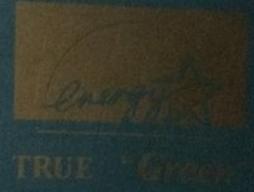
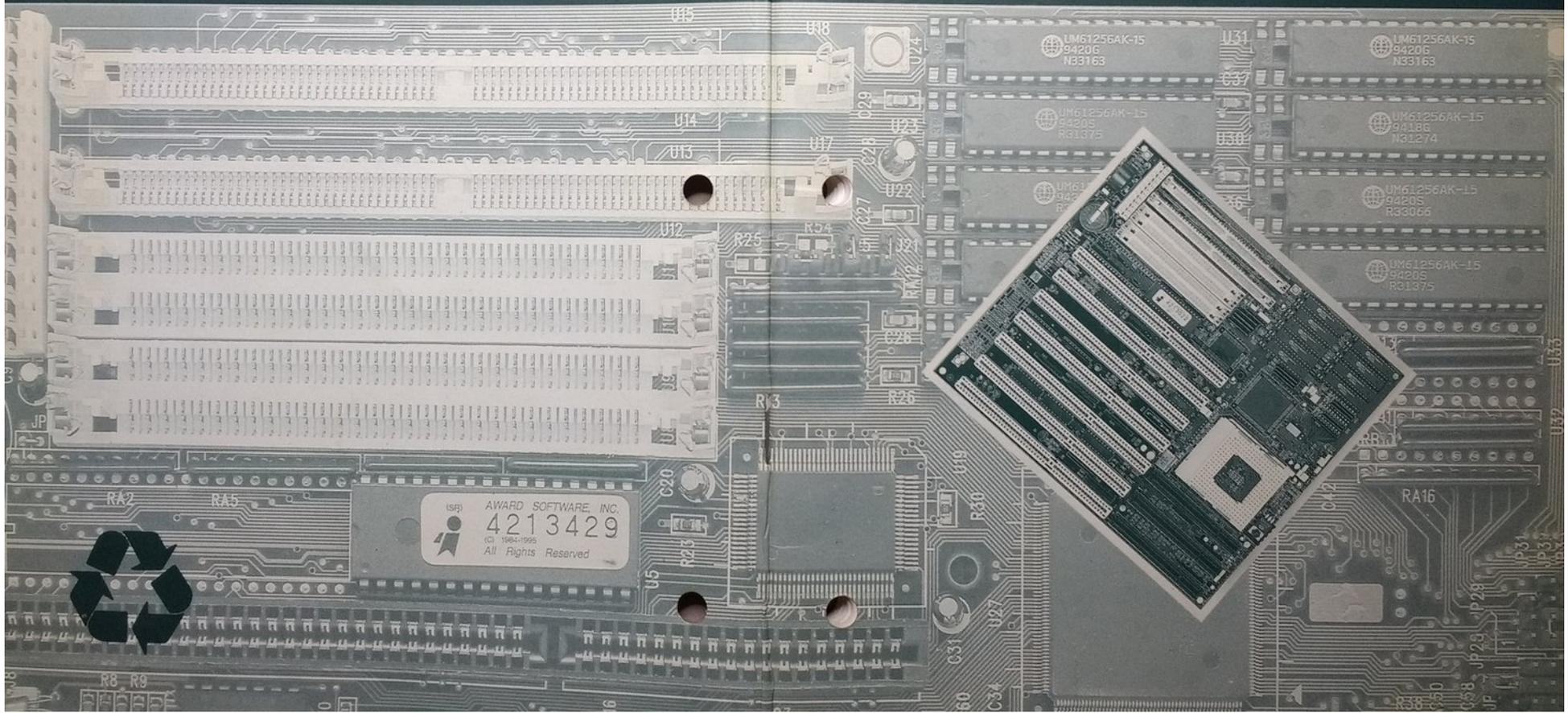


80486



# Motherboard User's Guide

ALL Green Features FULLY Supported



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**CAUTION:**

1. Please **SHORT JP1 pin 2-3** before using your system mainboard. Manufacture default setting is on pin 3-4.
2. In GREEN CPU inactive mode system will stop DOS timer. To update DOS timer, please using Microsoft POWER . EXE to put :  
**DEVICE =POWER. EXE STD**  
in your config.sys
3. Please check your Intel CPU type detected by BIOS in start up screen:  
If Intel CPU detected DX4 - S, 80486DX2-S , 80486DX-S, or 80486SX-S jumper must be set as DX-SL CPU;  
if Intel CPU 80486DX, 80486DX2 or 80486SX jumper must be set as DX/DX2 CPU.

The information presented in this publication has been carefully checked for reliability, however, no responsibility is assumed for inaccuracies. Specifications are subject to change without notice.

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## Quick Reference Table

The table helps you quickly find information on specific jumpers and connectors.

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### About This Guide

This guide contains instructions for configuring and installing the 80486 mainboard.

- Chapter 1, Introduction, acquaints you with the special features of the 80486 deep green mainboard.
- Chapter 2, Hardware Configuration, gives information on configuring memory and setting the mainboard's jumpers. Brief sections on installing memory is also included.
- Chapter 3, Mainboard Installation, is an overview of how to install the mainboard in a system.
- Chapter 4, BIOS Setup, describes how to run the BIOS setup program once the mainboard is installed.

