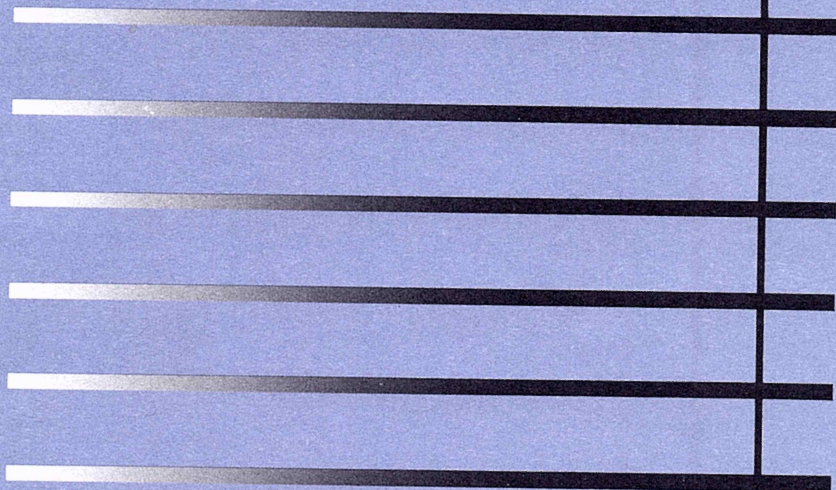


**4M50HL3**  
**System Board**  
**User's Manual**





# **4M50HL3**

## **System Board**

### **User's Manual**

#### **4DMU=50HL3-L4-VB**

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# Introduction

## The 486 Interchangeable Mother Board 4M50HL3

4M50HL3 is truly an universal mother board for all occasions - *the mother of all mother boards*. The sockets that can accommodate 486 series of CPU chips, 4M50HL3 allows the user to interchange the CPU chip on board any time he chooses to. With the help of changing a few jumper wires additionally, one can literally re-configure one's PC system from a low end 80486SX at 20MHz to a high end 80486DX at 50MHz any time one chooses. The economy and simplicity of upgrading or re-configure of the user's PC system, by only unplugging a CPU chip plus changing a few jumper wires, offers all kinds of ways to save and to expand in numerous applications!

# Chapter 1 Features

## 1.1 General Specifications and Features

The 4M50HL3 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: 80486SX, P24T, M6, C6, 80486DX2-66/50, and 80486DX 20MHz, 25MHz, 33MHz, 40MHz, 50MHz.

\* Built-in cache controller:

\* Optional 64KB, 128KB or 256KB cache memory allowing the CPU to run at full speed most of the time.

Cacheable 32MB main memory.

0 wait state for cache read/write hit.

Hidden DRAM refresh cycle to boost system performance.

Built-in registers to support three independent non-cacheable 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 fast/standard page mode.

- Supports two bank of SIMM sockets with up to 32MB of total memory.

- Flexible DRAM memory configuration to accommodate from 1MB to 32MB in different options of memory size by using a combination of 256KBx9, 1Mx9, 4MBx9, 1MBx3, DRAM SIMM modules.



- Programmable DRAM wait states.
- 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 DIP switches setting.
- \* Supports fast A20 Gates and fast CPU reset to boost performance of software utilizing 80486 protected mode, such OS/2, UNIX...etc.
- \* Support parity generation and checking.
- \* Eight ISA expansion slots:  
Seven 16-bit slots one 8 bit slot for AT-compatible add-on cards.
- \* Three VESA-Local bus slots. Slave/Master mode.

## **1.2 Major Components**

The 4M50HL3 mainboards are composed of many integrated circuits. Chips. The major components and their basic features are outlined as below.

UM82C481 Integrated Memory Controller (IMC)

UM82C482 Integrated System Controller (ISC)

UM82C206 Integrated Peripheral Controller (IMC)

VISA Local Bus

The 4M50HL3 board support VISA local bus Slave/Master mode.

