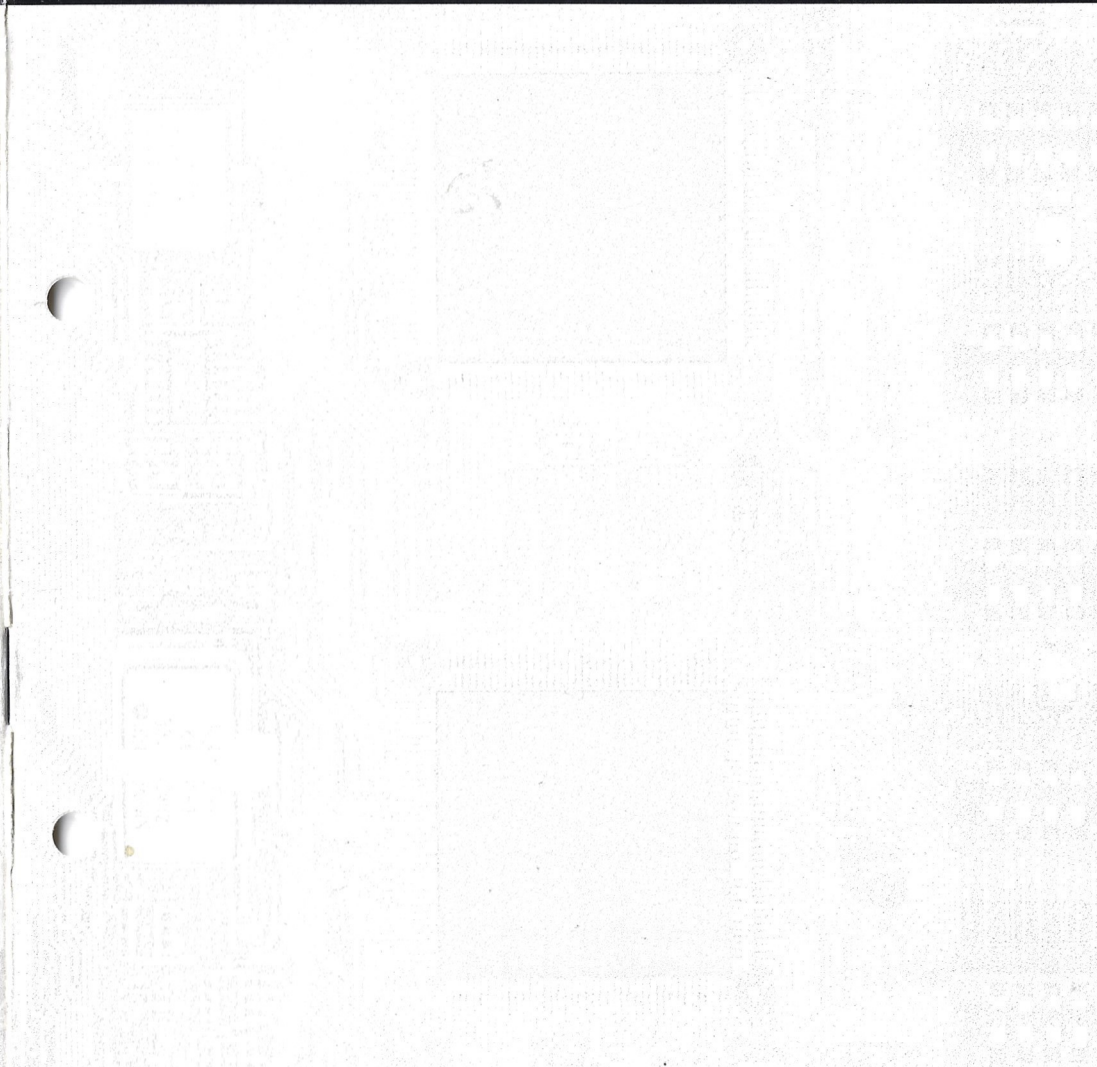


**4386-VC-HD
(AMD 386-40 PQFP)
MAINBOARD
MANUAL**



4386 -VC-HD

Mainboard User's Manual

DOC. NO. : 11699
Rev. : B
Date : Dec, 1992

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INTRODUCTION

SYSTEM GUIDE

The 4386-VC-HD Cache System Motherboard - support either 486 or 386 system

The 4386-VC-HD Cache System board is a high performance system board, utilizing the VIA Technology Inc.'s VT82C480 80486 PC/AT chipset, that offers outstanding features and performance for building advanced personal computers or workstations.

