

PCI54ST

V 1.0B



CE 950731FHH

94-LON-AQ-249

User's Manual

PCI54ST
User's Manual

NOTICE

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Chapter 1 Specifications

The PCI54ST is a high performance PCI system board. It's highly flexible in CPU frequency, L2 cache type and size, and main memory type and size. The main features are listed as following:

Main Processor

Intel Pentium 75/90/100/120/133/150/166

Process Upgrade

Intel P6 based Over Drive

L2 Cache

Size: 256K or 512K

Type: Pipelined Burst Synchronous module, Asynchronous module, or Discrete Asynchronous on board.

Main Memory

Up to 128MB total main memory

Supports 4, 8, 16 or 32MB SIMMs

Chip set

SiS 551X chip set

BIOS

Lincensed BIOS with additional features:

- . ISA Plug and Play (PnP) extension
- . Power management
- . NCR 53C810 SCSI BIOS
- . ADAPTEC 7850 SCSI BIOS

Expansion Slots

Four PCI slots

Four ISA slots

Chapter 2 Hardware Description

This chapter briefly describes each of the major features of the PCI54ST system board. The layout of the board is shown in *Figure 1* which shows the locations of the key components. The topics covered in this chapter are as follows:

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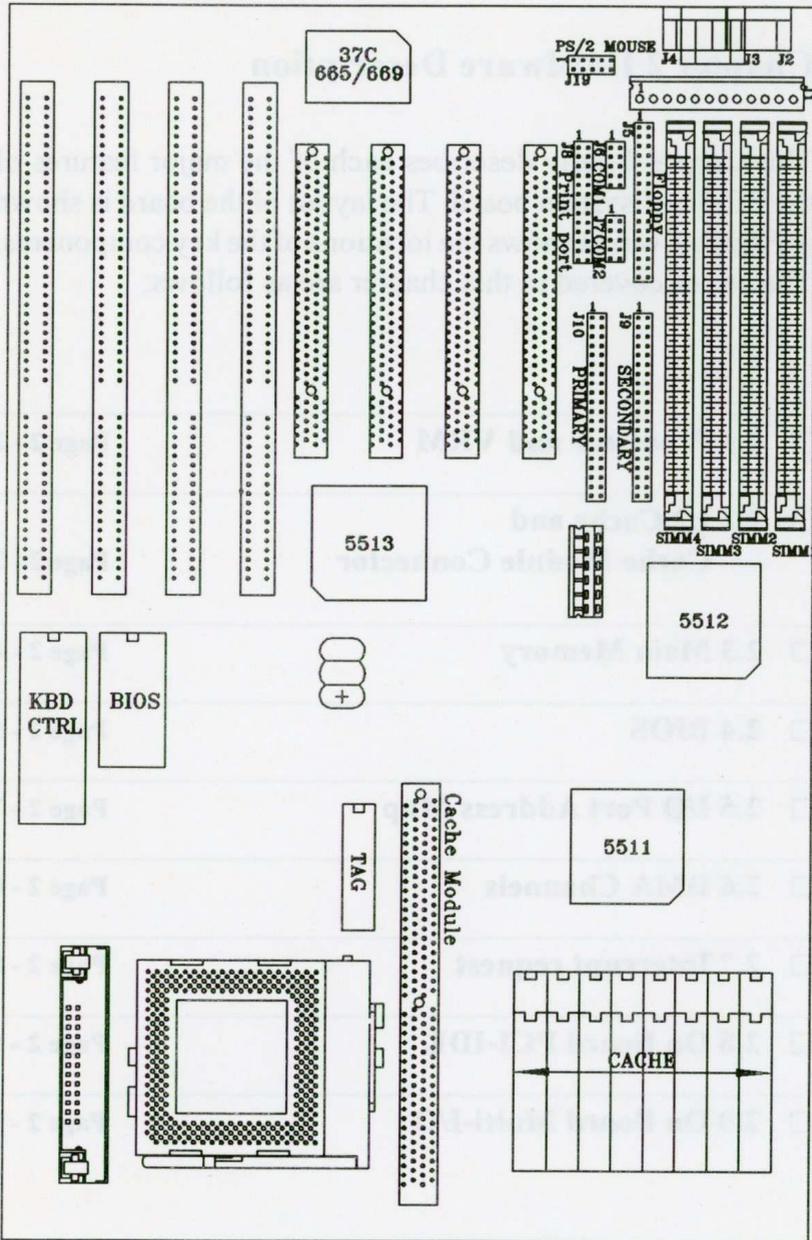


Figure 1: Layout of the PCI54ST

2.1 Processor and VRM

The PCI54ST is designed to take a PENTIUM Processor with bus speeds of 50, 60 and 66 MHz. Since the internal clock of the CPU can be multiples of 1.5 or 2 of the bus clock, the CPU frequency can be 75, 90, 100, 120, 133, 150 or 166. The VRM (Voltage Regulator Module) socket provides the support of CPUs requiring voltage other than 3.3V, such as 2.5V, and/or power consumption higher than 10 watts. One example is a P6 based Over Drive.

2.2 L2 Cache and Cache Module Connector

The PCI54ST supports both P.B. (Pipelined Burst) Synchronous Cache and Asynchronous Cache. The P.B. Synchronous Cache boosts the system performance 10% higher than regular Asynchronous Cache. There are four Cache configurations available and are shown in the following table:

Cache Size and Type	On Board Discrete	Cache Module
256K Asynchronous	Yes	Yes
512K Asynchronous	Yes	Yes
256K P.B. Synchronous	No	Yes
512K P.B. Synchronous	No	Yes

Note: The on board discrete and cache module can not co-exist.

2.3 Main Memory

The PCI54ST provides one 32bit (one piece SIMM) bank default SIMM2 or SIMM4 & two 64bit bank **Bootable** (SIMM1 & SIMM2 or SIMM3 & SIMM4) Support 32bit (one SIMM) and 64bit (two SIMMs) system boot. Each bank consists of two SIMMs, SIMM1/SIMM2 (Bank0) and SIMM3/SIMM4 (Bank1).

