Intel 430TX PCI Chipset Intelligent MAIN BOARD

ATX586
for
Dual CPUs ATX Factor

TX2
for
AT Factor / Wide SCSI

USER'S MANUAL
version 1.0

UPDATE INFORAMTION

1) When you install ATX power supply, please connect CASE STANDBY to front panel connector CN9/JP9 , pin 19-20 Power On.   Then turn on ATX power supply.
2) The difference between TX2 and TX3 is that TX3 is without SCSI port/chip.   Others are the same.

CONTENT

Preface

Inside the Document

This document describes setup *ATX586* Dual Pentium Main Board with Intel 430TX PCI CHIPSET, resulting in **Ultra IDE** performance.

ATX586 is for ATX platform with dual processors design, including Enhance I/O chip (SMC 669 compatible). There is an option that installing "**82093AA**" supports **two Intel Pentium (MMX) CPU**, **said Dual Processors.** Under single processor, the user installs Intel Pentium 75-233Mhz, MMX, AMD K5/K6-PR 233, CYRIX CX6x86 200[+].

Excepting above mentioned, ATX586 is designed with *Auto Switching between 3.3v and 2.8v CPU (when you use single CPU only), front panel connector and Smart Jumper Setting for different CPU.*

The package for ATX586 including:
- ☑ ATX586 mother board
- ☑ Two IDE drive ribbon cable for 4 devices
- ☑ One Floppy ribbon cable for 2 devices
- ☑ One Ultra IDE device disk
- ☑ This user' s manual

Chapter 1 is about positions, jumpers and connectors for ATX586. Due to the board supports full range of Pentium CPU MMX 75Mhz-233Mhz, AMD K5/K6-PR233, CYRIX 6x86 CX 200[+] .

Chapter 2 is for BIOS setup. If you want to use external I/O card, you can disable the I/O function in BIOS and then install a card on slot. You also modify the COM1 and COM2 as COM3 and COM4 in BIOS. Finally, the BIOS is PnP function. It auto detects the PCI IRQ, ISA IRQ and HDD mode. Chapter 3 is for IDE DRIVER installation and how to upgrade BIOS.

(Chapter 4 is about positions, jumpers and connectors for TX2. Due to the board supports full range of Pentium CPU MMX 75Mhz-233Mhz, AMD K5/K6-PR233, CYRIX 6x86 CX 200$^+$.)

Simple features:

✧ Intel 430 TX PCISET. 82439TX System Controller (MTXC), 82371AB PIIX4 PCI to ISA / IDE Xcelerator, 82093AA I/O Advanced Programmable Interrupt Controller (IOAPIC).

✧ Compatible SMC 669 super I/O on board.

✧ Supports full range of Pentium Processor Family, up to Intel Pentium MMX-233Mhz, AMD K6-PR-233, CX 6x86 200$^{+.}$ There is an auto- switching mode from   3.3v to 2.8v.

✧ ***Installing (option) 82093AA to let the board supports two Intel Pentium or MMX CPU at the same board for ATX586. It is perfect to run the same voltage CPU!***

✧ Support SDRAM/EDO/Fast page DRAM, 72-pin SIMM socket * 4pcs, 168-pin DIMM socket * 2pcs.   2 pairs/4 banks up to 256MB.   6-1-1-1 for SDRAM; 5-2-2-2 for EDO; 6-3-3-3 for FP.

✧ 64-MB DRAM cacheability.   Direct Mapped organization-write back only.   Supports 256K and 512K Pipelined Burst SRAM.

✧ PCI V2.1 compatible. Concurrent PCI, enhanced CPU/PCI/ISA performance.

✧ Provides Multiprocessor Interrupt Management: dynamic interrupt distribution routing interrupt to the lowest priority processor; software programmable control of interrupt inputs; off loads interrupt related traffic from the memory bus.

- ✧ 24 Programmable Interrupts: 13 ISA supported; 4 PCI; 1 interrupt/ SMI# rerouting; 2 motherboard ; 1 interrupt used for INTR input; 3 general purpose; independently programmable for edge/level sensitivity interrupts; each interrupt can be programmed to respond to active high or low   inputs.
- ✧ 4 * 32-bit PCI, 4 * 16 bit ISA Slots for ATX586
- ✧ 2 * *Ultra EIDE*, support 4 IDE devices. EPP/ECP/SPP printer port. 2 * 16550 UART serial ports. PS/2 mouse port. IR, infrared, port, option for FIR, fast infrared.   2 * USB, universal serial bus, ports.
- ✧ IDE controller: Independent timing of up to 4 drives. PIO mode 4 transfers up to 14 Mbytes/sec. Supports "Ultra 33" synchronous DMA mode transfers up to 33 Mbytes/sec.   Integrated 8*32-bit buffer for IDE PCI Burst transfers.
- ✧ Dual Power Supply.   Has both AT and ATX power connectors on board to   support AT or ATX power supply with soft-on/off features.
- ✧ Built-in AWARD PCI/ISA Plug and Play Flash BIOS GREEN BIOS
- ✧ Two-mega flash recovery BIOS ROM.

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Chapter   1

Hardware
Installation For ATX586

1.1   One Jumper to Set CPU , Simple Jumper

No more CPU jumper setting   when you use **Single Processor**
   Intel 133Mhz,
   CYRIX 166+,
   AMD K5-133 CPU.
You just install CPU directly and Power On.   (At the moment, JP6: 1-2 and JP7: 2-3 SHORT; JP8/JP9: 1-2 SHORT)
A: Using **Intel** CPU (Ensuring JP8/JP9: 1-2 SHORT)

CPU Speed	JP6	JP7
Intel 100Mhz	1-2 SHORT	**1-2 SHORT**
Intel 166Mhz	**2-3 SHORT**	2-3 SHORT
Intel 200Mhz	**2-3 SHORT**	**1-2 SHORT**
Intel 233Mhz	1-2 SHORT	**1-2 SHORT**

B: Using **AMD** K5/K6 (Ensuring JP8/9: 1-2 SHORT)

CPU Speed	JP6	JP7
AMD K5-100	1-2 SHORT	**1-2 SHORT**
AMD K5/K6-PR-166	**2-3 SHORT**	2-3 SHORT
AMD K6-PR200	**2-3 SHORT**	**1-2 SHORT**
AMD K6-PR233	1-2 SHORT	**1-2 SHORT**

C: Using **CYRIX** 6x86 CPU (Ensuring JP6: 1-2 and JP7: 2-3 SHORT)

CPU Speed	JP8	JP9
CX 133+, 55Mhz	**2-3 SHORT**	**2-3 SHORT**
CX 150+, 60Mhz	**2-3 SHORT**	1-2 SHORT
CX 200+, 75Mhz	1-2 SHORT	**2-3 SHORT**

When you want to install two CPU, they are perfect are the same voltage 2.8v (P55C) or 3.3v(P54C).   Different voltage can't be used together. Installing the 1st CPU at U4 socket!

Map of ATX586 Mother Board
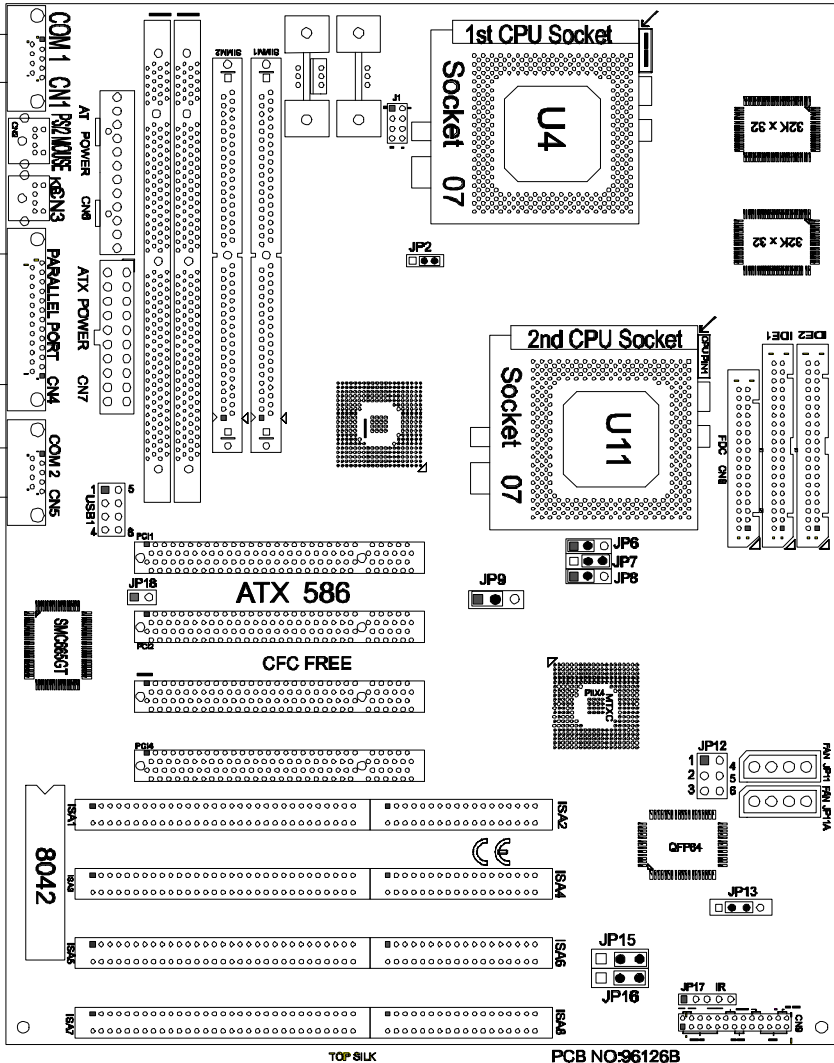
Default Setting for Intel Pentium 133Mhz,
AMD K5-133,CYRIX P166+ ,512K PB Cache

1.2   Two-Jumper Setting for CPU

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JP6/JP7: Set CPU External Bus Frequency Rate (BF1, BF0)
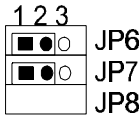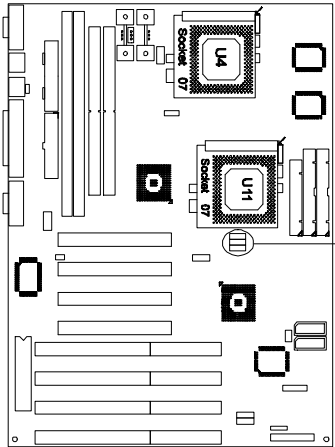
JP6/JP7: 1-2, SHORT for Intel 90/100Mhz, MMX 233Mhz, AMD K5 75-133, AMD K6 PR233Mhz
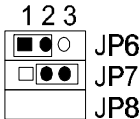
JP6: 1-2 and JP7: 2-3 SHORT for Intel 120/133 Mhz, CYRIX 120$^+$-200$^+$ (Default)
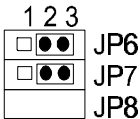
JP6/JP7: 2-3 SHORT for Intel MMX150/166Mhz, AMD K6 PR166Mhz
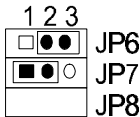
JP6: 2-3 SHORT and JP7: 1-2 SHORT for Intel MMX 180/ 200Mhz,and AMD K6 PR200.