The 4386-VC-HD Cache System board can easily upgrade from 386DX system to 486DX system, and simultaneously use a 386 and 486 CPU.

High-speed Memory

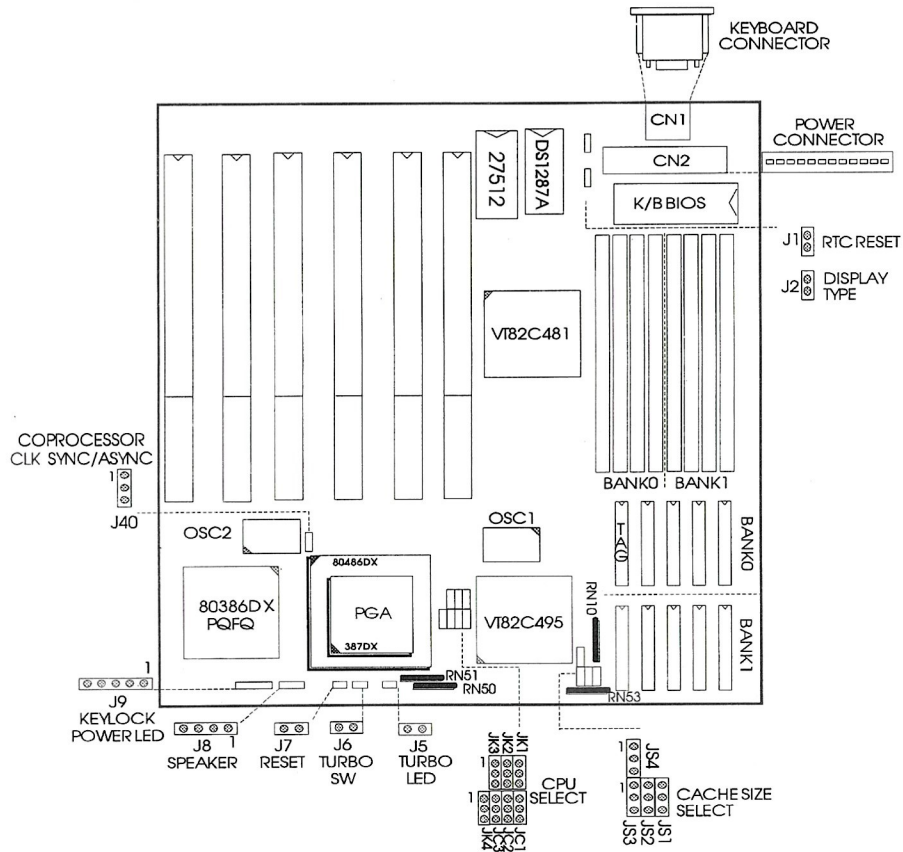
The 4386-VC-HD Cache System board is capable of accommodating 1 to 128 megabytes of on-board memory, using 256KB, 1MB, 4MB or 16MB SIMMs.

