EXP8C49
User's Manual
(Date 8/11/95

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CHAPTER 1
INTRODUCTION

1.1 OVERVIEW

The *EXP8C49* is complemented by a 512KB second level Write-Back cache providing workstation level computing performance, and SIMM sockets support up to 64MB of DRAM.

The *EXP8C49* motherboard offers outstanding I/O capabilities. Three PCI Local Bus slots provide a high bandwidth data path for data-movement intensive function such as Graphics. Four ISA slots complete the I/O mix.

The *EXP8C49* motherboard provides the foundation for cost effective, high performance, highly expandable platforms which deliver the latest in CPU and I/O technologies.

1.2 SYSTEM FEATURES

- ❑ CYRIX, DX2, DX4, 5x86, QFP CPU
- ❑ Supports H/W GREEN/WAKE UP Switch
- ❑ Supports EDO DRAM
- ❑ Supports L1/L2 Write Back/Write Through Cache Feature
- ❑ Supports 3 MASTER PCI Bus
- ❑ Supports 128KB/256KB/512KB Cache Size
- ❑ Supports 72pin SIM MODULES
- ❑ Supports SMI/SMM/PMU/APM Power Controllers
- ❑ Enchanced PCI IDE on Board (Two Channels)
- ❑ Supports 2S1P, Floppy on Board
- ❑ BIOS has been Hardware Integrated with Enhanced IDE Driver for Best Hard Disk Performance
- ❑ Supports Parallel Port EPP/ECP Mode

1.3 SYSTEM SPECIFICATIONS

Processor:	CYRIX CX486 DX2/DX4, 5x86 QFP CPU
CPU Clock:	25/33/40 MHz CPU
Memory:	Up to 64MB
Memory Configuration:	1MB/2MB/4MB/8MB/16MB/32MB/64MB
SRAM Configuration:	128KB/256KB/512KB
BIOS Subsystem:	AMI BIOS
I/O Subsystem No. Slot:	Four 16-bit ISA Bus and three PCI Bus
Dimension:	22cm x 22cm, 1/2 Baby AT Size

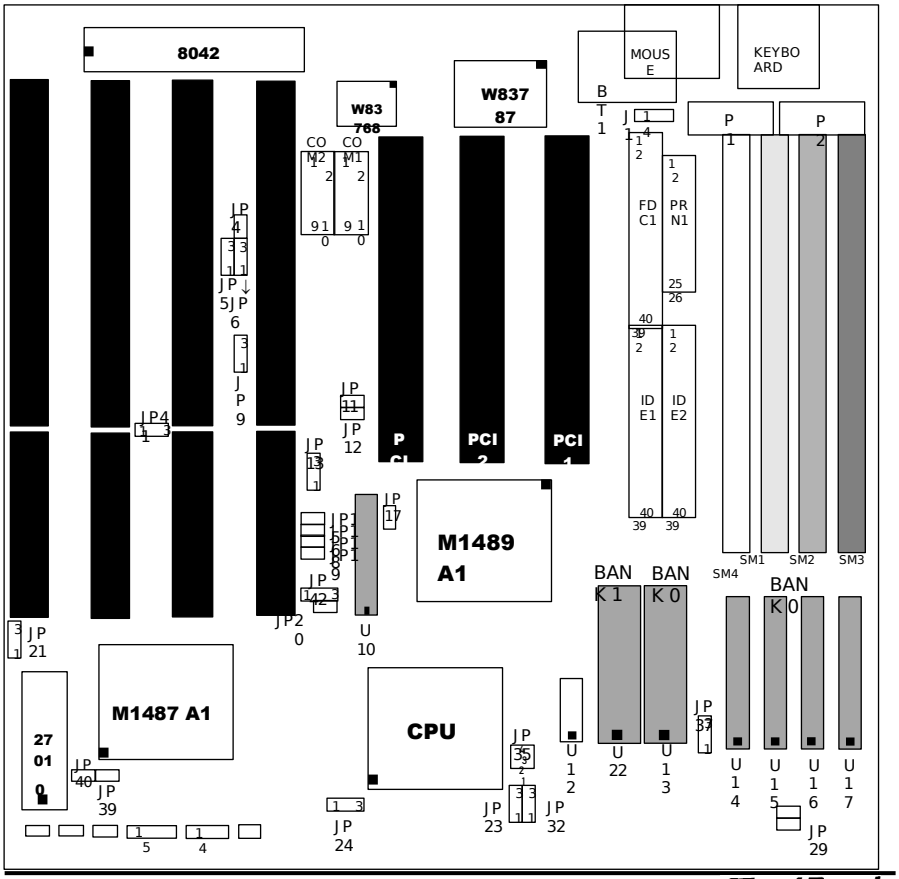
Additional Features

Miscellaneous Connectors:	Reset Button, Internal Battery, Turbo SW, Flash LED(Turbo LED) for Power Green
Board Design:	Four-layer Implementation for Low Noise Operation

1.4 SYSTEM PERFORMANCE

SOFTWARE / CPU TYPE	LANDMARK V2.0	POWER METER V1.8 MIPS	NORTON V8.0 CPU SPEED
CYRIX 486 DX4 - 100MHz	328.33MHz	28.4MIPS	169.0
CYRIX 5x86 - 100MHz	420.95MHz	35.5MIPS	262.7
CYRIX 5x86 - 120MHz	507.41MHz	43.1MIPS	316.7

1.5 EXP8C49 BOARD LAYOUT




RESET
T/S
T/LED
KEYLOCK
SPK
HDDLED

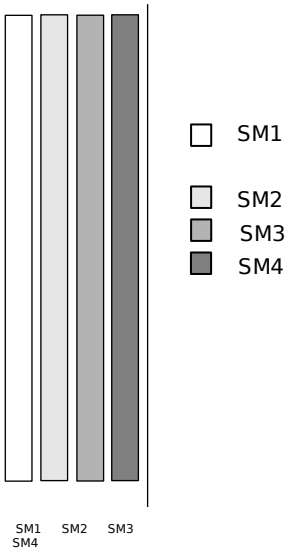
CHAPTER 2
INSTALLATION

Before the system is ready to operate, the hardware must be set up for various functions of the system. To set up the *EXP8C49* motherboard is a simple task. The user only has to set a few jumpers, connectors and sockets.

2.1 DRAM INSTALLATION

The *EXP8C49* main board can support expanded memory from 1MB to 64MB. Either 1MB, 2MB, 4MB, 8MB,16MB, 32MB, SIM Modules can be used on the *EXP8C49* motherboard.

ν The board layout below shows the locations of the DRAM memory banks :

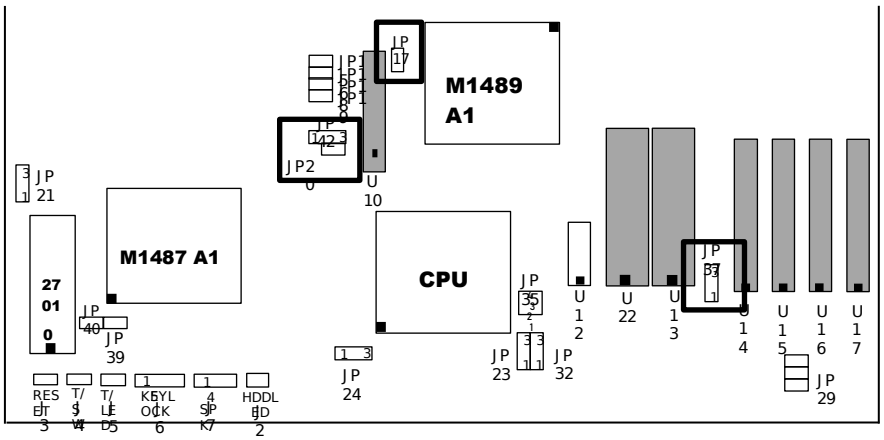


- **The motherboard consists of four memory banks, SM1, SM2, SM3 or SM4 .**

ν TABLE 1

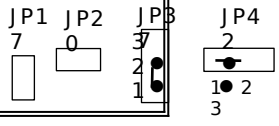
SM1	SM2	SM3	SM4	TOTAL MEMORY
4MB	None	None	None	4MB
4MB	4MB	None	None	8MB
4MB	4MB	4MB	None	12MB
8MB	4MB	None	None	12MB
8MB	8MB	None	None	16MB
16MB	None	None	None	16MB
16MB	4MB	None	None	20MB
16MB	4MB	4MB	None	24MB
16MB	4MB	4MB	4MB	28MB
16MB	16MB	None	None	32MB
16MB	16MB	4MB	None	36MB
16MB	16MB	4MB	4MB	40MB
16MB	16MB	16MB	None	48MB
16MB	16MB	16MB	4MB	52MB
16MB	16MB	16MB	16MB	64MB
32MB	32MB	None	None	64MB