The following are the important factors for populating the SIMM sockets:

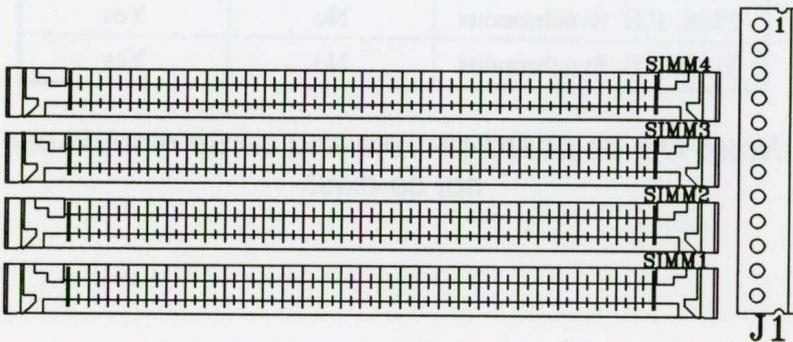
1. Each bank should consist of same size of SIMMs.

ex: SIMM1 and SIMM2 or SIMM3 and SIMM4 should be the same size of SIMMs

2. SIMM can be with (x36) or without (x32) parity.

3. A 1Mx32 SIMM has memory size of 4MB.

Memory configuration consist in SIMM2 or SIMM4 (32bit) will provide a total 4MB main memory else of SIMM1 & SIMM2 or SIMM3 & SIMM4 will a provide total 8MB main memory.



Available memory configurations are shown in the following table:

Bank 0		Bank 1		Total Memory
SIMM1	SIMM2	SIMM3	SIMM4	
----	4MB	----	----	4MB
----	----	----	4MB	4MB
----	8MB	----	----	8MB
----	----	----	8MB	8MB
4MB	4MB	----	----	8MB
----	----	4MB	4MB	8MB
----	16MB	----	----	16MB
----	----	----	16MB	16MB
8MB	8MB	----	----	16MB
----	----	8MB	8MB	16MB
4MB	4MB	4MB	4MB	16MB
8MB	8MB	4MB	4MB	24MB
4MB	4MB	8MB	8MB	24MB
----	32MB	----	----	32MB
----	----	----	32MB	32MB
16MB	16MB	----	----	32MB
----	----	16MB	16MB	32MB
8MB	8MB	8MB	8MB	32MB
4MB	4MB	16MB	16MB	40MB
16MB	16MB	4MB	8MB	40MB
8MB	8MB	16MB	----	48MB
16MB	16MB	8MB	32MB	48MB
32MB	32MB	----	16MB	64MB
----	----	32MB	32MB	64MB
16MB	16MB	16MB	4MB	64MB
4MB	4MB	32MB	32MB	72MB
32MB	32MB	4MB	8MB	72MB
8MB	8MB	32MB	32MB	80MB
32MB	32MB	8MB	8MB	80MB
16MB	16MB	32MB	32MB	96MB
32MB	32MB	16MB	16MB	96MB
32MB	32MB	32MB	32MB	128MB

2.4 BIOS

The BIOS on the PCI54ST system board provides standard BIOS functions plus the following additional features:

1. ISA Plug and Play (PnP) extension.

Unlike PCI cards which are plug and play, ISA cards require setting jumpers to resolve hardware conflict. To make a computer system PnP, ISA PnP standard is established and supported by the new Oses, such as Windows 95. Under Windows 95, the system board BIOS must have ISA PnP extension to support new ISA PnP cards.

2. Power management

The power management feature provides power saving by slowing down the CPU clock, turning-off the monitor screen, and stopping the HDD spindle motor.

3. NCR 53C810 & ADAPTEC AIC-7850 SCSI BIOS

NCR 53C810 is a PCI SCSI shipped from NCR. ADAPTEC AIC-7850 is a PCI SCSI shipped from ADAPTEC. The BIOS required to run the card with a 53C810 chip & AIC-7850 is built-in the system BIOS. The BIOS will automatically detect the existence of a 53C810 & AIC-7850 chip and configure it accordingly.

2.5 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port address which also becomes the identity of the device. There are a total of 1K port address space available. The following table lists the I/O port address used on the system board.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
378h - 3FFh	Parallel Port #1(LPT1)
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

2.6 DMA Channels

There are seven DMA Channels available on system board. Only DRQ2 is used by the floppy controller. In the case that ECP mode on parallel port is used, DRQ1 or DRQ3 will be used.

2.7 Interrupt Request (IRQ)

There are a total of 15 IRQ available on the system board. The peripheral device use interrupt request to notify CPU for the service required. the following table shows the IRQ used by the devices on the system board:

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	80486 FPU
IRQ14	Primary IDE
IRQ15	Secondary IDE
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Resened
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1

2.8 On board PCI-IDE

The on board PCI-IDE controller is a SiS82C5513 Enhanced IDE controller. It supports two IDE connectors and up to four IDE drives. A complete set of drivers to support 32-bit mode operations under popular OSes are provided in a diskette.

2.9 On Board Multi-I/O

The on board multi-I/O chip SMC37C665 or SMC37C669 (manufacture default SMC37C665) provides two serial ports, one parallel port, and one floppy controller. The serial ports are 16550 UART compatible. The parallel port supports high speed EPP/ECP mode. The floppy controller supports up to 2.88 MB format. The I/O port addresses of the serial and parallel ports are programmable via BIOS set-up. Each I/O can be individually disabled as well.

