UMC 486 VESA BUS

User's Manual

(4FVUD-1.0)

Mainboard

ISA BUS
EISA BUS
LOCAL BUS

CHAPTER 1

Introduction

The UMC 486 system board is a high-performance personal computer system board based on an 80486 microprocessor running at 25/33/40/50 MHz. The board offers a socket for a hand-inserted cpu.
A cache subsystem can be configured for 32kb,64kb,128kb, or 256kb cache memory to improve overall throughput. The board also features three32-bit Local Bus slots for VESA standard.
The UMC 486 system board uses the highly integrated UMC 491F chip that integrateds all system control functions.

FEATURES

The advanced features of the the 4FVUD motherboard include:

- *One of the following CPUS:*

  Intel i486DX CPU running at 33 or 50 MHz,
  Intel i486DX2 CPU running at 50 or 66MHz,
  Intel 80486SX CPU running at 20or 25MHz,

- *Internal 8K cache with 4-way set associate alogorithm built into the CPU*

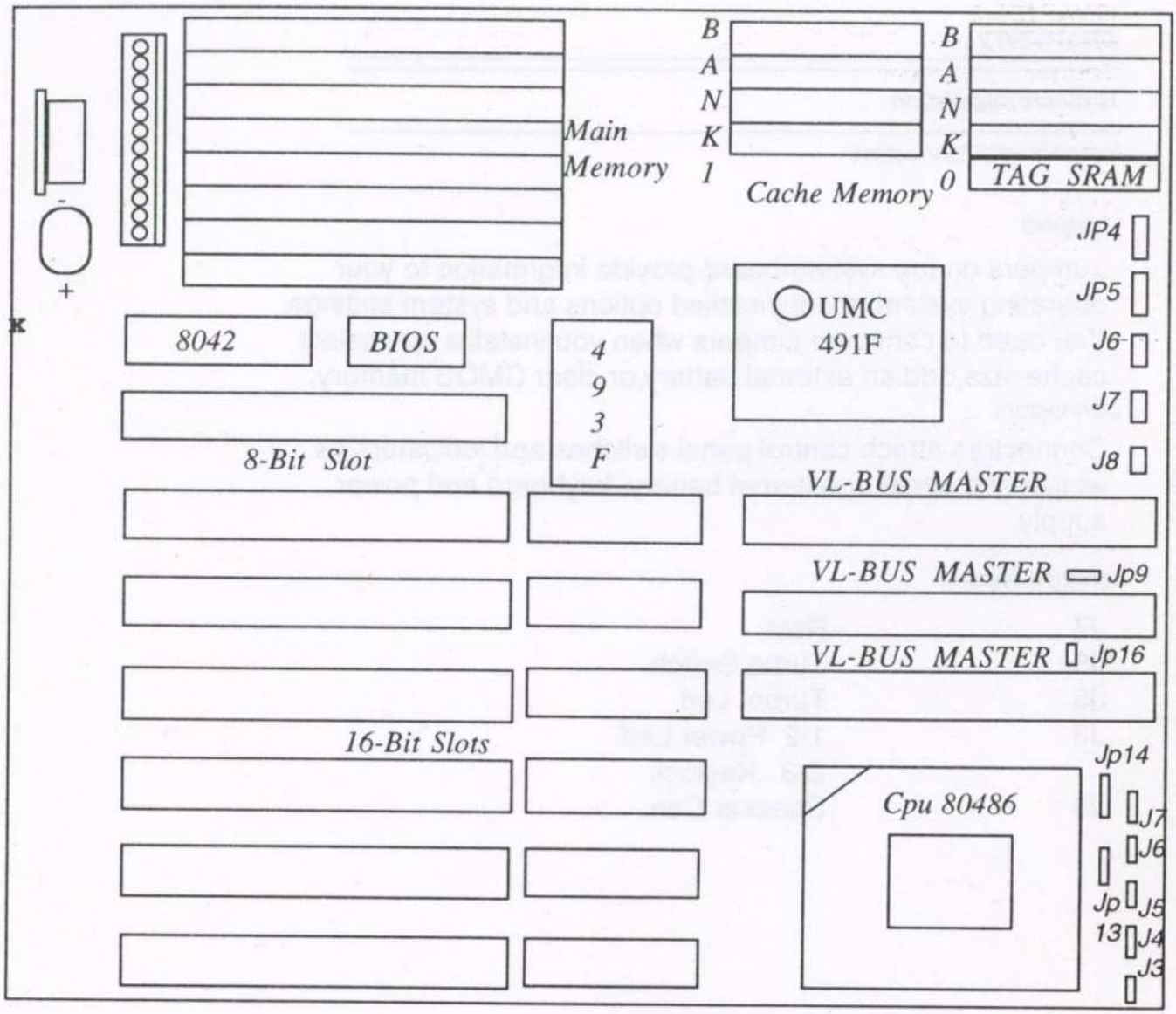
- *External 32K/64K/128K/256K cache system*

