



## Thunder i7522/S5362

Revision 1.02

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**Table of Contents**

<b>Before you begin</b> .....	iii
<b>Chapter 1: Introduction</b> .....	<b>1</b>
1.1 – Congratulations! .....	1
RoHS Compliant .....	1
1.2 – i7522 S5362 Hardware Specifications .....	2
1.3 – i7522 S5362 Board Image .....	5
1.4 – i7522 S5362 Block Diagram .....	6
1.5 – i7522 S5362 Components View .....	7
1.6 – i7522 S5362 Jumper Settings Quick Reference .....	8
<b>Chapter 2: Choose Proper Parts For Your System</b> .....	<b>9</b>
2.1 – Central Processor Unit (CPU) Considerations .....	9
2.2 – Memory Considerations .....	9
2.3 – Chassis/Enclosure Considerations .....	10
2.4 – Power Supply Considerations .....	10
<b>Chapter 3: Board Installation</b> .....	<b>12</b>
3.1 – Jumpers .....	13
3.2 – Installing the Processor and Heat sink .....	24
3.3 – Mounting the Motherboard .....	25
3.4 – Installing the Memory .....	26
3.5 – Attaching Drive Cables .....	27
3.6 – Installing Add-In Cards .....	29
3.7 – Connecting External Devices .....	30
3.8 – Installing the Power Supply .....	31
3.9 – Finishing Up .....	31
<b>Chapter 4: BIOS Setup</b> .....	<b>32</b>
4.1 – Main BIOS Setup .....	34
4.2 – Main CMOS Features .....	36
4.3 – Advanced BIOS Features .....	39
4.4 – Security .....	42
4.5 – Power .....	42
4.6 – Boot .....	43
4.7 – Exit .....	44
<b>Chapter 5: Diagnostics</b> .....	<b>45</b>
5.1 Beep Codes .....	45
5.2 Flash Utility .....	45
<b>Appendix I: Glossary</b> .....	<b>46</b>
<b>Appendix II: Post Error Code for BIOS</b> .....	<b>51</b>
<b>Appendix III: SMDC Information</b> .....	<b>53</b>
<b>Appendix IV: PCI-X/PCI Bus</b> .....	<b>54</b>
<b>Appendix V: Riser Card Support</b> .....	<b>55</b>
<b>Technical Support</b> .....	<b>57</b>

## Before you begin...

### Check the box contents!

The retail motherboard package should contain the following:



1x Thunder i7522 S5362 motherboard



1x 80-pin Ultra-DMA-133/100/66/33 IDE cable



1x Thunder i7522 S5362 User's Manual



1x Thunder i7522 S5362 Quick Reference



1x TYAN Driver CD



1x I/O shield



1 x Serial ATA driver diskette



1 x Serial ATA power cable



2 x Serial ATA cable s

If any of these items are missing, please contact your vendor/dealer for replacement before continuing with the installation process.

## Chapter 1: Introduction

### 1.1 – Congratulations!

You have purchased one of the most powerful Intel Xeon®-based server solutions in an Extended ATX form factor.

**Thunder i7522 S5362** is ideal for a pedestal or tower enterprise server systems featuring some state-of-the-art technologies such as dual/single 800 MHz FSB Xeon® processor support with Xeon dual-core processor, EM64T 64-bit technology, multiple PCI-X buses, PCI-Express bus, dual channel DDR2-400 Registered ECC memory design, onboard PCI-Express Gigabit Ethernet ports, Serial-ATA IDE ports, and multiple USB2.0 (Universal Serial Bus) ports.

#### RoHS Compliant

Starting from July 1 2006, the European Union (E.U.) will ban the use of four metals and two flame-retardants in electronic products sold in Europe. This requirement has been set into law the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive. Other governments are now following Europe's lead and enacting the similar legislation.

Tyan also provides Thunder i7522 S5362 RoHS-compliant version to meet EU's year 2006 standard, today.

Visit Tyan's website at <http://www.tyan.com>. There, you can find information on all of Tyan's product FAQ's, lists of worldwide distributors, Tyan software utilities, the latest Windows and Linux based drivers, memory compatibility listings and much more.

**1.2 – i7522 S5362 Hardware Specifications****Processors**

- Dual Intel® Xeon™ “Nocona”, “Irwindale”, “Paxville-DP” processors
- Two ZIF mPGA604 sockets
- Onboard EVRD 10.1
- 800 MHz FSB support
- Supports Intel Extended Memory 64 Technology (EM64T)

**Expansion Slots**

- Three PCI-X 133/100/66 MHz slots
- One PCI-X 100/66 MHz slot
- One (x 8) PCI-Express slot with PCI-E x4 signals
- One 32-bit/33 MHz 3.3Volts PCI 2.2 slot
- Four PCI-X, one PCI-Express (x 4), and one PCI independent buses
- Total six usable slots

**Chipset**

- Intel E7520 system core-logic chipsets
  - E7520 Memory Controller Hub
  - 82801ER (ICH5R) I/O Controller Hub
  - Two Intel 6700PXH 64-bit PCI Hubs
- Winbond W83627HF Super I/O chip

**Memory**

- Eight DDR2-400 DIMM sockets
- Up to 16 GB of Registered DDR2-400
- Supports Registered ECC type memory modules

**Integrated IDE (Parallel ATA)**

- Provides two PCI bus master channels for up to four UDMA IDE devices
- Support for UDMA 33/66/100 IDE and ATAPI devices

**Integrated Serial ATA (SATA) Host Controllers**

- Data transfer rates up to 1.5GB/s
- Supports RAID 0 or 1 (with 82801ER/ICH5R chip)
- With Adaptec's driver and option ROM

**Integrated I/O**

- One floppy connector for up to two drives
- Two 9pin UART serial support (1 port via cable---optional)
- One 25-pin ECP/EPP parallel header
- PS/2 mouse & keyboard stacked connectors
- Six USB 2.0 ports (2 rear USB connectors, four front USB ports via optional cables)

**BIOS**

- Phoenix BIOS 8 Mb flash ROM
- Supports ACPI Power Management: S1, S3, S4 and S5 modes
- Auto detection of memory size
- Auto configuration of IDE hard disk types
- User settings of hardware monitoring
- Multiple boot options including PXE
- Supports Console Redirect

**Form Factor**

- Extended ATX (12" x 13")
- One EPS ATX/12V 24-pin system power connector
- One SSI EEB v3.51 complaint 8-pin split CPU power connector
- Stacked PS/2 mouse/keyboard ports
- Stacked four rear USB2.0 ports
- One serial and one VGA ports
- Two side-by-side RJ45 connectors

**System Management**

- ADI ADT7468 H/W Monitor IC
- Three 4-pin (3-pin compatible) fan connectors
- Six 3-pin system fan headers
- Tachometer monitoring and PWM control for certain fans
- One 2pin chassis intrusion header
- SMBus connectors

**Integrated PCI Graphics**

- ATI ES1000 PCI controller
- 32 MB DDR memory Frame Buffer

**Integrated Two GbE LAN Controllers**

- Two Broadcom BCM5721 NICs
- PCI-Express 10/100/1000 GbE LANs
- Two side-by-side RJ45 connectors with LED's

**TARO™ 64-bit PCI-X Expansion Socket**

- Tyan proprietary 200-pin SODIMM socket
- Operates at 64-bit PCI-X bus
- Supports Intel RAIDIOS and Adaptec ZCR on the second 64-bit PCI-X slot (J41) with an optional M7902/M7901 SCSI TARO™ card or M8110/M8120 SATA TARO™ card

- Temperature and voltage monitoring
- Watchdog timer
- Optional Tyan SMDC (Server management Daughter Card) IPMI 1.5/2.0 via a 2x25 header

**Regulation**

- RoHS-compliant version available
- FCC Class B (Declaration of Conformity)
- European Community CE (Declaration of Conformity)

Visit <http://www.tyan.com> for TARO™ card support

\* Refer to Section IV for greater PCI bus routing clarification

**Software Specifications****OS (Operating System) Support**

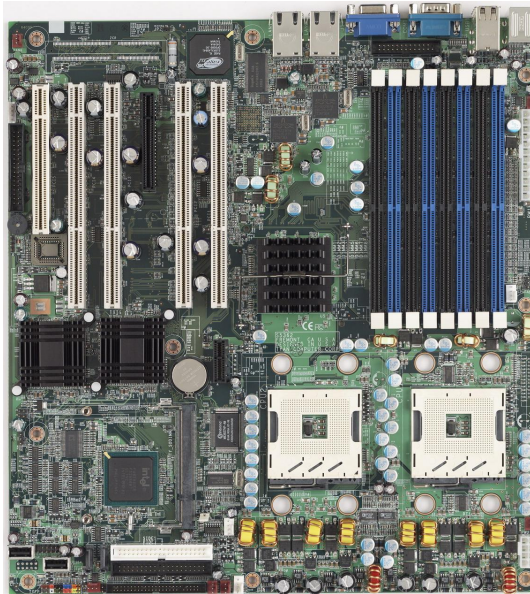
Microsoft Windows 2003 Enterprise Server 64-bit  
Microsoft Windows 2003 (Standard) Server 64-bit  
Microsoft Windows 2003 (Enterprise) Server 32-bit  
Microsoft Windows XP Professional  
Microsoft Windows XP Professional 64-bit  
Red Hat Advanced Server 3.0 Updated 4  
Red Hat EL 4.0 (64-bit)  
Red Hat 9.0  
SuSE Professional 9.3/10.0 (64-bit)  
SuSE Professional 9.3 (32-bit)  
SuSE Professional 9.3/10.0 (64-bit)  
SuSE 9.0 Enterprise Server (64-bit)

Other distributions of Linux pending validation

**TYAN reserves the right to add support or discontinue support for any OS with or without notice.**



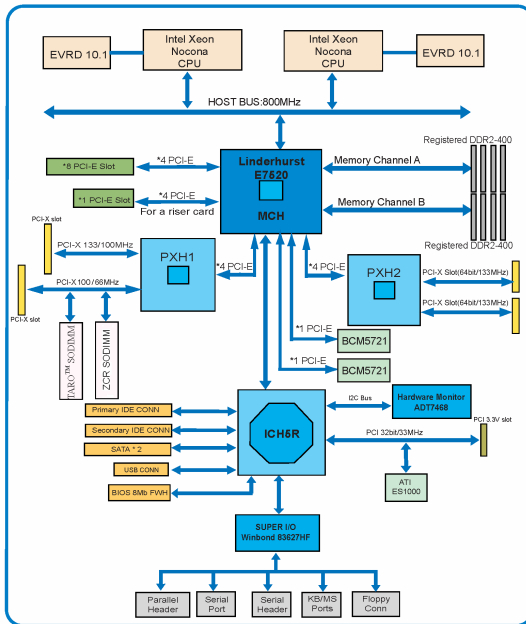
## 1.3 – i7522 S5362 Board Image



The above picture is purely representative. Due to engineering updates and new board revisions, certain components may change and or be repositioned. The picture above may or may not look exactly like the board you received.