2.2 SRAM INSTALLATION



CACHE CONFIGURATION SIZE

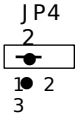
128K		
TAG RAM	***DATA RAM***	
U10	*U14-U17*	
8KX8	*32KX8*	



or

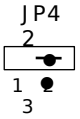
128K

TAG RAM	DATA RAM
U10 8KX8	U13 32KX32



256K

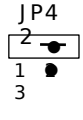
TAG RAM	DATA RAM
U10 16KX8, 32KX8	U14-U17 64KX8



or

256K

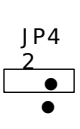
TAG RAM	DATA RAM
U10 16KX8, 32KX8	U14-U17 32KX8 U22 32KX32



or

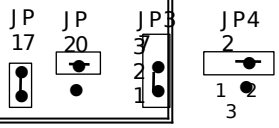
256K

TAG RAM	DATA RAM



U10 *16KX8,* *32KX8*	*U13, U22* *32KX32*

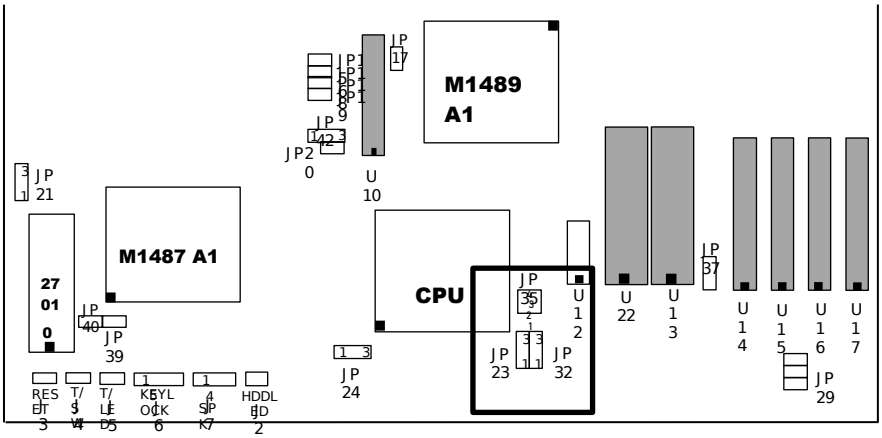
512K	
TAG RAM	***DATA RAM***
U10 *32KX8*	*U14-U17* *128KX8*

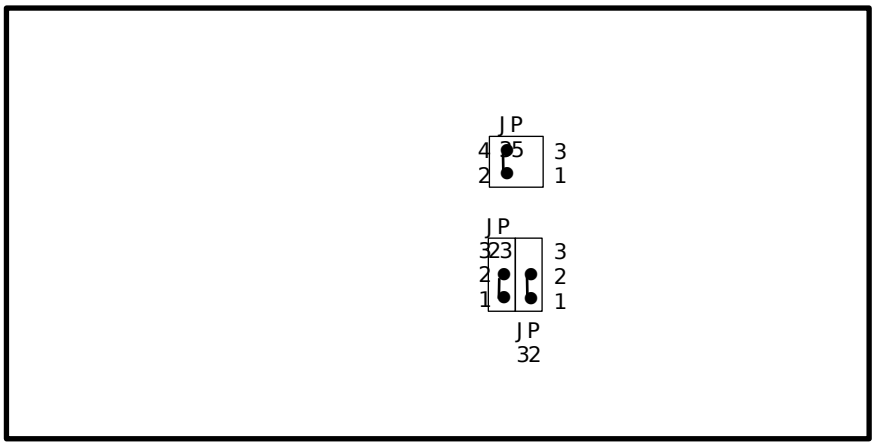


9 Default Setting

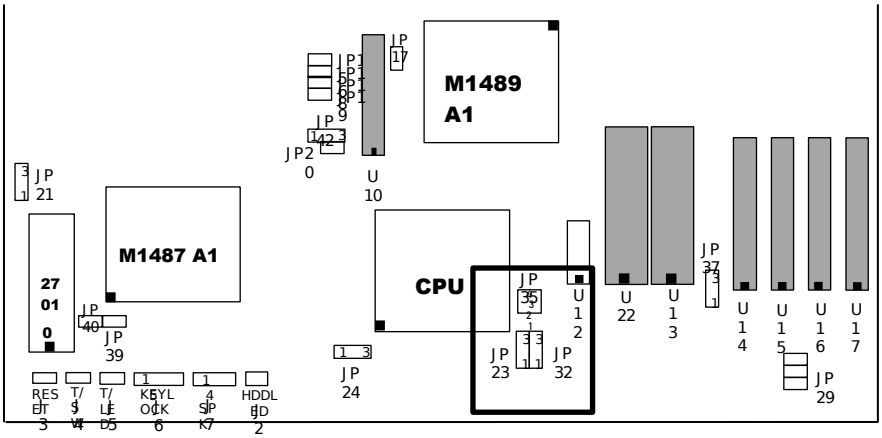
2.3 CPU INSTALLATION

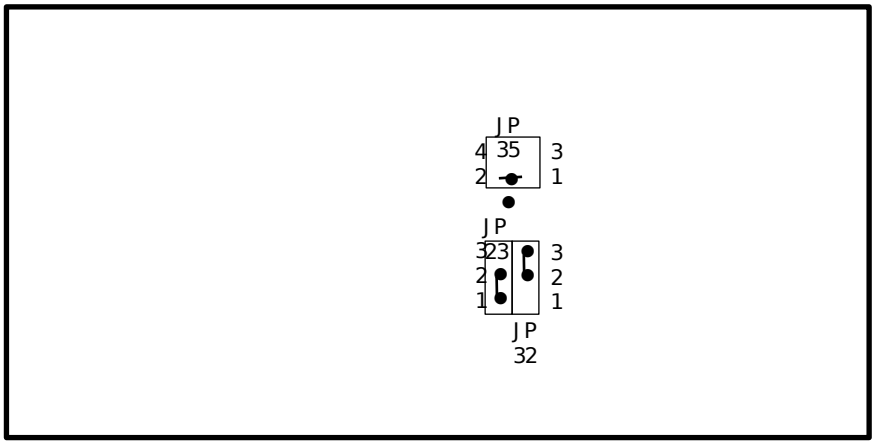
CYRIX 5x86 (MISC)

