



Thunder i7500



S2720

Revision 1.01

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Before you begin...

Check the box contents!

The retail motherboard package should contain the following:



1x Thunder i7500 motherboard



1x 34-Pin floppy drive cable



1x Ultra160/320 LVD SCSI cable (if optional SCSI included)



1x Ultra-DMA-100/66/33 IDE cable



1x Thunder i7500 user's manual



1x TYAN driver CD



1x Adaptec Ultra160/Ultra320 SCSI driver diskette (if optional SCSI included)



1x I/O shield with 2 LAN ports

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

Chapter 1: Introduction

1.1 – Congratulations!

You're now the owner of the most advanced dual Intel processor solution – the Thunder i7500. Based on Intel's E7500 chipset, the Thunder i7500 continues to carry the strong Thunder line and leaves little to be desired. Never leaving anything behind, the Thunder i7500 is **HyperThreading** ready – fully supporting HyperThreading enabled Xeons. This means the Thunder i7500 comes ready to meet networking, storage, and video demands right out of the box. All your networking needs are handled with ease by both the onboard 10/100Mbps and 1Gbps network ports and storage support is flexible and speedy with optional dual channel Ultra320 SCSI or Ultra160 SCSI. With onboard video and support for unprecedented remote management, the Thunder i7500 is one of the most compelling business solutions available.

The Thunder i7500 supports up to 12GB of Registered ECC PC2100/1600 DDR SDRAM, Xeon processors 2GHz and beyond, and supports two 133MHz/100MHz/66Hz PCI-X slots, two 66MHz/33MHz PCI-X slots and one 32-bit/33MHz slot.

Remember to visit TYAN's Website at <http://www.tyan.com>. There you can find information on all of TYAN's products with FAQs, distributors list and BIOS setting explanations.

1.2 – Hardware Specifications

Processor

- Dual PGA603 ZIF sockets
- Supports up to two Intel Xeon Processors
- Onboard VRM (VRM 9.1 spec)
- Front-Side Bus support for 400MHz

Chipset

- Intel E7500 chipset
- MCH + ICH3 + P64H2 + FWH
- P64H2 supports two PCI-X busses
- Winbond 83627HF Super I/O ASIC

Memory

- Six 184-pin 2.5v DDR DIMM sockets
- Supports up to 12GB of Registered PC1600/2100* DDR memory
- Also supports ECC memory modules

Expansion Slots

- Two 64-bit 100/66/33MHz (3.3-volt) PCI-X slots
- Two 64-bit 66/33MHz (3.3-volt) PCI-X slots*
- One 32-bit 33MHz (5-volt) PCI slot
- Total of five usable slots

***The Thunder i7500 supports both PC2100 and PC1600 but Intel's E7500 chipset will only operate at PC1600.**

Integrated SCSI (manufacturing option)

- Adaptec AIC-7899W (AIC-7902 option) controller
- Dual-channel Ultra160 (Ultra320 option) SCSI support
- 160MB/sec maximum data throughput per channel
- Supports up to 15 LVD SCSI devices per channel
- Supports Adaptec Zero-Channel RAID (ZCR) technology in PCI-X slot 2

Integrated 2D/3D Graphics

- ATI RAGE XL graphics controller
- 4MB (8MB optional) frame buffer (SDRAM)
- Standard 15-pin analog VGA port

Server Management Daughtercard (option)

- Q-Logic Zircon Baseboard Management Controller (BMC)
- I2C and IPMB
- Supports the Intelligent Platform Management Interface (IPMI)

Integrated PCI IDE

- Dual-channel master mode
- Supports up to four Enhanced IDE devices
- Support for ATA -100/66/33 IDE and ATAPI compliant devices

Integrated I/O

- One floppy connector supports up to two drives
- Two 9-pin 16550-based serial ports
- One 25-pin SPP/ECP/EPP parallel port
- Two USB ports
- PS/2 keyboard and mouse ports

Integrated LAN

- Gigabit and Fast Ethernet on-board
- Two LAN controllers
 - one Intel 82554GC 10/100/1000 controller
 - one Intel 82550 10/100 controller