1.4 – i7522 S5362 Block Diagram



The following page includes details on the vital components of this motherboard.

## 1.5 – i7522 S5362 Components View

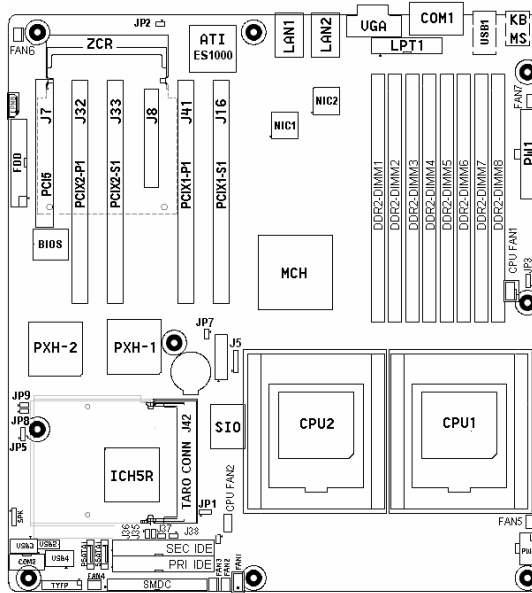


Fig. 3-1 Thunder i7522 S5362 Key Component View

This jumper diagram is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above diagram. The board parts are not to scale.

## 1.6 – i7522 S5362 Jumper Settings Quick Reference

Jumper	Function	Settings
JP1	CMOS Clear (Refer to Section 3.1.2)	1-2: Clear CMOS 2-3: <b>Normal</b>
JP2	Onboard VGA (Refer to Section 3.1.3)	<b>Open: Enable ATI VGA</b> Close: Disable ATI VGA
JP5	Watch-Dog Timer (Refer to Section 3.1.4)	<b>1-2: Watchdog Timer (WDT) resets system</b> 2-3: WDT generates NMI
JP7	PCIX1 Channel B (for PCIX1-S1 and PCIX1-S2 slots)	<b>Open: Enable 133 MHz maximum frequency</b> Close: Disable 133 MHz and up to 100/66 MHz Refer to Section 3.1.5
JP8	PCIX2 Channel A (for PCIX2-P1 slot)	<b>Open: Enable 133 MHz maximum frequency</b> Close: Disable 133 MHz and up to 100/66 MHz Refer to Section 3.1.7
JP9	PCIX2 Channel B (for PCIX2-S1 slot)	<b>Open: Enable 133 MHz maximum frequency</b> Close: Disable 133 MHz and up to 100/66 MHz Refer to Section 3.1.8
SPK	Buzzer/External Speaker	1-4: For external speaker connector <b>3-4: Enable onboard buzzer</b> Refer to Section 3.1.9
CPU	CPU1 Fan Connector	<b>Refer to Section 3.1.15</b>
FAN1	CPU2 Fan Connector	<b>Refer to Section 3.1.15</b>
CPU	CPU2 Fan Connector	<b>Refer to Section 3.1.15</b>
FAN2	CPU2 Fan Connector	<b>Refer to Section 3.1.15</b>
FAN1	4-pin System Fan Connector	<b>Refer to Section 3.1.15</b>
FAN2 – FAN7	3-pin System Fan Connectors	<b>Refer to Section 3.1.15</b>
J9	External HDD LED Input Header	<b>Refer to Section 3.1.10</b>
J34	SMDCC Connector	<b>Refer to Section 3.1.11</b>
J35, J36	LAN1 LED Header s	<b>Refer to Section 3.1.13</b>
J37, J38	LAN2 LED Header s	<b>Refer to Section 3.1.14</b>
USB2	USB Header	<b>Refer to Section 3.1.12</b>
USB3	USB vertical connector	<b>Refer to Section 3.1.12</b>
USB4	USB vertical connector	<b>Refer to Section 3.1.12</b>
P-SATA/S-SATA	SATA Connectors	<b>Refer to Section 3.1.16</b>



J18 (Front Panel Connector)			
Signal	Pin	Pin	Signal
HD LED +	1	2	PWR LED +
HD LED -	3	4	GND
GND	5	6	PWR ON-
Reset Button-	7	8	GND
+5V	9	10	Warning LED+
NC	11	12	GND
3Vsb	13	14	KEY
SMB DATA	15	16	GND
SMB CLK	17	18	Chassis Intrusion

## Chapter 2: Choose Proper Parts For Your System

Before you installing a system with this motherboard, make sure your major system parts meet the following basic guidelines and requirements:

### 2.1 – Central Processor Unit (CPU) Considerations

- **Process Type and Package**  
Thunder i7522 S5362 board supports Intel Xeon® 800 MHz front side bus (FSB) processors in 604-pin Pin Grid Array package. Low-voltage Xeon and 2MB L2 cache 800MHz FSB Xeon processors are also supported.
- **Front Side Bus (FSB)**  
The processor host bus, Front Side Bus (FSB), always operates at 800 MHz. Choose Intel Xeon® 800 MHz FSB processors for Thunder i7522 S5362 board. The system will not be operational, if you install Intel Xeon® 533 or 400 MHz FSB processors.
- **Single/Dual Processor System**  
The Thunder i7522 S5362 board supports single or dual Intel Xeon® 800 MHz FSB processors.  
Single Processor System:  
The processor must be installed on the CPU1 ZIF (Zero -Insertion-Force) socket, if only one processor is present.  
Dual Processor System:  
For dual processor configurations, both processors must operate with the same core frequency, and have the same internal cache sizes. Mixing processors operating at different FSB frequency, core frequency, core voltage, or cache sizes may cause system non-operation or damages on processors and/or the motherboard.

### 2.2 – Memory Considerations

- **Memory Type**  
Thunder i7522 S5362 board supports up to eight 184-pin *DDR-II 400 Registered ECC* DIMM modules. The DDR-II memory modules can be 256Mb, 512Mb and 1Gb memory chips. Unbuffered or DDR-I memory modules are not supported. Visit Tyan's web site for the memory recommendation list at: [www.tyan.com](http://www.tyan.com)
- **Memory Installation**  
Thunder i7522 S5362 is based on Intel's E7520 Lindenhurst chipset. The Intel E7520 Memory Control Hub (MCH) supports 144-bit wide dual memory channels in interleaved memory scheme, with installing paired memory. With the exception of Configuration 1 in the memory configuration table below, memory modules are installed in pairs, starting from DIMM8 towards DIMM1. Each pair of memory modules must be in the same capacity, density, speed, and configuration.

	DIMM 8 Ch. B	DIMM 7 Ch. A	DIMM 6 Ch. B	DIMM 5 Ch. A	DIMM 4 Ch. B	DIMM 3 Ch. A	DIMM 2 Ch. B	DIMM 1 Ch. A
	(Black)		(Blue)		(Black)		(Blue)	
Conf. 1	X							
Conf. 2	X	X						
Conf. 3	X	X	X	X				
Conf. 4	X	X	X	X	X	X		
Conf. 5	X	X	X	X	X	X	X	X

### 2.3 – Chassis/Enclosure Considerations

- Motherboard size**  
 The printed circuit board size is 13" (W) x12" (L).
- Motherboard and CPU Heat-sink Mounting Holes**  
 There are nine motherboard-mounting holes and eight CPU heat -sink mounting holes on this board design. The motherboard and CPU mounting hole pattern follows SSI EEB v3.51 (A Server System Infrastructure specification for Entry Pedestal Servers and Workstations) specifications. Ensure that your chassis supports those 9 motherboard-mounting holes to secure the motherboard. Thunder i7522/S5362 supports Intel's CEK ( *Common Enabling Kit*) for securing Intel's Xeon® 800 MHz FSB processors and processor cooling kits in the chassis. Two CEK springs for the dual processors are pre -assembled with the motherboard or enclosed in the motherboard accessory package. The CPU heat -sinks must be mounted down to the chassis base pan with stand -offs. Any additional chassis standoffs, besides the 9 motherboard -mounting holes and 8 CPU heat -sink mounting holes, should be removed to preventing from short -circuit or motherboard damage.
- Others**  
 As a system integrator, the air-flow/thermal, EMI/EMC, shock/vibration, and system packing should be also considered for choosing a proper enclosure.

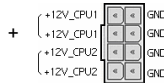
### 2.4 – Power Supply Considerations

- Power connectors**  
 The Thunder i7522 S5362 board supports EPS/12V power supply unit (PSU) with two power connectors listed below.

#### EPS/12V Power Connectors



24-pin system power connector  
(PW1)



8-pin CPU power connector  
(PW2)

- Split processor power planes**  
 Thunder i7522 S5362 board supports dual Intel's 800 MHz FSB Xeon® processors, which could reach up to 140 Watts per processor. (Check Intel's web for your processor specifications.) By following SSI EEB v3.51 specifications, Thunder i7522/S5362 is designed with two separate voltage regulator circuits to provide the power for both onboard processors in separate power rail. Using a power supply with a combined CPU power plane from the CPU power connector, is not allowed and may cause system failed to power up or a damage to power supply.

- **Power requirements**

Check your power supply specifications to ensure sufficient power currents for each power rail based on your system configuration.