## Static Electricity Precautions

Static electricity can easily damage your 80486 mainboard. Observing a few basic precautions can help you safeguard against damage that could result in expensive repairs. Follow the measures below to protect your equipment from static discharge:

- Keep the mainboard and other system components in their anti-static packaging until you are ready to install them.
- Touch a grounded surface before you remove any system component from its protective anti-static packaging. A grounded surface within easy reach is the expansion slot covers at the rear of the system case, or any other unpainted portion of the system chassis.
- During configuration and installation, touch a grounded surface frequently to discharge any static electric charge that may build up in your body. Another option is to wear a grounding wrist strap.
- When handling a mainboard or an adapter card, avoid touching its components. Handle the mainboard and adapter cards either by the edges or by the mounting bracket that attaches to the slot opening in the case.

## Chapter 1 Introduction

The 80486 Deep Green mainboard is a 32-bit high performance system board. This mainboard is not only compatible with IBM AT system but also provides power-saving features that allows the user to program the timer.

The 80486 Deep Green mainboard is configured with many of 486-base microprocessor:

- Intel P24T
- Intel P24D
- Intel 80486DX4 (P24C)
- Intel 80486DX2/DX/SX-SL
- Intel 80486DX2 / DX / SX
- Cyrix CX486DX2 / DX/S
- AMD AM486DXLT / DX2 / DX
- UMC U5

The 80486 Deep Green mainboard features the capability of on-board power-management that allows the user to assign system clock rates, hard disk power saving and display power saving when enter doze mode, suspend mode or inactive mode.

## Key Features

The advanced features of the 80486 Deep Green Mainboard include:

- Support microprocessor running at 25/33/40/50/66/75/100 MHz
  - Intel P24T
  - Intel P24D
  - Intel 80486DX4 (P24C)
  - Intel 80486DX2/DX/SX-SL
  - Intel 80486 DX2/DX/SX
  - Cyrix CX486DX2/DX/S
  - AMD AM486DXLT/DX2/DX
  - UMC U5
- L1 write back or write through cache.
- L2 write back policy for high performance.
- Flexible cache RAM size 64/128/256/512/1024 KB in two banks or one bank with 16 bytes line size.
- DRAM auto-detection / banking.
- Four banks of DRAM with memory size up to 64 MB using combinations of 256K, 1M, 2M, 4M, 8M, 16M, 32MB and 64MB SIMM modules.
- Providing green PC power management.
- Level 2 cache power saving.
- Four power management modes for SMM (system management mode) CPU: On, Standby, Inactive, Off
  - Standby mode: Either put CPU in stop grant state or scaling CPU and system clock.
  - Inactive mode: Stop CPU clock.
- Fully support Microsoft APM ( advance power management ).
- Providing flash ROM support.
- Seven 16-bit I/O slots ( including three 32-bit VESA master Local Bus slots ).
- On-board CR2032 3.0 Volt lithium battery.
- 237 pin ZIF socket
- 3.3 volt for Low Voltage CPU.

## Unpacking the Mainboard

The 80486 Mainboard comes packed in a sturdy cardboard shipping carton. The carton contains:

- The 80486 Mainboard
- This User's Guide

*Note: Do not remove the mainboard from its original packing until you are ready to install it.*

The 80486 mainboard is easily damaged by static electricity. Observe the following precautions while unpacking and installing the mainboard.

1. Touch an unpainted area of the system chassis before handling the mainboard or any component. Doing so discharges the static charge your body may have built.
2. Remove the mainboard from its anti-static wrapping and place it on a grounded surface, component side up.
3. Inspect the mainboard for damage. Shipping may have loosened integrated circuits from their sockets. If any intergrated circuit 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, or items are missing, contact your dealer immediately.

## Mainboard Components

This section gives a brief description of key components on the mainboard. Refer to Figure 1-1 for component locations.

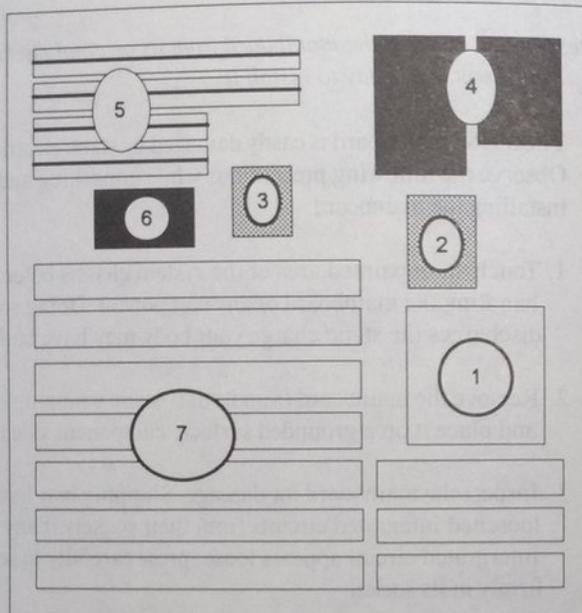


Figure 1-1. Key Components of the 80486 Mainboard

### 1. System microprocessor

The system microprocessor is a high-performance 32-bit 80486SX, 80486DX, 80486DX-2, 80486DX-4, Cyrix 486DX2, 486DX, 486S, AMD AMDXL, AM486DX2, AM486DX and UMC U5 microprocessor. The 80486 microprocessor is available in seven different clock speeds: 25MHz, 33MHz, 40MHz, 50MHz, 66MHz, 75MHz, or 100MHz.

### 2. Integrated System Controller (ISC)

The chip contains AT bus control logic, data bus conversion logic, CPU reset logic, clock generating for CPU, keyboard and timer, DMA/refresh logic, peripheral interface logic, page mode DRAM controller, and direct-mapped cache controller with write-back operation.