(JP6 means BF1 and JP7 means BF0. When 2-3 short means ACTIVE, 1-2 short means NON-ACTIVE)

JP8/9: Set CPU External Bus Frequency Selection (FS0, FS1, FS2)

<u>JP8: 1-2 and JP9: 2-3</u> SHORT : 75Mhz for CX 200[+]

JP8/9:1-2 SHORT: 66 Mhz for CX 166[+], AMD K6, MMX. Intel/AMD 100/133/ 166/ 200 / 233Mhz (Default)

<u>JP8: 2-3 and JP9: 1-2</u> SHORT : 60Mhz for CX 150[+,] Intel/AMD 90/120/150 /180Mhz CPU
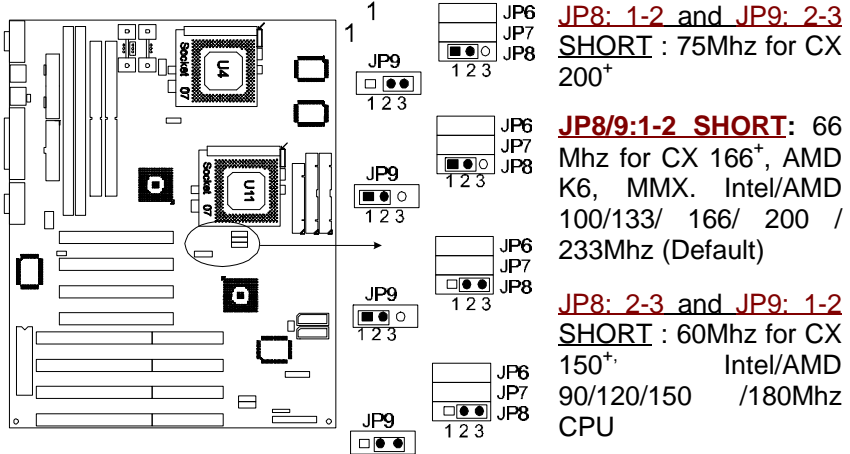
<u>JP8/9: 2-3</u> SHORT: 55Mhz for CX133^{+}

1.3 Other Hardware Jumpers

J1: Set the CPU Type: when you install **two CPUs please use J1 to indicate the Voltage of CPU.** If you only install one CPU, skip this part
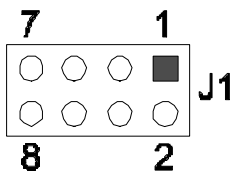
➧ **OPEN** for P55C(Intel MMX, AMD K6, CYRIX 6x86L CPU.   Default.   2.8v

➧ 1-2, 3-4, 5-6, 7-8 SHORT indicates Intel P54C (AMD K5 and CYRIX 6x86). 3.3v only
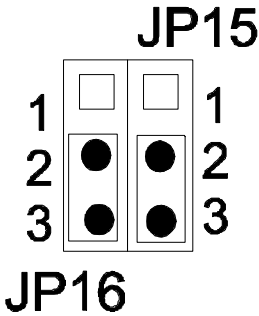
JP15

JP16

JP15: 2MB FLASH BIOS ONLY
2-3 SHORT for normal (set by factory). Default.
1-2 SHORT reserved for factory set only.

JP16: Select FLASH BIOS
2-3 SHORT for 5v Flash BIOS, normal, Default..
1-2 SHORT for 12v Flash BIOS (set by factory),

JP18
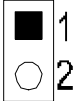
JP18: Choose Power Supply
SHORT: AT style power supply
OPEN: ATX style power supply
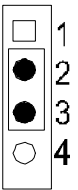
JP13

JP13: CMOS.   When you forget the password, clear CMOS, restart!
2-3 SHORT for normal. Default.
3-4 SHORT to clear CMOS (power must be off).
OPEN for external battery installed.
It is an important jumper.   When BIOS setting is changed by user becoming unstable in system board, or I/O don't work properly, reset CMOS RAM data (default setup.)

JP2
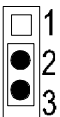
JP2: Set Cache.   Don't change it by users!
2-3 SHORT: 512K PB SRAM. Default.
1-2 SHORT: 256K PB SRAM

