



Toledo i3000R



S5191

Version 1.1

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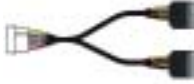







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Check the box contents!

	1x S5191 motherboard
	1x 34-Pin floppy drive cable
	1 x Ultra-DMA-133/100/66/33 IDE cable
	2 x Serial ATA power cables
	4 x Serial ATA cables
	1 x USB2.0 cable
	1 x S5191 user's manual
	1 x S5191 Quick Reference guide
	1 x TYAN driver CD
	1 x I/O shield
	1 x Serial & Parallel Port cable set

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

NOTE: The box contents do not include any driver diskette. Please use the included driver CD to make a driver diskette. Refer to Appendix II for the information on how to make a driver diskette.

NOTE

Chapter 1: Introduction

1.1 - Congratulations

You have purchased one of the most powerful server solutions available. The Toledo i3000R (S5191) is a flexible Intel® platform for multiple applications, based on the Intel® Mukilteo-2 MCH and ICH7-R chipsets.

Designed to support the family of Intel® Socket 775 processors and 8GB of DDR2 533/667 memory. The S5191 has integrated Dual Gigabit Ethernet LAN's, a built-in 16MB XGI Volari Z7 (XG20) video controller and four SATA-II ports. This motherboard represents the best choice for a server platform product.

Remember to visit TYAN's Website at <http://www.TYAN.com>. There you can find information on all of TYAN's products with FAQs, online manuals and BIOS upgrades.

1.2 - Hardware Specifications

Processor

- Single LGA775 socket
- Support Intel® Pentium® 4 (Prescott-2M/Cedar Mill), Pentium® D (Presler/Smith Field [FSB 800MHz]), Intel® Xeon® processor 3000 sequence (Conroe), Intel® Extreme Edition (Presler XE/Conroe XE), Intel® Celeron® processor
- 533/800/1066MHz FSB
- Onboard VRM 11

Chipset

- Intel® Mukilteo-2 MCH
- ICH7-R South Bridge
- PXH-V 64-bit PCI Hub
- SMSC SCH5027 Super I/O chip

Memory

- Four 240-pin DDR2 DIMM sockets
- Supports ECC DIMMs
- Maximum of 8GB non-reg/unbuffered DDR2-533/667

Integrated Video Controller

- XGI Volari Z7 (XG20)
- 16MB frame buffer memory

Integrated SATA Controllers (ICH7-R)

- Supports up to four SATA-II ports running at 3.0Gb/s
- RAID 0/1/5/10 capable (Windows driver support only)

Integrated LAN Controllers

- Two (2) Intel i82573V GbE LAN controllers
 - operating at PCIe x1 interface
- One (1) Intel i82551QM fast Ethernet LAN controller
 - operating at PCI 32-bit/33MHz

Expansion Slots

- One (1) PCI-X 64/133 slot in-line with one (1) inversed PCIe x4 slot (routed to PCIe x8 bus from the MCH)
- One (1) Tyan "TARO" SO-DIMM socket

Integrated ATA-100 (ICH7-R)

- One ATA-100 channel for up to two ATA-100 devices

System Management

- SMSC SCH5027 and EMC6D103 with hardware monitoring
- One (1) 3+1-pin CPU fan header with tachometer monitoring and smart FAN control (by SCH5027)
- Five (5) 3+1-pin system fan headers with tachometer monitoring, three (3) of them support smart FAN control
- Temperature and voltage monitoring
- Watchdog timer support
- Port 80 code display LED

Integrated I/O

- One floppy connector
- One IDE connector
- Four SATA ports
- Six USB 2.0 ports (2 at rear, 4 via cable)
- Two COM ports (1 at rear, 1 via cable)
- Tyan 2x9 front-panel pin header
- Tyan 2x6 front-panel pin header for LAN LED and ID LED/Switch
- 2x25 connector for optional Tyan IPMI SMDC

Back Panel I/O Ports

- Stacked PS/2 mouse & keyboard ports
- Stacked 2 USB ports & 1 RJ45 10/100 ports
- One 9-pin COM port
- One 15-pin VGA port
- Two side-by-side RJ-45 10/100/1000 ports

Form Factor

- ATX footprint
- 12" x 9.6" (305mm x244mm)

Optional Modules

- M3291, IPMI 2.0 Remote System Management card
 - Renesas H8S2167 BMC controller
 - BT, KCS, logging support
 - IPMI-over-LAN
 - Remote power on/off and reset
- M7901/M7902, Ultra320 SCSI "TARO" card
 - Adaptec AIC-7901/7902 single/dual-channel Ultra320 SCSI controller
 - Adaptec HostRAID 0,1,10 supported
- M9000 SAS/SATA/SATA-II "TARO" card
 - Adaptec AIC-9405/AIC-9410 SAS controller
 - Supports up to 4-port (M9000-05-RS) and 8-port (M9000-10-RS) SAS & SATA running at 3.0Gb/s
 - Adaptec HostRAID 0,1 & 10 supported

BIOS

- Phoenix BIOS on 8Mbit LPC Flash ROM
- Serial Console Redirect
- USB boot supported
- Supports APM1.2 and ACPI
- PnP, DMI2.0, WfM2.0 power management
- S0/S1/S4/S5 states supported

Power Supply

- EPS 12V
- Universal 24-pin + 8-pin power connectors

Regulatory

- FCC Class B (DoC)
- European Community CE (DoC)
- BSMI

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting hole pattern of the Toledo i3000R S5191 matches the ATX specification. Before continuing with installation, confirm that your chassis supports an ATX motherboard.

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

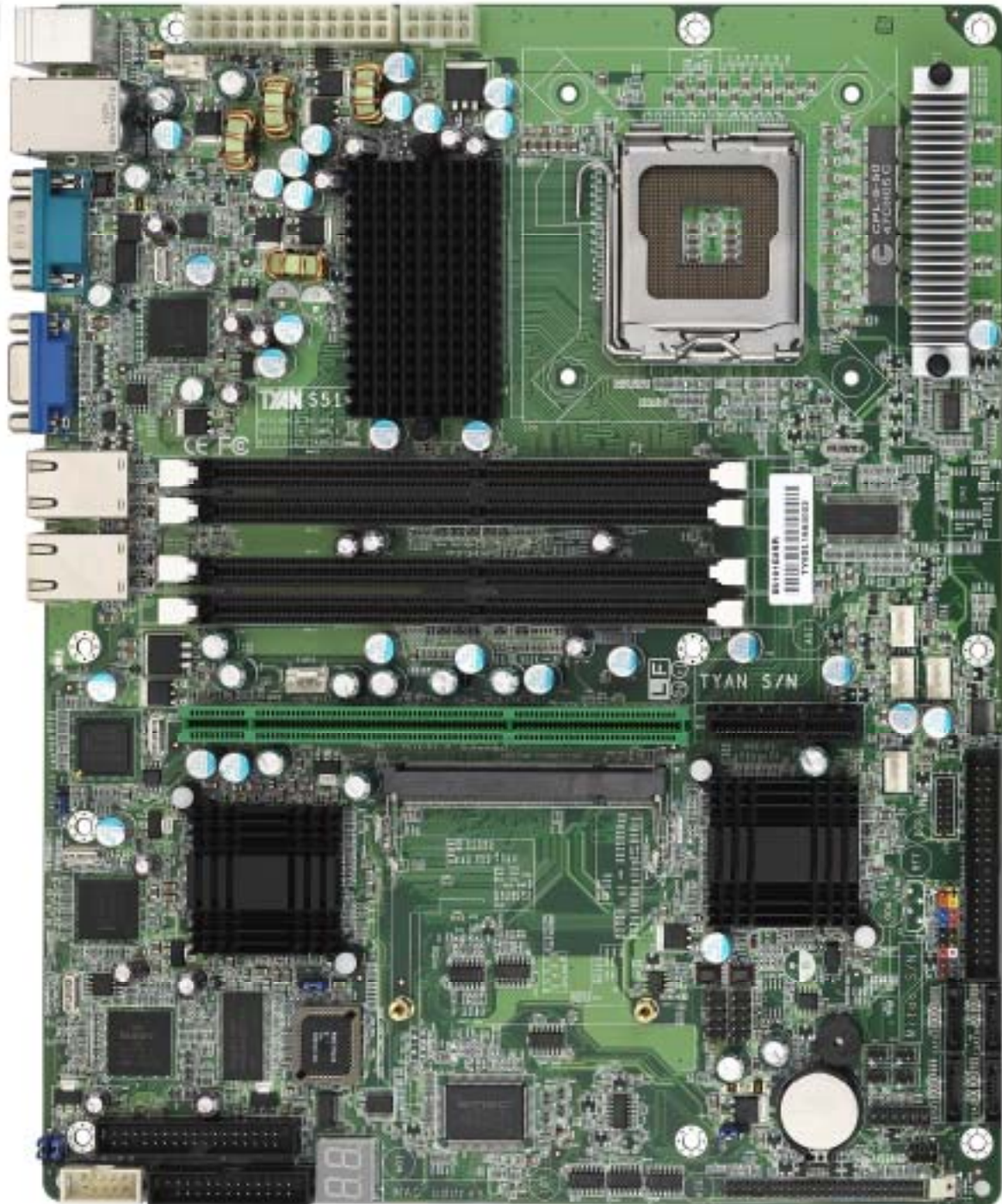
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

- (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) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
- (3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
- (4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
- (5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

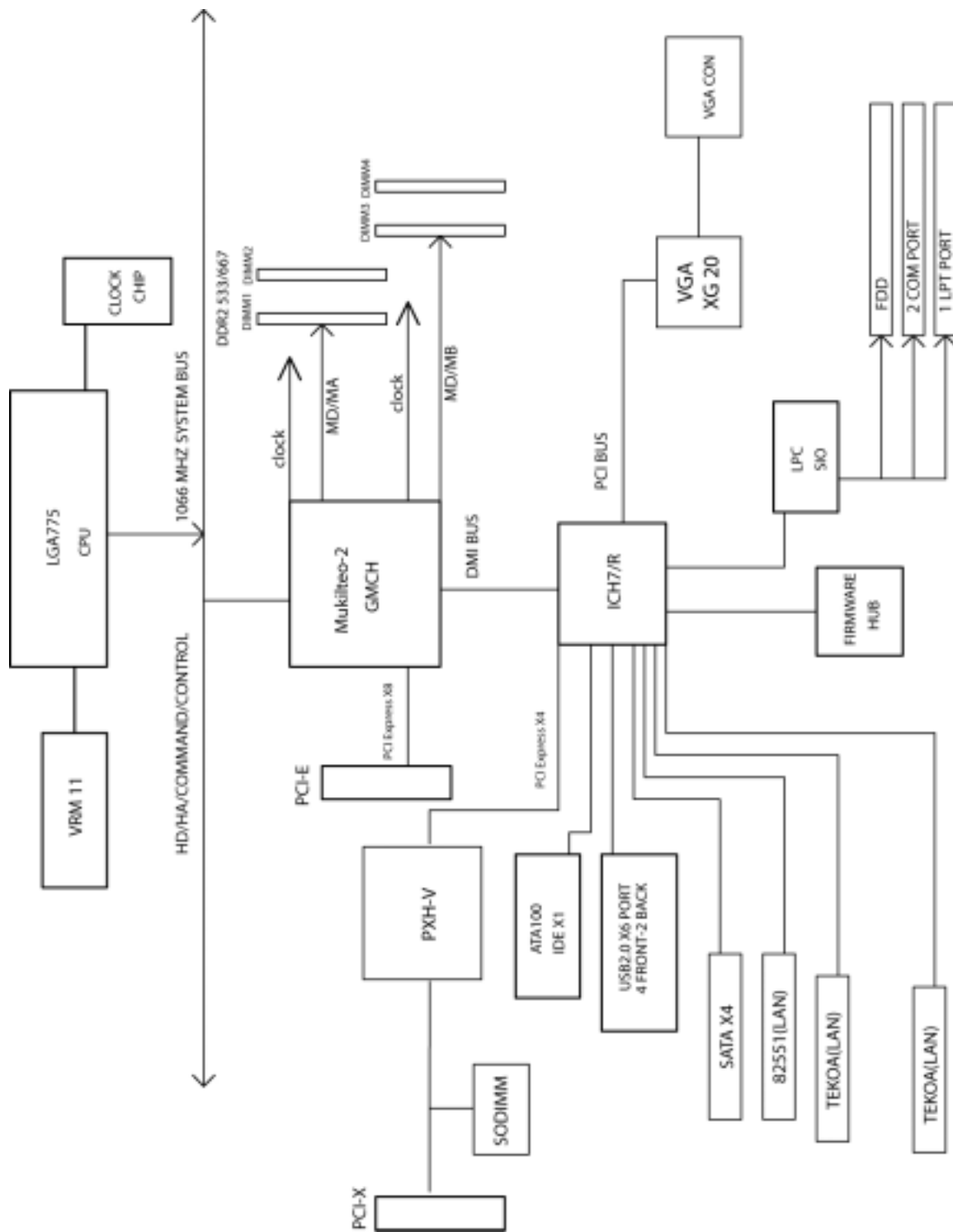
NOTE**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED**