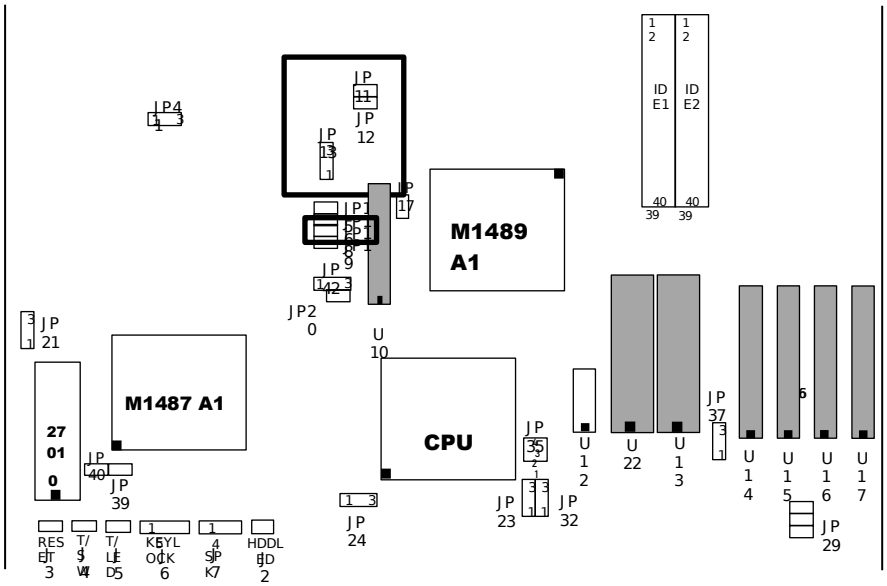




CYRIX 486DX2/DX4

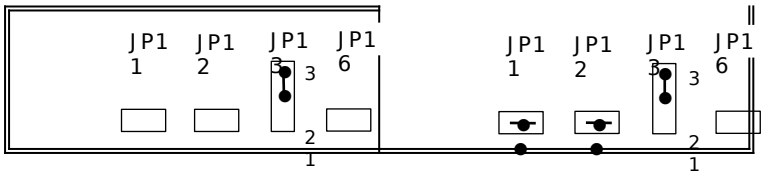


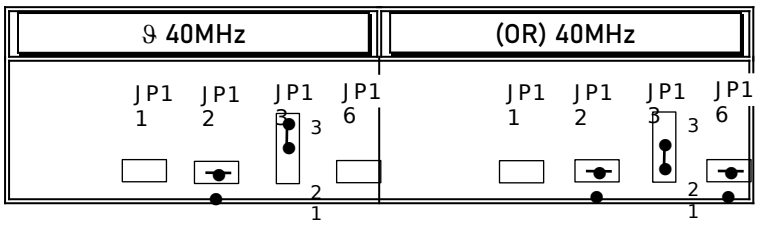




FREQUENCY SETTING

25MHz	33MHz



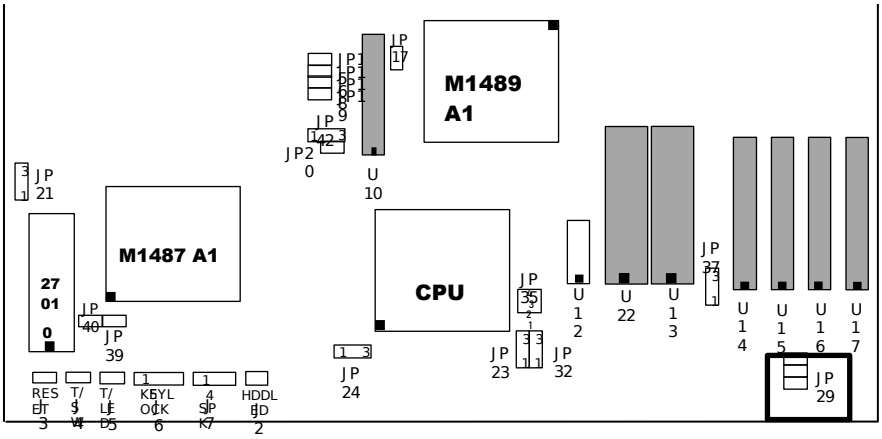


NOTICE:

The PCI clock specification should be under 33MHz. (Including 33MHz) If you encounter an unstable problem when you use the default setting, we suggest you to choose another setting for PCI clock.

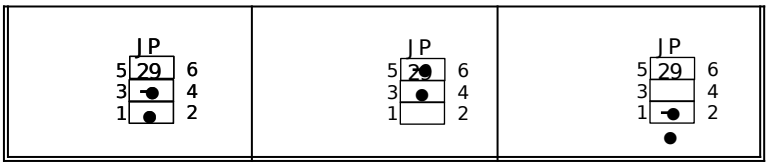
6

ϑ Default Setting



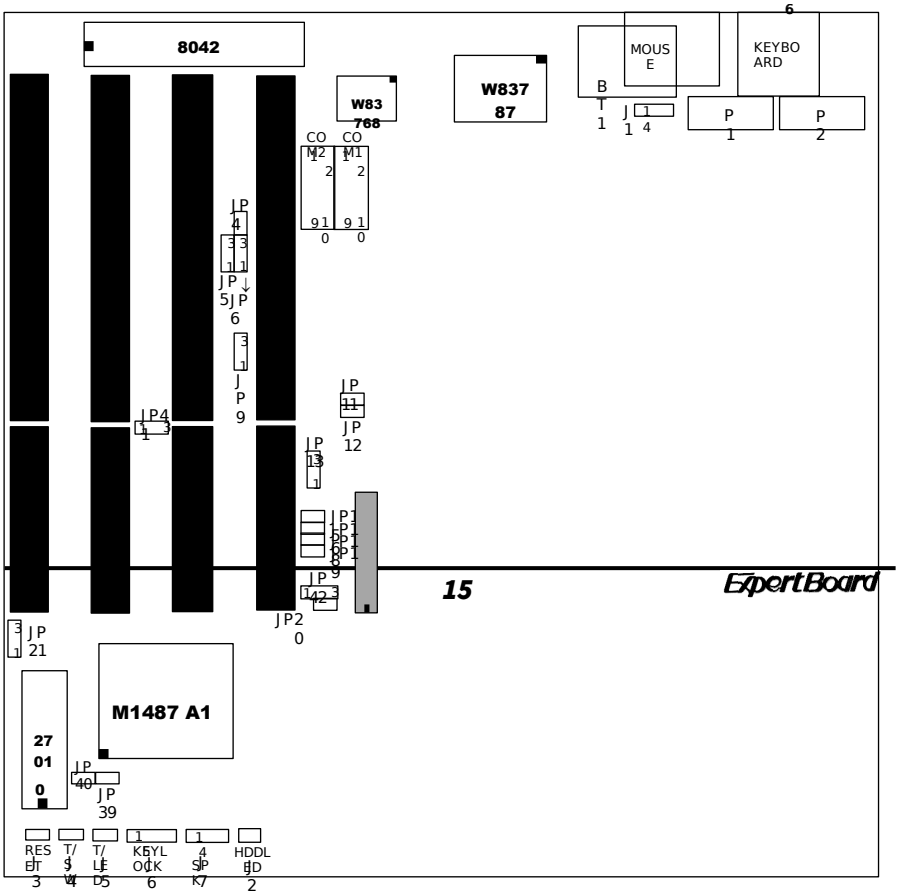
CPU POWER VOLTAGE

3.45V	3.6V	3.3V



9 **Default Setting**

2.4 OTHER JUMPER SETTING



INTERNALKEYBOARD CONTROL

	JP19	JP39	JP40
ϑ ENABLE	▭	●▭	●▭
DISABLE	●▭	▭	▭

ϑ **Default Setting**

OTHER JUMPER DESCRIPTION

JUMPER	DESCRIPTION	
JP5	EPP & ECP Function	
	1-2 DRQ1	2-3 DRQ3
JP6	EPP & ECP Function	
	1-2 DACK1	2-3 DACK 3
JP9	Printer Port	
	1-2 for IRQ 5	2-3 for IRQ 7
JP15	External Stop Buttom	
JP21	1-2 for 5V Flash Rom	2-3 for 12 V Flash Rom

CONNECTOR DESCRIPTION

CONNECTOR	PIN OUT	SIGNAL NAME
J1		1-2 Clear CMOS 2-3 For Normal 1-4 External Battery Connector (1: Ground) (4: External Battery Power In)
J2	On Board IDE LED	
J3 :	1 2	Ground Reset In

RESET		
J4 : TB-LED	1 2	+Anode -Cathode
J5 : TURBO SWITCH	Normal Speed	ϑ Turbo Speed
J6 : KEY LOCK	1 2 3 4 5	Power LED Not Used Ground Keyboard Inhibitor Ground
J7 : SPEAKER	1 2 3 4	+5V DC Data Out Data Out Data Out
KB1: KEYBOARD CONNECTOR	1 2 3 4 5	Keyboard Clock Keyboard-Data Space Ground +5V
P1 & P2 : POWER CONNECTOR	1 2 3 4 5,6,7,8 9 10,11,12	Power Good +5V DC +12V DC -12V DC Ground -5V DC +5V DC
IDE1, IDE2	On Board IDE Connector	
FDC1	Floppy Connector	
PRN1	Printer Connector	

ϑ Default Setting

CHAPTER 3
SYSTEM BIOS SETUP

WinBIOS Setup can be accessed via keyboard, mouse, or pen. The mouse click functions are:

- single click to change or select both global and current fields and
- double click to perform an operation in the selected field.