SPECIFICATIONS

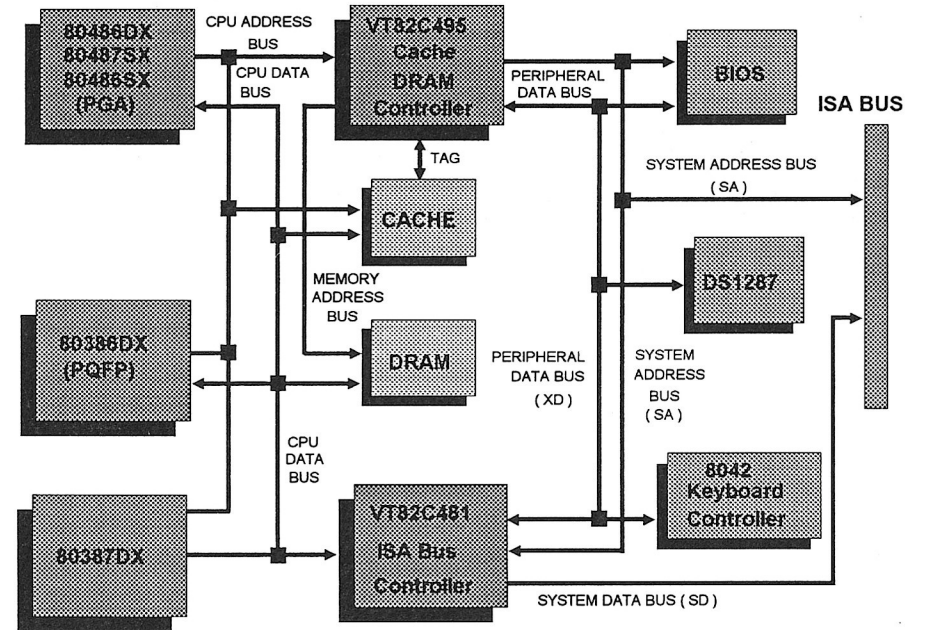
The 4386-VC-HD Cache System board comes with the following features:

- Both **486**-Intel 80486DX/80486DX2/80486SX/80487SX, and **386**-Intel80386DX/AMD80386DX microprocessor. Dual CPU of PQFP and PGA packages.
- VIA VT82C480 80486 PC/AT Chipset for high performance.
- Supports 0KB/64KB/128KB/256KB of direct mapped write-back cache memory.
- Supports 1MB up to 128MB of DRAM memory for 486 system, 1MB up to 32MB for 386 system; provides page mode DRAM operation.
- Shadow RAM for fast BIOS access.
- 64KB User-friendly BIOS.
- Six 16-bit expansion slots.
- Real time clock/calendar.

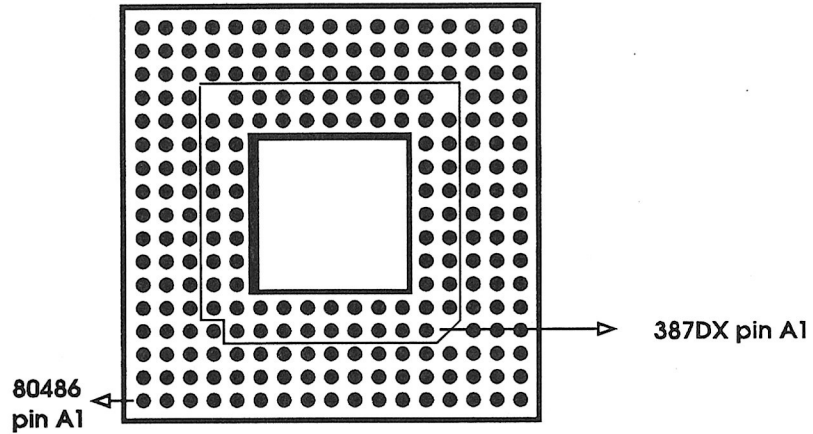
MOTHERBOARD LAYOUT



SYSTEM BLOCK DIAGRAM



COPROCESSOR PGA SOCKET



80486/80387DX PGA socket diagram

INSTALLATION

CONNECTOR & JUMPER PINOUTS

Jumper	Function	Pin outs	Signal name
J5	Turbo LED	1. 2.	VCC Turbo signal
J7	Hardware reset	1. 2.	Ground Reset signal
J8	Speaker connector	1. 2. 3. 4.	Speaker signal NC Ground + 5V
J9	Key lock & power LED	1. 2. 3. 4. 5.	Power signal Spare Ground Keylock Ground
CN2	Power connector	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	Power good + 5V + 12V -12V Ground -5V + 5V
CN1	Keyboard connector	1. 2. 3. 4. 5.	Keyboard clock Keyboard data No connection Ground + 5V

