80486

486VESA Green Mainboard
User's Guide &
Technical Reference

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SOYO™

About This Guide

This User's Guide is for assisting system manufacturers and end users in setting up and installing the mainboard. Information in this guide has been carefully checked for reliability; however, no guarantee is given as to the correctness of the contents. The information in this document is subject to change without notice.

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25H SERIAL

100% POST-CONSUMER RECYCLED PAPER

Electrostatic Discharge Precautions

Make sure you ground yourself before handling the mainboard or other system components. Electrostatic discharge can easily damage the components. Note that you must take special precaution when handling the mainboard in dry or air-conditioned environments.

Abide by the precautions below to protect your equipment from electrostatic discharge:

- Do not remove the anti-static packaging until you are ready to install the mainboard and other system components.
- Ground yourself before removing any system component from its protective anti-static packaging. You can ground yourself by grasping the expansion slot covers or other unpainted portions of the computer chassis.
- Frequently ground yourself while working, or use a grounding strap.
- Handle the mainboard by the edges and avoid touching its components.

Table of Contents

1 Introduction

The 486 VESA mainboard is a high-performance system board that supports 486DX2/DX/SX/SL Enhanced 486, P24T, and Cyrix M6/M7 CPUs. The mainboard is fully compatible with industry standards, while incorporating many technical enhancements.

The 486 VESA mainboard offers superior system performance, compatibility, and reliability, and is the ideal choice for a wide variety of system applications.

Key Features

- Fully AT compatible. Supports 486DX2/DX/SX/SL Enhanced 486, P24T, and Cyrix M6/M7 CPUs
- Supports internal cache (CPU) write-back (P24T, M6/M7) systems
- Supports Power Management Mode
  - — Supports the SMM and the SMI
  - — CPU Stop Clock Function
  - — Four Power Saving States (normal/standby/suspend/off)
  - — Supports the APM control
  - — Supports Berg Switch control
  - — Power Saving also on non-SMI CPU
  - — More System Event Monitoring and the Power Saving Control
- Direct map cache controller that supports 64K, 128K, or 256K cache size
- Fast page burst mode DRAM controller
- Memory configurations from 1MB to 128MB using combinations of 80ns 256K, 512K, 1M, 2M, 4M and 16M SIMM modules
- BIOS/Video ROM Cacheable
- Hardware turbo speed switch
- Six 16-bit slots, one 8-bit ISA slot and two master VESA slots

Unpacking the Mainboard

The mainboard package contains:

- The 486 VESA Mainboard
- This User's Guide

Note: Do not unpack the mainboard until you are ready to install it.

Follow the precautions below while unpacking the mainboard.

1. Before handling the mainboard, ground yourself by grasping an unpainted portion of the system's metal chassis.
2. Remove the mainboard from its anti-static packaging and place it on a grounded surface, component side up.
3. Check the mainboard for damage. If any chip appears loose, press carefully to seat it firmly in its socket.

Do not apply power if the mainboard appears damaged. If there is damage to the board contact your dealer immediately.

Mainboard Layout

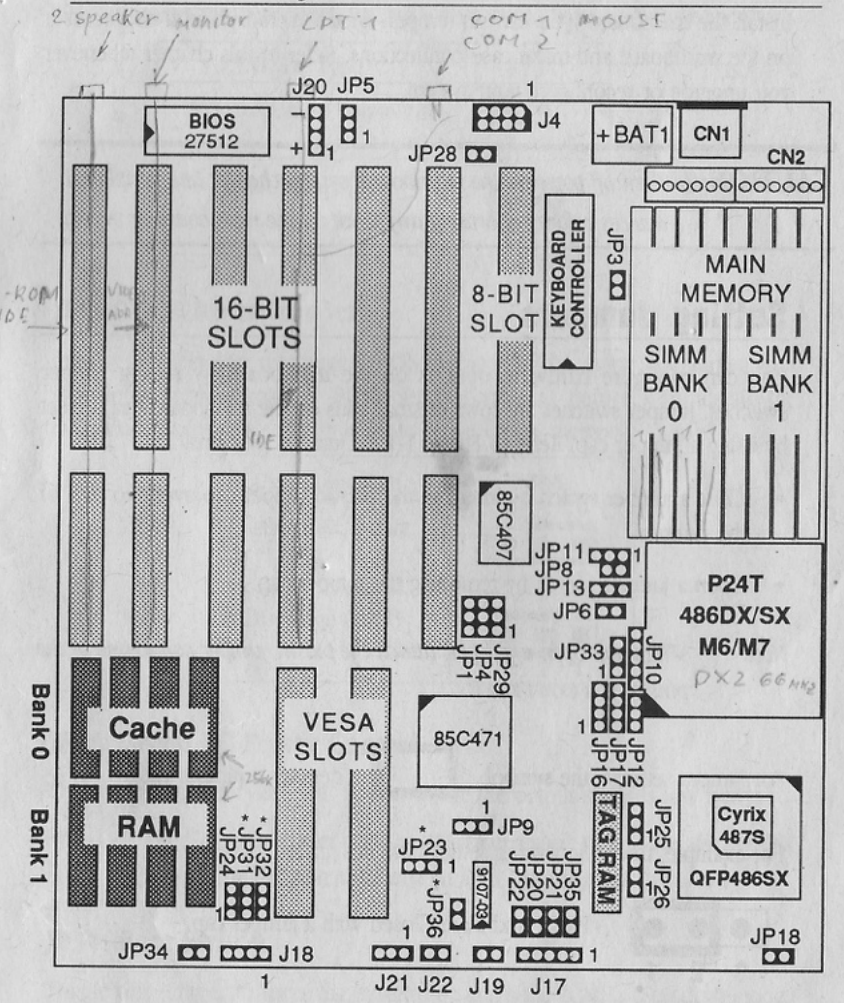


Figure 1–1. Mainboard Layout

*: JP31, JP32, JP23, JP36 factory setting

2 Hardware Setup

This chapter explains how to configure the mainboard's hardware. After you install the mainboard, you can set jumpers install memory and a coprocessor on the mainboard and make case connections. Refer to this chapter whenever you upgrade or reconfigure your system.

