System Board Specifications

CPU:

- Supports all 486 CPU running at 25/33/40 MHz

Cache memory:

- Supports 128K, 256K or 512K cache memory

Main memory:

- Supports four memory banks using four 72-pin SIMM modules with 1M, 2M, 4M, 8M, 16M, 32M, 64M DRAM.

Slots:

- Three 32-bit PCI Bus slots and four 16-bit ISA bus slots in maximum combinations of:

    — Four 16-bit ISA and two PCI, or

    — Three 16-bit ISA and three PCI

- Supports three Master/Slave PCI bus slots

Battery:

- 3.6V/480 mA Li battery

Dimensions:

- 27 x 22 cm x 4 layer PCB

Mounting:

- 9 mounting holes
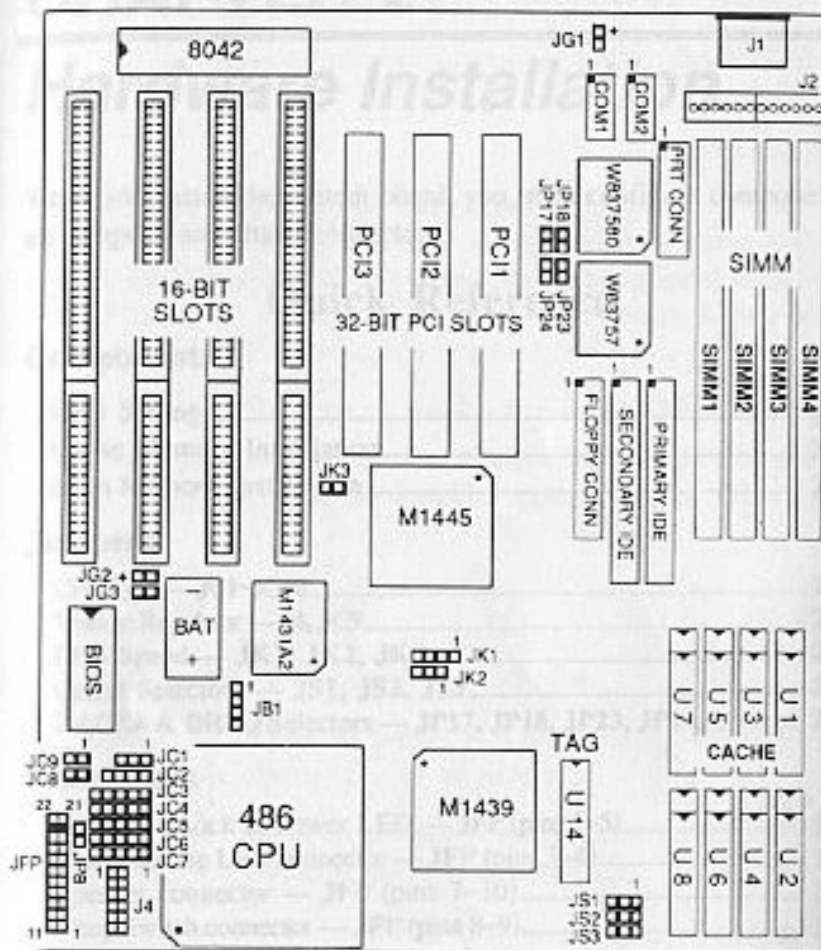
System Board Layout

Figure 1-1. System board Layout

Jumpers and Connectors

Refer to Figure 1-1 for jumper and connector locations.

Jumpers

Jumpers on the system board provide information to your operating system about installed options and system settings. You need to configure jumpers when you install the CPU, select cache size, or clear CMOS memory.

Connectors

Connectors attach control panel switches and indicators, as well as the speaker, external battery, keyboard and power supply.
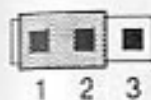
Setting Jumpers

Configure system board options by setting jumper switches. Use your fingers to position a jumper cap over the desired pin setting and gently press down.
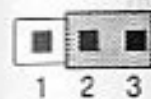
Note: *When you open a jumper, leave the plastic jumper cap attached to one of the pins so you don't lose it.*

Symbols:

For 3-pin jumpers, the following symbols are used:

– Close pins 1 and 2 with a jumper cap.

– Close pins 2 and 3 with a jumper cap.

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

– Close the jumper by inserting the jumper cap over the two pins of the jumper.

– Open the jumper by inserting the jumper cap over one or no pin(s) of the jumper.

MS-4143 PCI 486 AL2 MAINBOARD SUPPLEMENTS

Installation Guide

For mainboard installation, it is important that the jumper settings are set correctly. Improper jumper settings will cause system unstability or system hang-ups. Please refer to the installation procedures below.

☐ **STEP 1:   Setting the CPU Type Jumper (JC1 - JC9).**

> JC1, JC2 are used for coprocessor setting.
> JC4, JC5, JC6, JC8 are used for power management (green function) setting. If not set properly, there might be no system display or "CTRL-ALT-DEL" (warm boot) might cause the system to hang.
> JC3, JC7 are used for internal cache (write-back or write-through) setting.

Note: Please refer to the manual for the jumper setting for CPUs with internal write-back function (such as Intel P24D, Intel Pentium OverDrive P24T and AMD Enhanced CPU).

☐ **STEP 2:   Setting the CPU Voltage Jumper (JP8 and J4).**

> During the purchase of your CPU, please confirm if the CPU you're getting is 3-volt (3.3 and 3.45), 4-volt or 5-volt.
>
> For Intel, only DX4-75 and DX4-100 are 3-volt. The rest are 5-volt. There is also some special 5-volt CPUs, DX4 OverDrive and Pentium OverDrive P24T, which has a regulator and heat sink on the top surface.
>
> For AMD, CPUs marked with 3 volt are 3-volt. The rest are 5-volt.
>
> For Cyrix, CPUs marked with V50 and V66 are 3-volt. CPUs marked with V80 are 4-volt. CPUs without the "V" mark are 5-volt.