JUMPER DESCRIPTION

Jumper	Function	Open	Close
J1	RTC reset (if using DS1287A)	Normal (default)	Reset
J2	Display type	Mono/EGA/ VGA (default)	Color
J6	CPU speed (Turbo switch)	Turbo	Normal
J7	Hardware reset (Reset)	Normal	Reset
J40	Coprocessor clock	Sync. mode 1-2 shorted (default)	Async. mode 2-3 shorted

CPU SELECTION

	JK1	JK2	JK3	JK4	JC1	JC2	JC3	OSC1 MHz	0 OHM 10P5R	22 OHM 8P4R
486DX-50 *	2-3	2-3	2-3	1-2	1-2	1-2	1-2	50.00	RN51	RN10
486DX-33	2-3	2-3	2-3	1-2	1-2	1-2	1-2	33.33	RN51	RN10
486DX-25	1-2	1-2	2-3	1-2	1-2	1-2	1-2	50.00	RN51	RN10
486DX-20	1-2	1-2	2-3	1-2	1-2	1-2	1-2	40.00	RN51	RN10
486DX2-66	2-3	2-3	2-3	1-2	1-2	1-2	1-2	33.33	RN51	RN10
486DX2-50	1-2	1-2	2-3	1-2	1-2	1-2	1-2	50.00	RN51	RN10
487SX-25	1-2	1-2	2-3	1-2	1-2	1-2	2-3	50.00	RN51	RN10
487SX-20	1-2	1-2	2-3	1-2	1-2	1-2	2-3	40.00	RN51	RN10
486SX-33	2-3	2-3	2-3	1-2	2-3	2-3	off	33.33	RN51	RN10
486SX-25	1-2	1-2	2-3	1-2	2-3	2-3	off	50.00	RN51	RN10
486SX-20	1-2	1-2	2-3	1-2	2-3	2-3	off	40.00	RN51	RN10
386DX-40	1-2	1-2	1-2	2-3	1-2	1-2	1-2	80.00	RN50	RN53
386DX-33	1-2	1-2	1-2	2-3	1-2	1-2	1-2	66.66	RN50	RN53

* Note: the 486DX-50 CPU cannot be used in conjunction with any other processors.

MEMORY SYSTEM

MEMORY CONFIGURATION

Memory	Bank 0	Bank 1
1MB	256Kx4	
2MB	256Kx4	256Kx4
5MB	256Kx4	1Mx4
17MB	256Kx4	4Mx4
65MB *	256Kx4	16Mx4
4MB	1Mx4	
5MB	1Mx4	256Kx4
8MB	1Mx4	1Mx4
20MB	1Mx4	4Mx4
68MB *	1Mx4	16Mx4
16MB	4Mx4	
17MB	4Mx4	256Kx4
20MB	4Mx4	1Mx4
32MB	4Mx4	4Mx4
80MB *	4Mx4	16Mx4
64MB *	16Mx4	
65MB *	16Mx4	256Kx4
68MB *	16Mx4	1Mx4
80MB *	16Mx4	4Mx4
128MB *	16Mx4	16Mx4

* The memory sizes marked with a star are for use in 486 systems only.

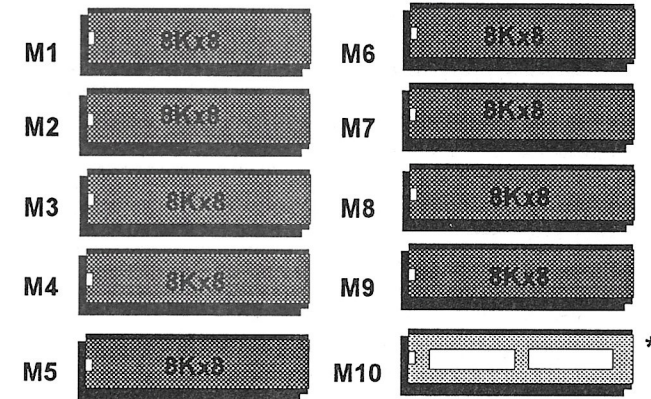
CACHE RAM & CONFIGURING CACHE SIZE

The 4386-VC-HD Cache System board uses four jumpers to configure the cache size.

