

BIOS Manual

for

JAGUAR V 386

(AMI BIOS)

System BIOS

The system BIOS provides an interface for operating systems and applications to access hardware. It is fully compatible with standard AT BIOS and works in the network system. It also performs self-test after reset and includes a setup program to setup the system.

SELF-TEST

To ensure the computer hardware is functional, the system BIOS will carry out a self-test upon reset. The test is very intensive and covers all parts of hardware. It takes a while before some messages are shown on the screen. It does not mean that the system is not working when the screen is blank. So wait for a while after turning on the power and listen carefully to the speaker. Some errors are reported by a number of beep sounds. After completing the self-test, the BIOS will display some messages on the screen.

In case of serious errors, the BIOS will suspend the test. If the display is not initialized, the BIOS will report the error through a sequence of beep sounds. Otherwise, error message will be shown on the screen.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list below correspond to the number of beeps for the corresponding error. All errors listed, with the exception of #8, are fatal errors.

<i>No. of Beeps</i>	<i>Error Message</i>
<i>1</i>	<i>DRAM Refresh Failure</i>
<i>2</i>	<i>Base 64KB Memory Parity Error</i>
<i>3</i>	<i>Base 64KB Memory Failure</i>
<i>4</i>	<i>System Time Failure</i>
<i>5</i>	<i>Processor Error</i>
<i>6</i>	<i>Keyboard Controller Gate A20 Failure</i>
<i>7</i>	<i>Processor Exception Interrupt Error</i>
<i>8</i>	<i>Display Memory Read / Write Error (Video Adapter)</i>
<i>9</i>	<i>ROM Checksum Error</i>
<i>10</i>	<i>CMOS Shutdown Register Read/Write Error</i>

If no error is found during self-test, the system BIOS will proceed to boot from floppy disk or hard disk. The system BIOS will list the system configuration on the screen shown in next page.

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System Configuration (C) Copyright 1985-1990, American Megatrends Inc.,

Main Processor	: 80386	Base Memory Size	: 640 KB
Numeric Processor	: None	Ext. Memory Size	: 7424 KB
Floppy Drive A:	: 1.2 MB, 5¼"	Hard Disk C: Type	: 2
Floppy Drive B:	: 1.44MB, 3½"	Hard Disk D: Type	: None
Display Type	: VGA or EGA	Serial Port(s)	: None
ROM-BIOS Date	: 04/30/90	Parallel Port(s)	: 3BC

Do check the list to make sure that the configuration is correct. Sometimes, problems arise because of the incorrect information of the configuration. For example, if you forget to modify the setup after changing the floppy disk drive from one type to another, it can not boot from floppy disk or may not work properly. If you check the list, you can find the cause of the problem.

SYSTEM SETUP

The BIOS incorporates FIVE setup sections:

- (1) Standard CMOS Setup*
- (2) Advanced CMOS Setup*
- (3) Advanced Chipset Setup*
- (4) Auto Configuration with BIOS Defaults*
- (5) Hard Disk Utilities*

It is important that all the setup procedures should be completed before operating the system. Otherwise, the system will not run properly with the incorrect setup information. Run the setup again if the configuration is changed.

To enter the setup section, press 'DEL' when the following message is shown during memory test :

Hit if you want to run SETUP

Whenever the system BIOS finds that the configuration of the system is altered, error message will be shown and you may press 'F1' to run setup. Then the following messages are shown on the screen.

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<i>BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES</i>
<i><C> 1990 American Megatrends, Inc. All Rights Reserved</i>
<i>STANDARD CMOS SETUP</i>
<i>ADVANCED CMOS SETUP</i>
<i>AUTO CONFIGURATION WITH BIOS DEFAULTS</i>
<i>HARD DISK UTILITY</i>
<i>WRITE TO CMOS AND EXIT</i>
<i>DO NOT WRITE TO CMOS AND EXIT</i>
<i>Configure system with Power On Default Values for Chipset and Advanced CMOS</i>



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OPTION 1 TIME AND DATE

Use PgUp and PgDn keys to change the value. The date and time cannot be entered directly. An calender is displayed on the lower right corner of the screen for your reference.