1.3 Software Specifications

OS (Operating System) Support

- Microsoft Windows NT 4
- Microsoft Windows 2000
- Microsoft Windows XP

Hardware Monitoring

- Winbond W83782D hardware monitoring ASIC
- CPU temperature/voltage monitoring
- Chassis intrusion header
- 6 (Rev-1) fan headers (3 headers monitoring ready)
- 6 (Rev-2) fan monitoring headers (all headers monitoring ready)
- 3 additional fan monitoring from Super I/O

BIOS

- AMI BIOS on 4Mbit/8Mbit Flash ROM
- Auto-configuration of IDE hard drive types
- Multiple boot options

Form Factor

- SSI EEB v3.0 footprint (12" x 13") – see page 10 for website related information.
- EPS12V power connectors (24-pin and 8-pin)
- Stacked parallel (one), serial (one) and VGA (one) ports
- Stacked USB (two) ports
- LAN (two) ports
- Stacked keyboard and mouse ports

Regulatory

- FCC DoC (Declaration of Conformity)
- European CE (Declaration of Conformity)

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

Chapter 2: Board Installation

WARNING: The Thunder i7500 only supports EPS12V power supplies and will not operate with other types. Refer to section 2.10 for instructions on installing EPS12V power supplies. DO NOT use ATX 2.x, ATX12V and dual AMD power supplies as they will damage the board and void your warranty.

Only EEB V3.0 form factor chassis is supported. Other form factors may short the board because the installation studs are in different locations than ones required by the Thunder i7500.

Installation

You are now ready to install your motherboard. The mounting hole pattern of the Thunder i7500 matches the SSI system board specifications. Your chassis should support a standard SSI motherboard form factor.

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

The first thing you should do is read this user's manual. It contains important information which 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 the power supply. 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.
- (3) Avoid touching the motherboard components, IC chips, connectors, and leads.
- (4) Avoid touching memory module contacts and IC chips
- (5) Place the motherboard on a grounded antistatic surface or on the antistatic bag from which it came in.

Having reviewed the precautions above, the next step is to take the motherboard out of the cardboard box and static bag, hold it by its edges and place it on a grounded antistatic surface, component side up. Inspect the board for damage.

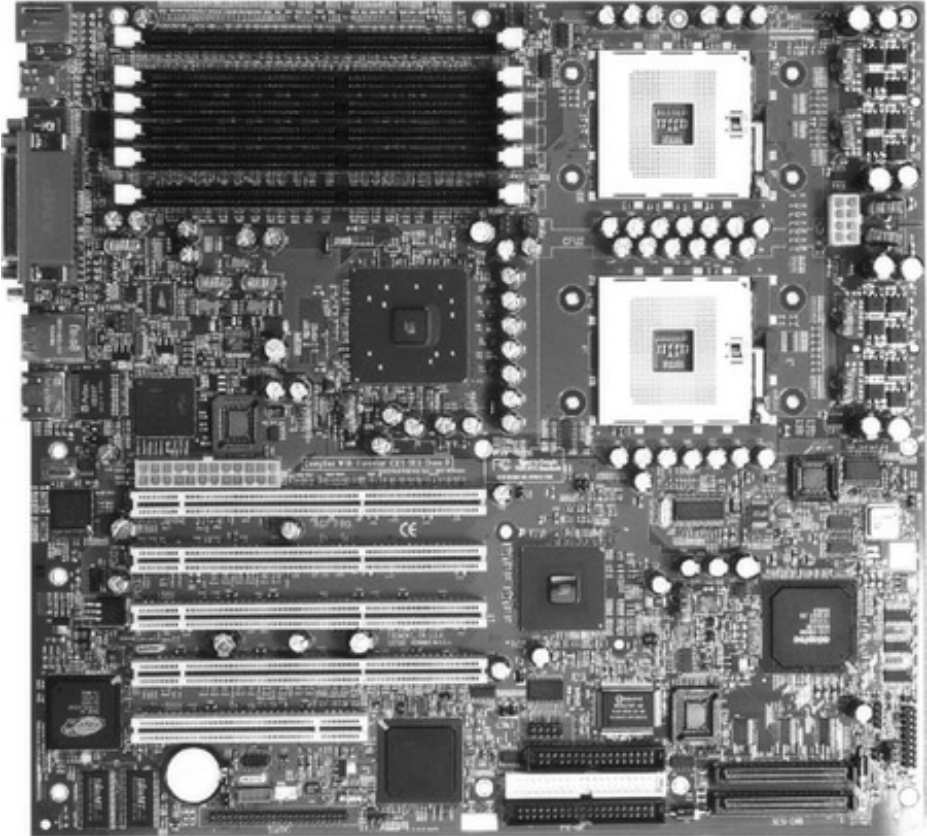
The following pages will detail for you on how to install your motherboard into your chassis, install processor(s), memory, hard drive and floppy cables/drives and heatsinks.