- *Memory support up to 32Mbytes with combinations of 256K,1M,and 4M SIMM modules.*

- *Three 32-BIT VESA BUS MASTER slots*

- *Six 16-bit ISA slots and one 8-bit ISA slot*

- *AMI BIOS*



UMC491 Placement

CHAPTER 2

Hrdware installation

Jumpers and Connectors

Jumpers

Jumpers on the system board provide information to your operating system about installed options and system settings. You need to configure jumpers when you install a cpu,select cache size,add an external battery,or clear CMOS memory.

Connectors

Connectors attach control panel switches and indicators,as well as the speaker,external battery, keyboard and power supply.

Setting Jumpers

J7	Rset
J8	Turbo Switch
J5	Turbo Led
J3	1-2 Power Led
	2-3 Keylock
J4	Speaker Con.

CPU Type Selectors:JP3 , JP13 , JP14

The UMC 491 system board can support several type of CPU. To configure the system board to recognize which type of CPU is installed,you must set jumpers JP3,JP13,and JP14 as below.

CPU	JP13	JP14
486	1-2,2-3	1-2
P23	2-3	open
p23N	1-2,3-4	2-3

JP3	short enable cx487s
	open disable cx487s

Cache Memory Selection: Jp4 - JP8

The system board supports 32K,64K,128K or 256K of cache memory. You configure cache memory by installing 8K8 r 32K8 SRAM chips in Data RAM sockets U13 - U16 and U21- U24,and in TAG RAM socket U20,and then setting the cache jumpers.

Cache Size and Memory Locations

Cache Size	Tag RAM (U20)	Date RAM (U13-U16)	Data RAM (U21-U26)
32K	8k8	None	32K8
64K	8K8	8K8	8K8
128K	8K8	None	32K8
256K	32K8	32K8	32K8

Cache Size Selection :

Cache Size	JP4	JP5	JP6	JP7	JP8
32K					
64K	open	1-2	Off	On	On
128K	2-3	2-3	Off	On	On
256K	1-2	1-2	On	On	On

Memory Bank Configuration

The UMC 486 system board supports tow memory banks on-board,numberd bank 0 and bank1. User needn't care which bank he should install which type DRAM.So these functions are very convenient to End-user.

Table 2-1 below for possable configurations.

Bank 0	Bank 1	Memory
256K	----	1M
256K	256K	2M
1M	------	2M
256K	1M	5M
1M	------	4M
1M	256K	5M
1M	1M	8M
4M	------	16M
256K	4M	17M
4M	256K	17M
1M	4M	20M
4M	1M	20M
4M	4M	32M