OPTION 2 FIXED DISK DRIVE

There are 47 types of fixed disks supported by the BIOS. Consult your fixed disk manual to determine its correct type. The parameters such as cylinder number, head number, sector number and pre-compensation must match your fixed disk's parameters.

Use PgUp and PgDn keys to change the fixed disk type. If the type of your fixed disk is not included in the hard disk list, define a new type as type 47. Use left and right arrow keys to move between the parameter fields and enter the parameters. The parameters will be stored in the CMOS RAM and your fixed disk can be used afterwards. Each hard disk can be assigned a different type 47 hard disk. So two hard disks which are not included in the list can be used together in your system.

If the type of fixed disk is wrong, it takes a while before the BIOS can identify the error. After setting the fixed disk type, if the system halts after reboot, please wait for a while. It is most likely that the setting of fixed disk type is incorrect.

When you install a new hard disk, make sure whether it is already formatted. If not, the BIOS has to check for a while before reporting the hard disk error. In fact, the error arises only because the hard disk is not formatted. If the hard disk is formatted, you can run DOS FDISK and DOS FORMAT.

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Some fixed disks are specially handled and must be set to 'Not Installed'. Consult the fixed disk manual for details.

OPTION 3 FLOPPY DISK DRIVE

Four types of floppy disk drives are supported:

- 1. 5- $\frac{1}{4}$ inch standard drive (360K)*
- 2. 5- $\frac{1}{4}$ inch high-density drive (1.2M)*
- 3. 3- $\frac{1}{2}$ inch standard drive (720K)*
- 4. 3- $\frac{1}{2}$ inch high-density drive (1.44M)*

The system BIOS supports two floppy disk drives and they are recognized as drive A and B. Select the correct types. Otherwise the drives cannot work properly. If one of them is not installed, select 'Not Installed' for that drive.

The BIOS is able to detect the type of the drives automatically. But remember to check the settings before exit.

OPTION 4 DISPLAY

Four types of display are supported:

- 1. CGA 80 column mode*
- 2. CGA 40 column mode*
- 3. EGA and VGA*
- 4. Monochrome*

If the type of display is incorrect, the BIOS will prompt you and ask you to set up again. But the BIOS is still able to display messages on the display attached to the system. Thus you can enter the setup program.

The jumper JP8 must be set according to this setting. Otherwise, the BIOS will report error after self-test.

OPTION 5 KEYBOARD

If a keyboard is attached to the system, select 'Installed'. The BIOS will test the keyboard during self-test.

(2) ADVANCED CMOS SETUP

All the registers of the chipsets are set to default values by the system BIOS. Usually, there is no need to modify these registers unless the configuration is changed. Since improper settings of these registers may cause the system malfunction, check your settings carefully before exit.

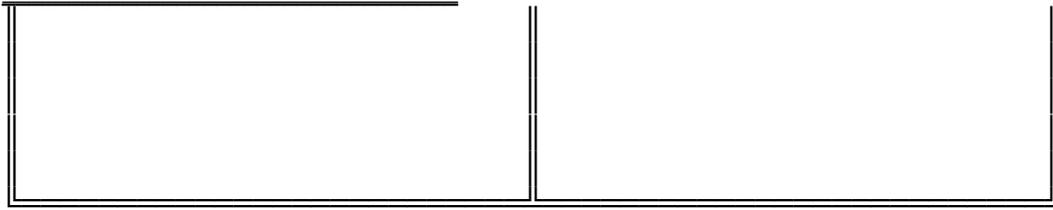
In ADVANCED CMOS SETUP, the main menu is shown as below:



BIOS SETUP PROGRAM - ADVANCED CMOS SETUP
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Typematic Rate Programming	: Disabled	System ROM Shadow F000,32K	: Disabled
Typematic Rate Delay (Msec)	: 500	CAS Read Wait State	: 3 w/s
Typematic Rate (Chars/Sec)	: 15.0	CAS Write Wait State	: 2 w/s
Above 1MB Memory Test	: Disabled	AT Bus CLK	: 3CLK/5
Memory Test Tick Sound	: Enabled	Hidden Refresh	: Enabled
Hit Message Display	: Disabled		
Hard Disk Type 47 RAM Area	: 0:300		
Wait for <F1> if Any Error	: Enabled		
System Boot Up Num Lock	: On		
Numeric Processor Test	: Disabled		
System Boot Up Sequence	: A:, C:		
Cache Memory	: Enabled		
Video ROM Shadow C000,32K	: Disabled		
Adapter ROM Shadow C800,32K	: Disabled		
Adapter ROM Shadow D000,32K	: Disabled		
Adapter ROM Shadow D800,32K	: Disabled		
Adapter ROM Shadow E000,32K	: Disabled		
Adapter ROM Shadow E800,32K	: Disabled		

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After changing the registers' settings, test your system first to make sure that the settings are correct. It is possible that your system becomes unstable and you need to setup the registers again.

In this section, you simply use the up and down arrow keys to move between options and press PgUp/PgDn to scroll bit value. After you finish the Setup, press `Esc' to return to main menu. The BIOS will set the registers accordingly.

A short description follows for each of the options on the Advanced CMOS Setup Screen. If any problem in some options, press the <F1> Help Key.

Typematic Rate Programming :

By enabling this option, the user can adjust the rate at which a keystroke is repeated. The options "Typematic Rate Delay" and "Typematic Rate" affect this rate. When a key is pressed and held down, the character appears on the screen and after a delay set by the Typematic Rate Delay, it keeps on repeating at a rate set by the Typematic Rate Value. When two or more keys are pressed and held down simultaneously, only the last key pressed will be repeated at the typematic rate. This stops when the last key pressed is released, even if other keys are depressed.

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Above 1MB Memory Test :

This feature, when enabled, will invoke the POST memory routines on the RAM above 1 MB (if present on the system). If disabled, the BIOS will only check the first 1 MB of RAM.

Memory Test Tick Sound :

This option will enable (turn on) or disable (turn off) the "ticking" sound during the memory test.

Memory Parity Error Check :

If the system board does not have parity RAM, the user may disable the memory parity error checking routines in the BIOS. The user should check with the manufacturer regarding the proper setting of this option.

Hit Message Display :

When enabled, the following message will be shown during the boot up to allow you to enter BIOS Setup.

"Hit if you want to run SETUP"

If disabled, the message is not shown.

To enter the system setup, press `DEL' when counting DRAM in cold boot, or before the `Waiting 'message in warm boot.

Hard Disk Type 47 Data Area :

The AMI BIOS SETUP features two user-definable hard disk types. Normally, the data for these disk types are stored at 0:300 in lower system RAM. If a problem occurs with other software, this data can be located at the upper limit of the DOS shell (640 KB). If the option is set to 'DOS 1 KB,' the DOS Shell is shortened to 639 KB, the top KB is used for the hard disk storage.

When the system BIOS shadow F000 is enabled, the BIOS will add the user-defined hard disk type to the hard disk type table in the system BIOS. Hence, there is no need to store the data for the user-defined hard disk type in the separate area. So this option will be ignored.

Wait for <F1> if Any Error :

Before the system boots-up, the BIOS will execute the POST routines, a series of system diagnostic routines. If any of these tests fail, but a non-fatal error has occurred and the system can still function, the BIOS will respond with an appropriate error message followed by the following statement :

"Press <F1> to continue"

If this option is disabled, any non-fatal error which occurs will not generate the above statement, but the BIOS will still display the appropriate error message. This will eliminate the need for any user response to a non-fatal error condition message.

System Boot Up Num Lock :

The user may turn off the "num lock" option on his Enhanced Keyboard when the system is powered on. This will allow him to use the arrow keys on the

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numeric keypad instead of using the other set of arrow keys on the Enhanced Keyboard. The BIOS will default to turning the "num lock" on.