The major system components/parts power sources are listed below as reference:

Components/Parts	Main Power Source	Power Connectors
CPU1	+12V CPU1	8-pin CPU power connector
CPU2	+12V CPU2	8-pin CPU power connector
Memory (Normal)	+5V	24-pin power connector
Memory (Suspend to RAM)	+5Vstandby	24-pin power connector
System logic	+3.3V	24-pin power connector
X8 PCI-Express	+12V and +3.3V	24-pin power connector
X1 PCI-Express	+12V and +3.3V	24-pin power connector
64-bit PCI-X	+12V, +5V, +3.3V and 3.3Vstandby	24-pin power connector
32-bit PCI	+12V, +5V and +3.3V	24-pin power connector
Cooling fans	+12V	24-pin power connector
IDE/SATA hard drives	+12V and +5V	From PSU
CDROM/DVD drives	+12V and +5V	From PSU

Visit Tyan's web site for the power supply recommendation list at: [www.tyan.com](http://www.tyan.com)

## Chapter 3: Board Installation

### How to install our products right.... the first time!

The first thing you should do read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

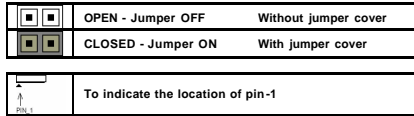
- (1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e., power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.
- (2) Inspect the mounting holes pattern of the Thunder i7522 S5362 to match your chassis standoff locations and remove the additional standoffs.
- (3) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
- (4) Avoid touching the motherboard components, IC chips, connectors, memory modules and leads.
- (5) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
- (6) Inspect the board for damage.
- (7) Check the jumper settings and connector locations as described in next sections.

In last sections of this chapter, we will cover the details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

**Note:** DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED

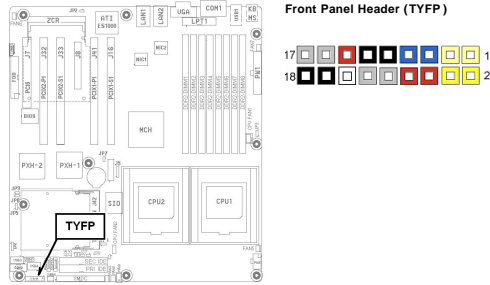
### 3.1 – Jumpers

#### Jumper Example:



#### 3.1.1 - Front Panel Header (TYFP)

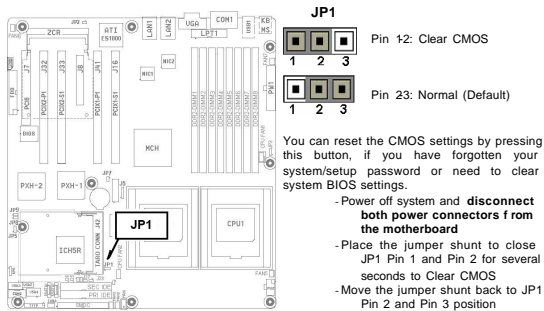
Normally, a chassis has some control or signal wires can be connected on a motherboard for hard drive LED, power LED, power button, and reset button. The front panel header (marked as "TYFP") has been implemented on a Thunder i7522 S5362 board for such purposes.



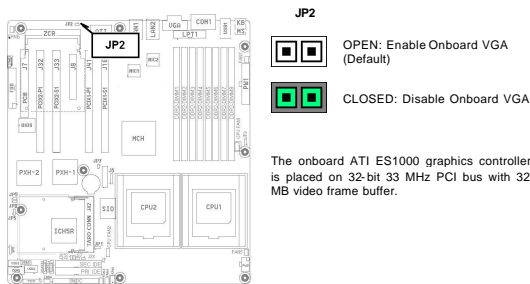
TYFP (Front Panel Connector)			
Signal	Pin	Pin	Signal
HD LED +	1	2	PWR LED +
HD LED -	3	4	GND
GND	5	6	PWR_ON-
Reset Button-	7	8	GND
+5V	9	10	Warning LED+
NC	11	12	GND
USB	13	14	KEY
SMB DATA	15	16	GND
SMB CLK	17	18	Chassis intrusion



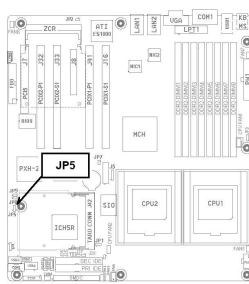
## 3.1.2 - Clear CMOS (JP1)



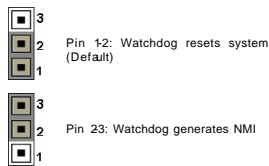
## 3.1.3 - Enable/Disable onboard ATI ES1000 graphics (JP2)



## 3.1.4 – Watch dog Timer (JP5)



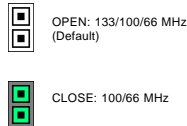
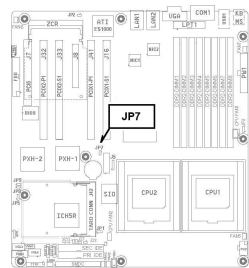
JP5



Once the watchdog function is enabled in BIOS setup, system needs an application or utility to clear the watchdog timer periodically before the timer expiration. If the application or utility fails to clear the watchdog timer, the system will be reset or entered a NMI service routine, depending on the JP5 setting. It is an OEM option of generating NMI service routing for watchdog function.

## 3.1.5 – PCI-X-1 Channel B (for PCI-X1-S1 and PCI-X1-S2 slots) Maximum Frequency (JP7)

JP7



JP7 is for onboard PXH-1 Channel B PCI-X bus frequency setting.

The PCI-X1-S1 and PCI-X1-S2 slots are the only devices on this PCI-X bus. Only one device/add-in card on PCI-X1-S1 slot is allowed to run this bus to run PCI-X frequency up to 133 MHz. Placing two or more devices on PCI-X1-S1 through a riser card or installing one device on PCI-X1-S2 slot can only support up to PCI-X 100 MHz.

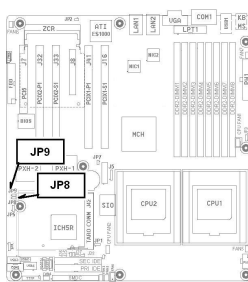
### 3.1.6 – PCIX-1 Channel A Maximum F requency

The following devices are connected to PCIX-1 Channel A PCI-X bus:


- TARO Socket (Tyan's 200-pin SODIMM proprietary socket)
- PCIX1-P1 64-bit PCI-X slot (available on Thunder i7522 S5362 only)
- ZCR socket (Reserved)


The maximum PCI-X bus frequency on this bus (PCIX-1 Channel A) is set to 100/66MHz.

### 3.1.7 – PCIX-2 Channel A Maximum F requency



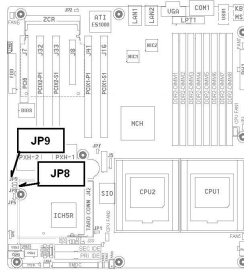
**JP8** (For PCIX2-P1 PCI-X slot)

 OPEN: 133/100/66 MHz  
(Default)

 CLOSE: 100/66 MHz

JP8 is for the onboard secondary PXH I/O Bridge chip (PXH-2) Channel A PCI-X bus frequency setting.  
The PCIX2-P1 slot is the only device on this PCI-X bus.

## 3.1.8 – PCI-X-2 Channel B Maximum F requency



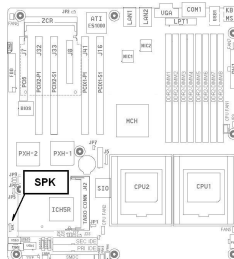
**JP9** (For PCI-X2-S1 PCI-X slot)

OPEN: 133/100/66 MHz  
(Default)

CLOSE: 100/66 MHz

JP9 is for the onboard secondary PXH I/O Bridge chip (PXH-2) Channel B PCI-X bus frequency setting. The PCI-X2-S1 slot is the only device on this PCI-X bus.

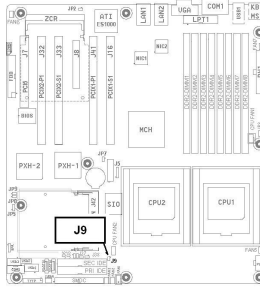
## 3.1.9 – External Speaker Header (SPK)



1  
 2 **Pin 2-3: Enable onboard buzzer**  
 3 (Default)  
 4

1  
 2 **Pin 1 and Pin 4: For connecting**  
 3 an external chassis speaker  
 4 (with disabling onboard buzzer)

## 3.1.10 – External LED Input Connector(J9)

**J9 External LED Input Connector**

Pin 1: External LED ACTIVE signal input (active at Logic High)

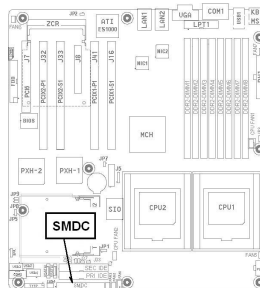
Pin 2: GND

J9 is for an external LED input connector. It can be connected with an internal device LED indication, such as hard disk drive LED.

This signal is combined or shared with onboard primary IDE LED, secondary IDE LED and SATA LED.

With M7902 SCSI module on TARO SODIMM socket, the M7902 SCSI drive LED is also combined with above LED signals and to be connected to the front panel header HDD LED pins (TYFP Pin 1 and Pin 3).

## 3.1.11 - SMDC Connector(J34)

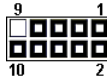
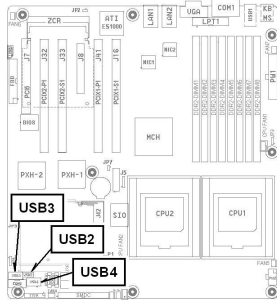
**J34 SMDC Connector**

J34 is a 25 x 2 position connector, which is for connecting an optional Tyan Server Management Daughter Card (SMDC).