VL-Bus Master Setting : JP9, JP16

Settings

CPU Speed	*JP9*	*JP16*
< = 33MHz	*Off*	*1-2*
> 33MHz	*On*	*2-3*

CHAPTER 3

AMI BIOS SETUP PROGRAM

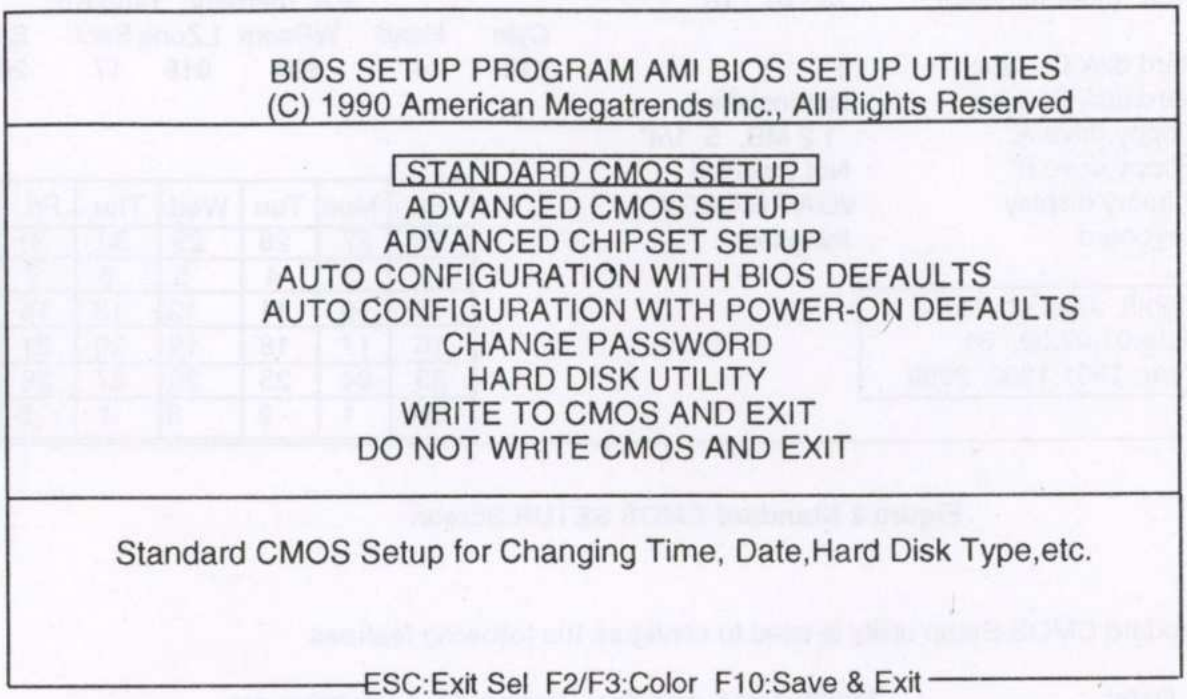
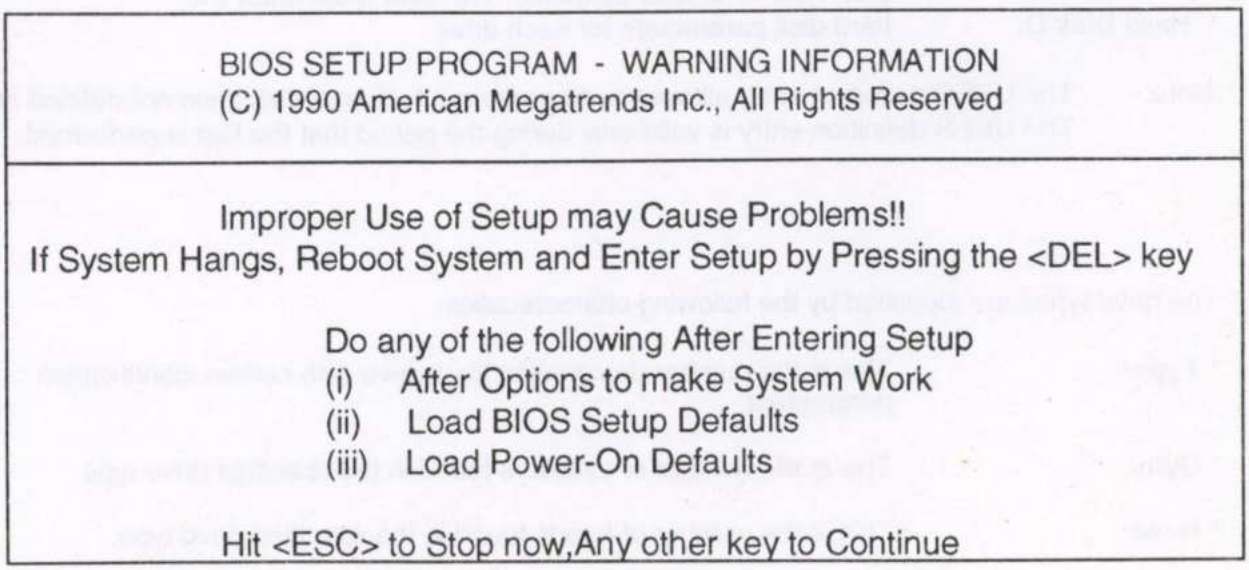


Figure 1

The generic menu options of the BIOS SETUP Program are shown in Figure 1

A warning message, shown in below is displayed each time one of the first three options (Standard CMOS Setup, Adveanced CMOS Setup, and Advanced Chips Set Setup) is selected, before any changes are showed to any of the setup parameters.



