Main Board
User's Guide

April 1995

100% POST-CONSUMER RECYCLED PAPER

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"Quick Reference Jumper Setting" is put in the middle of user's guide.

Introduction

1-1 About this Manual

This manual is arranged to help you set up and run this 486 main board as soon as possible.

Information is presented in three chapters: In *Introduction*, we tell you what you should receive in your 486 main board as well as provide information on the features and specifications of the product. The chapter enclosed with a diagram showing the layout of the 486 main board.

Chapter 2, *Main Board Setup*, includes detailed information on how to install and configure your 486 main board.

Chapter 3, *Memory installation*, describes the size and configuration of your system's on-board memory and external cache memory and gives instructions for installing the memory devices on the system board.

When the above steps have all been completed, you will need to adjust the BIOS setup using the software utility described in the *Appendix*.

1-2 The Green PC Function

The Power Management Unit (PMU) of this board strictly controls and dramatically reduces overall system power consumption. This is an accomplishment of the activity monitors which detect the system inactivity timer time-out, and signals the power-saving devices to slow down the clock frequency or remove the power sources from various peripherals.

There are four Power management mode in this board : Normal, Doze, Standby and Suspend mode.

✱ NORMAL mode: This mode is the normal operation mode of the PC system. In this mode, the doze timer start counting if no activity is taking place and the programmable time-out period has expired.

✱ DOZE mode: In this mode, CPU frequency is slow down to lower frequency.

✱ STANDBY mode: There are two options in the standby mode. One option is to put CPU in the STOPGRANT state, and the other is to scale the CPU and system clock to a lower frequency.

✱ SUSPEND mode: In this mode. The PMU will stop the CPU clock (0MHz), slow down the system clock, reduce the External Cache and so on.

More detail information, please refer to Appendix A-4.

1-3 Main Board Specifications :

❉ Fully PC/AT Compatible System

❉ Support CPU Type:
- Intel   i486SX/DX/DX2/DX4/SL-Enhanced/P24D/OverDrive/P24T   CPUs
- AMD Am486 DX/DX2/DX4 CPUs
- Cyrix Cx486 DX/DX2/DX2V CPUs
- UMC U5S
- System clock 25/33/40/50MHz
- 237-Pin ZIF CPU socket.

❉ Memory:
- 72pin SIMM Socket x 4 (1/2/4/8/16/32MB 32/36-bits 70/80-ns SIMM Modules acceptable)
- Maximum 128MB On board

❉ Cache memory :
- Support Cache memory size 0/128/256/512KB (32Kx8,64Kx8 DIP) and 1MB (128Kx8 DIP)

❉ Expansion Slots:
- ISA slot 16 bits x 4
- PCI slots x 3

❉ Built-In Enhanced IDE Controller
- Supporting up to 4 hard drives
- Compliant ATA spec.

❉ On Board Ultra I/O
- UMC 8663
- 1 Floppy disk port
- 2 Serial ports (16550 compatible)
- 1 printer port (Support SPP/EPP/ECP)
- 1 Game port

❉ Shadow RAM:
- System BIOS, Video BIOS and Other Adapter ROM BIOS

❉ BIOS:
- Award system BIOS

❉ PCB Size : 220mm x 250mm

❉ Software/Hardware turbo speed toggle

❉ Green PC :
- Meet EPA Green PC standard : power consumption under 30W on the Doze, Standby or Suspend mode

❉ Regulator on board

1-4 Why EPP, ECP and 16550

EPP (Enhanced Parallel Port) is an IEEE P1284 standard.
ECP (Extended Capabilities Parallel Port) is a protocol created by Microsoft and H.P.
Both EPP and ECP are designed to provide a high performance, standard solution for connecting external devices such as CD-ROM, HDD, Printer ... etc.
The high speed **UART 16550** (baud rate supported from 50 baud to 115.2K baud) was announced to collaborate high speed modem needed nowadays.

