System Board Layout

Figure 1-1. System board Layout

Quick Jumper Setting Reference

(See Chapter 2 for details on jumper settings and connectors.)

CPU Type	JC1	JC4	JC6	JC7	JC8	JC11	JC13
Intel/AMD SX	2-3	2-3	2-3	2-3	2-3		1-2
Intel SX SL	2-3	3-4	2-3	2-3	2-3		1-2
Intel/AMD DX/DX2 (Default)	1-2, 3-4	2-3	2-3	2-3	2-3		1-2
Intel DX/DX2 SL	1-2, 3-4	3-4	2-3	2-3	2-3		1-2
Cyrix M7	1-2, 3-4	1-2, 3-4	2-4	2-4	1-2	3	2-3

CPU Speed	JK1	JK2
SX-25, DX-25, DX2-50	1, 2	1, 2, 3
SX-33, DX-33, DX2-66 (Default)	1, 3	1, 2, 3
DX-40	2	4, 5, 6

Cache Size	SRAM	JS1	JS2
128K	32K*8	1-2	2-3
256K (Default)	32K*8	2-3	1-2
256K	64K*8	2-3	2-3

VL Bus	JV1	JV2	JV3
≤ 33M (Default)	2-3	1-2	1-2
> 33M	2-3	2-3	1-2

CPU Type Selectors: JC1, JC4, JC6, JC7, JC8, JC11, JC13

The 486 PCI AL1 system board supports the following CPU types:

— Intel 486™ 486SX / 486DX / 486DX2

— S-Series   Intel 486™ 486SX / 486DX / 486DX2 SL

S-Series CPUs provide SMM mode, which includes:
SMI (System Management Interrupt),
SMIACT (System Management Interrupt Active),
STPCLK (Stop Clock),
and pin support for SMM mode.

S-Series CPUs are clearly marked with "SA5V1X".

— AMD 486   486SX / 486DX / 486DX2

— Cyrix M7

Note that the system board has a Zero Insertion Force (ZIF) Overdrive Socket for PGA type 486 CPUs.

To configure the system board to recognize which type of CPU is installed, you must set jumpers JC1, JC4, JC6, JC7, JC8 and JC13 as below. See Figure 1-1 for jumper locations.

Important: You must make sure the CPU type jumpers settings match your CPU type, as shown below. Otherwise, your system may not start, or may experience system hang ups.

CPU Type: JC1, JC4, JC6, JC7, JC8, JC11, JC13

	Intel / AMD 486SX	Intel / AMD 486 DX / DX2	Intel 486SX-SL	Intel 486DX/ DX2-SL	Cyrix M7
JC1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
JC4	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
JC6	4 / 3 2 1	4 / 3 2 1	4 / 3 2 1	4 / 3 2 1	4 / 3 2 1
JC7	4 / 3 2 1	4 / 3 2 1	4 / 3 2 1	4 / 3 2 1	4 / 3 2 1
JC8	3 2 1	3 2 1	3 2 1	3 2 1	3 2 1
JC11	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
JC13	3 2 1	3 2 1	3 2 1	3 2 1	3 2 1

CPU Speed Selector: JK1, JK2

The 486 PCI AL1 supports 25, 33, 40, and 50 MHz CPUs, such as the following:

Speed		CPU Type
25MHz	Intel	486SX-25, 486DX-25, 486DX2-25, 486DX2-50
	AMD	486SX-25, 486DX-25, 486DX2-50
33MHz	Intel	486SX-33, 486DX-33, 486DX2-66,
		486SX SL-33, 486DX SL-33, 486DX2 SL-66
	AMD	486SX-33, 486DX-33, 486DX2-66
40MHz	AMD	486SX-40, 486DX-40
	Cyrix	M7-40

The 486 PCI AL1 uses an on-board clock generator, so there is no need to replace an oscillator to change the CPU speed. You just need to set jumpers JK1 and JK2 to select the frequency of the clock generator. See Figure 1-1 for the location of the jumpers.

The 486 PCI AL1 also provides power-saving functions for non S-series CPUs (CPUs without SL enhancement). When an event has not occurred for a specified period of time, systems running at 25/33 MHz automatically change to 8 MHz, and systems running at 40 MHz automatically change to 16 MHz.