BIOS SETUP PROGRAM-STANDARD CMOS SETUP
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Date (mn/date/year) : Sun, Feb,2,1992
TIME (hour/min/sec) : 15 : 01 : 16

Base memory: 640 KB
Ext. memory: 1408 KB

	Cyln	Head	WPcom	LZone	Sect	Size
Hard disk C: type : 2	615	4	300	615	17	20MB

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

Month: Jan,Feb....Dec
Date:01,02,03...31
Year: 1901,1902..2099

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	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	1	2	3	4	5	6

Figure 2 Standard CMOS SETUP Screen

The Standard CMOS Setup utility is used to configure the following features:

* **Date:** Month, Date, and Year, Ranges for each value are listed below in prompt box in the lower left corner of the CMOS Setup Screen (Figure 2).

***Time:** Hour, Minute, and Second. Uses 24 hour clock format, i.e., for PM numbers, add 12 to the hour. You would enter 4:30 P.M. as 16:30:00.

* **Daylight Saving:** Disabled or Enabled.

* **Hard Disk C:**
* **Hard Disk D:** Hard disk types from 1 to 46 are standard ones: and type 47 is user definable. The user must enter the hard disk parameters for each drive.

Note: The USER definition entry allows you to perform a test on a disk drive not defined in ROM. The USER definition entry is valid only during the period that the test is performed.

The drive types are identified by the following characteristics:

* **Type:** This is the number designation for a drive with certain identification parameters.

* **Cyln:** This is the number of cylinders found in the specified drive type.

* **Head:** This is the number of heads found in the specified drive type.

*** WPcom:** WPcom is the read delay circuitry which takes into account the timing differences between the inner and outer edges of the surface of the disk platter .

*** L-zone:** L-zone is the landing zone of the heads. This number determines the cylinder location where the heads will normally park when the system is shut down.

*** Capacity:** This is the formatted capacity of the drive based on the following formula: (# of heads) x (#of cylinders) x (17 secs/cyl) x (512 bytes/sec)

Listed below are the attributes for disk types 1 through 46.

Type	Cyln	Head	WPcom	LZone	Sect	Size
1	306	4	128	305	17	10MB
2	615	4	300	615	17	20MB
3	615	6	300	615	17	31MB
4	940	8	512	940	17	62MB
5	940	6	512	940	17	47MB
6	615	4	65535	615	17	20MB
7	462	8	256	511	17	31MB
8	733	5	65535	733	17	30MB
9	900	15	65535	901	17	112MB
10	820	3	65535	820	17	20MB
11	855	5	65535	855	17	35MB
12	855	7	65535	855	17	50MB
13	306	8	128	319	17	20MB
14	733	7	65535	733	17	43MB
16	612	4	0	663	17	20MB
17	977	5	300	977	17	41MB
18	977	7	65535	977	17	57MB
19	1024	7	512	1023	17	60MB
20	733	5	300	732	17	30MB
21	733	7	300	732	17	43MB
22	733	5	300	733	17	30MB
23	306	4	0	336	17	10MB
24	925	7	0	925	17	54MB
25	925	9	65535	925	17	69MB
26	754	7	754	754	17	44MB
27	754	11	65535	754	17	69MB
28	699	7	256	699	17	41MB
29	823	10	65535	823	17	68MB
30	918	7	918	918	17	53MB
31	1024	11	65535	1024	17	94MB
32	1024	15	65535	1024	17	128MB
33	1024	5	1024	1024	17	43MB
34	612	2	128	612	17	10MB
35	1024	9	65535	1024	17	77MB
36	1024	8	512	1024	17	68MB

37	615	8	128	615	17	41MB
38	987	3	987	987	17	25MB
39	987	7	987	987	17	57MB
40	820	6	820	820	17	41MB
41	977	5	977	977	17	41MB
42	981	5	981	981	17	41MB
43	830	7	512	830	17	48MB
44	830	10	65535	830	17	69MB
45	917	15	65535	918	17	114MB
46	1224	15	65535	1223	17	152MB

"Not Installed" is available for use as an option.
This option could be used for diskless workstations and SCSI hard disks. Type 47 may be used for both hard disks C: and D:.
The parameters for type 47 under Hard Disk C:and Hard Disk D: may be different, which effectively allows 2 different user-definable hard disk types
* Floppy Drive A and Floppy Drive B: The options are 360 KB 5 1/4," ,1.2 MB 5 1/4",720KB 31/2",1.44MB 3 1/2", 2.88MB 3 1/2",and Not installed. Not installed could be used as an option for diskless workstations.
* Primary Display: Options are Monochrome,Color 40 x 25, VGA/PGA/EGA,Color 80 x 25, and Not Installed. The Not installed option could be used for network file servers.
* Keyboard: Options are installed or Not installed.