CAUTION: *Turn off power to the mainboard, system chassis, and peripheral devices before performing any work on the mainboard or system.*

Setting Jumpers

You can configure hardware options on the mainboard by setting jumper switches. Jumper switches are rows of small pins on the mainboard that are set by using a jumper cap. Refer to Figure 1-1 for jumper locations.

- *Close* a jumper switch by inserting the plastic jumper cap over two pins of the jumper.
- *Open* a jumper switch by removing the jumper cap.

Note: *When you open a jumper, attach the plastic jumper cap to one of the pins so you won't lose it.*

For jumper settings, the symbol:  denotes a jumper cap.

For example, three-pin jumper settings are designated as below.

Pins 1 and 2 are Closed with a jumper cap.

Pins 2 and 3 are Closed with a jumper cap.

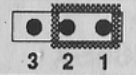
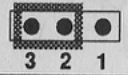
JP3: Display Type Settings

JP3 configures the mainboard for use with a color or monochrome monitor.

Display Type	JP3
Monochrome (Default)	
Color/EGA/VGA	

JP5: CMOS Reset Jumper

Jumper JP5 lets you discharge CMOS memory in the event you forget your password or encounter a BIOS Setup problem. Before you install the mainboard make sure that JP5 is set to retain CMOS memory.

CMOS Setting	JP5
Retain CMOS Data	
Discharge CMOS	

JP28: Green PC Power Control

This jumper controls Green PC Power, where the output status is **low active**.

Note: *The Green PC Power must accept a* ***low input*** *signal and the POWER MANAGEMENT function must be Enabled (see page 25).*

JP34: Berg Switch

Toggle this jumper to force the system to enter the 8 MHz (Standby) mode. Press any key or move the mouse to wake the system to full speed mode.

J4: Green Control Pin

The mainboard supports 4 sets of BIOS controlled jumpers. You can set the timer to control an external device. Output status is **low active**.

CPU Type Configuration

Configure the 486 VESA mainboard's CPU by inserting the specified CPU and setting jumpers as described in the diagrams that follow. Note that the CPU Type jumpers on the mainboard have **yellow** caps and the Clock Setting jumpers have **red** caps.