Thunder i7522 S5362 supports Tyan M329 1 (SMDC)

**See Appendix III for details about the Tyan SMDC**

3.1.12 - Front USB Connector (USB2, USB3 and USB4)



Front USB Header (USB2)

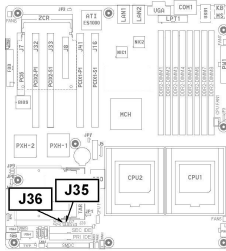
Function	Pin#	Pin#	Function
Power	1	2	Power
USB2-	3	4	USB3-
USB2+	5	6	USB3+
GND	7	8	GND
Key	9	10	Reserved



USB3 and USB4  
(USB Type A Vertical Connectors)

Pin#	Function
1	Power
2	USB-
3	USB+
4	GND

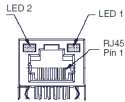
3.1.13 – Gigabit LAN 1 LED Headers (J 35) & (J36)



**J35:** NIC1 external SPEED LED Header  
**Pin\_1:** LINK\_100\_N (Active Low)  
**Pin\_2:** LINK\_1000\_N (Active Low)

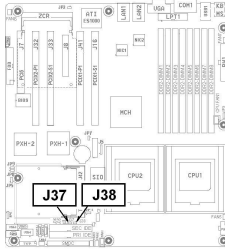
**J36:** NIC1 external LINK/ACTIVITY LED Header  
**Pin\_1:** ACT\_N (Active Low)  
**Pin\_2:** LINK\_ALL\_N (Active Low)

NIC1 and NIC2 RJ45 LED Scheme



Description	Left LED (ACTIVITY)	Right LED (SPEED)
No Link	OFF	OFF
Linked at 10 Mbps	Green	OFF
Linked at 100 Mbps	Green	Green
Linked at 1000 Mbps	Green	Yellow
Activity at any speed	Blink Green	

## 3.1.14 – Gigabit LAN 2 LED Headers (J 37) &amp; (J38)



- J37:** NIC2 external SPEED LED Header  
Pin\_1: LINK\_100\_N (Active Low)  
Pin\_2: LINK\_1000\_N (Active Low)
- J38:** NIC2 external LINK/ACTIVITY LED Header  
Pin\_1: ACT\_N (Active Low)  
Pin\_2: LINK\_ALL\_N (Active Low)



## 3.1.15 - Fan Connector

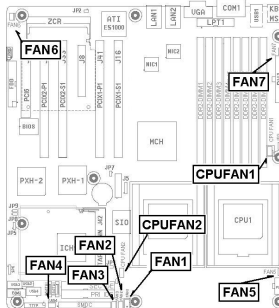


Pin1: GND  
 Pin2: +12V  
 Pin3: Tachometer  
 Pin4: Fan PWM (Speed) Control

\* PWM stands for Pulse Width Modulation

This 4-pin fan connector supports a new standard of fan connector for better fan life. It has an integrated fan speed control on the fan itself. The first 3 pins of this 4-pin fan connector are backward compatible with a traditional 3-pin fan connector without PWM fan speed control. (Pin4 will be unconnected for connecting a 3-pin fan).

There are three 4-pin fan connectors (CPU FAN1, CPUFAN2 and FAN1) and six 3-pin fan connectors (FAN2, FAN3, FAN4, FAN5, FAN6 and FAN7) on the Thunder i7522 S5362 board. Use these connectors to connect chassis and processor cooling fans to your motherboard. Cooling fans can keep the system stable and reliable for its product life.



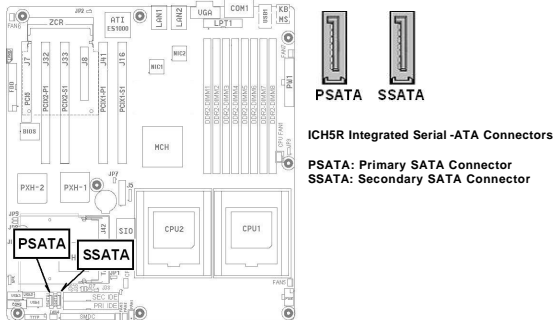
FAN	PWM Control	Tachometer Reading
CPUFAN1	Yes (ADT7463 Pin24/PWM1)	Yes (ADT7463 Pin11/TACH1)
CPUFAN2	Yes (ADT7463 Pin10/PWM2)	Yes (ADT7463 Pin12/TACH2)
FAN1	Yes (ADT7463 Pin13/PWM3)	Yes (ADT7463 Pin9/TACH3)
FAN2	No	No
FAN3	Yes (SIO Pin116/FANPWM1)*	Yes (SIO Pin111/FANIO3)
FAN4	Yes (SIO Pin116/FANPWM1)*	Yes (SIO Pin113/FANIO1)
FAN5	No	No
FAN6	No	No
FAN7	Yes (SIO Pin115/FANPWM2)	Yes (SIO Pin112/FANIO2)

\* FAN3 and FAN4 are shared the same PWM control.

**3.1.16 - Serial ATA Connectors (P-SATA & S-SATA)**

The Primary SATA (SATA0) and the secondary SATA (SATA1) ports are integrated into Intel's ICH5R South Bridge chip:

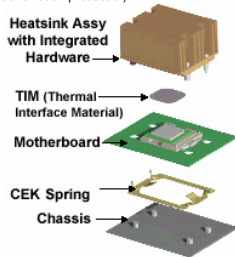
Users can connect up to two serial-ATA hard disks onto these two connectors to run IDE mode or configure both drives as a RAID (RAID level 0 or 1) under Microsoft's Windows XP and Windows 2000 operating systems.



Regarding to SATA RAID setup information, you may search the contents of the driver CD that shipped with your motherboard or visit our website at: [www.tyan.com](http://www.tyan.com)

### 3.2 – Installing the Processor and Heatsink

DCA (Direct Chassis Attach) is required to install the Intel Xeon® processors on Thunder i7522 S5362. The processor heat-sinks need to be Intel's CEK (Common Enabling Kit) compliant. Each processor heat-sink needs to be mounted to chassis with which are 8 processor heat-sink mounting holes (4 holes for each processor)



After you finish installing the heatsink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heatsink) to the motherboard. The following diagram illustrates how to connect fans onto the motherboard.

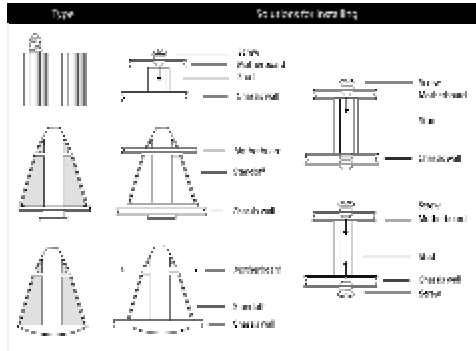


After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

### 3.3 – Mounting the Motherboard

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are in gold or silver color. Usually, the chassis manufacturer will pre-install the support studs. Remove the unused or additional studs, which may scratch the motherboard or cause short-circuit with the components on the bottom side. If you're unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed. Some chassis' include plastic studs instead of metal. Although the plastic studs are usable, TYAN recommends using metal studs with screws that will fasten the motherboard more securely in place.

Mounting the Motherboard

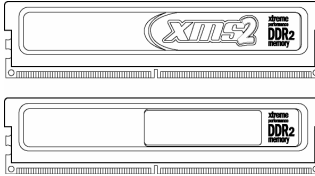


**TIP:** Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

### 3.4 – Installing the Memory

Before attempting to install any memory, make sure that the memory you have is compatible with the motherboard as well as the processor. Check Section 2.2 "Memory Consideration" for your memory module selection. For this information, please check TYAN's web site at: [www.tyan.com](http://www.tyan.com)

When installing memory modules, make sure the modules align properly with the memory socket. There should be keys (small indents) on your memory modules that fit according to the keys in the memory socket. Registered DDR2-400 memory modules and sockets have only one key, which is slightly near the center of the module/socket. The method of installing memory modules is detailed in the following diagrams.



Once the memory modules are firmly seated in the socket, two clamps on either side will close and secure the module into the socket. Sometimes you may need to close the clamps manually.

To remove the memory module, simply push the clamps outwards until the memory module pops up. Then simply remove the module.

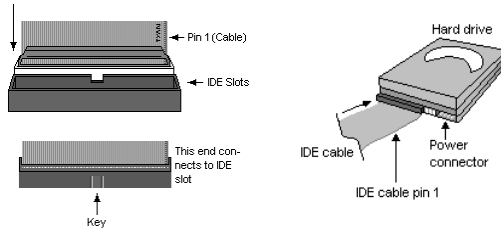
**TIP:** When installing memory, a module may require a considerable amount of force to seat properly, although this is very rare. To avoid bending and damaging your motherboard, place it on its antistatic bag and onto a flat surface, and then proceed with memory installation.

**Note:** You **MUST** unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion device.

### 3.5 – Attaching Drive Cables

Attaching IDE drive cabling is simple. These cables are “keyed” to only allow them to be connected in the correct manner. TYAN motherboards have two on-board IDE channels, each supporting two drives. **The black connector designates the Primary channel, while the white connector designates the Secondary channel.**

Attaching IDE cables to the IDE connectors is illustrated below:

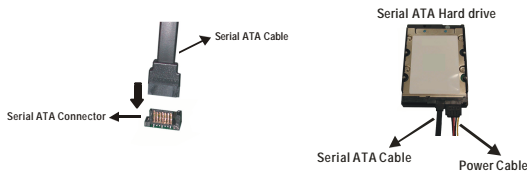


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

**TIP:** Pin 1 on the IDE cable (usually designated by a colored wire) faces the drive's power connector.

#### Serial ATA

Attaching Serial ATA cables to the Serial ATA connectors is illustrated below:

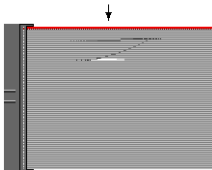


Simply plug in the BLACK END of the Serial ATA cable into the motherboard Serial ATA connector, and the other end(s) into the drive(s). Each standard Serial ATA cable has two connectors. Both BLACK ENDS of the Serial ATA cable are the same that are used to connect to drives or motherboard.

### Floppy Drives

Attaching a floppy drive can be done in a similar manner to an IDE drive. See the diagram below for an example of a floppy cable. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there will be a key pin on the cable which will force proper connection of the cable.