### 3. Chips Integrated Peripherals Controller (IPC)

The Chips integrated peripherals controller provides all of the standard peripherals required for system board implementation except the keyboard interface controller. The Chips offers 7 DMA channels, 13 interrupt request channels, 2 timer/counter channels, and a real-time clock.

### 4. Cache Memory

The on-board cache memory consists of eight SRAM (Static Random Access Memory) chips that contain the cached code and data.

The cache tag subsystem consists of one SRAM chip that registers the address of the cache data.

### 5. Main Memory

Four 30pin and two 72pin SIMM sockets are provided for 256k, 1MB, 2MB, 4MB, 8MB, 16MB, 32MB and 64MB SIMM modules. Memory can be configured from 1MB to 64 MB.

### 6. System BIOS

The AWARD BIOS is included in this ROM chip. The BIOS lets you control the speed of system, shadow RAM and cache functions by setting up BIOS system.

### 7. Expansion slots

Seven standard 16-bit ISA bus expansion slots including three 32-bit MASTER Local Bus slots are provided on the mainboard.

---

## Cache overview

A special feature of the 80486 mainboard is a built-in direct-mapped cache controller with write-back operation and support for 64KB to 1024KB cache memory with 16 bytes cache line size.

The cache capabilities of the 80486 mainboard significantly improve the performance of your software applications. Cache works by copying your most recently accessed data and placing it in an area of high speed memory called SRAM. Cache SRAM is positioned between main memory DRAM and then from SRAM to the CPU. The CPU then accesses data in and out of the SRAM at a very high speed, allowing your applications to run much faster.

Since most program executions are sequential and repetitive, the likelihood is great that the CPU will find data already stored in cache. If the data is already in cache, a **cache hit** results. If the CPU must go to main memory DRAM or your floppy disk to access the data, then a **cache miss** occurs.

The 80486 mainboard's built-in cache controller offers several features that enhance system performance during **cache hit** and **cache miss** cycles. A Page DRAM memory enhances performance during **read miss** cycles.

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## Chapter 2 Hardware Configuration

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Before you install the 80486 mainboard into the system chassis, you may find it convenient to first configure the mainboard's hardware. This chapter describes how to set the mainboard jumpers for cache memory and display type, and how to install a math coprocessor and memory modules.

### Power Precautions

Before you begin configuration, make sure you are working with an unplugged mainboard. Many components are powered by low-voltage current, but there still may be a dangerous electric current coming from the leads and power supply. You should take the following precautions:

- Turn off the mainboard, and unplug the power cord before you begin.
- Unplug all cables that connect the mainboard to any external devices.

### Jumper Settings

You configure hardware options by setting jumper switches on the mainboard. Jumper switches are rows of small pins on the mainboard that you can set by using a jumper cap.

#### Set a jumper switch as follows:

- Short a jumper switch by placing 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.*

### Symbols:

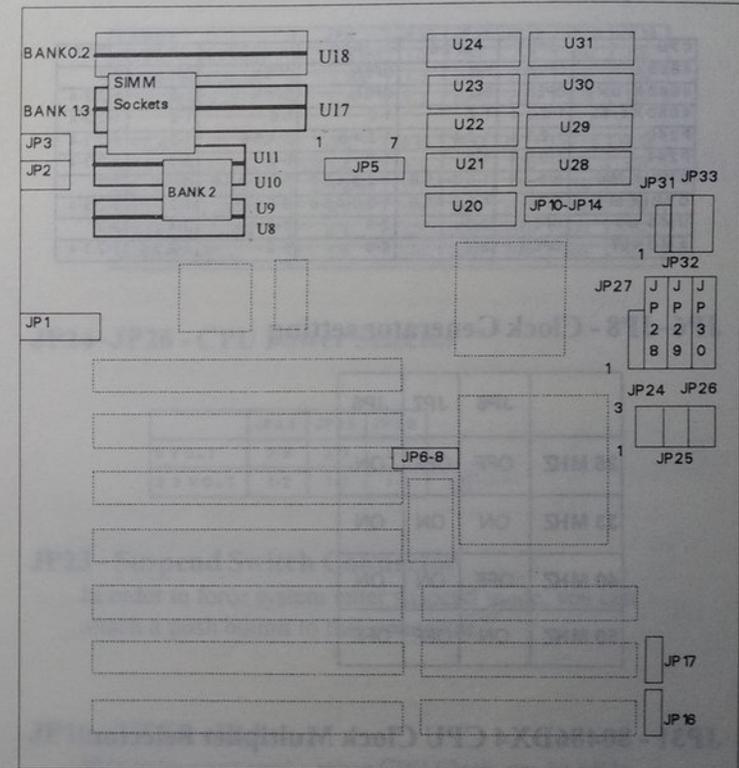
For setting Multi-pin jumpers, the symbols below are used:

- 1 - 2 means to Short with a jumper cap in pin 1 and pin 2.
- 2 - 3 means to Short with a jumper cap in pin 2 and pin 3.

For setting 2-pin jumpers, the following symbols are used:

- The jumper is Shorted when the jumper cap is placed over the two pins of the jumper.
- The jumper is Open when the jumper cap is removed from the jumper.
- The jumper is Off when the jumper cap is removed from the jumper.

### Jumper and Socket Locations



### JP27~JP30,JP32,JP33 - CPU Selectors

Jumpers JP27~JP30,JP32,JP33 configure the mainboard to accept different CPUs.

