

317

386DX™ MAIN BOARD

USER'S MANUAL

NOTICE

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Manual Version R3.0

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Chapter 1

Introduction

1.1 Preface

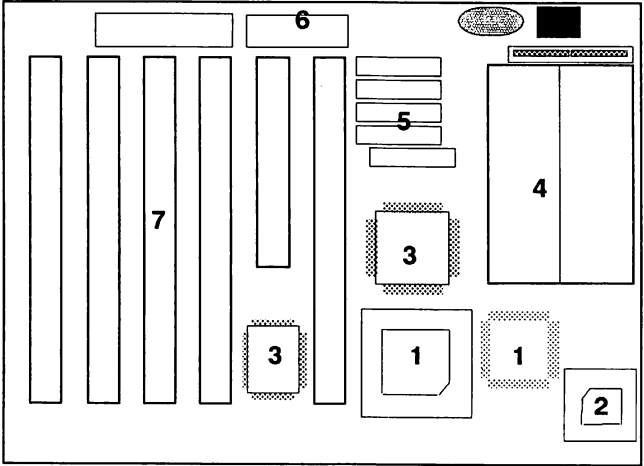
Congratulation on purchasing this 317 mainboard. 317 mainboard is a highly integrated system board designed to accommodate most member of the 386 family of CPUs in 40MHz., and features a high-performance secondary cache memory architecture of 128KB in size. This mainboard features five 16-bit and one 8-bit Industry Standard Architecture (ISA) bus slots which may accommodate many third-party expansion cards.

1.2 Major Feature

- » Support for any member of the 386 family of CPUs running at 40MHz.
- » Support five 16-bit ISA expansion slots.
- » Support one 8-bit ISA expansion slot.
- » Support for 128KB of secondary cache.
- » Supports 2-1-1-1, 3-1-1-1, 2-2-2-2, and 3-2-2-2 cache burst cycles.
- » Support two non-cacheable regions.
- » Support local high-speed, page mode flexible memory from 1MB up to 64MB.
- » Shadow RAM support for the system and video BIOS.
- » Support AT-bus clock selectable from CLKI/6 to CLKI/3.
- » Provides AMI system BIOS with powerful ChipAway Virus program.
- » Board size : 22 cm × 17 cm.

1.3 317 Mainboard Description

The major components of 317 mainboard are illustrated and described below. Please take a minute to become familiar with the board design.



1. System Microprocessor

317 mainboard may accept any members of the 386 family of high performance 32-bit microprocessors in PGA or PQFP package such as AMD Am386DX and TI/Cyrix 486DLC. *The mainboard is designed to run at a clock speed of 40 MHz.*

2. System Math co-processor

317 mainboard may accept members of the 387 family of high performance 32-bit co-processors in PGA package. The co-processor is designed to run at a clock speed of 40 MHz to synchronize with CPU clock speed.

3. Chipset ASIC

317 mainboard is designed around a set of highly integrated OPTi ASIC, which offers optimum performance on ISA base system with a cache controller, a local DRAM controller, and Integrated Peripherals controller.

4. Memory Architecture

317 mainboard features eight 30-pin SIMM (Single In-Line Memory Module) sockets and organized into two banks, which allow flexible memory configuration and expansion. It may use 256K×9, 1M×9, 4M×9, or 16M×9 SIMMs for configuration memory size from 1MB to 64MB.

5. Secondary Cache Architecture

317 mainboard features a secondary cache memory architecture of 128KB in size which are 32K×8 high speed SRAM.

6. ISA Expansion Slots

317 mainboard provides five 16-bit ISA expansion slots and one 8-bit expansion slot, which may accommodate any third-party expansion cards and enormous flexibility in designing custom platforms.

7. System BIOS

317 mainboard provides a licensed AMI BIOS, a particular designed to offer optimum performance of the mainboard. The BIOS permit easy configuration of the mainboard and the system.

317 also provides a special and powerfull anti-virus feature in system BIOS named **ChipAway Virus**, it can keep your system away from the attacking of boot-sector virus.

Chapter 2

Hardware Configuration

This chapter explains how to configure the 317 mainboard's hardware. Before you install the mainboard on you system, you must insert a CPU(if there are no PQFP CPU on board), install the memory, and plug in power connector, keyboard, and others external connectors etc ..