Twist at the end of the ribbon cable



The first floppy drive (commonly denoted as **A:**) is usually attached to the end of the cable with the twist in it. Drive **B:** is usually connected to the second or third connector in the cable (the second or third connector after you install Drive **A:**).

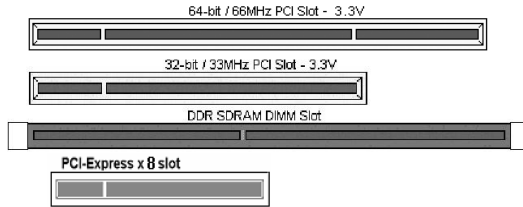
Refer to your floppy drive's installation instructions (if available), or contact your dealer if you are unsure about how to attach the floppy drive(s). Remember, you can only have 2 floppy drives connected at any given time.

Below are some symptoms of incorrectly installed floppy drives. While they are minor and installing them incorrectly doesn't cause severe problems, it may cause your system to freeze or crash when trying to read and/or write to diskettes.

Symptoms of incorrectly installed floppy drives	
Drive is not automatically detected	Usually caused by faulty cables, cables put in backwards or a bad floppy drive or motherboard. Try another floppy drive to verify the problem if the cable is properly installed or try replacing the actual cable. Also check to see if the onboard floppy controller is enabled in the BIOS setup.
Drive Fail message at bootup	The cable, floppy drive or motherboard may be faulty. Try another drive or cable to verify.
Drive does not power on	Check power cable and cabling. Maybe a bad power supply or drive cable problem.
Drive activity light is constantly on	Usually signifies that the cable on the drive is on backwards, which is a common issue. Reverse the cable at the floppy drive end and try again.

### 3.6 – Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the most common slots that may appear on your motherboard. Not all of the slots shown will necessarily appear on your motherboard, however, there will be combinations of what you see here.



Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards (or anything else) into any slots if they won't seat in place. It's better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

**TIP:** It's a good practice to install add-in cards in a staggered manner, rather than directly adjacent to each other. This allows air to more easily circulate within the chassis, providing improved cooling for all installed devices.

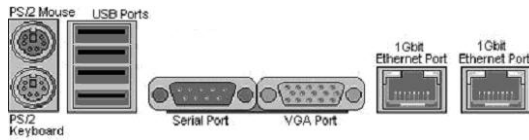
**Note:** **YOU MUST** unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion device.



### 3.7 – Connecting External Devices

Connecting external devices to the motherboard is an easy task. The standard devices you should expect to plug into the motherboard are keyboards, mouse, and printer cables. The following diagram will detail the ATX port stack for the following board:

Thunder i7522 S5362

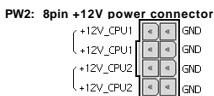
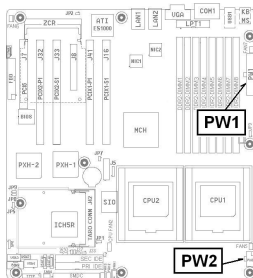


Besides being used primarily to connect printers, the Printer Port is also used for devices such as Zip drive, some external CD-RW drives and other external devices. More on the uncommon side these days are the Serial Ports. They were primarily used to connect external modems, but most modems today are using USB or are installed internally.

**TIP:** While the ports have been created to accept connectors in only one direction, make sure to be careful when inserting connectors. At times, attaching connectors in the incorrect orientation can damage, bend and or break the pins.

### 3.8 – Installing the Power Supply

There are two power connectors on this motherboard. By default, this motherboard requires that you have an EPS ATX12V power supply that has the standard ATX-style 24-pin connector, as well as an additional 8-pin square connector. The CPU power is provided by the onboard switching voltage regulator, which is sourced by +12V power. This +12V CPU power source is from the onboard 8-pin split power planes. The +12V power on the 24-pin ATX power connector is for system board and separated from CPU +12V regulator power source. Therefore, the CPU will not be powered if you do not connect the 8-pin CPU power connector.



**NOTE** YOU MUST unplug the power supply before plugging in the 24-pin and 8-pin power cables to motherboard connectors.

### 3.9 – Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

## Chapter 4: BIOS Setup

### Installation

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. This chapter describes different settings for the BIOS that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information when the power is turned off.

This motherboard's BIOS is a customized version of the industry-standard BIOS for IBM PC AT-compatible personal computers. The BIOS provides critical, low-level support for the system's central processing unit (CPU), memory, and I/O subsystems.

This BIOS has been customized by adding important features such as password protection, power management, and chipset "tuning" features that control the system. This section will guide you through the process of configuring the BIOS for your system setup.

### Starting Setup

The BIOS is immediately activated when you turn on the computer. The BIOS reads system configuration in CMOS RAM and begins the process of checking out the system and configuring it through the Power-On-Self-Test (POST).

When these preliminary tests are complete, the BIOS searches for an operating system on one of the system's data storage devices (hard drive, CD-ROM, etc). If one is found, the BIOS will launch that operating system and hand control over to it. You can enter the BIOS setup by pressing the [F2] key when the machine boots up and begins to show the memory count.

### Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Change from one menu to the next
Up/Down Arrow Keys	Move between selections
Enter	Opens highlighted section
+/- Keys	Change settings

### Getting Help

Pressing [F 1] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [ESC] or [F1] key again.

### In Case of Problems

If you discover that you have trouble booting the computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.

The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of the outcome. The chipset defaults are carefully chosen by TYAN or your system manufacturer for the best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

### Setup Variations

Not all systems will have the same BIOS setup layout or options. While the basic look and function of the BIOS set up remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

**NOTE:** On the following pages, options written in **bold type** represent the BIOS Setup default.

#### 4.1 – Main BIOS Setup

When you enter Phoenix BIOS Setup Utility, the following screen will appear as below:

Phoenix cME FirstBIOS Pro Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
System Time:		[ 10 : 15 : 18 ]	Item Specific Help		
System Date:		[02/15/2004]	-----		
Legacy Diskette A:		[1.44/1.25 MB 31/2]	<Tab>, <Shift-Tab>, or <Enter> selects field.		
? IDE Channel 0 Master		[None]			
? IDE Channel 0 Slave		[None]			
? IDE Channel 1 Master		[None]			
? IDE Channel 1 Slave		[None]			
? IDE Channel 2 Master		[None]			
? IDE Channel 3 Master		[None]			
? Memory Cache					
? Boot Features					
? System Information					
-----					
F1: Help	?? Select Item	+/- Change Value	F9: Setup Defaults		
Esc: Exit	F7: Select Menu	Enter: Select > Sub-Menu	F10: Save and Exit		

##### Main

Use this menu for basic system configuration and system date and time settings.

##### Advanced

Use this menu to set the Advanced Features available on your system.

- o **Advanced Chipset Control**  
Use this menu to change the values in the chipset registers and optimize your system's performance.
- o **Advanced Processor Options**  
Use this menu to specify your processor settings.
- o **I/O Device Configuration**  
Use this menu to specify your basic I/O peripherals such as floppy, serial and parallel ports.
- o **Console Redirection**  
Use this menu to assign one of serial ports to perform the console redirection function.
- o **Hardware Monitor**  
Use this menu to setup BIOS event logging. The information of system voltages, temperatures and fan tachometers is also display in this sub-menu.

**Security**

Use this menu to setup passwords and storage media protection.

**Power**

Configure the power button behavior and the settings for system power resume from an AC power loss.

**Boot**

Configure the system boot up sequence for multiple bootable devices.

**Exit**

Use this menu to save or ignore the changes of CMOS settings. The default BIOS settings can also be retrieved, in case of improper custom CMOS settings.

## 4.2 – Main CMOS Features

In this section, you can alter general features such as the date and time, as well as access to the IDE configuration options. Note that the options listed below are for options that can directly be changed within the Main Setup screen. User can use the arrow or <Enter> keys to highlight the item and then use the <←> or <→> keys to select the value you want in each item.

Main	Advanced	Security	Power	Boot	Exit
System Time: [10]: 15: 18				Item Specific Help	
System Date: [02/15/2004]					
Legacy Diskette A: [1.44/1.25 MB 31/2']				<Tab>, <Shift-Tab>, or <Enter> selects field.	
? IDE Channel 0 Master [None]					
? IDE Channel 0 Slave [None]					
? IDE Channel 1 Master [None]					
? IDE Channel 1 Slave [None]					
? IDE Channel 2 Master [None]					
? IDE Channel 3 Master [None]					
? Memory Cache					
? Boot Features					
? System Information					
<b>F1:</b> Help <b>??</b> Select Item <b>+/-</b> Change Value <b>F9:</b> Setup Defaults <b>Esc:</b> Exit <b>F2:</b> Select Menu <b>F5:</b> Select ? Sub Menu <b>F10:</b> Save and Exit					

### System Time / Date Setup:

System Time: Adjusts the system clock.

**[HH: MM: SS]**

HH Hours (24hr. format)

MM Minutes

SS Seconds

System Date: Adjusts the system date.

**[MM/DD/YYYY]**

MM Months

DD Days

YYYY Years

**Legacy Diskette A:**

Defines the floppy drive type.

None / 360K, 5.25in / 1.2M, 5.25in / 720K, 3.5in / 1.44M, 3.5in / 2.88M, 3.5in**IDE and Integrated SATA Master / Slave Setup:**

Computer detects IDE drive types.

None / Auto / Manual

**Memory Cache**

To select the memory cache types for memory segments within 640KB base address and extended memory.

Feature	Option	Description
Cache System BIOS Area:	<b>Uncached</b> <b>Write Protect</b>	Control Caching of System BIOS Area.
Cache Video BIOS Area	<b>Uncached</b> <b>Write Protect</b>	Control Caching of Video BIOS Area.
Cache Base 0-512k	Uncached Write Through Write Protect <b>Write Back</b>	Control caching of 512k Base Memory
Cache Base 512k-640k	<b>Uncached</b> Write Through Write Protect <b>Write Back</b>	Control caching of 512k-640k Base Memory
Cache Extended Memory Area	<b>Uncached</b> Write Through Write Protect Write Back	Control Caching of System Memory above One Megabyte
Cache A000 -AFFFB000 -BFFF	<b>Disabled</b> USWC Caching Write Through Write Protect Write Back	Control Caching of This Block
Cache C800 -CBFF/CCC0 -CFFF...DC00- DFFF	<b>Disabled</b> Write Through Write Protect Write Back	Control Caching of This Block
Cache E000-E3FF/E400-E7FF...EC00- EFFF	<b>Disabled</b> Write Through <b>Write Protect</b> Write Back	Control Caching of This Block



**Boot Features:**

## Summary Screen:

Enable or disable the system configuration information on display during system boot up stage.