2.1- Board Image



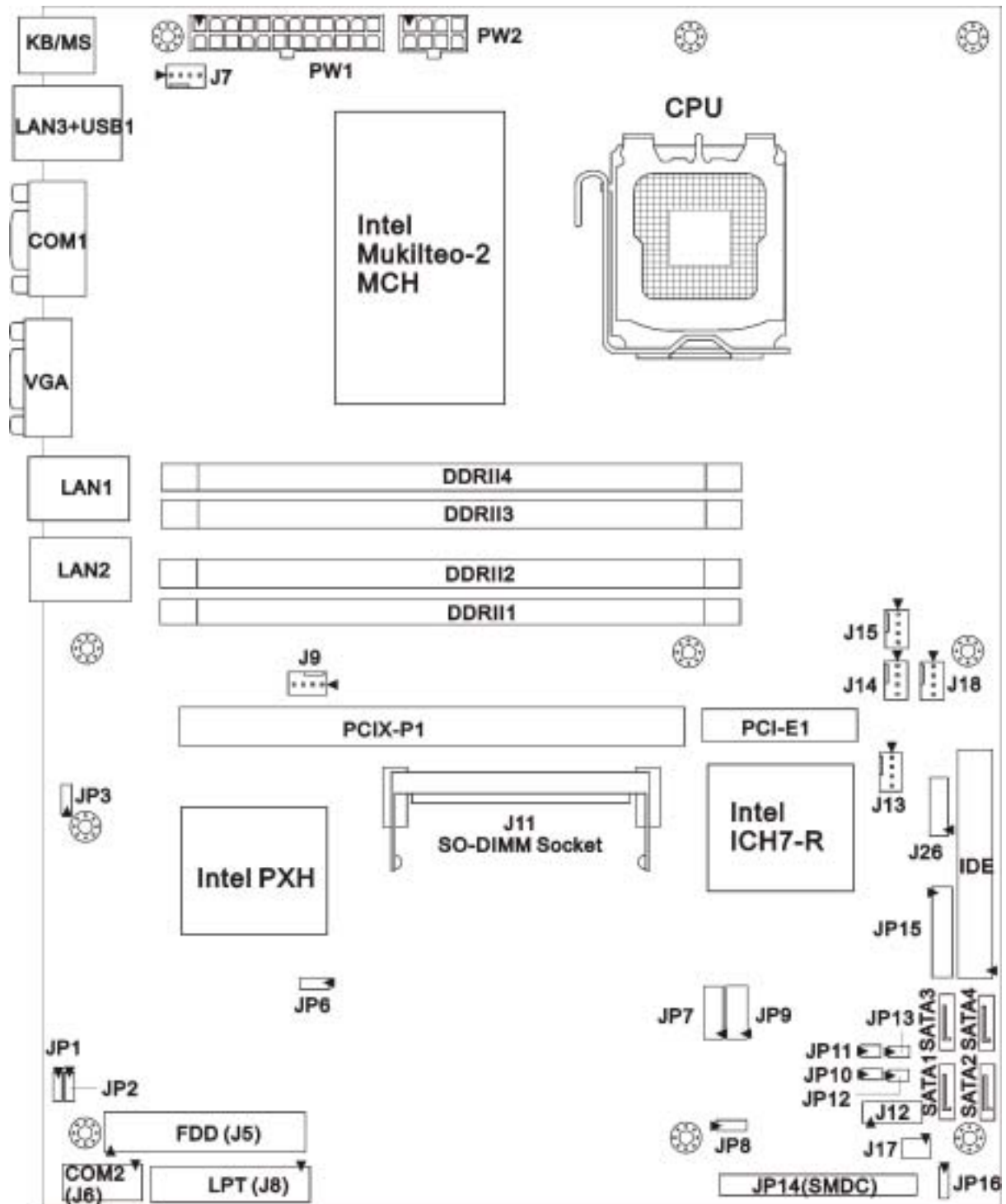
This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

2.2 - Block Diagram



Toledo i300R S5191

2.3 - Board Parts, Jumpers and Connectors

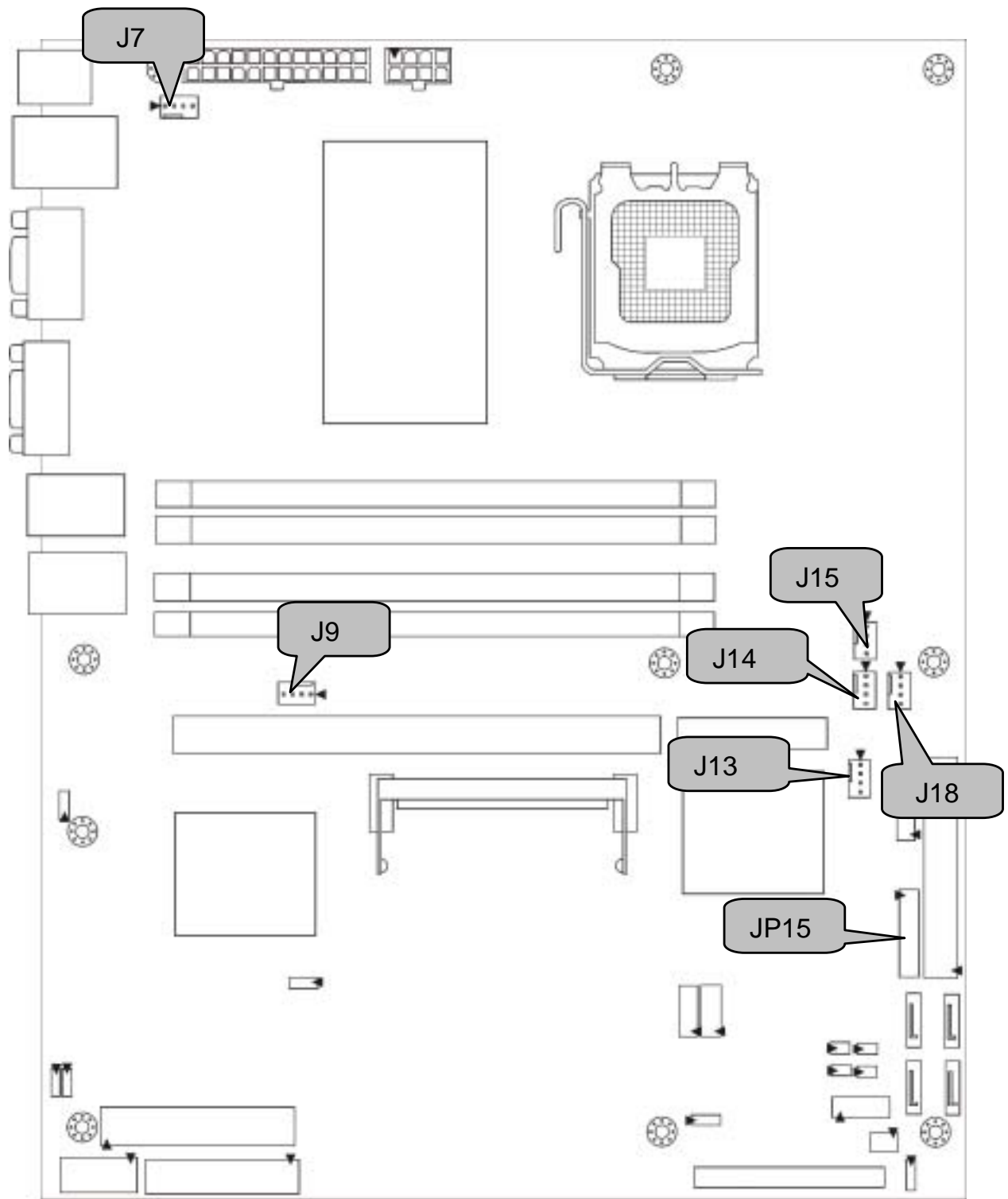


This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

Jumper Legend

	OPEN - Jumper OFF, without jumper cover
	CLOSED – Jumper ON, with jumper cover

Jumper/Connector	Function
J6	COM2 Header
J7/J9	Chassis Fan Connector
J13/J14/J18	Front Fan Connector
J15	CPU_Fan Connector
J11	SO-DIMM Socket
J12	LED Connector (Reserved for OEM only)
JP14	SMDC Connector
JP15	Front Panel Header
JP7/JP9	Front Panel USB2.0 Connector
J17	LCM Connector
J5	FDD Connector
J8	LPT Connector
J26	Tachometer Connector (Reserved for OEM only)
JP1/JP2	SMDC/ASF2.0 Select Header
JP3	LAN3 Enable/Disable Jumper
JP6	PCI-X Speed Select Header
JP16	Clear CMOS Jumper
JP8/JP10/JP11/JP12/JP13	Reserved for OEM only



J13/J14/J15/J18: Fan Connector

<p>4-pin Fan</p> <p>3-pin Fan</p>	<p>Use these headers to connect the 3-pin or 4-pin cooling fans to your motherboard to keep the system stable and reliable.</p> <p>J13: FAN3, J14: FAN1, J18: FAN2 J15: CPUFAN</p> <p>These connectors support the tachometer monitoring and auto fan speed control.</p>
-------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

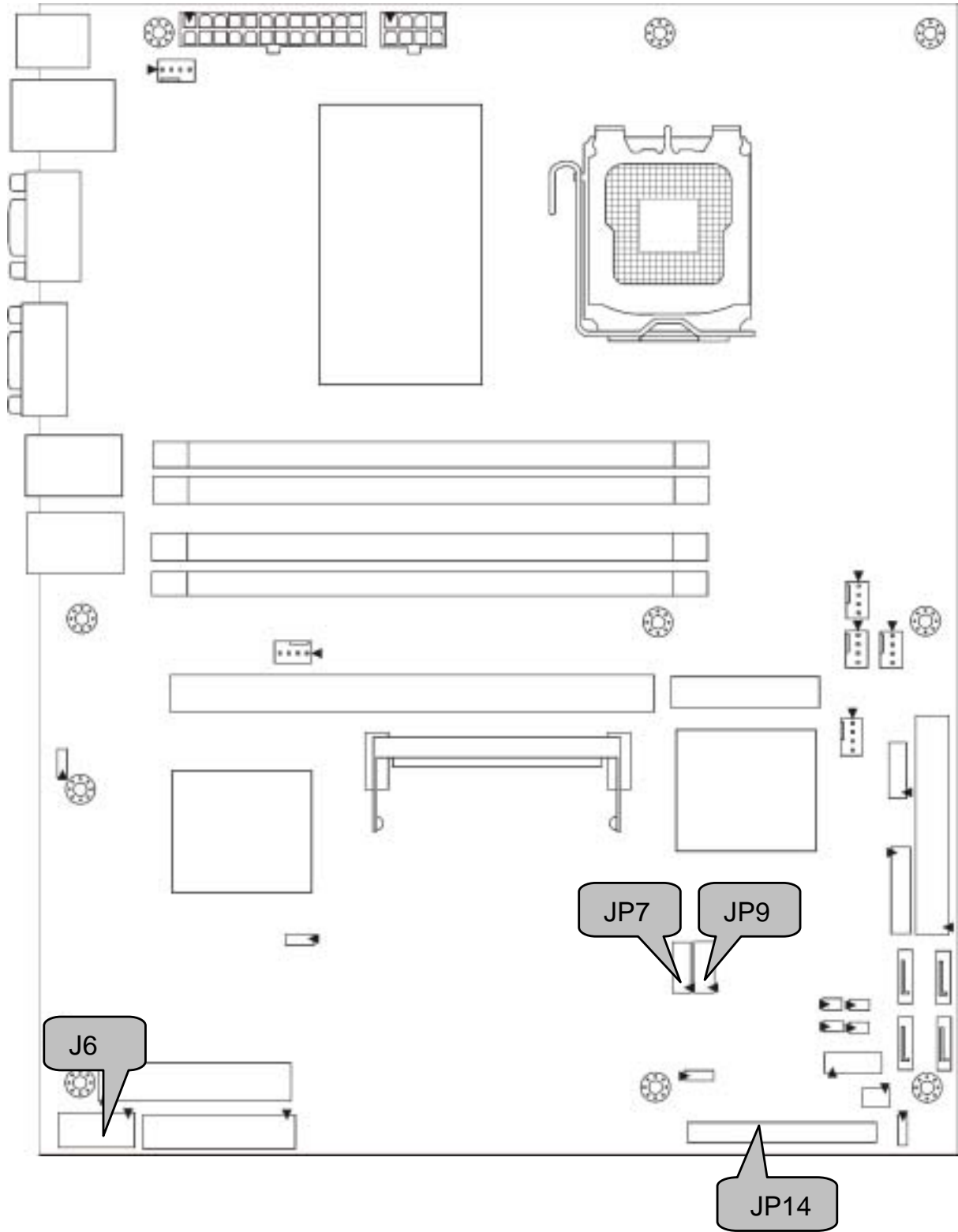
J7/J9: Chassis Fan Connector

	<p>Use this header to connect the chassis cooling fan to your motherboard to keep the system at optimum performance levels.</p> <p>J7: FAN 5, J9: FAN4</p>
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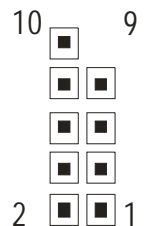
JP15: Front Panel Header

The Front Panel Header is used to connect some control or signal wires from motherboard to chassis, such as HDD LED, power LED, power button, and reset button.

HDD LED+	1	2	Power LED+
HDD LED-	3	4	Power LED-
Reset SW-	5	6	Power SW+
Reset SW+	7	8	Power SW-
External INT-	9	10	Warning LED+
External INT+	11	12	Warning LED-
+5VSB	13	14	x
SMBUS Data	15	16	Chassis Intr# -(Active Low)
SMBUS Clock	17	18	Chassis Intr# + (Active Low)




JP7/JP9: Front Panel USB2.0 Connector



Signal	Pin	Pin	Signal
USB PWR	1	2	USB PWR
USB_A-	3	4	USB_B-
USB_A+	5	6	USB_B+
GND	7	8	GND
Key	9	10	NC

Use these headers to connect to the USB devices via the enclosed USB cable.