2. 1 CPU Type Decription

317 mainboard accept any member of the 386 and 486DLC series of microprocessor at the clock speed of 40MHz. The manufacture range from AMD, Cyrix, and TI CPU.

2.2 Co-Processor Reset Signal

To meet the various brands co-processor(387DX) reset timing, 317 provide jumper JP10 to configure co-processor reset timing.

This jumper is reserved for testing purpose only. Please do not change, or else may cause serious system error.

2.3 Display Type Configuration

317 provide jumper JP2 to configure system display type, "Close " for color and "Open" for monochrome.

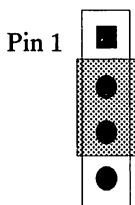
| Display Type | JP2 |
|-------------------|-------|
| Set to Color | Close |
| Set to Monochrome | Open |

2.4 Connectors

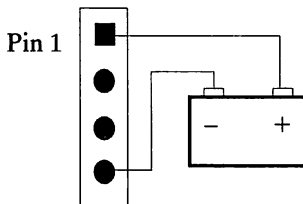
There are several connectors located on the 317 mainboard. They are used to connect with peripheral devices to enhance the performance of the system operation.

| Connector | Function |
|--------------|---------------------------------|
| J3, J4 | Power Connector |
| J1 | Keyboard Connector |
| J2 (Note 1) | External Battery Connector |
| J16 | Power LED & KeyLock Connector |
| JP4 | Speaker Connector |
| JP6 | Turbo LED Connector |
| JP5 (Note 2) | Hardware Turbo Switch Connector |
| S1 | Hardware Reset Connector |

Note 1 : J2 is a four pin external battery connector, when internal battery is used, there are a jumper cap cover on pin 2 and pin 3. If external battery is used, please remove the jumper cap.



Using Internal Battery



Using External Battery

Note 2 : JP5 is a two pin hardware turbo switch connector. The system will run in turbo mode when JP5 is opened, and the system will run in normal mode when JP5 is shorted.

317 mainboard also supports turbo switching by keyboard.

< Ctrl > < Alt > < + > for switching to turbo mode,
< Ctrl > < Alt > < - > for switching to normal mode.

** While using the keyboard turbo switch, the turbo LED will not change.*

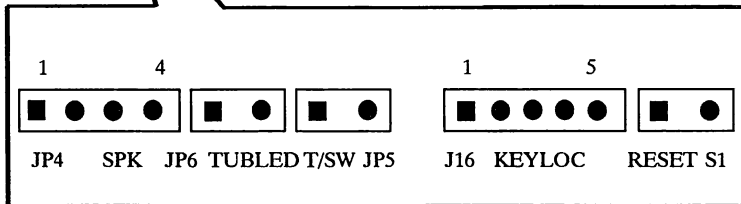
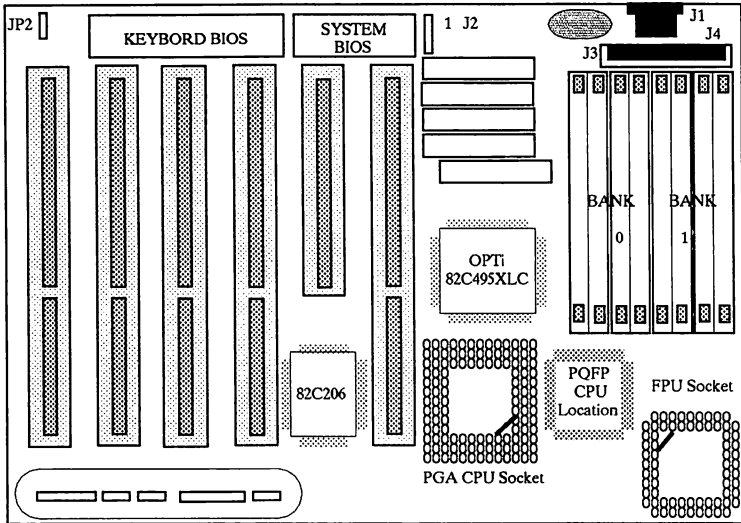
2.5 On-Board Memory Installation

317 mainboard provides tremendous flexibility to support a number of different on-board DRAM configuration. The on-board memory is organized into two banks, with four SIMMs (Single In-line Memory Module) socket assigned to each bank. The mainboard supports 256K × 9, 1M × 9, 4 M × 9, and 16M × 9 page mode SIMM in each memory bank, and achieves its best performance when every banks are filled.

