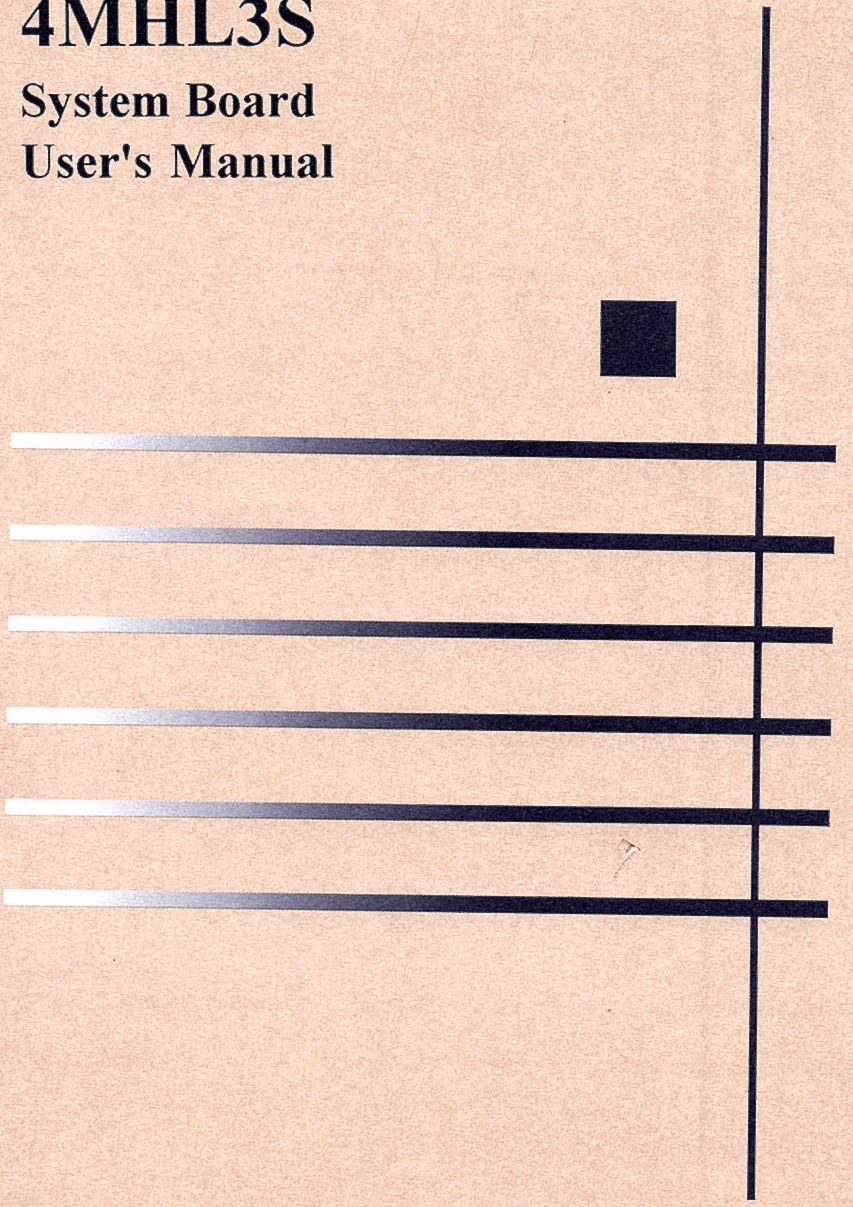
4MHL3S

System Board
User's Manual



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4DMU=HL3S-L4-V0

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Chapter 1 Features

1.1 General Specifications and Features

The 4MHL3S mainboards are based on the powerful 80486SX/DX/DX2 microprocessor, respectively, and incorporate advanced computer technology to meet the requirements of the next generation of operating systems and applications. Yet they retain full compatibility with the original IBM PC XT and AT and use existing PC software and hardware.

* Intel or AMD CYRIX microprocessor: M6, C6, 80486SX, 80486DX2-66/50, and 80486DX/20MHz, 25MHz, 33MHz, 40MHz.

* Built-in cache controller:

* Optional 64KB, 128KB or 256KB cache memory allowing the CPU to run at full speed most of the time.
  Cacheable 64MB main memory.
  0 wait state for cache read/write hit.
  Hidden DRAM refresh cycle to boot system performance.
  Built-in registers to support three independent non-cachable memory area.
  Supports interleaved cache RAM for high speed CPU.
  Supports cache line fill as well as 80486 burst mode.
  Cache enable/disable and programmable non-cacheable memory area via software setup.
* Sophisticated DRAM controller
- Supports true page mode DRAM source.
- Supports two bank of SIMM sockets with up to 64MB of total memory.
- Flexible DRAM memory configuration to accommodate from 1MB to 64MB in different options of memory size by using a combination of 256KB, 1MB, 4MB, 16MB, 256Kx36, 512Kx36, 1MBx36, 2MBx36, 4MBx36, 16MBx36 DRAM SIMM modules.

- Support 64MB addrissing space for DMA.
- Programmable DRAM wait states 0/1/2
- Support 64MB addresssing space for DMA..
- Intelligently relocation the 256KB or 384KB memory block up from the reserved 384KB memory space to the top of DRAM memory.
- Support automatic memory size detection.