1-5 Main Board Layout
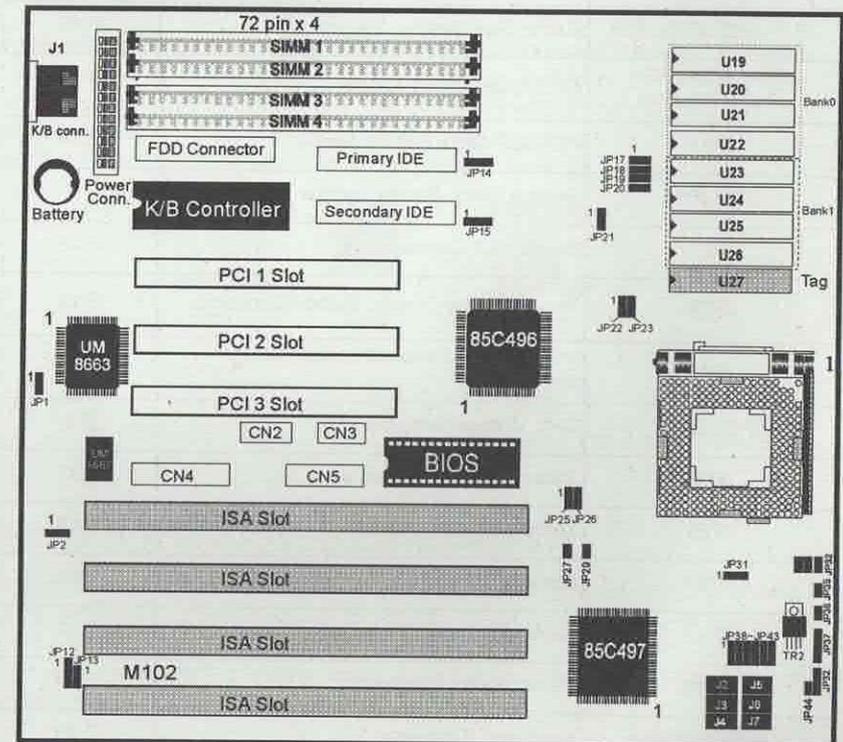
Jumper & Connector NO.	FUNCTION	REF. PAGE
JP12	External Battery Connector	P.12
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Chapter 2

Main Board Setup

If your main board has already been installed by the dealer, you will still want to refer to this chapter in case you plan to make any changes or upgrade your system.

2-1 How to set Jumper

Jumper switch is used to select between various operating modes. A jumper switch consists of two or three gold pins stretches out from the system board. Placing the plastic jumper cap over two pins connects those pins and makes a particular selection. By using the cap to connect two pins is to short those pins. If the cap is not placed on any pins , it indicates to leave the pins open.

Pins   Cap   Setting

1   1
○ ○ ○   ● ● ○
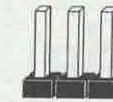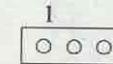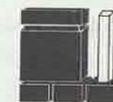
3 Pin Jumper   1-2 : Pin 1 and Pin 2 short together

2-2 CPU Type and System Clock Setting

The main board can support all 486 serial microprocessors up to DX4 (P24C), running system at a clock speed up to 50Mhz. If you are installing or upgrading the CPU on this board, you must set the CPU type (JP31, JP39, JP40, JP42, JP43, J2~J7) and configure the system clock generator jumper (JP22, JP23) to match the speed rating of the Microprocessor.

System Clock Setting Configuration (JP22, JP23)

| System Clock	CPU Type	Clock Setting Jumper (JP22, JP23)
25MHz	486SX-25 486DX-25 486DX2-50 486DX4-75 P24T-63	JP22 JP23
33MHz	486SX-33 486DX-33 486DX2-66 486DX4-100 P24T-83	JP22 JP23
40MHz	486SX-40 486DX-40 486DX2-80	JP22 JP23
50MHz	486DX-50	JP22 JP23