Set JK1 and JK2 for the appropriate CPU speed as below.

CPU Speed Settings: JK1, JK2

Cache Size: JS1, JS2

The 486 PCI AL1 supports 128K or 256K of cache memory. You configure cache memory by installing 8K8, 32K8, or 64K8 SRAM chips in Data RAM sockets U20~U23 and U28~U31, and in Tag RAM socket U24, and then setting the cache jumpers JS1 and JS2. For 256K cache you can use eight 32K8 SRAM or four 64K8 SRAM. Note that the speed required for SRAM chips is 20ns.

Cache Size Selection and Memory Locations

Cache Size	Jumper Settings	Tag RAM (U24)	Data RAM (U20~U23)	Data RAM (U28~U31)
128K	`3 2 1` JS1 / JS2	8K8	32K8	None
256K (Default)	`3 2 1` JS1 / JS2	32K8	32K8	32K8
256K	`3 2 1` JS1 / JS2	32K8	64K8	None

Cache Chip Configuration

Sockets U20~U23 are 32-pin DIP sockets that can accept either 28-pin 32K8 SRAM or 32-pin 64K8 SRAM. Note that when you install 28-pin 32K8 SRAM in sockets U20~U23, make sure that you insert the SRAM starting from the bottom of the socket — the four empty pin holes should appear at the top of the socket.

128K Cache Size Using 32K8 SRAM

U24 — U23 U22 U21 U20
8K×8 TAG
32K×8 × 4 — BANK 0 32-pin DIP Sockets
Empty × 4 — BANK 1 28-pin DIP Sockets
U31 U30 U29 U28

256K Cache Size Using 32K8 SRAM

U24 — U23 U22 U21 U20
32K×8 TAG
32K×8 × 4 — BANK 0 32-pin DIP Sockets
32K×8 × 4 — BANK 1 28-pin DIP Sockets
U31 U30 U29 U28

256K Cache Size Using 64K8 SRAM

U24 — U23 U22 U21 U20
32K×8 TAG
64K×8 × 4 — BANK 0 32-pin DIP Sockets
Empty × 4 — BANK 1 28-pin DIP Sockets
U31 U30 U29 U28

VL-Bus Jumpers: JV1, JV2, JV3

Jumpers JV1~JV3 set the VL-Bus for use with the CPU speed.

JV1, JV2, JV3 Settings

CPU Speed	JV1	JV2	JV3
< = 33 MHz (Default)	3 2 1	3 2 1	3 2 1
> 33 MHz	3 2 1	3 2 1	3 2 1

Note: *If you plug a VL Slave VGA card into VL Slot #2 at a CPU speed of 40 MHz or 50 MHz, and the system hangs up, or there is no display at power-on, you can try shorting pins 2-3 of jumper JV3.*

PCI Bus Selectors: JP4, JP6, JP12

The 486 PCI AL1 provides three PCI slots on board. You can use any slot as a Master or Slave. The system board uses three jumpers — JP4, JP6 and JP12 — to set interrupts for PCI add-on cards. See Figure 1-1 for slot and jumper locations.

Using PCI Slot #2 (PCI2)

The chipset of the 486 PCI AL1 conforms to PCI Spec 2.0 requirements for PCI interrupts (INTA#, INTB#, INTC#, INTD#) and only supports Low-active Level Sensitive Interrupt. However, since many PCI IDE cards on the market are designed for Edge Sensitive Interrupt, the 486 PCI AL1 provides slot PCI2 for this type of card.

To configure the system for use with a PCI card that uses Edge Sensitive Interrupt, first go to the **PCI Device** screen in the BIOS Advanced System Setup and set the "PCI Device, Slot #2" items **IRQ** line to [None], and **Enable Device** to [Disabled]. Then set the system board's jumper JP12 for either **Falling-edge** Sensitive Interrupt (short pins 2-3) or **Rising-edge** Sensitive Interrupt (short pins 1-2).

Notes:

1. **Falling-edge** Sensitive Interrupt must first pass the system board's Inverter Gate to conform with the ISA Style Interrupt, which is why you short pins 2-3 of jumper JP12.