* Single ROM BIOS support, default 64KB AMI BIOS with built-in Setup program.

* Complementary metal oxide semiconductor (CMOS) RAM to maintain system configuration.

* CPU clock by Jumpers setting.

* Eight ISA expansion slots:
Eight 16-bit slots for AT-compatible add-on cards.

*Three VESA-Local bus slots. Slave/Master mode.

Chapter 2 Memory

2.1 DRAM Banks Configuration

The 2 banks are composed of 8 standard 30-pin SIMM sockets. These sockets take 256-KB, 1MB, 4MB or 16MB SIMM. (It can be a mix or these SIMMS). In table 2.1, all the possible combination of the DRAM modules to make up from 1-MB to 64MB as the total amount of memory for the system are listed. For better performance, We do recommend quality 70ns SIMM for 486DX 33MHz boards and 80ns SIMM for 486SX 20MHz.

Table 2.1 Memory Configuration

Option	SIMM1-4 BANK 0 30PIN SIMM	SIMM5 BANK 1 72PIN SIMM	SIMM6 BANK 2 72PIN SIMM	Total Memory
1	* 256KB	-----	-----	1MB
2	256KB	256Kx36bits	-----	2MB
	256KB	-----	256Kx36bits	2MB
	-----	256Kx36bits	256Kx36bits	2MB
	-----	512Kx36bits	-----	2MB
	-----	-----	512Kx36bits	2MB
3	256KB	256Kx36bits	256Kx36bits	3MB
	256KB	512Kx36bits	-----	3MB
	-----	512Kx36bits	256Kx36bits	3MB
	-----	256Kx36bits	512Kx36bits	3MB
4	* 1MB	-----	-----	4MB
	-----	512Kx36bits	512Kx36bits	4MB
	256KB	512Kx36bits	256Kx36bits	4MB

Option	SIMM1-4 BANK 0 30PIN SIMM	SIMM5 BANK 1 72PIN SIMM	SIMM6 BANK 2 72PIN SIMM	Total Memory
5	1MB	256Kx36bits	-----	5MB
	1MB	-----	256Kx36bits	5MB
	-----	1Mx36bits	256Kx36bits	5MB
	-----	256Kx36bits	1Mx36bits	5MB
	256KB	1Mx36bits	-----	5MB
	256KB	-----	1Mx36bits	5MB
6	1MB	256Kx36bits	256Kx36bits	6MB
	256KB	1Mx36bits	256Kx36bits	6MB
	256KB	256Kx36bits	1Mx36bits	6MB
	-----	1Mx36bits	512Kx36bits	6MB
	-----	512Kx36bits	1Mx36bits	6MB
7	1MB	512Kx36bits	256Kx36bits	7MB
8	1MB	1Mx36bits	-----	8MB
	1MB	-----	1Mx36bits	8MB
	-----	1Mx36bits	1Mx36bits	8MB
9	1MB	1Mx36bits	256Kx36bits	9MB
	1MB	256Kx36bits	1Mx36bits	9MB
	256KB	1Mx36bits	1Mx36bits	9MB
10	-----	2Mx36bits	512Kx36bits	10MB
	1MB	512Kx36bits	1Mx36bits	10MB
11	1MB	1Mx36bits	1Mx36bits	12MB
	1MB	2Mx36bits	-----	12MB
	-----	2Mx36bits	1Mx36bits	12MB
	-----	1Mx36bits	2Mx36bits	12MB
12	256KB	2Mx36bits	1Mx36bits	13MB
	1MB	2Mx36bits	256Kx36bits	13MB
13	* 4MB	-----	-----	16MB
	1MB	2Mx36bits	1Mx36bits	16MB
	-----	2Mx36bits	2Mx36bits	16MB

Option	SIMM1-4 BANK 0 30PIN SIMM	SIMM5 BANK 1 72PIN SIMM	SIMM6 BANK 2 72PIN SIMM	Total Memory
14	4MB	256Kx36bits	-----	17MB
	4MB	-----	256Kx36bits	17MB
	256KB	4Mx36bits	-----	17MB
	256KB	-----	4Mx36bits	17MB
15	4MB	256Kx36bits	256Kx36bits	18MB
	256KB	4Mx36bits	256Kx36bits	18MB
	256KB	256Kx36bits	4Mx36bits	18MB
16	4MB	512Kx36bits	256Kx36bits	19MB
17	4MB	1Mx36bits	-----	20MB
	4MB	-----	1Mx36bits	20MB
	1MB	4Mx36bits	-----	20MB
	1MB	-----	4Mx36bits	20MB
18	256KB	4Mx36bits	1Mx36bits	21MB
	256KB	1Mx36bits	4Mx36bits	21MB
	1MB	4Mx36bits	256Kx36bits	21MB
	1MB	256Kx36bits	4Mx36bits	21MB
	4MB	1Mx36bits	256Kx36bits	21MB
	4MB	256Kx36bits	1Mx36bits	21MB
19	4MB	512Kx36bits	1Mx36bits	22MB
20	4MB	1Mx36bits	1Mx36bits	24MB
	1MB	4Mx36bits	1Mx36bits	24MB
	1MB	1Mx36bits	4Mx36bits	24MB
	-----	4Mx36bits	2Mx36bits	24MB
	-----	2Mx36bits	4Mx36bits	24MB
21	256KB	2Mx36bits	4Mx36bits	25MB
	4MB	2Mx36bits	256Kx36bits	25MB
22	4MB	2Mx36bits	1Mx36bits	28MB
	1MB	2Mx36bits	4Mx36bits	28MB