ADVANCED CMOS SETUP

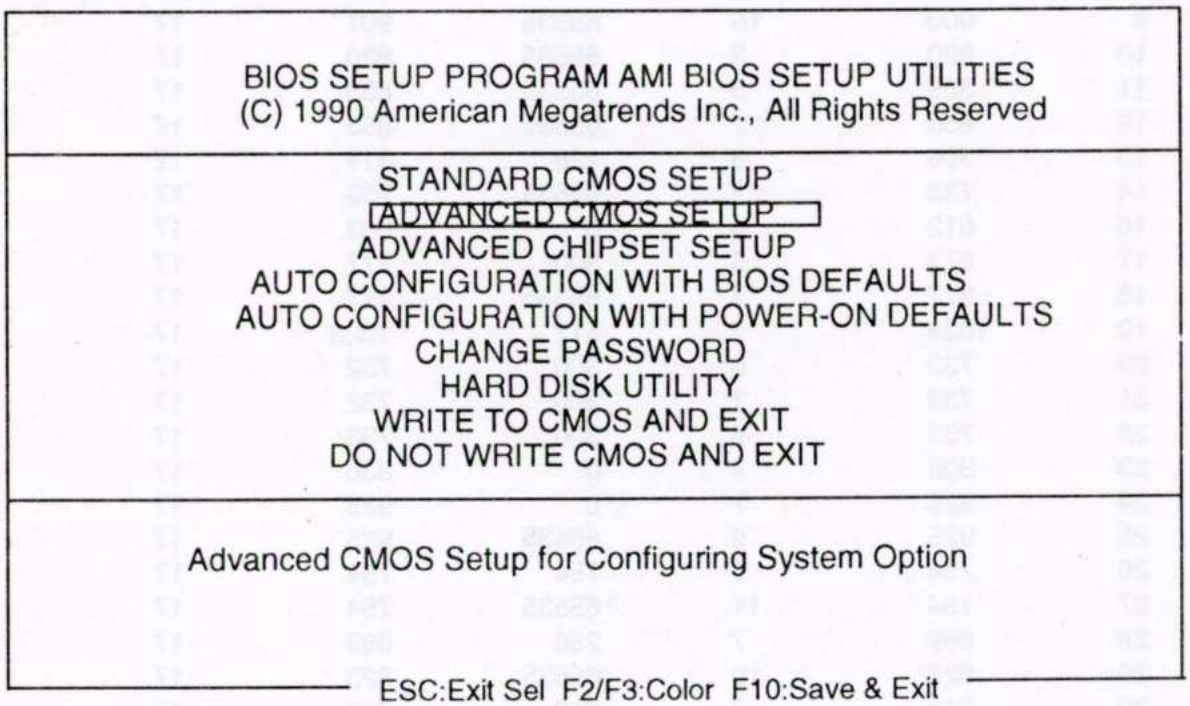

Figure 3

Typematic Rate Programming
Extended Momory Test
Memory Test Tick Sound
Memory Parity Error Check
Hit<DEL>Message Display
Wait for<F1>If Any Error
Internal/External Cache Memory
(486) of Cache Memory (386)
* Fast Gate A20 Option
* Video of Adapter ROM Shadow
* GA20 Line After System Boot
The options for the following featuers of the Advancde CMOS setup are either "Present" or "Absent:"
Numeric Processor
Weitek Processor
The options for Power-On Up Num Lock are "On" or "Off."
The options for system boot Up Speed are "High" or "Low."