2. **Rising-edge** Sensitive Interrupt already conforms with the ISA Style Interrupt and passes directly through the ISA IRQ Line, which is why you short pins 1-2 of jumper JP12.

PCI2 (PCI slot #2)	JP4	JP12	BIOS Setup Limitation for PCI2
PCI IDE controller card using Rising-edge Sensitive Interrupt		1 2 3	Enable Device: [Disabled or Enabled] * Enable Master: [Disabled] IRQ Line: [None]
PCI IDE controller card using Falling-edge Sensitive Interrupt (Default)		1 2 3	Enable Device: [Disabled or Enabled] * Enable Master: [Disabled] IRQ Line: [None]
PCI IDE controller card using Low-Active Level Trigger Interrupt		1 2 3	Enable Device: [Disabled or Enabled] * Enable Master: [Disabled] IRQ Line: [IRQ14]
PCI IDE controller card using Low-Active Level Trigger Interrupt		1 2 3	Enable Device: [Disabled or Enabled] * Enable Master: [Disabled] IRQ Line: [None]
No PCI IDE add-on card		1 2 3	Depends on the add-on card Enabled/Disabled Device or Master and IRQ line

* Depends on whether the add-on card is a true PCI device. For an add-on card that is a true PCI device, set Enable Device to [Enabled], otherwise set it to [Disabled].

Using PCI Slot #1 (PCI1)

The Phoenix BIOS allocates AD-17 as PCI1 slot's IDSEL# signal for NCR 53C810 PCI SCSI Controller Cards.

For cards other than NCR 53C810 PCI SCSI Controller Cards AD-19 is used as PCI1 slot's IDSEL# signal.

Set JP6 depending on the type of card as below.

JP6

1 ■ —— AD-19
2 ■
3 ■ —— AD-17

PCI1 (PCI slot #1)	JP6
NCR 53C810 PCI SCSI Controller Card (Default)	1 2 3
Non - NCR 53C810 PCI SCSI Controller Card	1 2 3

Examples of PCI Configuration

The following examples show how to configure the 486 PCI AL1 for use with common PCI cards.

MS-4803 PCI IDE Card

1. Set the MS-4803 card for use with Low-Active Sensitive Level Trigger.

2. Insert the MS-4803 card into PCI2 (PCI slot #2) on the system board.

3. Short pins 2-3 of jumper JP12 on the system board.

4. In the BIOS Advanced System Setup, go to the PCI Devices screen and set two items under **PCI Device , Slot #2** as follows:

      Enable Device: [Enabled]
      IRQ line: [None]

Chaintek PCI IDE Card or TEKRAM PCI IDE Cache Controller Card

1. Set the PCI IDE card for use with INTA#.

2. Insert the PCI IDE card into PCI2 (PCI slot #2) on the system board.

3. Short pins 2-3 of jumper JP12 on the system board.

4. In the BIOS Advanced System Setup, go to the PCI Devices screen and set two items under **PCI Device , Slot #2** as follows:

      Enable Device: [Disabled]
      IRQ line: [None]

DRAM Module Configuration

The 486 PCI AL1 system board supports four memory banks using three SIMM banks: SIMM 0, SIMM 1, and SIMM 2.

SIMM 0 consists of four 30-pin DRAM module sockets. Each socket accepts a 256K, 1M, 4M, or 16M DRAM module.

SIMM 1 / SIMM 2 consists of two 72-pin DRAM sockets. Each socket accepts a single-sided or double-sided 1M, 4M, 8M, 16M, or 32M DRAM module.

You can install DRAM modules in the SIMM banks in any order and combination, except for the following restriction: *If SIMM 0 is installed with 30-pin DRAM modules, then you can only install a Single density (single-sided) DRAM in SIMM 2.*

Maximum installed memory is SIMM 0 (64MB) + SIMM 1 (32MB) + SIMM 2 (16MB) = 112 MB on-board.

See Table 2-1 below for possible configurations.