NOTES

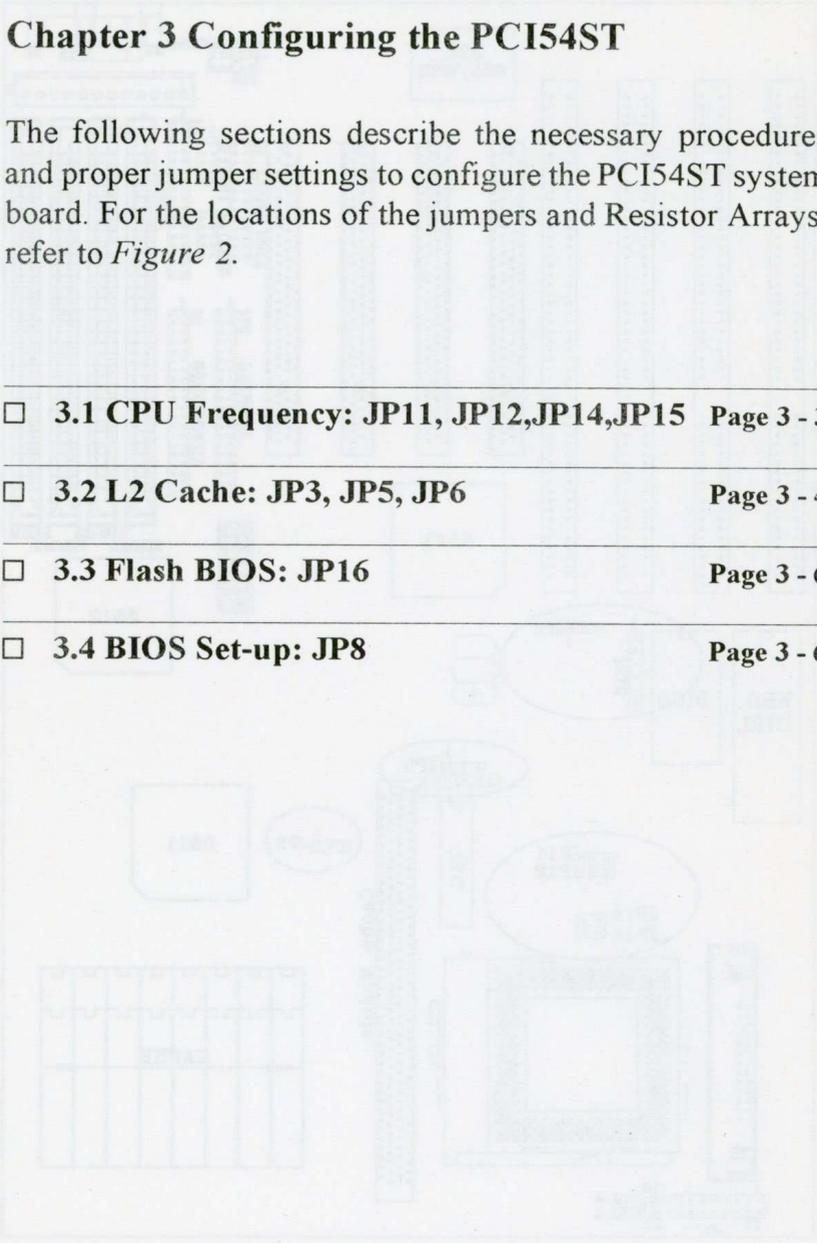
The on-board PCI-IDE controller is a SiS82C513 Enhanced IDE controller. It supports two IDE connectors and up to four IDE drives. A complete set of drivers to support 32-bit mode operations under popular OSes are provided in a diskette.

2.9 On Board Multi-IO

The on-board multi-IO chip (SMC37C65 or SMC37C65) (manufactured by SMC37C65) provides two serial ports, one parallel port, and one floppy controller. The serial ports are 16550 UART compatible. The parallel port supports high speed EPP/ECP mode. The floppy controller supports up to 3.85 MB format. The I/O port addresses of the serial and parallel ports are programmable via BIOS set-up. Each I/O can be individually disabled as well.

Chapter 3 Configuring the PCI54ST

The following sections describe the necessary procedures and proper jumper settings to configure the PCI54ST system board. For the locations of the jumpers and Resistor Arrays, refer to *Figure 2*.

-
- | | |
|---|-------------------|
| <input type="checkbox"/> 3.1 CPU Frequency: JP11, JP12, JP14, JP15 | Page 3 - 3 |
| <input type="checkbox"/> 3.2 L2 Cache: JP3, JP5, JP6 | Page 3 - 4 |
| <input type="checkbox"/> 3.3 Flash BIOS: JP16 | Page 3 - 6 |
| <input type="checkbox"/> 3.4 BIOS Set-up: JP8 | Page 3 - 6 |
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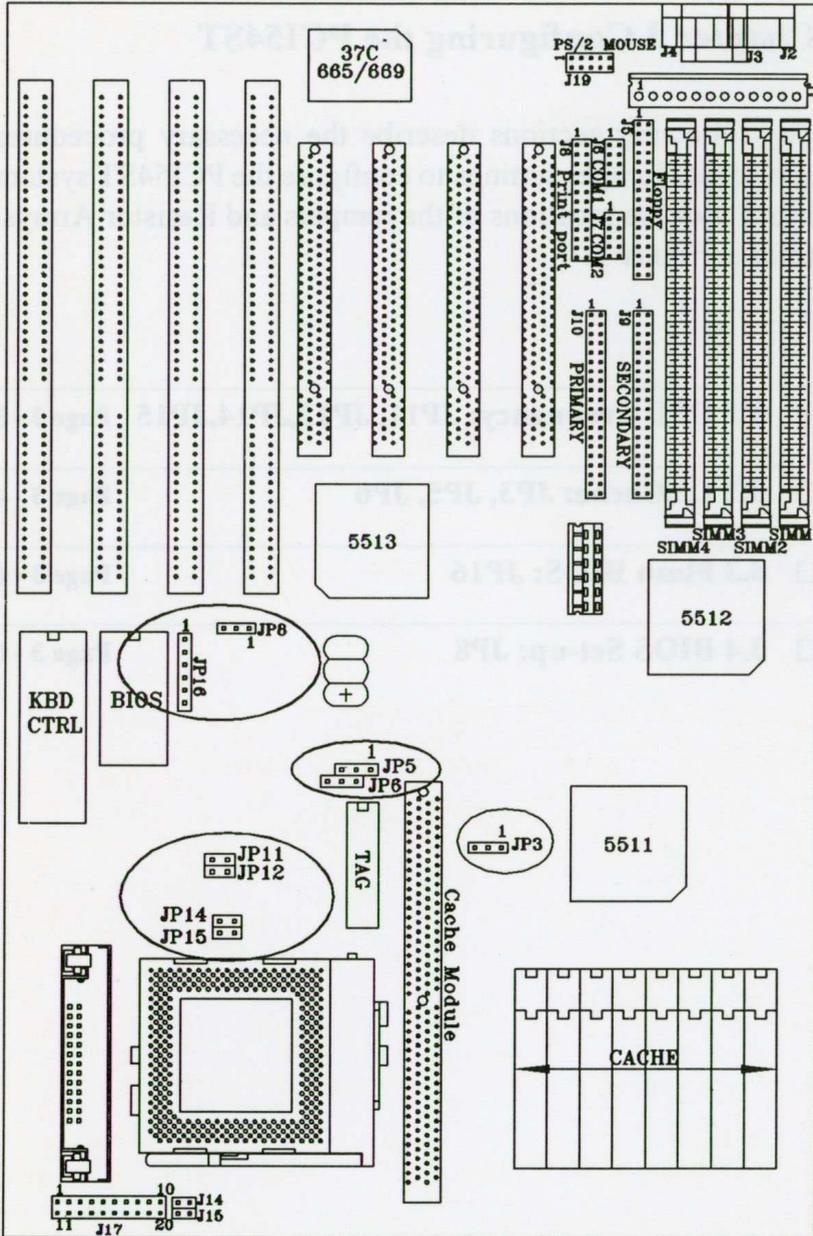