! Warning: **Improper voltage setting might cause serious damage to your CPU.**

☐ **STEP 3:   Setting the CPU External Frequency Jumper (JK1 - JK3).**

> From the mark of the CPU, "486DXY-KK":
> Y = blank, refers to KK frequency.
> Y = 2, refers to KK/2 frequency.
> Y = 4, refers to KK/3 frequency.

For example:

    486DX-33, external frequency is 33MHz.
    486DX2-66, 66 divided by 2, external frequency is
        33MHz. The internal frequency is 66MHz.
    486DX4-100, 100 divided by 3, external frequency
        is 33MHz. The internal frequency is 100MHz.

! Warning: **Improper speed setting might cause system unstability or system hang-ups. Setting the CPU to run in a frequency higher than what it actually supports might cause serious damage to your CPU.**

□ STEP 4: **Setting the Cache Size Jumper (JS1 - JS3).**

This jumper must be set according to the actual cache size installed.

! Warning: **Improper jumper setting might still show the cache size upon boot-up, but might cause system unstability or system hang-ups.**

□ STEP 5: **Installing the SIMM Modules into the proper SIMM sockets.**

During the purchase of your SIMM, please confirm if the SIMM you're getting is single density (single bank) or double density (double bank).

This mainboard supports only 4 banks of memory. So, this means that it can only accomodate 4 pcs. of single density SIMM or 2 pcs. of double density SIMM.

For single density SIMM, any sockets can be used. For double density SIMM, only SIMM1 and SIMM2 can be used, and SIMM1 must be filled up first.

SIMM1	SIMM2	SIMM3	SIMM4	TOTAL
Single:				
4M	—	—	—	4M
4M	4M	—	—	8M
4M	16M	—	—	20M
4M	4M	4M	—	12M
4M	4M	16M	—	24M
4M	4M	4M	4M	16M
4M	4M	4M	16M	28M
16M	—	—	—	16M
16M	16M	—	—	32M
16M	16M	16M	—	48M
16M	16M	16M	16M	64M

SIMM1	SIMM2	SIMM3	SIMM4	TOTAL
Double:				
4M/4M	—	—	—	8M
4M/4M	4M/4M	—	—	16M
4M/4M	16M/16M	—	—	40M
16M/16M	—	—	—	32M
16M/16M	16M/16M	—	—	64M

SIMM1	SIMM2	SIMM3	SIMM4	TOTAL
Double +	Single			
4M/4M	4M	—	—	12M
4M/4M	4M	4M	—	16M
4M/4M	16M	—	—	24M
4M/4M	16M	16M	—	40M
16M/16M	4M	—	—	36M
16M/16M	4M	4M	—	40M
16M/16M	16M	—	—	48M
16M/16M	16M	16M	—	64M

! Warning: **Improper installation will show the wrong memory
size upon boot-up. Furthermore, it but might cause
system unstability or system hang-ups.**

☐ **STEP 6: Setting the DACK# / DREQ# Jumper (JP17/JP18,
JP23/JP24)**

These jumpers can be left open and are required to be set
only if you are using ECP/EPP devices. Before setting this
jumper, check first which channel is available. A sound card
normally uses an 8-bit DMA, so you have to check the
DMA channel used, in case one is installed.

☐ **STEP 7: Connecting the front panels to JFP.**

Connect JFP to the front panel of your system case.

☐ **STEP 8: Connecting the HDD, FDD, LPT, COM1, COM2,
and all the other add-on cards and peripherals .**

After booting up, you can press "DEL" key to enter
SETUP. (You can refer to Chapter 3 for the BIOS
Setup.) In Setup, you are only required to "set the
standard Setup", "load the optimal values" and "detect
the hard disk type." Afterwards, you can start working.

Note: If you are using CPU with internal write-back function
(such as Intel P24D, Intel Pentium OverDrive P24T and
AMD Enhanced CPU), the "internal cache" should be set to
"WB".

CPU Type Jumpers: JC1~JC10

JC1~JC10 set the system board to recognize the type of CPU that is installed. Set JC1~JC10 according to CPU type as shown below. See Figure 1-1 for the location of the jumpers.