	64K	128K	256K
ALTER RAM	8Kx8	8Kx8	32Kx8
TAG RAM	8Kx8	8Kx8	32Kx8
DATA RAM	8Kx8	32Kx8	32Kx8
JS1	1-2 shorted	1-2 shorted	2-3 shorted
JS2	1-2 shorted	2-3 shorted	2-3 shorted
JS3	1-2 shorted	2-3 shorted	1-2 shorted
JS4	1-2 shorted	2-3 shorted	1-2 shorted

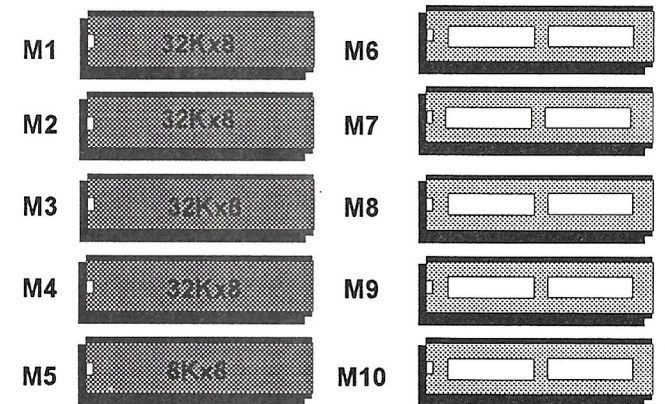
64Kbytes Direct Mapped Cache

The 64Kbytes Direct Mapped Cache option is achieved by installing eight 8Kx8 SRAM (DATA RAM) in M1, M2, M3, M4, M6, M7, M8, M9. Install one 8Kx8 SRAM (TAG RAM 28 pin) in M5.



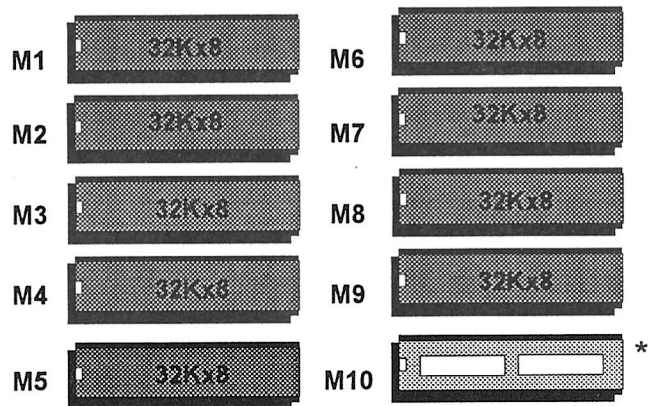
128Kbytes Direct Mapped Cache

The 128Kbytes Direct Mapped Cache option is achieved by installing four 32Kx8 SRAM (DATA RAM) in M1, M2, M3, M4. Install one 8Kx8 SRAM (TAG RAM 28 pin) in M5.



256Kbytes Direct Mapped Cache

The 256Kbytes Direct Mapped Cache option is achieved by installing eight 32Kx8 SRAM (DATA RAM) in M1, M2, M3, M4, M6, M7, M8, M9. Install one 32Kx8 SRAM (TAG RAM 28 pin) in M5.



*M10 is Alter RAM, it is optional.

AWARD BIOS SETUP

SETUP SYSTEM CONFIGURATION

A setup program has been built into the system BIOS so the configurations stored in the CMOSRAM can be changed. This program should be executed only after:

- (1) User has changed system configuration.
- (2) User has changed system backup battery.
- (3) System has detected a configuration error and has asked the user to run the setup program.