Pin assignment list belows:

Pin	Assignment	Pin	Assignment	Pin	Assignment	Pin	Assignment
P1	PD1	P29	PA18	P59	PD0	P87	GND
P2	PD3	P30	PA16	P60	PD2	P88	PA17
P3	GND	P31	PA14	P61	PD4	P89	PA15
P4	PD5	P32	PA12	P62	PD6	P90	VCC
P5	PD7	P33	PA10	P63	PD8	P91	PA13
P6	PD9	P34	PA8	P64	GND	P92	PA11
P7	PD11	P35	GND	P65	PD10	P93	PA9
P8	PD13	P36	PA6	P66	PD12	P94	PA7
P9	PD15	P37	PA4	P67	VCC	P95	PA5
P10	GND	P38	N/C	P68	PD14	P96	GND
P11	PD17	P39	PBE*0	P69	PD16	P97	PA3
P12	VCC	P40	VCC	P70	PD18	P98	PA2
P13	PD19	P41	PBE*1	P71	PD20	P99	N/C
P14	PD21	P42	PBE*2	P72	GND	P100	LRESET*
P15	PD23	P43	GND	P73	PD22	P101	PDC
P16	PD25	P44	PBE*3	P74	PD24	P102	PMIO
P17	GND	P45	PADS*	P75	PD26	P103	PWR
P18	PD27	P46	WIKRDY*	P76	PD28	P106	PRDY*
P19	PD29	P49	CLBA*	P77	PD30	P107	GND
P20	PD31	P50	LREQ*	P78	VCC	P108	IRQ9
P21	PA30	P51	GNE	P79	PA31	P109	BRDY*
P22	PA28	P52	LGNT*	P80	PA29	P110	BLST*
P23	PA26	P53	VCC	P81	GND	P111	ID0-1
P24	GND	P54	ID2-1	P82	PA27	P112	ID1-1
P25	PA24	P55	ID3-1	P83	PA25	P113	GND
P26	PA26	P56	ID4	P84	PA23	P114	JP02
P27	VCC	P57	KET*	P85	PA21	P115	VCC
P28	PA20	P58	PEADS*	P86	PA19	P116	LSV16*

# 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, 1-MB or 4-MB SIMM. (It can be a mix of these SIMMS). In table 2.1, all the possible combination of the DRAM modules to make up from 1-MB to 32-MB 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**

BANK 0	BANK 1	TOTAL MEMORY
256K	-----	1M
256K	256K	2M
256K	1M	5M
1M	-----	4M
1M	1M	8M
1M	4M	20M
4M	-----	16M
4M	4M	32M

**Note:** 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 relation the 256-KB/384-KB memory. In this case, the total memory displayed on the screen will be 3968-KB/384-KB.

To relocation the unused 256-KB/384KB of reserved memory above normal extended memory, you could enable the main memory relocation option in the CMOS SERUP 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 4M50HL3 accept optional 64KB, 128KB or 256KB or SRAM for cache memory support. The SRAM chip should be 8Kx8bit or 32Kx8bit with speed of 25ns for the 486SX 20MHz, 20ns for 486DX 33/50MHz. The TAGRAM (U17) is for saving address and compare the next CPU address. A TAGRAM should be used ap 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.

**Table 2.2 SRAM Configuration**

Option	BANK 0 U24, U25, U26, U27	BANK 1 U34, U35, U36, U37	Cache Memory Amount	TAG RAM (U17)
1	8K x 8bit SRAM	8K x 8bit SRAM	64K	8K x 8
2	32K x 8bit SRAM	0	128K	8K x 8
3	32K x 8bit SRAM	32K x 8bit SRAM	256K	32K x 8

# Chapter 3 Jumper

## Jumper Settings and Connectors

This chapter will assist you with setting-up the 4M50HL3 before you install it in a system case. If your 4M50HL3 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 4M50HL3 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 closed jumper. All jumpers must be set to one of the two possible settings.