Intel / AMD CPUs

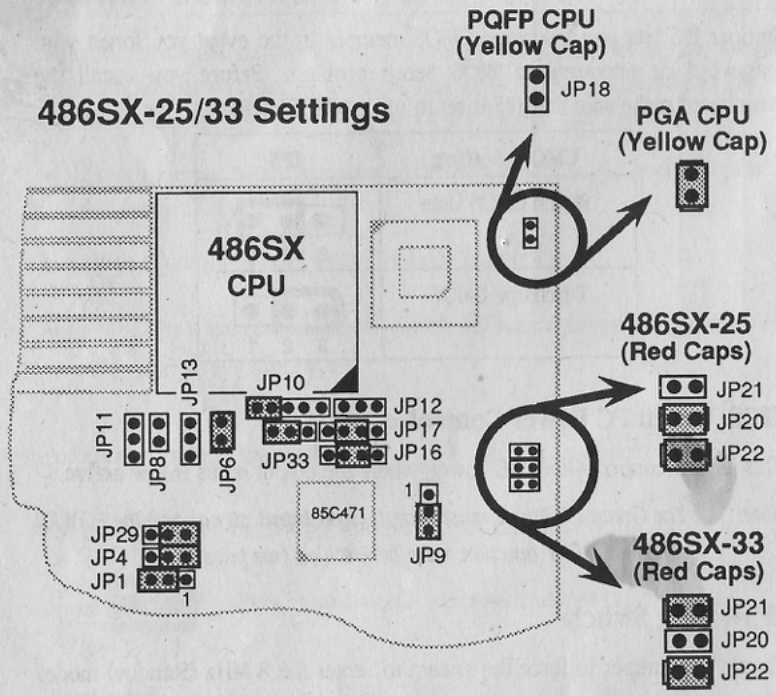


Figure 2–1. 486SX-25/33 Jumper Settings

486DX-25/33/40/50 and 486DX2-50/66 Settings

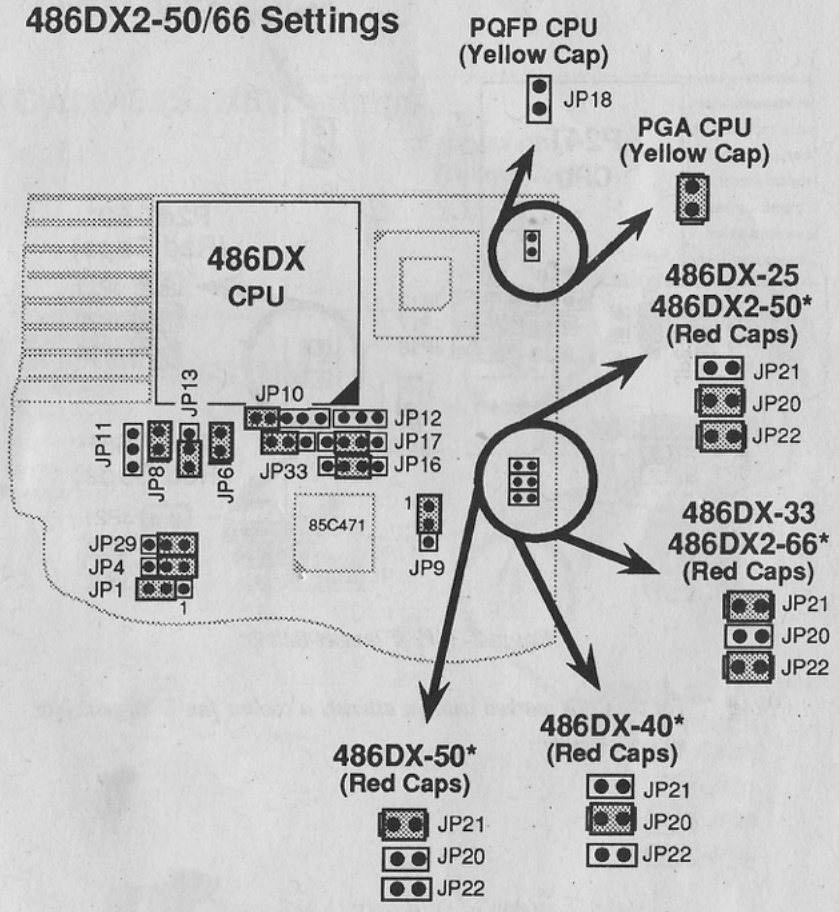


Figure 2–2. 486DX-25/33/40/50 and 486DX2-50/66 Jumper Settings

**Note: For the CPUs marked with an asterisk, a cooling fan is suggested for system stability.*

P24T Settings

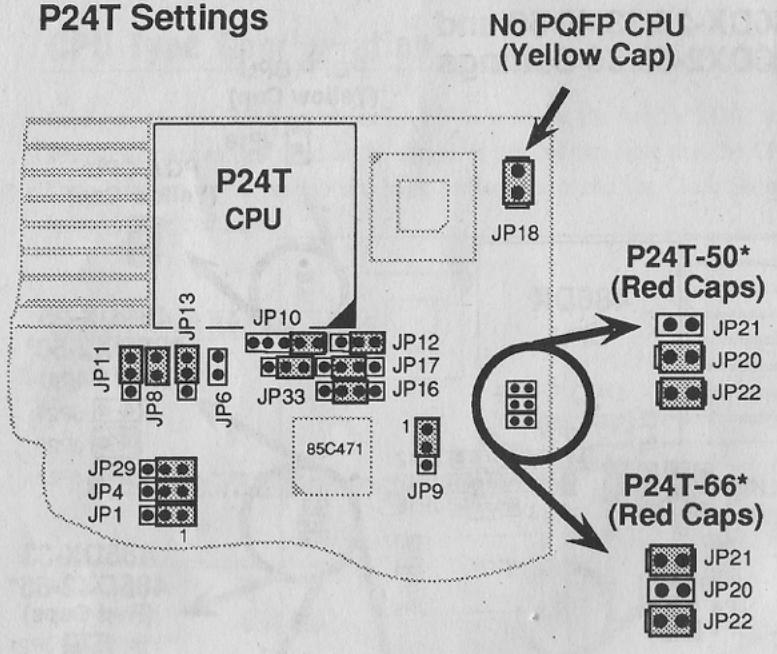


Figure 2–3. P24T Jumper Settings

Note: For the CPUs marked with an asterisk, a cooling fan is suggested for system stability.

Cyrix CPUs

Cyrix 486S (M6) Settings

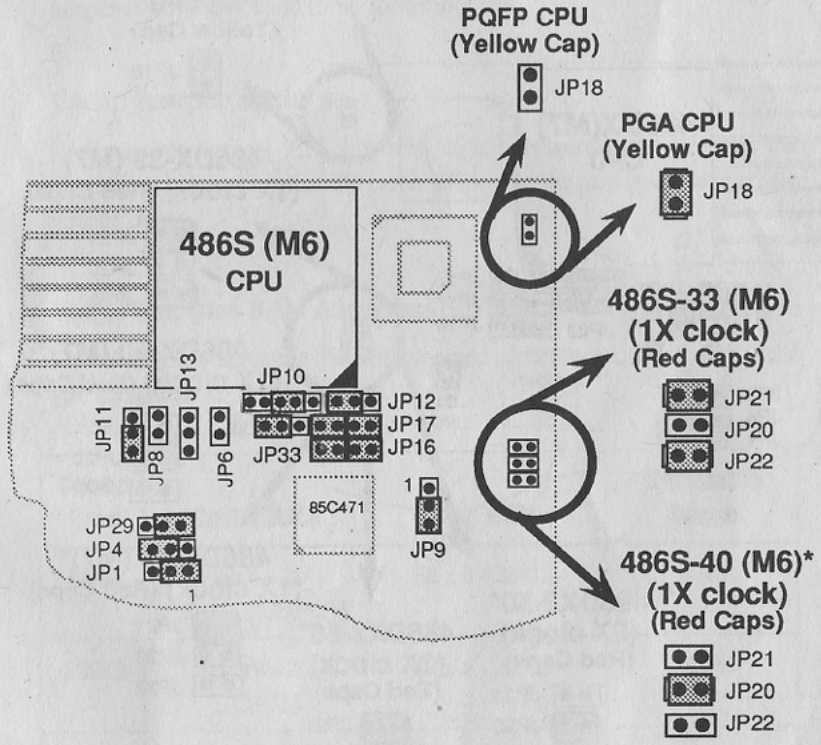


Figure 2–4. Cyrix 486S (M6) Jumper Settings

Note: For the CPUs marked with an asterisk, a cooling fan is suggested for system stability.