CPU Type Jumper Setting

CPU type	Power voltage	JP32	JP38	JP31	JP39	JP40	JP41	JP42	JP43
Intel 486SX	5V	S	X	1-2	1-2	1-2	X	1-2	1-2
Intel/AMD 486DX/DX2	5V	S	X	1-2	1-2	1-2	X	1-2	1-2
Intel P24D (486DX2 write back)	5V	S	X	1-2	1-2	1-2	X	1-2	1-2
Intel/AMD DX4	3.3 V	O	1-2	1-2	1-2	1-2	O	1-2	1-2
Intel 486OPDR(OverDrive)	5V	S	X	1-2	1-2	1-2	X	1-2	2-3
Intel P24T(Pentium OverDrive)	5V	S	X	1-2	1-2	1-2	X	1-2	2-3
AMD DX2	3.3 V	O	1-2	1-2	1-2	1-2	X	2-3	1-2
Cyrix DX/DX2	5V	S	X	1-2	1-2	1-2	X	1-2	1-2
Cyrix DX2V	4V	O	2-3	1-2	1-2	1-2	X	1-2	1-2
UMC U5S	5V	S	X	2-3	2-3	2-3	X	1-2	1-2

CPU type	Power voltage	J2	J3	J4	J5	J6	J7
Intel 486SX	5V	S	O	O	O	S	O
Intel/AMD 486SX/DX2	5V	O	S	O	O	S	O
Intel P24D (486DX2 write back)	5V	O	O	S	O	O	S
Intel/AMD DX4	3.3 V	O	S	O	O	S	O
Intel 486OPDR(OverDrive)	5V	O	S	O	O	S	O
Intel P24T(Pentium OverDrive)	5V	O	O	S	O	O	S
AMD DX2	3.3 V	O	S	O	O	S	O
Cyrix DX/DX2	5V	O	S	O	S	O	O
Cyrix DX2V	4V	O	S	O	S	O	O
UMC U5S	5V	S	O	O	O	S	O

* CPU Voltage Setting Juper (JP32, JP38)

JP32 JP38
For 3.3V CPU
For 4V CPU
For 5V CPU
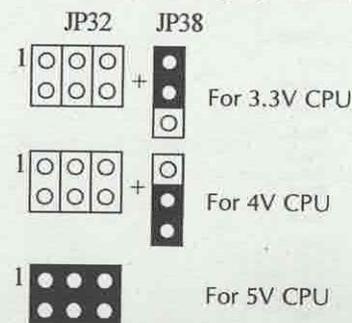
* Intel DX4 CPU internal spec. select jumper (JP41)

JP41
CPU int. speed = 2 x system clock.
CPU int. speed = 3 x system clock.
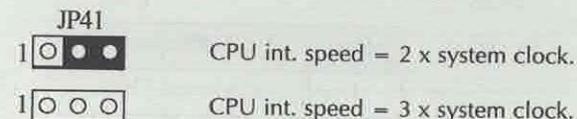
2-3 Connectors and Jumper Setting

Connectors are used to connect the system board to other parts of the system, including the power supply, the keyboard and the various controllers on the front panel of the system case. When connecting connect-wires to the connectors you should remember that some of them must be aligned in a specific way in order to have proper function.

Power Supply Connector (P1)

When installing the board, the power supply connector is usually the last connector to be connecting before installing the system peripherals. Before connect the power supply, check that it is not connected to power source.

Most power supplies have two sets of six-wire connectors that must be connected to the system board. Two of the wires on each connector are black. While connecting these two connectors, be sure that the four black wires are located in the middle.

1	POWER GOOD	Orange
2	+5V	Red
3	+12V	Yellow
4	-12V	Blue
5	GROUND	Black
6	GROUND	Black
1	GROUND	Black
2	GROUND	Black
3	-5V	White
4	+5V	Red
5	+5V	Red
6	+5V	Red

Keyboard Connector (J1)
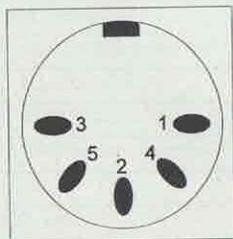
Pin	Definition
1	Keyboard Clock
2	Keyboard Data
3	(None)
4	Gound
5	+5V DC

Keyboard Connector / Pin Definitions

Keyboard Lock Connector (JP45)

When this connector is connected to the keylock on the front panel of the system case, the keylock can enable or disable the keyboard. It prevents other users to operate your computer. As clearly labeled on the board, Pin 1 of the keyboard lock connector is counted from the left.