The following table illustrates the partial configurations.

| MEMORY CONFIGURATION TABLE | | | |
|----------------------------|--------|--------|-------|
| Options | Bank 0 | Bank 1 | Total |
| 1 | 256K | None | 1MB |
| 2 | 256K | 256K | 2MB |
| 3 | 1M | None | 4MB |
| 4 | 256K | 1M | 5MB |
| 5 | 1M | 1M | 8MB |
| 6 | 4M | None | 16MB |
| 7 | 1M | 4M | 20MB |
| 8 | 4M | 4M | 32MB |
| 9 | 16M | None | 64MB |

2.6 317 Mainboard Placement



Chapter 3

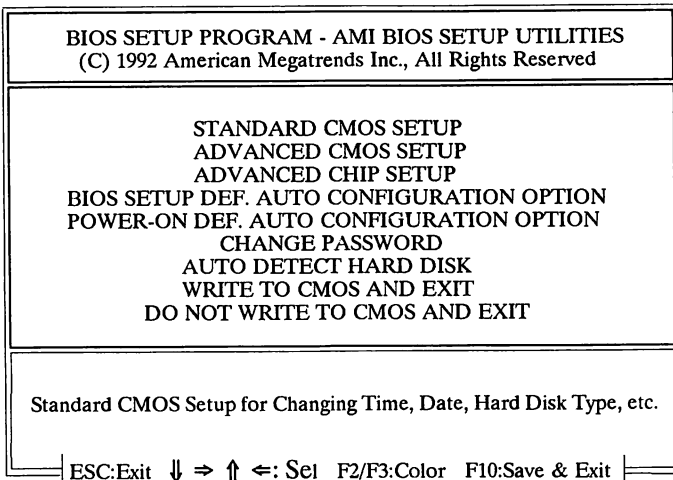
BIOS SETUP

317 mainboard provides the most famous system BIOS in the PC world - AMI BIOS. This BIOS setup reference is written to assist you in the proper usage of BIOS setting, please take a few minutes to become familiar prior to using BIOS program.

- 1 After power on or reboot the system, during a series of diagnostic checks, the following message will be display on the screen :

" Hit if you want to run SETUP "

- 2 Press the key to enter the AMI BIOS Setup program and the following main menu screen will appear :



- 3 Using the up/down arrow key to choose an option item and press <Enter>. A warning message displays each time when one of the three setup options is selected.

| |
|---|
| AMIBIOS SETUP PROGRAM-WARNING INFORMATION (C) 1992 American Megatrends Inc . , All Rights Reserved |
| <p>Improper Use of Setup may Cause Problems !!</p> <p>If System Hangs, Reboot System and Enter Setup By Pressing the Key</p> <p>Do any of The following after Entering Setup</p> <ul style="list-style-type: none"> (i) Alter Options to make System Work (ii) Load BIOS Setup Defaults (iii) Load Power-On Defaults <p>Hit <ESC> to Stop now, Any other Key to Continue</p> |

- 4 Press <ESC> at anytime to return to the main menu.
- 5 In the main menu, choose " WRITE TO CMOS AND EXIT " or <F10> to save your changes and reboot the system. Choosing "DO NOT WRITE TO CMOS AND EXIT" ignores your changes and exits the programs.
- 6 Listed below is an explanation of the key display at the bottom of the screens accessed through the BIOS setup program :

| Key Pad | Usage |
|---------------|---|
| ESC | Exit to previous screen |
| Arrow Keys | Move cursor to the desired selection |
| PageUp/PageDn | Modify the default value of the options for the highlightes feature |
| F1 | Displays help screen for selected feature |
| F2 / F3 | Changes beckground and foreground colors |
| F5 | Retrieves the values which were resident when current setup session was started |
| F10 | Saves all changes made to Setup and Exit program |

3. 1 STANDARD CMOS SETUP

Choose the "STANDARD CMOS SETUP" from the main menu and listed screen will display.

Use the arrow keys to move between items and to select values. Modify the selected fields using the PageUp/PageDown keys. Some fields let you enter numeric values directly.