SIMM 0	SIMM 1	SIMM 2
Installed	—	—
Installed	Single or Double density DRAM modules	Single density DRAM module
—	Single or Double density DRAM modules	Single or Double density DRAM modules
—	—	Single or Double density DRAM modules

Table 2-1. Memory Configurations

Green PC Hot Key Connector: JG1

Attach a power saving switch (hot key) to this connector. When the hot key is pressed, the system goes immediately into power saving mode. Press the hot key again and the system wakes up, returning to normal.

Note: If the system's Power Saving Mode is set to Disabled, this hot key does not function.

Green Monitor Power Connector: JG2

The 486 PCI AL1 provides Green Monitor Power On/Off Control functions. Shutting the monitor power off as the system goes into power saving mode greatly reduces the amount of power consumed. To use the Green Monitor Power functions:

1. Your system's SMPS (Switching Mode Power Supply) must support the Active Low signal, during which the SMPS shuts off the monitor power.

2. Your monitor's power cord must be plugged into the SMPS.

2   1

□ □   **JG2**

─   +

Figure 2-1. Green Monitor Power Control Connector

Green PC LED Connector: JG3

You can attach an LED — such as on the front panel of a system case — to this connector, to let you know when the system is in power saving mode.

When the system's power saving mode is **Enabled**, the LED connected to JG3 **flashes** when the system enters power saving mode, and it shuts off when the system is exits power saving mode.

When the system's power saving mode is **Disabled**, the LED connected to JG3 is always **off** when the system is running in Turbo mode, and it is always **on** when the system is running in non-Turbo mode.

Note: For another power saving LED, refer to Case Connector Block JP10 pins 4-5.

─   +

□ □   **JG3**

2   1

Figure 2-2. Green PC LED Connector

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 2-3. Attaching Power Supply Connectors

Connector Pin Description

Pin	Description		Pin	Description	
1	Power Good	(orange)	1	Ground	(black)
2	+5V DC	(red)	2	Ground	(black)
3	+12V DC	(yellow)	3	-5V DC	(white)
4	-12V DC	(blue)	4	+5V DC	(red)
5	Ground	(black)	5	+5V DC	(red)
6	Ground	(black)	6	+5V DC	(red)

Case Connector Block: JP10

The Turbo LED, Turbo switch, Hardware Reset, Keylock, Power LED, and Speaker are all connected to the JP10 Connector Block as shown below. See Figure 1-1 for the connector block's location.

JP10: Case Connector Block

Figure 2-4. Case Connector Block - JP10

External Battery Connector: JB

A battery must be used to retain the system board configuration in CMOS RAM. Use either the on-board rechargeable battery or an external battery. If you use the on-board rechargeable battery you must short pins 2-3 of JB. For an external battery, the battery's cable connector attaches to pins 1 and 4 of JB. See Figure 1-1 for the connector's location.

JB: *External Battery Connector*

```
1  [■]  GND            1  ┌─┐         ┌──────────┐
2  [■]  +3.6V (output) 2  │■│         │    ─     │
3  [■]  +3.6V (Input)  3  │■│         │  DC 6V   │
4  [■]  +6V (input)    4  │■│         │    +     │
                          └─┘         └──────────┘
```

Jumper Setting for   **External Battery**
using on-board Battery   **Connection**

Figure 2-5. Setting the External Battery Connector - JB

Keyboard Connector: J1

Plug a keyboard cable directly into this standard five-pin female DIN connector. Figure 1-1 shows connector location.

CPU Heat Sink Fan Power Connector: JP9

Attach the cable from a CPU heat sink fan onto this connector. For a +12V fan attach the cable to pins 3-4. For a +5V fan attach the cable to pins 1-2. Figure 1-1 shows connector location.

```
       4    3    2    1
     ┌────┬────┬────┬────┐
     │ ■  │ ■  │ ■  │ ■  │
     └────┴────┴────┴────┘
     +12V GND  GND  +5V
```

Flash Memory Power Selector: JP20

Jumper JP20 selects power for Flash memory.

```
      +5V    +12V
     ┌────────────┐
     │ ■   ■   ■  │
     └────────────┘
      3    2    1
```

Set jumper JP20 as below.

Memory Type	JP20
+12V Flash Memory	■ [■ ■] 3 2 1
+5V Flash Memory	[■ ■] ■ 3 2 1
Normal EPROM	■ ■ ■ 3 2 1