Option	SIMM1-4 BANK 0 30PIN SIMM	SIMM5 BANK 1 72PIN SIMM	SIMM6 BANK 2 72PIN SIMM	Total Memory
23	4MB	4Mx36bits	-----	32MB
	4MB	-----	4Mx36bits	32MB
	-----	4Mx36bits	4Mx36bits	32MB
24	256KB	4Mx36bits	4Mx36bits	33MB
	4MB	256Kx36bits	4Mx36bits	33MB
	4MB	4Mx36bits	256Kx36bits	33MB
25	4MB	512Kx36bits	4Mx36bits	34MB
26	1MB	4Mx36bits	4Mx36bits	36MB
	4MB	1Mx36bits	4Mx36bits	36MB
	4MB	4Mx36bits	1Mx36bits	36MB
27	4MB	2Mx36bits	4Mx36bits	40MB
28	4MB	4Mx36bits	4Mx36bits	48MB
29	* 16MB	-----	-----	64MB

*:User may optionally choose RAM modules with equal memory size and put them into either SIMM1-4 (30Pin SIMM socket), SIMM5, or SIMM6

Note:4MHL3S supports the RAS Remapping H/W of which the concept is for the access address decoded as any bank(0-1), it no longer activates the relative RAS(0-3), but it could remap to any one of the four RAS signals, i.e. by the W/R detecting DRAM type and setting RAS-REMAP register, user needn't care which bank he shousk install which type DRAM.

Memory counting during the Power-on self test (POST), The memory count shown on the screen does not include the shadow RAM area (128K). The following formula illustrates how the total memory comes out:

Memory count on the monitor = Installed total memory 384KB +
Relocation memory.

For example, the user installed a total of 4MB on board and relocation the 256KB/384KB memory. In this case, the total memory display on the screen will be 3968KB/4069KB.

To relocation the unused 256-KB/384-KB of reserved memory above normal extended memory, you could enable the main memory reloction option in the CMOS SETUP menu. To run the SETUP program and enable the main memory relocation function, refer to Chapter 4 for details.

2.2 Cache Memory Subsystem

The 4MHL3S accept optional 64KB, 128KB or 256KB SRAM for cache memory support. The SRAM chip should be 8K x 8 bit or 32K x 8 bit with speed of 25ns for the 486SX 20MHz, 20ns for 486DX 33MHz. The TAG RAM (U26) is for saving address and compare the next CPU address. The TAG RAM should be used a speed 20ns for the 486DX. The table below list all the possible SRAM location and the total amount of Cache RAM memory for each option.

Option	BANK 0 U19,U23,U25,U28	BANK 1 U18,U22,U24,U27	Cache Memory Amont	TAGRAM U26
1	8Kx8bit SRAM	8Kx8bit SRAM	64K	8Kx8
2	32Kx8bit SRAM	0	128K	8Kx8
3	32Kx8bit SRAM	32Kx8bit SRAM	256K	32Kx8 or 16Kx8

JP27: 1-2 Short: When use 32Kx8 TAG RAM
2-3 Short: When use 16Kx8 TAG RAM

Note

Chapter 3 Jumper

Jumper Settings and Connectors

This chapter will assist you with setting-up the 4MHL3S before you install it in a system case. If your 4MHL3S has already been installed and you do not wish to change the configuration settings, you can skip over this section.

3.1 Jumper Switches

The 4MHL3S has several jumper switches that must be set to define a system configuration. These Jumper are three-pin components on the mainboard. They are turned off and on by placing or removing a cover cap over the pins. This is called a open or short jumper. All jumpers must be set to one of the two possible settings.

3.2.1 Cache RAM Jumper Setting

	JP15	JP16	JP17	JP19	JP20
32K Byte	2-3 Short	Open	Open	Open	Open
64K Byte	1-2 Short	Open	Open	Close	Open
128K Byte	2-3 Short	2-3 Short	Close	Close	Open
256K Byte	1-2 Short	1-2 Short	Close	Close	Close

Note: 64K byte = 8 pieces of 8K x 8 SRAM on cache bank 0 and 1
128K byte = 4 pieces of 32K x 8 SRAM on cache bank 0
256K byte = 8 pieces of 32K x 8 SRAM on cache bank 0 and 1

3.2.2 486SX/M6 Switch Setting (PGA Packing)

Jumper Configuration CPU Speed Select			
	JP2	JP3	JP4
486SX-20	Open	Open	Open
486SX-25	Close	Open	Open
486SX-33	Close	Close	Close
486SX-40/486S-40	Close	Close	Open

Jumper Configuration CPU Type Select		
	JP9	JP11
486S-40 / 486SX	Open	2-3 Short
486SX Overdrive	2-3 Short	1-2/3-4 Short