After power-on RAM testing, the message: "TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC" is displayed on the screen. Press "CTRL+ ALT+ ESC" to run setup or do nothing to bypass. If the "CTRL+ ALT+ ESC" is pressed, the following message will be displayed:

Date : 13 Jan 1992	ROM ISA (486)
Time : 10:49:26	Award Software, Inc.
Drive A : 1.2M, 5in.	Base Memory : 640K
Drive B : 1.44M, 3in.	Extended Memory : 3072K
Video : EGA/VGA	Expanded Memory: 0K
Halt On : All Errors	Other Memory : 384K
	Total Memory : 4096
Cache : External & Internal	Boot Sequence : A, C
Shadow : System & Video	Virus Warning : Enable
Security : Disable	
Drive C : 9 (112Mb)	CYL Head Sector Precomp Landzone
Drive D : None (****Mb)	900 15 17 None 901
	0 0 0 0 0
Alt-F1 for Menu Help	F10 exits
Page 01 : Status Page	PgDn = Options Page
	F2 change colors

* Before disable the system & video shadow, you have first to disable the video cacheable and system cacheable function in the options page setup.

STATUS PAGE SETUP

The setup program is completely menu-driven. Use the arrow keys to select an entry; "+" / "-" keys to change an entry; and "F10" key to exit. Help messages are displayed in the window on the screen.

If this option is chosen then the screen above is displayed. System BIOS automatically detects memory size, thus no changes are necessary. After the changes are made, press "F10" to exit.

OPTIONS PAGE SETUP

The Options Page Setup program functions the same way as the status page Setup, as shown below.

Users are not encouraged to run the status page Setup program, as your system should have been fine tuned before shipping. Improper setup may cause the system to fail, so consult your dealer before making any changes.

Bus Control		
ISA Command Delay	:	Normal
ISA Wait state	:	Normal
I/O Recovery Time	:	Disable
Extended ALE	:	Disable
Decouple Refresh	:	Disable
Cache/DRAM Control		
256K/384K Relocation	:	Disable
Cache Timing	:	Turbo
Video Cacheable	:	Enable
System Cacheable	:	Enable
Alt-F1 for Menu Help	PgUp = Status Page	F10 exits
Page 02 : Options Page		F2 change colors

SAVE AND EXIT

Once you have completed Setup, then press F10 to exit. If you did not make any changes, press F1 to exit; otherwise, press F5 to save and exit.

AMI BIOS SETUP

SETUP SYSTEM CONFIGURATION

A setup program has been built into the system BIOS so the configurations stored in the CMOSRAM can be changed. This program should be executed only after:

- (1) User has changed system configuration.
- (2) User has changed system backup battery.
- (3) System has detected a configuration error and has asked the user to run the setup program.

After power-on RAM testing, the message: "Press < DEL > if you want to run SETUP/EXTD" is displayed on the screen. Press "DEL" to run setup or do nothing to bypass. If the "DEL" key pressed, the following message will be displayed:

AMIBIOS SETUP PROGRAM - BIOS SETUP UTILITIES (C) 1992 American Megatrends Inc., All Rights Reserved
STANDARD CMOS SETUP ADVANCED CMOS 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

Use ↓ and ↑ keys to select and press "Enter" to run the selected program.

STANDARD CMOS SETUP

AMIBIOS SETUP PROGRAM - STANDARD CMOS SETUP			
(C) 1992 American Megatrends Inc., All Rights Reserved			
Date (mn/date/year)	: Fri, Dec 11 1992	Base memory	: 640 KB
Time (hour/min/sec)	: 11 : 32 : 03	Ext. memory	: 3072 KB
Hard disk C: Type	: 17	Cyln Head WPcom LZone Sect Size	977 5 300 977 17 41 MB
Hard disk D: Type	: Not Installed		
Floppy drive A:	: 1.2MB, 5 1/4"		
Floppy drive B:	: Not Installed		
Primary display	: VGA/PGA/EGA		
Keyboard	: Installed		

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	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
3	4	5	6	7	8	9

Esc: Exit ↓ → ↑ Select F2/F3: Color PU/PD: Modify

The setup program is completely menu driver; use the arrow keys to select an entry; "PgUp"/"PgDn" keys to change an entry; and "Esc" key to exit. Help messages are displayed in the window on the screen.

If this option is chosen then the screen above is displayed. System BIOS automatically detects memory size, thus no changes are necessary. After the changes are made, press "Esc" to exit.