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JP12
 1 ■ ○ 4
 2 ○ ○ 5
 3 ○ ○ 6
```
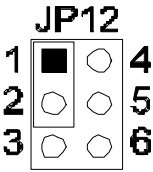
JP12: Choose CPU SMI Mode
1-2 SHORT: SMI by PIIX4 (Single CPU request SMI), Default.
2-3 SHORT: SMI by IOAPIC (Dual CPU request SMI)

1.4   Install System DRAM Memory

The board supports 2pcs 72-pin, 32-bit SIMMs (Single Inline Memory Modules) and 2pcs 168-pin, 64-bit DIMM (Dual Inline Memory Modules) of 4, 8, 16, 32MB to form a memory size between 8MB to 128MB. The SIMMs can be 60ns or 70ns Fast Page Mode (FPM), or Enhanced Data Out (EDO) (BEDO & Parity are not supported).   SIMMs must be installed in pairs so that each bank (see Map of ATX-586)contains 64-bit of same memory chips.

DIMM can be used as one bank.   It is available for 3.3v (power level) Unbuffered Synchronous DRAM (SDRAM) or EDO DRAM of either 8, 16, 32, 64, 128MB, to form a memory size   between 8MB to 128MB. SIMM and DIMM can be used together, but the limitations are two banks and max memory size 128MB. 2pcs 72-pin SIMM is one bank and 1pce DIMM is one bank too.

Bank 0	Bank 1	TOTAL
1MB * 32 SS	X	8MB
1MB * 32 SS	1MB * 32 SS	16MB
1MB * 32 SS	2MB * 32 DS	24MB
1MB * 32 SS	4MB * 32 SS	40MB
1MB * 32 SS	8MB * 32 DS	72MB
2MB * 32 DS	X	16MB
2MB * 32 DS	1MB * 32 SS	24MB
2MB * 32 DS	2MB * 32 DS	32MB
2MB * 32 DS	4MB * 32 SS	48MB
2MB * 32 DS	8MB * 32 DS	80MB
4MB * 32 SS	X	32MB
4MB * 32 SS	1MB * 32 SS	40MB
4MB * 32 SS	2MB * 32 DS	48MB
4MB * 32 SS	4MB * 32 SS	64MB
4MB * 32 SS	8MB * 32 DS	96MB

8MB * 32 DS	X	64MB
8MB * 32 DS	1MB * 32 SS	72MB
8MB * 32 DS	2MB * 32 DS	80MB
8MB * 32 DS	4MB * 32 SS	96MB
8MB * 32 DS	8MB * 32 DS	128MB
16MB * 32SS	X	128MB
16MB * 32SS	16MB * 32SS	256MB

1.5   Install IDE, Enhanced I/O and Front Panel Connectors

There is a special design that CN9 is for Key Lock, Sleep/Resume SW, Speaker, IDE LED, TB SW, Reset SW, and Turbo LED.   It is convenient for you to connect the cable from front board of Case.
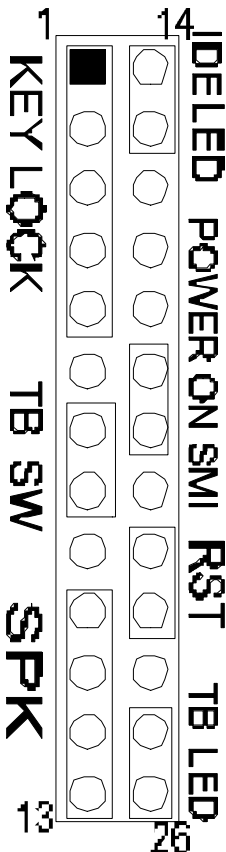
CN9: 1-5, Key Lock -   Keyboard lock switch & power LED connector.   1. Power LED (+), 2. N/C, 3. GND, 4. Key lock, 5. GND

CN9: 7-8, Turbo Switch.

CN9: 10-13, Speaker - Connect to the system's speaker for beeping. 10. Speaker, 11. GND, 12. GND, 13. VCC.

CN9: 14-15, IDE LED Indicator - LED ON when on board PCI IDE HDD activities.

CN9: 19-20, Turn on power when ATX power supply is on sleep mode

CN9: 22-23, Reset - Short to restart system.

CN9: 25-26, Turbo LED Indicator - LED ON when high speed (CN9: 7-8 SHORT).

JP17: IR, fast infrared port. PIN-1: IRRX, PIN-2: GND; PIN-3: IRTX; PIN-4: VCC
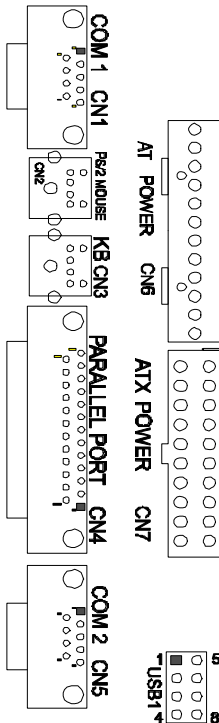
COM1-2/CN1-CN5: Support 16550 high speed serial ports/ UART.

PS/2 Mouse CN2: PS/2 mouse port. 5-pin Mouse:

LPT/CN4: Printer port with ECP/ PP. bi-direction. It can be used with external IDE/ SCSI device.

AT POWER CONNECTOR/CN6: For normal AT style power supply

ATX POWER CONNECTOR/CN7: For ATX factor style power supply

USB1/: 4-PIN connectors. PIN-1: VCC(5V), PIN-2: USB-, PIN-3: USB+, PIN-4: GND
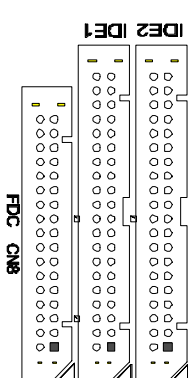
IDE 1: Primary   IDE port to support ATAPI Mode 5 IDE devices
IDE 2: Secondary IDE port to support ATAPI Mode 5 IDE devices.
FDC/CN8: Support 2 FDD up to 1.44MB or 2.88MB .

1.6   I/O Address and IRQ/DRQ

I/O Address and IRQ

On Board I/O	Address	IRQ	DRQ
GAME	200-20F	X	X
COM1	3F8-3FF	4	X
COM2	2F8-2FF	3	X
COM3	3E8-3EF	3	X
COM4	2E8-2EF	3	X
IDE1	1F0-1F7	14	X
IDE2	170-177	15	X
LPT1	378-37F	7	3 (ECP)
LPT2	278-27F	7	3 (ECP)
LPT3	3BC-3BF	7	3 (ECP)
FDD1	3F0-3F7	6	2
PS/2 MOUSE	X	12	X

1.7   Jumpers and Connectors List

ITEMS	DESCRIPTION
JP2	1-2 for 256K Cache, 3-4 for 512K Cache
JP6	Set CPU External Bus Frequency Rate (BF0, BF1)
JP7	Set CPU External Bus Frequency Rate (BF0, BF1)

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JP8	Set CPU External Bus Frequency (FS0, FS1, FS2)
JP9	Set CPU External Bus Frequency (FS0, FS1, FS2)
JP12	Choose CPU SMI Mode
JP13	2-3 Normal CMOS, 3-4 CMOS Clear
JP15	Select Recovery BIOS
JP16	2-3 for 5v Flash BIOS, 1-2 for 12v
JP17	IR Connector
JP18	Choose Power Supply
J1	Indicate the CPU voltage
CN1	COM1
CN2	PS/2 MOUSE Connector
CN3	Keyboard
CN4	Parallel Port
CN5	COM2
CN6	AT Power Supply Connector
CN7	ATX Power Supply Connector
CN8	Floppy Drive
CN9	Front Panel Connector
USB1	USB Connector
IDE1-2	IDE Drive connector

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Chapter   2

AWARD, PnP GREEN BIOS SETUP

2.1   BIOS   Setup

Powe on the computer and press <DEL> key immediately
and the screen will display you CMOS SETUP UTILITY as
follows:

ROM PCI/ISA   BIOS (2A59GT4A)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUPG
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	↑↓←→: Select Item
F10 : Save & Exit Setup	(Shift) F2: Change Color
Time, Date, Hard Disk Type.......	

2.2   Standard CMOS Setup

The STANDARD CMOS SETUP allows user to configure
system setting such as current date and time, type

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of hard disk drive installed in the system, floppy
drive type, and the type of display monitor.

ROM PCI/ISA BIOS (2A59GT4A)
STANDARD CMOS   SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy)   : Wed, Jan 5 2000
Time (hh:mm:ss)   : 0 :   0 : 0

HARD DISKS	TYPE	SIZE	CYLS	HEADS	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:	NONE	0	0	0	0	0	0	--------
Primary Slave:	NONE	0	0	0	0	0	0	--------
Secondary Master:	NONE	0	0	0	0	0	0	--------
Secondary Slave:	NONE	0	0	0	0	0	0	--------

Drive A: 1.2M, 5.25 in
Drive B: None

Video: EGA/VGA

Halt On: All Errors

Base Memory: 640K
Extended Memory: 3072K
Other Memory: 384K
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Total Memory: 4096K

Esc: Quit   ↑↓→←: Select Item   Pu/Pd/+/-: Modify
F1: Help   (Shift) F2: Change Color

2.3   BIOS Features Setup

ROM PCI/ISA BIOS (2A59GT4A)
BIOS FEATURES UTILITY
AWARD SOFTWARE, INC.

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

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OS Select for DRAM >64MB	: NON-OS2	F7 : Load Setup Defaults

2.4 Chipset Features Setup

ROM PCI/ISA BIOS (2A59GT4A)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	DRAM Fast Leadoff	: Disabled
DRAM Timing	: 60ns	Delayed Transaction	: Disabled
DRAM RAS# Precharge Time	: 3		
DRAM R/W Leadoff Timing	: 6		
DRAM RAS To Cas Relay	: 3		
DRAM Read Burst(EDO?FP)	: 3		
DRAM Write Burst Timing	:x222/x333		
Fast MA To RAS# Delay CLK	: 1		
Fast EDO path Select	: Disabled		
Refresh RAS# Assertion	: 4 CLKS		
ISA Bus Clock	: PCICLK/4		
System BIOS Cacheable	: Disabled		
Video BIOS Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1	↑↓←→: Select Item	
16 Bit I/O Recovery Time	: 1	F1 : Help	PU/PD/+/- : Modify
Memory Hole At 15M-16M	: Disabled	F5 : Old Values	(Shift)F2 : Color
Peer Concurrency	: Enabled	F6: Load BIOS Defaults	
Passive Release	: Enable	F7 : Load Setup Defaults	

2. 5 Power Management Setup

ROM PCI/ISA BIOS (2A59GT4A)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: User Define	**power Down &	Resume Events **
PM Control by APM	: Yes	IRQ3 (COM2)	: ON
Video Off Method	: V/H SYNC+Blank	IRQ4 (COM1)	: ON
Modem Use IRQ	: 3	IRQ5 (LPT2)	: ON
Doze Mode	: 1 Min	IRQ6 (Floppy Disk)	: OFF
Standby Mode	: 1 Min	IRQ7 (LPT1)	: ON
Suspend Mode	: 1 Min	IRQ8 (RTC ALARM)	: OFF
HDD Power Down	: I Min	IRQ9 (IRQ2 Redir)	: ON
		IRQ10 (Reserved)	: ON
** Wake Up Events In Doze	& Standby **	IRQ11 (Reserved)	: ON
IRQ3 (Wake-Up Event)	: ON	IRQ12 (PS/2 Mouse)	: ON
IRQ4 (Wake-Up Event)	: ON	IRQ13 (Coprocessor)	: ON
IRQ8 (Wake-Up Event)	: ON	IRQ14 (Hard Disk)	: ON
IRQ12 (Wake-Up Event)	: ON	IRQ15 (Reserved)	: ON
		↑↓←→: Select Item	
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	
		F6: Load BIOS Defaults	
		F7 : Load Setup Defaults	(Shift)F2 : Color

2.6   PNP/PCI Configuration

ROM PCI/ISA BIOS (2A56GT5A)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled By	: Manual	PCI IRQ Actived By	: Level
Reset Configuration Data	: Enabled	PCI IDE IRQ Map To	: PCI-AUTO
		primary IDE INT#	: A
IRQ-3 assigned to	: Legacy ISA	Secondary IDE INT#	: B
IRQ-4 assigned to	: Legacy ISA	Used Mem Base Addr	: N/A
IRQ-5 assigned to	: Legacy ISA		
IRQ-7 assigned to	: Legacy ISA		