Other		
JP18	VL-BUS Speed<= 33MHz	Open
	VL-BUS Speed > 33MHz	Close
JP7	CPUCLK >= 40/50MHz	2-3 Short
	CPUCLK <= 33MHz	1-2 Short
JP12/JP14	For Intel CPU or M6 CPU	(JP12 2-3 Short) (JP14 Open)
	For Cyrix M6+C6 CPU	(JP12 1-2 Short) (JP14 2-3 Short)
JP8	1-2 Short (Default) 2-3 Short for power 9000 VGA	
JP10	1-2 Short: Normal 2-3 Short: When use External green card	
JP13	1-2 Short (Default)	
JP29/JP30	2-3 Short (Defalut)	
JP31	Close (Defalut)	
JP32	1-2 Short: For MX8310 Clock generator Open: For MX8315 Clock generator	
JP33	Open: For MX8310 Clock generator Close: For MX8315 Clock generator	
JP6	1-2 Short: When use Cyrix M6+C6 Open: Normal	

3.2.3 486DX/M6+C6 Switch Setting (PGA Packing)

Jumper Configuration CPU Speed Select			
	JP2	JP3	JP4
486DX-20	Open	Open	Open
486DX-25	Close	Open	Open
486DX-33	Close	Close	Close
486DX-50	Open	Open	Close
486DX-40/M6+C6-40	Close	Close	Open

Jumper Configuration CPU Type Select		
	JP9	JP11
M6+C6-40	1-2 Short	1-2/3-4 Short

Other		
JP18	VL-BUS Speed<= 33MHz	Open
	VL-BUS Speed > 33MHz	Close
JP7	CPUCLK >= 40/50MHz	2-3 Short
	CPUCLK <= 33MHz	1-2 Short
JP12/JP14	For Intel CPU or M6 CPU	(JP12 2-3 Short) (JP14 Open)
	For Cyrix M6+C6 CPU	(JP12 1-2 Short) (JP14 2-3 Short)
JP8	1-2 Short (Default) 2-3 Short for power 9000 VGA	
JP10	1-2 Short: Normal 2-3 Short: When use External green card	
JP13	1-2 Short (Default)	
JP29/JP30	2-3 Short (Defalut)	
JP31	Close (Defalut)	
JP32	1-2 Short: For MX8310 Clock generator Open: For MX8315 Clock generator	
JP33	Open: For MX8310 Clock generator Close: For MX8315 Clock generator	
JP6	1-2 Short: When use Cyrix M6+C6 Open: Normal	

3.2.4 486DX2 Switch Setting

Jumper Configuration CPU Speed Select			
	JP2	JP3	JP4
486DX2-50	Close	Open	Open
486DX2-66	Close	Close	Close

Jumper Configuration CPU Type Select		
	JP9	JP11
486DX2	1-2 Short	1-2/3-4 Short
486DX2 Overdrive	2-3 Short	1-2/3-4 Short

Other		
JP18	VL-BUS Speed<= 33MHz	Open
	VL-BUS Speed > 33MHz	Close
JP7	CPUCLK >= 40/50MHz	2-3 Short
	CPUCLK <= 33MHz	1-2 Short
JP12/JP14	For Intel CPU or M6 CPU	(JP12 2-3 Short) (JP14 Open)
	For Cyrix M6+C6 CPU	(JP12 1-2 Short) (JP14 2-3 Short)
JP8	1-2 Short (Default) Short for power 9000 VGA	2-3
JP13	1-2 Short (Default)	
JP10	1-2 Short: Normal 2-3 Short: When use External green card	
JP13	1-2 Short (Default)	
JP29/JP30	2-3 Short (Defalut)	
JP31	Close (Defalut)	
JP32	1-2 Short: For MX8310 Clock generator Open: For MX8315 Clock generator	
JP33	Open: For MX8310 Clock generator Close: For MX8315 Clock generator	
JP6	1-2 Short: When use Cyrix M6+C6 Open: Normal	

3.3 Connectors

There are several connectors located on the 4M50AHL. They are used to connect with some peripheral devices to enhance the performance of the system operation.

Refer to Appendix B for the positions of all the connectors on the mainboard. Their functions are listed below:

Connector	Function
KB1	Keyboard Connector
P1	Power Connector
JP1	Open: When use EXT Battery Close: When use INT Battery
JP21	EXT Battery Connector
JP22	Keylock Connector
JP23	Speaker Connector
JP24	Turbo LED Connector
JP25	Turbo SW Connector
JP26	Reset SW Connector
JP28	Green PC Connector

Note

Chapter 4 Setup

4.1 Built-in BIOS Setup program

This chapter provides detailed instructions on how to configure your system using the Built-in BIOS Setup Program and gives some technical information about your computer. If you are not very familiar with microcomputers, please carefully read this chapter before proceeding. If you do not want to change the system's configuration, you can skip this chapter.
SETUP program built in the system BIOS.