Figure 2: Jumper locations of the PCI54ST

3.1 CPU Frequency: JP11,JP12,JP14,JP15

JP11 and JP12 set the clock generator frequency to be 50, 60, or 66MHz. JP14 & JP15 sets the ratio of CPU internal clock, which is the frequency of the CPU, to the bus clock. Refer to the following table for the correct setting to match the CPU frequency.

Clock Select		
Clock	JP11	JP12
66MHz	Short	Short
60MHz	Open	Short
50MHz	Open	Open

CPU Clock					
JP14	JP15	JP14	JP15	JP14	JP15
Open	Open	Open	Short	Short	Short
100MHz		133MHz		166MHz	
90MHz		120MHz		150MHz	
75MHz		-----		-----	

3.2 L2 Cache: JP3 & JP5, JP6

The PCI54ST provides various L2 cache configuration. The on board discrete sockets accommodate 256KB or 512KB Asynchronous cache. The cache module connector supports both P.B. [Note 2] Synchronous and Asynchronous cache module.

Key factors in configuring the L2 cache:

1. Jumper setting should be set correctly to match the cache installed
2. Cache type selection in the BIOS set-up should reflect the type installed or no cache
3. The size of cache that is functioning will automatically be detected by the BIOS.

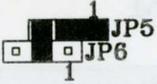
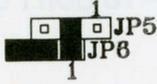
Cache module type selection: JP3

JP3	Module Type
1 - 2	Async SRAM
2 - 3	Sync SRAM (Burst/Pipe-Burst)

Note: 1. This Jumper applies to cache modules only

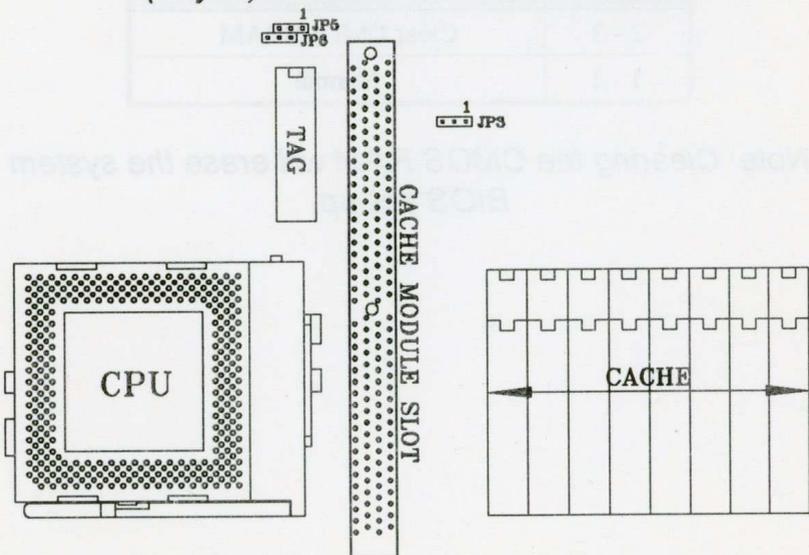
2. P.B.: Pipeline burst.

On board cache size selection: JP5, JP6

Cache Size Select			
Cache Size	JP5, JP6	Tag RAM (U20)	Date RAM
256K		8Kx8	32Kx8
512K		16Kx8	64Kx8
1M		32Kx8	128Kx8

Note: 1. These Jumpers Setting For L2 Cache (Sync/Async) SRAM.

2. Data RAM location: U4, U5, U6, U8, (Async) SRAM U10, U11, U13, U14.



3.3 Flash BIOS: JP16

Depending on the manufacturer and model, the programming voltage of the flash ROM can be 5V or 12V. This jumper should **not** be altered unless the flash BIOS is being replaced with a different type of flash ROM.

JP16	Flash Type
1 - 2	12V programming
2 - 3	5V programming

** SST Flash ROM JP16 don't care.*

3.4 BIOS Set-up: JP8

JP8 control BIOS set-up related options. The function of each jumper is listed in the following tables:

JP8	ON
2 - 3	Clear CMOS SRAM
1 - 2	Normal

Note: Clearing the CMOS RAM will erase the system BIOS set-up.