Cyrix 486DX (M7, or M6+C6) Settings

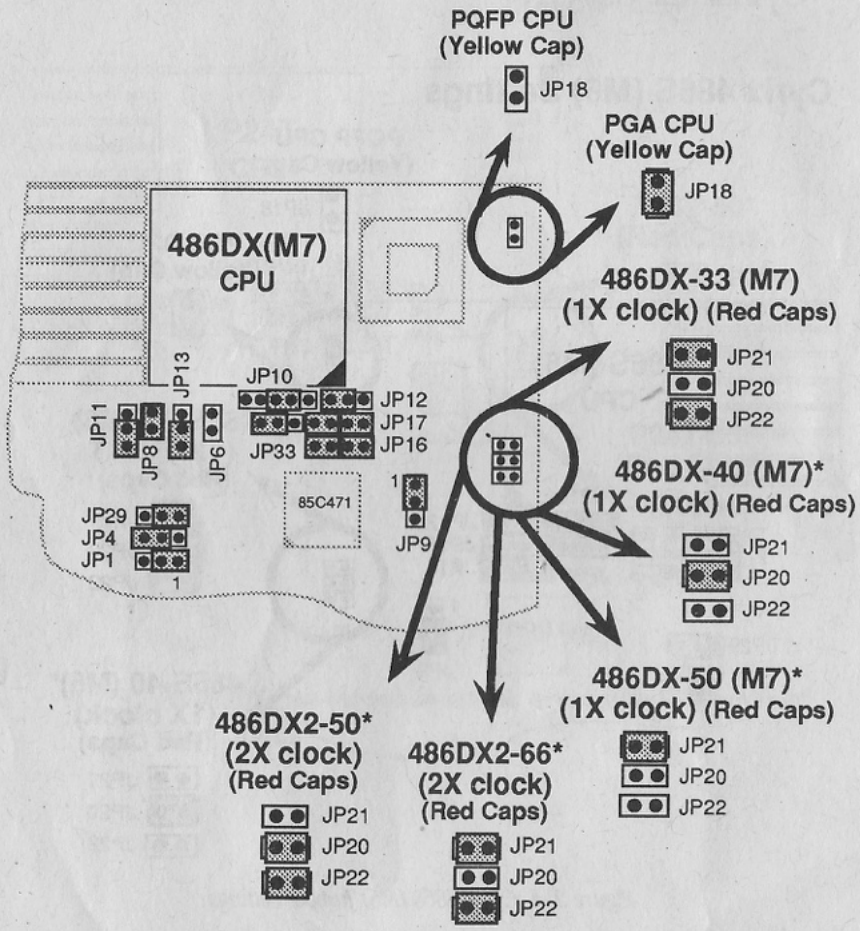


Figure 2-5. Cyrix 486DX/DX2 (M7) Jumper Settings

Note: For the CPUs marked with an asterisk, a cooling fan is suggested for system stability.

Cache Configuration

The 486 VESA mainboard has a write-back caching scheme. You can configure the mainboard's external cache for 64KB, 128KB, or 256KB by setting jumper switches and installing cache chips. Refer to the following pages for jumper switch settings and cache socket locations.

Cache Jumper Settings

You must set jumpers JP24, J25, and J26 to configure cache size. See the illustrations below. Note that the cache jumpers on the mainboard have **white** jumper caps.

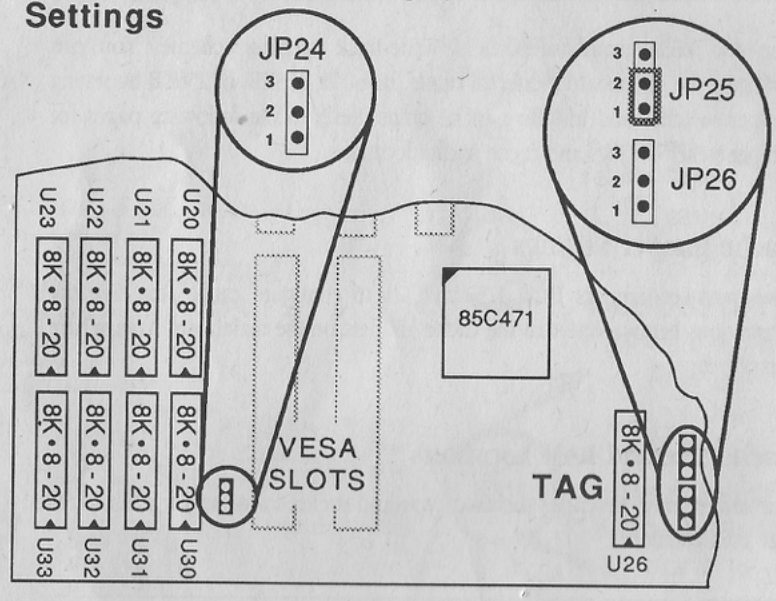
Cache Size and RAM Locations

The table below describes the chip type and socket locations for each cache size configuration.

Cache Size	Cache RAM	Tag RAM	Cacheable Range
64KB	8K x 8 – 20/ U20~U23, U30~U33	8K x 8 – 20/U26	8 MB
128KB	32K x 8 – 20/ U20~U23	8K x 8 – 20/U26	16 MB
256KB	32K x 8 – 20/ U20~U23, U30~U33	32K x 8 – 20/U26	32 MB

Note: Tag and Data RAM use 20ns for all conditions.