#### 3.2.1 Cache RAM Jumper Setting

CAC SIZE	J16	J15	J8	J7	J12	J11	J10	J9	CACHEABL RANGE
64K Byte	1.2	1.2	2.3	Open	Open	Open	Open	Open	16MB
128K Byte	2.3	1.2	1.2	2.3	Open	Close	Open	Close	32MB
256K Byte	2.3	2.3	2.3	1.2	Close	Close	Close	Close	64MB

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 Switch Setting (PGA Packing)

<b>Switch 1 Configuration CPU Speed Select</b>				
	SW1-1	SW1-2	SW1-3	SW1-4
486SX-20	OFF	OFF	ON	OFF
486SX-25	ON	ON	OFF	ON
486SX-33	ON	OFF	ON	ON
M6	OFF	OFF	ON	OFF
<b>Jumper Configuration CPU Type Select</b>				
	J18	J19	J20	J21
486SX-20	OPen	Open	Short	Short
M6/486SX-25/33	Open	Open	Open	Short
<b>Other</b>				
Jumperb J17	Open			

### 3.2.3 486DX Switch Setting (PGA Packing)

<b>Switch 1 Configuration CPU Speed Select</b>				
	SW1-1	SW1-2	SW1-3	SW1-4
486DX-25	ON	ON	OFF	ON
486DX-33	ON	OFF	ON	ON
M7 / 486DX-40	OFF	OFF	ON	OFF
486DX-50	OFF	OFF	OFF	OFF
<b>Jumper Configuration CPU Type Select</b>				
	J18	J19	J20	J21
M7 / 486DX SERIAL	Short	Short	Open	Open
<b>Other</b>				
Jumper 17	1-2 Short			

### 3.2.4 486DX2 Switch Setting (PGA Packing)

#### Switch 1 Configuratio CPU Speed Select

	SW 1-1	SW 1-2	SW 1-3	SW1-4
486DX2-50	ON	ON	OFF	ON
486DX2-66	ON	OFF	ON	ON
<b>Other</b>				
486DX2 Serial	J18	J19	J20	J21
486DX2 Serial	Short	Short	Open	Open
Jumper 17	1-2 Short			

### 3.2.5 CYRIX M6 with C6 Switch Setting

Switch 1 Configuration CPU Speed Select				
	SW1-1	SW1-2	SW1-3	SW1-4
M6+C6 (33MHz)	ON	OFF	ON	ON
M6+C6 (40MHz)	OFF	OFF	ON	OFF
Jumper Configuration CPU Type Select				
	J18	J19	J20	J21
M6+C6 Serial	Short	Short	Open	Open
Other				
Jumper J17	1-2 Short			
Jumper	CPU Type	W/CYRIX C6	W/O CYRIX C6	
Jumper 14	Short		Open	
Jumper 13	2-3 Short		1-2 Short	

### 3.2.6 VL-BUS Jumper Setting

J23: VL-BUS FAST write wait state

J22,J6: CPU Speed select

Fast Write Wait	J23	CPU SPEED	J22	J6
0 WAIT	User Select Mode 1-2short	<= 33MHz	1-2	1-2
1 WAIT	User Select Mode 2-3 short	> 33MHz	2-3	2-3



### 3.2.7 Other Jumper Setting

Select Jump	1-2 Open	1-2 Short	Default	Remark
J29	Turbo	Normal	Open	Speed Select
J3	ON Board Battery Disable	ON Board Battery Enable	Short	Battery Select

Select Jump	1-2 Short	2-3 Short
J2	Enable CMOS RAM	Clear CMOS RAM

Jump	CPU Type	SX/DX/DX2./Overdriver
J24		1-2 Short
J30		2-3 Short

Jump	CPUType	Cyrix DX2-50	Cyrix DX-40	Other CPU
JP31		1-2 Short	2-3 Short	Open

Jump	CPU Type	CPU Type Select
J5: 1-2		SX/DX/DX2/Overdriver
J5: 2-3 Short		CYRIX M6 / M7

**North:** If use WESTERN DIGITAT HDD NO: WDAC2340 please set J5-2-3 short.

### 3.3 Connectors

There are several connectors located on the 4M50HL3. 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
J1	External Battery Connector
J27	Keylock Connector, Power LED Connector
J26	Speaker Connector
J28	Hardware Reset Connector
KB1	Keyboard Connector
PS1	Connectors the Power Ssupply
J25	Turbo LED Connector

The following lists the pin assignments for each connectors.