Using the keyboard with WinBIOS Setup

WinBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations:

KEYSTROKE	FUNCTION
<Tab>	Move to the next window or field.
→, ←, ↑, ↓	Move to the next field to the right, left, above, or below.
<Enter>	Select in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Closes the current operation and return to previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt>, <H>	Access a help window.
<Alt><Spacebar>	Exit WinBIOS Setup.
Alphabetic Keys	A to Z are used in the Virtual Keyboard, and are not case sensitive.
Numeric Keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

The hardware features and options of the *EXP8C49* are on-site selectable for maximum flexibility. You will need to configure these options through the built-in Setup Utility prior to using *EXP8C49* for the first time. This setup Utility is a multi-screen, menu driven program and is contained within the BIOS EPROM.

The following sections show the procedures that you may need to configure the *EXP8C49*:

1. Press <DEL> while turning on or rebooting the system to invoke Setup Utility program.
2. The main menu will be shown as follows:

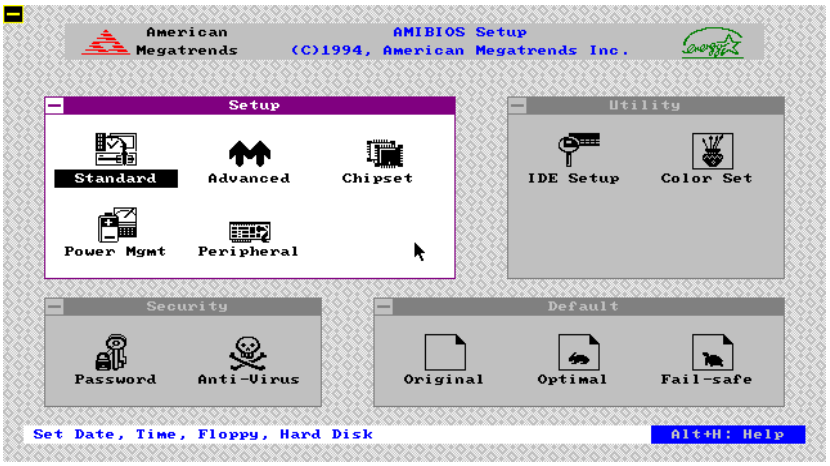


Figure 1

3. The functions are grouped into four categories which are Setup, Utility, Security and Default.
4. By using <TAB> key or mouse cursor to select the function group.
5. Use arrow keys or mouse to select the function icon within the group. Then press <Enter> key to invoke the setup function.
6. Use <Esc> Key to go back to the previous screen.

3.1 SYSTEM SETUP

There are five icons in the Setup Group.

Selecting Standard icon displays the following menu:

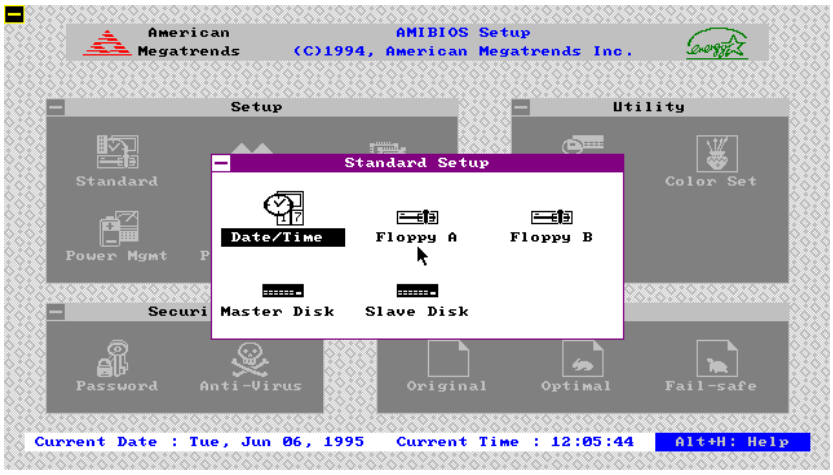


Figure 2

Selecting Date/Time icon displays the following menu:

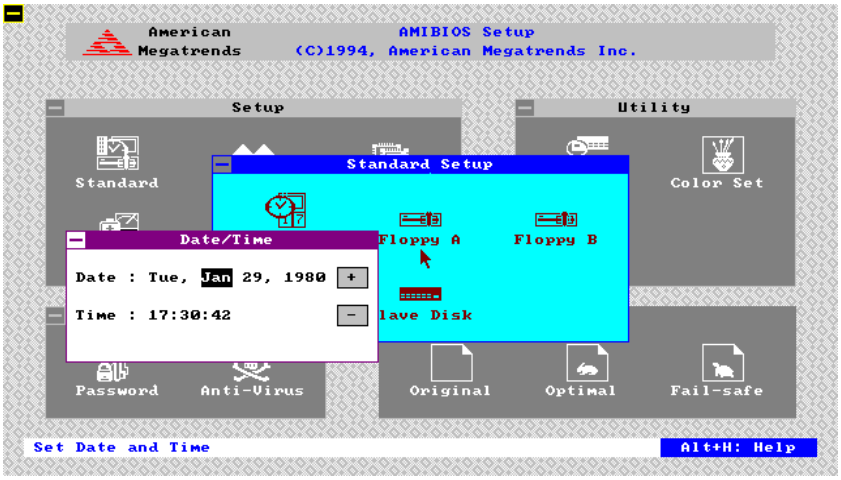


Figure 3

After entering correct date and time, press <Esc> to go back to the previous menu.

Selecting Floppy A/B icon displays the flowing menu:

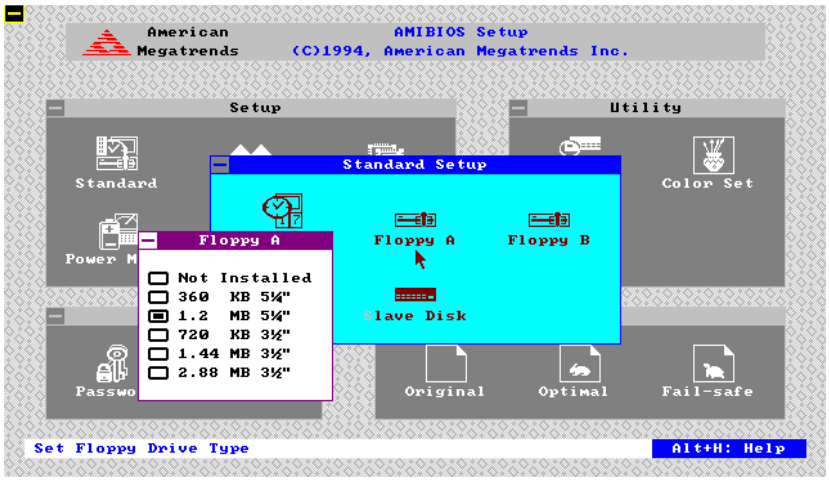


Figure 4

Using arrow keys or mouse to select the correct specification of floppy drive. Press <Esc> key to go back to the previous menu.