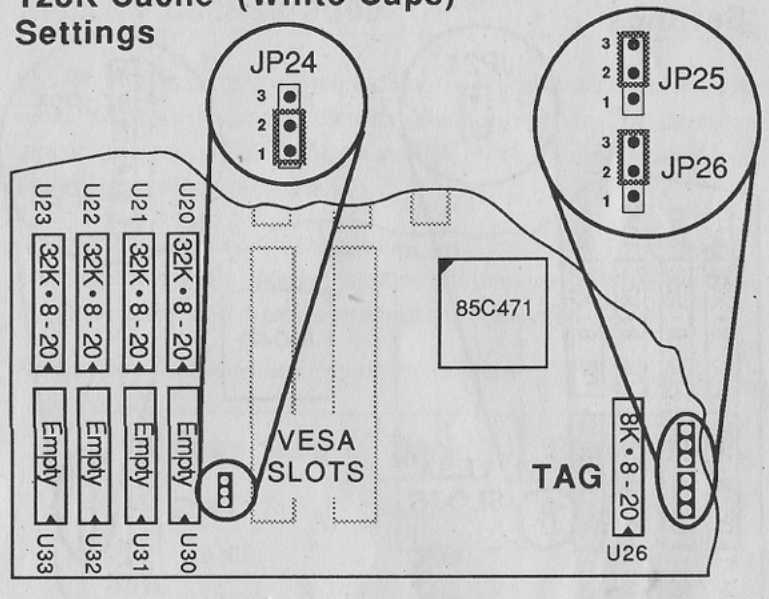
64K Cache (White Caps) Settings



Cache Size	JP24	JP25	JP26
64K	X	1-2	X

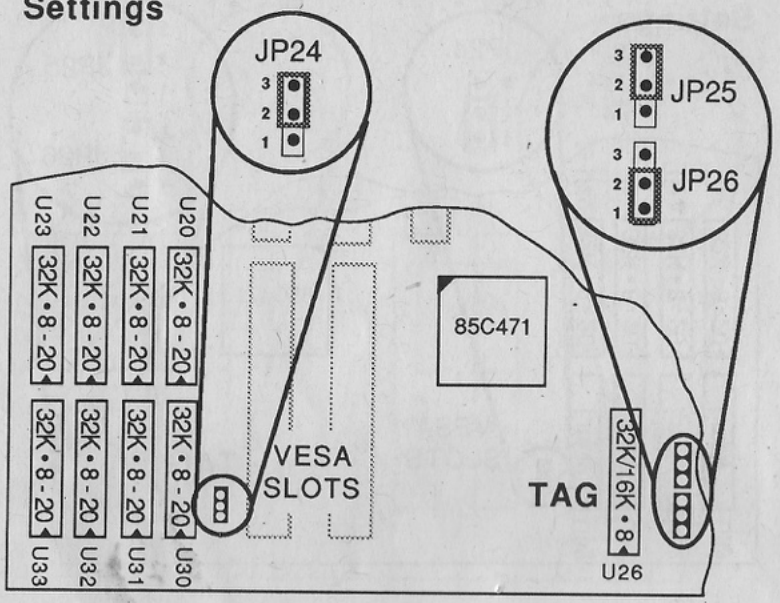
X = setting doesn't matter

128K Cache (White Caps) Settings



Cache Size	JP24	JP25	JP26
128K	1-2	2-3	2-3

256K Cache (White Caps) Settings



Cache Size	JP24	JP25	JP26
256K	2-3	2-3	1-2

Memory Configuration

The 486 VESA mainboard lets you increase the system's main memory via on-board SIMM (Single In-line Memory Modules) sockets. The mainboard supports two banks of 256K, 1M, 4M and 16M SIMM.. The mainboard requires SIMM of at least 80ns access time.

On-board memory is located in two banks: Bank 0 and Bank 1. See Figure 1-1. Four SIMM sockets are provided in each bank. You can install either a 256K, 1M, 4M or a 16M SIMM in each socket with any configuration.

The mainboard supports the following configurations:

Memory Size	Bank 0	Bank 1
1 MB	256K	—
2 MB	256K	256K
4 MB	1M	—
5 MB	256K	1M
8 MB	1M	1M
16 MB	4M	—
17 MB	256K	4M
20 MB	1M	4M
32 MB	4M	4M
64 MB	16M	—
68 MB	1M	16M
80 MB	4M	16M
128 MB	16M	16M

Table 2–1. On-board Memory Configurations

Connectors

Attach the 486 VESA mainboard to case devices, or an external battery, via connectors on the mainboard. Refer to Figure 1-1 for connector locations and connector pin positions.

J17 - Keylock & Power LED Connector

J17 is a connector for a lock that may be installed on the system case for enabling or disabling the keyboard. J17 also attaches to the case's Power LED.

J18 - Speaker Connector

Attach the system speaker to connector J18.

J19 - Hardware Reset Control

Attach the Reset switch to J19. Closing the Reset switch restarts the system.

J20 - External Battery Connector

J20 is a 4-pin connector to which you can attach an external battery. Pin 1 of J20 is positive (+) and pin 4 is negative (–).

J21 - Turbo Switch Connector

J21 is connected to a Turbo switch on the front of the system case. The connector's pins 1-2 are shorted for normal operation and pins 2-3 are shorted for turbo operation.

J22 - Turbo LED Connector

J22 connects to a Turbo LED on the case control panel and works with the Turbo Switch. If the mainboard is in Turbo mode, the Turbo LED lights.