CPU	JP27	JP28	JP29	JP30	JP32	JP33
486SX	OPEN	2-3	OPEN	OPEN	OPEN	2-3
486DX/DX2	OPEN	2-3	OPEN	OPEN	1-2	1-2,3-4
486DX4/SL	1-2,3-4	1-2	1-2	5-6	1-2	1-2,3-4
P24D	1-2,3-4	1-2,4-5	1-2,4-5	3-4,5-6	1-2	1-2,3-4
P24T	1-2,3-4	1-2	1-2	5-6	2-3	1-2,3-4
CYRIX M6	2-3,4-5	1-2,3-4,5-6	1-2,3-4,5-6	1-2,3-4,5-6	OPEN	2-3
CYRIX M7	2-3	1-2,3-4,5-6	1-2,3-4,5-6	2-3,4-5	1-2	1-2,3-4
UMC U5	OPEN	2-3	2-3	1-2	3-4	2-3
AMDXTL	OPEN	2-3	2-3	1-2	1-2,3-4	1-2,3-4

### JP6~JP8 - Clock Generator setting

	JP6	JP7	JP8
25 MHZ	OFF	OFF	ON
33 MHZ	ON	ON	ON
40 MHZ	OFF	ON	ON
50 MHZ	ON	OFF	OFF

### JP31 - 80486DX4 CPU Clock Multiplier Selector

	3X	2.5X	2X
JP31	OPEN	1-2	2-3

### JP5,JP10~JP14 - Cache Jumper

Cache Memory size is configured with jumpers JP5, JP10~JP14.

1 BANK	JP5	JP10	JP11	JP12	JP13	JP14
512 KB (128 Kx8x4)	1-2,3-4,5-6	1-2	OFF	ON	ON	ON
256 KB (64 Kx8x4)	1-2,3-4	1-2	OFF	OFF	ON	ON
128 K (32 Kx8x4)	1-2	1-2	OFF	OFF	OFF	ON

2 BANKS	JP5	JP10	JP11	JP12	JP13	JP14
1024 KB (128 Kx8x8)	2-3,4-5,6-7	2-3	ON	ON	ON	ON
512 KB (64 Kx8x8)	2-3,4-5	2-3	OFF	ON	ON	ON
256 KB (32 Kx8x8)	2-3	2-3	OFF	OFF	ON	ON
128 KB (16 Kx8x8)	2-3	2-3	OFF	OFF	OFF	ON
64 KB (8 Kx8x8)	2-3	2-3	OFF	OFF	OFF	OFF

### JP24~JP26 - CPU Power Selector

	JP24	JP25	JP26
5 VOLT	2-3	2-3	2-3
3.3 VOLT	1-2	1-2	1-2

### JP23 - Suspend Switch Connector

In order to force system enter suspend mode, you can attach a push button to this connector.

### JP16 - VESA clock

JP16 to be set opened - when CPU Clock <= 33 MHz.

JP16 to be set closed - when CPU Clock > 33 MHz.

	JP16
<=33MHZ	OPEN
> 33MHZ	CLOSE

### JP17 - VESA Wait State

The JP17 is VESA wait state setting. 0WS to be opened; 1WS to be closed.

	JP17
0WS	OPEN
1WS	CLOSE

### JP3 - Flash ROM VPP Supply Selector

The JP3 is Flash ROM Program Voltage selector. Pin 1 and 2 are shorted in 5 volt; Pin 2 and 3 are shorted in 12 volt.

5 VOLT	1-2
12 VOLT	2-3

### Memory Configuration

The DRAM sub-system contain 4 banks. Four 30-pin SIMM Socket U8 - U11 using as bank 2 ; two 72-pin SIMM Socket U17 using as bank 1 and 3 ; U18 using as bank 0 and 2 . So you can not install 30-pin SIMM if using 2 banks type DRAM on to U18 and you can install 30-pin SIMM if using 1 bank type DRAM on to U18.

U8-U11 BANK2	U18 BANK 0 , 2	U17 BANK 1 , 3
INSTALL	1 BANK TYPE DRAM OR NONE	2 BANKS TYPE DRAM OR 1 BANK TYPE DRAM OR NONE
NONE	2 BANKS TYPE DRAM OR 1 BANK TYPE DRAM OR NONE	2 BANKS TYPE DRAM OR 1 BANK TYPE DRAM OR NONE

### Cache Configuration

The 80486 mainboard has a built-in cache controller. It requires external SRAM chips as tag and cache memory. The caching Scheme is direct mapping with write-back operation. The mainboard allows 1024KB cache configurations. Memory size is selected by the hardware jumpers. The BIOS automatically detects cache size.

The speed of the SRAM chips needed depends on the clock speed of the microprocessor:

- 50MHz and above CPU requires 20ns (tag) and 20ns (data) SRAM chips.
- 40MHz CPU requires 20ns (tag) and 20ns (data) SRAM chips
- 33MHz CPU requires 20ns (tag) and 20ns (data) SRAM chips.
- 25MHz CPU requires 20ns (tag) and 20ns (data) SRAM chips