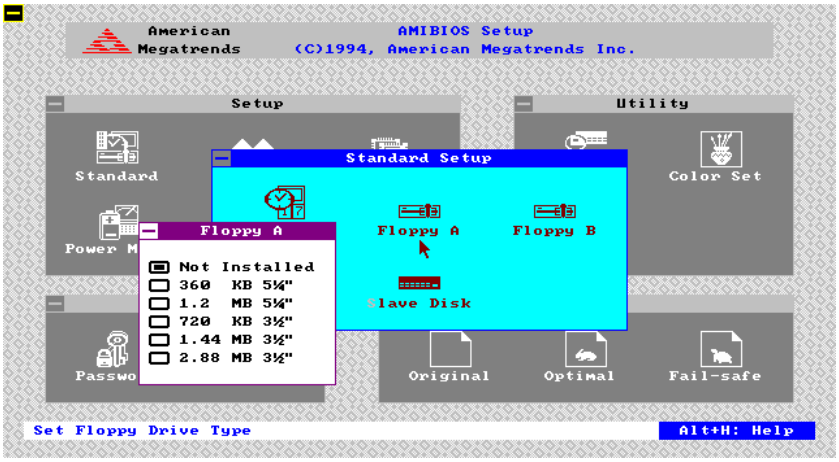


Figure 5

Selecting Master/Slave Disk icon displays the following menu:

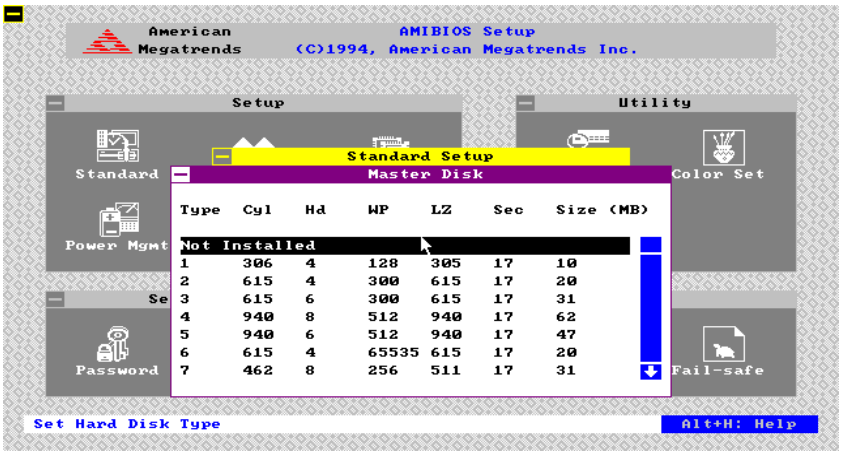


Figure 6

Use arrow keys or mouse to select or enter the Master Hard Disk specifications.

Press <Esc> to go back to the previous menu.

Selecting Slave Disk icon displays the following menu:

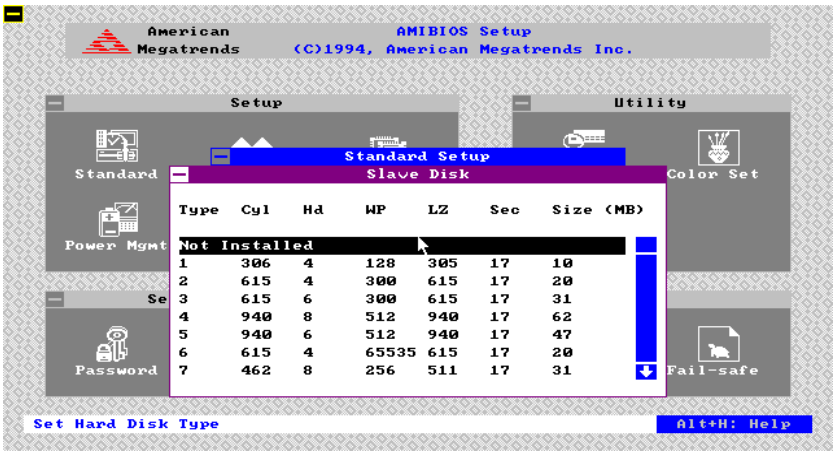


Figure 7

Selecting Advance icon displays the following menu:

Use arrow keys to select the desired entries and make changes. Press <Esc> key to go back to the previous menu.