IRQ-9 assigned to	: Legacy ISA		
IRQ-10 assigned to	: Legacy ISA		
IRQ-11 assigned to	: Legacy ISA		
IRQ-12 assigned to	: Legacy ISA		
IRQ-14 assigned to	: Legacy ISA		
IRQ-15 assigned to	: Legacy ISA		
DMA-0 assigned to	: Legacy ISA		
DMA-1 assigned to	: Legacy ISA	↑↓←→: Select Item	
DMA-5 assigned to	: Legacy ISA	F1 : Help	PU/PD/+/- : Modify
DMA-6 assigned to	: Legacy ISA	F5 : Old Values	
DMA-7 assigned to	: Legacy ISA	F6: Load BIOS Defaults	
	:	F7 : Load Setup Defaults	(Shift)F2 : Color

2.7   Integrated Peripherals

ROM PCI/ISA BIOS (2A59GT5A)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD block Mode	: Enabled	USB Controller	: Enabled
IDE Promary Master PIO	: Auto		
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
On-chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
Onboard FDD Controller	: Enabled		
Onboard Serial Port 1	: 3F8/IRQ4		
Onboard Serial Port 2	: 2F8/IRQ3		
UART 2 Mode	: Standard		
Onboard Parallel Port	:378H/IRQ7		
Onboard Parallel Mode	: SPP		
		↑↓←→: Select Item	
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	
	:	F6: Load BIOS Defaults	
		F7 : Load Setup Defaults	(Shift)F2 : Color

2.8   AWARD BIOS Post Code

POST (hex)	Description

C0	1. Turn off OEM specific cache, shadow...
	 2. Initialize all the standard devices with default values
	     standard devices includes:
	      -DMA controller (8237), -Programmable Interrupt Controller (8259), -Programmable Interval Timer (8254), -RTC chip

C1	Auto-detection of onboard DRAM & Cache
C3	1. Test system BIOS checksum 2. Test the first 256K DRAM 3. Expand the compressed codes into temporary DRAM area including the compressed System BIOS & Option ROMs
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS only)
04	Reserved
05	1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS's basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
09	1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 2. OEM specific cache initialization (if needed)
0A	1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers;Initialize INT no from 33-120 with Dummy(Suprious); Interrupt Handler. 2. Issue CPUID instruction to identify CPU type 3. Early Power Management initialization (OEM specific)
0B	1. Verify the RTC time is valid or not 2. Detect bad battery

	3. Read CMOS data into BIOS stack area
	4. PnP initializations including (PnP BIOS only)
	-Assign CSN to PnP ISA card
	-Create resource map from ESCD
	5. Assign IO & Memory for PCI devices (PCI BIOS only)
0C	Initialization of the BIOS Data Area (40 : 0N − 40:FF)
0D	1. Program some of the Chipset's value according to Setup.
	(Early Setup Value Program)
	2. Measure CPU speed for display & decide the system
	clock speed
	3. Video initialization including Monochrome,CGA,EGA / VGA.
	If no display device found, the speaker will beep
0E	1. Initialize the APIC (Multi-Processor BIOS only)
	2. Test video RAM (If Monochrome display device found)
	3. Show messages including:
	-Award Logo, Copyright string, BIOS Date code
	& Part No.
	-OEM specific sign on messages
	-Energy Star Logo (Green BIOS ONLY)
	-CPU brand, type & speed
	-Test system BIOS checksum(Non-Compress
	Version only)
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved

1E	If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)
1F-29	Reserved
30	Detect Base Memory & Extended Memory Size
31	1. Test Base Memory from 256K to 640K 2. Test Extended Memory from 1M to the top of memory

32	1. Display the Award Plug & Play BIOS Extension
	     message (PnP BIOS only)
	2. Program all onboard super I/O chips (if any) including
	     COM ports, LPT ports, FDD port... according to setup
	     value

33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h
3F-40	Reserved

BF	1. Program the rest of the Chipset's value according to
	     Setup. (Later Setup Value Program)
	2. If auto-configuration is enabled, programmed the chipset
	     with pre-defined values in the MODBINable Auto-Table

41	Initialize floppy disk drive controller
42	Initialize Hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports
44	Reserved
45	Initialize math coprocessor.
46-4D	Reserved
4E	If there is any error detected (such as video, kb...), show all the error messages on the screen & wait for user to press <F1> key
4F	1. If password is needed, ask for password 2. Clear the Energy Star Logo (Green BIOS only)

50	Write all CMOS values currently in the BIOS stack area back into the CMOS
51	Reserved

52	1. Initialize all ISA ROMs
	2. Later PCI initializations (PCI BIOS only)
	    -assign IRQ to PCI devices
	    -initialize all PCI ROMs
	3. PnP Initializations (PnP BIOS only)
	    -assign IO, Memory, IRQ & DMA to PnP ISA
	     devices
	    -initialize all PnP ISA ROMs
	4. Program shadows RAM according to Setup settings
	5. Program parity according to Setup setting
	6. Power Management Initialization
	    -Enable/Disable global PM
	    -APM interface initialization

53	1. If it is NOT a PnP BIOS, initialize serial & parallel
	    ports
	2. Initialize time value in BIOS data area by translate the
	    RTC time value into a timer tick value

60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting

61	1. Try to turn on Level 2 cache
	    Note: if L2 cache is already turned on in POST 3D, this
	    part will be skipped
	2. Set the boot up speed according to Setup setting
	3. Last chance for Chipset initialization
	4. Last chance for Power Management initialization (Green
	    BIOS only)
	5. Show the system configuration table

62	1. Setup daylight saving according to Setup value 2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting

63	1. If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only)
	2. Clear memory that have been used
	3. Boot system via INT 19H
FF	System Booting. This means that the BIOS already pass the control right to the operating system

📖📖📖

Chapter   3

Quick Installation Guide
Ultra IDE Driver
and
Update Flash BIOS
for Intel TX Chipset

Thise Chapter includes two parts: one is to instal Enhance IDE Driver and the other is to update main board BIOS.

PART 1. Installation IDE driver:

Dear Customer,

Thank you for choosing the Intel PIIX Bus Master IDE Drivers.   This production release of the drivers provides support for Intel PCIsets.

To install the drivers, follow the steps below:

1.   **For all drivers: execute the appropriate self-extracting archive.**
            Windows 95* archive   - bmide_95.exe
            Windows NT* archive   - bmide_nt.exe
            IBM OS/2* archive   - bmideos2.exe
        This will place the SETUP files in a subdirectory on your hard disk.

2.   **For all drivers: run the setup program.**
            Click on SETUP.EXE from Windows* File Manager/Explorer
OR
            Execute Program/Run from the Program Manager.

3.   **Driver Installation**
        For the Windows 95 Driver:
        [See auto install procedures.]

[If using OEM Version of Windows 95 CD-ROM on PIIX3 based systems   see also " 82371SB PIIX3 Application Note #3 Microsoft Windows 95* Support for PIIX3 IDE Controller".]

For the IBM OS/2 and Windows NT Drivers:
After running SETUP, follow the installation instructions in the README.TXT file which is extracted to the driver installation directory.

The Driver Version Numbers included in this release are:
        Windows 95 Driver - version 2.61
        Windows NT Driver - version 1.59
        IBM OS/2 Driver   - version 2.05

Sincerely,
PCIsets Product Line Marketing
PCI Components Division
Intel Corporation

*Other brands and names are the properties of their respective owners
****

PIIX Bus Master IDE Drivers for Windows 95*
Installation, Usage, and Release Note Information

NOTE: This document refers to desktop systems with
the following Intel PCIset devices:
82371FB (PIIX1), 82371SB (PIIX3) or 82371AB (PIIX4) in
conjunction with the following Intel PCIsets:
430FX, 430HX, 430TX, 430VX and 440FX

The terms "PIIX", "82371xB" refer to any/all of the
following Intel PCIset devices: 82371FB, 82371SB, 82371AB

Also, the term "processor" refers to the Pentium(R) processor,
the Pentium(R) processor with MMX(tm) technology, the
Pentium(R) Pro processor, and the Pentium(R) II processor
ONLY.
****