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

Date (mon/date/year) : Mon, Nov, 18, 1993 Base memory : 640 KB
 Time (hour/min/sec) : 05 : 54 : 48 Ext. memory : 3712 KB

| | Cyln | Head | W/Pcom | LZone | Sect | Size |
|--------------------|-----------------|------|--------|-------|------|---------|
| Hard disk C : Type | : 17 | 977 | 5 | 300 | 977 | 17 41MB |
| Hard disk D : Type | : Not Installed | | | | | |
| Floppy drive A : | : 360 KB, 51/4" | | | | | |
| Floppy drive B : | : Not Installed | | | | | |
| Primary display | : Monochrome | | | | | |
| Keyboard | : Installed | | | | | |

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

| 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 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |

ESC : Exit ← ↑ ⇒ ↓ : Select F2/F3 : Color Pu/Pd : Modify

Date
(mn/date/year)

Please type the current date.

Time
(hour:min:sec)

Please type the current time.

Hard disk C :

Select the primary hard disk drive from the standard hard disk types 1 to 46, and type 47 is user definable. If there are no hard disk drive installed, choose " Not installed."

3. 2 ADVANCED CMOS SETUP

The ADVANCED CMOS SETUP is the second option from the main setup menu.

Let the highlighted bar stay at "ADVANCED CMOS SETUP" and press <Enter>, the following screen appear.

| BIOS SETUP PROGRAM - ADVANCED CMOS SETUP | |
|---|------------|
| (C) 1992 American Megatrends Inc. , All Rights Reserved | |
| Above 1 MB Memory test | : Disabled |
| Memory Test Tick Sound | : Enabled |
| Hard Disk Type 47 RAM Area | : 0 : 300 |
| System Boot Up Num Lock | : On |
| Floppy Drive Seek At Boot | : Enabled |
| System Boot Up Sequence | : A ; , C: |
| System Boot Up CPU Speed | : High |
| External Cache Memory | : Enabled |
| Internal Cache Memory | : Disabled |
| Turbo Switch Function | : Enabled |
| Password Checking Option | : Setup |
| Adaptor ROM Shadow C800, 16K | : Disabled |
| Adaptor ROM Shadw CC00, 16K | : Disabled |
| Adaptor ROM Shadow D000, 16K | : Disabled |
| Adaptor ROM Shadow D400, 16K | : Disabled |
| Adaptor ROM Shadow D800, 16K | : Disabled |
| Adaptor ROM Shadow DC00, 16K | : Disabled |
| Adaptor ROM Shadow E000, 16K | : Disabled |
| Adaptor ROM Shadow E400, 16K | : Disabled |
| Adaptor ROM Shadow E800, 16K | : Disabled |
| Adaptor ROM Shadow EC00, 16K | : Disabled |
| Shadow RAM Option | : Both |
| IDE Block Mode Transfer | : Disabled |
| ChipAway Virus | : Enabled |

ESC : Exit ← ↑ ⇒ ↓ : Sel (Ctrl) Pu/Pd : Modify F1 : Help F2/F3 : Color

F5 : Old Values F6 : BIOS Setup Defaults F7 : Power-On Defaults

- » **Above 1 MB Memory Test** If there are more than 1 MB of RAM on system board, by enabling this option, will involve the POST memory routines will check the RAM above 1 MB. If disabled, the BIOS only check the first 1 MB RAM.
- » **Memory Test Tick Sound** This option will enable or disable the ticking sound during RAM test.
- » **Hard Disk Type 47 Data Area** The 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 1 KB is used for the hard disk data storage.
- » **System Boot Up Num Lock** When this option is turned on, it may allow the user to use the numeric key on the enhanced keyboard numeric keypad when the system is powered on.
- » **Floppy Drive Seek At Boot** This option enable or disable seeking floppy drive A: when the system boots-up. Disable it to allow a fast boot and to decrease the possibility of damage to floppy drive heads.
- » **System Boot Up Sequence** If the option is set to "C:, A:", the system will attempt to boot from hard disk drive C:, and then A:. If the option is set to "A:, C:", the sequence is reversed. (Note: "A:, C:" must match the enabling of floppy drive seek at boot)

- » System Boot Up CPU Speed If the option is *high*, the system will boot-up in turbo mode, when turbo switch JP5 is set to turbo (open); and the system will boot-up in normal mode when turbo switch JP5 is to normal (close). If the option is *low*, the system will boot-up and run in normal mode always.

- » External Cache Memory With this feature, the user may specify whether the external cache memory is enable or disable.

- » Internal Cache Memory On TI/Cyrix 486DLC, the cache memory built inside of CPU is called internal cache memory, with this option, the user may enable or disable the internal cache memory.