4.1.1 How to Recall the Setup Program

You can run the built-in SETUP program in several ways:

1. When powering-on the system

When you turn on the system power, or press the button on the system case while the system is running (not every system has this button), the BIOS will first test the functionalityof the system components and display a start-up message similar to the following:

```
XXX KB OK
Hit <Del> key, if you want to run setup
```

The numeral digits will continue to count at the top left of the screen. This is the BIOS testing the mainboard memory chips. After the above message disappears, you can , press the <Del> key to run the Setup program.

2. To reset the system

By pressing <Ctrl> <Alt> <Del> key combination when the system is up and running (assuming you are running under DOS or other environments that support this feature), the system will immediately reset itself and boot up. Before booting up from a diskette or hard disk, you can also see the below start-up message:

Hit <Del> key, if you want to run setup

3. When the BIOS Prompts you

In the self-test process, if the BIOS detects inconsistent or incorrect configuration information, or some physical system error, it will display an error message on the screen, and prompt you to take action; for example:

RUN SETUP UTILITY Press the <F1> to RESUME

Press the <F1> key, and continue.

4. To Enter password

If you set the password checking option to the "Setup" or " Always" field in the Advanced CMOS Setup program, after pressing the <Del> key to run he Setup program, it will display the Enter password message on the screen. Refer to section 4.5 Using Change Password Setup. The default password setting is "<enter>" key.

4.1.2 Running the SETUP Program

When you call up the Setup program, the screen displays a "main menu" similar to the following:

AMI BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES (C) 1992American Megatrends Inc., All Rights Reserved
STANDARD CMOS SETUP ADVANCED CMOS SETUP ADVANCED CHIPSET SETUP AUTO CONFIGURATION WITH BIOS DEFAULTS AUTO CONFIGURATION WITH POWER-ON DEFAULTS CHANGE PASSWORD AUTO DETECT HARD DISK HARD DISK UTILITY WRITE TO CMOS AND EXIT DO NOT WRITE TO CMOS AND EXIT
Standard CMOS Setup for changing Time,Date,Hard Disk Type,etc. ESC: EXIT ←↑→↓ : Sel F2/F3: color F10: Save & Exit

Figure 4.1 BIOS Setup Main Menu Options

On-screen instructions at the bottom or the screen explain how to use the program.

Using the Setup main menu

The following table describes available keys in the SETUP main menu:

Key	Usage
ESC	To exit without Saving and reboot the machine
←↑→↓	To move the selection bar around
F2 / F3	To change color
F10	To Save changes and reboot the machine

The following is a brief description of the six options of the Setup main menu:

STANDARD CMOS SETUP

Display the standard CMOS Setup screen to check or modify general configuration information. The standard CMOS setup for the date, time, floppy type, hard disk type, video type, etc.

ADVANCED CMOS SETUP

The ADVANCED CMOS SETUP option is used to set the various system options for the user, including the above 1 MB memory test, Scratch RAM area for BIOS, Co-processor detection, Video ROM Shadow and System ROM Shadow.

ADVANCED CHIPSET SETUP

This Setup Option is for the user who wishes to program the chip set registers. The chip set registers control most of the system options in the computer.

AUTO CONFIGURATION WITH BIOS DEFAULTS

This option allows for automatic configuration of all the options in the Advanced CMOS Setup/Advanced Chipset Setup with the BIOS defaults.

CHANGE PASSWORD

The Password is required for entering the Setup Program or boot your system. The user can Change the ROM default or current (user) password stored in the CMOS by accessing this option. The ROM default password is the "AMI" string. When you want to use this option, you must be enabled the password option in ADVANCED CMOS SETUP.

WRITE TO CMOS AND EXIT

Choose this option to save the changes you have made in the "Standard Setup", "advanced Setup" and "Advanced Chipset setup" option, and then exit to reboot the system.

DO NOT WRITE TO CMOS AND EXIT

Choose this option to all abandon all previous settings and then exit to reboot the system, To choose an item from the setup main menu, move the cursor to appropriate line using the Up <↑> and Down <↓> arrow keys and press <Enter>. The screen will display a warning message as below:

BIOS SETUP PROGRAM - WARNING INFORMATION
(C) 1992 American MegatrEnds Inc., ALL Rights Reserved

Improper Use of Setup may cause Problems!
If System Hangs, Reboot System and Enter Setup by pressing the<Del>key

Do any of the following Alter Entering Setup

(i) Alter options to make System work
(ii) Load Bios Setup Defaults
(iii) Load Power-On Defaults

Hit <ESC> to Stop now, any other Key to continue

Figure 4.2 BIOS Setup Warning Message

4.2 Running the Standard CMOS Setup

To check or modify the general system configuration, choose "STANDARD CMOS SETUP" from the Setup main menu and press <Enter>. The screen will display the following:

BIOS SETUP PROGRAM. Standard CMOS SETUP
(C) 1992 American Megatrends Inc., ALL Rights Reserved

Date (mn/date/year) : Tue, Jan 01 1891 Base memory size 640 KB
Time (hour/min/sec) : 04:07:29 Ext. memory size 0 KB Daylight
Saving : Disabled

	Cylin	Head	Wpcom	LZone	Sec	Size
Hard disk C: type : 47 = USER TYPE	642	8	0	0	17	43MB

Hard disk D: type : Not Installed
Floppy drive A: : 1.2MB, 5 1/4"
Floppy drive B: : Not Installed
Primary display : Monochrome
Keyboard : Installed

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2

Month : Jan,Feb,.....Dec
Date : 01,02,03,.....31
Year : 1901,1902,....2009

ESC: Exit←↑→↓ Select F2/F3: color Pu/Pd: Modify

Figure 43 The Standard CMOS Setup Program Screen

One-screen instructions in the lower left corner of the screen explain how to use the program. After making all selections, Press <ESC> key and then return to the main menu program to choose another Setup program.