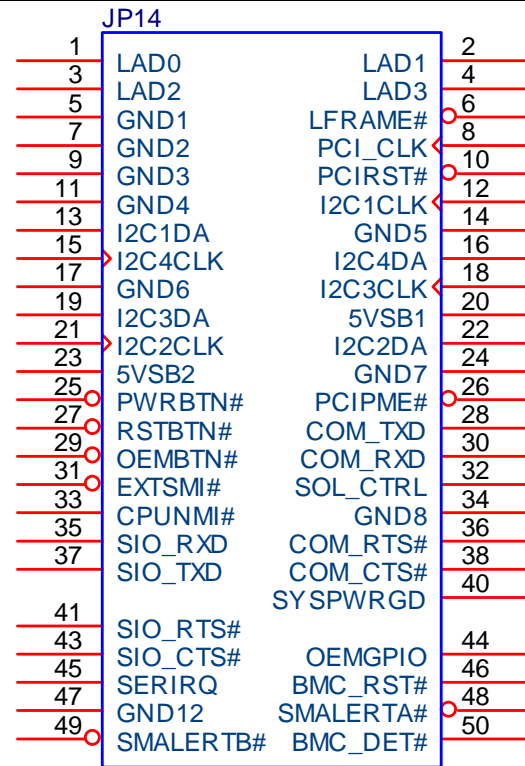
J6: COM2 Header



Use these pin definitions to connect a port to COM2.
**TYAN does not provide cable for this header. It is designed for OEM use only.*

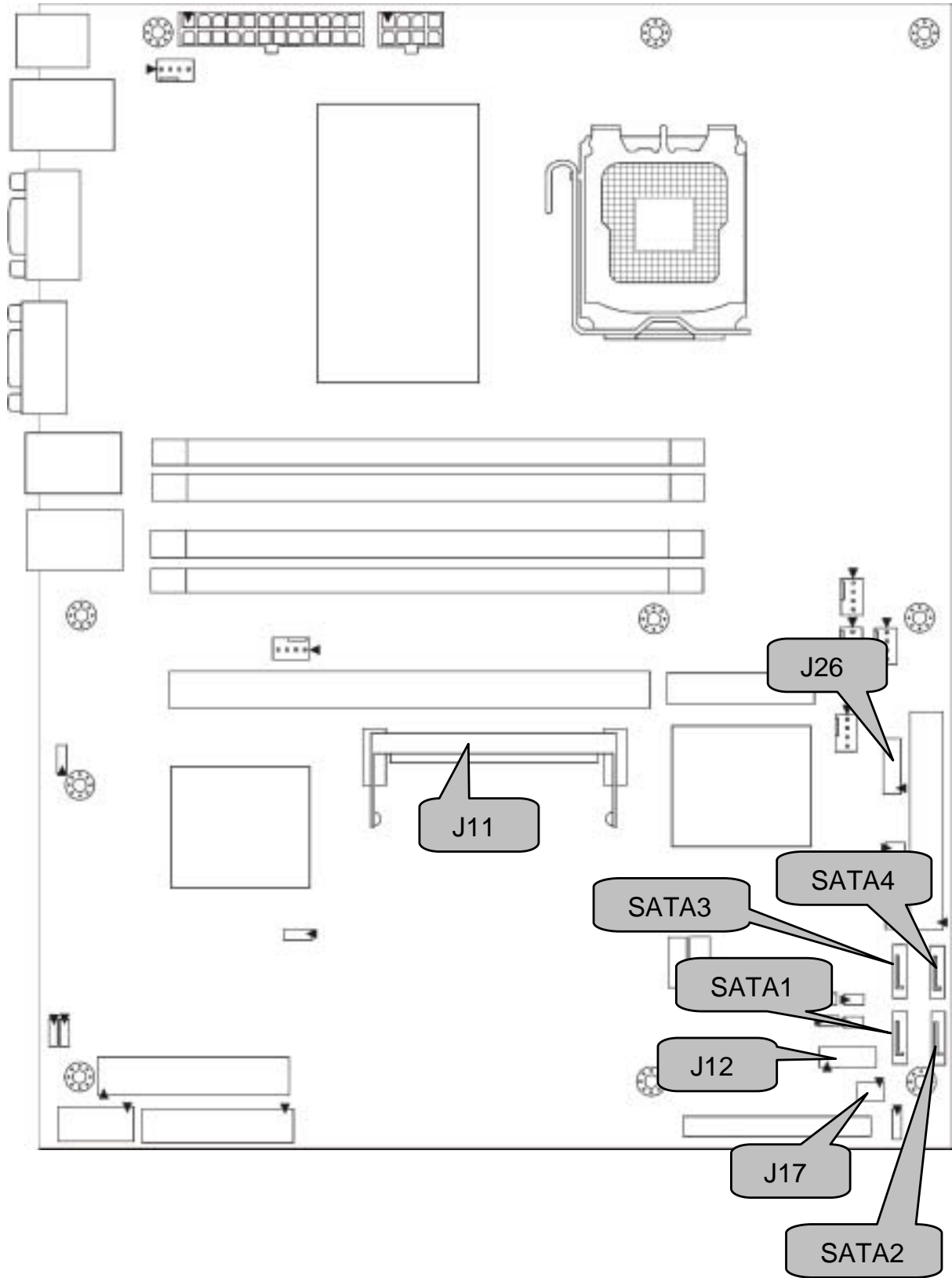
Signal	Pin	Pin	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	Key

JP14: SMDC Connector

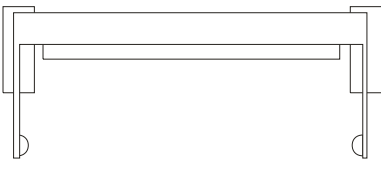


The SMDC connector allows you to connect with the Tyan Server Management Daughter Card (SMDC). The S5191 supports Tyan SMDC M3291. Refer to Appendix I for more information on SMDC.

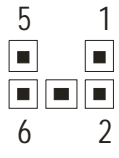
CON25X2_M3291



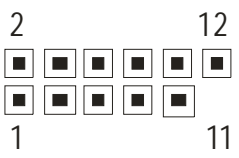
J11: Tyan SO-DIMM Connector

	<p>Use this connector to connect the Tyan TARO card.</p>
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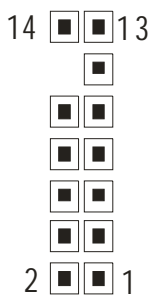
J17: LCM Header

	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>V5</td> <td>2</td> <td>RXD2</td> </tr> <tr> <td>3</td> <td>Key</td> <td>4</td> <td>GND</td> </tr> <tr> <td>5</td> <td>V5DUAL</td> <td>6</td> <td>TXD2</td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	V5	2	RXD2	3	Key	4	GND	5	V5DUAL	6	TXD2
Pin	Signal	Pin	Signal														
1	V5	2	RXD2														
3	Key	4	GND														
5	V5DUAL	6	TXD2														

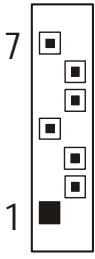
J12: LED Connector (Reserved for OEM only)

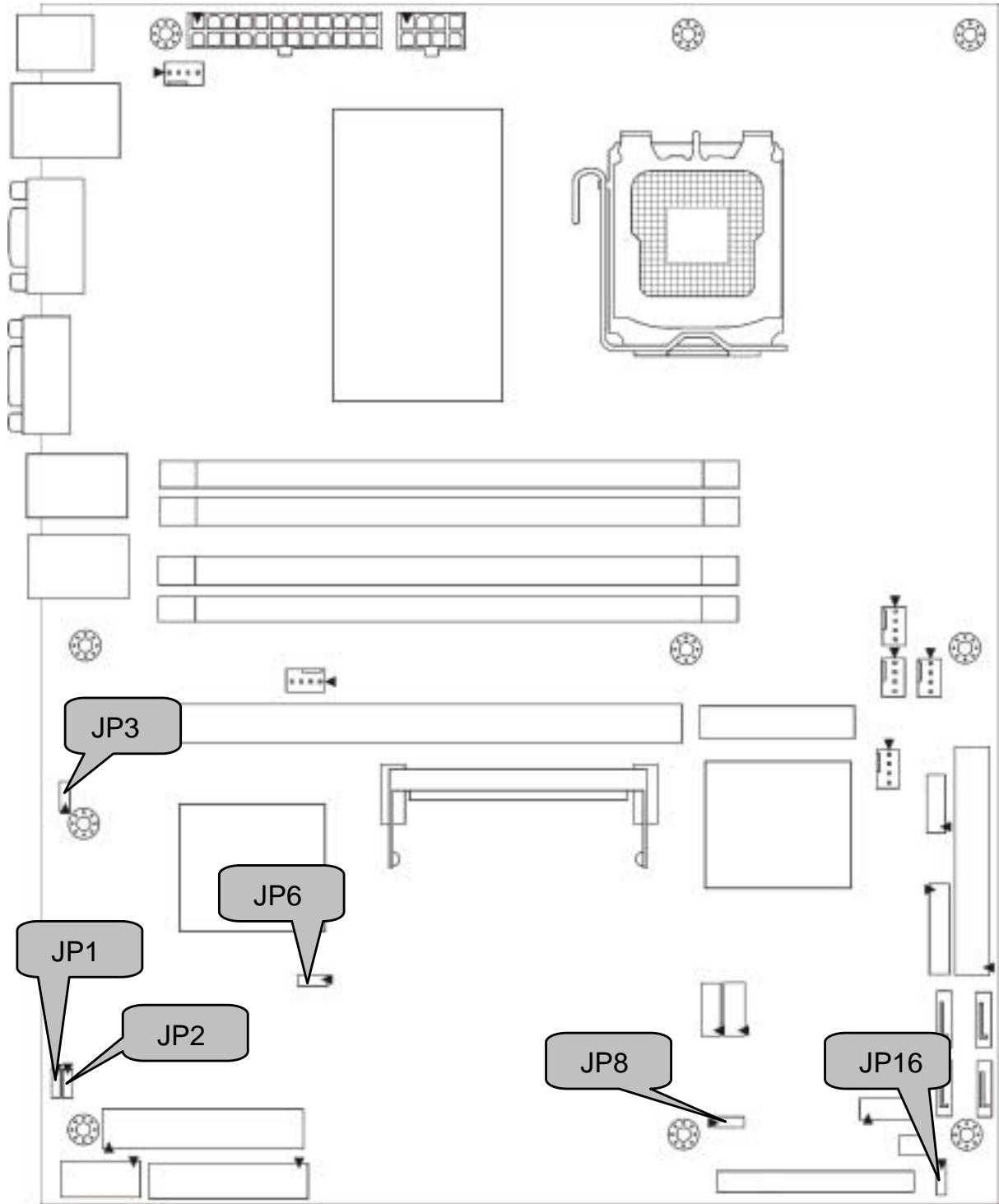
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LAN1_LED+</td> <td>2</td> <td>LAN1_LED-</td> </tr> <tr> <td>3</td> <td>LAN2_LED+</td> <td>4</td> <td>LAN2_LED-</td> </tr> <tr> <td>5</td> <td>LAN3_LED+</td> <td>6</td> <td>LAN3_LED-</td> </tr> <tr> <td>7</td> <td>ID_LED+</td> <td>8</td> <td>ID_LED-</td> </tr> <tr> <td>9</td> <td>ID_SW+</td> <td>10</td> <td>ID_SW-</td> </tr> <tr> <td>11</td> <td>Key</td> <td>12</td> <td>NC</td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	LAN1_LED+	2	LAN1_LED-	3	LAN2_LED+	4	LAN2_LED-	5	LAN3_LED+	6	LAN3_LED-	7	ID_LED+	8	ID_LED-	9	ID_SW+	10	ID_SW-	11	Key	12	NC
Pin	Signal	Pin	Signal																										
1	LAN1_LED+	2	LAN1_LED-																										
3	LAN2_LED+	4	LAN2_LED-																										
5	LAN3_LED+	6	LAN3_LED-																										
7	ID_LED+	8	ID_LED-																										
9	ID_SW+	10	ID_SW-																										
11	Key	12	NC																										

J26: Tachometer Connector (Reserved for OEM only)


	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>FAN1</td> <td>2</td> <td>FAN6</td> </tr> <tr> <td>3</td> <td>FAN2</td> <td>4</td> <td>NC</td> </tr> <tr> <td>5</td> <td>FAN3</td> <td>6</td> <td>NC</td> </tr> <tr> <td>7</td> <td>FAN4</td> <td>8</td> <td>NC</td> </tr> <tr> <td>9</td> <td>FAN5</td> <td>10</td> <td>NC</td> </tr> <tr> <td>11</td> <td>GND</td> <td>12</td> <td>Key</td> </tr> <tr> <td>13</td> <td>GND</td> <td>14</td> <td>PWM</td> </tr> </tbody> </table>	Pin	Signal	Pin	Signal	1	FAN1	2	FAN6	3	FAN2	4	NC	5	FAN3	6	NC	7	FAN4	8	NC	9	FAN5	10	NC	11	GND	12	Key	13	GND	14	PWM
Pin	Signal	Pin	Signal																														
1	FAN1	2	FAN6																														
3	FAN2	4	NC																														
5	FAN3	6	NC																														
7	FAN4	8	NC																														
9	FAN5	10	NC																														
11	GND	12	Key																														
13	GND	14	PWM																														

SATA1/SATA2/SATA3/SATA4: SATA RAID Connector


	<p>Connects to the Serial ATA ready drives via the Serial ATA cable.</p> <table border="1"> <thead> <tr> <th>Pin 1</th> <th>Pin 2</th> <th>Pin 3</th> <th>Pin 4</th> <th>Pin 5</th> <th>Pin 6</th> <th>Pin 7</th> </tr> </thead> <tbody> <tr> <td>GND</td> <td>TXP</td> <td>TXN</td> <td>GND</td> <td>RXN</td> <td>RXP</td> <td>GND</td> </tr> </tbody> </table> <p>You may use any two of the four SATA ports to have the support of RAID 0 and 1 through the onboard ICH7R south bridge chip.</p>	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	GND	TXP	TXN	GND	RXN	RXP	GND
Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7									
GND	TXP	TXN	GND	RXN	RXP	GND									




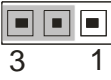
JP1/JP2: SMDC/ASF2.0 Select Header

	Pin 1-2 Closed: Enable ASF2.0 support (Default)
	Pin 2-3 Closed: Enable SMDC card support

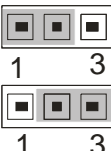
JP3: LAN3 Enable/Disable Jumper

	Pin 1-2 Closed: Enable LAN3 (Default)
	Pin 2-3 Closed: Disable LAN3



JP6: PCI-X Speed Select Header

	Pin 1-2 Closed: 133MHz (Default)
	Pin 2-3 Closed: 100MHz max.