```
*****************************************************************************
```
INTRODUCTION
```
*****************************************************************************
```

This document describes the installation procedure and usage information for the PIIX Bus Master IDE Drivers for Windows 95*. Also included are release notes describing any problems or issues with the software which were known at the time of shipment.

```
*****************************************************************************
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CONTENTS OF THIS DOCUMENT
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```

This document contains the following sections:

1. System Requirements
2. Contents of the Distribution Package
3. Installing the Software
4. Verifying Installation of the Software
5. De-installing the Software
6. Troubleshooting
7. Identifying the Software Version Number
8. Release Notes
      8A. IDE Devices Supported By the Driver
      8B. Applications Supported By the Driver
      8C. Large (>528MB) IDE Fixed Disk Drive Support By the
Driver
      8D. Release-Specific Troubleshooting Information
      8E. Revision History
      8F. Release Testing Information

```
*****************************************************************************
```
1. SYSTEM REQUIREMENTS
```
*****************************************************************************
```

This section describes system requirements for the PIIX Bus Master IDE Device Driver for Windows 95*. Refer to the Release Notes section of this document for additional information regarding this release.

NOTE: This driver has been designed for and tested with Windows 95* only. This driver will only install on systems with Windows 95*.

1. The system must contain a supported Intel processor and chip set configuration:
    Chip set: Intel 430FX, 430HX, 430TX, 430VX and 440FX chip sets.
    Processor: Intel Pentium(R), Pentium(R) with MMX(TM) Technology, Pentium(R) Pro, and Pentium(R) II devices ONLY.

2. Ensure that a mouse is connected to the system.

3. One of the following versions of Windows 95*   must be installed on the system prior to running utility program.
    Windows 95* 4.00.950   (Retail)
    Windows 95* 4.00.950a   (OSR1)
    Windows 95* 4.00.950b   (OSR2 without USB Supplement)
    Windows 95* 4.00.950b   (OSR2.1 with USB Supplement)

4. This utility should only be used on desktop systems.   The utility must not be executed on notebook or portable systems with or without dock.

5. It is assumed that the BIOS properly initialized the 82371xB IDE interface for Bus Master IDE operation.

6. There are no other non-82371xB IDE controllers (add-in IDE controller or sound card with IDE) enabled on the system.

****
  2.   CONTENTS OF THE DISTRIBUTION PACKAGE
****

The Intel PIIX Bus Master IDE Driver for Windows 95*, Version 3.00 release package contains the following items:

Date	Time	Size	File
04/15/97	12:00a		
BMIDE_95.EXE			
04/15/97	12:00a		
README.TXT			
04/15/97	12:00a	29,268	PIIXDRV.Z
03/28/97	12:00a	45,312	SETUP.EXE
03/28/97	12:00a	69,592	SETUP.INS
03/28/97	12:00a	320,411	_INST32I.EX_