Numeric Processor :

This option allow the user to mark the numeric processor (Intel 80x87 or compatible) as present or absent.

System Boot Up Sequence :

The AMI BIOS will normally attempt to boot from floppy drive A: (if present), and if unsuccessful, it will attempt to boot from hard disk C:. This sequence can be switched using this option. If the option is set to "C:, A:," the system will attempt to boot from the hard drive C:, and then A:. If the option is set to "A:, C:," the sequence is reversed.

Cache Memory :

The cache controller is incorporated in the chipset and can be enabled or disabled. If disabled, the performance will be very low.

Video, Adapter and System ROM shadow :

There are two options of shadow RAM for video adapter, ten options of shadow RAM for add-on card and one for the system BIOS. For the option System ROM, the content of the system at F000H segment BIOS is copied to the on board memory. For the option Video ROM, the video ROM at C0000H segment or C4000H segment are copied to memory. If you install an add-on card which ROM BIOS is located at one of the Adapter ROM shadow options, you may select corresponding option to shadow this ROM. If there is any problem after enabling the shadow memory on the add-on card, it recommends to enable the shadow RAM function for system BIOS only.

CAS Read/Write Wait State :

The number of wait state for memory operation depends on the speed rating of the DRAM. Check carefully whether your DRAM is suitable for the number of wait states you want to select. Improper setting can make the system unstable. Since the specification of DRAM from different manufacturers may vary, you would better consult your local dealer for the detail information. In general, using CAS 3 w/s Read and CAS 2 w/s Write for 40 MHz operation.

AT BUS Clock :

Bus clock is used by peripherals on the motherboard and slots, such as display and DMA. Bus clock is

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generated from CPU clock and the speed of Bus clock is shown below.

<i>Bus Clock</i>	<i>CPU Speed</i>
	40 MHz
<i>SCLK/5</i>	8
<i>SCLK/4</i>	10
<i>SCLK/3</i>	13.3
<i>SCLK/2</i>	20

The system performance can be improved by selecting a higher Bus clock speed. To be compatible with general add-on cards, the Bus clock must be 8 MHz or less. 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.

Hidden Refresh :

If enable, the refresh operation of main memory will not suspend the CPU operation and the overall performance is better. When 4MB DRAM is used, this option must be disabled.

**(3) AUTO CONFIGURATION WITH BIOS
DEFAULTS**

The Auto configuration with BIOS default is used for the user to setup the system in higher performance and operate in reliable setting. Once the Auto Configuration is applied, the user need not to configure the ADVANCED CMOS SETUP. The STANDARD CMOS SETUP will need to set those options after the Auto Configuration is used.



(4) HARD DISK UTILITY

Hard Disk Diagnostics option is taken by pressing <Enter> at the Main Setup Menu, the screen is shown as below :



BIOS SETUP PROGRAM - HARD DISK UTILITY
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	Cylin	Head	WPcom	LZone	Sect	Size (MB)
Hard Disk C:Type : 47 USER TYPE	1314	7	1314	1314	17	76
Hard Disk D: Type : Not Installed						

Hard Disk Type can be changed from the STANDARD CMOS SETUP option in Main Menu

Hard Disk Format
Auto Interleave
Media Analysis

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There are three options in the hard disk utility :

Hard Disk Format :

performs a "low level" format of the hard drive(s). The user should check with the system or hard drive manufacturer to determine if this option should be taken.

Auto Interleave :

determines the optimum interleave factor prior to the format of the hard drive(s).

Media Analysis :

performs an analysis of each track of the hard drive to determine whether it is usable, the track is marked as "bad" so that data cannot be stored there in the future.

If you are installing a brand new hard disk (drive), the manufacturer of the hard drive usually provides a list of "bad tracks" with the hard drive. Your system documentation might also include the optimum interleave factor.