486SX Settings - Intel SX CPU without Green functions
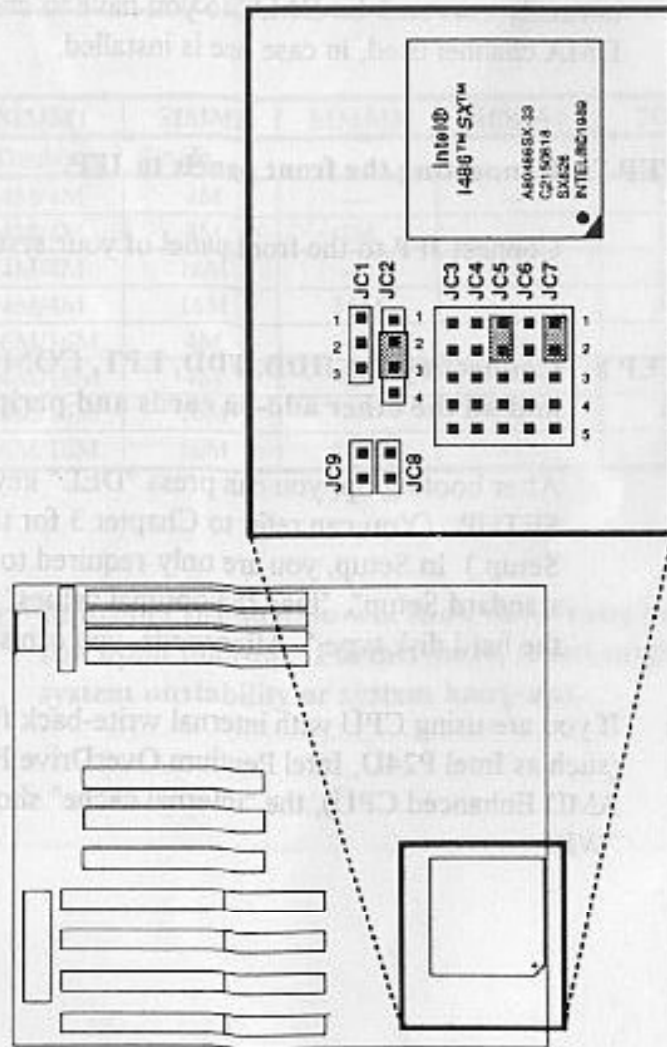
486SX Settings - Intel SX CPU with Green functions The CPU is marked with "5V1X."
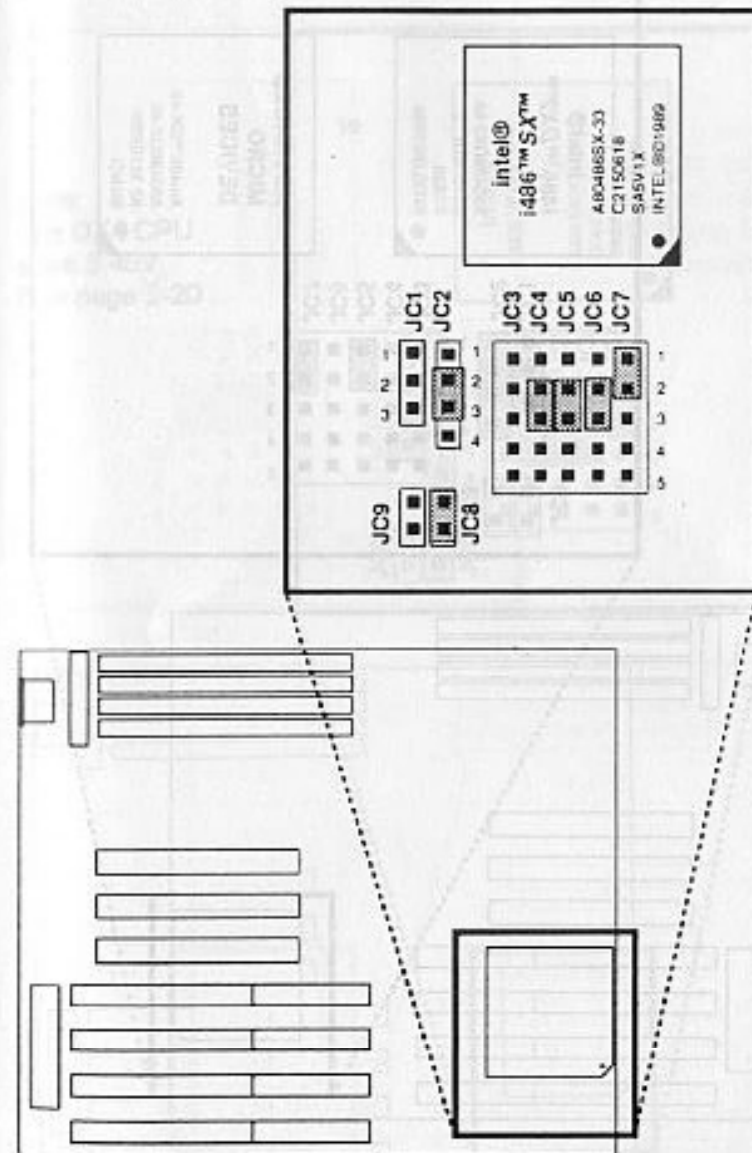
486DX/DX2 Settings - Intel CPU without Green function or AMD 486 DX/DX2 CPU.
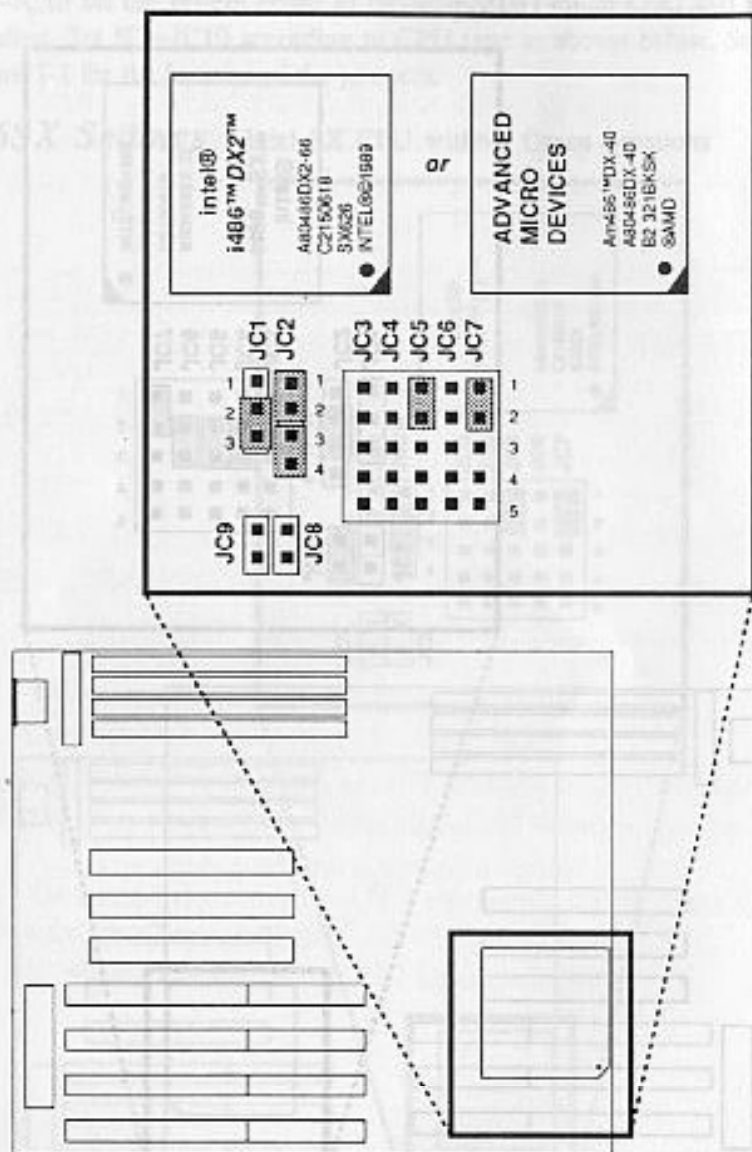
486DX/DX2/DX4 Settings - Intel CPU with Green function including 486DX, 486DX2, 486DX4, or DX4-OverDrive CPUs. These CPUs are marked with "5V1X".