Using the Standard CMOS Setup Program

Key	Usage
←↑→↓	To move the selection bar around
PgUp/PgDn	To modify the values of the option by scrolling through the predefined values in most fields
F2 / F3	To change color
Enter	To move teh selection bar around
ESC	To exit to previous screen

Date

In the Date fields, you manually set the electronic calendar on the mainboard only if the values are incorrect.

Time

Time fields include hour, minutes, seconds, but you can only set the value of hour and minute. Check and adjust these fields as you would a clock or wrist watch.

Daylight saving

In this field you can enable or disable the daylight saving function.

Floppy Drive A and B

In this field you may specify the capacity and format of the floppy drives installed in your system.

* 360 KB, 5-1/4"
* 1.2 MB, 5-1/4"
* 720 KB, 3-1/2"
* 1.44 MB, 3-1/2"
* 2.88 MB, 3-1/2"
* Not Installed

Hard Disk C: and Hard Disk D:
In these fields, you specify the physical and electronic properties of the " Standard" hard disk drives installed in your system. Relevant specifications include the number of cylinders and heads, write pre-compensation time, read/write head landing zone, number of sectors per track.

The BIOS provides 46 predefined types of popular hard disk drives. You select the appropriate type by scrolling forward/backward using the <PgUp> and <PgDn> keys. The relevant specifications of the selected drive Will be immediately displayed on the corresponding field positions.

If for some reason your particular drive is not one of the 46 pre-defined types, simply scroll down to select type 47, then use the left <←> and right <→> arrow keys to move to the Cyln (Cylinders), Head, WPcom (Write Pre-compensation), Lzone (Landing Zone), and Sec (Sectors) fields and directly key in the appropriate values. The Setup program will calculate the capacity of the drive based on the input cylinder, head and sector numbers and display the result on the capacity field for your reference.

Refer to Appendix A for the table of hard disk types.

Primary Display
In the display field, you specify the display adapter installed in your system.

Keyboard
This setting is used to select "Installed" or "Not Installed" for the keyboard during to Power On Self Test. Normally, it should be set as "Installed"

Base Memory and Extended Memory Size

A small section in the upper right corner of the screen displays important status information on your system, including base and extended memory amount. They are updated automatically by the Setup program according to status to status detected by the BIOS self-test; no manual change is allowed.

4.3 Running the Advanced CMOS Setup

When you choose the "RUN Advanced CMOS Setup" option in the Setup main menu, the screen displays the following menu:

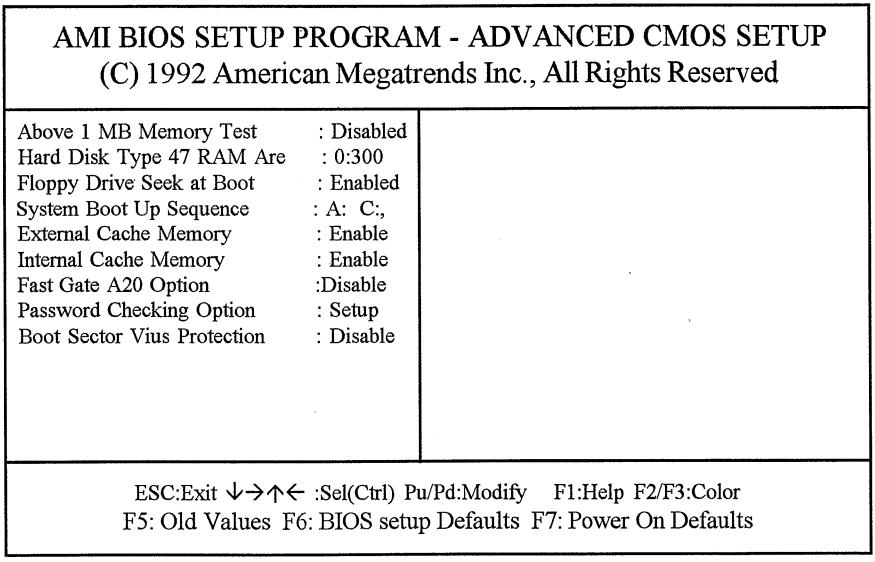

Figure 4.3 The Advanced CMOS Setup Program Screen

* Using the Advanced CMOS Setup Program

Key	Usage
↓←↑→	To move the selection bar around
PgUp/PgDn	To modify the valuses of the option by scrolling through the pre-defined values in most fields
Ctrl+PgUp/PgDn	To quickly modify the values of the Option by scrolling through the predefined values in the "Non-Cacheable Base & Size" field.
F1	To get help for each of the options
F2/F3	To change color
F5	To get the old values. These values are the values which the user started the current session with. If the CMOS was good, then the old values are the CMOS values; otherwise they are the BIOS Setup default values.
F6	To load all the options in the Advanced CMOS Setup/ Advanced Chipset Setup with teh BIOS Setup default.
F7	To load all the options in the Advanced CMOS Setup/ Advanced Chipset Setup with the Power-On default.
ESC	To exit to previous screen

Above 1MB Memory Test

You can disable this option to bypass the memory test if a lot of memory is installed in the system, or you can enable this option to test all the memory.