Chapter 4 Installation

This chapter describes the interface that the PCI54ST provides for creating a working system. Refer to *Figure 3* for the location of the connectors.

The following items are covered in this chapter:

-
- | | | |
|--------------------------|---------------------------------------|-------------------|
| <input type="checkbox"/> | 4.1 Power Supply Connector: J1 | Page 4 - 3 |
|--------------------------|---------------------------------------|-------------------|
-
- | | | |
|--------------------------|---|-------------------|
| <input type="checkbox"/> | 4.2 Keyboard /PS/2 Mouse Connectors:
J2, J3, J4, J19 | Page 4 - 5 |
|--------------------------|---|-------------------|
-
- | | | |
|--------------------------|----------------------------|-------------------|
| <input type="checkbox"/> | 4.3 I/O Connectors: | Page 4 - 7 |
| | IDE: J10, J9 | |
| | Floppy: J5 | |
| | Parallel port: J8 | |
| | Serial port: J6, J7 | |
-
- | | | |
|--------------------------|--|-------------------|
| <input type="checkbox"/> | 4.4 Front Bezel Connectors: J17, J15, J14 | Page 4 - 8 |
|--------------------------|--|-------------------|
-
- | | | |
|--------------------------|--------------------------------------|-------------------|
| <input type="checkbox"/> | 4.5 How to install IDE Driver | Page 4 - 9 |
|--------------------------|--------------------------------------|-------------------|

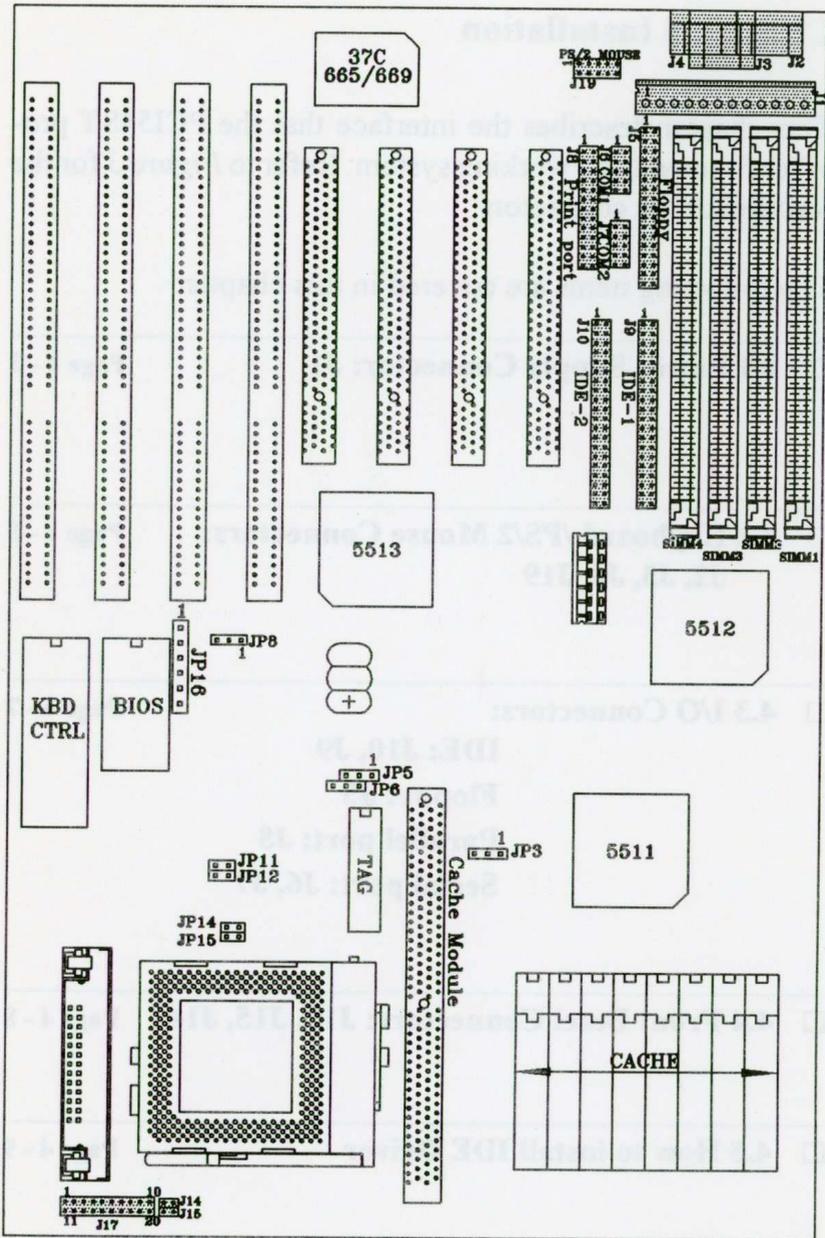


Figure 3: Connector locations and orientation

4.1 Power Supply Connector: J1

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

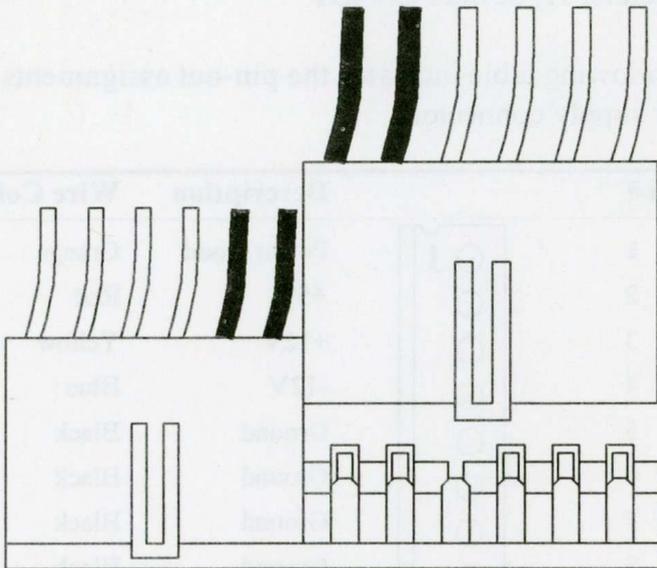
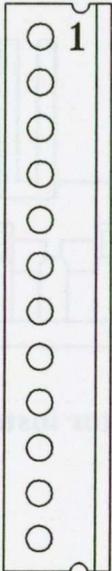


Figure 4: Power connector installation

When using an AT compatible power supply, plug both of the power supply connectors into J1.