Note:
The DX4 CPU
uses 3.45V.
See page 2-20
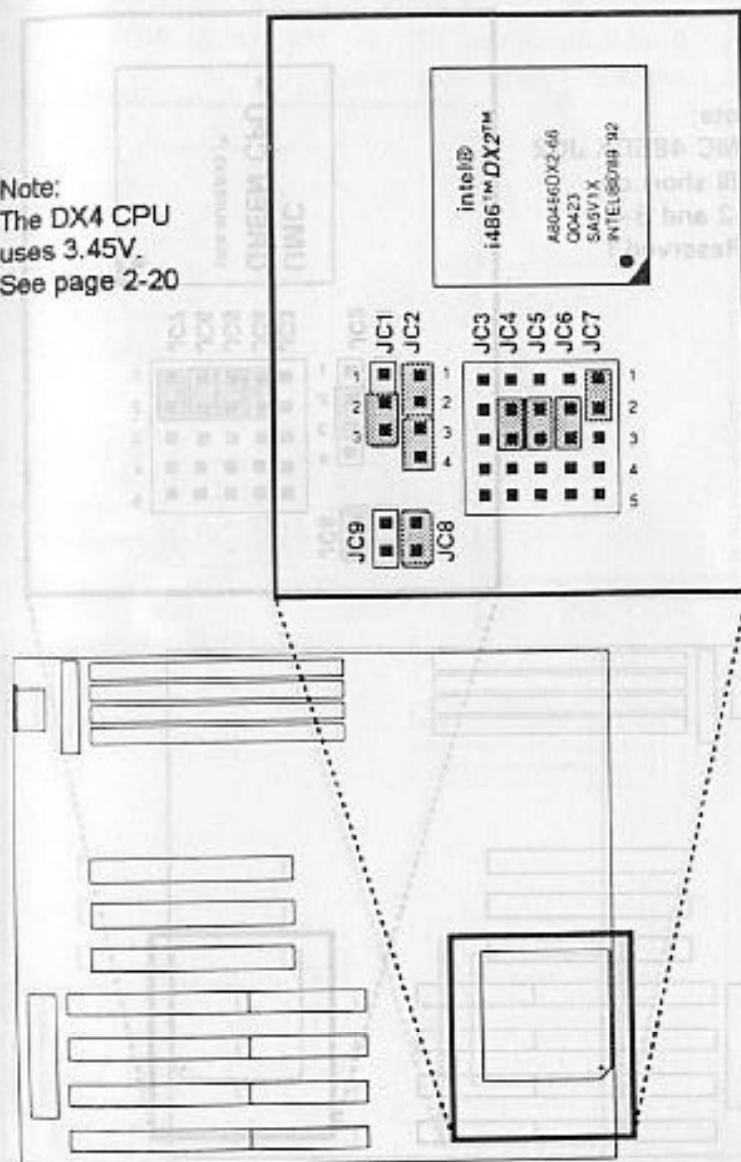
UMC 486SX Settings

Note:
UMC 486DX JC2
will short on
1-2 and 3-4
(Reserved)
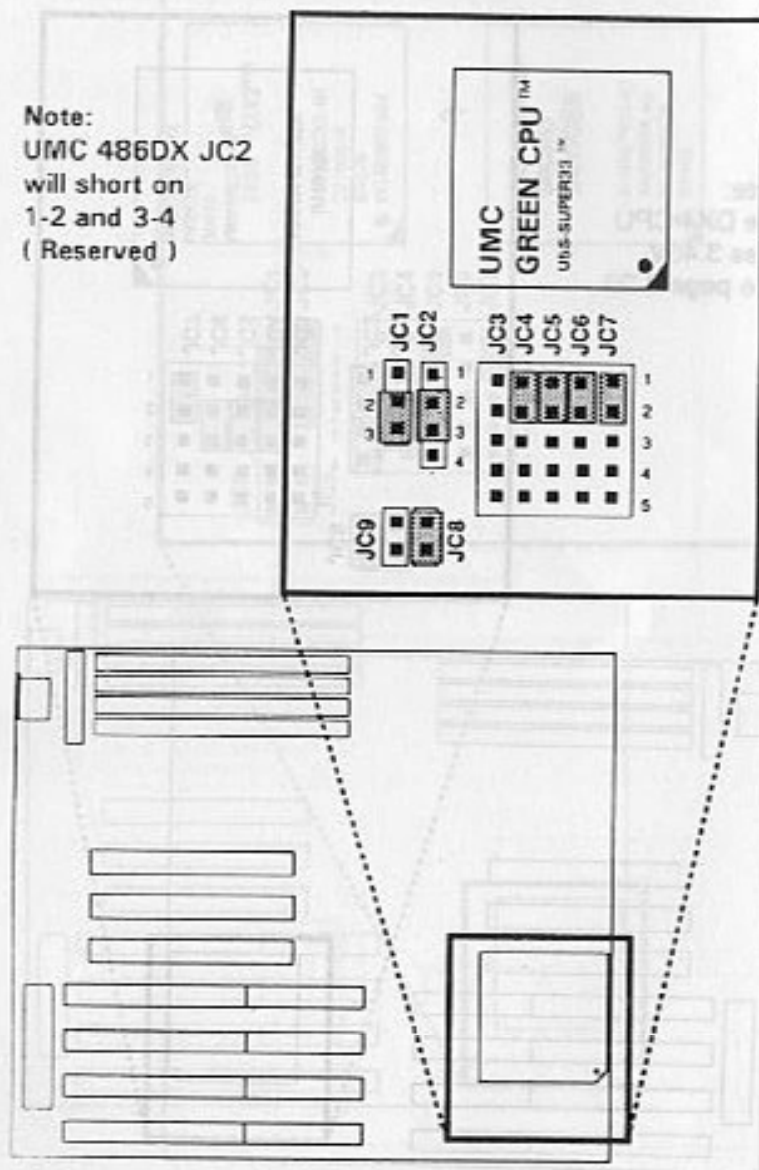
DX2 OverDrive Settings — Intel CPU with Green

