

486 -VC-HD

Mainboard User's Manual

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INTRODUCTION

SYSTEM GUIDE

The 486VC-HD Cache System Motherboard

The 486VC-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.

High-speed Memory

The 486VC-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 486VC-HD Cache System board comes with the following features:

- Intel 80486DX/80486DX2/80486SX/80487SX 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; provides page mode DRAM operation.
- Shadow RAM for fast BIOS access.
- 64KB User-friendly BIOS.
- Six 16-bit expansion slots.
- Real time clock/calendar.

INSTALLATION

CONNECTOR DESCRIPTION

| 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 |

INSTALLATION

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 |

CPU SELECTION

| Jumper | 486SX | 487SX | 486DX |
|--------|-------------|-------------|-------------|
| JC1 | 2-3 shorted | 1-2 shorted | 1-2 shorted |
| JC2 | 2-3 shorted | 1-2 shorted | 1-2 shorted |
| JC3 | open | 2-3 shorted | 1-2 shorted |

CPU PACKAGE SELECTION

| Jumper | PGA only | PQFQ only | Dual CPU |
|--------|----------|-----------|----------|
| JC4 | open | open | close |

CPU CLOCK SELECTION

| Jumper | 1x freq. | 2x freq. |
|--------|-------------|-------------|
| JK1 | 2-3 shorted | 1-2 shorted |
| JK2 | 2-3 shorted | 1-2 shorted |

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 |

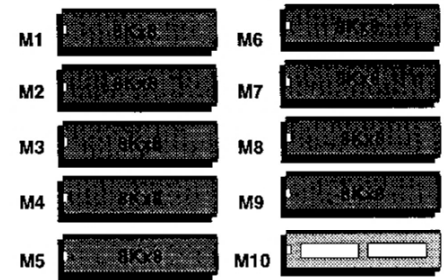
CACHE RAM & CONFIGURING CACHE SIZE

The 486VC-HD Cache System board uses two 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 | 2-3 shorted | 2-3 shorted |
| JS2 | 1-2 shorted | 1-2 shorted | 2-3 shorted |

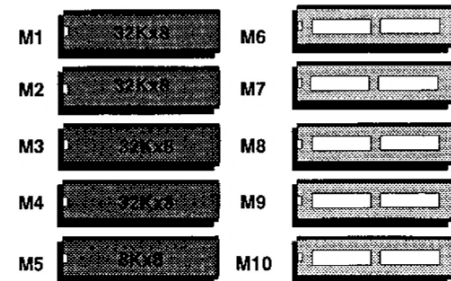
64Kbytes Direct Mapped Cache

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

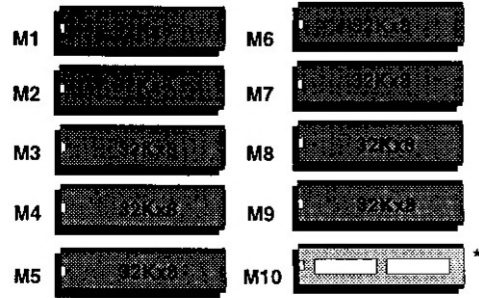
The 128Kbytes Direct Mapped Cache option is achieved by installing four 32Kx8 SRAM (DATA RAM) in M1, M2, M3, M4. Install one 8Kx8 SRAM (TAG RAM 28 pin) in M5.



MEMORY SYSTEM

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 | NumLock Boot Status : On |
| | |
| 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 Control | |
| 256K/384K Relocation | : Enable |
| Cache Timing | : Turbo |
| Dram Timing | : Fast |
| Video Cacheable | : Enable |
| System Cacheable | : Enable |
| Alt-F1 for Menu Help F10 exits | |
| Page 01 : Status Page PgDn = 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 (mm/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 | | |

| Partition Type | Win | HP | PS | ESL |
|----------------|-----|----|----|----------|
| 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 D800, 32K | : Disabled |
| Typematic Rate (Char/Sec) | : 15 | Adaptor ROM Shadow E800, 32K | : Disabled |
| Above 1 MB Memory Test | : Disabled | Adaptor ROM Shadow E800, 64K | : Disabled |
| Memory Test Tick Sound | : Enabled | BootSector Virus Protection | : Enabled |
| Hit < DEL > Message Display | : Enabled | BIOS Cacheable Option | : Enabled |
| Hard Disk Type of R.A.M. Area | : C: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 |
| Writek Processor | : Abort | IO 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 C800, 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-30084 | 85MB | 526 | 8 | 39 |
| CP-30084E | 85MB | 526 | 8 | 39 |
| CP-30104 | 120MB | 726 | 8 | 39 |
| CP30104H | 120MB | 726 | 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 |
| CP-30254 | 251MB | 895 | 10 | 55 |
| CP-3364 | 360MB | 702 | 16 | 63 |
| CP-3544 | 544MB | 1024 | 16 | 63 |

MAXTOR

| MODEL | CAPACITY | CYLINDER | HEAD | SECTOR |
|-------|----------|----------|------|--------|
| 7120A | 120MB | 1023 | 14 | 17 |
| 7170A | 170MB | 984 | 10 | 34 |
| 7213A | 213MB | 683 | 16 | 38 |
| 7245A | 245MB | 967 | 16 | 31 |
| 7345A | 345MB | 790 | 15 | 17 |

HARD DISK SPECIFICATIONS

QUANTUM

| MODEL | CAPACITY | CYLINDER | HEAD | SECTOR |
|----------|----------|----------|------|--------|
| LPS80AT | 80MB | 611 | 16 | 17 |
| LPS105AT | 105MB | 755 | 16 | 17 |
| LPS120AT | 120MB | 901 | 5 | 53 |
| LPS240AT | 240MB | 723 | 13 | 51 |
| ELS85AT | 85MB | 977 | 10 | 17 |
| ELS127AT | 127MB | 919 | 16 | 17 |
| ELS170AT | 170MB | 1011 | 15 | 22 |

SEAGATE

| MODEL | CAPACITY | CYLINDER | HEAD | SECTOR |
|---------|----------|----------|------|--------|
| ST3096A | 85MB | 1024 | 10 | 17 |
| ST3120A | 102MB | 1024 | 12 | 17 |
| ST3144A | 125MB | 1001 | 15 | 17 |
| ST3283A | 245MB | 978 | 14 | 35 |

WESTERN DIGITAL

| MODEL | CAPACITY | CYLINDER | HEAD | SECTOR |
|--------|----------|----------|------|--------|
| AC280 | 85M | 980 | 10 | 17 |
| AC2120 | 125M | 872 | 8 | 35 |
| AC2200 | 200M | 989 | 12 | 35 |
| AC2250 | 255M | 1010 | 9 | 55 |
| AC2340 | 341M | 1010 | 12 | 55 |