NOTE

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

2.0 – Board

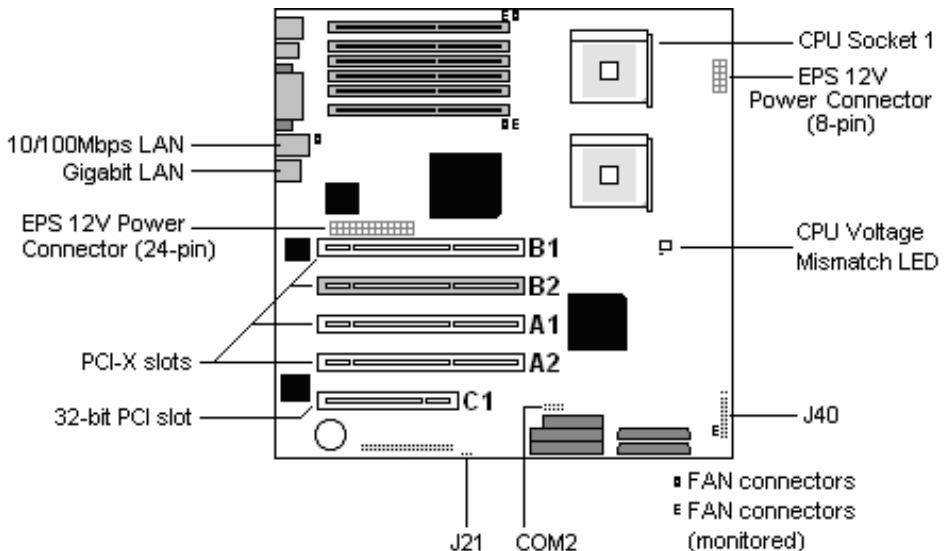
The following is an image of the S2720 Thunder i7500.



The above photograph is only a representation of the actual board. Because boards tend to be updated and go through different revisions, certain components may change and or be repositioned. The picture above may or may not look exactly like the board you received.

The following page will detail vital components of this board.

2.1 – Board Jumpers



PCI slots A1, A2, B1 and B2 are all PCI-X slots while PCI slot C is a conventional 32-bit/33MHz PCI slot. However, PCI slots A1, A2, B1 and B2 will operate at the speed of the slowest PCI card that is installed into them. If a 33MHz PCI card is inserted into bus A, both A slots will operate at 33MHz. The same rule applies for Bus B slots.

PCI Slot B1: PCI-X 66/33MHz

- Onboard SCSI (optional) and LAN (optional) utilizes this slot's resources
- 3.3 volt cards accepted

PCI Slot B2: PCI-X 66/33MHz

- Onboard SCSI (optional) and LAN (optional) utilizes this slot's resources
- Supports Adaptec Zero-Channel RAID (Nighthawk)
- 3.3 volt cards accepted

PCI Slot A1: PCI-X 100/66/33MHz

- Will operate at 100MHz if A1 is used but A2 is not with 100MHz PCI card inserted
- Will operate at 66MHz if A1 and A2 slots are used simultaneously with 66MHz PCI card inserted
- Will operate at 66MHz if PCI-X 66MHz card is inserted
- Will operate become PCI 64-bit/66MHz if PCI 64-bit/66MHz card is used
- 3.3 volt cards accepted