<b>External Battery Connector (J1)</b>			
Pin No.	Assignment	Pin No.	Assignment
1	+ 3.6 VDC	3	GND
2	Not Used	4	GND
<b>Turbo LED Connector (J25)</b>			
1	+ 5 V	2	Turbo
<b>Hardware Connector (J28)</b>			
1	RESET	2	GND
<b>Speaker Connector (J26)</b>			
1	Data IN	3	GND
2	Not Used	4	+ 5 V
<b>Keylock Connector (J27)</b>			
1	+ VDC	4	Keylock
2	NC	5	GND
3	GND		
<b>Keyboard Connector (KB1)</b>			
1	Keyboard LOCK	4	GND
2	Keyboard DATA	5	VCC
3	Not Used		
<b>Power Connector (PS1)</b>			
1	Power Good	7	GND
2	+5V	8	GND
3	+12V	9	-5V
4	-12V	10	+5V
5	GND	11	+5V
6	GND	12	+5V

## Note

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# Chapter 4

## 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 functionality of 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. Before 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 the Setup program, it will display the Enter password message on the screen. Refer to section 5.6, 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:

<p>AMI BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES (C) 1992 American Megatrends Inc., All Rights Reserved</p>
<p>STANDARD CMOS SETUP ADVANCED CMOS SETUP ADVANCED CHIPSET SETUP POWER MANAGEMENT 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</p>
<p>Standard CMOS Setup for changing Time, Date, Hard Disk Type, etc. ESC: EXIT ↑→↓←, Sel F2/F3: color F10: Save &amp; Exit</p>

Figure 4.1 BIOS Setup Main Menu Options

On-screen instructions at the bottom of 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
F 10	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:

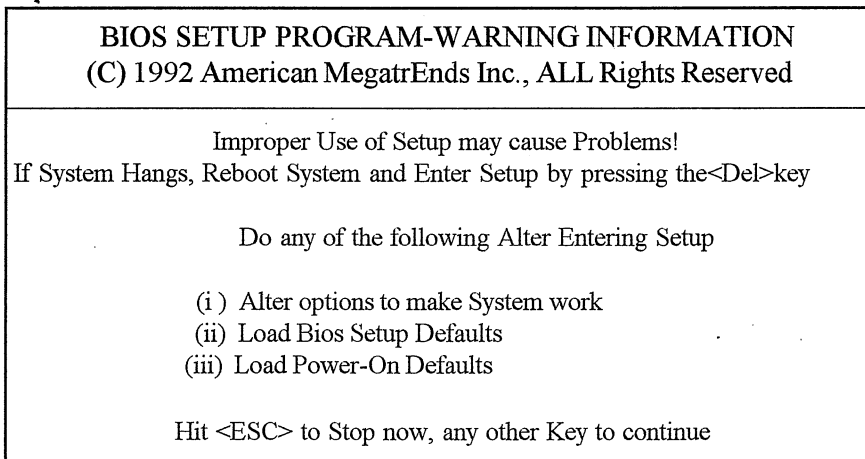


Figure 4.2 BIOS Setup Warning Message

## 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	43	MB	
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
Month : Jan, Feb,.....Dec	13	14	15	16	17	18	19
Date : 01,02,03,.....31	20	21	22	23	24	25	26
Year : 1901,1902,.....2009	27	28	29	30	31	1	2
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 the 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 Cyl'n (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:

AMI BIOS SETUP PROGRAM - ADVANCED CMOS SETUP (C) 1992 American Megatrends Inc., All Rights Reserved	
Typematic Rate Programming : Disabled	Video ROM Shadow C000,16K : Enabled
Typematic Rate Delay (msec) : 500	Video ROM Shadow C40016K : Enabled
Above 1MB Memory Test : 15	Adaptor ROM Shadow C800,16K : Disabled
Memory TEST Tick sound : Disabled	System ROM Shadow F000,64K : Enabled
Hard Disk Type 47 RAM Are : 0:300	BootSector Virus Protectin : Present
Wait for <F1> if any error : Enable	IDE Block Mode Transfer : Present
System Boot Up Num lock : On	
Floppy Drive Seek at Boot : Enabled	
System Boot Up Sequence : C:, A:	
Cache Memor : Both	
Gate A20 Emulation : Both	
Password Checking Option : Setup	

ESC:Exit ↑ → ↓ ← :Sel(Ctrl) Pu/Pd: Modify F1:Help F2/F3:Color  
F5: Old Values F6: BIOS setup Defaults F7: Power On Defaults

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 values 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

### Hard 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".

### **System Boot Up Num Lock**

This option can set the "Num Lock" key to "On" or "Off" after system boot up.