Pin	Definition
1	+5V DC
2	Ground
3	Ground
4	Keylock
5	Ground

Keyboard Lock Connector / Pin Definitions

Speaker Connector (JP37)

An external speaker mounted inside the case can connect to the main board via this connector.

Pin	Definition
1	Speaker Signal
2	GND
3	GND
4	+5V DC

Speaker connector / Pin Definition

External or Internal Battery Power Connector (JP12)

This connector may be used to connect an external 4.5V to 6V battery to back up or replace the on-board battery. When connecting the external battery, it is very important that the connecting wire should be placecd correctly.

Pin	Definition
1	+4.5 - 6V DC
2	No Connection
3	Ground
4	Ground

Battery Connector / Pin Definitions

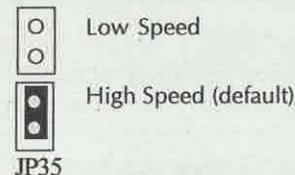**System Reset Switch Connector (JP44)**

This connector should be connected to the Reset switch on the front panel of the system case. The reset switch allows you to restart the system without turning off.

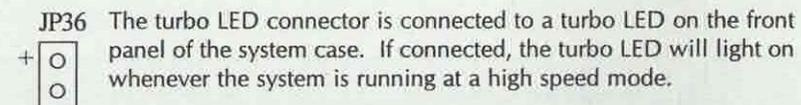| Pin	Definition
1	GND
2	System Reset

Reset Switch Connector / Pin Definitions

Hardware Turbo Switch Connector (JP35)

The hardware turbo switch connector is used to connect the board to a hardware turbo switch on the front panel of the system unit. If connected, the hardware turbo switch can be used to toggle the turbo (high speed) mode on or off.
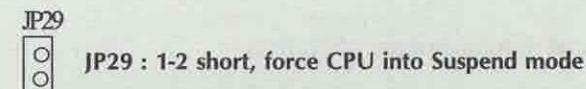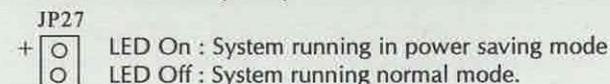
Low Speed

High Speed (default)

JP35

Other high/low speed changed by Keyboard
"CTRL-ALT-–": Set to Low speed
"CTRL-ALT-+": Set to High speed

Turbo LED Connector (JP36)

JP36   The turbo LED connector is connected to a turbo LED on the front
+   panel of the system case. If connected, the turbo LED will light on
       whenever the system is running at a high speed mode.

Power Saving Toggle Switch Connector (JP29)

If you have power saving control switch on the front panel of the system case, you can trigger system into Suspend mode directly. Meantime the CPU clock will be down to zero Hz and also power down external cache circuit to reduce the total power consumption of system. The system will wake up while the keyboard or mouse be touched.

JP29

JP29 : 1-2 short, force CPU into Suspend mode

Green LED Connector (JP27)

JP27
+   LED On : System running in power saving mode
       LED Off : System running normal mode.