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```
03/28/97    12:00a                          6,128   _SETUP.DLL
03/28/97    12:00a                        179,689   _SETUP.LIB
```

****
3.   INSTALLING THE SOFTWARE
****

This installation procedure is specific only to the version of the driver
and installation file included in this package.

This subsection describes how to install the software on a system
where Windows 95* is installed.

NOTE: Record the location of the Windows 95* directory before
             installing the driver.

1.   Check the System Requirements.   Windows 95* must be fully
       installed and   running on the system prior to running this
       software.

2.   Close any running applications.

3.   Remove references to installed real-mode IDE device drivers in
       the AUTOEXEC.BAT and CONFIG.SYS files (especially any
       drivers that control ATAPI CD-ROM and special IDE features).
       Use the Notepad utility to do   this.

4.   The driver files are stored in an integrated application setup
       program. This program is a Windows 95* program that allows the
       driver files to be INSTALLED or DE-INSTALLED.

          Execute the driver setup program.

          Run SETUP.EXE.

5.   Click 'Next' on Welcome Screen to read and agree to the license
       agreement. View the text file and choose File\Exit to close
       Notepad and continue.   NOTE: If you click 'No', program will
       terminate.

6.   Click 'Yes' if you agree to continue.   NOTE: If you click 'No', the

     program will terminate.

7.   Select 'INSTALL', to install the PIIX Bus Master IDE Device
     Driver when prompted to do so.

     NOTE: if the driver is currently installed on the system,
     SETUP will ask you whether or not you want to continue.   Follow
     the prompts on the   screen to Install the driver if desired.

8.   Click 'OK' to restart the system when prompted to do so.

9.   Follow the screen instructions and use default settings to
     complete the setup when Windows 95* is re-started.

     Upon re-start, Windows 95* will display that it has found an Intel
     PCI Bus Master IDE controller hardware and is installing hardware
     for it.

     If a "New Hardware Found" dialog box is displayed requesting the

     location of   the drivers, use the mouse to click on the scrollbar
     and click on the <Windows 95* directory>\System\IOSubSys
path:

     For example:
     a.   Click on 'C:\WINDOWS\SYSTEM\IOSUBSYS\'
     b.   Click 'OK'.

10.   Select 'Yes',   when prompted to re-start Windows 95*.

NOTE: After installation,   the following driver and related   files
          are stored as listed.
          <Windows 95* directory>\System\IOSubSys\IDEATAPI.MPD
          <Windows 95* directory>\System\IOSubSys\PIIXVSD.VXD
          <Windows 95* directory>\INF\IDEATAPI.INF

****
4.   VERIFYING INSTALLATION OF THE DRIVER
****

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This installation verification procedure is specific only to the version of the driver and installation file included in this package.
This subsection describes how to verify installation of the software on a system where Windows 95* is installed.

This installation verification procedure is specific only to the version of the driver and installation file included in this package.

If the system does not operate reliably or fails to boot when the driver is installed, De-install the driver.   Refer to the RELEASE NOTES section for more information.

In order to verify the installation of the driver:

1.   Open the Control Panel folder.

2.   Invoke the System applet.

3.   Click on the Device Manager tab.

4.   Select the View Devices by Type option.   A list of the devices connected to the system will be displayed.

5.   Click on the Hard Disk Controllers record.   One of two cases will be listed.

> For CASE 1, there could be up to three instances listed:
> Intel 82371XX PCI Bus Master IDE Controllers
> Primary Bus Master IDE Controller
> Secondary Bus Master IDE Controller
> Go to step 6 for CASE 1.
>
> For CASE 2, there could be up to two instances listed:
> Intel PIIX PCI Bus Master IDE Controller
> Intel PIIX PCI Bus Master IDE Controller
> Go to step 7 for CASE 3.
>
> NOTE FOR ALL CASES:
> a.   The content of the text strings is dependent on the driver's INF file (named IDEATAPI.INF in the driver's install directory).

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As a result, the individual controller descriptions
may vary slightly from what is listed above.   In this
case, select   the closest match.

NOTES FOR CASE 1:
b.   XX in 82371XX, shown in CASE 1 may be: FB,
SB, AB.

c.   Depending on your current system configuration,
only one of the   instances displayed for the Primary
or the Secondary IDE   controllers may be displayed.
d.   The order in which the individual hard disk controller
instances   are listed may vary.

NOTE FOR CASE 2:
e.   Depending on the current system configuration, only
one of the instances may be displayed.

6.   Verify the Intel 82371xx PCI Bus Master IDE Controllers Driver
listing.
NOTES:
a.   A yellow mark on an instance is NORMAL if no
devices are connected   to that controller.

b.   If only one instance is present, there should be no
yellow

warning symbol next to it.

If a yellow warning symbol appears in error (cannot be attributed to
either of Steps 6a or 6b), the driver may not be installed and/or
working properly.

****
5.   DE-INSTALLING THE SOFTWARE
****

This de-installation procedure is specific only to the version of the
driver and installation file included in this package.

This subsection describes how to install the software on a system
where Windows 95* is installed.

NOTE: Record the location of the Windows 95* directory before
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de-installing the driver.

1.   Check the System Requirements.   Windows 95* must be fully installed and running on the system prior to running this software.

2.   Close any running applications.

3.   The driver de-installer is stored in an integrated application setup program.   This program is a Windows 95* program that allows the driver   files to be INSTALLED or DE-INSTALLED.

   Execute the driver setup program.

   Run SETUP.EXE.

4.   Click 'Next' on Welcome Screen to read and agree to the license agreement. View the text file and choose File\Exit to close Notepad and continue.   NOTE: If you click 'No', program will terminate.

5.   Click 'Yes' if you agree to continue.   NOTE: If you click 'No', the
   program will terminate.

6.   Select 'DE-INSTALL', to install the PIIX Bus Master IDE Device Driver when prompted to do so.

   NOTE: if the driver is not currently installed on the system, SETUP will exit.

7.   Click 'OK' to restart the system when prompted to do so.

8.   Follow the screen instructions and use default settings to complete the setup when Windows 95* is re-started.

   Upon re-start, if Windows 95* if responds with an "Update Device Driver   Wizard" dialog box (applies to systems with Windows 95* Version 950B) then follow the UPDATE DEVICE DRIVER WIZARD directions section, otherwise go to the NON-WIZARD directions.

NON-WIZARD directions:

A.   Select 'Windows default driver', A "New Hardware Found"   dialog box will request a driver location.

B.   Select 'Yes' to restart the system when prompted to do so.
    Step C may happen several times.

UPDATE DEVICE DRIVER WIZARD directions:

A.   Select 'Next',   A Wizard dialog box requests to search for drivers.

B.   Select 'Finish', The Wizard dialog box will indicate it found a driver in the <Windows 95* directory>\INF directory.

C.   Select 'Yes' to restart the system when prompted to do so. Step C may happen several times.

D.   Go to step 4, De-Installation process is complete.

4.   De-Install process is complete.

****
6.   TROUBLESHOOTING
****

The following procedure assumes that the hardware/software requirements from above have been satisfied.   The following procedure also assumes that the installation of the driver was performed as described in the 'Verifying Installation of the Driver' section.   Refer to the 'Release Notes' section of the document for additional information.

COMMON PROBLEMS:
****

1.   The device is incompatible with PCI Bus Master IDE operation.
    This is due to the fact that the device does not work properly when

accessed in a PCI Bus Master IDE fashion.   Contact the device
    manufacturer for more information.

2.   Verify the length of the cables that are being used to connect the IDE or ATAPI devices to the primary and secondary PIIX IDE interfaces.   The length of these cables from END-TO-END should not exceed 18 inches (0.46 m).   Furthermore, the capacitance of the cable should not exceed 35 pF.

3.   A conflict between the PIIX Bus Master IDE driver and a real-mode ATAPI CD-ROM or IDE device driver may occur if the real-mode driver references have not been properly removed from the AUTOEXEC.BAT and/or CONFIG.SYS files.   This conflict occurs when the PIIX Bus Master IDE driver attempts to access the legacy ISA IDE resources to control the PIIX. ALL REFERENCES TO REAL-MODE DRIVERS (IDE or ATAPI) IN THE TOEXEC.BAT
    AND CONFIG.SYS MUST BE REMOVED.

****
7.   IDENTIFYING THE SOFTWARE VERSION NUMBER
****
The driver's version can be determined by reading Windows*
properties embedded in the driver file.

The driver version can be obtained by querying the driver file's properties under File Manager.

NOTE: After installation,   the following driver and related   files
            are stored as listed.
            <Windows 95* directory>\System\IOSubSys\IDEATAPI.MPD
            <Windows 95* directory>\System\IOSubSys\PIIXVSD.VXD
            <Windows 95* directory>\INF\IDEATAPI.INF

1.   Under Windows 95*, invoke the "Explorer" application.

2.   Select the path containing the driver file.
        <Windows 95* directory>\System\IOSubSys

For example,
            C:\WINDOWS\SYSTEM\IOSUBSYS

3.   Select the driver file, "IDEATAPI.MPD".

4.   Open the "File" menu.

5.   Click on the "Properties" item.

6.   Click on the "Version" tab.

7.   The IDEATAPI.MPD driver's version should be listed in the
      'Product Version' portion of the dialog.

****
8.   RELEASE NOTES
****
The release notes describe the current known state of the PIIX Bus
Master IDE Driver for Windows 95*, Version 3.00 at the time of release.
The release notes are divided into the following sections:

        8A.   IDE Devices Supported By the Driver
        8B.   Applications Supported By the Driver
        8C.   Large (>528MB) IDE Fixed Disk Drive Support By the
Driver
        8D.   Release-Specific Troubleshooting Information
        8E.   Revision History
        8F.   Release Testing Information
****
  8A.   IDE DEVICES SUPPORTED BY THE DRIVER
****
The Intel PIIX Bus Master IDE driver supports only specific ATA/ATAPI
device types.   The Intel driver should not be installed if the system is
equipped with any of the non-supported ATAPI devices.

The Intel PIIX Bus Master IDE driver supports the following devices
connected to the PIIX IDE interface:
        - ATA fixed disk
        - ATAPI CD-ROM   devices

The Intel driver does not support the following types of device in the system:
- ATAPI Tape Drives
- ATAPI CD-ROM Changer Drives
- ATAPI DVD-ROM Drives
- ATAPI Writeable CD Drives
- ATA/ATAPI ZIP*, LS-120*, Cartridge, Optical, Removable Media Drives
- IDE Fixed Disk Drives larger than 8.4GBbytes

During initialization, the driver will auto-identify all the devices connected to the PIIX IDE interface.   Depending on the capabilities of the devices connected to the system, the driver will initialize the PIIX IDE interface for bus mastering operation.

Only drives identified as bus master capable will be accessed as a bus master;   all other drives will be accessed in a PIO-only fashion.   In general, bus mastering is possible for ATA/ATAPI devices that support the following DMA timing modes:

Single Word DMA Mode 2
Multi-Word DMA Mode 1
Multi-Word DMA Mode 2

Ultra DMA Mode 0
Ultra DMA Mode 1
Ultra DMA Mode 2

These devices will be accessed by the driver in either a bus mastering or a PIO-fashion, depending on the specific transfer conditions.

Devices that do not support the DMA timing modes listed above, or whose PIO timings are faster than their DMA timings, will be accessed in a PIO-fashion ONLY.

For more information and a list of tested devices, see the 'Devices Tested' section of this document.
****
   8B.   APPLICATIONS SUPPORTED BY THE DRIVER
****

Advanced CD-ROM applications/features have not been tested with this driver.   This driver does not support Microsoft SMART IOCTL API and any mobile IDE features on portable PCs (notebooks).   If any problem is encountered, de-install the driver.

The driver supports general CD-ROM operations such as:
- File transfers
- Data streaming
- Audio

The driver does not support the following applications:
- Enhanced CD Applications such as VideoCD*, CDPlus*
- Multi-CD changers
- Applications used Microsoft SMART IOCTL API
- Ontrack Disk Manager and EZ-Driver* API
- Mobile IDE features on Notebooks

****
8C.   LARGE IDE FIXED DISK DRIVE (>528MB) SUPPORT BY THE DRIVER
****
Intel recommends that the "Auto" mode of disk recognition should be used in most systems' BIOS setup option when installing new disk drives.   Some older systems may not support the large disk drives because of BIOS limitations.   Users are encouraged to contact their system provider for the system or BIOS upgrade before installing the Intel driver for large drive support.

Intel PIIX Bus Master IDE driver for Windows 95* supports the following fixed disk geometry translation mechanisms. Do not install the Intel driver if the system does not support them or the drive is not configured to use them.
- Standard Cylinder-Head-Sector (CHS) translation in BIOS
- Logical Block Addressing (LBA) mode
- BIOS Disk Services INT13h, Function 08h to report the drive
  geometry parameters

The Intel PIIX Bus Master IDE driver for Windows 95* does not support the certain disk geometry translation mechanisms.   The user should use the default Microsoft Windows 95* IDE driver if the system uses the following translation mechanisms.
- All other BIOS translation schemes not supported by
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the driver.
- Any software translation mechanisms, such as Ontrack
  Disk Manager*, EZ-Drive*, or master boot record
  hooking.

****
8D.   RELEASE-SPECIFIC TROUBLESHOOTING INFORMATION
****

Verifying the installation of the driver and other generic troubleshooting
is discussed in the "TROUBLESHOOTING" section above.   This
section describes release-specific troubleshooting.

This section contains a list of known problems with certain system
configurations discovered during testing of the driver.   A list of all
storage devices tested with the driver is given below in the "RELEASE
TESTING INFORMATION" section of this document.

If the solution given to any of the problems listed below is to de-install
the driver, follow the de-installation instructions outlined above in the
"DE-INSTALLING THE SOFTWARE" section.

In general, if the system fails to operate reliably, the recommendation
isto de-install the PIIX Bus Master driver.

Q1>   Windows 95* doesn't recognize or see CD-ROM drive on the
       secondary IDE   interface after system is restarted.

A1>   Some ATAPI CD-ROM drives   may need to be placed on the
       same cable, as a   slave, to a Hard Disk drive, which is
       configured as a Master.   Below is   a list of   some CD-
       ROM drives that meet this requirement.   Generally,   with
       the exception of   the devices listed below,   the
       recommended configuration for a single ATAPI CD-ROM drive
       on a cable is as a Master.

       Mitsumi* FX400   NEC* CDR251   Toshiba*
XM5302B
       Sony*   CDU55E   NEC* CDR261   Toshiba*
XM5602B
                   Sony*   CDU76E   NEC* CDR271

Torisan* CDR-C3G   NEC* CDR272
Torisan* CDR-S1G   NEC* CDR273

Q2>   There is an Exclamation(!) or Question(?) mark next to the
       primary or   secondary IDE controller instance under Device
       Manager where devices are   connected.   -OR-

        The secondary IDE controller instance is missing under
        Device Manager and devices are connected to this cable.

A2>   There are several possible causes for this issue:
            1.   Your CD-ROM drive may need be configurated as a
            slave drive.   Please refer to Item A1 for a detailed
            description.

            2.   There is a hardware conflict in the system. Only TWO
            IDE
              channels are allowed in a system. The driver will not
            operate on   systems that have a non-Intel IDE
            controller or a sound card with an IDE interface.   The
            driver should not be de-installed on these systems.

            3.   The system BIOS may not have initialized the
            82371xB IDE controller   properly.   Again, please
            contact your system provider for BIOS upgrade. If the
            system fails to operate reliably, de-install the driver.

Q3>   The system does not operate reliably   or fails to boot when
        the driver   is installed.   -OR-

         The system fails to boot in   NORMAL (non SAFE-MODE)
        mode when the driver   is installed.

A3>   Please de-install the driver.   Please make sure that your
        system meets   the system requirements of the driver and you
        don't have any non- supported IDE devices or applications
        installed on the system.

         Please refer to the Release Notes section for supported
        devices and   applications.

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Q4> One or more of the IDE/ATAPI drives on the system fail to perform   correctly and/or is not recognized by the driver.

A4> Ensure devices on the system are connected according to the   manufacturers' documentation.   Please make sure that you don't have any   non-supported IDE devices or applications installed on the system.   Please refer to the release note for supported devices and applications.

 If the system fails to operate reliably, de-install the driver.

Q5> The CD-ROM drive fails to perform correctly   after the driver has been installed (e.g. audio CD-ROMs or some advanced CD-ROM applications don't operate correctly).

A5> Please ensure that ONLY supported IDE devices or applications are installed on the system.   Please refer to the release note for supported   devices and applications.

 A conflict between the PIIX Bus Master IDE driver and a DOS real-mode ATAPI CD-ROM device driver may have occurred. This conflict occurs when both the real-mode driver and the PIIX Bus Master IDE driver attempt to access the resources of the PIIX controller.   If the drive fails to   operate in the case that there is NO real-mode driver for the device is installed, de-install the driver.

 If the system fails to operate reliably, de-install the driver.

Q6> The driver does not support the following CD-ROM drives.
            Gallant GCD-R542B
            Mitsumi FX400
            Torisan S1G
            Torisan C3G
            Toshiba XM-5302B
            Wearnes CDD-220
            Wearnes CDD-620
            Wearnes CDD-820

A6>   Do not install the driver on a system equipped with these CD-ROM drives.   There are no plans to support these drives with the PIIX Bus Master river.

Q7>   The driver does not support   the following fixed disk drives:
         Conner CFA850A
         Maxtor 71626A
         Maxtor 71260AT

A7>   Do not install the driver on a system equipped with these fixed disk drives.   There are no plans to support these drives with the PIIX Bus aster driver.

Q8>   Windows 95 fails to report the actual size of the drive.
         -OR-
         Data loss or system hang has occurred after installing the PIIX Bus Master driver.

A8>   If your disk drive is > 528MB, you should check and compare the capacity of the drive before and after installing PIIX Bus Master IDE driver.

         If the system fails to operate reliably, de-install the driver.

         It is recommended to de-install the system in Safe mode: Press the "F8" function key when you see "Starting Windows 95"; Select "Safe mode"; and de-install the Intel driver after the system has re-booted.

Q9>   How can I play MS-DOS based CD-ROM games?   -OR-
         I could not access my CD-ROM drive in MS-DOS real mode.

A9>   Your CD-ROM drive is not available in MS-DOS mode because CD-ROM   real-mode driver is not loaded.   There is a conflict between Intel PIIX   Bus Master IDE driver and a DOS real-mode ATAPI CD-ROM device driver.
         This conflict occurs when both the real-mode driver and the PIIX Bus   Master IDE driver attempt to access the resources of the PIIX controller.

To workaround the issue, you can create a custom startup configuration   that loads CD-ROM real-mode driver. The game will run in exclusive   MS-DOS mode using its own MS-DOS configuration.

To Create a Exclusive MS-DOS Mode For MS-DOS CD-ROM Games:
1. Right-click the game's executable file in My Computer
2. Click on Properties
3. Click on Advanced...
4. In the Advanced dialog box, click on MS-DOS mode
5. Select "Specify a new MS-DOS configuration" to edit the CONFIG.SYS and AUTOEXEC.BAT files.
6. Please refer to your CD-ROM manual for the proper command line settings of CD-ROM real-mode driver

and

MSCDEX.EXE in CONFIG.SYS and AUTOEXEC.BAT

files.
7. Please refer to game manual for the required system environment settings.