In this case, assuming that you have a list of bad tracks and know the interleave factor, it will not be necessary to take the auto interleave and media analysis options. Simply follow the instructions in the Hard Disk Format. If you have a bad track list but have not been provided with the optimum interleave factor, follow the instructions in the Auto Interleave Section.

If you are installing a used hard disk or reformatting an existing hard disk, perform the Media Analysis and then follow the instructions in the Auto

Interleave section.

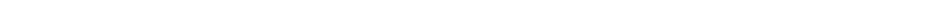
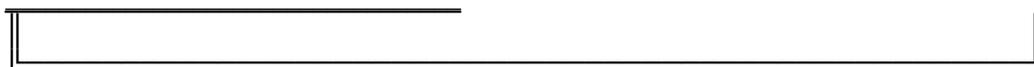
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	Cylin	Head	WPcom	LZone	Sect	Size (MB)
Hard Disk C:Type : 47 USER TYPE	1314	7	1314	1314	17	76
Hard Disk D: Type : Not Installed						

Hard Disk Format

Disk Drive (C/D) ? C
Disk Drive Type ? 47
Interleave (1-16) ? 3
Mark Bad Tracks (Y/N) ?
Proceed (Y/N) ?



Option 1 Hard Disk Format Utility

Using the Hard Disk Format option to integrate a new hard disk to the system, or to reformat a used hard disk which has developed some bad patches as a result of aging or poor handling. To find these bad patches on a used drive, you may select the Media Analysis option.

The value for Disk Drive is C for a C: Drive or D for a D: Drive. If two disk drives have been previously entered at the Standard CMOS Setup Screen, then the ID (C/D) will appear to the right of the question mark following the Disk Drive field. Choose which drive you wish to format by selecting the appropriate letter and pressing <ENTER>. If only one drive was selected at the Standard CMOS Setup Screen, the cursor will automatically be placed at the interleave prompt.

The Disk Drive Type is read from the CMOS. The

interleave factor can be selected manually, or can be determined with the Auto Interleave feature of the SETUP program.

The manufacturer of the hard drive usually provides a list of "bad tracks" with the hard drive. These tracks should be entered with this option, and they will then be marked as "bad" in order to prevent data from being stored there in the future.

*The default for the Proceed prompt is <N> to prevent accidental formatting of the hard drive and subsequent loss of data. **Once this prompt is changed to <Y> and the <ENTER> key pressed, any data residing on the hard disk will be irrevocably lost.***

Option 2 Auto Interleave Utility

The Auto Interleave utility calculates the optimum interleave value through trial and error by measuring the transfer rate for four different interleave values. To determine the best interleave factor, the system will format a portion of the hard disk for each transfer rate calculated. The cylinders, heads and sectors formatted for each value will be displayed in the actively box on the screen.

BIOS SETUP PROGRAM - HARD DISK UTILITY
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Hard Disk C:Type : 47 USER TYPE	Cylin	Head	WPcom	LZone	Sect	Size (MB)
Hard Disk D: Type : Not Installed	1314	7	1314	1314	17	76

Auto Interleave		Bad Track %
Disk Drive (C/D)	? C	Ms. Cyl. Head
Disk Drive Type	? 47	
Mark Bad Tracks (Y/N)	? N	
Proceed (Y/N)	?	

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Option 3 Media Analysis Utility

The Media Analysis utility performs a series of tests to locate bad or damaged patches on the hard disk as a result of aging or poor handling. This utility locates all bad tracks on the hard disk and lists them in the Bad Track List Box. Since this test writes to all cylinders and heads on the hard disk to verify any bad tracks, the test may require several minutes to complete. For best results, run this test in its entirety.

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BIOS SETUP PROGRAM - HARD DISK UTILITY
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	Cylin	Head	WPcom	LZone	Sect	Size (MB)
Hard Disk C:Type : 47 USER TYPE	1314	7	1314	1314	17	76
Hard Disk D: Type : Not Installed						

Media Analysis

Disk Drive (C/D) ? C
Disk Drive Type ? 47
Proceed (Y/N) ?