ADVANCED CMOS SETUP

AMIBIOS SETUP PROGRAM - ADVANCED CMOS SETUP			
(C) 1992 American Megatrends Inc., All Rights Reserved			
Typematic Rate Programming	: Disabled	Adaptor ROM Shadow C800, 32K	: Disabled
Typematic Rate Delay (msec)	: 500	Adaptor ROM Shadow D000, 32K	: Disabled
Typematic Rate (Chars/Sec)	: 15	Adaptor ROM Shadow D800, 32K	: Disabled
Above 1 MB Memory Test	: Disabled	Adaptor ROM Shadow E000, 64K	: Disabled
Memory Test Tick Sound	: Enabled	BootSector Virus Protection	: Enabled
Hit < DEL > Message Display	: Enabled	BIOS Cacheable Option	: Enabled
Hard Disk Type 47 RAM Area	: 0:300	Video Cacheable Option	: Enabled
Wait For < F1 > If Any Error	: Enabled	256K Relocate Option	: Disabled
System Boot Up Num Lock	: On	ISA Bus Command Delay	: Disabled
Numeric Processor Test	: Enabled	ISA Slave Wait States	: 4 W/S
Weitek Processor	: Absent	I/O Recovery Time	: Disabled
Floppy Drive Seek At Boot	: Enabled	Extended ALE	: Disabled
System Boot Up Sequence	: A, C:	Decouple Refresh	: Disabled
System Boot Up CPU Speed	: High	AUTO Config Option	: Enabled
External Cache Memory	: Enabled	DRAM Speed Select	: 0 W/S
Internal Cache Memory	: Enabled	Bus Clock Rate Select	: CLK2/1.5
Password Checking Option	: Setup	Cache Read Cycle Select	: 0 W/S
Video ROM Shadow C000, 32K	: Enabled	Cache Write Cycle Select	: 0 W/S

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

The Advance CMOS Setup program shown on the screen above works in the same way as the standard CMOS setup.

Users are not encouraged to run Advanced CMOS setup program, your system should have been fine-tuned before shipping. Improper setup may cause the system to fail, consult your dealer before making any changes.

WRITE TO CMOS AND EXIT

If you completed Setup, press "Esc" return to the main menu, move cursor to "Write to CMOS and Exit", and answer "y" to change the CMOS Setup. if you didn't change anything, press ESC again and answer "y", then the CMOS Setup will not change.

AMIBIOS SETUP PROGRAM - BIOS SETUP UTILITIES (C) 1992 American Megatrends Inc., All Rights Reserved
STANDARD CMOS SETUP ADVANCED CMOS SETUP AUTO CONFIGURATION WITH BIOS DEFAULTS AUTO CONFIGURATION WITH POWER-ON DEFAULTS CHANGE PASSWORD
Write to CMOS and Exit (Y/N) ? Y
Write the settings to the CMOS and Exit
ESC : Exit ↓ → ↑ Sel F2/F3 : Color F10 : Save & Exit

HARD DISK SPECIFICATIONS

CONNER

Model	Capacity	Cylinder	Head	Sector
CP-3000	40MB	977	5	17
CP-30064	60MB	762	4	39
CP-30064H	60MB	762	4	39
CP-30084	85MB	526	8	39
CP-30084E	85MB	526	8	39
CP-30104	120MB	762	8	39
CP-30104H	120MB	762	8	39
CP-30174	170MB	903	8	46
CP-30174E	170MB	903	8	46
CP-30204	200MB	683	16	38
CP-30204F	200MB	683	16	38

MAXTOR

Model	Capacity	Cylinder	Head	Sector
7120AT	120MB	1024	14	17
7213AT	203MB	683	16	38

QUANTUM

Model	Capacity	Cylinder	Head	Sector
PRO52AT	52MB	751	8	17
PRO80AT	80MB	611	16	17
PRO105AT	105MB	755	16	17
PRO120AT	120MB	901	5	53
PRO240AT	240MB	723	13	51

SEAGATE

Model	Capacity	Cylinder	Head	Sector
ST351A/X	40MB	977	5	17
ST3096A	85MB	1024	10	17
ST3120A	102MB	1024	12	17
ST3144A	125MB	1001	15	17
ST3283A	245MB	978	14	35