```
*** Sample CONFIG.SYS File ***
DOS=HIGH,UMB
DEVICE=C:\WINDOWS\HIMEM.SYS
DEVICE=C:\nec_ide.sys /D:MSCD000


*** Sample AUTOEXEC.BAT ***
SET PROMPT=$p$g
MSCDEX.EXE /D:MSCD000 /m:10
```

****
8E.   REVISION HISTORY INFORMATION
****

The Revision History describes the incremental feature and documentation changes of the different Intel PIIX Bus Master IDE for Windows 95* Driver releases.

****

VERSION 2.64 RELEASE
****

This subsection describes the Intel PIIX Bus Master IDE Driver for
Windows 95*, Version 2.64 (May, 1996), Release.

1. Driver only supports systems with the Intel PCI Bus Master IDE
     Controllers:
     - Intel 82371FB PCI Bus Master IDE Controller (PIIX)
     - Intel 82371SB PCI Bus Master IDE Controller (PIIX3)

2. Driver supports Windows 95* Retail and OSR1 releases.

3. Driver uses PCI Bus Master IDE accesses on devices that capable
   of
     - Single Word DMA Mode 2
     - Multi Word DMA Modes 1-2

4. Driver uses PIO mode(0-4) accesses on devices that do not support
   PCI Bus Master IDE.

5. Driver provides full auto- and re-configuration for all ATA/ATAPI
   devices and the Intel PCI Bus Master IDE Controllers on the system.

****
VERSION 3.00 RELEASE
****

This subsection describes the differences between Intel PIIX Bus
Master IDE Driver for Windows 95*, Version 3.00 (April, 1997) and
Version 2.64 (May, 1996), Releases.

1. Added driver installation support for Windows 95* 950B(OSR2,
OSR2.1) Releases.

2. Added PCI Bus Master IDE transfer support for all devices that
     support:
     - Ultra DMA Mode 0
     - Ultra DMA Mode 1
     - Ultra DMA Mode 2

3. Added support the Intel 82371AB PCI Bus Master IDE Controllers.

4. Added support to use BIOS Disk Services INT13h, function 08h, to determine fixed disk drive geometry parameters.

5. Added documentation clarifications to README.TXT.

****
8F.   RELEASE TESTING INFORMATION
****
This section contains information on how the driver was tested, including a list of storage devices used in testing.   If any problems are encountered running the driver with devices listed below, refer to the
"RELEASE-SPECIFIC TROUBLESHOOTING INFORMATION" section above for more detailed information.

The following fixed disk drives were tested with the PIIX Bus Master IDE Driver:

Conner*:
        CFA540A
        CFA1275A
        CFS425A
        CFS850A
        CFS1275A

IBM*:
        DALA-3540
        DALA-31080

Maxtor*:
        7540AV
        71626AP

Quantum*:
        FB540A
        FB640A
        FB1080A
        FB1280A
        LPS270A
        TRB420A
        TRB850A

Seagate*:
        ST5660A
        ST5850A
        ST51080A
        ST31220A
        ST31270A
        ST32140A

Western Digital*:
        AC2420
        AC2510
        AC2700
        AC2850
        AC31000
        AC31600
        AC21000

The following ATAPI CD-ROM drives were tested with the PIIX Bus
Master IDE Driver:
Hitachi*:
        CDR-7930
        CDR-8130

Mitsumi*:
        FX400
        FX600S
        FX600T
        FX810T
        FX120T

NEC*:
        CDR271
        CDR272
        CDR273
        CDR1300A
        CDR1400A

Panasonic*:
        CR581
        CD-574B

CR-583-B

Sanyo*:
CRD-S54P

Sony*:
CDU55E
CDU76E
CDU77E
CDU311-GI

TEAC*:
CD44E
CD56E

Toshiba*:
XM5302B
XM5602B
XM5702

****
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completely defines the license and use of the PIIX Bus Master IDE
Driver.
****

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        Date: Apr 23 1997 21:40:28 $
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        Revision: 1.0 $
        Date: Apr 23 1997 17:41:24 $
        Disclaimer Revision Information:
        Revision: 1.0 $
        Date: Apr 23 1997 17:41:06 $

PART II. Update Flash BIOS

Because the BIOS of Pentium Triton main board is Flash BIOS, there are two methods to update   BIOS.   Before programming the BIOS.
(THIS MODIFICATION IS UNDER THE SUPPLIER' S PERMISSION AND FOR QUALIFIED ENGINEER.)

BIOS is writeable so that don' t write anything in the BIOS local address from FFF0:E000 - FFF0:FFFF.   Keep BIOS ROM data is available.

From the BIOS of new main board to old main board:

1. Perform the command, AWDFLASH.   The command is in the BIOS of new main board, sub directory of AWARD.
2. Save BIOS.OLD and save it to another disk.
3. Program the BIOS.OLD of the disk to old main board.

From disk to old main board:

1. Get the disk from your supplier.   Usually EIDE Driver include the update function.
2. Program the file, TX.BIN, of disk to old main board.

❑❑❑

Chapter   4

Hardware
Installation For TX2

TX2 is for AT platform for single processors design, including Enhance I/O chip (SMC 669 compatible) resulting in ultra IDE performance. Another difference is that TX2 can be installed **AHA Wide SCSI chip** to offer internal or external SCSI driver. It puts a RAID slot also.   Of course, TX2 supports Intel Pentium 75-233Mhz, MMX, AMD K5/K6-PR 233, CYRIX CX6x86 200$^+$.   Not to mention, it has Auto Switching between 3.3v and 2.8v CPU.

You can review the content of Preface for parts of specification.   The main differences between ATX586 and TX2 is as follows:
1. ATX586 is ATX factor, but TX2 is AT factor;
2. ATX586 supports dual processors, but TX2 is only for single processor;
3. ATX586 can' t be installed SCSI on board, but TX2 does;
4. TX2 is only with 3 * 32-bit PCI, 3 * 16 bit ISA Slots, and 1 RAID for TX2.

TX2 also has smart setting design.   In words, set a quick jumper to change CPU and a connector module for front panel.

The package for TX2 including:
- ☑ TX2 mother board
- ☑ One set I/O cable bracket
- ☑ One IDE drive ribbon cable for 2 devices
- ☑ One Floppy ribbon cable for 2 devices
- ☑ One Ultra IDE device disk
- ☑ This user' s manual
- ☑ SCSI cable for TX2 only.

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4.1   One Jumper to Set CPU , Simple Jumper

No more CPU jumper setting   when you use
Intel 133Mhz,
CYRIX 166[+,]
AMD K5-133 CPU.
You just install CPU directly and Power On. (At the moment, JP8:2-3, 4-5 SHORT; JP5: OPEN)

A: Using **Intel** CPU (Ensuring JP5: OPEN)

CPU Speed	JP8
Intel 100Mhz	**1-2,** 4-5 SHORT
Intel 166Mhz	2-3, **5-6** SHORT
Intel 200Mhz	**1-2, 5-6** SHORT
Intel 233Mhz	**1-2,** 4-5 SHORT

B: Using **AMD** K5/K6 (Ensuring JP5: OPEN)

CPU Speed	JP8
AMD K5-100	**1-2,** 4-5 SHORT
AMD K5/K6-PR166	2-3, **5-6** SHORT
AMD K6-PR200	**1-2, 5-6** SHORT
AMD K6-PR233	**1-2,** 4-5 SHORT

C: Using **CYRIX** 6x86 CPU (Ensuring JP8: 2-3, 4-5 SHORT)

CPU Speed	JP5
CX 133[+], 55Mhz	1-3, 2-4 SHORT
CX 150[+], 60Mhz	**1-3 SHORT,** 2-4 OPEN
CX 200[+], 75Mhz	**2-4 SHORT,** 1-3 OPEN

Map of TX2 Mother Board
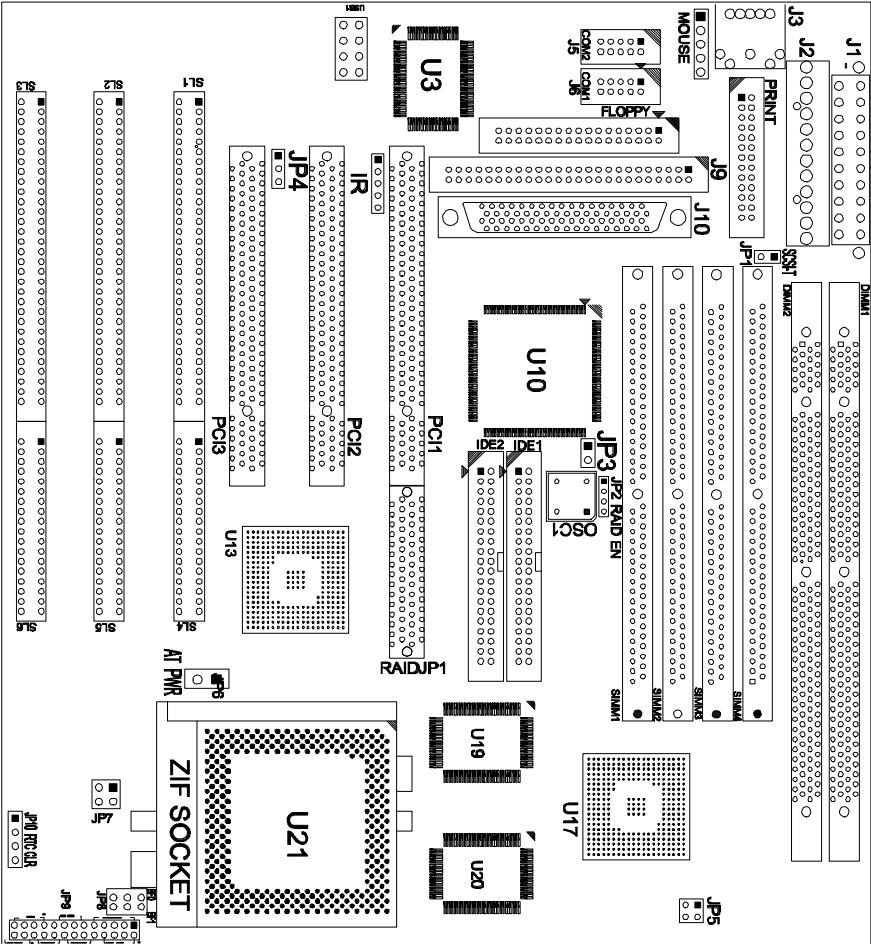
Default Setting for Intel Pentium 133Mhz, AMD K5-133,CYRIX P166+ , 512K PB Cache

4.2   Two-Jumper Setting for CPU

JP8: Set CPU External Bus Frequency Rate (BF0, BF1)
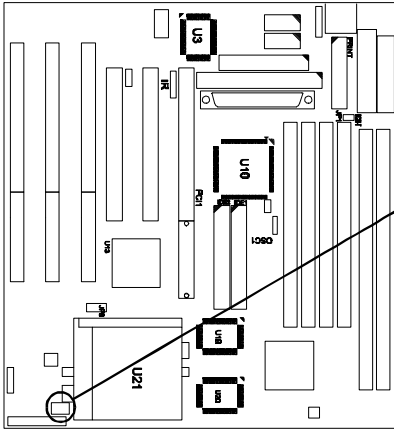
JP8:1-2/4-5, SHORT for Intel 90/100Mhz, MMX 233Mhz, AMD K5 75-133, AMD K6 PR233Mhz

JP8: 2-3/4-5 SHORT for Intel 120/ 133Mhz, CYRIX 120$^+$-200$^+$ (Default)
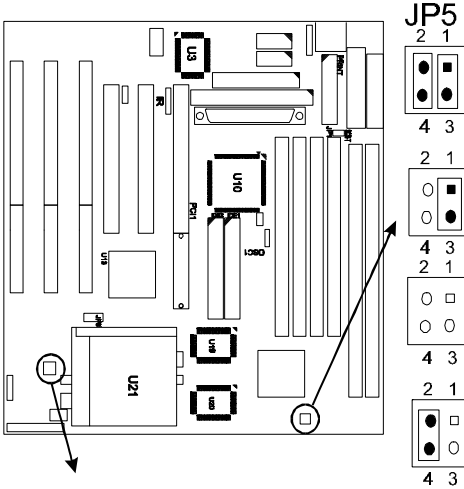