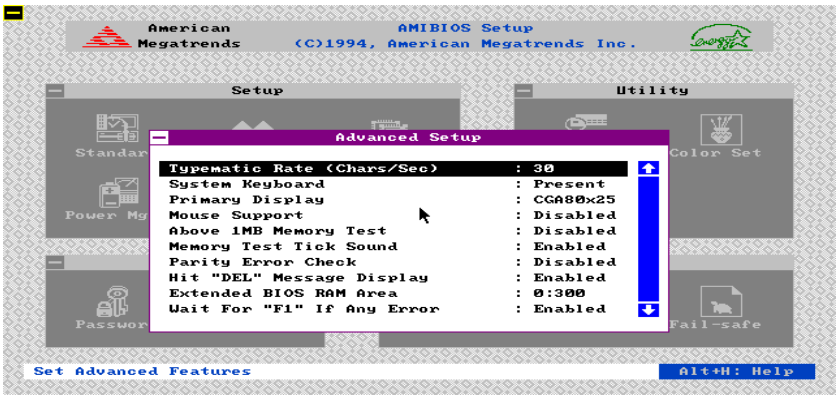


Figure 8

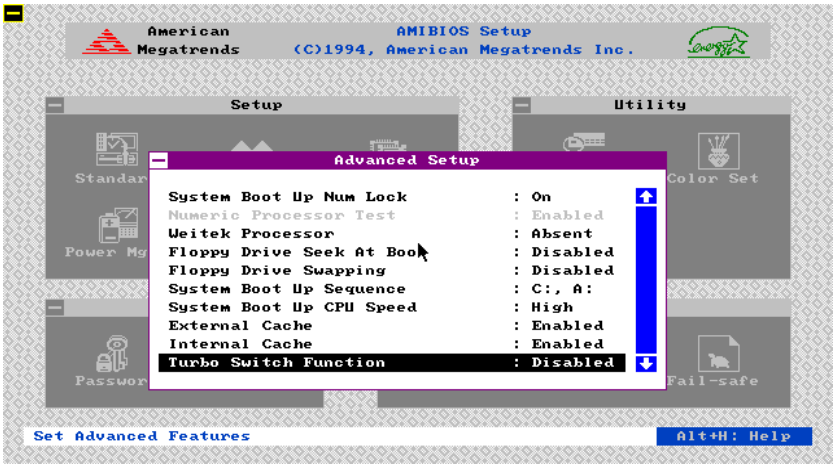


Figure 9

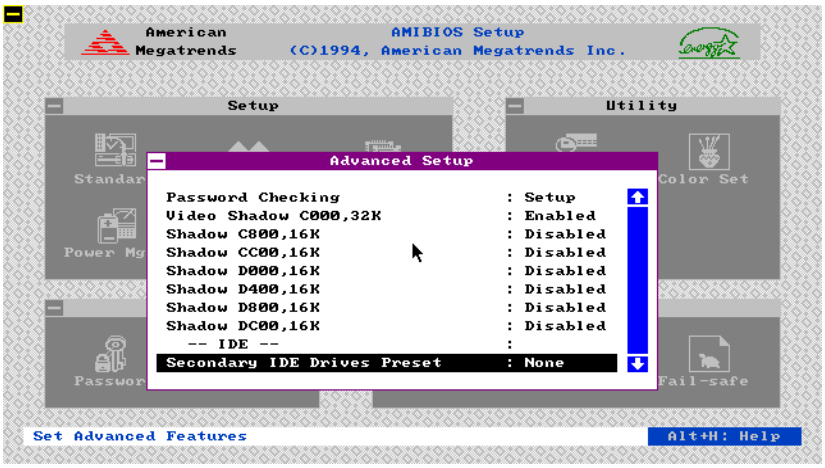


Figure 10

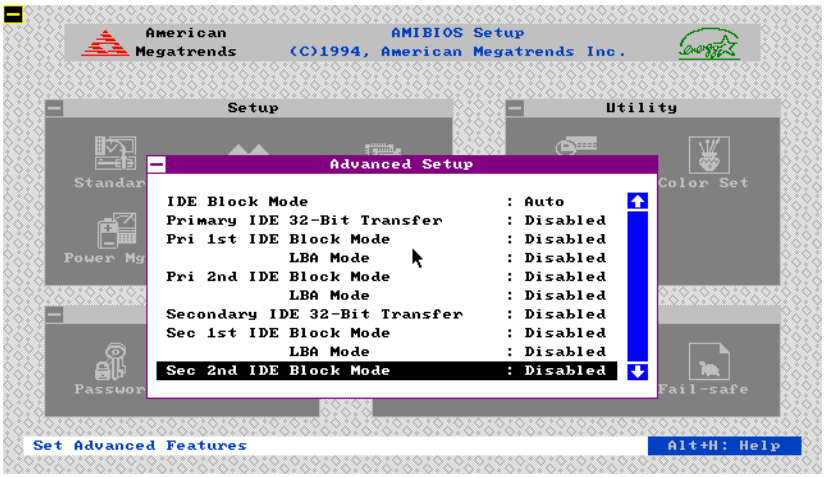


Figure 11

Selecting Chipset icon displays the following menu:

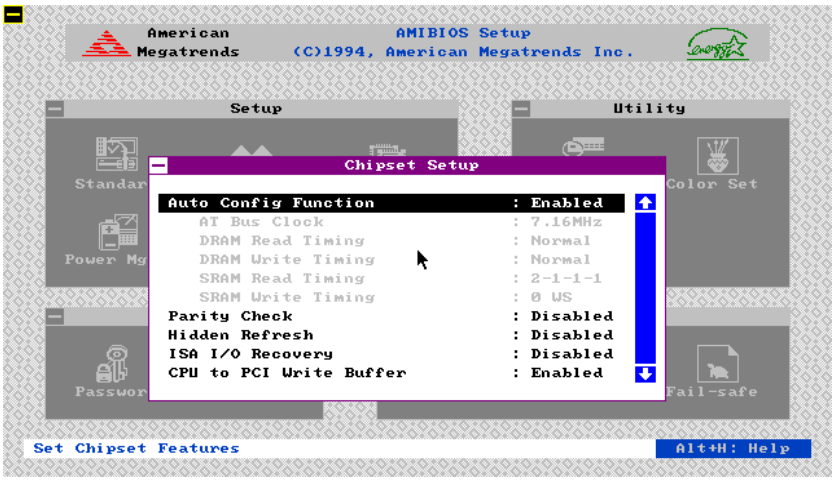


Figure 12

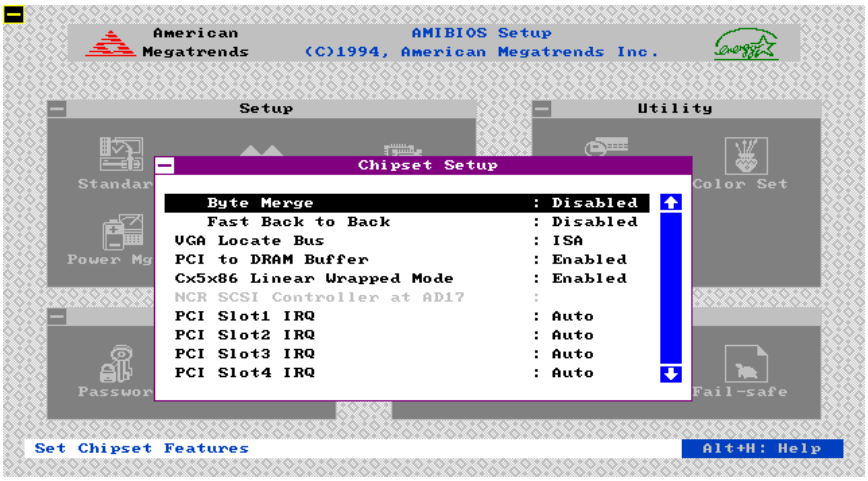


Figure 13

NOTE:

1. *Byte merge:*
   This feature is used to merge byte or word to double word. Since PCI is a 32-bit bus.

2. *Fast Back to Back:*
   This feature is used to enable PCI fast-back-to-back cycle defined in PCI specification.

But in our tests, not every PCI VGA card can accept these features correctly, we suggest this feature programmed as an option in CMOS setup.

CX5x86 Linear Wrapped Mode: For Linear Burst Mode of 5X86 (M1sc) CPU.

NOTE:

Many entries on the screen are defined in PCI specification. Unless you truely understand the meaning of these entries, please DO NOT try to change the settings. For more detailed information, refer to the PCI specification.