BIOS SETUP PROGRAM - ADVANCED CMOS SETUP
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Typematic Rate Programming	: Disabled
Typematic Rate Delay (msec)	: 500
Typematic Rate (Chars/Sec)	: 15
Above 1 MB Memory Test	: Disabled
Memory Test Tick Sound	: Enabled
Memoty Parity Error Check	: Enabled
Hit <DEL> Message Display	: Enabled
Hard Disk Type 47 RAM Area	: 0:300
Wait For <F1> If Any Error	: Enabled
System Boot Up Num Lock	: On
System Boot Up CPU Speed	: Hight
Floppy Driver Seek At Boot	: Disabled
System Boot Up Sequence	: A: , C:
External Cache Memory	: Enabled
Internal Cache Memory	: Enabled
Password Checking Option	: Setup
Fast Gate A20 Option	: Enable

Figure 4

A short description follows for each of the options on the Advanced CMOS Setup Screen.

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.

Extended 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 1MB 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 <DEL> Message Display :

Disabling this option, will prevent the message:

"Hit <DEL> if you want to run SETUP"

From appearing on the screen when the system boots-up.

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 (640KB). If the option is set to "DOS 1 KB," the DOS Shell is shortened to 639 KB, and the top KB is used for the hard disk data storage. Please refer to Figure 4 for this option.

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 "numlock" option on his Enhanced Keyboard when the system is powered on. This will allow him to use the arrow keys on the numeric keypad instead of using the other set of arrow keys on the Enhanced Keyboard. The BIOS will default to turning the "num lock"

Floppy Drive Seek At Boot :

The default for this option is "Disabled" to allow a fast boot and to decrease the possibility of damage to the heads.

System Boot Up CPU Speed :

The speed at which the system will boot up is determined with this option. Choices for this option are "high" or "low". The default speed is "low".

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. Please refer to Figure 4 for this option.

Password Check Option :

The password feature can be used to prevent unauthorized system boot-up or unauthorized use of BIOS SETUP. The option in the BIOS SETUP only allows the user to enable the password check option every time the system boots or upon entering SETUP only. Second option is to disable the password option entirely.

The default option is **"Setup."** The prompt for the password will not appear when the system is rebooted.

If the **"Always"** option is chosen at Setup.each time the system is turned on, i.e. "booted,"the prompt for user password will appear.

If the **"Setup"** option is chosen at Setup. The password prompt will not appear when the system is turned on, but will appear if the user attempts to enter the Setup program.
The program allows three attempts to key in the correct password. After each incorrect attempt, the prompt to enter the current password will appear, followed by an "X." After the third incorrect attempt, the system will lock and it will be necessary to reboot. The screen will not display the characters entered.

External Cache Memory:

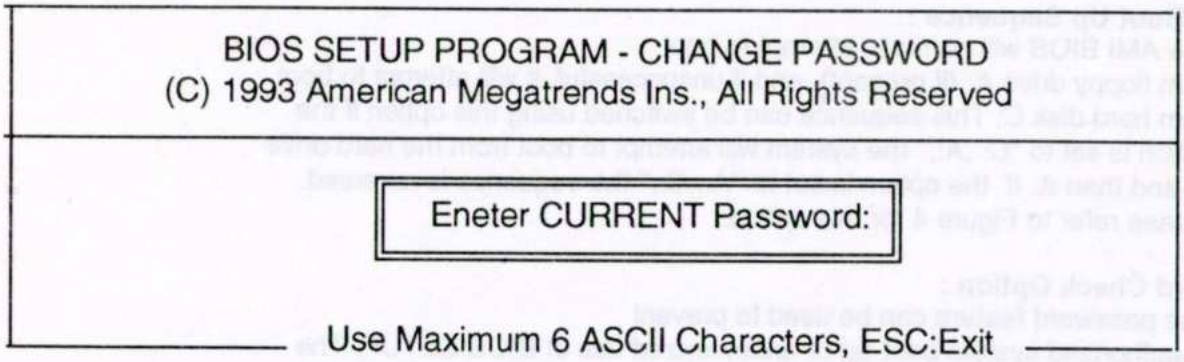
With this option, the user may enable or disable the 64K, 128K, 256K Externai cache.