- » Password Checking Option The password checking feature can be used to prevent unauthorized system boot-up or unauthorized use of BIOS SETUP. There are two options in this item, " **SETUP** " and " **ALWAYS** ".

- » Adaptor ROM Shadow xxxx, 16K ROM shadow is a procedure in which BIOS code is copied from slower ROM to faster RAM. Each option allows for a segment of 16 KB to be shadowed from ROM to RAM, if these options are enabled.

- » Shadow RAM Option In this item available options are " **Disabled** ", " **Video** ", " **Main** ", " **Both** ". The same concept applies here as above. If you chose " **Both** ", then system and video BIOS will be shadowed. Setting " **Main** ", only system BIOS will be shadowed, and " **Video** " will shadow the video ROM in RAM instead.

- » **IDE Block Mode Transfer** If your hard disk drive support IDE Block Mode, enable this option for faster data transfer.

- » **ChipAwayVirus** 317 support this feature for a hardware-based anti-virus to control of the system very early in the boot process before DOS to detect and clean all viruses especially effective against Boot Viruses.
If this feature is enabled, it will occupy about 2KB memory in base memory.

3.3 ADVANCED CHIPSET SETUP

This program of the BIOS Setup is entirely chip set specific, and is used to change the values of chipset registers. These registers control most of the system options in the computer. By using arrow keys you make highlighted bar stay at "ADVANCED CHIPSET SETUP " then press <Enter >. The following screen will be displayed.

| BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP | |
|---|-----------------|
| (C) 1992 American Megatrends Inc. , All Rights Reserved | |
| Hidden Refresh | : Enabled |
| AT Bus Clock Selection | : CLKI / 5 |
| Memory Read Wait States | : 1 W / S |
| Memory Write Wait States | : 1 W / S |
| Cache Read Cycle | : 2 - 1 - 1 - 1 |
| Cache Write Wait States | : 1 W / S |
| Non-Cacheable Block-1 Size | : Disabled |
| Non-Cacheable Block-1 Base | : 0 KB |
| Non-Cacheable Block-2 Size | : Disabled |
| Non-Cacheable Block-2 Base | : 0 KB |
| Cacheable RAM Address Range | : 32 MB |
| Video BIOS Area Cacheable | : Yes |

ESC : Exit ← ↑ ⇒ ↓ : Sel (Ctrl) Pu/Pd : Modify F1 : Help F2/F3 : Color

F5 : Old Values F6 : BIOS Setup Defaults F7 : Power-On Defaults

- » **Hidden Refresh** **Hidden refresh is performed independent of the CPU, as long as the CPU does not try to access local memory or the AT bus during a hidden refresh cycle, refresh will be transparent to the CPU. The CPU can continue to execute from its internal cache and execute internal instructions during hidden refresh without any loss in performance due to refresh arbitration.**

- » **AT Bus Clock Selection** **This feature allows the user to select the AT bus clock that derive from system clock, on system clock speed of 40MHz. **CLKI/5** will get **8MHz** clock speed on AT bus, **CLKI/4** will get **10MHz** clock speed on AT bus and **CLKI/3** will get **13.3MHz** clock speed on AT bus.**

- » **Memory Read Wait State** **This feature allows the user to select the memory read settings, zero, one or two memory read wait state. The optimal setting depends on CPU clock speed, one memory read wait state for clock speed of 40MHz.(default).**

- » **Memory Write Wait State** **This feature allows the user to select the memory write settings, zero, one, two, or three memory write wait state. The optimal setting depends on CPU clock speed, one memory write wait state for clock speed of 40MHz.(default).**

- » **Cache Read Cycle** **This feature allows the user to select four cache read burst settings, 2-1-1-1, 3-1-1-1, 2-2-2-2, or 3-2-2-2. The optimal setting depends on CPU clock speed, 2-1-1-1 for clock speed of 40MHz.(default).**

- » Cache Write Wait State This feature allows the user to select between three cache write settings, zero, one, or two cache write wait state. The optimal setting depends on CPU clock speed, one memory write wait state for clock speed of 40MHz. (default).

- » Non-Cacheable Block - 1 Size This feature provide one of two non-cacheable block on system memory. The options block size are 64KB, 128KB, 256KB, 512KB or Disabled.

- » Non-Cacheable Block-1 Base This feature assign the second non-cacheable block base address on system memory.