function including 486DX2 are marked with OverDrive.
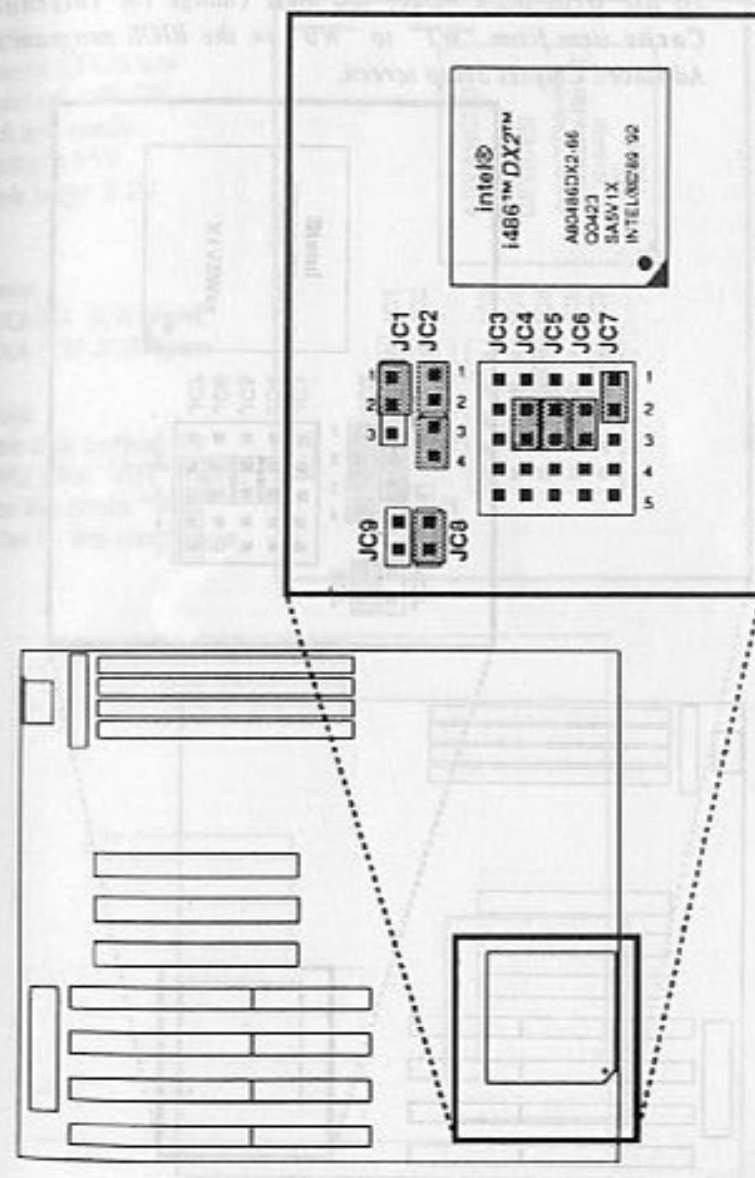
P24D/Pentium OverDrive (P24T) Settings

CPUs marked with "W5VIX" can support Write-Back mode for the CPU's internal cache.

Note: *To use Write-Back mode, you must change the Internal Cache item from "WT" to "WB" in the BIOS program's Advanced Chipset Setup screen.*
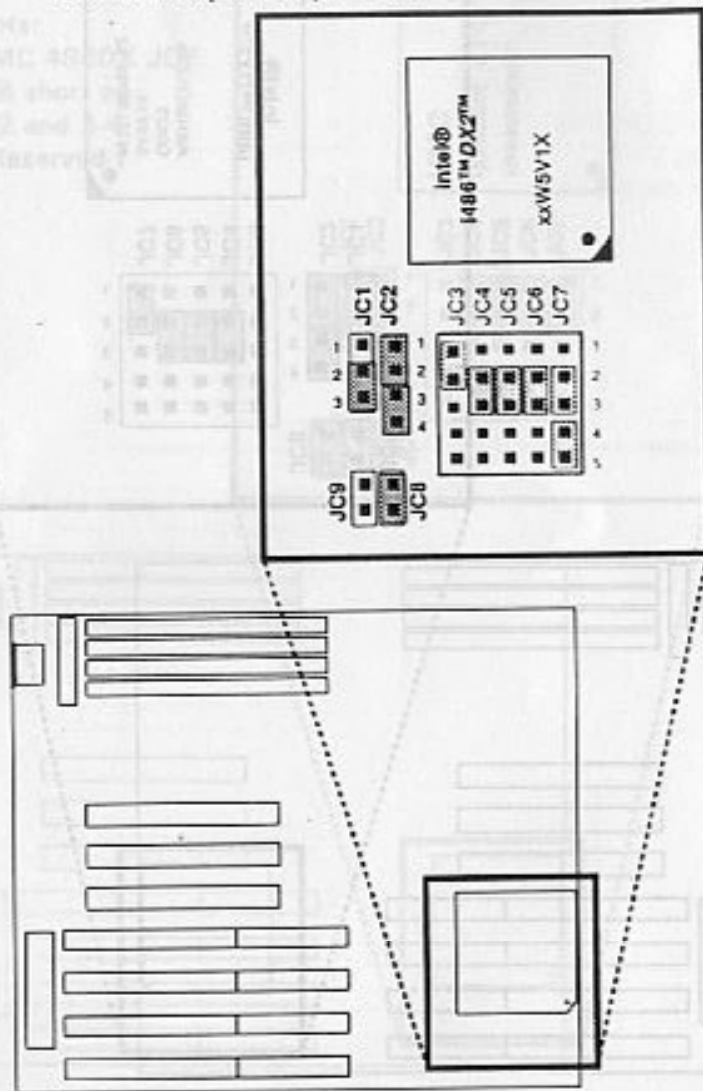
AMD Enhance 486 DX Settings

Includes DX2-66, DX2-80, DX4-100. These CPUs are marked with 3V.