JP8: 2-3/5-6 SHORT for Intel MMX150/ 166 Mhz, AMD K6 PR166Mhz

JP8: 1-2/5-6 SHORT for Intel MMX 180/ 200Mhz,and AMD K6 PR200.

(JP8:1 to 3 means BF0 and JP8:4 to 6 means BF1.   When 2-3 short means ACTIVE, 1-2 short means NON-ACTIVE)

JP5: Set CPU External Bus Frequency Selection (FS0, FS1)

JP5

JP5: 1-3/2-4 SHORT: 55Mhz for CX133^{+}

JP5: 1-3 SHORT : 60Mhz for CX 150[+,] Intel/AMD 90/120/150/180Mhz

JP5:OPEN: 66 Mhz for CX 166[+], AMD K6, MMX. Intel/AMD 100/133/166/200/233Mhz (Default)

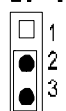JP5: 2-4 SHORT : 75Mhz for CX 200[+]

4.3   Other Hardware Jumpers

JP7

JP7: Set the CPU Type
➠ **OPEN** for P55C, Intel MMX, AMD K6, CYRIX 6x86L. Default.   2.8v
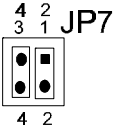
➠ 1-2, 3-4 SHORT indicates Intel P54C, AMD K5 and CYRIX. 3.3v only

JP4

JP4: Select FLASH BIOS
1-2 SHORT for 12v Flash BIOS (set by factory)
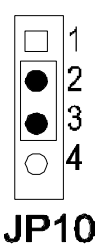**2-3 SHORT for 5v Flash BIOS** (normal). Default.

JP6

JP6: Choose Power Supply
SHORT: AT style power supply. Default.
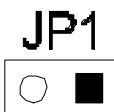OPEN: ATX style power supply

JP10: CMOS.   When you forget the password, clear CMOS, restart!
2-3 SHORT for normal. Default.
3-4 SHORT to clear CMOS (power must be off).
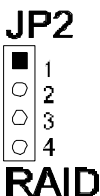OPEN for external battery installed. It is an important jumper. When BIOS setting is changed by user becoming unstable in system board, or I/O don't work properly, reset CMOS RAM data (default setup.)
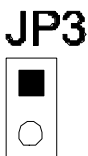
JP10

JP1: Set SCSI port power down mode.
SHORT: Power-down mode
OPEN: **Normal Power mode**. Default.

JP1

JP2: RAID function.
OPEN: RAID function enable
1-2, 3-4 SHORT: RAID function disable.   Default.

JP2

RAID

JP3: Wide SCSI function
SHORT: Enable Wide SCSI function
OPEN: Disable Wide SCSI function.   Default

JP3

4.4   Install System DRAM Memory

The board supports 2pcs 72-pin, 32-bit SIMMs (Single Inline Memory Modules) and 2pcs 168-pin, 64-bit DIMM (Dual Inline Memory Modules) of 4, 8, 16, 32MB to form a memory size between 8MB to 128MB. The

SIMMs can be 60ns or 70ns Fast Page Mode (FPM), or Enhanced Data Out (EDO) (BEDO & Parity are not supported).   SIMMs must be installed in pairs so that each bank (see Map of TX2)contains 64-bit of same memory chips.

DIMM can be used as one bank.   It is available for 3.3v (power level) Unbuffered Synchronous DRAM (SDRAM) or EDO DRAM of either 8, 16, 32, 64, 128MB, to form a memory size   between 8MB to 128MB. SIMM and DIMM can be used together, but the limitations are two banks and max memory size 128MB. 2pcs 72-pin SIMM is one bank and 1pce DIMM is one bank too.

Bank 0	Bank 1	TOTAL
1MB * 32 SS	X	8MB
1MB * 32 SS	1MB * 32 SS	16MB
1MB * 32 SS	2MB * 32 DS	24MB
1MB * 32 SS	4MB * 32 SS	40MB
1MB * 32 SS	8MB * 32 DS	72MB
2MB * 32 DS	X	16MB
2MB * 32 DS	1MB * 32 SS	24MB
2MB * 32 DS	2MB * 32 DS	32MB
2MB * 32 DS	4MB * 32 SS	48MB
2MB * 32 DS	8MB * 32 DS	80MB
4MB * 32 SS	X	32MB
4MB * 32 SS	1MB * 32 SS	40MB
4MB * 32 SS	2MB * 32 DS	48MB
4MB * 32 SS	4MB * 32 SS	64MB
4MB * 32 SS	8MB * 32 DS	96MB
8MB * 32 DS	X	64MB
8MB * 32 DS	1MB * 32 SS	72MB
8MB * 32 DS	2MB * 32 DS	80MB
8MB * 32 DS	4MB * 32 SS	96MB
8MB * 32 DS	8MB * 32 DS	128MB
16MB * 32SS	X	128MB
16MB * 32SS	16MB * 32SS	256MB

4.5   Install IDE, Enhanced I/O and Front Panel Connectors

There is a special design that JP9 is for Key Lock, Sleep/Resume SW, Speaker, IDE LED, TB SW, Reset SW, and Turbo LED.   It is convenient for you to connect the cable from front board of Case.
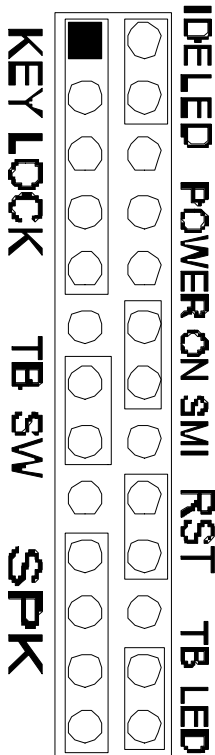
JP9: 1-5, Key Lock -   Keyboard lock switch & power LED connector.   1. Power LED (+), 2. N/C, 3. GND, 4. Key lock, 5. GND

JP9: 7-8, Turbo Switch.

JP9: 10-13, Speaker - Connect to the system's speaker for beeping. 10. Speaker, 11. GND, 12. GND, 13. VCC.

**JP9: 14-15**, IDE LED Indicator - LED ON when on board PCI IDE HDD activities.

JP9: 19-20, Power On SMI, Sleep/Resume Switch - Short to sleep mode.   A key strobe or mouse movement (mouse driver exists). The system will instantly " wake up" , GREEN FUNCTION .

JP9: 22-23, Reset - Short to restart system.

JP9: 25-26, Turbo LED Indicator - LED ON when high speed (CN9: 7-8 SHORT).
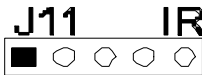
J11: IR,   fast infrared port. PIN-1: IRRX, PIN-2: GND; PIN-3: IRTX; PIN-4: VCC

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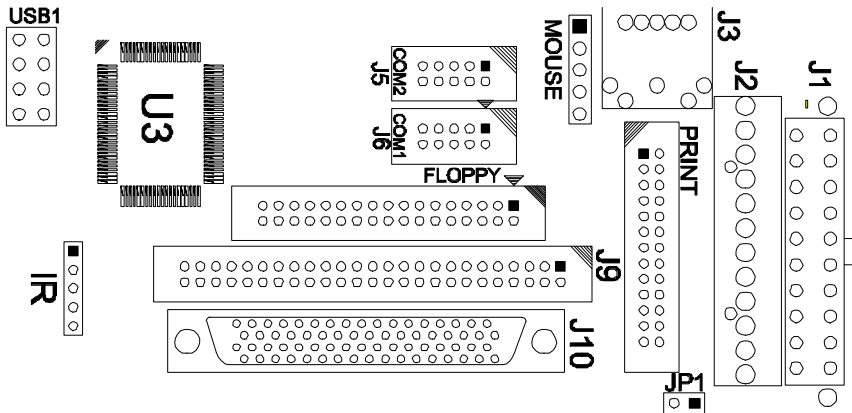
ATX POWER CONNECTOR/J1: For ATX factor style power supply
AT POWER CONNECTOR/J2: For normal AT style power supply

PS/2 Mouse J4: PS/2 mouse port. 5-pin Mouse:

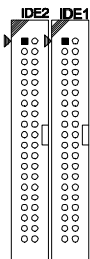**COM1-2/J5-6**: Support 16550 high speed serial ports/ UART.
LPT/J7: Printer port with ECP/ PP. bi-direction.   It can be used with external IDE/ SCSI device.
FDC/J8: Support 2 FDD up to 1.44MB or 2.88MB .

SCSI CONNECTOR/J9: AHA SCSI port
Wide SCSI CONNECTOR/J10: AHA Wide SCSI port
USB1: 4-PIN connectors.   PIN-1: VCC(5V), PIN-2: USB-, PIN-3: USB+, PIN-4: GND

IDE 1: Primary   IDE port to support ATAPI Mode 5 IDE devices
IDE 2: Secondary IDE port to support ATAPI Mode 5 IDE devices.

4.6   I/O Address and IRQ/DRQ

I/O Address and IRQ

On Board I/O	Address	IRQ	DRQ
GAME	200-20F	X	X
COM1	3F8-3FF	4	X
COM2	2F8-2FF	3	X
COM3	3E8-3EF	3	X
COM4	2E8-2EF	3	X
IDE1	1F0-1F7	14	X
IDE2	170-177	15	X
LPT1	378-37F	7	3 (ECP)
LPT2	278-27F	7	3 (ECP)
LPT3	3BC-3BF	7	3 (ECP)
FDD1	3F0-3F7	6	2
PS/2 MOUSE	X	12	X

4.7   Jumpers and Connectors List

ITEMS	DESCRIPTION
JP1	SCSI Port Power Down Mode
JP2	RAID Function Jumper
JP3	Wide SCSI Function Jumper
JP4	Flash BIOS, 12v or 5v
JP5	Set CPU External Bus Frequency ,CPU Type for clock
JP6	Choose AT or ATX Power Supply
JP7	CPU Voltage, 2.8v or 3.3v
JP8	Set CPU External Bus Frequency (BF0, BF1)
JP9	Front Panel Connector
JP10	2-3 Normal CMOS, 3-4 CMOS Clear
J1	ATX Power Supply Connector
J2	AT Power Supply Connector

J3	Key Board Connector
J4	PS/2 Mouse Connector
J5	COM2 Port
J6	COM1 Port
J7	Parallel Port
J8	Floppy Drive Port
J9	SCSI Port
J10	Wide SCSI Port
J11	IR Connector
USB1	USB Connector
IDE1-2	IDE Drive connector

4.8   Pin Definition for Cable Connection

There are two cables for COM1 and COM2.   Each cable is connected to 10-pin IDC connector.   The pin definitions for COM1/COM2 are as follows:

9-pin D-Sub	Definition		10-pin IDC
Pin-1	CD, Carrier Detect	⟶	Pin-1 (IN)
Pin-2	RXD, Receive Data	⟵	pin-3 (IN)
Pin-3	TXD, Transmit Data		Pin-5 (OUT)
Pin-4	DTR, Data Terminal Ready	⟵	Pin-7 (OUT)
Pin-5	GND, Signal Ground		Pin-9
Pin-6	DSR, Data Set Ready	⟶	Pin-2 (IN)
Pin-7	RTS, Request To Send	⟵	Pin-4 (OUT)
Pin-8	CTS, Clear To Send	⟵	Pin-6 (IN)
Pin-9	RI, Ring Indicator	⟵	Pin-8 (IN)

25-pin D-Sub	Definition		10-pin IDC
Pin-8	CD, Carrier Detect	⟶	Pin-1 (IN)
Pin-6	DSR, Data Set Ready	⟶	Pin-2(IN)
Pin-3	RXD, Receive Data	⟶	Pin-3 (IN)

Pin-4	RTS, Request To Send	←	Pin-4 (OUT)
Pin-2	TXD, Transmit Data	←	Pin-5 (OUT)
Pin-5	CTS, Clear To Send	→	Pin-6 (IN)
Pin-20	DTR, Data Terminal Ready	←	Pin-7 (OUT)
Pin-22	RI, Ring Indicator CTS	→	Pin-8 (IN)
Pin-7	GND, Signal Ground		Pin-9

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