CLKIN/8	4.2
CLKIN/6	5.6
CLKIN/5	6.7
CLKIN/4	8.4
CLKIN/3	11.1
CLKIN/2	16.7

The system performance can be improved by selecting a higher Bus clock speed. There are many old version add-on cards that can only run at the slow speed. So, be careful when you want to set to higher speed. The default AT Bus clock for 33MHz is 8.4MHz.