Hard Disk Type 47 RAM Area

The purpose of this field is to specify the address of the memory area used by the system BIOS for storing extended information, such as to save the user definable drive type 47. You have the following options:

* 0:300
  To reserve the stack area at address 0:300H
* DOS 1KB

To reserve the top 640 KB in the DOS base memory and reduce the size of base memory by 1 KB. The default is option "0:300H".

Floppy Drive Seek at Boot

When booting it can chose to do FLOPPY DRIVE SEEK OR NOT.

System Boot Up Sequence

This option can set the "System Boot Up Sequence" to "A:, C or C:, A.

External/Internal Cache Memory

Due to constraint of technology, the speed of currently available DRAM may not be high enough to catch up with the speed of the CPU. This means that every step of a program execution, the CPU must wait for the DRAM to respond.

In fact, for the CPU to run faster the system must be designed to use another kind of fast RAM chip, such as the -SRAM (Static RAM).
In 4MHL3S, you can combine a dual cache architecture:
Internal (from the CPU) & External cache, in the 4MHL3S, The options are as follows:

*Disable
*Enable

You should usually set the "Enable" option to get full potentil of the system.

Fast Gate A20 Option

This option uses the fast gate A20 line to access any memory above 1MB. Normally, all RAM access above 1MB is handled through the keyboard controller chip, Using this option will make the faster than the normal method. This option is very useful in networking operating systems.

Password Checking Option

The purpose of this field is to determine whether the password is to be used for every boot (set to "Always") when entering into the Setup program (set to "Setup") or never to be used (set to "Disabled").

Boot Sector Virus Protection

When booting, it can choose to do tht action of clear virus or not?

4.4 Running the Advanced Chipset Setup

To program the registers of the CHIPSET, choose the "Advanced Chipset Setup" option from the setup main menu and press <Enter>. The screen will display the following menu:

AMIBIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C) 1992 American Megatrends Inc., All Rights Reserved	
Memory Remapping : Enable	
ESC: Exit ↑→↓← : Sel (Ctrl) Pu/Pd: Modify F1: Help F2/F3: Color F5: Old Values F6: BIOS setup Defaults F7: Power On Defaults	

Figue4.4The Advanced ChipSet Setup

Memory Remapping

Remapping 256KB (A,B,D and E segments) only and leaving C/F segments for shadows RAM, if you set to "enable"

4.5 Using the Change Password Setup

To change the password, choose the "CHANGE PASSWORD" option form the Setup main menu and press <Enter>.

Enter Current Password:

Enter the current Password and continue to change the password.

3. After pressing the <Enter> key (ROM Password) or current password (user-defined password), you can change the password stored in the CMOS. The password can be at most 6 characters long. To change the passwords please follow the steps below:

Enter NEW Password:

Re-Enter NEW Password:

New Password Installed:

Press <Enter> and return to main menu.

Note

Appendix A HDD Type

Type	Cylinders	Heads	Sector	Capacity (Mbytes)
1	306	4	17	10
2	615	4	17	20
3	615	6	17	31
4	940	8	17	62
5	940	4	17	47
6	615	4	17	20
7	462	8	17	31
8	733	5	17	30
9	900	15	17	112
10	820	3	17	20
11	855	5	17	35
12	855	7	17	50
13	306	8	17	20
14	733	7	17	43
15	000	0	17	00
16	612	4	17	20
17	977	5	17	41
18	977	7	17	57
19	1024	7	17	60
20	733	5	17	30
21	733	7	17	43
22	733	5	17	30

Type	Cylinders	Heads	Sector	Capacity (Mbytes)
23	306	4	17	10
24	325	7	17	54
25	925	9	17	69
26	754	3	17	44
27	754	7	17	69
28	699	7	17	41
29	823	10	17	68
30	918	7	17	53
31	1024	11	17	94
32	1024	15	17	128
33	1024	5	17	43
34	612	2	17	10
35	1024	9	17	77
36	1024	8	17	68
37	615	8	17	41
38	987	3	17	25
39	987	7	17	57
40	820	6	17	41
41	977	5	17	41
42	981	5	17	41
43	830	7	17	48
44	830	10	17	69
45	917	15	17	114
46	1224	15	17	152