Internal Cache Memory:

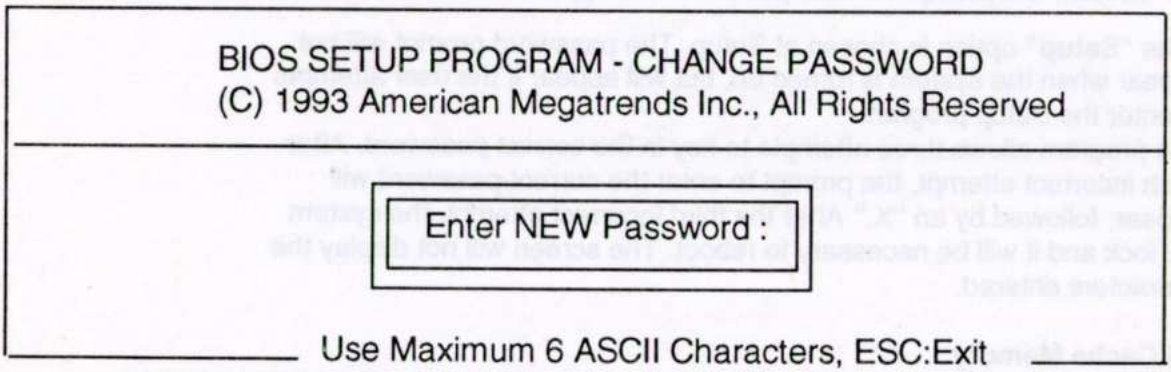
With this option, the user may enable or disable the CPU`s Internal Cache Memory.

Fast Gate A20 option:

This option supported in some chip sets,to assess any memory above 1MB.

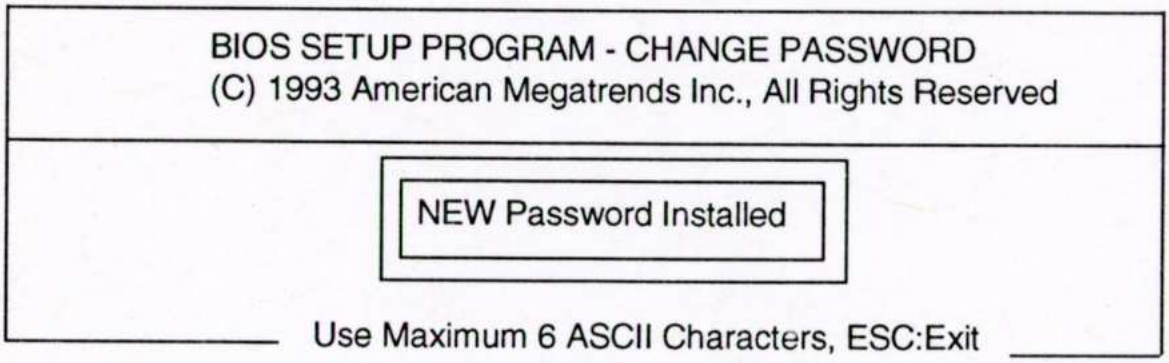


The first time you select this option, enter the default password AMI, or the default password specified in your system documentation, then press <Enter> to complete your selection. The screen will not display the characters entered. After the current password has been correctly entered, the screen in following Figure will appear, prompting you for the new password.



After the new password is entered, the prompt in above figure will appear. Rekey the new password and press <Enter>.

If the new password confirmation is entered without error, the screen in following.will appear. Perss <ESC> to return to the Main Setup menu.



Once Setup is completed and the changed values have been stored in the CMOS, when the system next boots. The user will be prompted for the password if the password function is present and has been enabled.

When and if the prompt appears is dependent upon the options chosen in Advanced CMOS Setup :

If the "Always" option was chosen in Advanced CMOS Setup. the prompt will appear each time the system is powered on.

If the "Setup" option was chosen in Advanced CMOS Setup, the prompt will not appear when the system is powered on, but will appear each time an attempt is made to enter the Setup program.

If the "Disabled" option was chosen in Advancde CMOS Setup, the password prompt will never appear.

When the password prompt appears, the new password, which is now stored in the CMOS, should be entered and the <Enter> key pressed. If the CMOS is corrupted,e.g., the batteries fall out or are loosened, the default ROM password mentioned above should be used instead.

NOTE: When the password is change, however, it is important that a record of the change be kept in a safe place. In the event the password check has been enabled in Setup and the user forgets or loses the new password, the default password stored in the ROM cannot be used unless the CMOS is disabled. A relatively safe way to do this would be to disconnect the CMOS batteries.