PCI-BUS Clock Setting (JP21)

PCI CLK = System CLK (default)

PCI CLK = 1/2 System CLK
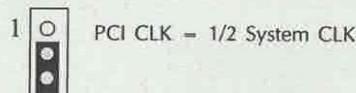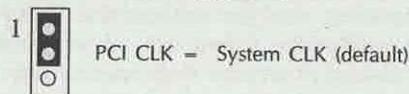
CMOS DATA Clear Jumper (JP13)

This jumper is used to clear the system configuration data which is stored in the CMOS RAM and reload the default system configuration setting. (The function would be useful if you forget the user's password for the system)

Default
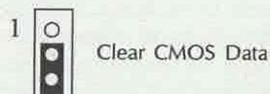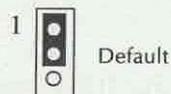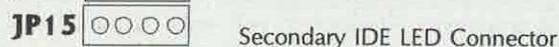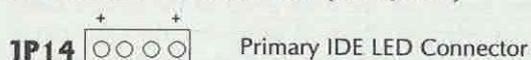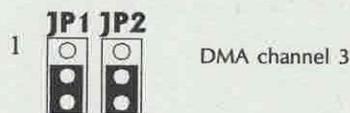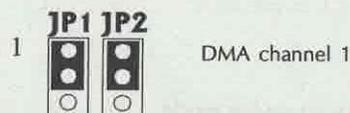
Clear CMOS Data

Hard Disk LED Connector (JP14,JP15)

JP14 Primary IDE LED Connector

JP15 Secondary IDE LED Connector

ECP DMA Channel Setting Jumper (JP1,JP2)

JP1 JP2 DMA channel 1

JP1 JP2 DMA channel 3

Chapter 3

Memory Installation

This 486 main board can operate from 1MB up to 128MB of system memory installed on-board. There is also an external cache memory on the system board that may be installed as either 0KB or up to 1MB in size.
This chapter describes the types of memory devices that should be used with the main board and shows how to install the memory.

3-1 External Cache Memory Configuration

When you first install the cache memory on your system board or each time you upgrade or modify it, you will need to adjust the cache memory size setting for the system. The cache memory size for the system is set by adjusting Jumpers JP17~JP20, JP25 and JP26.

Cache Size	TAG RAM (U27)	Data RAM		JP25	JP26	JP17	JP18	JP19	JP20
		U19-U22	U23-U26						
128K	8k*8	32k*8	----	1-2	1-2	1-2	2-3	2-3	1-2
256K	32k*8	32K*8	32k*8	2-3	1-2	2-3	2-3	2-3	2-3
		64k*4	----			1-2	2-3	1-2	1-2
512K	32k*8	64k*8	64k*8	2-3	2-3	2-3	2-3	2-3	2-3
		128k*4	----			1-2	1-2	2-3	1-2
1MB	64k*8	128k*8	128k*8	2-3	2-3	2-3	2-3	2-3	2-3

* "1-2" means Pin 1 and Pin 2 short together
* If you want to install the SRAM by youself, please consult the mainboard dealer which can provide more detail information.

3-2 Main Memory Configuration

72	1
SIMM 4	
SIMM 3	
SIMM 2	
SIMM 1	
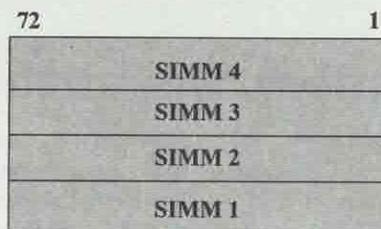
The system provides four 72-pin SIMM socket, which can be configured memory size as from 1MB to 128MB and offers table free DRAM SIMM installation way to allow user using any kind of SIMM with random combinations.

Require Memory Specifications:

Module size: 1/2/4/8/16/32/64 MB
DRAM Mode: Fast page mode
DRAM Speed: 70ns (or faster)
Parity: Either parity or non-parity