JP8: PCI 3.3V/5V Select Header (Reserved for OEM only)

	Pin 1-2 Closed: select 5V (Default)
	Pin 2-3 Closed: select 3.3V

JP16: Clear CMOS Jumper

 <p>Normal (Default)</p>	<p>Use this jumper when you have forgotten your system/setup password or need to clear the system BIOS settings.</p> <p>How to clear the CMOS data</p> <ul style="list-style-type: none"> - Power off system and disconnect the power supply from the AC source - Use jumper cap to close Pin 2 and 3 for several seconds to Clear CMOS - Replace jumper cap to close Pin 1 and 2 - Reconnect the power supply to the AC source - Power on system
 <p>Clear</p>	

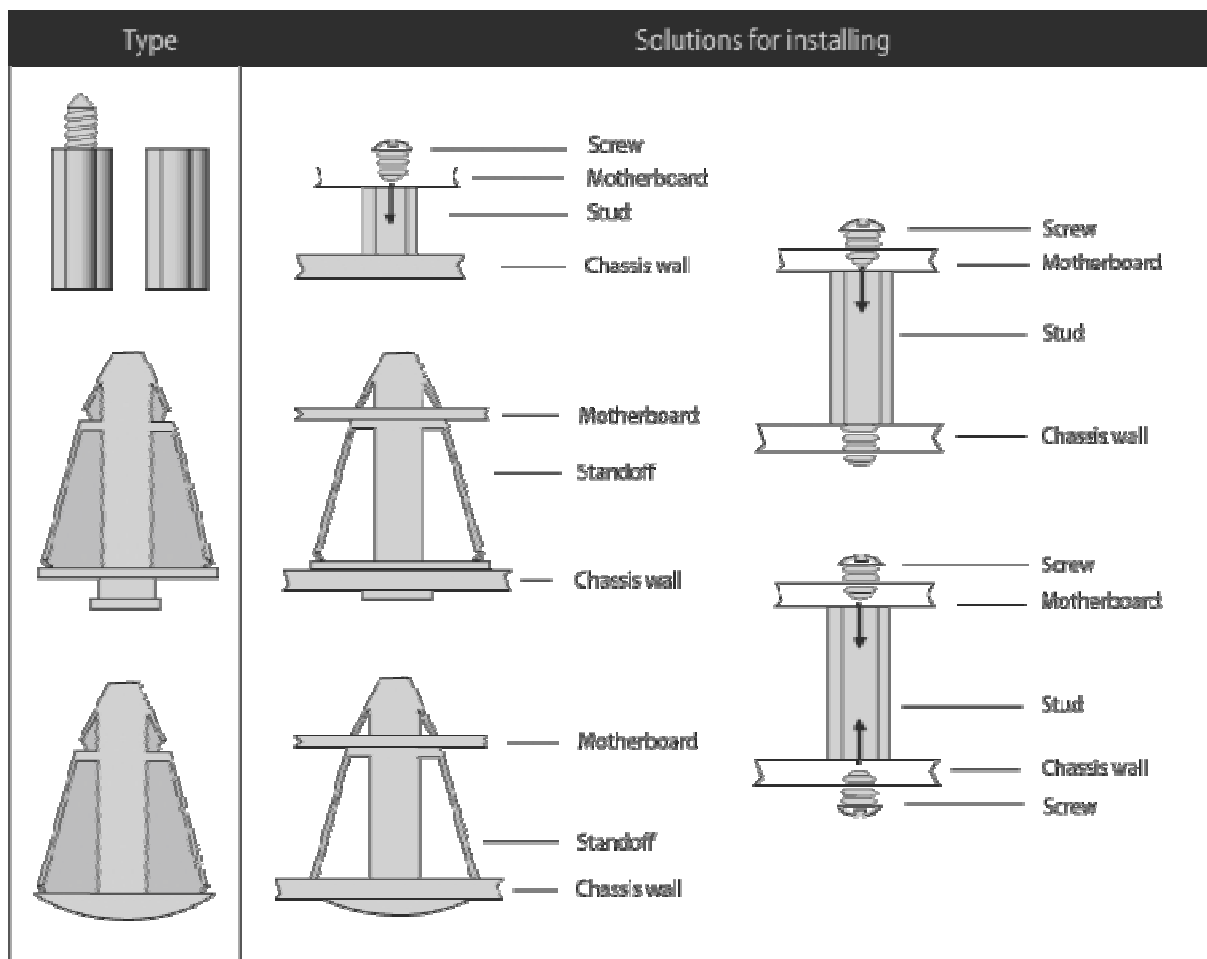
2.4 - Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are 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.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



2.5 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Only DDRII-533/667 DIMM modules are required. Check the TYAN Web site at: www.tyan.com for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDRII memory modules.



Key points to note before installing memory:

For optimal dual-channel DDRII operation, always install memory in pairs beginning with DDRII1 and DDRII3. Memory modules of the same type and density are required for dual-channel DDRII operation. Mismatched memory may cause system instability.

- Only **DDRII 533/667 un-buffered ECC/non-ECC** memory modules are supported.
- All installed memory will automatically be detected and no jumpers or settings need changing.

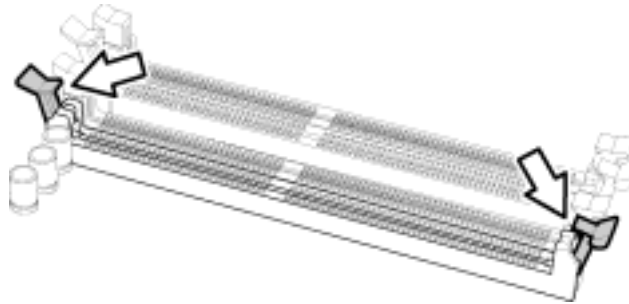
Refer to the following table for supported DDRII populations.
(Note: X indicates a populated DIMM slot)

Population Option	1	2
DDRII1	x	x
DDRII2		x
DDRII3	x	x
DDRII4		x

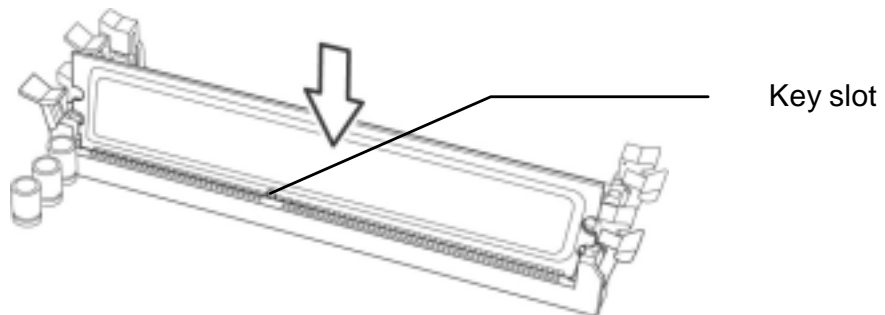
Memory Installation Procedure

Follow these instructions to install memory modules into the S5191.

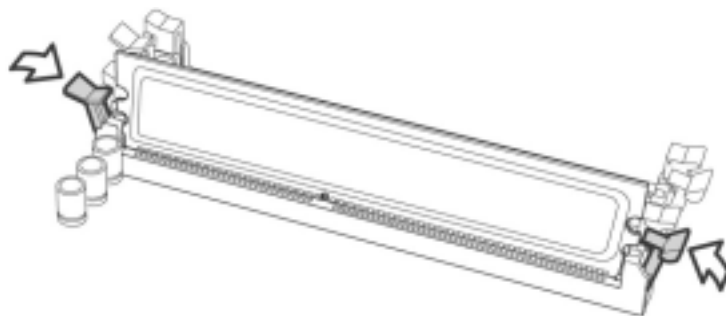
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.6 - Installing the Processor and Cooling Fan

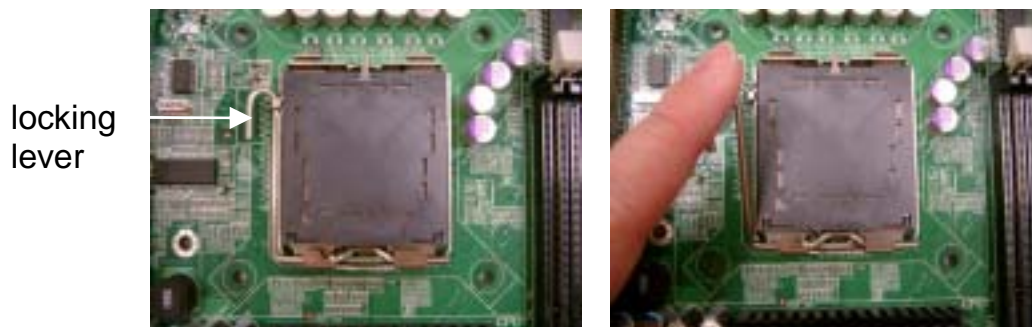
Your Toledo i3000R S5191 supports the latest processor technologies from Intel. Check the TYAN website for latest processor support:

<http://www.tyan.com>

Processor Installation (LGA 775 Socket)

The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible. Follow these instructions to install your processor and heat sink.

1. Locate the processor socket on the motherboard and lift the locking lever to a fully open position.



2. Lift the load plate to a fully open position.



3. Insert the processor into the socket and make sure that pin 1 is correctly located.



4. Remove the PnP cap from the load plate.



5. Replace the load plate and return the locking lever to the locking position.



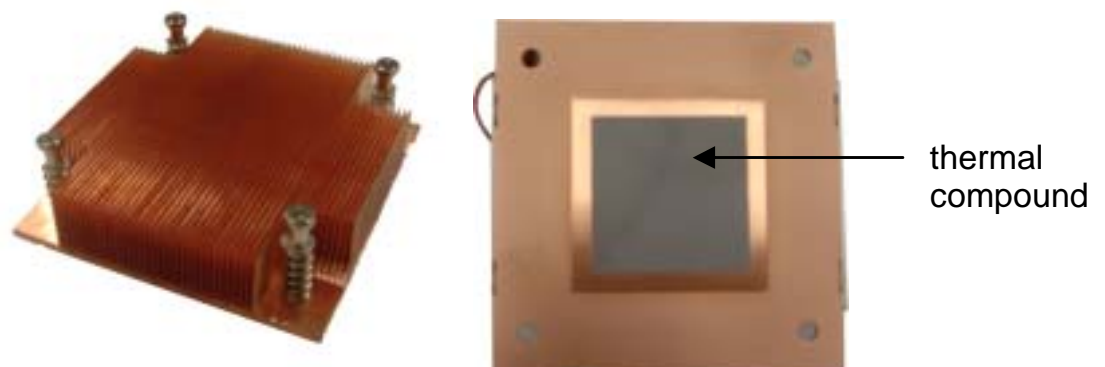
6. The CPU installation is now complete.

Cooling Fan Installation

After you have installed the processor, the heatsink should be installed to ensure that the processor runs efficiently and does not overheat. Use the heatsink supplied for best results.

Follow these instructions to install the heatsink shown.

1. Take out the heatsink from the package. Turn the heatsink upside down and you can see that the heatsink has already applied a layer of thermal compound.



2. Turn the board upside down and insert the heat sink spring mechanism as shown.



3. Align the heatsink with the four holes around the processor socket.



4. Press the heatsink down until the four screws are securely seated in the holes.



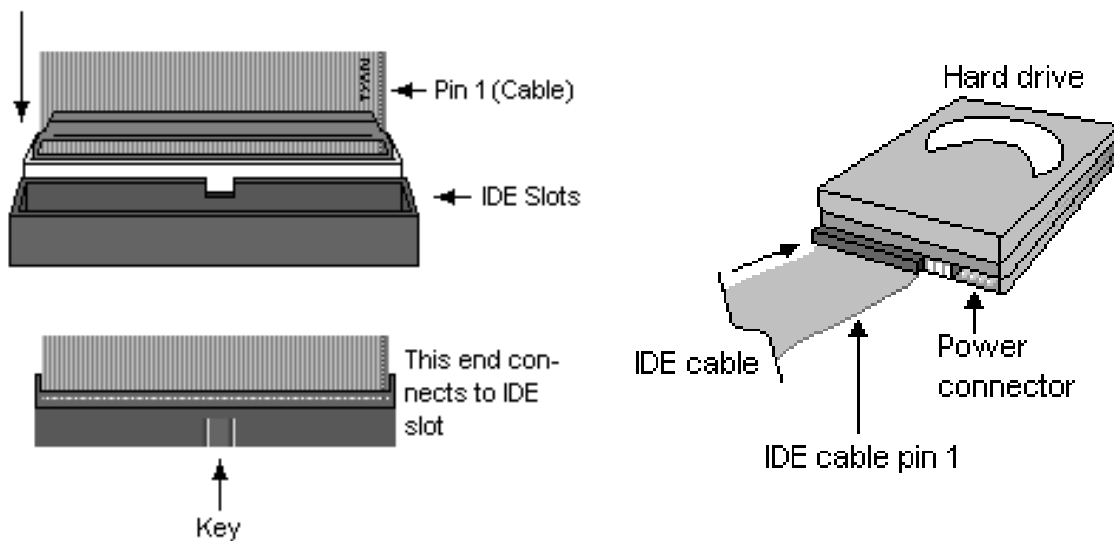
5. Use screw drive to secure the four screws.

2.7 - Attaching Drive Cables

Attaching IDE Drive Cable

Attaching the IDE drive cable 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.