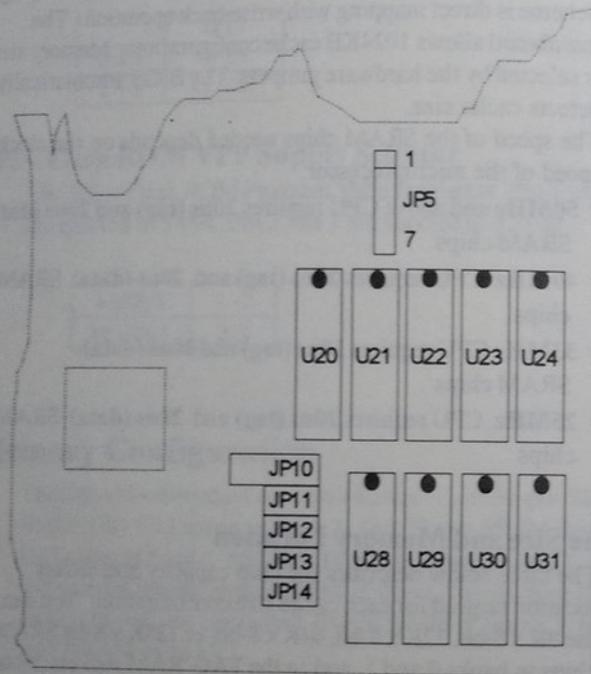
### Cache Size and Memory Location

The table below describes the chip capacity and socket location required for each cache size configuration. You can use 8K x 8-bit, 32K x 8-bit, 64K x 8-bit, or 128K x 8-bit SRAM chips in banks 0 and 1, and in the TAG RAM sockets. Note that you cannot combine different chip capacities in banks 0 and 1.

Size	Cache Memory									TAG
	U21	U22	U23	U24	U28	U29	U30	U31	U20	
64KB	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8
128KB	32Kx8	32Kx8	32Kx8	32Kx8	---	---	---	---	---	8Kx8
256KB	32Kx8	32Kx8	32Kx8	32Kx8	32Kx8	32Kx8	32Kx8	32Kx8	32Kx8	32Kx8
256KB	64Kx8	64Kx8	64Kx8	64Kx8	---	---	---	---	---	32Kx8
512KB	64Kx8	64Kx8	64Kx8	64Kx8	64Kx8	64Kx8	64Kx8	64Kx8	64Kx8	32Kx8
512KB	128Kx8	128Kx8	128Kx8	128Kx8	---	---	---	---	---	32Kx8
1024KB	128Kx8	128Kx8	128Kx8	128Kx8	128Kx8	128Kx8	128Kx8	128Kx8	128Kx8	64Kx8

## Cache Chip Sockets and Jumper Locations

The diagram below describes the location of the cache chip sockets and cache jumpers.



### Installing Cache Chips

Install Cache chips on the mainboard as follows:

**Caution:** Static electricity can damage a cache chip.

1. Review the section on static electricity precautions at the beginning of this manual, and make sure that power to the mainboard is off.
2. Align the chip so that the notched corner of the chip matches the notched corner of the socket.
3. Align the pins with the socket holes.
4. Carefully press the chip into the socket.

## Chapter 3 Mainboard Installation

Once you have configured the 80486 Deep Green mainboard's hardware, you are ready to install the mainboard into the system chassis. This chapter describes what you need to assemble an advanced computer system based on the 80486 mainboard.

### What You Need

The following components and tools are the minimum required to build a working computer system.

#### Components

The following components are recommended:

- Case with standard chassis and hardware. The 80486 fits most AT compatible cases.
- Standard AT power supply.
- 8 ohm speaker
- Floppy disk drive(s) (360KB, 1.2MB, 1.44MB or 2.88MB)
- Hard disk drive (optional)
- Hard disk and floppy disk drive controller card
- Flat ribbon cables to connect the disk drive controller and the disk drive(s)
- Serial /parallel interface card
- AT-compatible keyboard
- Video card and Display (monochrome, CGA, EAG, or VGA)

#### Tools

Installing the 80486 mainboard requires the following tools:

- 1/4 -inch Nutdriver
- 3/16-inch Nutdriver

You can also use a Phillips screwdriver with a 6-inch shaft and a flat blade screwdriver instead of the nutdrivers.

## Power Supply Requirements

You need a clean, steady power source to get the best performance from your system. For reliable performance, make sure your power supply provides a voltage range of 5.25 volts maximum to 4.75 volts minimum. If your area has noisy power transmission, use a line noise filter between the power source and your computer.

You must make sure the power supply can supply the total power required by all the devices in your system. Check the power requirements of the floppy disk drives, hard disk drives, and any additional boards that you will use. In a system that includes a hard disk drive installed adapter cards, use a power supply of at least 180 watts.

## Installing the Mainboard

Before you begin, check the location of the mounting holes in the case and on the mainboard.

### Caution: Static electricity can damage the mainboard.

Install the 80486 mainboard as follows:

1. Review the section on static electricity precautions at the beginning of this manual.
2. Place the case on an anti-static mat and remove the cover. Remove the nylon standoffs and screws for mounting the mainboard.
3. Put the front of the case to your right and the rear to your left. The mainboard occupies the section of the case nearest you; the power supply goes on the far side.
4. Align the mounting holes on the case to the mounting holes on the mainboard. Make sure you can access the keyboard connector (J1 once the board is installed.)
5. From the bottom of the mainboard, insert standoffs onto the proper holes on the board, and attach the mounting screws to the bottom of the case.