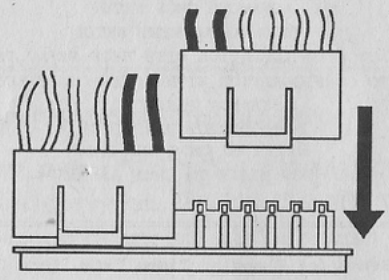
CN1- Keyboard Connector

A five-pin female DIN keyboard connector is located at the rear of the board. Plug the keyboard jack into this connector.

CN2 - Power Supply Connectors

The mainboard requires a power supply with at least 200 watts and a "power good" signal. CN2 has two six-pin male header connectors.

Plug the dual connectors from the power directly onto the board connector while making sure the black leads are in the center.



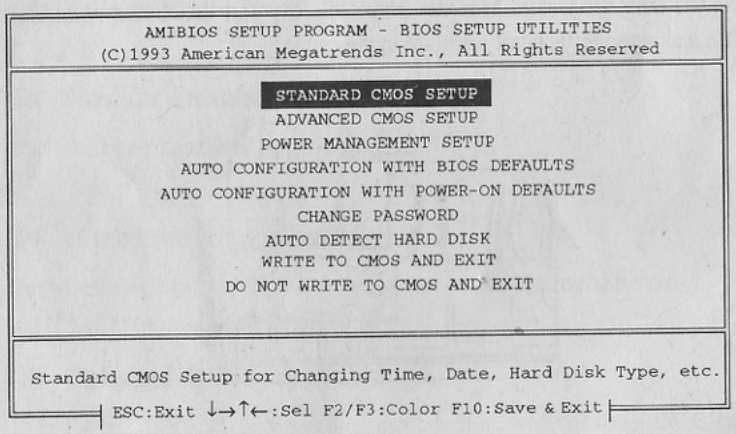
3 BIOS Setup

The mainboard's BIOS setup program is the AMI BIOS from American Megatrends Inc. Enter the AMI Setup program's Main Menu as follows:

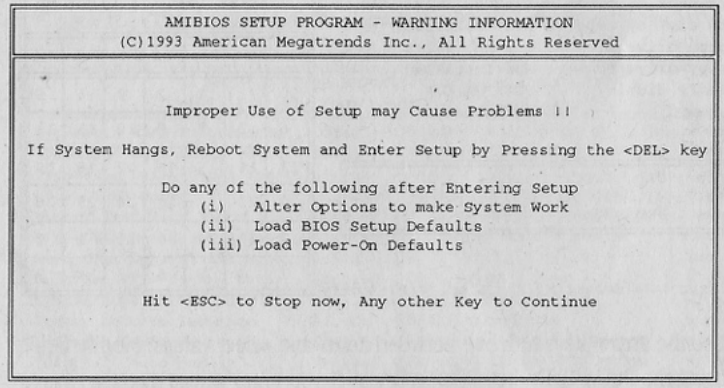
1. Turn on or reboot the system. After a series of diagnostic checks, the following message appears:

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

2. Press the <DEL> key to enter the AMI BIOS setup program and the following screen appears:



3. Choose an option and press <Enter>. Modify the system parameters to reflect the options installed in the system. (See the following sections.) A warning message appears each time one of the first three options is selected, before any changes are allowed to the parameters.



4. Press <ESC> at anytime to return to the Main Menu.

5. In the Main Menu, choose "WRITE TO CMOS AND EXIT" to save your changes and reboot the system. Choosing "DO NOT WRITE TO CMOS AND EXIT" ignores your changes and exits the program.

Main Menu Options

The Main Menu options of the AMI BIOS are described below.

Standard CMOS Setup

Run the Standard CMOS Setup as follows.

1. Choose "STANDARD CMOS SETUP" from the Main Menu and a screen with a list of items appears.

```
AMIBIOS SETUP PROGRAM - STANDARD CMOS SETUP
(C)1993 American Megatrends Inc., All Rights Reserved

Date (mn/date/year): Sat, Aug 28 1993          Base memory : 640 KB
Time (hour/min/sec): 00 : 43 : 55              Ext. memory : 19456 KB

                              Cyln  Head  WPcom LZone Sect Size
Hard disk C: type  : 47=USER TYPE  723   13   65535 723   51   234 MB
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

ESC:Exit ↓→↑←:Select F2/F3:Color PU/PD:Modify
```

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

2. Use the arrow keys to move between items and select values. Modify fields using the PgUp/PgDn keys. Some fields let you enter values directly.

Date (mn/date/year) Type the current date.

Time (hour:min:sec) Type the current time.

Hard disk C & D Choose from the standard hard disk types 1 to 46. Type 47 is user definable. If a hard disk is not installed choose "Not installed." (default)

Floppy drive A & B Choose 360KB , 5 1/4"
1.2MB , 5 1/4" (default)
720KB , 3 1/2"
1.4M , 3 1/2"
2.88 MB, 3 1/2" or
Not installed

Primary display Choose Monochrome, (default)
Color 40x25,
VGA/EGA/PGA,
Color 80x25, or
Not installed

Keyboard Choose Installed (default) or Not installed.

3. After you have finished with the Standard CMOS Setup program, press the <ESC> key to return to the Main Menu.

Advanced CMOS Setup

Run the Advanced CMOS Setup as follows.