JP17~JP20 : Data RAM Jumper Setting
JP25~JP26 : Tag RAM Jumper Setting

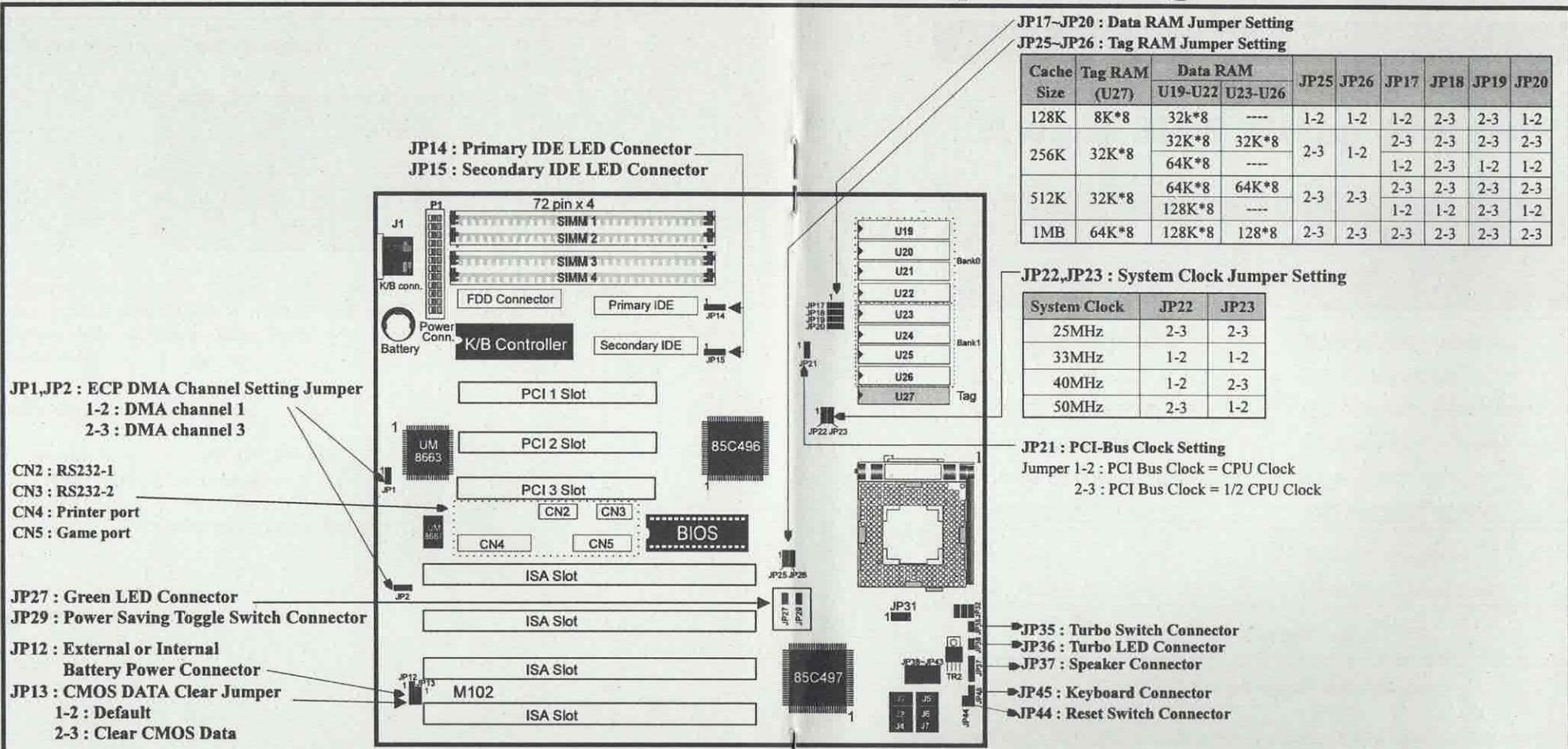| Cache Size	Tag RAM (U27)	Data RAM		JP25	JP26	JP17	JP18	JP19	JP20
		U19-U22	U23-U26						
128K	8K*8	32k*8	----	1-2	1-2	1-2	2-3	2-3	1-2
256K	32K*8	32K*8	32K*8	2-3	1-2	2-3	2-3	2-3	2-3
		64K*8	----			1-2	2-3	1-2	1-2
512K	32K*8	64K*8	64K*8	2-3	2-3	2-3	2-3	2-3	2-3
		128K*8	----			1-2	1-2	2-3	1-2
1MB	64K*8	128K*8	128*8	2-3	2-3	2-3	2-3	2-3	2-3