Make sure the power supply connectors are connected in the right orientation. The power supply connectors are connected in the right orientation if the black wires of each power cable are ADJACENT to each other. That is, black wires of each connector should be aligned in the center of the power supply connectors, J1, of the PCI54ST.

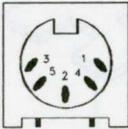
The following table indicates the pin-out assignments of the power supply connectors.

J1 Pin #		Description	Wire Color
1		Power Good	Orange
2		+5V	Red
3		+12V	Yellow
4		-12V	Blue
5		Ground	Black
6		Ground	Black
7		Ground	Black
8		Ground	Black
9		-5V	White
10		+5V	Red
11		+5V	Red
12		+5V	Red

4.2 Keyboard/Mouse Connector: J2, J3, J4, J19

There are two configuration available on PCI54ST, an AT keyboard or PS/2 keyboard and mouse.

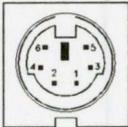
J3: AT keyboard connector; A five- pin female keyboard connector is located at the rear of the board plug the keyboard jack into this connector.



J3: AT Keyboard

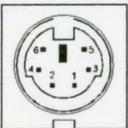
J3 Pin#	Function
1	Keyboard Clock
2	Keyboard Data
3	N.C.
4	Ground
5	VCC

NOTE : Manufacture Default



J2: PS/2 Keyboard

J2 Pin#	Function
1	Data
2	N.C.
3	GND
4	5V
5	Clock
6	N.C.

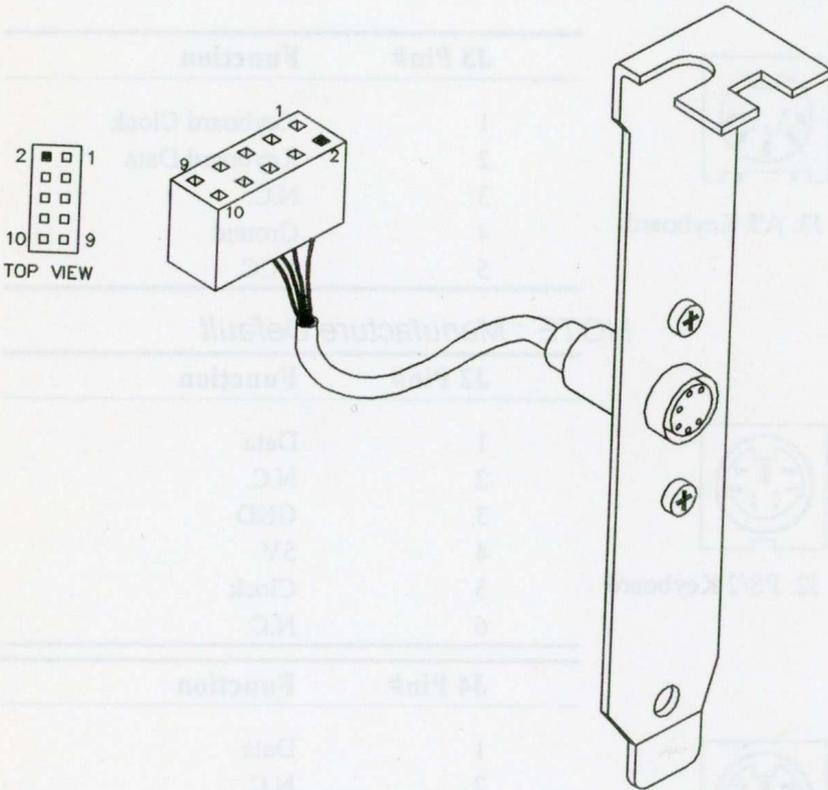


J4: PS/2 Mouse

J4 Pin#	Function
1	Data
2	N.C.
3	GND
4	5V
5	Clock
6	GND

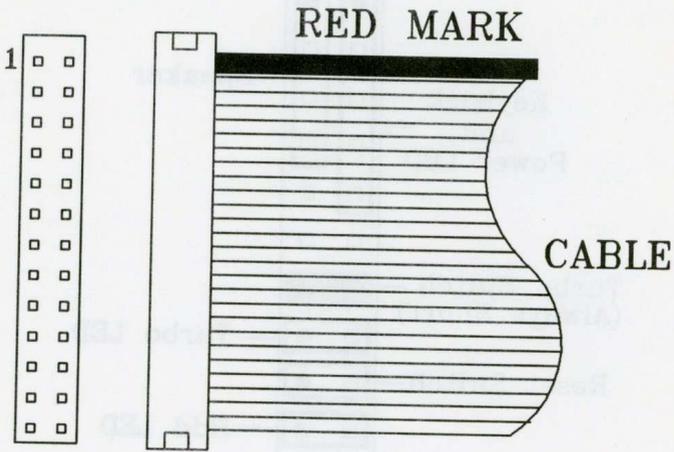
PS/2 Mouse Connector: J19

A ten-pin male connector from the PS/2 mouse cable directly into the board connector, while making sure easy to connection.