*Note: Some cases do not use standoffs and mounting screws; in this case you can fasten the mainboard into the case with regular screws.*

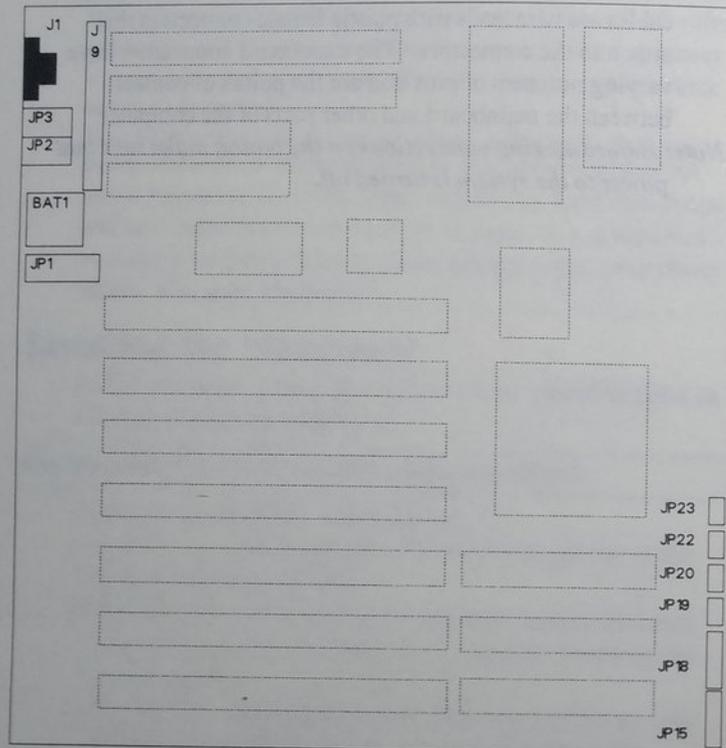
6. Place the mainboard into the case and fasten the board securely with regular screws.

## Connecting the Mainboard

Once you have fastened the mainboard into the system case, the next step is to connect the internal cables. The internal cables are wire leads with plastic female connectors that attach to the connectors. The mainboard connectors have varying numbers of pins and are the points of contact between the mainboard and other parts of the computer.

*Note: Before making connections on the board, make sure that power to the system is turned off.*

## Connector Locations



## Connectors

### J1 - Keyboard Connector

A standard five-pin female DIN keyboard connector is located at the rear of the board (J1). Plug the jack on the keyboard cable into this connector.

Pin	Description
1	Keyboard Clock
2	Keyboard Data
3	Spare
4	Ground
5	+5V DC

### J9 - Power Supply Connectors

The power supply connector has two six-pin male header connectors. Plug the dual connectors from the power directly onto the board connectors.

Pin	Description	Pin	Description
12	+5V DC	6	Ground
11	+5V DC	5	Ground
10	+5V DC	4	-12V DC
9	-5V DC	3	+12V DC
8	Ground	2	+5V DC
7	Ground	1	Power Good

### JP18 - Speaker Connector

Attach the system speaker to connector JP18.

Pin	Description
1	Data Out
2	Not Used
3	Ground
4	+5V

### JP1 - External Battery

The 80486 mainboard has a **nonchargeable lithium** battery on-board; however, you can also attach an external battery to connector JP1. Using an external battery helps you conserve the on-board battery.

EXTERNAL BATTERY	1-4
INTERNAL BATTERY	2-3
CLEAR CMOS	3-4

*Note 1: The factory default setting has a jumper cap on pins 3 and 4 for an installed internal battery. When you install an external battery, remove this jumper cap.*

*Note 2: To clear the CMOS configuration, place a jumper cap on pins 3-4 and then place the cap back on pins 2-3 for normal operation.*

### JP15 - Keylock & Power LED Connector

JP15 is a keylock connector that enables and disables the keyboard and the Power-LED on the case.

Pin	Description
1	LED power
2	Not Used
3	Ground
4	Keyboard Inhibiter
5	Ground

### JP19 - Turbo LED Connector

JP19 is usually connected to a Turbo Led on front of the system case. If the system board select is in Turbo mode, the indication lights during high-speed operation.

Pin	Description
1	+Anode
2	- Cathode

### JP20 - Reset Switch Connector

Attach the Reset switch cable to this connector. The Reset switch restarts the system.

Setting	Description
Short	Reset
Open	Not Reset

### JP22 - Turbo Switch Connector

JP22 connects to the Turbo switch, which is used to select the mainboard's clock speed.

Setting	Description
Open	Turbo Mode
Short	Low speed Mode

In addition to switching clock speed using hardware control via the turbo switch, you can also switch the clock speed using software control via keyboard commands.

The keyboard commands are as follows:

CTRL,ALT,[+ ]: Press these three keys simultaneously to select Turbo Mode.

CTRL,ALT,[- ]: Press these three keys simultaneously to select Low Speed Mode.

Note that hardware control and software control are alternately activated. Before you can activate software control from hardware control, and vice versa, the system must be in High Speed Mode.

## System Assemble Overview

After you have installed and connected the mainboard, assemble components in the following order:

1. **Power Supply:** Place the power supply so that it fits the raised tongues on the chassis floor. Insert and fasten the two screws on the back panel of the chassis. Connect the power supply to the power supply connectors, J9
2. **Disk Drives:** Slide the disk drives into the chassis. Connect a wide 34-wire ribbon cable to each disk drive; this cable will attach to an adapter card. The power supply has four cables, each with four wires. Connect these cables to the disk drives.
3. **Adapter Cards:** Insert each adapter card - Disk Controller cards, Video card, Serial/Parallel Interface card, etc. configuration instructions that comes with the card. Connect the disk drives to the Floppy Disk and Hard Disk Controller cards.
4. **Keyboard:** Connect the keyboard to its connector, J1.
5. **Display:** Connect the display cable to the Video Card, and the display's power cord into a power outlet.
6. **Case:** Slide on the case cover and fasten its screws.

Connect the power cord to the power supply and plug it into a wall outlet. Put your boot disk into drive A: and turn on the power. You will then need to run the BIOS setup program.

## Chapter 4 BIOS Setup

After you have configured the mainboard, and have assembled the components, you can turn on the completed system. At this point, run the software setup to ensure that the system information is correct.