Enabled / Disabled

## Quiet Boot:

Enable or disable the display of OEM logo screen during POST (Power On Self Test).

Enabled / Disabled

## QuickBoot Mode:

Enable or disable the system to skip certain tests during POST. Enabling this item will reduce the system boot time

Enabled / Disabled

## F12 Boot Menu:

Enable or disable the display of Multiboot menu. When this item is enabled, users can choose a different boot device from BIOS settings by pressing <F12> hotkey during system boot up stage.

Enabled / Disabled

## Halt on POST Errors:

Determines if the computer should stop when an error is detected during power up.

Enabled / Disabled

**System Information:**

Display system board model, BIOS version and BIOS build date.

### 4.3 – Advanced BIOS Features

In Advanced BIOS features, you will be able to adjust many of the feature that effect system speed and boot-up options.

Phoenix cME FirstBIOS Pro Advanced CMOS Setup Menu

Main	Advanced	Security	Power	Boot	Exit
Installed O/S	[ Win2000 ]			Item Specific Help	
Reset Configuration Data	[No]				
Large Disk Access Mode	[DOS]				
Parallel ATA	[Both]			Select the operating system installed on your system, which you will use most commonly.	
Serial ATA	[Enabled]				
Native Mode Operation	[Auto]				
SATA RAID Enable	[Disabled]			Note: An incorrect setting can cause some operating systems to display unexpected behavior.	
? Advanced Chipset Control					
? Advanced Processor Options					
? I/O Device Configuration					
? Console Redirection					
Legacy USB Support	[Enabled]				
? Hardware Monitor					
F1: Help    ?? Select Item    +/- Change Value    F9: Setup Defaults Esc: Exit    F2: Select Menu    Enter: Select ?    Sub Menu    F10: Save and Exit					

#### Installed O/S:

Select the operating system installed on your system, which you will use most commonly.  
 Note: An incorrect setting can cause some operating systems to display unexpected behavior.  
 Win95 / Win98 / WinMe / Win2000 / Other

#### Reset Configuration Data:

If you select "Yes" on this item, the Extended System Configuration Data (ESCD) area will be cleared.

No / Yes

#### Large Disk Access Mode

Different operating systems may require different representations of hard disk geometries. For UNIX, Novell Netware, or certain operating systems, this item needs to set as "Other". For Microsoft Windows or DOS operating systems, choice "DOS".

Other / DOS

#### Parallel ATA

This option allows users to enable or disable the integrated primary and/or secondary parallel ATA channels.

Disable d / Channel 0 / Channel 1 / Both

**Serial ATA:**

This option allows users to enable or disable the integrated ICH5R serial ATA ports.

Enabled / Disabled

**Native Mode Operation:**

This option for ATA hard drives. Certain operating systems cannot support Native Mode Operation. Setting "Auto" for this item is recommended.

Auto / Parallel ATA / Serial ATA / Both

**SATA RAID Enable:**

Select the ICH5R integrated SATA ports to be IDE mode or RAID mode. If select to "RAID" mode for attached SATA drives, there is an option ROM banner display to allow users to enter the RAID configuration menu during the system boot up.

The ICH5R integrated SATA ports support RAID level 0 or RAID level 1 under Windows.

Enabled / Disabled

**Advanced Chipset Control:**

## Integrated USB

Integrated USB 1.1

Enabled / Disabled

Integrated USB 2.0

Enabled / Disabled

## Integrated Gbit LAN

Integrated Gbit LAN

Enabled / Disabled

Onboard LAN1 Boot Strap

Enabled / Disabled

Onboard LAN2 Boot Strap

Enabled / Disabled

**Advanced Processor Options:**

Users can enable or disable Intel's Hyper Threading Technology to enable or disable a logical processor for each processor under Microsoft Windows XP or Windows 2003.

Hyper Threading Technology

Enabled / Disabled

Other options in this sub-menu are for debug purpose.

**I/O Device Configuration:**Floppy disk controller: **Enabled** / DisabledSerial port A: Disabled / **Enabled** / Auto  
Base I/O Address: **3F8** / 2F8 / 3E8 / 2E8  
Interrupt: **IRQ3** / IRQ4Serial port B: Disabled / **Enabled** / Auto  
Base I/O Address: **3F8** / 2F8 / 3E8 / 2E8  
Interrupt: **IRQ3** / IRQ4Parallel port: Disabled / **Enabled** / Auto  
Mode: Output Only / Bi-directional / EPP / **ECP**  
Base I/O Address: **3F8** / 278 / 3BC  
Interrupt: **IRQ5** / **IRQ7**  
DMA: DMA1 / **DMA3****Console Redirection:**COM Port Address: **Disabled** / Onboard COM A / Onboard COM B  
Select onboard serial port or serial port on BMC IPMI card for console redirection.Baud Rate: 300 / 1200 / 2400 / 9600 / **19.2K** / 38.4K / 57.6K / 115.2KConsole Type: VT100 / VT100 8bit / PC-ANSI, 7bit / **PC ANSI** / VT100+ / VT-UTF8Flow Control: None / XON/XOFF / **CTS/RTS**Console connection: **Direct** / Via Modem  
Indicate whether the console is connected directly to the system or a modem is used to connect.Continue C.R. after POST  
**ON** / **OFF**  
Enable Console Redirection after OS has loaded.**Legacy USB Support**Enable support for legacy Universal Serial Bus.  
**Enabled** / Disabled**Hardware Monitor**BIOS Event Logging  
BIOS Event Logging: **Enabled** / Disabled  
View BIOS Event Log: [**Enter**] Press < Enter > key to view the event log  
Clear all BIOS Event Logs: **Enabled** / DisabledReal-time Sensors  
Auto display CPU/system temperatures, fan speeds and voltages.

#### 4.4 – Security

In Security BIOS features, you will be able to setup passwords and floppy write-protect.

Phoenix cME FirstBIOS Pro Advanced CMOS Setup Menu

Main	Advanced	Security	Power	Boot	Exit
Supervisor Password Is		Clear / Set		Item Specific Help	
User Password Is		Clear / Set			
Set Supervisor Password		[Enter]		Supervisor Password controls access to the setup utility.	
Set User Password		[Enter]			
Diskette Access		[Supervisor]			
Fixed Disk Boot Sector		[Normal]			
Virus Check Reminder		[Disabled]			
System Backup Reminder		[Disabled]			
Password on Boot		[Disabled]			
Start From Floppy		[Enabled]			
Start From IDE CD-ROM		[Enabled]			
Floppy Write Protect		[Disabled]			
<b>F1:</b> Help <b>??</b> Select Item <b>+/-</b> Change Value <b>F9:</b> Setup Defaults <b>Esc:</b> Exit <b>F2:</b> Select Menu <b>F5:</b> Select 2 Sub-Menus <b>F10:</b> Save and Exit					

Please refer to the "Item Specific Help" fields for the descriptions of each settings.

#### 4.5 – Power

##### Power Button Behavior:

Select the desired system power state after press power button.

[On/Off] / [Wake/Sleep]

##### After Power Failure:

With this setting, users can specify the choice for the AC power resume ...

[Stay Off]: Set to stay off to leave the computer in the power off state, after power resume from an AC power loss.

[Last State]: Set to last state to restore the system to the previous status before power failure or interrupt occurred.

[Power On]: Set to power on to leave the computer in the power on state. .

[Last State] / [Stay Off] / [Power On]

## 4.6 – Boot

Main	Advanced	Security	Power	Boot	Exit
+ Removable Devices + Hard Drive CD-ROM Device Network Boot				Item Specific Help <hr/>	
F1: Help    ?? Select Item    +/- Change Value    F9: Setup Defaults Esc: Exit    F7: Select Menu    Enter: Select ? Sub-Menu    F10: Save and Exit					

The boot menu will list all bootable devices. Use <Enter> to expand or collapses devices with a + or -. Use <+> or <-> to arrange the priorities of all bootable devices

## 4.7 – Exit

Main	Advanced	Security	Power	Boot	Exit
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes					Item Specific Help <hr/>
F1: Help    ?? Select Item    +/- Change Value    F9: Setup Defaults Esc: Exit    ?? Select Menu    Enter: Select ? Sub-Menu    F10: Save and Exit					

**Exit Saving Changes**

Use this option to exit setup utility and re-boot.  
 All new selections you have made are stored into CMOS.  
 System will use the new settings to boot up.

**Exit Discarding Changes**

Use this option to exit setup utility and re-boot.  
 All new selections you have made are not stored into CMOS.  
 System will use the old settings to boot up.

**Load Setup Defaults**

Use this option to load all default setup values.  
 Use this option when system CMOS values have been corrupted or modified incorrectly.

**Discard Changes**

Use this option to restore all new setup values that you have made but not saved into CMOS.

**Save Changes**

Use this option to store all new setup values into CMOS.

## Chapter 5: Diagnostics

Note: if you experience problems with setting up your system, always check the following things in the following order:

### Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at: <http://www.tyan.com>

### 5.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through a series of audible beeps. For example, if the BIOS POST can initialize the video but an error occurs, an error message will be displayed. If it cannot display the message, it will report the error as a series of beeps.

The most common type of error is a memory error.

Before contacting your vendor or TYAN Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

### 5.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site: <http://www.tyan.com/>.

**Note:** Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.



## Appendix I: Glossary

**ACPI (Advanced Configuration and Power Interface):** a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

**ATAPI (AT Attachment Packet Interface):** also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

**Bandwidth:** refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path, can carry. Greater bandwidth, then, also results in greater speed.