### **Cache Memory**

Due to constraint of technology, speed of currently available DRAM may not be high enough to catch up with the speed of the CPU, which means that at every setup of program execution, the CPU must wait for the DRAM to response. In fact, CPU to run faster, the system must be designed to use another kind of fast RAM chip - SRAM (Static-column RAM).

In 4M50HL3, you can have a dual cache architecture -internal (from the CPU) & external cache (from the SRAM).

The options are as follows:

\* Disable

\* Internal

\* BOTH

You should usually setting the "BOTH" option to get full potential of the system when you using a 486 DX CPU. You have to setting the "BOTH" to 486DLC CPU (Because 386 CPU have not internal cache RAM).



### \*Gate A20 emulation

Press F1 the screen display the following explanation

Gate A20 Emulation	
Disabled:	Gate-20 is controlled by keyboard controller (8042) for programs which uses BIOS calls as well as for programs which uses I/O ports.
Chipset:	Gate-20 is controlled by chipset (UMC82C482A) for programs which uses BIOS calls as well as for programs which uses I/O ports 60H/64H for doing Gate-A20 operations.
Fast :	Gate-20 is controlled by I/O port 92H for programs which uses BIOS calls for doing Gate-A20 operations. For programs which uses I/O ports 60H/64H for doing Gate-A20 operations Gate-A20 is controlled by keyboard controller (8042).
Both :	Gate-A20 is controlled by I/O port 92H for programs which uses BIOS calls for doing Gate-A20 operations. For programs which uses I/O port 60H/64H for doing Gate-A20 operations Gate-A20 is controlled by chipset (UM82C482A).

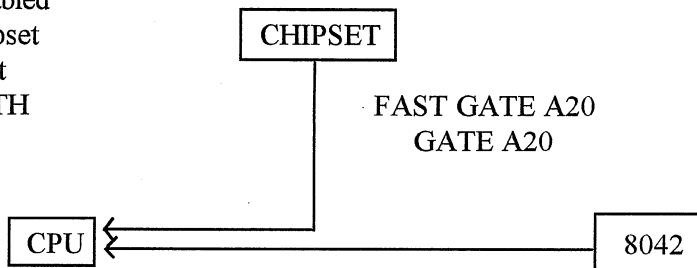
Available Options:

Disabled

Chipset

Fast

BOTH



**Note:**

Also you can pressing the <Ctrl>, <Alt>, <Shift>, and <+>/<-> keys combination to enable or disable the cache memory subsystem.

**Password Checking Option**

The purpose of this field is to determine whether the password is asked for in every boot (set to “Always”) when entering into the Setup program (user to “Setup”) or never (set to “Disabled”).

**Video ROM Shadow**

Choose these two options for better video display performance. It enables the shadow RAM operation for the video BIOS on display cards such as VGA or EGA. The Video card should be checked to see whether it has 16K or 32K of ROM. If there is no ROM in the display card, there is no need to shadow the Video BIOS. If it has 16K of ROM, the Video BIOS should be shadowed at C000, 16K. If the card has 32K of ROM, the Video BIOS should be shadowed at both C000, 16K and C400, 16K.