Note: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

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

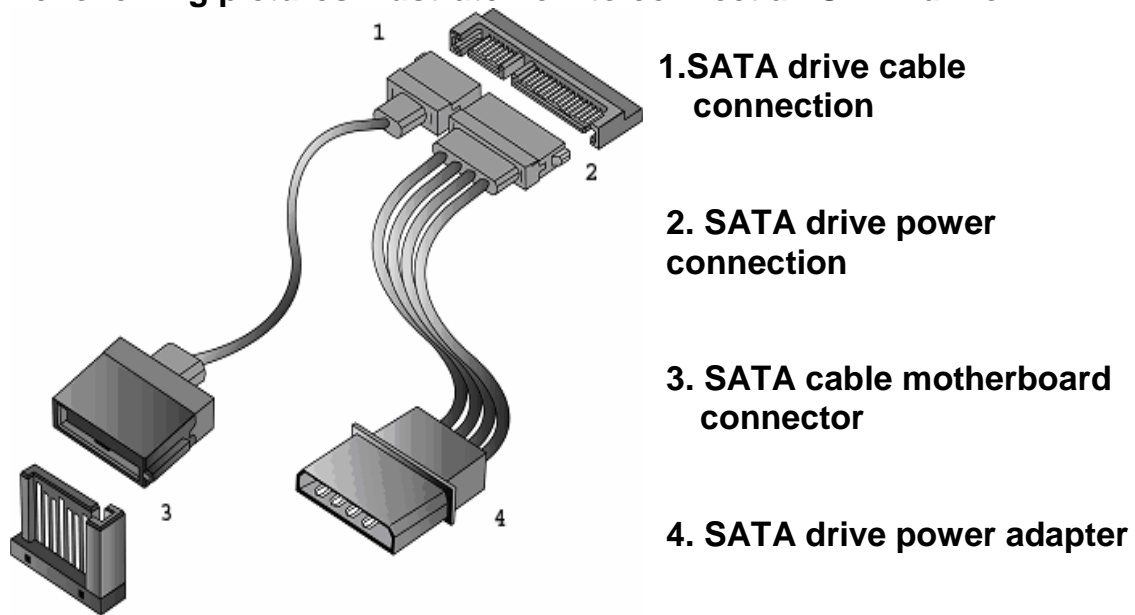
Attaching Serial ATA Cables

The Toledo i3000R is also equipped with 4 Serial ATA (SATA) channels. Connections for these drives are also very simple.

There is no need to set Master/Slave jumpers on SATA drives.

Tyan has supplied two SATA cables and one SATA power adapter. If you are in need of other cables or power adapters please contact your place of purchase.

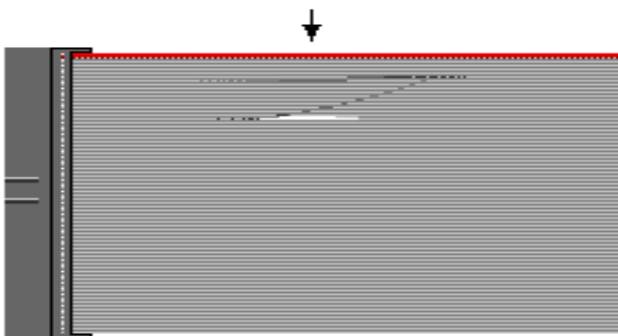
The following pictures illustrate how to connect an SATA drive



Attaching Floppy Drive Cables

Attaching floppy diskette drives are done in a similar manner to hard drives. See the picture 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 a proper connection of the cable.

Twist at the end of the ribbon cable



Attach first floppy drive (drive **A:**) to the end of the cable with the twist in it. Drive **B:** is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

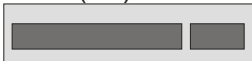
2.8 - Installing Add-In Cards

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 slots that appear on your motherboard.

PCI-X (64/133)



PCIe (x4)



The PCIe (x4) slot is designed for the Tyan M2082-2 riser card only. The M2082-2 allows you to install a PCI-E (x8) card. Please install the M2082-2 into the indicated PCI-X and PCIe slots. While using the M2082-2 for PCI-E capabilities, you can not use the PCI-X slot for an additional PCI-X add-in card.



PCI IDESELs and IRQ Assignments

Slot or Device	IDSEL#	Bus#
PCI-X	PAAD19	PCI-X Bus
SODIMM	PAAD22	PCI-X Bus
Onboard 82551	AD18	PCI Bus
Onboard XG20	AD21	PCI Bus

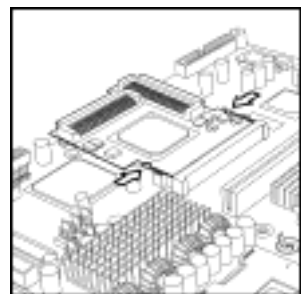
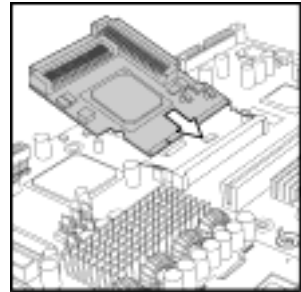
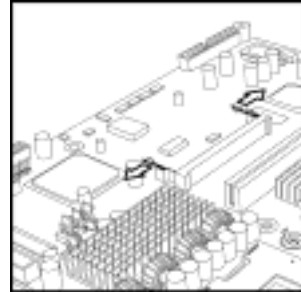
NOTE

YOU MUST ALWAYS unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

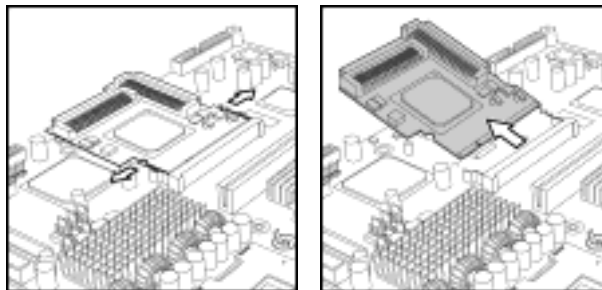
2.9 - Installing Optional SO-DIMM modules

Your Toledo i3000R S5191 motherboard is equipped with an optional proprietary SO-DIMM connector. The SO-DIMM connector can be used for expansion cards to provide such features as, additional SAS/SATA II or SCSI support. For details of available expansions cards, visit the TYAN website at <http://www.tyan.com>. To install a SO-DIMM expansion card:

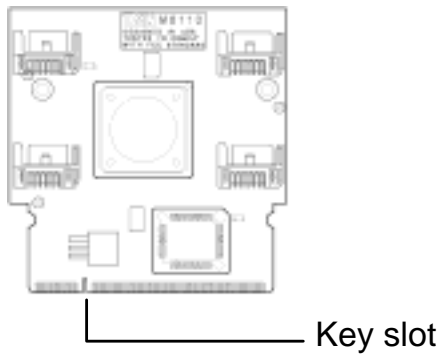
1. Open the spring levers as shown.
2. Insert the SO-DIMM card as shown, making sure that the card is the right way up. The card will fit in only one way and the screw holes in the card should line up exactly with the mounting posts on the motherboard.
3. Push the SO-DIMM card down into place and make sure the spring levers click into place as shown.
4. Screw the board into place using one or two screws as required.



Removal of a SO-DIMM card is a reversal of the installation procedure. Push out the spring levers as shown and pull the card out of the socket.



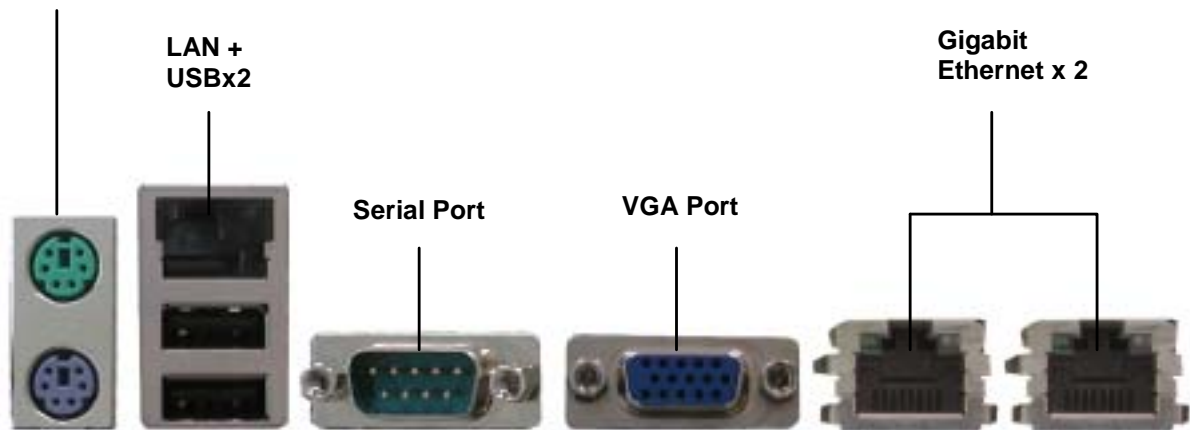
The SO-DIMM expansion cards will fit in the slot only one way. Make sure that you align the slot in the card with the key in the card slot.



2.10 - Connecting External Devices

The following diagrams will detail the rear port stack for this S5191 motherboard:


PS/2
Mouse/Keyboard



NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

Onboard LAN LED Color Definition

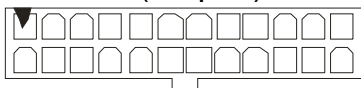
The three onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
		Left LED	Right LED
10 Mbps	Link	Green	Off
	Active	Blinking Green	Off
100 Mbps	Link	Green	Green
	Active	Blinking Green	Green
1000 Mbps	Link	Green	Orange
	Active	Blinking Green	Orange
No Link		Off	Off

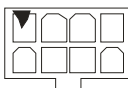
2.11 - Installing the Power Supply

There are two power connectors on your Toledo i3000R S5191. The Toledo i3000R S5191 requires that you use an EPS12V power supply that has a 24-pin and an 8-pin power connector. Please be aware that ATX 2.x, ATX12V and ATXGES power supplies are **not** compatible with the motherboard and can damage.

EPS12V (24-pin)



EPS12V (8-pin)



Applying power to the board

1. Connect the EPS 12V 8-pin power connector.
2. Connect the EPS 12V 24-pin power connector.
3. Connect power cable to power supply and power outlet

NOTE

YOU MUST unplug the power supply before plugging the power cables to motherboard connectors.

2.12 - 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 3: BIOS Setup

3.1 About the BIOS

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 virus and 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 **[Delete]** key when the machine boots up and begins to show the memory count.

Setup Basics

The table below shows how to use the setup program with the keyboard.

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Moves between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Changes settings.

Getting Help

Pressing [F1] displays 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 the [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, 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 sure of the outcome. TYAN or your system manufacturer has carefully chosen the chipset defaults for 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 have the same BIOS setup layout or options. While the basic look and function of the BIOS setup 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.

3.2 Main BIOS Setup

When you enter PhoenixBIOS CMOS Setup Utility, the following screen will appear as below:

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
System Time: [xx:xx:xx]				Item Specific Help	
System Date: [xxxx-xx-xx]				[Tab], [Shift-Tab], or [Enter] selects field.	
Legacy Diskette A: [1.44/1.25 MB 3½"]					
▶ IDE Primary/Master [None]					
▶ IDE Primary/Slave [None]					
▶ IDE Secondary/Master [None]					
▶ IDE Secondary/Slave [None]					
▶ Memory Cache					
▶ Boot Features					
Installed Memory 4096MB					
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values		

The main menu contains the following menu items:

Main

Use this menu for basic system configuration.

Advanced

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

Security

Use this menu to configure security settings for your system.

Power

Use this menu to configure power options for your system.

Boot

Use this menu to configure boot options for your system.

Exit

This contains the various BIOS exit options.

3.3 Main

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. Users use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
System Time:				[xx:xx:xx]	Item Specific Help
System Date:				[xxxx-xx-xx]	
Legacy Diskette A:				[1.44/1.25 MB 3½"]	[Tab], [Shift-Tab], or [Enter] selects field.
▶ IDE Primary/Master				[None]	
▶ IDE Primary/Slave				[None]	
▶ IDE Secondary/Master				[None]	
▶ IDE Secondary/Slave				[None]	
▶ Memory Cache					
▶ Boot Features					
Installed Memory				4096MB	
F1	Help	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	Select Menu	Enter	Select ▶ Sub-Menu	F10 Previous Values

System Time / Date setup

System Time: Adjusts the system clock.

HHHours (24hr. format): MMMinutes : SSSeconds

System Date: Adjusts the system date.

MMMonths : DDDays : YYYYYears

Legacy Diskette A

Defines the floppy drive type.

Options: NONE / 360K, 5.25 in / 1.2 M, 5.25 in / 720 K, 3.5 in / **1.44 M, 3.5 in / 2.88M, 3.5 in**

Installed Memory

This displays the amount of system memory present on the system.

3.3.1 IDE Primary / Secondary Master / Slave

Computer detects the hard disk drive type for each drive.

Press **Enter** on any of the Master/Slave options to view advanced details of the corresponding drive.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
IDE Primary Master		[None]		Item Specific Help	
Type:		[Auto]		User = your enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 1-39 = you select pre-determined type of hard-disk drive installed here. CD-ROM = a CD-ROM drive is installed here. ATAPI Removable = removable disk drive is installed here.	
Multi-Sector Transfers:		[16 Sectors]			
LBA Mode Control:		[Enabled]			
32 Bit I/O:		[Disabled]			
Transfer Mode:		[FPIO 4/ DMA 2]			
Ultra DMA Mode:		[Mode 5]			
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	► Sub-Menu	F10 Previous Values	

The system displays advanced details like the number of heads/cylinders/sectors on the detected disk and the maximum storage capacity of the disk.

This option lets you set the following hard disk parameters:

Type

Selects the type of device connected to the system.

Options: **Auto** / CD/DVD / Not Installed / ARMD

Multi-Sector Transfers

This option allows you to specify the number of sectors per block for multiple sector transfers.

Options: Disabled / 2 Sectors / 4 Sectors / 8 Sectors / **16 Sectors**

LBA Mode Control

Enables or disables LBA Mode.

In LBA Mode, instead of referring to a cylinder, head and sector number, each sector is instead assigned a unique "sector number". In essence, the sectors are numbered 0, 1, 2, etc. up to (N-1), where N is the number of sectors on the disk. In order for LBA to work, it must be supported by the BIOS and operating system, but since it is also a new way of talking to the hard disk, the disk must support it as well. All newer hard disks do in fact support LBA, and when auto detected by a BIOS supporting LBA, will be set up to use that mode.

When LBA is turned on, the BIOS will enable geometry translation. This translation may be done in the same way that it is done in Extended CHS or large mode, or it

may be done using a different algorithm called LBA-assist translation. The translated geometry is still what is presented to the operating system for use in Int 13h calls. The difference between LBA and ECHS is that when using ECHS the BIOS translates the parameters used by these calls from the translated geometry to the drive's logical geometry. With LBA, it translates from the translated geometry directly into a logical block (sector) number.