Note:
These CPUs are marked with 3V, but are really using 3.45V. See page 2-20

Note:
DX2-XX JC9 short.
DX4-100 JC9 open.

Note:
Use this setting for CPU with "V8T" mark. For the mark "V8B" refer to the next page.
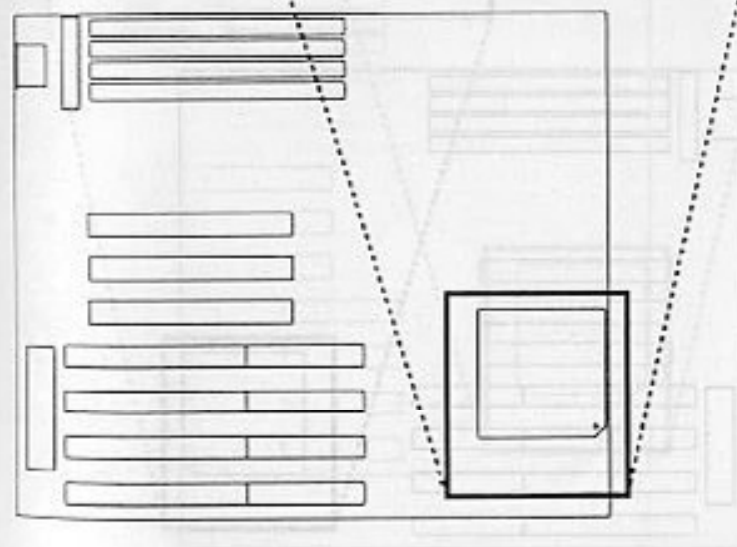
AMD Enhance 486 DX Settings

CPUs marked with "V8B" can support Write-Back mode for the CPU's internal cache.

Note: To use Write-Back mode, you must change the Internal Cache item from "WT" to "WB" in the BIOS program's Advanced Chipset Setup screen.

Note:
DX4-100
JC3 pin 5-6 open.
DX2-80 or DX2-66
JC3 pin 5-6 short.
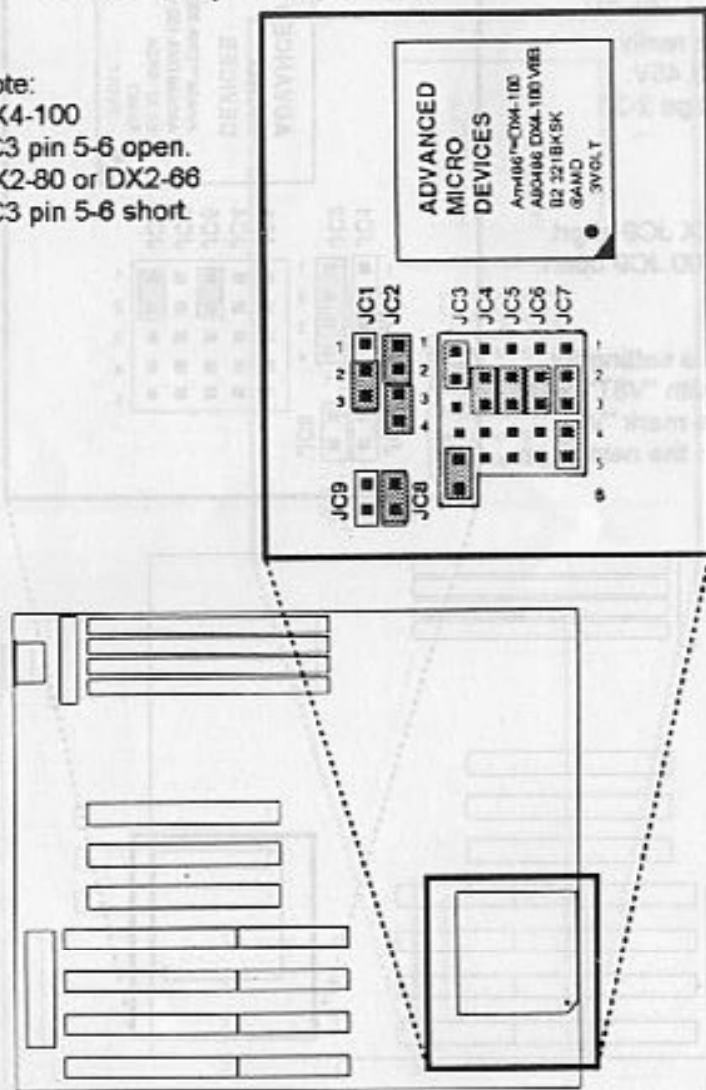
Cyrix Cx486DX2-XX Settings