The software setup of the system board is achieved through Basic Input-Output System (BIOS) programming. You use the BIOS setup program to tell the operating system what type of devices (such as disk drives) are connected to your system board.

The system setup is also called CMOS setup. Normally, you need to run system setup if either the hardware is not identical with information contained in the CMOS RAM, or if the CMOS RAM has lost power.



**Date (mm/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. See Appendix A. Type 47 is user definable. If a hard disk is not installed choose "Not installed."

#### Floppy drive A & B

360KB 5 1/4"  
1.2MB 5 1/4"  
720KB 3 1/2"  
1.44MB 3 1/2"  
2.88MB 3 1/2" or  
Not installed

#### Video

Monochrome,  
Color 40x25,  
VGA/PGA/EGA,  
Color 80x25, or  
Not installed

Halt The category determines whether the computer will stop if an error is detected during power up.

- After you have finished with the Standard CMOS Setup program, press the <ESC> key. The following appears:  
**"Write to CMOS and Exit (Y/N)?"**
- Typing "N" and <Enter> returns you to the Main Menu.  
Typing "Y" and <Enter> saves the system parameters and the system reboots.

## BIOS Feature Setup

1. Choose "BIOS FEATURES SETUP" from Main menu and a screen with a list of item appear

**BIOS Feature Setup**  
**AWARD SOFTWARE, INC.**

Virus Warning	: Disabled	System BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	Video BIOS Shadow	: Enabled
External Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	CC000-CFFFF Shadow	: Disabled
Boot Sequence	: C,A	D0000-D3FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up NumLock Status	: On	DC000-DFFFF Shadow	: Disabled
Boot Up System Speed	: High	E0000-E3FFF Shadow	: Disabled
IDE HDD Block Mode	: Disabled	E4000-E7FFF Shadow	: Disabled
Gate A20 Option	: Fast	E8000-EBFFF Shadow	: Disabled
Typematic Rate Setting	: Disabled	ESC : Quit	←↑→↓ : Select Item
Typematic Rate (Chars/Sec)	: 6	F1 : Help	PU/PD/+/- : Modify
Typematic Delay (Msec)	: 250	F5 : Old Values	(Shift) F2 : Color
Security Option	: Setup	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

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

An explanation of <F> keys follows:

- F1:** "Help" gives options available for each item.
- F2:** Change color
- F5:** Get the old values. These values are the values with which the user 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 in the Advanced CMOS Setup / Chipset Features Setup with the BIOS Setup default values.
- F7:** Load all options in the Advanced CMOS Setup / Chipset Features Setup with the Power-On default values.

A short description of the screen items follow:

### Typematic Rate Setting

Choose enable or disable. Enable this option to adjust the keystroke repeat rate. Adjust the rate via Typematic Rate

### Typematic Rate

Chose the rate a character keeps repeating.

### Internal Cache

Choose enabled or disabled. this option enables the CPU internal cache.

### External Cache

Choose Enabled or Disabled to enable mainborad secondary cache memory

### Boot Up Floppy Seek

Choose Enabled or Disabled. "Disabled" provides a fast boot and reduce the possibility of damage to the heads.

### Boot Sequence

The default setting first attempts to boot from drive A: and then if unsuccessful , from hard disk C: , your can reverse this sequence with "C: A:", but then driver a: cannot boot direct.

### Boot Up Numlock Status

Choose ON or OFF , On put numeric keypad in Numlock mode at boot-up. Off put numeric keypads in arrow key mode at boot-up

### Gate A20 Option

Choose Normal or Fast. Normal keyboard controller pin. Fast imitated instead of chipset.

### Virus Warning

During and after the system boots up, any attempt to write to the boot sector or partition table of hard disk drive will halt system and the following error message will appear , in the mean time , you can run anti-virus program to locate the problem.

## CHIPSET FEATURES SETUP

The Advanced Chipset Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

Note: Change these settings only if you are familiar with the Chipset.

Run the Advanced Chipset Setup as follows.

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

ROM ISA BIOS  
CHIPSET FEATURES SETUP  
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	Alt Bit in Tag SRAM	: 7+1 Bits
DRAM Wait State select	: 2 WS	ISA Bus Refresh Mode	: Slow
DRAM Hiddern Refresh	: Disabled	DRAM Page Mode	: Normal
L2 Cache Read Wait State	: 3-1-1-1	LOWA20# Select	: Chipset
L2 Cache Write Wait State	: 0 WS	RC Reset Select	: Chipset
System BIOS Cacheable	: Disabled	Non_Cacheable Block 0	: Disable
Video BIOS Cacheable	: Disabled	Non_Cacheable Block0 Size	: 1MB
		Non-Cacheable Block0 Base	: 1000000H
Keyboard Controller Clock	: 9.5Mhz	Non_Cacheable Block 1	: Disable
ISA Bus Clock Option	: CLKI/4	Non_Cacheable Block1 Size	: 1MB
I/O Recovery (Bus/Onboard)	: 5/ 3	Non-Cacheable Block1 Base	: 0000000H
Local Ready Delay Setting	: Delay 1T	ESC : Quit	←↑→↓ : Select Item
Signal LDEV# Sample Time	: In T3	F1 : Help	PU/PD/+/- : Modify
CPU ADS# Delay 1T or Not	: No Delay	F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

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

An explanation of the <F> keys follows:

- F1: "Help" gives options available for each item.
- F2: Change color

**F5:** Get the old values. These values are the values with which the user 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 in the Advanced CMOS Setup / Chipset Features Setup with the BIOS Setup default values.

**F7:** Load all options in the Advanced CMOS Setup / Chipset Features Setup with the Power-On default values.

3. After you have finished with the Chipset Features Setup, press the ESC key. The following appears:  
"Save & Exit Setup (Y/N)?"