LBA has in recent years become the dominant form of hard disk addressing. Since the 8.4 GB limit of the Int13h interface was reached, it became impossible to express the geometry of large hard disks using cylinder, head and sector numbers, translated or not, while remaining below the Int13h limits of 1,024 cylinders, 256 heads and 63 sectors. Therefore, modern drives are no longer specified in terms of classical geometry, but rather in terms of their total number of user data sectors and addressed using LBA.

Options: Disabled / **Enabled**

32 Bit I/O

Enables or disables 32 bit data transfer mode.

Enabling this option causes the PCI hard disk interface controller to bundle together two 16-bit chunks of data from the drive into a 32-bit group, which is then transmitted to the processor or memory. This results in a small performance increase.

Options: Enabled / **Disabled**

Transfer Mode

These modes determine the speed at which data is transferred to and from the drive. The Auto option automatically determines the correct transfer rates.

Options: Auto / Standard / Fast PIO 1 / Fast PIO 2 / Fast PIO 3 / Fast PIO 4 / FPIO 3 / DMA 1 / **FPIO 4 / DMA 2**

Ultra DMA Mode

Enables or disables Ultra DMA Mode.

Ultra DMA (UDMA, or, more accurately, Ultra DMA/33) is a protocol for transferring data between a hard disk drive through the computer's data paths (or bus) to the computer's random access memory (RAM). The Ultra DMA/33 protocol transfers data in burst mode at a rate of 33.3 MBps (megabytes per second), twice as fast as the previous Direct Memory Access (DMA) interface.

Ultra DMA support in your computer means that it will boot (start) and open new applications more quickly. It will also help users of graphics-intensive and other applications that require large amounts of access to data on the hard drive. Ultra DMA uses Cyclical Redundancy Checking (CRC), offering a new level of data protection.

Because the Ultra DMA protocol is designed to work with legacy application PIO and DMA protocols, it can be added to many existing computers by installing an Ultra DMA/33 Peripheral Component Interconnect adapter card. Ultra DMA uses the same 40-pin Integrated Drive Electronics interface cable as PIO and DMA.

Options: Disabled / Mode 0 / Mode 1 / Mode 2 / **Mode 5**

3.3.2 Memory Cache

This setting allows you to tweak the various cache settings for optimal performance of your system.

Press Enter to display the various cache settings.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Memory Cache				Item Specific Help	
Cache System BIOS area:		[Write Protect]		Controls caching of system BIOS area.	
Cache Video BIOS area:		[Write Protect]			
Cache Base 0-512K:		[Write Back]			
Cache Base 512K-640K:		[Write Back]			
Cache Extended Memory Area:		[Write Back]			
Cache A000 – AFFF:		[Disabled]			
Cache B000 – BFFF:		[Disabled]			
Cache C800 – CBFF:		[Disabled]			
Cache CC00 – CFFF:		[Disabled]			
Cache D000 – D3FF:		[Disabled]			
Cache D400 – D7FF:		[Disabled]			
Cache D800 – DBFF:		[Disabled]			
Cache DC00 – DFFF:		[Disabled]			
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	► Sub-Menu	F10 Previous Values	

Cache System BIOS Area

This feature is only available when the system BIOS is shadowed. It enables or disables the caching of the system BIOS ROM at F0000h-FFFFFFh via the L2 cache. This greatly speeds up accesses to the system BIOS. However, this does not necessarily make the system perform better because the OS does not need to access the system BIOS often.

As such, it would be a waste of L2 cache bandwidth to cache the system BIOS instead of data that are more critical to the system's performance. In addition, if any program writes into this memory area, it will result in a system crash. So, it is recommended that you write protect this area for optimal system performance.

Options: NULL / **Write Protect**

Cache Video BIOS Area

This feature is only valid when the video BIOS is shadowed. It enables or disables the caching of the video BIOS ROM at C0000h-C7FFFh via the L2 cache. This greatly speeds up accesses to the video BIOS. However, this does not necessarily make the system perform better because the OS bypasses the BIOS and uses the graphics driver to access the video card's hardware directly.

As such, it would be a waste of L2 cache bandwidth to cache the video BIOS instead of data that are more critical to the system's performance. In addition, if any program writes into this memory area, it will result in a system crash. So, it is recommended that you write protect this area for optimal system performance.

Options: NULL / **Write Protect**

Cache Base 0-512K

Control caching of 512K base memory.

Options: Write Through / **Write Back**

Cache Base 512-640K

Control caching of 512K-640K base memory.

Options: Write Through / **Write Back**

Cache Extended Memory Area

Control caching of system memory above one megabyte.

Options: Write Through / **Write Back**

Cache A000-AFFF~ Cache DC00-DFFF

Control caching of the memory blocks.

Options: **Disabled** / Write Back/ Write Through / Write Protect

3.3.3 Boot Features

This setting allows you to tweak the various boot settings for optimal performance of your system.

Press Enter to display the various boot features.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Boot Features				Item Specific Help	
Floppy check:		[Disabled]		Enabled verifies floppy type on boot; disabled speeds boot.	
Summary screen:		[Enabled]			
Boot-time Diagnostic Screen:		[Enabled]			
QuickBoot Mode:		[Enabled]			
Error Halt in POST:		[all Errors]			
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	► Sub-Menu	F10 Previous Values	

Floppy Check

This feature is used to verify floppy type on boot. Selecting “Disabled” will speed the boot process.

Options: **Disabled** / Enabled

Summary Screen

Enables or disables the display of the summary screen during boot up.

When Summary Screen is Enabled (the default), a Phoenix BIOS Setup Utility summary screen appears during system boot after the power-on self-test (POST). The summary screen lists many of the system setup settings. When this option is set to Disabled, the summary screen does not appear.

Options: **Enabled** / Disabled

Boot-time Diagnostic Screen

This feature is used to display the diagnostic screen during the boot process.

Options: **Enabled** / Disabled

Quick Boot Mode

This BIOS feature allows you to decrease the time it takes to boot up the computer by shortening or skipping certain standard booting procedures.

If enabled, the BIOS will shorten the booting process by skipping some tests and shortening others. In addition, it will also perform the following to further speed up the booting process:

- Spin up the hard disks as soon as power is supplied (or as soon as possible)

- Initialize only critical parts of the chipset

- Read memory size from the SPD (Serial Presence Detect) chip on the memory modules

- Eliminate logo delays

If disabled, the BIOS will run the whole gamut of boot-up tests.

It is recommended that you disable this feature when you boot up a new computer for the first time or whenever you install a new piece of hardware. This allows the BIOS to run full diagnostic tests to detect any problems that may slip past Quick Boot's abbreviated testing scheme.

After a few error-free test runs, you should enable this feature for much faster booting.

Options: **Enabled** / Disabled

Error Halt in POST

Select Disable if user don't want stop POST with any error.

Options: **All Errors** / No Errors / All, But Keyboard

3.4 Advanced

This section facilitates configuring advanced BIOS options for your system.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
<p style="text-align: center;">Setup Warning</p> <p>Setting items on this menu to incorrect values may cause your system to malfunction.</p>				Item Specific Help	
<ul style="list-style-type: none"> ▶ Advanced Chipset Control ▶ Advanced Processor Options ▶ I/O Device Configuration ▶ Hardware Monitor ▶ DMI Event Logging <p>Installed O/S: [Win2K/XP] Reset Configuration Data: [No] Large Disk Access Mode: [DOS]</p> <p>Route Port 80h cycles to: [LPC] Legacy USB Support: [Enabled] ▶ Console Redirection</p>				<p>Selects options for Advanced Chipset features.</p>	
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values		

Installed OS

Select the operating system installed on the PC.

Note: An incorrect setting can cause the operating system to behave unpredictably.

Options: Other / Win95 / Win98 / WinMe / **Win2K/XP**

Reset Configuration Data

If you install a new piece of hardware or modify your computer's hardware configuration, the BIOS will automatically detect the changes and reconfigure the ESCD (Extended System Configuration Data). Therefore, there is usually no need to manually force the BIOS to reconfigure the ESCD.

However, sometimes, the BIOS may not be able to detect the hardware changes. A serious resource conflict may occur and the operating system may not even boot as a result. This is where the Reset Configuration Data BIOS feature comes in.

This BIOS feature allows you to manually force the BIOS to clear the previously saved ESCD data and reconfigure the settings. All you need to do is enable this BIOS feature and then reboot your computer. The new ESCD should resolve the conflict and allow the operating system to load normally.

Please note that the BIOS will automatically reset it to the default setting of No after reconfiguring the new ESCD. So, there is no need for you to manually disable this feature after rebooting.

Options: Yes / **No**

Large Disk Access Mode

This option determines whether a hard drive with more than 1024 cylinders, more than 16 heads and or more than 64 tracks per sector is present on the system. Set this option to **DOS** if such a hard drive is present. Else, set this option to **Other**. Virtually, all modern hard disks have these characters so leave this option at **DOS**, unless you know otherwise.

Options: **DOS** / Other

Route Port 80h cycles to

This feature allows you to route Port 80h I/O cycles to LPC or PCI bus.

Options: **LPC** / PCI

Legacy USB Support

When enabled, the BIOS takes control of the USB ports. Enable this only if you run an OS that does not support USB (e.g. DOS) or when you have USB hardware like USB mice that you want to use even before the operating system loads.

Options: **Enabled** / Disabled

3.4.1 Advanced Chipset Control

This section allows you to fine tune the chipset configuration.

PhoenixBIOS Setup Utility				
Main	Advanced	Security	Power	Boot Exit
Advanced Chipset Control			Item Specific Help	
▶ Integrated Device Control Sub-Menu ▶ PCI Express Sub-Menu			These items determine whether the integrated PCI Devices will be Enabled in PCI Config Space.	
Onboard VGA Control		[Enabled]		
Default Primary Video Adapter		[Auto]		
PXH Bus Frequency Control		[133MHz]		
Spread Spectrum		[Disabled]		
Parallel ATA:		[Enabled]		
Serial ATA:		[Enabled]		
Native Mode Operation:		[Auto]		
SATA Controller Mode Option:		[Compatible]		
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults	
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values	

Onboard VGA Control

Enable or disable Onboard XGI 27 PCI VGA.

Options: **Enabled** / Disabled

Default Primary Video Adapter

This feature is used to select the priority of initialing VGA card (PCI VGA or PCI-E VGA).

Options: **Auto** / PCI

PHX Bus Frequency Control

It is used to select the PHX bus frequency.

Options: 100MHz / **133MHz** / 66MHz

Spread Spectrum

<Clock Spread Spectrum>

Options: **Disabled** / Enabled

Parallel ATA

This feature is used to enable the PATA function.

Options: Enabled / **Disabled**

Serial ATA

This feature is used to enable the SATA function.

Options: Enabled / **Disabled**

Native Mode Operation

This feature is used to choose Native Mode for ATA. However, certain OS is not supported under Native Mode.

Options: **Auto** / Serial ATA

SATA Controller Mode Option

This feature is used to select SATA controller mode. In “compatible mode”, SATA and PATA drives are auto-detected and placed in Legacy mode. In “Enhanced (non-AHCI) mode”, SATA and PATA drives are auto-detected and placed in Native IDE mode.

Options: **Compatible** / Enhanced (non-AHCI)

3.4.1.1 Integrated Device Control Sub-Menu

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Integrated Device Control Sub-Menu				Item Specific Help	
USB - Device 29, Function 3:		[Enabled]		Enable or disable this USB device by setting item to the desired value.	
USB - Device 29, Function 2 & 3:		[Enabled]			
USB - Device 29, Function 1 & 2 & 3:		[Enabled]			
USB - Device 29, Function 0 & 1 & 2 & 3:		[Enabled]			
USB - Device 29, Function 7:		[Enabled]			
i82551 Option ROM Scan:		[Disabled]			
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	▶ Sub-Menu	F10 Previous Values	

USB Device 29, Function 3:

Controls the listed USB functions by setting the item to the desired value.

Options: **Enabled** / Disabled

USB Device 29, Function 2 & 3:

Controls the listed USB functions by setting the item to the desired value.

Options: **Enabled** / Disabled

USB Device 29, Function 1 & 2 & 3:

Controls the listed USB functions by setting the item to the desired value.

Options: **Enabled** / Disabled

USB Device 29, Function 0 & 1 & 2 & 3:

Controls the listed USB functions by setting the item to the desired value.

Options: **Enabled** / Disabled

USB Device 29, Function 7:

Controls the listed USB functions by setting the item to the desired value.

Options: **Enabled** / Disabled

i82551 Option ROM Scan:

This feature is used to enable the functionality of i82551 option ROM scan.

Options: **Disabled** / Enabled

3.4.1.2 Integrated Device Control Sub-Menu

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
PCI Express Sub-Menu				Item Specific Help	
▶ PCI-E Slot 1 (x8 Port) Sub-Menu				Enable or disable this USB device by setting item to the desired value.	

▶ Integrated PXH-V (x4 Port) Sub-Menu					
▶ Integrated LAN1 (Intel 82573V) Sub-Menu					
▶ Integrated LAN2 (Intel 82573V) Sub-Menu					
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	▶ Sub-Menu	F10 Previous Values	

3.4.1.2.1 PCI-E Slot 1 (x8 Port) Sub-Menu

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
PCI -E Slot 1 (x8 Port) Sub-Menu				Item Specific Help	
PCI Express Graphics Port [Auto]				Disabled – port always disabled.	

PEG Port Enabled = Yes				Enabled – port always enabled.	
PEG Width = x0					
PEG Slot Card Detect = No					
				Auto – only enable if card found.	
				Debug – only enable if card found. Don't force link width.	
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	▶ Sub-Menu	F10 Previous Values	

PCI Express Graphics Port

This feature is used to control the PCI Express Graphics Port.

Options: Enabled / Disabled / **Auto** / Debug

PEG Port Enabled/ PEG Width/ PEG Slot Card Detect

Read only.

3.4.1.2.2 Integrated PXH-V (x4 Port) Sub-Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Exit	
Integrated PXH-V (x4 Port) Sub-Menu				Item Specific Help		
PCI Express Port #1		[Auto]		Disabled – port always disabled. (If Port #1 is disabled, then the rest of the Ports will also be disabled.) Enabled – port always enabled. Auto – only enable if card found.		