Appendix B Motherboard Layout

Note

Appendix C 491 Pin Assignment

#	Assignment	#	Assignment	#	Assignment	#	Assignment
001	A20M#	026	PD3	043	PD18	068	CROEA#
002	ERROR7# FERR#	027	GND1	044	PD19	069	GND2
003	BUSY6# PEADS#	028	PD4	045	VCC1	070	CA3A
004	ERROR6# IGNNE#	029	PD5	046	PD20	071	CA2
005	TURBO	030	PD6	047	PD21	072	ALTWR#
006	FLUSH#	031	PD7	048	PD22	073	ALT
007	PADS#	032	PD8	049	PD23	074	TRWR#
008	ELBA#	033	PD9	050	PD24	075	TAG7
009	PHLDA	034	PD10	051	PD25	076	TAG6
010	PWR	035	PD11	052	PD26	077	TAG5
011	PMIO	036	GND2	053	VCC2	078	VCC2
012	PDC	037	PD12	054	PD27	079	TAG4
013	BE0#	038	PD13	055	PD28	080	TAG3
014	BE1#	039	PD14	056	PD29	081	TAG2
015	BE2#	040	PD15	057	PD30	082	TAG1
016	BE3#	041	PD16	058	PD31	083	TAG0
017	PRDY#	042	PD17	059	GND2	084	PER3
018	GND2	043	PD18	060	CRWRB#	085	PER2
019	PHOLD	044	PD19	061	CROEB#	086	PER1
020	RESCPU	045	VCC1	062	CA3B	087	GND2
021	PINTR	046	PD20	063	CRCS3#	088	PER0
022	PNME	047	PD21	064	CRCS2#	089	RTCCS#
023	PD0	048	PD22	065	CRCS1#	090	MWE#
024	PD1	049	PD23	066	CRCS#0	091	CAS3#
025	PD2	050	PD24	067	CRCWRA#	092	RAS3#

#	Assignment	#	Assignment	#	Assignment	#	Assignment	#	Assignment
093	CAS2#	118	SEL0	143	ATALE	165	SD1	187	GND1
094	RAS2#	119	MUXI2	144	VHE#	166	SD0	188	PA14
095	CAS1#	120	MUXI1	145	SA1	167	KBCLK	189	PA15
096	GND2	121	GND2	146	SA0	168	ROMCS#	190	PA16
097	RAS1#	122	MUXIO	147	DIRHI	169	XTL2/RTC	191	PA17
098	CAS0#	123	TC	148	DIRLO	17017	XTL1	192	PA18
099	RAS0#	124	IOCHRDY	149	VCC2	171	RSTIN#	193	PA19
100	MA10	125	MEMW#	150	SK15	172	CLKIN	194	PA20
101	MA9	126	MEMR#	151	SD14	173	VCC2	195	VCC2
102	VCC2	127	GND2	152	SD13	174	CLKOUT	196	PA21
103	MA8	128	POWGD	153	SD12	175	PA2	197	PA22
104	MA7	129	LOWEN#	154	SD11	176	PA3	198	PA23
105	MA6	130	IOW#	155	SD10	177	PA4	199	PA24
106	MA5	131	IOR	156	SD9	178	PA5	200	PA25
107	MA4	132	MEMCS16#	157	SD8	179	PA6	201	PA31
108	MA3	133	OWS	158	SD7	180	PA7	202	GND2
109	MA2	134	RFSH#	159	SD6	181	PA8	203	WRKRDY#
110	MA1	135	MASTER#	160	SD5	182	PA9	204	BLAST#
111	GND2	136	RFSH#	161	SD4	183	PA10	205	PEREQ7 LOCK#
112	DAC2	137	MASTER#	162	GND2	184	PA11	206	BUSY7# PCD
113	DAC1	138	SPKDATA	163	SD3	185	PA12	207	PEREQ6 BRDY#
114	VCC1	139	OSC	164	SD2	186	PA13	208	I7RDY# KEN#
115	DAC0	140	SYSRST	165	SD1	187	GND1		
116	SEL2	141	ATCLK	166	SD0	188	PA14		
117	SEL1	142	GND2	167	KBCLK	189	PA15		

PART NO. :M409G00100 VER:2

Errata: (Applicable version. PCB P/N: P409F00100&P409F0010A)

To avoid system unstable or shutdown due to wrong settings, some errors in the 4MI-IL3S manual are listed out:

1. Page 2-5

Before	JP27	When use 32Kx8 TAGRAM	1-2 Short
		When use 16Kx8 TAGRAM	2-3 Short
After	JP27	When use 32Kx8 or 8Kx8 TAGRAM	1-2 Short
		When use 16Kx8 TAGRAM	2-3 Short

2 .In page 4-9 add two options in Advanced CMOS Setup.

a) IDE Block Mode Transfer: Disable

When this item is enabled the screen will show up the manufacturer, model type, as well as the memory size of the selected HDD.
No similar informations shown indicates the HDD does not support block transfer function.

b) IDE Standby: Disable

Please make sure that your harddisk supports the standby mode function before enable this mode you may select between 1 to 15 minutes when standby mode is enabled. For instance, suppose that 1 minute is choosed. The system will automatically shutdown the HDD motor when there is no access action to the HDD for more than one minute. Harddisk will be waken up if user accesses the HDD in later time.

Caution: Make sure to disable this mode if your HDD do not support standby mode, otherwise your HDD may not be read in some instances.

3. In page 4-12

Delete one option in Advanced Chipset Setup, now the presence of the Cyrix 487s Math Processor can be detected automatically, so the setup option for Cyrix 487s Math Processor is not necessary.

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