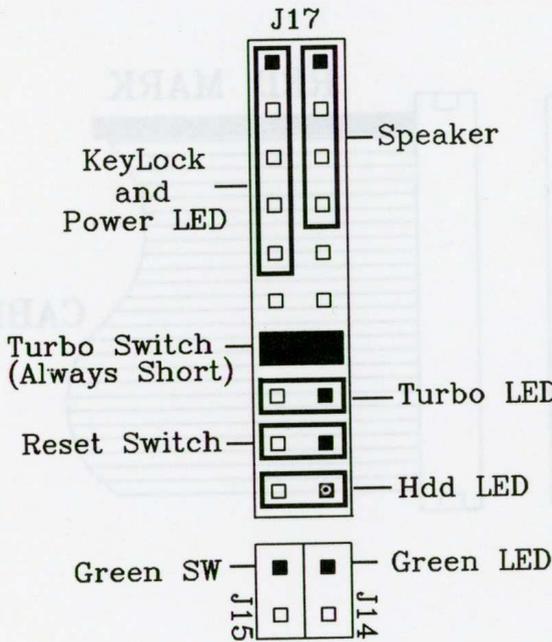
4.3 I/O Connector

The I/O connectors connect PCI54ST to the most common peripherals. To connect cables to these connectors, align carefully Pin 1 of the cables to that of the connectors. Refer to Figure 3 for the location and orientation of the connectors.



4.4 Front Bezel Connectors

The front bezel of the case has a control panel which provides the light indication of the computer activities and switches to change the computer status. See the following diagram for the location of each connector.



4.5 How to install IDE Driver

- **Install "DOS IDE device & Windows 3.1 IDE device" driver**

Put IDE driver diskette into Floppy driver in **DOS mode**

SETPI: A:>install

```
IDE DEVICE DRIVER INSTALL UTILITY  Ver 1.05
Copyright (C) Silicon Integrated System Corp. 1995.
All Rights Reserved.
```

```
Current Setup Information: IO Port = 1F0. IRQ Line= 14
```

```
Format Utility   Install Driver   Setup   Help   DOS Shell
```

Press [ESC] Quit.

SETP2: Move Arrow key  to "Install Driver" (highlight) press "ENTER" key.

SETP3: Select you want install item move Arrow key  or  then press "ENTER" key, that will doing install.

IDE DEVICE DRIVER INSTALL UTILITY Ver 1.05
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Current Setup Information: IO Port = 1F0. IRQ Line= 14

Format Utility Install Driver Setup Help DOS Shell

Select Work Item

- Install DOS IDE Device Driver.
- Install OS/2 2.x-3.x IDE Device Driver.
- Install Netware 3.11 IDE Device Driver.
- Install Netware 3.12-4.x IDE Device Driver.
- Install Windows 3.1 IDE Device Driver.
- Install Windows NT 3.x IDE Devive Driver.
- Install SCO Unix Device Driver.

Press [ESC] Quit.

SETP4:

(A) When you select "Install DOS IDE Devivr Driver." will have message driver type for you selection, always select "Slave PIO IDE driver". If you want to choice "Master DMA IDE driver, please check hard disk must be "DMA mode".

(B) When you move Arrow key  to "*Insatll windows 3.1 IDE Device Driver*" *also the same setp as "Install DOS IDE Device Driver"*.

```

IDE DEVICE DRIVER INSTALL UTILITY   Ver 1.05
Copyright (C) Silicon Integrated System Corp. 1995.
All Rights Reserved.
  
```

```

Current Setup Information: IO Port = 1F0. IRQ Line= 14
Format Utility   Install Driver   Setup   Help   DOS Shell
  
```

Select Work Item

```

In  Driver Type           Driver.
In  Slave PIO IDE driver   ice Driver.
In  Master DMA IDE Driver  ce Driver.
Install Netware 3.12-4.x IDE Device Driver.
Install Windows 3.1 IDE Device Driver.
Install Windows NT 3.x IDE Devive Driver.
Install SCO Unix Device Driver.
  
```

Work information

```

Modify config.sys file.....
driver Installed...
Original config.sys is backedup to config.sis
Press any key to continue
  
```

Press [ESC] Quit.

■ **Install SIS IDE driver for OS/2.**

When you select "Install OS/2 2.x-3.x IDE Device Driver" . For a while display "Step by step", "SiS IDE Driver installation for OS/2" message, please follow-up this message step by step.

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Current Setup Information: IO Port = 1F0. IRQ Line= 14

Format Utility Install Driver Setup Help DOS Shell

Step by step

SIS IDE Driver Installation For OS/2

1. From the OS/2 desktop, open OS/2 system.
2. Open System Setup.
3. Select Device Driver Install.
4. Put the driver floppy disk in A:
5. ChangeSource Directory to A:OS2
6. Select Install
7. Select OK.
8. Default Transfer Mode is Slave PIO
9. Add /M option in CONFIG.SYS to enable Master DMA Mode

Press [ESC] Quit.

Step1: From the OS/2 desktop, open OS/2 system.

Step2: Open system setup.

Step3: Insert the driver floppy disk in A:

OS/2 Device Driver Installation	
Source directory	A:OS/2
<input type="button" value="CHANGE"/>	
Destination directory	C:
<input type="button" value="CHANGE"/>	
<input type="button" value="Install"/>	<input type="button" value="Exit"/> <input type="button" value="Help"/>

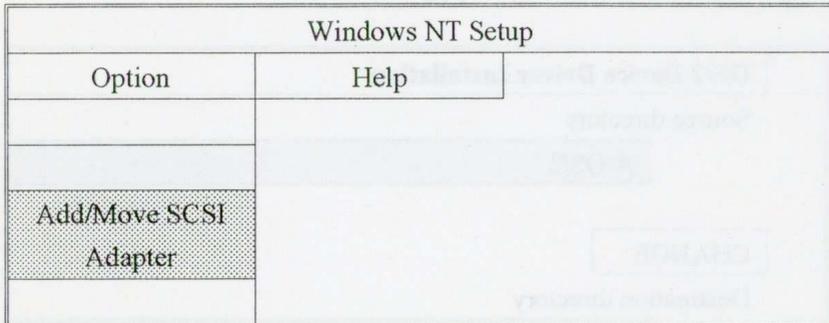
Step5: Change source director to A:OS2

Step6: Select "Install"