- » Non-Cacheable Block - 2 Size This feature provide the other one non-cacheable block on system memory. The options block size are 64KB, 128KB, 256KB, 512KB, or Disabled.

- » Non-Cacheable Block - 2 Base This feature assign the first non-cacheable block base address on system memory.

- » Video BIOS Area Cacheable This option puts the Video BIOS routines in cacache to improve video efficiency. This option is **Yes** by default. If compatibility problems arise, you may set this option to **No**.

» **This Page Is Left Blank Intentionly**

Chapter 4

ChipAway Virus

4.1 Preface

Welcome to use the 317 main board with the finest computer security solutions available today. ChipAway Virus will easily give you a high-security computing environment for years to come. ChipAway Virus is easy to use and very effective.

4.2 What Is ChipAway Virus ?

Since you enabled the ChipAway Virus feature on **ADVANCED CMOS SETUP** of System BIOS, you probably already realize the inherent benefits in this hardware-based anti-Virus solution.

The single most important attribute of anti-Virus of 317 is that it features preemptive virus action. This technology, called **JumpLoading™** allows ChipAway Virus to gain control of your system very early in the boot process -- even before DOS. Since all viruses, by their very nature, rely on DOS as their habitat (living environment), they are completely helpless against a system that features **JumpLoading™**.

4. 3 Boot Viruses

ChipAway Virus of 317 is especially effective against **Boot Viruses**. Some of the most dangerous Boot Viruses, such as **Stoned, Michaelangelo, Disk Killer**, etc..

Boot Viruses are extremely dangerous because of the way they infect computers during the load process. During a normal boot process, the boot sector is loaded long before the user (or the AUTOEXEC.BAT file) gains control of the system. Therefore, even with the best anti-virus software, a boot virus can easily infect the system.

4. 4 ChipAway Virus Features

JumpLoading™ Boot Virus Protection

As mentioned above, this protection method means that Chip-Away Virus is protecting your system long before any virus has a chance to load.

Auto-checking of floppy diskettes when they are accessed

Even when you are using your computer, ChipAway Virus is protecting you by quickly checking your floppy disks as you access them. Does this slow the system down? Not at all. The few milliseconds that it takes to check a floppy disk boot sector are totally unnoticeable.

Additional anti-virus software

Just to give you even more peace of mind, 317 main board attached some anti-virus software that you can use to scan for viruses other than boot-sector viruses. With this software, 317 represent a whole solution against every type of virus.

4. 5 How ChipAway Virus Work

Since ChipAwayVirus is auto-checking of floppy diskettes when they are accessed, and when a virus is found, the warning message will be display.

ChipAwayVirus Warning

**Boot sector on diskette is infected
by a virus.
Do not boot the system from this
diskette.**

Press any key for instructions.

This means the boot sector on floppy diskette that you are using is infected by a virus and may not boot the system from this diskette.

Then you may take off this floppy diskette from floppy drive and trun off the power to avoid system infected by diskette, or just press any key simply for next instruction and the following mesage will be display.

**Do you want to CLEAN your floppy diskette
or LEAVE it unchange ?**

[C] -- CLEAN boot sector of floppy

[L] -- LEAVE it unchange.

ChipAwayVirus may ask for instruction input by pressing " C " or " L " key.

"C " for clean virus from boot sector of floppy diskette.

" L " for leave it unchange.

Normally, pressing " C " is recommend.

4. 6 Keeping Your Security High

Keeping your computer free from intruders and viruses isn't always easy, but it is simple. Now that you have anti-viruses feature, you have taken care of most security issues that can damage your hard drive. However, in any computing environment that you may use today or in the future, it's always a good idea to follow these guidelines :

- » *Never boot from floppy disk unless you know they are virus-free.*
- » *Always scan programs before you install them (this includes from new diskette).*
- » *Always scan programs that you downloaded before executing them.*
- » *If you operate in a network environment, get some kind of server-based anti-virus protection.*
- » *Do not give free access of your computer to other people.*
- » *Always use a rule-based anti-virus product that is not extremely dependent on pattern updates.*

By following these guidelines, and by using 317 anti-virus feature, you should be able to work productively in a virus-free environment.

FCC Notice :

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used properly. In strict accordance with the manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- * Reorient or relocate the receiving antenna.
- * Increase the separation between the equipment and receiver.
- * Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- * Consult the dealer or an experienced radio/television technician for help and for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4

FCC Warning

The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Note : In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables and power cord must be used.