4. Typing "N" and Enter returns you to the Main Menu. Typing "Y" and Enter saves the system parameters and the system reboots.

### LOAD BIOS DEFAULTS

BIOS defaults indicates the most appropriate value of the system parameter which the system would be in minimum performance.

### LOAD SETUP DEFAULTS

Chipset defaults indicates the values required by the system for the maximum performance.

### PASSWORD SETTING

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

### ENTER PASSWORD:

Type the password, up to eight characters, and press Enter. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press Enter. You may also press Esc to abort the election and not enter a password.

1. To disable password, just press Enter when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

### PASSWORD DISABLED.

2. If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

### IDE HDD AUTO DETECTION

Automatically configure hard disk parameters.

### POWER-ON BOOT

After you have made all the changes to CMOS values and the system can not boot with the CMOS values selected in Setup, restart the system by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously press Ctrl, Alt and Delete keys. Upon restart the system, immediately press Insert to load BIOS default CMOS value for boot up.

## POWER MANAGEMENT SETUP

The Power Management Setup option is used to change the values of the Power Control. These registers control most of the CPU clock display and Hard disk in the computer.

Run the Power Management Setup as follows.

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

ROM ISA BIOS		
POWER MANAGER SETUP		
AWARD SOFTWARE, INC.		
Power Management	: User Define	* Monitor Even In Full On Mode
Video Off Method	: Blank Screen	VESA Slave Activity : Disabled
HDD Standby Timer	: Disabled	LPT Port Activity : Enabled
Doze Timer Select	: 0.5 Min	COM Port Activity : Enabled
Standby Timer Select	: 2 Min	ISA Master Activity : Enabled
Inactive Timer Select	: 2 Min	IDE Activity : Enabled
		Floppy Activity : Enabled
		VGA Activity : Disabled
		Keyboard Activity : Enabled
Control Item	: CPU CLK VGA	
Doze Mode Control	: 1/2 CLKI On	
Standby Mode Control	: 1/2 CLKI On	
Inactive Mode Control	: 1/8 CLKI On	
Suspend Switch Select	: Enabled	
ESC : Quit ←↑→↓ : Select Item		
F1 : Help PU/PD/+/- : Modify		
F5 : Old Values (Shift) F2 : Color		
F6 : Load BIOS Defaults		
F7 : Load Setup Defaults		

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

An explanation of the Function keys follows:

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

F2: Change color

F5: Get the old values. These values are the values with which the user 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 in the Advanced CMOS Setup / Power Manager Setup with the BIOS Setup default values.

F7: Load all options in the Advanced CMOS Setup / Power Manager Features Setup with the Power-On default values.

3. After you have finished with the Power Manager Setup, press the ESC key to exit.

Every item in power manager describes as follows:

### Power Management:

The "Power Management" setting controls the HDD power down, system Doze, standby, suspend timer, display ON/OFF and CPU clock feature. There are five options:

**User Define** allows you to customize all timer setting, define HDD and system power management settings.

**Optimize** is the recommended setting for general time. **Max Saving** is useful for testing and demonstrating system performance.

**Min Saving** is minimized the power saving.

**Disable** will turn off all BIOS and the power saving functions on operating system.

### Video off Method:

Select a method to protect screen. "Blank screen" only make your screen blank but display card still work properly. "V/II SYNC + Blank" not only makes your screen blank, but cuts off display cards SYNC signal.

### **HDD Standby Time:**

Cause IDE HDD "spin down" when it is not accessed with a specified period. The disk returns to full speed the next time it is accessed. You can select range from "1 Min" to "15 Min" and include "Disabled".

### **Doze mode timer select:**

To set a period of time to enter doze mode from full on mode. In this mode CPU clock and display on/off can be control from control item. You can set range from 0.5 min to 512 min.

**Note:** "None green CPU" only can enter this mode.

### **Standby Mode timer select:**

To set a period of time to enter standby mode from doze mode. In this mode CPU clock and display on/off can be controlled from control item. You can set range from 2 min to 512 min.

### **Inactive Mode timer select:**

To set a period of time to enter inactive mode from standby mode. In this mode CPU clock and display on/off can be controlled from control item. You can set range from 2 min to 512 min.

### **Control Item:**

To set every mode's CPU clock and display turned on/off.

**CPU CLK** can change performance of every mode. you can set range from 1/2 to 1/8.

**VGA** can be turned on/off in every mode.. If you set **VGAoff** in this mode, display will be turned off.

### **Suspend switch Select:**

To set suspend switch Enabled or Disabled. Push this switch you can enter Inactive mode directly.

### **Monitor Even In Full On Mode:**

To set which condition will make system wake up and work in full on mode.

**VESA slave Activity** Enabled / Disabled setting will tell BIOS to monitor for VESA bus-slave card activity.

**LPT port Activity** Enabled/Disabled setting will tell BIOS to monitor printer port activity.

**COM port Activity** Enabled / Disabled setting will tell BIOS to monitor RS232 interface activity. ( e.g. mouse )

**ISA Master activity** Enabled/Disabled setting will tell BIOS to monitor ISA master activity.

**IDE activity** Enabled / Disabled setting will tell BIOS to monitor Hard Disk activity.

**Floppy activity** Enabled/Disabled setting will tell BIOS to monitor Floppy Driver activity.

**VGA activity** Enabled / Disabled setting will tell BIOS to monitor VGA display card activity.

**Keyboard activity** Enabled / Disabled will tell BIOS to monitor keyboard activity.