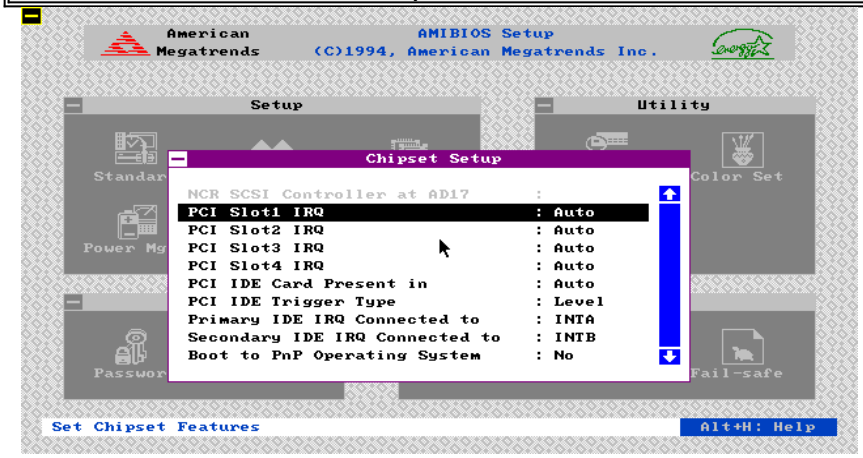


Figure 14

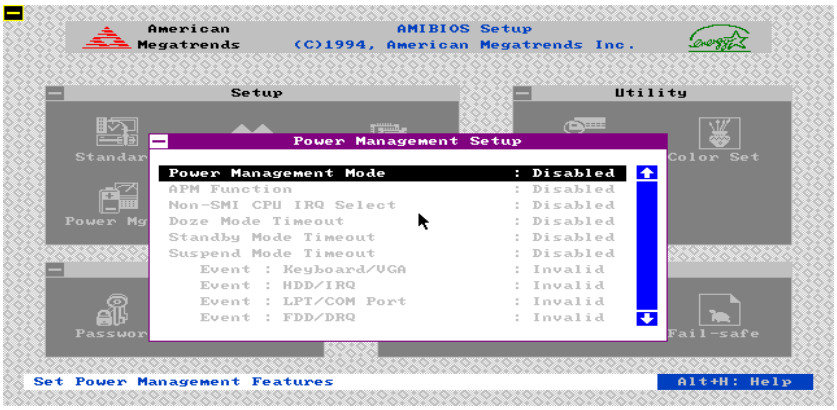


Figure 15

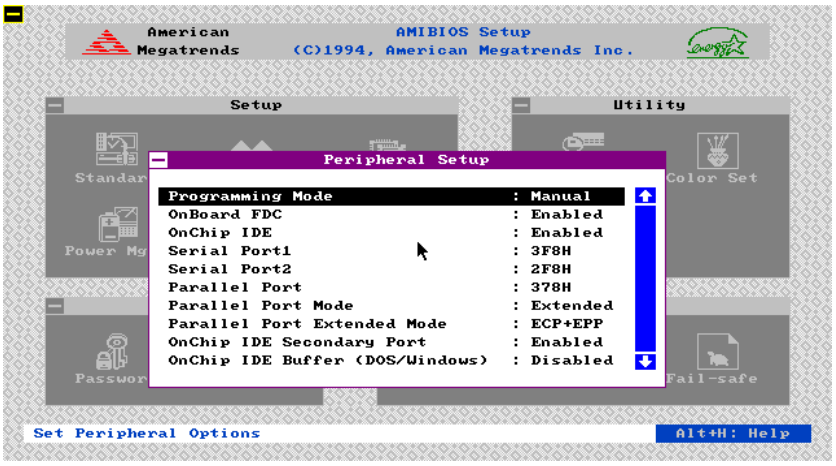

American
Megatrends
AMIBIOS Setup
(C)1994, American Megatrends Inc.
Setup
Utility
Peripheral Setup
Programming Mode : Manual
OnBoard FDC : Enabled
OnChip IDE : Enabled
Serial Port1 : 3F8H
Serial Port2 : 2F8H
Parallel Port : 378H
Parallel Port Mode : Extended
Parallel Port Extended Mode : ECP+EPP
OnChip IDE Secondary Port : Enabled
OnChip IDE Buffer (DOS/Windows) : Disabled
Color Set
Fail-safe
Set Peripheral Options
Alt+H: Help

Figure 16

3.2 UTILITY

The following icons appear in this section:

IDE SETUP If drive C: or D: is an IDE drive, the hard disk drive parameters for drive C: or D: are automatically detected and reported to the Hard Disk Drive C: or D: screen in Standard Setup, so you can easily configure drive C: or D:.

Color Set Set the WinBIOS Setup screen colors.

Language Permits you to select a foreign language-specific screen character set.

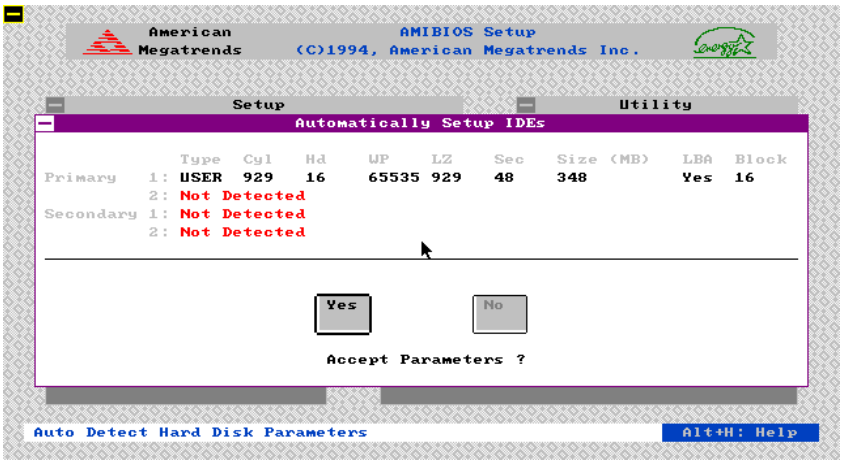


Figure 17

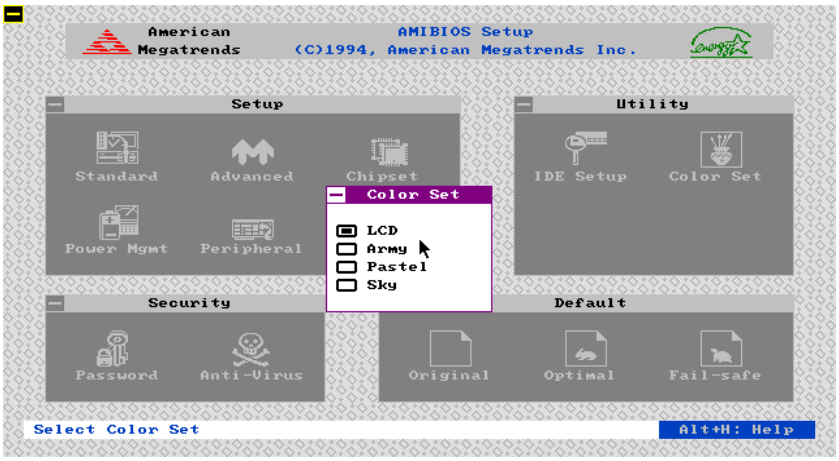


Figure 18

Use arrow key to select the desired entries and make changes, press <Esc> key to go back to the previous menu.

WinBios Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when WinBIOS Setup is executed. The following screen appears when you select the password icon.

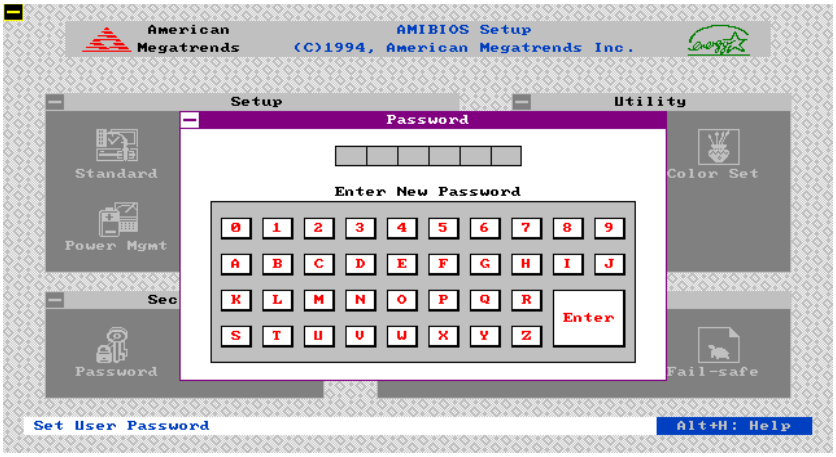


Figure 19

You can enter a password by:

- typing the password on the keyboard,
- selecting each letter via the mouse, or
- selecting each letter via the pan stylus.

Pen access must be customized for each specific hardware platform.

The password check option is enabled in Advanced Setup by choosing either Always (the password prompt appears every time the system is powered on) or Setup (the password prompt appears only when WinBIOS Setup is run). The password is stored in CMOS RAM. The system asks for a password.

Enter a 1-6 character password. The password does not appear on the screen when typed. WinBIOS will ask you to retype the password. Make

sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system. WinBIOS will then display the following:

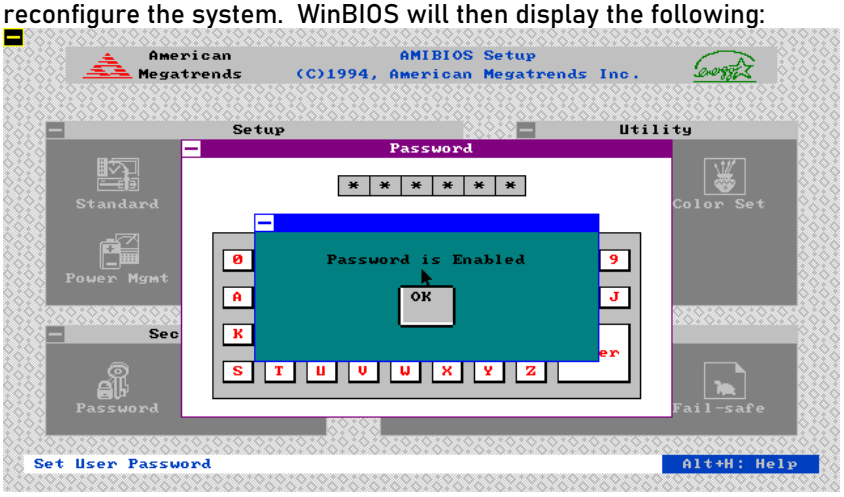


Figure 20

Select the Password icon from the Security section of the WinBios Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WinBIOS Setup Main Menu. The password is stored in CMOS RAM after WinBIOS Setup completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Remember the Password

Keep a record of the new password when the password is changed. If you forget the password and your computer has an American Megatrends motherboard, remove the computer cover, set switch 1-2

(the DIAG switch) to ON, power on the computer. WinBIOS erases the password.