JP14 : Primary IDE LED Connector
JP15 : Secondary IDE LED Connector

JP22,JP23 : System Clock Jumper Setting

System Clock	JP22	JP23
25MHz	2-3	2-3
33MHz	1-2	1-2
40MHz	1-2	2-3
50MHz	2-3	1-2

JP1,JP2 : ECP DMA Channel Setting Jumper
  1-2 : DMA channel 1
  2-3 : DMA channel 3

JP21 : PCI-Bus Clock Setting
  Jumper 1-2 : PCI Bus Clock = CPU Clock
      2-3 : PCI Bus Clock = 1/2 CPU Clock

CN2 : RS232-1
CN3 : RS232-2
CN4 : Printer port
CN5 : Game port

JP27 : Green LED Connector
JP29 : Power Saving Toggle Switch Connector

JP12 : External or Internal Battery Power Connector
JP13 : CMOS DATA Clear Jumper
  1-2 : Default
  2-3 : Clear CMOS Data

JP35 : Turbo Switch Connector
JP36 : Turbo LED Connector
JP37 : Speaker Connector
JP45 : Keyboard Connector
JP44 : Reset Switch Connector

Board labels: J1, P1, 72 pin x 4, SIMM 1, SIMM 2, SIMM 3, SIMM 4, K/B conn., FDD Connector, Primary IDE, JP14, Power Conn., Battery, K/B Controller, Secondary IDE, JP15, PCI 1 Slot, UM 8663, PCI 2 Slot, 85C496, PCI 3 Slot, JP1, CN2, CN3, UM 866, CN4, CN5, BIOS, ISA Slot, JP25 JP26, JP2, ISA Slot, JP27 JP29, JP31, ISA Slot, JP12 JP13, M102, 85C497, ISA Slot, JP35-JP43, TR2, U19, U20, U21, U22, U23, U24, U25, U26, U27, Bank0, Bank1, Tag, JP17/JP18/JP19/JP20, JP21, JP22 JP23, J5, J3, J2, J6, J4, J7

CPU Type	Power Voltage (V)	JP32	JP38	JP31	JP39	JP40	JP41	JP42	JP43	J2	J3	J4	J5	J6	J7
Intel 486SX	5	S	X	1-2	1-2	1-2	X	1-2	1-2	S	O	O	O	S	O
Intel/AMD 486DX/DX2	5	S	X	1-2	1-2	1-2	X	1-2	1-2	O	S	O	O	S	O
Intel P24D (486DX2 Write Back)	5	S	X	1-2	1-2	1-2	X	1-2	1-2	O	O	S	O	O	S
Intel / AMD DX4	3.3	O	1-2	1-2	1-2	1-2	O	1-2	1-2	S	O	O	O	S	O
Intel 486OPDR (OverDrive)	5	S	X	1-2	1-2	1-2	X	1-2	2-3	S	O	O	O	S	O
Intel P24T (Pentium OverDrive)	5	S	X	1-2	1-2	1-2	X	1-2	2-3	O	O	S	O	O	S
AMD DX2	3.3	O	1-2	1-2	1-2	1-2	X	2-3	1-2	O	S	O	O	S	O
Cyrix DX/DX2	5	S	X	1-2	1-2	1-2	X	1-2	1-2	S	O	S	O	S	O
Cyrix DX2V	4	O	2-3	1-2	1-2	1-2	X	1-2	1-2	S	O	S	O	O	O
UMC U5S	5	S	X	2-3	2-3	2-3	X	1-2	1-2	S	O	O	O	S	O

* The "1-2" means Pin1 & Pin 2 short together
* "X":don't care
* "O":Open
* "S": Short
* JP32,JP38:CPU Voltage setting jumper
* JP41: Intel DX4 CPU Internal speed setting
   2-3 : CPU Int. clock = 2 x system clock
   O : CPU Int. clock = 3 x system clock

9503