**BBS (BIOS Boot Specification):** is a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails for some reason. At that point, the next IPL device is called upon to attempt loading of the OS.

**BIOS (Basic Input/Output System):** the program that resides in the ROM chip, and provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

**Buffer:** a portion of RAM which is used to temporarily store data, usually from an application, though it is also used when printing, and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it, all at once, to a disk drive. While this improves system performance --- reading to or writing from a disk drive a single time is much faster than doing so repeatedly --- there is also the possibility of losing your data should the system crash. Information stored in a buffer is temporarily stored, not permanently saved.

**Bus:** a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

**Bus mastering:** allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

**Cache:** a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times, since the needed information is stored in the SRAM instead of in the slow DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

**Cache size:** refers to the physical size of the cache onboard. This should not be confused with the cacheable area, which is the total amount of memory which can be scanned by the system in search of data to put into the cache. A typical setup would be a cache size of 512KB, and a cacheable area of 512MB. In this case, up to 512KB of the main memory onboard is capable of being cached. However, only 512KB of this memory will be in the cache at any given moment. Any main memory above 512MB could never be cached.

**Closed and open jumpers:** jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

**CMOS (Complementary Metal-Oxide Semiconductors):** chips that hold the basic startup information for the BIOS.

**COM port:** another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

**DDR (Double Data Rate):** is a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

**DIMM (Dual In-line Memory Module):** faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

**DIMM bank:** sometimes called DIMM sockets, because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

**DMA (Direct Memory Access):** channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

**ECC (Error Correction Code or Error Checking and Correcting):** allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

**EEPROM (Electrically Erasable Programmable ROM):** also called Flash BIOS, is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN's BIOS updates can be found at <http://www.tyan.com>

**EMRL:** Embedded RAID Logic. An Adaptec specific RAID technology.

**ESCD (Extended System Configuration Data):** a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

**Fault-tolerance:** a term describing a system where one component can quickly be replaced without causing a loss of service, such as in a RAID system.

**Firmware:** low-level software that controls the system hardware.

**Form factor:** an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX, although TYAN also makes some Baby-AT and ATX Footprint boards.

**Global timer:** onboard hardware timer, such as the Real-Time Clock (RTC).

**Handshaking:** a process where two devices initiate communications. One device, typically the server, sends a message to another device, typically a client, in order to request establishment

of a communications channel. The two devices will then exchange messages back and forth in order to settle on a communications protocol.

**HDD:** stands for Hard Disk Drive, a type of fixed drive.

**H-SYNC:** controls the horizontal synchronization/properties of the monitor.

**IC (Integrated Circuit):** the formal name for the computer chip.

**IDE (Integrated Device/Drive Electronics):** a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

**IDE INT (IDE Interrupt):** a hardware interrupt signal that goes to the IDE.

**I/O (Input/Output):** the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

**Initial Program Load (IPL):** a feature built into BIOS-compliant devices, describing those devices as capable of loading and executing an OS, as well as being able to provide control back to the BIOS if the loading attempt fails.

**IPL:** see Initial Program Load.

**IRQ (Interrupt Request):** an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line: doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

**Latency:** the amount of time that one part of a system spends waiting for another part to catch up. This is most common when the system sends data out to a peripheral device, and it waiting for the peripheral to send some data back (peripherals tend to be slower than onboard system components).

**Mirroring:** see RAID.

**NVRAM:** ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

**OEMs (Original Equipment Manufacturers):** Compaq or IBM package other companies' motherboards and hardware inside their case and sell them.

**Parallel port:** transmits the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

**PCI (Peripheral Component Interconnect):** a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

**PCI PIO (PCI Programmable Input/Output) modes:** the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

**PCI-to-PCI bridge:** allows you to connect multiple PCI devices onto one PCI slot.

**Pipeline burst SRAM:** a type of RAM that can maintain its data as long as power is provided to the memory chips. In this configuration, SRAM requests are pipelined, which means that larger packets of data are sent to the memory at one time, and acted upon quickly. This type of SRAM operates at bus speeds higher than 66MHz.

**Pipelining:** improves system performance by allowing the CPU to begin executing a second instruction before the first is completed. A pipeline can be likened to an assembly line, with a given part of the pipeline repeatedly executing a set part of an operation on a series of instructions.

**PM timers (Power Management timers):** software timers that count down the number of seconds or minutes until the system times out and enters sleep, suspend, or doze mode.

**PnP (Plug-n-Play):** a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Novice end users can simply plug them into a computer that is running on a Plug-n-Play aware operating system (such as Windows 98), and go to work. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**PXE (Preboot Execution Environment):** one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client, towards the goal of allowing networked-based booting to boot using industry standard protocols.

**RAID (Redundant Array of Independent Disks):** a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly, also the multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

**RAIDIOS:** stands for RAID I/O Steering, a type of RAID technology from Intel. RAIDIOS is a specification used to enable an embedded I/O controller, embedded on the motherboard, to be used as just an I/O controller or to be the I/O component of a hardware RAID subsystem. The RAIDIOS circuit allows an I/O Processor (either embedded on the motherboard or on an add-in card) to configure the I/O controller and service the I/O controller's interrupts. The I/O controller and the I/O Processor together are two of the primary components of a hardware RAID subsystem.

**RAM (Random Access Memory):** technically refers to a type of memory where any byte can be accessed without touching the adjacent data, is often used to refer to the system's main memory. This memory is available to any program running on the computer.

**ROM (Read-Only Memory):** a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

**SATA (Serial ATA):** is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is a drop-in solution in that it is compatible with today's software and

operating systems. It will provide for systems, which are easier to design, with cables that are simpler to route and install, smaller cable connectors, and lower voltage requirements.

**SDRAM (Synchronous Dynamic RAM):** called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

**Serial port:** called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

**SCSI Interrupt Steering Logic (SISL):** Architecture that allows a RAID controller, such as AccelaRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic ( LSI ) (only on LSI SCSI boards)

**SIMM (Single In-line Memory Module):** formally the most common form of RAM for motherboards. They must be installed in pairs, and do not have the carrying capacity or the speed of DIMM modules.

**Sleep/Suspend mode:** in this mode, all devices except the CPU shut down.

**SRAM (Static RAM):** unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

**SSI (Server System Infrastructure):** an industry initiative intended to provide ready-to-use design specifications for common server hardware elements (chassis, power supplies, and racks) to promote and support server industry growth.

**Standby mode:** in this mode, the video and hard drives shut down; all other devices continue to operate normally.

**Striping:** see RAID

**UltraDMA-33/66/100:** a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

**USB (Universal Serial Bus):** a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

**VGA (Video Graphics Array):** the PC video display standard

**V-SYNC:** controls the vertical scanning properties of the monitor.

**ZCR: Zero Channel RAID.** PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

**ZIF Socket (Zero Insertion Force socket):** these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding into the board and locking it into place.

## Appendix II: Post Error Code for BIOS

Code	Beeps / Description	Code	Beeps / Description
02h	Verify Real Mode	3Ah	Autosize cache
03h	Disable Non-Maskable Interrupt (NMI)	3Ch	Advanced configuration of chipset registers
04h	Get CPU type	3Dh	Load alternate registers with CMOS values
06h	Initialize system hardware	42h	Initialize interrupt vectors
08h	Initialize chipset with initial POST values	45h	POST device initialization
09h	Set IN POST flag	46h	2-1-2-3. Check ROM copyright notice
0Ah	Initialize CPU registers	48h	Check video configuration against CMOS
0Bh	Enable CPU cache	49h	Initialize PCI bus and devices
0Ch	Initialize caches to initial POST values	4Ah	Initialize all video adapters in system
0Eh	Initialize I/O component	4Bh	QuietBoot start (optional)
0Fh	Initialize the local bus IDE	4Ch	Shadow video BIOS ROM
10h	Initialize Power Management	4Eh	Display BIOS copyright notice
11h	Load alternate registers with initial POST values	50h	Display CPU type and speed
12h	Restore CPU control word during warm boot	51h	Initialize EISA board
13h	Initialize PCI Bus Mastering devices	52h	Test keyboard
14h	Initialize keyboard controller	54h	Set key click if enabled
16h	1-2-2-3. BIOS ROM checksum	58h	2-2-3-1. Test for unexpected interrupts
17h	Initialize cache before memory autosize	59h	Initialize POST display service
18h	8254 timer initialization	5Ah	Display prompt "Press F2 to enter SETUP"
1Ah	8237 DMA controller initialization	5Bh	Disable CPU cache
1Ch	Reset Programmable Interrupt Controller	5Ch	Test RAM between 512 and 640 KB
20h	1-3-1-1. Test DRAM refresh	60h	Test extended memory
22h	1-3-1-3. Test 8742 KBD Controller	62h	Test extended memory address lines
24h	Set ES segment register to 4 GB	64h	Jump to UserPatch1
26h	Enable A20 line	66h	Configure advanced cache registers
28h	Autosize DRAM	67h	Initialize Multi Processor APIC
29h	Initialize POST Memory Manager	68h	Enable external and CPU caches
2Ah	Clear 512 KB base RAM	69h	Setup System Management Mode (SMM) area
2Ch	1-3-4-1. RAM failure on address	6Ah	Display external L2 cache size
2Eh	1-3-4-3. RAM failure on data bits of low byte of memory bus	6Bh	Load custom defaults (optional)
2Fh	Enable cache before system BIOS shadow	6Ch	Display shadow-area message
30h	1-4-1-1. RAM failure on data bits of high byte of memory bus	6Eh	Display possible high address for UMB recovery
32h	Test CPU bus-clock frequency	70h	Display error messages
33h	Initialize Phoenix Dispatch Manager	72h	Check for configuration errors
36h	Warm start shut down	76h	Check for keyboard errors
38h	Shadow system BIOS ROM	7Ch	Set up hardware interrupt vectors
7Eh	Initialize coprocessor if present	8Ah	Initialize DMI parameters
80h	Disable onboard Super I/O ports and I/Os	8Bh	Initialize PnP Option ROMs