1. Choose "ADVANCED CMOS SETUP" from the Main Menu and a screen appears. **(The screen below shows the BIOS default settings.)**

```
AMIBIOS SETUP PROGRAM - ADVANCED CMOS SETUP
(C)1993 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 E000,32K: Disabled
Memory Test Tick Sound     : Enabled      Adaptor ROM Shadow E800,32K: Disabled
Hit <DEL> Message Display  : Enabled      IDE Block Mode Transfer    : Enabled
Hard Disk Type 47 RAM Area : 0:300        AUTO Config Function       : Enabled
Wait For <F1> If Any Error : Enabled      DRAM Speed Option          : Slowest
System Boot Up Num Lock    : On           DRAM Write CAS Pulse       : 2T
System Boot Up Sequence    : A:, C:       DRAM Write Cycle           : 1 W/S
External Cache Memory      : Enabled      Internal Cache W/B Option  : W/TROUGH
Internal Cache Memory      : Enabled      External Cache W/B Option  : W/BACK
Fast Gate A20 Option       : Enabled      Cache Write Cycle Option   : 3T
Turbo Switch Function      : Enabled      Cache Burst Read Cycle     : 2T
Password Checking Option   : Setup        Bus Clock Frequency Select : 7.15 MHz
Video   ROM Shadow C000,32K: Enabled      Video Cacheable Option     : Disabled
                                          BIOS Cacheable Option      : Disabled

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

2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUp/PgDn keys. <F> keys are explained below:

<F1>: "Help" gives options available for each item.

<F2/F3>: Change color.

<F5>: Get the old values. These values are the values with which you started the current session. If the CMOS was good, then the old values are either the CMOS values or the BIOS Setup default values.

<F6>: Load all options with the BIOS Setup default values.

<F7>: Load all options with the Power-On default values.

A short description of the screen items follows:

Typematic Rate Programming Choose Enabled or Disabled. Enable this option to adjust the keystroke repeat rate. Adjust the rate via Typematic Rate Delay and Typematic Rate.

Typematic Rate Delay Choose the delay between holding down a key and when the character begins repeating.

Typematic Rate Choose the rate a character keeps repeating.

Above 1 MB Memory Test Choose Enabled or Disabled. Enable this option to invoke the POST memory routines on the RAM above 1MB. Disable and BIOS only checks the first 1MB of RAM.

Memory Test Tick Sound Choose Enabled or Disabled. Enable this option to turn on the "ticking" sound during the memory test. Disable to turn off this sound.

Hit <DEL> Message Display Choose Enabled or Disabled. Disable this option to prevent "Hit <DEL> if you want to run SETUP" message from appearing when system boots-up.

Hard Disk Type 47 RAM Area The choice "0:300" is recommended for most cases. However, if the system is involved with Novell Netware, choose "DOS 1KB" to avoid conflicts with DOS. (Novell uses 0:300 for operation system programming.)

Wait for F1 if any Error Choose Enabled or Disabled. Enable this option to display "Press <F1> to continue" when a POST non-fatal error occurs. Disable to eliminate the need for user response to a non-fatal error message.

System Boot Up Num Lock Choose On or Off. On puts numeric keypad in Num Lock mode at boot-up. Off puts numeric keypad in arrow key mode at boot-up.

System Boot Up Sequence The AMI BIOS first attempts to boot from drive A: and then, if unsuccessful, from hard disk C:. You can reverse this sequence with this option.

External Cache Memory Choose Enabled or Disabled. This option lets you enable or disable the external on-board cache memory.

Internal Cache Memory Choose Enabled or Disabled. Use this option to enable or disable the 486 CPU's internal cache.

Fast Gate A20 Option Choose Enabled or Disabled. Enable this option to allow RAM accesses above 1MB using the fast gate A20 line.

Turbo Switch Function Choose Enabled or Disabled. This option lets you enable or disable the turbo switch function.

Password Checking Option Choose Setup, or Always. Use this feature to prevent unauthorized system boot-up or unauthorized use of BIOS Setup.

"Always" – Each time the system is booted the password prompt appears.

"Setup"– If a password is set, the password prompt only appears if you attempt to enter the Setup program. If a password is not set, this choice disables the Password Checking Option.

Video or Adaptor ROM Shadow ROM shadow copies BIOS code from slower ROM to faster RAM. BIOS can then execute from RAM. These 32K segments can be shadowed from ROM to RAM. BIOS is shadowed in a 32K segment if it is enabled and it has BIOS present.

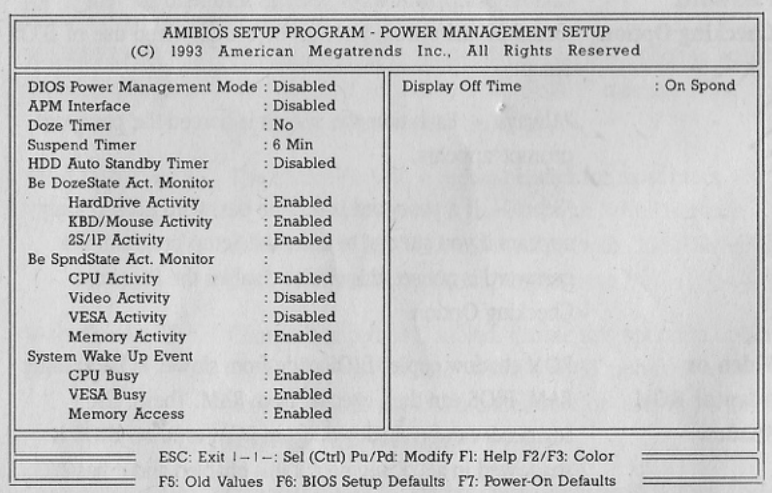
IDE Block Mode Transfer Some advanced hard disks support block mode transfer, which enhances hard disk performance. The default setting is Enabled. **This function is not supported by some older model hard disks.**

AUTO Config Function The default setting is Enabled. This option **automatically** configures the menu items that follow it to their **optimal** settings. Note that **optimal** settings are not necessarily shown on the screen — so do not adjust any settings when this function is enabled.