Note:
These CPUs with
mark "V ^XX ".
See page 2-20.
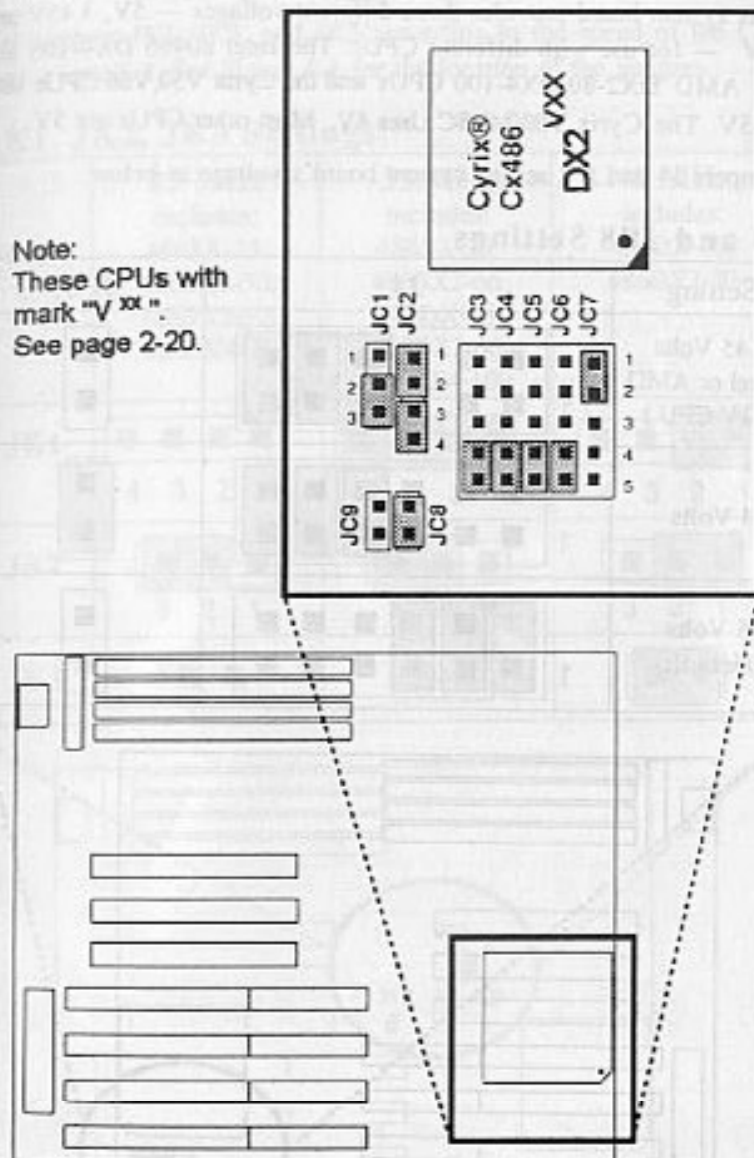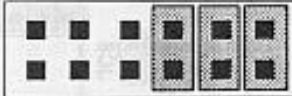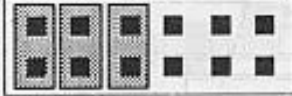
Voltage Regulating Jumpers: J4, JP8

This system board provides three different voltages — 5V, 3.45V and 4V — for use with different CPUs. The Intel 80486 DX4-100 and the AMD DX2-80/DX4-100 CPUs and the Cyrix V50,V66 CPUs use 3.45V. The Cyrix V80/MI-SC Uses 4V. Most other CPUs use 5V.

Jumpers J4 and JP8 set the system board's voltage as below.

J4 and JP8 Settings
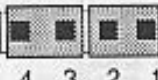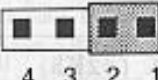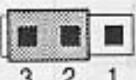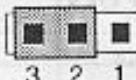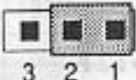
Setting	J4	JP8
3.45 Volts (Intel or AMD 3.3V CPU)		
4 Volts		
5 Volts (Default)		
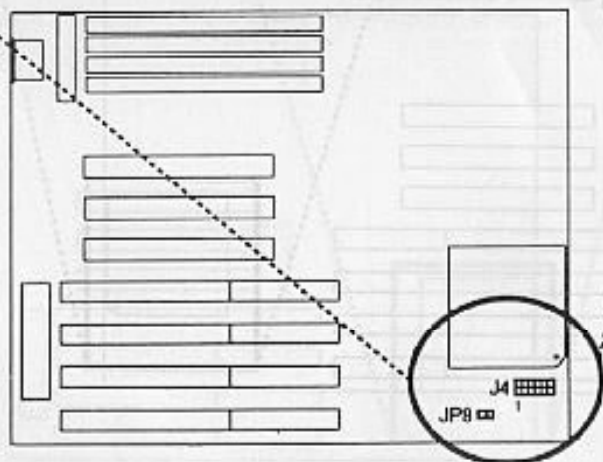
CPU Speed: JK1, JK2, JK3

Set jumpers JK1, JK2, and JK3 according to the speed of the CPU that is installed. See Figure 1-1 for the location of the jumpers.

JK1, JK2, JK3 Settings

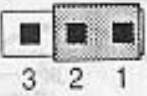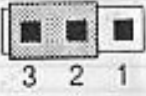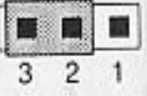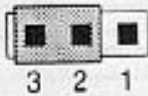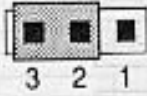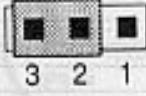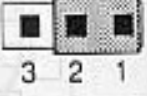| Jumper	25 MHz includes: 486SX-25, 486SX2-50, 486DX2-50, 486DX4-75	33 MHz includes: 486SX-33, 486SX2-66, 486DX-33, 486DX2-66, 486DX4-100	40 MHz includes: 486DX-40, 486DX2-80
JK1	4 3 2 1	4 3 2 1	4 3 2 1
JK2	3 2 1	3 2 1	3 2 1
JK3			
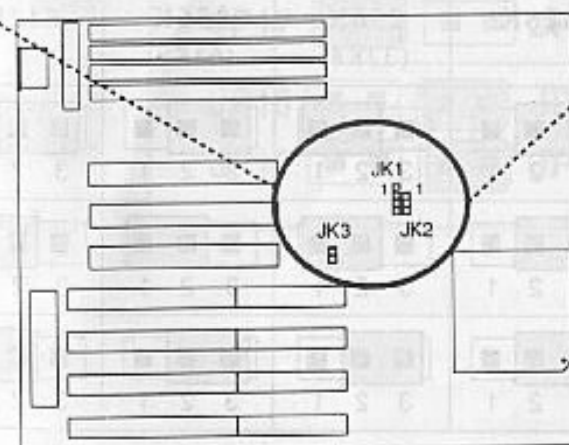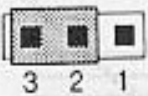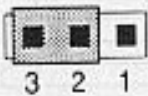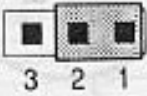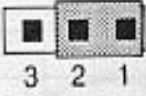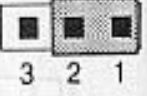
Cache Selection: JS1, JS2, JS3

The system board supports 128K, 256K, or 512K of cache memory. You configure cache memory by installing 32K8, 64K8, or 128K8 SRAM chips in Data RAM sockets U1~U8, and a 8K8, 16K8, or 32K8 SRAM chip in Tag socket U14. You then set jumpers JS1, JS2, and JS3 as below. Note that speed required for SRAM chips is **20ns**.