## 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	
I/O Recovery Time Delay :4BCLK	Non-Cacheable Block1 Enable: Disabled
DRAM Page Mode :Disabled	Non-cacheable Block-1 Size :1MB
DRAM Read WS Options :2WS	Non-Cacheable Block-1 Base: 0KB
DRAM Write WS Options :Disabled	Non-Cacheable Block2 Enable: Disabled
Memory Remapping :Disabled	Non-Cacheable Block-2 Size :16MB
Memory Above 16MB Cacheable: No	Non-Cacheable Block-2 Base :0KB
ESC: Exit ↑→↓←: Sel (Ctrl) Pu/Pd: Modify F1: Help F2/F3: Color F5: Old Values F6: BIOS setup Defaults F7: Power On Defaults	

Figure 4.4 The Advanced ChipSet Setup

### Non-Cacheable Block Size and Address

For some special I/O card need to use system memory, you should reserve space of the memory for its use. There is two continuous address areas for Non-cacheable blocks in the 4M50HL3. The options of Non-cacheable Block-1 size.

- \* Disabled
- \* 4 KB
- \* 8 KB
- \* 16 KB
- \* 32 KB
- \* 64 KB
- \* 128 KB
- \* 256 KB
- \* 1 MB

According to the above non-cacheable block-1 size setting, you should set the proper address.

- \* 64 KB
- \* 128 KB
- \* 512 KB
- \* 1 MB
- \* 2 MB
- \* 4 MB
- \* 8 MB
- \* 16 MB

### **F000 Memory, 64K Cacheable**

If you have shadowing of the system BIOS, you can enable this option for memory cacheable function.

### **C400 Memory, 16K Cacheable**

If you shadowing the video BIOS at C400, 16K, you can enable this memory cacheable function.

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

## 4.5 Using the Change Password Setup

To change the password, choose the “CHANGE PASSWORD” option from the Setup main menu and press <Enter>.

1. If the CMOS is bad or this option has never been used, there is default password which is stored in the ROM the screen will display messages:

Enter ROM Password:

Press the <Enter> key and continue to change the password.

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

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.

## 4.6 BIOS Errors and Messages

After entering setup choices, the system will reboot. The setup summary and system information will appear on screen, along with messages. These may include ERROR messages concerning the system or setup.

AMI BIOS performs various diagnostic tests at the time the system is turned-on. Whenever an error is encountered during these tests, there will be either a few short beeps or an error displayed on the monitor. If the error is FATAL, the system halts after reporting before the display device is initialized the system reports the error with several short beeps. The FATAL error. If the error is NON-FATAL the process continues after reporting the error.

### 4.6.1 Fatal Errors Through Beeps

These errors are converted through a number of beeps.

Beep Count	Meaning
1	DRAM refresh failure
2	Base 64 KB RAM failure
4	System timer failure
5	Processor failure
6	Keyboard controller GATE A20 error
7	Virtual Mode Exception Error
9	ROM-BIOS CheckSum Failure

## 4.6.2 Non-Fatal Errors Through Beeps

These errors are converted as one long beep followed by several short beeps.

Beep Count	Meaning
3	Conventional and Extended memory test failure
8	Display test and vertical and horizontal retrace test failure

## 4.6.3 Fatal Errors shown in Display

When these errors are displayed, the screen is cleared, and the error message display is followed by a line saying SYSTEM HALTED.

1. CMOS IN OPERATIONAL: indicates failure of CMOS shutdown register test.
2. 8042 GATE-A20 ERROR: error in getting into protected mode.
3. INVALID SWITCH MEMORY FAILURE
4. DMA ERROR: DMA controller page register test failed.
5. DMA #1 ERROR: DMA Unit 1 register test failed.
6. DMA #2 ERROR: DMA Unit 2 register test failed.

## 4.6.4 Non-Fatal Errors In Display

There are two types of errors in this category :

1. Ones that require you to press the F1 key and give you the option of running SETUP.
2. Ones that require you to press the F1 key and don't give you the SETUP Option.

## **4.6.5 Errors With Setup Option**

1. CMOS battery state low indicates failure of CMOS battery or failure in the set and checksum tests.
2. CMOS system options not set indicates failure of CMOS battery or failure in set and checksum tests.
3. CMOS checksum failure indicates CMOS battery low or a failure in set and checksum tests
4. CMOS display type mismatch indicates failure of display verification.
5. CMOS memory size mismatch indicates a System Configuration and setup failure.
6. CMOS time & date not set indicates System Configuration verification error and setup error (in timer).