It is recommended that you enable this option. If this option is Enabled, you must boot from Turbo mode.

3. After you have finished with the Advance CMOS Setup, press the <ESC> key to return to the Main Menu.

Power Management Setup

1. Choose "POWER MANAGEMENT SETUP" from the Main Menu and a screen with a list of items appears.



2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUp/PgDn keys.

A short description of screen items follows:

BIOS Power Management Mode Choose Enabled or Disabled. This item lets you enable or disable the mainboard's Green (power saving) function.

APM Interface Choose Enabled or Disabled (default). APM stands for Advanced Power Management. To use APM you must run "power.exe" under DOSV6.O or later version.

Doze Timer The default setting is No — you can adjust the time from 10 sec. to 15 min. depending on your requirements.

Suspend Timer The default setting is 6 minutes. Only an SL-Enhanced (or SMI) CPU can enter this mode. Time is adjustable from 10 seconds to 2 hours. Doze mode time plus Suspend time is the actual elapsed time before Suspend mode.

HDD Auto Standby Timer When the set time has elapsed, the BIOS sends a command to the HDD to enter standby (sleep) mode, which turns off the motor. Time is adjustable from 1 to 15 minutes. The default setting is Disabled. Some older model HDDs may not support this advanced function.

Be DozeState Act Monitor This item controls when the system enters Doze mode. If an item is Enabled, its activity prevents the system from entering Doze mode.

Be SpndState Act Monitor This item controls when the system enters Suspend mode. If an item is Enabled, its activity prevents the system from entering Suspend mode. Only an SL-Enhanced (or SMI) CPU supports this function.

System Wake Up Event This item controls system wake up. If an item is Enabled, its activity wakes up the system.

Display Off Timer When Suspend mode occurs, the monitor screen shuts off. If keys on the keyboard are pressed or if the mouse is moved, the screen comes back on. Only an SL-Enhanced (or SMI) CPU supports this function.

Auto Configuration with BIOS Defaults

This Main Menu item loads the default system values. If the CMOS is corrupted the defaults load automatically. Choose this item and this message appears:

"Load BIOS Setup Default Values from ROM Table (Y/N)? N"

To use the BIOS defaults, change the prompt to "Y" and press <Enter>. The following message appears:

"Default values loaded. Press any key to continue."

Auto Configuration with Power-On Defaults

This Main Menu item uses the default Power-On values. Use this option as a diagnostic aid if your system behaves erratically. Choose this item and the following message appears:

"Load Power-On Default Values (Y/N)? N"

To use the Power-On defaults, change the prompt to "Y" and press <Enter>. The following message appears:

"Default values loaded. Press any key to continue."

Change Password

This Main Menu item lets you configure the system so that a password is required every time the system boots or an attempt is made to enter the Setup program.

The password cannot be longer than 6 characters. Note that there is no default password stored in the ROM.

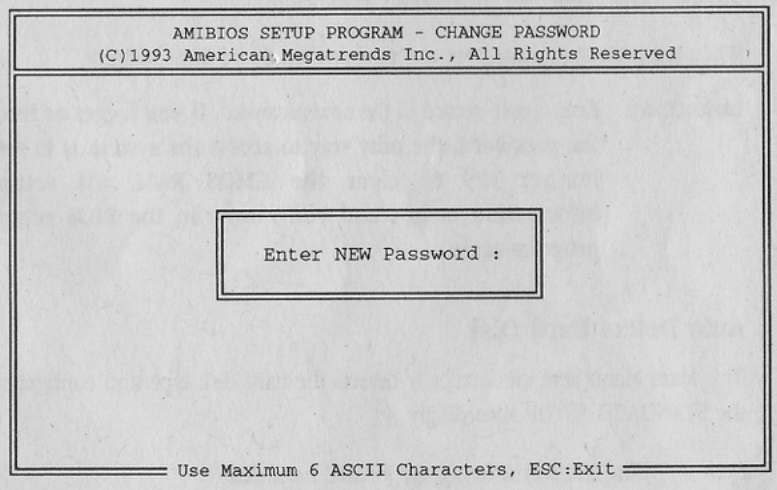
Change the password as follows:

1. Choose "Change Password" in the Main Menu and press <Enter>. The following message appears:

   "Enter NEW Password:" (if there's no password) **or**

   "Enter CURRENT Password:" (if a password is already set)

2. The screen will not show the characters entered.



3. After you correctly enter the current password, the following message appears prompting you for the new password:

   "Enter NEW Password:"

4. Enter the new password and the following appears:

   "Re-Enter NEW Password:"

5. Re-enter the new Password. If the password is miskeyed, the following error message appears:

   "ERROR, Press Any Key..."

   If the password is keyed in correctly the following confirmation message appears:

   "NEW Password Installed"

6. Press <ESC> to exit to the Main Menu.

When you next boot the system, after saving the changed values to CMOS, you will be prompted for the password.

If you are not prompted for the password, check that the "Password Checking Option" in the Advanced CMOS Setup is configured for "Always" or "Setup." See the section above on "Advanced CMOS Setup."

When the prompt appears, type the new password and press <Enter>.

Important: Keep a safe record of the new password. **If you forget or lose the password, the only way to access the system is to set jumper JP5 to clear the CMOS RAM. All setup information is lost and you must run the BIOS setup program again.**

Auto Detect Hard Disk

This Main Menu item automatically detects the hard disk type and configures the STANDARD SETUP accordingly.

Note: This function is only valid for **IDE** *hard disks.*

NOTE