Cache Size and Memory Locations

Cache Size	Tag RAM (U14)	Data RAM (U2, U4, U6, U8)	Data RAM (U1, U3, U5, U7)
128K	8K8, 16K8, or 32K8	32K8	None
256K (32K8)	16K8 or 32K8	32K8	32K8
256K (64K8)	16K8 or 32K8	64K8	None
512K	32K8	128K8	None

JS1, JS2, JS3: Cache Size Settings

Cache Size	128K	256K (32K8)	256K (64K8)	512K
JS1	3 2 1	3 2 1	3 2 1	3 2 1
JS2	3 2 1	3 2 1	3 2 1	3 2 1
JS3	3 2 1	3 2 1	3 2 1	3 2 1

Memory Bank Configuration

The system board provides four 72-pin Single In-line Memory Module (SIMM) sockets on-board, numbered SIMM1~SIMM4. Each socket accepts single bank or double bank SIMM. You can install four single bank SIMM or a maximum of two double bank SIMM. There is no need to set jumpers for memory configuration.

DACK# and DREQ Selectors: JP17/18, JP23/24

When the on-board printer port is set to ECP, you should also set the DMA channel used by the ECP. The system board provides DREQ 1, 3, and DACK #1, #3 for you to set. You must set the DREQ and DACK# channels the same way. See Figure 1-1 for the location of the jumpers.

Description	Jumper Settings	
DREQ1 / DACK#1	JP18 ▪▪ ▪▪ JP23	JP17 ▪▪ ▪▪ JP24
DREQ3 / DACK#3	JP18 ▪▪ ▪▪ JP23	JP17 ▪▪ ▪▪ JP24

Case Connector Block: JFP

The Turbo LED, Turbo Switch, Hardware Reset, Keylock, Power LED, Power Saving LED, Sleep Switch, Speaker and HDD LED all connect to the JFP Connector Block as shown below. See Figure 1-1 for JFP's location.
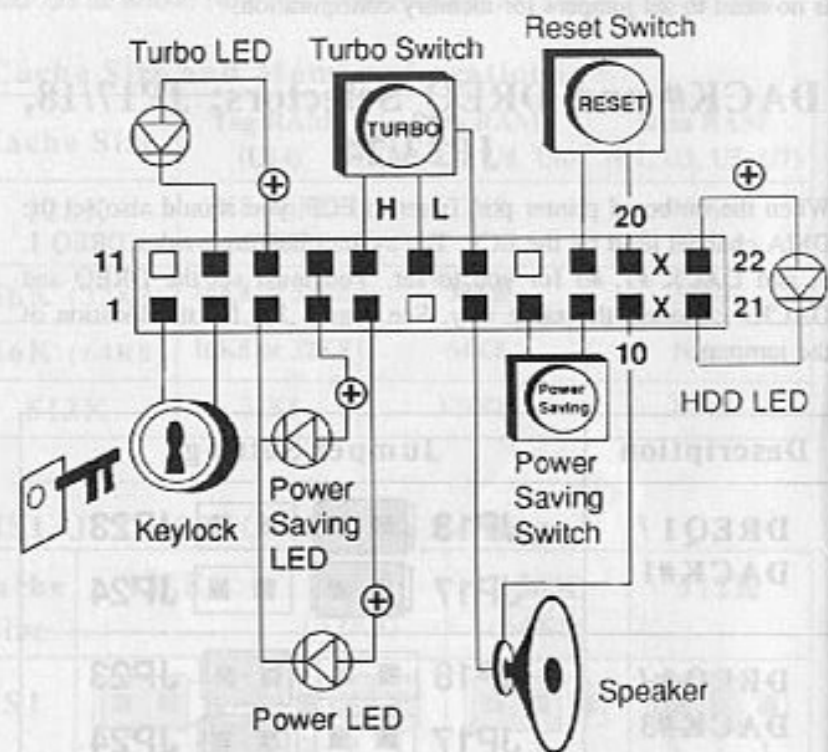

Figure 2-1. Case Connector Block - JFP

Keyboard Connector: J1

The system board provides a standard five-pin female DIN connector, J1, for attaching a keyboard. You can plug a keyboard cable directly into this connector. See Figure 1-1 for connector location.

Power Supply Connector: J2

The power supply connector is a twelve-pin male connector. Dual connectors from the power supply can fit in only one direction. Make sure to attach the connectors with the two black wires at the center, as show in the diagram below. See Figure 1-1 for the connector's location.
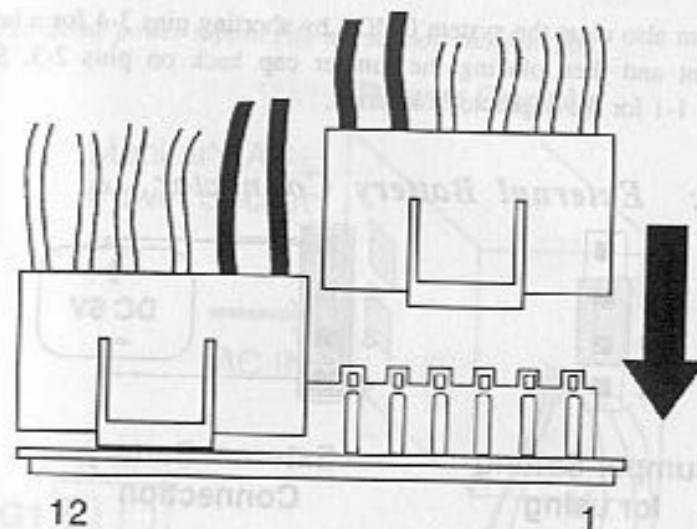

Figure 2-2. Attaching Power Supply Connectors

Connector Pin Description

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