Port #1 Enabled	=	Yes				
Port #1 Width	=	x4				
Port #1 Slot Card Detect	=	Yes				
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults			
Esc Exit	Select Menu	Enter Select	▶ Sub-Menu	F10 Previous Values		

PCI Express Port #1

This feature is used to enable PCI Express Port #1 control.

Options: **Auto** / Enabled / Disabled

Port #1 Port Enabled/ Port #1 Width/ Port #1 Slot Card Detect

Read only.

3.4.1.2.3 Integrated LAN1/LAN2 (Intel 82573V) Sub-Menu

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Integrated LAN1 (Intel 82573V) Sub-Menu				Item Specific Help	
PCI Express Port #5		[Auto]		Disabled – port always disabled. (If Port #5 is disabled, then the rest of the Ports will also be disabled.)	
Option ROM Scan:		[Disabled]			

Port #5 Enabled:		=Yes		Enabled – port always enabled.	
Port #5 Slot Card Detect:		=Yes			
Auto – only enable if card found.					
F1 Help	Select Item	-/+	Change Values	F9	Setup Defaults
Esc Exit	Select Menu	Enter	Select ▶ Sub-Menu	F10	Previous Values

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Integrated LAN2 (Intel 82573V) Sub-Menu				Item Specific Help	
PCI Express Port #6		[Auto]		Disabled – port always disabled. (If Port #6 is disabled, then the rest of the Ports will also be disabled.)	
Option ROM Scan:		[Disabled]			

Port #6 Enabled:		=Yes		Enabled – port always enabled.	
Port #6 Slot Card Detect:		=Yes			
Auto – only enable if card found.					
F1 Help	Select Item	-/+	Change Values	F9	Setup Defaults
Esc Exit	Select Menu	Enter	Select ▶ Sub-Menu	F10	Previous Values

PCI Express Port #5/ PCI Express Port #6

This feature is used to enable Integrated LAN1 or LAN2 control.

Options: **Auto** / Enabled / Disabled

Option ROM Scan

This feature is used to enable the functionality of option ROM scan.

Options: **Disabled** / Enabled

Port #5/#6 Port Enabled / Port #5/#6 Slot Card Detect

Read only.

3.4.2 Advanced Processor Options

This section allows you to fine-tune the processor options.

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Exit	
Advanced Processor Options				Item Specific Help		
Core Multi-Processing		[Enabled]		Determines whether the 2nd core is enabled. Disabled = 2 nd core is disabled Enabled = 2 nd core is enabled		
Hyperthreading:		[Enabled]				
Thermal Management 2		[Disabled]				
Numbers of Stop Grant		[Per Core]				
Set Max Ext CPUID = 3		[Disabled]				
C1 Enhanced Mode		[Enabled]				
Intel® Virtualization Technology		[Disabled]				
No Execute Mode Protection		[Enabled]				
Processor Power Management:		[GV1/GV3 Only]				
F1	Help	Select Item	-/+	Change Values	F9	Setup Defaults
Esc	Exit	Select Menu	Enter	Select ▶ Sub-Menu	F10	Previous Values

Core Multi-processing

Determines whether the second core is enabled.

[Disabled]: the second core is disabled

[Enabled]: the second core is enabled.

Options: **Disabled** / Enabled

Hyperthreading

Enable this only if you have an Intel Hyper Threading processor.

Hyper-Threading Technology enables multi-threaded software applications to execute threads in parallel. Hyper-Threading Technology provides thread-level-parallelism (TLP) on each processor resulting in increased utilization of processor execution resources. As a result, resource utilization yields higher processing throughput. Hyper-Threading Technology is a form of simultaneous multi-threading technology (SMT) where multiple threads of software applications can be run simultaneously on one processor. This is achieved by duplicating the architectural state on each processor, while sharing one set of processor execution resources. Hyper-Threading Technology also delivers faster response times for multi-tasking workload environments. By allowing the processor to use on-die resources that would otherwise have been idle, Hyper-Threading Technology provides a performance boost on multi-threading and multi-tasking operations for the Intel NetBurst® microarchitecture.

Options: **Enabled** / Disabled

Thermal Management 2

Select between TM1 and TM2.

Options: **Disabled** / Enabled

Numbers of Stop Grant

This feature is used to configure the numbers of Stop Grant.

Options: **Per Core** / Single

Set Max Ext CPUID = 3

Sets Max CPUID extended function value to 3.

Options: **Disabled** / Enabled

C1 Enhanced Mode

This feature is used to enable the C1 Enhanced mode.

Options: **Enabled** / Disabled

Intel® Virtualization Technology

Intel Virtualization Technology is a set of platform features that support virtualization of platform hardware and multiple software environments.

Options: **Disabled** / Enabled

No Execute Mode Protection

This feature is used to enable the function of No Execute Mode Protection.

Options: **Enabled** / Disabled

Processor Power Management

Thermal Management throttles the processor back as it reaches its maximum operating temperature. Throttling reduces the number of processing cycles, thereby diminishing the heat dissipation of the CPU. This cools the unit. Once the CPU has reached a safe operating temperature, thermal throttling is automatically disabled, and normal full speed processing begins again.

Options: **GV1/GV3 only** / Disabled

3.4.3 I/O Device Configuration

This setting allows you to configure I/O devices.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
I/O Device Configuration				Item Specific Help	
Serial port A:		[Enabled]		Configure serial port A using options:	
Base I/O address:		[3F8]		[Disabled]	
Interrupt:		[IRQ 4]		No configuration	
Serial port B:		[Enabled]		[Enabled]	
Base I/O address:		[2F8]		User Configuration	
Interrupt:		[IRQ 3]		[Auto]	
Parallel port:		[Enabled]		BIOS or OS chooses configuration	
Mode:		[Bi-directional]			
Base I/O address:		[378]			
Interrupt:		[IRQ 7]			
Floppy disk controller:		[Enabled]		(OS Controlled)	
				Displayed when controlled by OS	
F1	Help	Select Item	-/+ Change Values	F9	Setup Defaults
Esc	Exit	Select Menu	Enter Select ▶ Sub-Menu	F10	Previous Values

Serial Port A/B:

This defines how the serial port A/B is detected and configured.

Options: Disabled / **Enabled** / Auto

Base I/O Address:

Set the base I/O address for serial port A/B.

Options: **3F8** / 2F8 / 3E8 / 2E8

Interrupt:

Set the interrupt for serial port A/B.

Options: IRQ3 / **IRQ4**

Parallel Port

This defines how the parallel port is detected and configured.

Options: Disabled / **Enabled** / Auto

Mode

This field allows the user to select the parallel port mode. The default value is Standard that automatically selects the correct mode to use. The other modes are explained as follows:

SPP works with all parallel port devices. However, it is the slowest transfer mode and should only be used when faster transfer modes cannot be used.

There are two faster bidirectional modes available - the ECP (Extended Capabilities Port) and EPP (Enhanced Parallel Port) modes.

For those who don't know what mode to select but at least know that their parallel port device supports bidirectional transfers, the BIOS offers the ECP+EPP mode. If you select this mode, then the parallel port device will be able to use either one of those modes. However, this should be considered as a last resort as you may be needlessly tying up an IRQ if your device does not use ECP at all. Or the BIOS may not select the best parallel port mode for the device. If possible, set the parallel port to the transfer mode that best suits your parallel port device.

However, the manufacturer of your parallel port peripheral may have designated a preferred parallel port mode for the device in question. In that case, it's best to follow their recommendation.

Options: EPP / ECP / EPP & ECP / **Bi-directional**

Base I/O Address:

Set the base I/O address for parallel port.

Options: **378** / 278 / 3BC

Interrupt:

Set the interrupt for parallel port.

Options: **IRQ7** / IRQ5

Floppy Disk Controller:

This defines how the floppy disk controller is detected and configured.

Options: Disabled / **Enabled** / Auto

3.4.4 Hardware Monitoring

This section allows you to fine tune the Hardware Monitoring configuration.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Hardware Monitoring				Item Specific Help	
<p>▶ Voltage Monitoring Sub-Menu</p> <p>▶ FAN Control Sub-Menu</p> <p>CPU FAN 2250 RPM</p> <p>FAN1 No Fan Input</p> <p>FAN2 No Fan Input</p> <p>FAN3 No Fan Input</p> <p>FAN4 No Fan Input</p> <p>FAN5 No Fan Input</p> <p>CPU Temp.= 56°C/132°F</p> <p>Ambient Temp.= 37°C/98°F</p>					
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values		

All items on this submenu can not be modified in user mode. Read only.

3.4.4.1 Voltage Monitoring Sub-Menu

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Voltage Monitoring Sub-Menu				Item Specific Help	
<p>VDIMM= Xxxx V</p> <p>Vccp= Xxxx V</p> <p>Vcc= Xxxx V</p> <p>+5V= Xxxx V</p> <p>+12V= Xxxx V</p> <p>+3.3Vsb= Xxxx V</p> <p>VBAT= Xxxx V</p>					
<p>All items on this menu can not be modified in user mode. If any items require changes, please consult your system supervisor.</p>					
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values		

All items on this submenu can not be modified in user mode. Read only.

3.4.4.2 FAN Control Sub-Menu

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
FAN Control Sub-Menu				Item Specific Help	
Auto Fan Control		[Disabled]		Auto Mode Fan Control Parameters	
CPU FAN Input type select		[4 Pin]			
FAN1 Input type select		[4 Pin]			
FAN2 Input type select		[4 Pin]			
FAN3 Input type select		[4 Pin]			
F1	Help	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	Select Menu	Enter	Select ► Sub-Menu	F10 Previous Values

Auto Fan Control:

This feature is used to set function of Auto Mode Fan Control.

Options: Enabled / **Disabled**

CPU FAN / FAN1 / FAN2 / FAN3 Input Type Select:

These features are used to select 3 or 4 pin fan connector. After the setting, then you can use the function of "Auto Fan Control".

Options: **4 Pin** / 3 Pin

3.4.5 DMI Event Logging

This section allows you to fine tune the DMI Event Logging configuration.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
DMI Event Logging				Item Specific Help	
Event Log Validity		Valid		View the contents of the DMI event log.	
Event Log Capacity		Full			
View DMI event log:		[Enter]			
Event Logging:		[Enabled]			
Mark DMI events as read:		[Enter]			
Clear all DMI Event logs:		[No]			
F1	Help	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	Select Menu	Enter	Select ► Sub-Menu	F10 Previous Values

View DMI Event log

Press [Enter] to view BIOS event log

Event Logging

When set to [Enabled], errors will be logged to BIOS event log.

Options: **Enabled** / Disabled

Mark DMI Events as Read

Press [Enter] to mark DMI events as read.

Clear all DMI Event logs

When set to [Enabled], BIOS event log will be cleared.

Options: **Disabled** / Enabled

3.4.6 Console Redirection

This section allows you to configure the Console Redirection.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Console Redirection				Item Specific Help	
Com Port Address		[Disabled]		Select Com Port on BMC or motherboard.	
Baud Rate		[19.2K]			
Console Type		[VT100]			
Flow Control		[None]			
Continue C.R. after POST:		[Off]			
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values		

Com Port Address

Select Com Port on BMC or motherboard.

Options: **Disabled** / On-board COM A / On-board COM B

Baud Rate

Enables the specified baud rate.

Options: **19.2K** / 300 / 1200 / 2400 / 9600 / 38.4K / 57.6K / 115.2K

Console Type

Enables the specified console type.

Options: **VT100** / VT100, 8bit / PC-ANSI 7bit / PC ANSI / VT100+ / VT-UTF8

Flow Control

Enables Flow Control.

Options: **None** / XON/XOFF / CTS/RTS

Continue C.R. after POST

Enables Console Redirection after OS has loaded.

Options: **Off** / On

3.5 Security

These settings allow you to configure the security options for your system.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Supervisor Password Is:				Clear	
User Password Is:				Clear	
Set Setup Password				[Enter]	
Set User Password				[Enter]	
Diskette Access:				[Supervisor]	
Fixed Disk Boot Sector:				[Normal]	
Virus Check Reminder:				[Disabled]	
System Backup Reminder:				[Disabled]	
Password on boot:				[Disabled]	
FirstWare Authentication Level:				[High]	
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ▶ Sub-Menu	F10 Previous Values		

The system displays the current supervisor and user passwords.

Set Setup Password

This option allows the supervisor to set the supervisor password to restrict access to the BIOS settings.

Set User Password

This option allows the user to set the user password.

Diskette access

This option allows the user to control access to diskette drives.

Options: **Supervisor** / Disabled

Fixed disk boot sector

This option allows the user to write protect boot sector on hard disk to protect against viruses.

Options: **Normal** / Write Protect

Virus check reminder

This feature is used to display reminder message at the boot process.

Options: **Disabled** / Daily / Weekly / Monthly

System backup reminder

This feature is used to display reminder message at the boot process.

Options: **Disabled** / Daily / Weekly / Monthly

Password on boot

When enabled, the system will ask for a password at every boot. The system will continue booting only if the correct password is entered. If the wrong password is entered three times, the system will automatically shut down.

Options: **Disabled** / Enabled

FirstWare Authentication Level

This feature is used to select FirstWare Authentication Level.

Options: **High** / Medium / Low

3.6 Power

Use this screen to select options for the Power Settings Configuration.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Resume on Time: [Off] Resume Time: [00:00:00] Power Button Behavior [On/Off] After Power Failure: [Last State] Chassis Intrusion Detect [No] S5 Wake-Up by PCI Card: [Disabled]				Item Specific Help Enabled wakes the system up at a specific time.	
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ► Sub-Menu	F10 Previous Values		

Resume On Time

When enabled, this allows the system to be worked up at a specified time. This time is specified by the Resume Time parameter.

Options: **Off** / On

Resume Time

This option allows the user to specify the time when the system is to wake up.

Power Button Behavior

This specifies the behavior of the system after the power button is pressed.

On/Off - This powers on / powers off the system after the power button is pressed.

Wake/Sleep - This wakes the system from/puts the system to sleep.