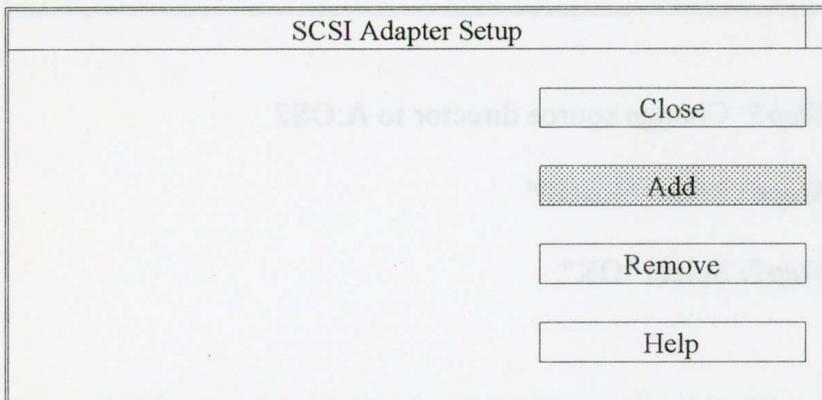
Step7: Select "OK"

■ **Install SIS IDE driver for *Windows NT***

Step1: From the Option Menu in "Windows Nt Setup", choose "Add/Remove SCSI Adapter."

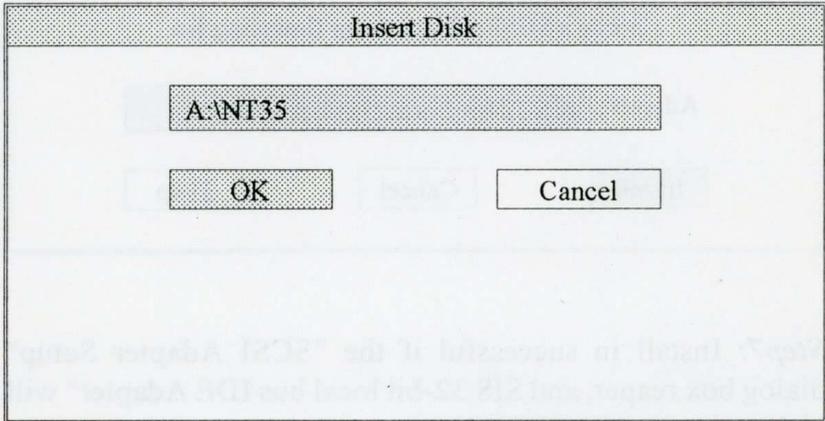


Step2: In the SCSI Adapter Setup dialog box, choose the "ADD" button.



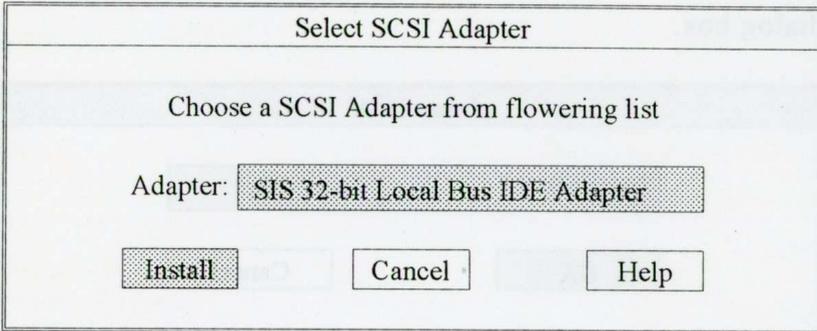
Step3: In the "Adapter" list dialog box, choose "other (requires a disk from hardware manufacture)"

Step4: Next, you will see the "Insert diskette" dialog box, insert the SIS driver disk into Driver A and type "A:\NT31 (for Version 3.1) or A:\NT35 (for Version 3.5) into to the dialog box.



Step5: Next, in "Select OEM Option" dialog, choose "SIS 32-bit Local Bus IDE Adapter" and click "OK" button.

Step6: Next, in the "Select SCSI Adapter Option" dialog box, click on the "Insatll" button in the dialog box.



Step7: Install in successful if the "SCSI Adapter Setup" dialog box reaper, and SIS 32-bit local bus IDE Adapter" will be listed as an installed driver.

Step8: Reboot your System.

Step9: "Wait for a moment." Windows NT IDE driver check system then complete doing it.

■ Installing **SCO UNIX 3.2.x** device driver for SIS IDE Adapter

First, install SCO UNIX 3.2.4.x or SCO Desktop 2.x using the default SCO IDE driver.

Step1: Boot your SCO UNIX system and bring it into single-user mode.

Step2: Use `discp` command to copy the file `sis.tar` to your `/tm` pdirectory.

e.g. if you are using floppy drive A, type `discp A:/SCO/SISIdes.tar/tmp`

Step3: have a SCO UNIX-formatted diskette ready.

Step4: From root, type the followong commands `mkdir /sis`
`cd /sis`
`tar xvf /tmp /siside.tar`

Step5: Now, insert the diskette into the drive and issue the following command

```
tar cvf /dev/(your floppy drive 0 device name).
```

Your floppy drive 0 device name could be:

<code>rfd096ds15</code>	-	5.25 DSHD
<code>rfd0135ds18</code>	-	3.5 DSHD
<code>rfd048ds9</code>	-	5.25 DSHD
<code>rfd0135ds9</code>	-	3.5 DSHD

Step6: You are now ready to install the driver package for SiS 496/7 IDE Driver Start the insatllation by typing

custom

Step7: Follow the instruction to install the SiS IDE Drivr to system.

The new kernel will be built and the original kernel will be renamed to unix.old

Step8: Reboot your system for the new kernel to take effect. The new kernel should initialize the chip to the new timing setting.