## **4.6.6 Errors Without Setup Option**

1. CH-2 timer error indicates channel 2,1,0 timer test
2. Keyboard error indicates keyboard test failure.
3. KB/Interface error indicates keyboard test failure.
4. Display switch setting not proper indicates display type verification error.
5. Keyboard is locked .....Unlock it.
6. FDD controller error indicates System Configuration verification error in diskette setup.
7. HDD controller failure indicates System Configuration verification error in hard disk setup.
8. C: Drive error indicates hard disk setup error.
9. D: Drive error indicates hard disk setup error.
10. D: Drive failure indicates hard disk failure.



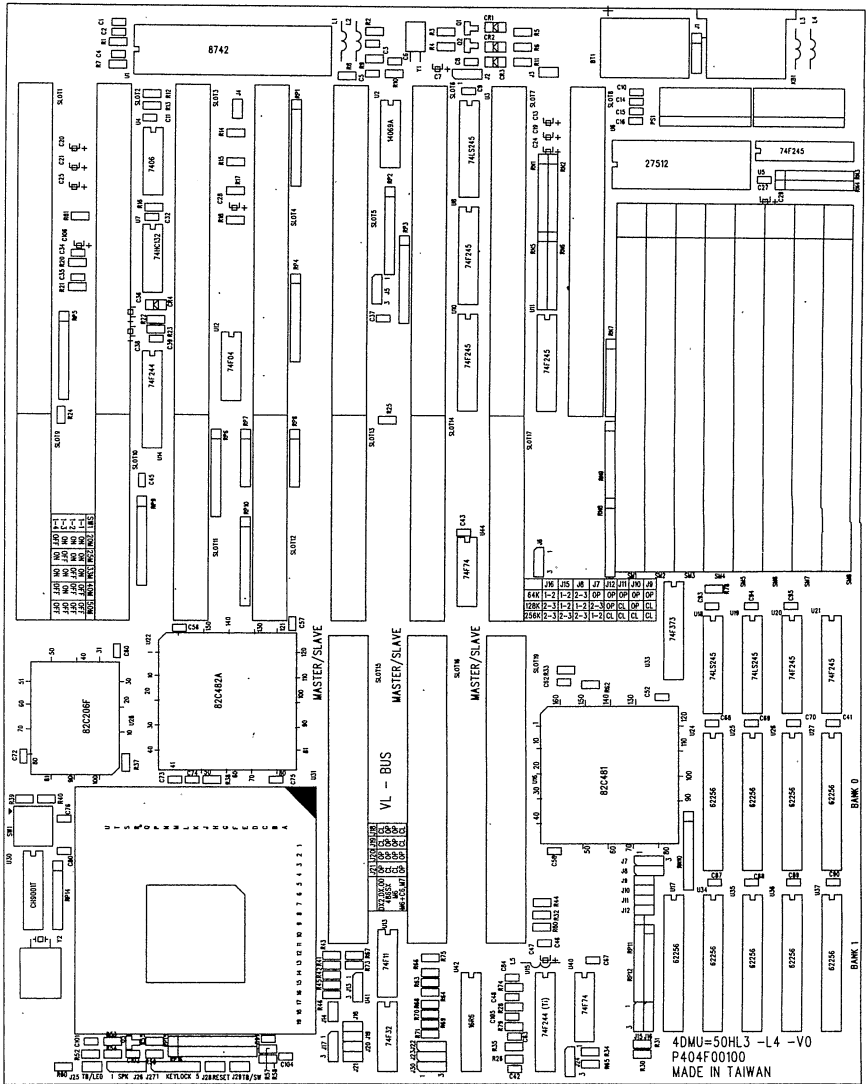
# Appendix A

## Hard Disk Types

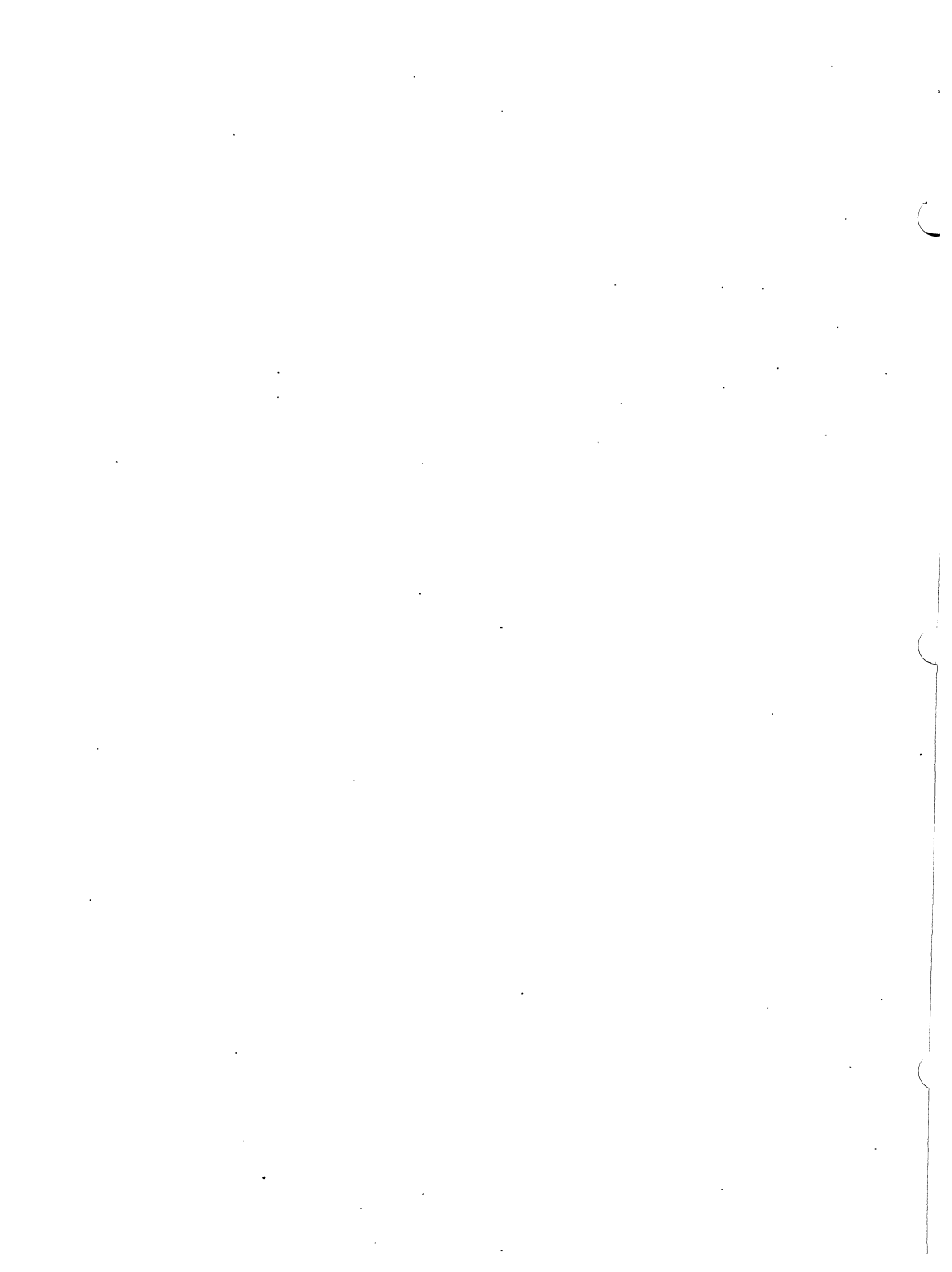
Type	Cylinders	Heads	Sector	Capacity (Mbytes)
1	306	4	17	10
2	615	4	17	20
3	615	6	17	31
4	940	8	17	62
5	940	4	17	47
6	615	4	17	20
7	462	8	17	31
8	733	5	17	30
9	900	15	17	112
10	820	3	17	20
11	855	5	17	35
12	855	7	17	50
13	306	8	17	20
14	733	7	17	43
15	000	0	17	00
16	612	4	17	20
17	977	5	17	41
18	977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



SILK SCREEN  
4MU=50HL3 -L4 -V0  
P404F00100  
(EL182FJ1)



C



M404G0010A  
Printed in Taiwan