Code	Beeps / Description	Code	Beeps / Description
81h	Late POST device initialization	8Ch	Clear parity checkers
82h	Detect and install external RS232 ports	8Dh	Display MultiBoot menu
83h	Configure non-MCD IDE controllers	8Eh	Clear screen (optional)
84h	Detect and install external parallel ports	8Fh	Check virus and backup reminders
85h	Initialize PC-compatible PnP ISA devices	C0h	Try to boot with INT 19
86h	Re-initialize onboard I/O ports.	C1h	Initialize POST Error Manager (PEM)
87h	Configure Motherboard Devices	C2h	Initialize error logging
88h	Initialize BIOS Data Area	C3h	Initialize error display function
89h	Enable Non-Maskable Interrupts (NMI)	C4h	Initialize system error handler
8Ah	Initialize Extended BIOS Data Area	C5h	PnPnd dual CMOS (optional)
8Bh	Test and initialize PS/2 mouse	C6h	Initialize notebook docking (optional)
8Ch	Initialize floppy controller	C7h	Initialize notebook docking late
8Fh	Determine number of ATA drives (optional)	C8h	Force check (optional)
90h	Initialize hard-disk controllers	C9h	Extended checksum (optional)
91h	Initialize local-bus hard-disk controllers	D2h	Unknown interrupt
92h	Jump to UserPatch2	E0h	Initialize the chipset
93h	Build MPTABLE for multiprocessor boards	E1h	Initialize the bridge
95h	Install CD ROM for boot	E2h	Initialize the CPU
96h	Clear huge ES segment register	E3h	Initialize system timer
97h	Fixup Multi Processor table	E4h	Initialize system I/O
98h	Find Search for option ROMs.	E5h	Check force recovery boot
99h	Check for SMART Drive (optional)	E6h	Checksum BIOS ROM
9Ah	Shadow option ROMs	E7h	Go to BIOS
9Ch	Set up Power Management	E8h	Set Huge Segment
9Dh	Initialize security engine (optional)	E9h	Initialize Multi Processor
9Eh	Enable hardware interrupts	EAh	Initialize OEM special code
9Fh	Determine number of ATA and SCSI drives	Ebh	Initialize PIC and DMA
A0h	Set time of day	ECh	Initialize Memory type
A2h	Check key lock	EDh	Initialize Memory size
A4h	Initialize Typematic rate	Eeh	Shadow Boot Block
A8h	Erase F2 prompt	Efh	System memory test
AAh	Scan for F2 key stroke	F0h	Initialize interrupt vectors
ACh	Enter SETUP	F1h	Initialize Run Time Clock
Aeh	Clear Boot flag	F2h	Initialize video
B0h	Check for errors	F3h	Initialize System Management Mode
B2h	POST done - prepare to boot operating system	F4h	Output one beep before boot
B4h	One short beep before boot	F5h	Boot to Mini DOS
B5h	Terminate QuietBoot (optional)	F6h	Clear Huge Segment
B6h	Check password (optional)	F7h	Boot to Full DOS
B8h	Prepare Boot		

## Appendix III: SMDC Information

Tyan Server Management Daughter Card (SMDC) is a powerful yet cost-efficient solution for high-end server management hardware packages. Tyan's goal is to provide remote system monitoring and control even when the operating system is absent or simply fails. This empowers Tyan's server board with advanced industrial-standard features.

Tyan SMDC is a snap-in card that provides essential server management solution. It enables any IT Manager by providing multiinterfaces to access the hardware remotely and perform **monitor**, **control** and **diagnose** activities effectively.

Tyan SMDC is powered by an intelligent controller known as Baseboard Management Control (BMC). BMC is a standalone mini-CPU and runs on its own Real Time Operating System (RTOS) to complete all different kinds of tasks. Backed Renesas' H8 technology, IT manager can rest assure his server machines are always taken care.

Tyan SMDC is not a peripheral card. Unlike an AGP card, Network card or SCSI card, the SMDC does not require any hardware specific driver. As long as a standby power comes into the system, the SMDC will be active on the system.

Tyan SMDC is compatible with all IPMI-compliance software as well as Tyan System Operator™ (TSO) software package.

By adding SMDC, Tyan's server board becomes a highly manageable and IPMI compatible system with all the advanced features suggesting in IPMI Specifications.

More detailed information on Tyan's SMDC card can be found on our website:

<http://www.tyan.com>

The SMDC M 3291 is equipped with the following features:

- Hardware Monitoring
- Protocol and Standard
- Auxiliary Communication Interface
- Auxiliary SMBus / I<sup>2</sup>C buses
- Team ed with other IPMB Devices (PMCs and EMCs)
- Remote Monitor, Control and Diagnostics
- Remote Console Redirect over LAN
- Sensor Data Record
- System Event Log
- Field Replaceable Unit Information Storage
- Real Time Clock
- Upgrade BMC firmware
- "Always Ready"
- TYAN System Operator™ (TSO)
- OEM Drivers
- Front Panel LED and Buzzer (Optional)



## Appendix IV: PCI-X/PCI Bus

### Thunder i7522 S5362

S5362 board has two onboard Intel 6700PXH 64-bit PCI Hubs. Each of Intel 6700PXH chip supports two independent 133 MHz PCI-X channels. Those two Intel 6700PXH chips are marked as "PXH-1" and "PXH-2" on Fig. AP4-1.

#### Intel 6700PXH chip (PXH-1):

- PCI-X Channel A Bus: Connected to TARO™ SO-DIMM (J42), PCI-X1-P1 expansion slot (J41) and ZCR socket (reserved and unpopulated).
- PCI-X Channel B Bus: Connected to PCI-X1-S1 expansion slot

#### Secondary Intel 6700PXH chip (PXH-2):

- PCI-X Channel A Bus: Connected to PCI-X2-P1 expansion slot
- PCI-X Channel B Bus: Connected to PCI-X2-S1 expansion slot

#### Expansion Slot Frequency:

- PCI-X1-S1 (J16): PCI-X up to 133/100/66 MHz
- PCI-X1-P1 (J41): PCI-X up to 66 MHz
- PCI-E (J8): PCI-Express x8 connector with PCI-Express x4 signals
- PCI-X2-S1 (J33): PCI-X up to 133/100/66 MHz
- PCI-X2-P1 (J32): PCI-X up to 133/100/66 MHz
- PCI15 (J7): 32-bit PCI at 33 MHz
- J16: Proprietary connector for M2360 2U riser (see Appendix V)

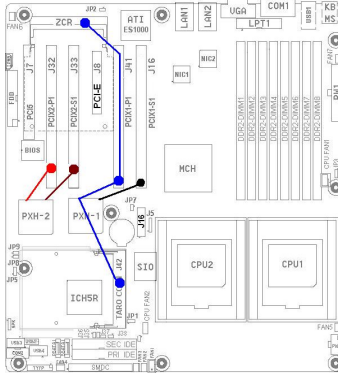
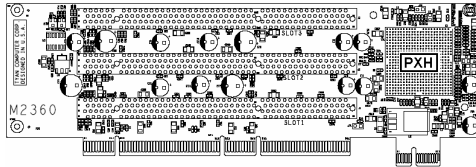


Fig. AP4-1: Thunder i7522 S5362 PCI-X/PCI Buses

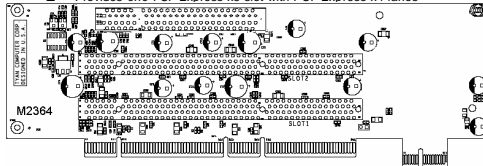
## Appendix V: Riser Card Support

### 2U Riser Cards

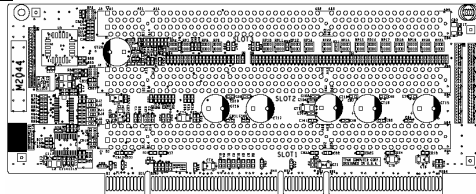
**M2360**  Provides three PCI-X 133/100/66 MHz slots on independent PCI -X buses



**M2364**  Provides two PCI-X 100/66 MHz slots on a PCI -X bus  
 Provides one PCI-Express x8 slot with PCI-Express x4 lanes

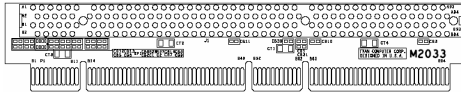


**M2044**  Provides three PCI-X slots on a PCI-X bus

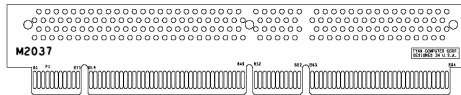


1U Riser Cards

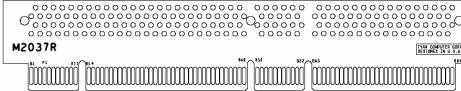
**M2033** □ Universal card edge with one PCI -X/PCI slot (with 3.3 V key)



**M2037** □ Universal card edge with one 64-bit PCI slot (with 5 V key)



**M2037R** □ Universal card edge with one right-side 64-bit PCI slot (with 5 V key)



## Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then Tyan Computer Corporation can help. Besides designing innovative and quality products for over a decade, Tyan has continuously offered customers service beyond their expectations. Tyan's website ([www.tyan.com](http://www.tyan.com)) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. Tyan also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, Tyan serves multiple market segments with the industry's most competitive services to support them.

**"Tyan's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com**

Please feel free to contact us directly for this service at [techsupport@tyan.com](mailto:techsupport@tyan.com)

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQs, bulletins, driver updates, and other information: <http://www.tyan.com>
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: [alt.comp.periphs.mainboard.TYAN](mailto:alt.comp.periphs.mainboard.TYAN)

### Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

**NOTE:** A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

**Notice for the USA**

Compliance Information Statement (Declaration of Conformity

Procedure) DoC

FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and the receiver.
  - Plug the equipment into an outlet on a circuit different from that of the receiver.
  - Consult the dealer on an experienced radio/television technician for help.

**Notice for Canada**

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux normes de Classe B d'interférence radio tel que spécifié par le Ministère Canadien des Communications dans les règlements d'interférence radio.)

**Notice for Europe (CE Mark)**

This product is in conformity with the Council Directive 89/336/EEC, 92/31/EEC (EMC).

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

**Document #: D1624 - 102**