Options: **On/Off** / Wake/Sleep

After Power Failure

Sets the mode of operation if an AC/Power Loss occurs. The two modes are:

[Enabled]: restores the previous power state before loss occurred.

[Disabled]: keeps the power off until the power button is pressed.

Options: Power On / Stay Off / **Last State**

Chassis Intrusion Detect

This feature is used to enable/disable the function: when chassis open event is detected, BIOS will record the event.

Options: **No** / Yes

S5 Wake-Up by PCI Card

If enabled, this option awakens the system from the S5 (power-off) state with an input signal from PME on the PCI card,

Options: Enabled / **Disabled**

3.7 Boot

Use this screen to select options for the Boot Settings Configuration.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Boot priority order 1. Legacy Floppy Drives 2. IDE 0: 3. IDE 1: 4. IDE 2: 5. IDE 3: 6. IDE 4: 7. IDE 5: 8. USB FDC: Excluded from boot order : USB KEY: : USB HDD: : USB CDROM: : USB ZIP: : USB LS120: : USB SCSI: : USB BEV: : Other USB: : PCI: : Legacy Network Card:				Item Specific Help Keys used to view or configure devices: Up and Down arrows select a device. <+> and <-> moves the device up or down. <f> and <r> specifies the device fixed or removable. <x> exclude or include the device to boot. <Shift + 1> enables or disable a device. <1-4> Loads default boot sequence.	
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select ► Sub-Menu	F10 Previous Values		

These settings can be customized depending on your preference.

3.8 Exit

These settings set the exit options on your system.

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes				Item Specific Help Exit system Setup and save your changes to CMOS.	
F1 Help	Select Item	-/+ Change Values	F9 Setup Defaults		
Esc Exit	Select Menu	Enter Select	▶ Sub-Menu	F10 Previous Values	

Exit Saving Changes

This exits BIOS setup after saving the changes made.

Exit Discarding Changes

This exits BIOS setup after discarding the changes made.

Load Setup Defaults

This loads the factory default values.

Discard Changes

This discards all changes made without exiting BIOS setup.

Save Changes

This saves all changes made without exiting BIOS setup.

NOTE

Chapter 4: 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>.

4.1 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.

4.2 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.

4.3 Phoenix BIOS Post Code

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

	memory bus		
2Fh	Enable cache before system BIOS shadow	68h	Enable external and CPU caches
30h	1-4-1-1. RAM failure on data bits of high byte of memory bus	69h	Setup System Management Mode (SMM) area
Code	Beeps / Description	Code	Beeps / Description
6Ah	Display external L2 cache size	A2h	Check key lock
6Bh	Load custom defaults (optional)	A4h	Initialize Typematic rate
6Ch	Display shadow-area message	A8h	Erase F2 prompt
6Eh	Display possible high address for UMB recovery	AAh	Scan for F2 key stroke
70h	Display error messages	ACH	Enter SETUP
72h	Check for configuration errors	Aeh	Clear Boot flag
76h	Check for keyboard errors	B0h	Check for errors
7Ch	Set up hardware interrupt vectors	B2h	POST done - prepare to boot operating system
7Eh	Initialize coprocessor if present	B4h	One short beep before boot
80h	Disable onboard Super I/O ports and IRQs	B5h	Terminate QuietBoot (optional)
81h	Late POST device initialization	B6h	Check password (optional)
82h	Detect and install external RS232 ports	B9h	Prepare Boot
83h	Configure non-MCD IDE controllers	BAh	Initialize DMI parameters
84h	Detect and install external parallel ports	BBh	Initialize PnP Option ROMs
85h	Initialize PC-compatible PnP ISA devices	BCh	Clear parity checkers
86h.	Re-initialize onboard I/O ports.	BDh	Display MultiBoot menu
87h	Configure Motherboard Devices	BEh	Clear screen (optional)
88h	Initialize BIOS Data Area	BFh	Check virus and backup reminders
89h	Enable Non-Maskable Interrupts (NMIs)	C0h	Try to boot with INT 19
8Ah	Initialize Extended BIOS Data Area	C1h	Initialize POST Error Manager (PEM)
8Bh	Test and initialize PS/2 mouse	C2h	Initialize error logging
8Ch	Initialize floppy controller	C3h	Initialize error display function
8Fh	Determine number of ATA drives (optional)	C4h	Initialize system error handler
90h	Initialize hard-disk controllers	C5h	PnPnd dual CMOS (optional)
91h	Initialize local-bus hard-disk controllers	C6h	Initialize notebook docking (optional)
92h	Jump to UserPatch2	C7h	Initialize notebook docking late
93h	Build MPTABLE for multi-processor boards	C8h	Force check (optional)

95h	Install CD ROM for boot	C9h	Extended checksum (optional)
96h	Clear huge ES segment register	D2h	BIOS Boot Block
97h	Fixup Multi Processor table	E0h	BIOS Boot Block
98h	1-2. Search for option ROMs.	E1h	BIOS Boot Block
99h	Check for SMART Drive (optional)	E2h	Initialize the CPU
9Ah	Shadow option ROMs	E3h	Initialize system timer
9Ch	Set up Power Management	E4h	Initialize system I/O
9Dh	Initialize security engine (optional)	E5h	Check force recovery boot
9Eh	Enable hardware interrupts	E6h	Checksum BIOS ROM
9Fh	Determine number of ATA and SCSI drives	E7h	Go to BIOS
A0h	Set time of day	E8h	Set Huge Segment
Code	Beeps / Description	Code	Beeps / Description
E9h	Initialize Multi Processor	F1h	Initialize Run Time Clock
EAh	Initialize OEM special code	F2h	Initialize video
EBh	Initialize PIC and DMA	F3h	Initialize System Management Mode
ECh	Initialize Memory type	F4h	Output one beep before boot
EDh	Initialize Memory size	F5h	Boot to Mini DOS
EEh	Shadow Boot Block	F6h	Clear Huge Segment
EFh	System memory test	F7h	Boot to Full DOS
F0h	Initialize interrupt vectors		

Appendix I: SMDC Information

Overview

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 multi-interfaces to access the hardware remotely and perform **monitor**, **control** and **diagnose** activities effectively.

Tyan SMDC is not a peripheral card. Unlike regular peripheral card such as AGP card, Network card or SCSI card, SMDC does not require any hardware specific driver. As long as a standby power comes into the system, SMDC will begin looking after the system.

Tyan SMDC provides diversified methods to communicate with the hardware. IT manager has the flexibility to choose among *Keyboard Controller Style (KCS)*, *Block Transfer (BT)* style, Intelligent Chassis Management Bus (ICMB), Intelligent Platform Management Bus (IPMB), Emergency Management Port (EMP) and standard IPMI-Over-LAN communication as defined in latest IPMI 1.5 specification.

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

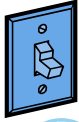
By adding SMDC, Tyan's server board becomes a highly manageable and IPMI compatible system with all the advanced features suggesting in IPMI Spec.

More detailed information on Tyan's SMDC card can be found on our website: <http://www.tyan.com>

Features of Tyan Server Management



Monitor various system components remotely
 -such as fans, processor temperature, and more



Remote power on and power off



Console redirect
 -the ability to view system remotely



Alert and error actions
 -such as audible beep, e-mail, power down and reboot



SMDC runs on stand-by power
 -the SMDC will continue to function, even if the system is not powered on

How SMDC and TSO Work

The brief descriptions below will help explain how these items function.

	<p>Agent – a system with SMDC installed The SMDC is installed in the Agent system that uses a compatible/supported Tyan motherboard.</p>
	<p>Manager – manages the Agent The Manger is set up to manage the Agent that has the SMDC. The Manager and Agent should be located in the same place.</p>
	<p>Console – communicates with Manager The Console is used to monitor and control the Agent through the Manager.</p>

Appendix II: How to Make a Driver Diskette

Follow the steps below to make a driver diskette from the TYAN driver CD provided.

1. Start the system and insert the TYAN CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to Tyan diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from hard disk.).

```
Boot from CD:

ISOLINUX 2.00 2002-10-25 Copyright (C) 1994-2002 H. Peter Anvin
0) Boot from first hard drive
1) Boot to TYAN diskette maker
boot: 1_
```

2. Choose the chipset vendor which you need from the main menu.

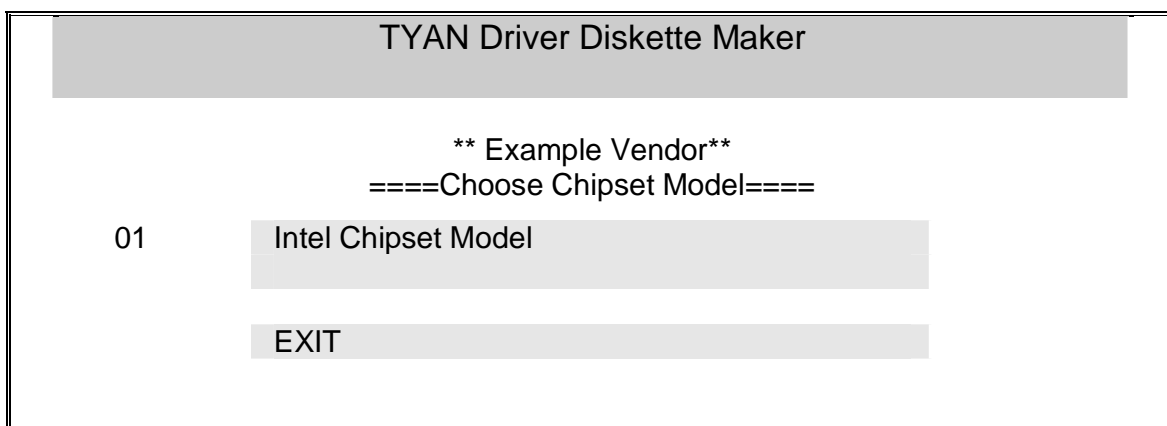
```
TYAN Driver Diskette Maker V1.0

** Main Menu**
====Choose Chipset Vendor====

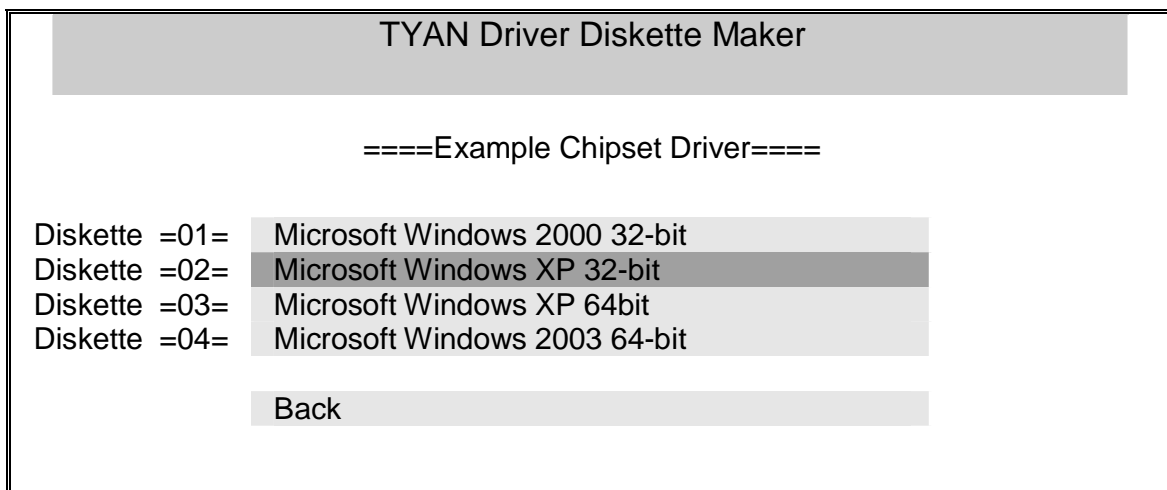
01  Adaptec
02  nVidia
03  LSI
04  Intel
05  Promise
06  Silicon Image
07  VIA

EXIT
```

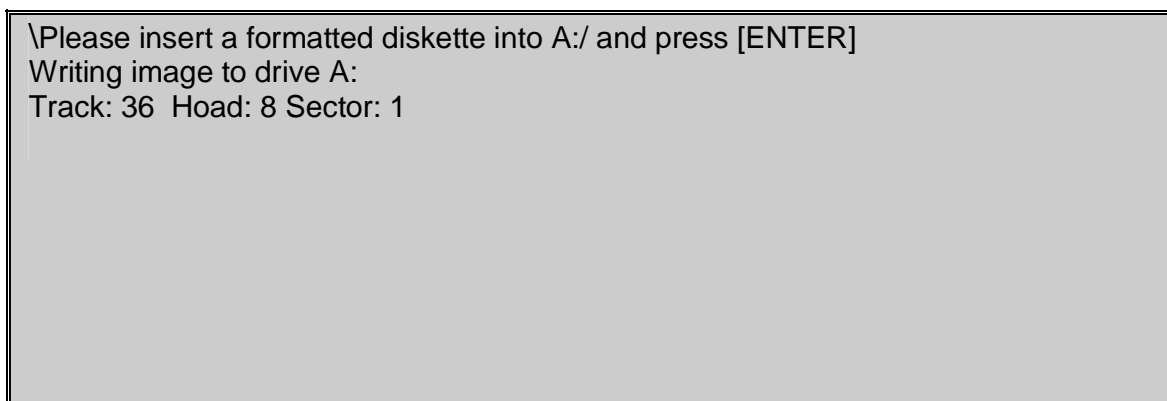
3. The following picture pops up after selecting the chipset model.



4. After selecting the chipset model, select the OS to start the diskette making.



5. Follow the instruction on menu to insert a diskette and press [ENTER].



6. Using "ESC" key to quit the Tyan diskette maker. The system will automatically restart.

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.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs at only 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

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.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

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.

Doze mode: in this mode, only the CPU's speed is slowed.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which has the unfortunate tendency to lose data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

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.

ISA (Industry Standard Architecture): a slower 8- or 16-bit bus (data pathway).

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 AcceleRAID 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 shift the processor over and down, guiding into the board and locking it into place.

NOTE

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) 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

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, 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

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 norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference 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 #: D1807-110