ADVANCED CHIPSET SETUP

BIOS SETUP PROGRAM AMI BIOS SETUP UTILITIES
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STANDARD CMOS SETUP
ADVANCED CMOS SETUP
ADVANCED CHIPSET SETUP
AUTO CONFIGURATION WITH BIOS DEFAULTS
AUTO CONFIGURATION WITH POWER-ON DEFAULTS
CHANGE PASSWORD
HARD DISK UTILITY
WRITE TO CMOS AND EXIT
DO NOT WRITE CMOS AND EXIT

Advanced CHIPSET Setup for Configuring the CHIPSET Registers

ESC:Exit Sel F2/F3:Color F10:Save & Exit

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP
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AUTO Config Function	:Disabled	Memory Remapping	:Enable
Cache Read Option	:3-2-2-2	F Segment Shodow RAM	:Enable
Cache Write Option	:1w.s.	E Segment Shodow RAM	:Disable
DRAM Type	:Page Mode	C000-C3FF Shodow RAM	:Enable
DRAM Wait State(s)	:2 W.S.	C400-C7FF Shodow RAM	:Disable
Keyboard Clock Select	:CPUClk/6	C800-CBFF Shodow RAM	:Disable
AT Clock Select	:CPUClk/6	CC00-CFFF Shodow RAM	:Disable
IO Recover time	:5/3 Bus Clock	D000-D3FF Shodow RAM	:Disable
HOLD PD Bus	:2~3T	D400-D7FF Shodow RAM	:Disable
Coprocessor Ready	:Delay 1T	D800-DBFF Shodow RAM	:Disable
Check ELBA# Singal	:In T2	DC00-DFFF Shodow RAM	:Dsable
Non-Cacheable Block1 Enable	:Disabled	Data Location Of Local Bus	:Isa
Non-Cacheable Block1 Size	:4MB	LowA20# ; RC Emulation	:None
Non-Cacheable Block1 Base	:0KB	Stretch Ows# Sngal Option	:Do Not
Non-Cacheable Block2 Enable	:Disabled	Hardware Parity Check	:Disable
Non-Cacheable Block2 Size	:16MB	Cyrix Cx487s Math Processor	:Absent
Non-Cacheable Block2 Base	:0KB		

AUTO Config Function : Choose Enabled or Disabled. Enabled automatically sets all parameters related to DRAM and cache. The automatic settings consider reliability and performance trade-offs. Enabled is the recommanded option.

If you choose Enabled, the screen setting the following six items have no effect.

If you choose Disabled, you must set the DRAM and cache through the following four items.

Cache Read Option:

CPU Speed (MHz)	Option
DX 50	3-2-2-2
DX 40	3-2-2-2
DX 33 or DX-2 66	2-1-1-1
DX 25, DX-2 50 or below	2-1-1-1

Cache Write Option:

CPU Speed(MHz)	Option
Dx50	1WS
DX40	1WS
DX33 OR DX2-66	0WS
DX25,DX2-50 OR Below	0WS

DRAM Type:

CPU Speed(MHz)	Option
DX50	Page Mode
DX40	Page Mode
DX33 OR DX2-66	Fast Page
DX25,DX2-50 OR Below	Fast Page

DRAM Wait State(s):

CPU Speed(MHz)	Option
DX50	2W.S.
DX40	2W.S.
DX33 OR DX2-66	1W.S.
DX25,DX2-50 OR Below	1W.S.

Non-cacheable Bock There are two non-cacheable areas. Each area has a 0KB to 4KB range that is selectable. Memory space is mapped by both the on board DRAM and EISA add-on memory. If you select DRAM as non-cacheable, the CPU access the add-on memory. If you select AT Bus as non-cacheable, the CPU access the on board memory. If you select a non-cacheable area size of 0KB, the function is disabled and the CPU access the on board memory first.

AT Clock Select :

CPU Speed(MHz)	Option
DX50	CPUClk/6
DX40	CPUCk/5
DX33 OR DX2-66	CPUCk/4
DX25,DX2-50 OR Below	CPUCK/3

I/O Recovery Select : Choose 3, 4, 5, or 11 BCLKs. The system provides four type of programmable I/O recovery time for the CPU to 8-bit ISA I/O cycle.

UMC 486 VL BUS M/B ------ APPEND A

1. CLOCK GENERATOR SETTING

CLOCK	JP10	JP11
33Mhz	CLOSE	OPEN
40Mhz	CLOSE	CLOSE
50Mhz	OPEN	CLOSE