When this icon is selected from the Security section of the WinBIOS Setup main menu, WinBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The following screen appears when you select the Anti-Virus icon:

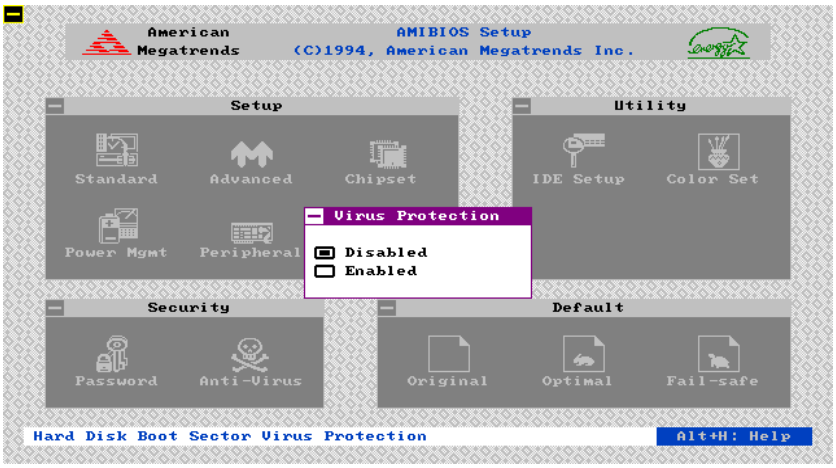


Figure 21

The setting are Enabled or Disabled. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write.

3.3 DEFAULT

The icons in this section permit you to select a group of settings for all WinBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

Original

Choose the Original icon to return to the system configuration values present in WinBIOS Setup when you first began this WinBIOS Setup session.

Optimal

You can load the optimal default settings for the WinBIOS Setup options by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

Fail-Safe

You can load the Fail-Safe WinBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WinBIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

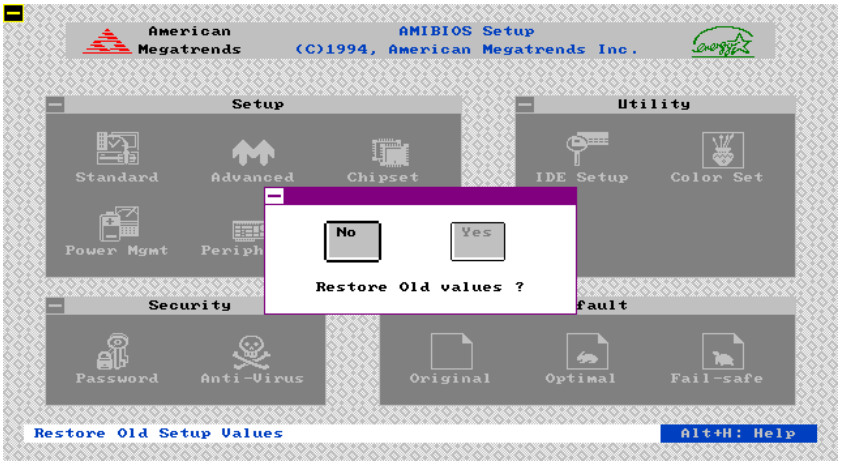


Figure 22

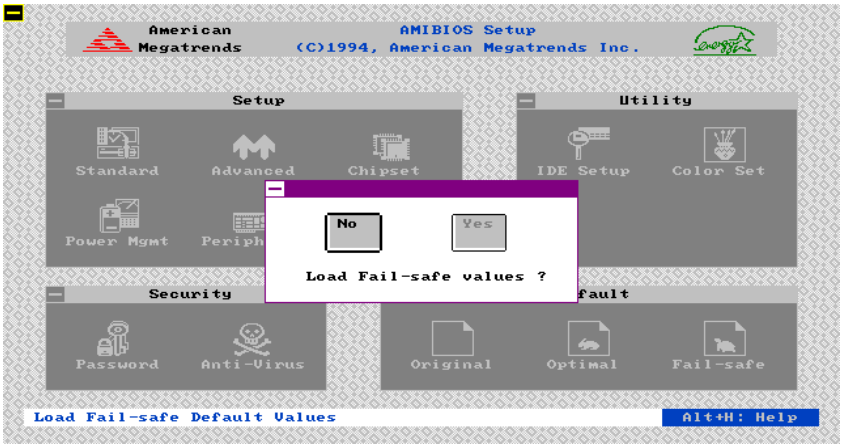


Figure 23

WINBIOS BEEP CODES

BEEPS	ERROR MESSAGE	DESCRIPTION
1	Refresh Failure	The memory refresh circuitry is faulty.
2	Parity error	Parity error in the base memory (the first 64 KB block) of memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.
4	Timer Not Operational	A memory failure in the first 64 KB of memory, or Timer is not functioning.
5	Processor error	The CPU generated an error.
6	8042-Gate A20 Failure	Cannot switch to protected mode.
7	Processor exception Interrupt Error	The CPU on the CPU Card generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in WinBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed.
11	Cache memory bad - do not enable cache	The cache memory test failed. Cache memory is disabled. Do not press <Ctrl> <Alt> <+> to enable cache memory.

What to Do If the Computer Beeps

Here is what you need to do if your computer has a WinBIOS and it starts beeping:

IF THE SYSTEM BEEPS...	THEM...
1, 2, or 3 times...	reseat the memory SIMMs or DIPs. If the system still beeps, replace the memory.
6 times...	reseat the keyboard controller chip. If it still beeps, replace the keyboard controller. If it still beeps, try a different keyboard, or replace the keyboard fuse, if the keyboard has one.
8 times...	there is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS ROM chip is bad. The system probably needs a new BIOS ROM chip.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	the motherboard must be replaced.

APPENDIX

AUTO CONFIG FUNCTION: (On Figure 12)

This option when set "Enabled" will automatically set the AT-bus clock, DRAM Read/Write Timing and SRAM Read/Write Timing according to the CPU configuration default table.

PROGRAMMING MODE: (On Figure 16)

The settings are "Auto" or "Manual". When set to "Auto", the WINBIOS automatically detects all adapter cards installed in the system and configures the on-board serial ports, parallel ports, Floppy controller and IDE controller automatically. Default setting is set as "Enabled".

RMA FORM

When the motherboard can not work well, please fill up this form to describe related situations. If the space is not enough to use, you can attach separate paper.

MODEL: **MODEL NO:**

HARDWARE

CPU: Brand _____, Model _____, Speed _____ MHz
CO-PROCESSOR: Brand _____, Model _____, Speed _____ MHz
SIMM: Brand _____, Speed _____ ns, Q'ty _____ pcs, Total _____ MB
CACHE: Brand _____, Speed _____ns, Total _____K
TAG RAM: Brand _____, Speed _____ns
BIOS DATE CODE: _____
SYSTEM SPEED RUNNING _____ MHz
VIDEO CARD: Chip _____, RAM _____, VGA Mode _____
Bus_____(ISA, VESA or PCI)
OTHER ADD-ON CARDS:

SOFTWARE

OPERATING SYSTEM _____ VERSION _____
SOFTWARE PROGRAM _____
BIOS SETUP: DRAM Wait State_____ CACHE Wait State_____
If you change BIOS SETUP, please describe the changes:

<A> ERROR

☐ HANG UP ☐ NO SCREEN ☐ FLOPPY R/W ERROR

☐ HARD DISK R/W ERROR ☐ PARITY
MEMORY ERROR
☐ OTHER
_____

<B> ERROR MESSAGES ON YOUR SCREEN (PLEASE SHOW US THE WHOLE SENTENCE)

<C> PROBLEM DESCRIPTION