PCI Slot A2: PCI-X 100/66/33MHz

- Will operate at 100MHz if A2 is used but A1 is not with 100MHz PCI card inserted
- Will operate at 66MHz if A1 and A2 slots are used simultaneously with 66MHz PCI card inserted
- Will operate at 66MHz if PCI-X 66MHz card is inserted
- Will operate at PCI 64-bit/66MHz if PCI 64-bit/66MHz card is used
- 3.3 volt cards accepted

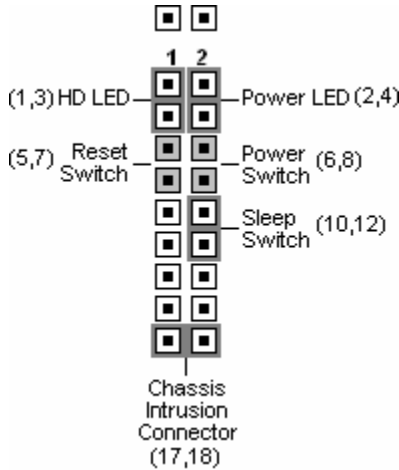
PCI Slot C1: PCI 32-bit/33MHz

- 5 and 3.3 volt cards accepted

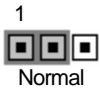
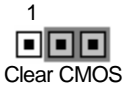
Bus A, B and C are independent of each other and do not share the same resources.

2.2 – Front Panel Connector (J40)

Your chassis will usually come with connectors to install onto the motherboard, such as HDD and Power LEDs. The Front Panel Connector (J40) has been implemented for such purposes.



2.3 – CMOS Reset (J21)



You can reset the CMOS settings in case an incorrect setting causes system instability or you have forgotten your system/setup password or have just flashed your BIOS by using these jumpers.

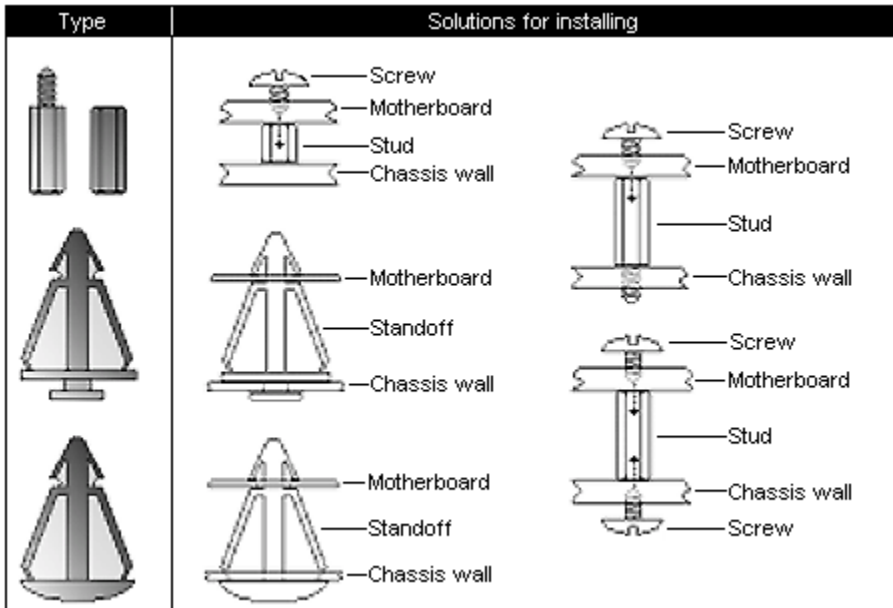
- Power off system, disconnect power supply from motherboard
- Set jumper J21 to Clear CMOS
- Wait about 5 seconds Set jumper J21 to Normal

2.4 – Mounting the Motherboard

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold colored. Usually, the chassis manufacturer will preinstall the support studs in SSI EEB v3.0 form factor. If you're not sure which stud goes where, simply lay the motherboard inside the chassis, aligning the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you'll know right away since the motherboard will not be able to be securely installed.

Some chasses include plastic studs instead of metal ones. These ones are also usable but TYAN recommends using metal studs with screws to make sure the motherboard does not get jarred during shipping or lots of movement.

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



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

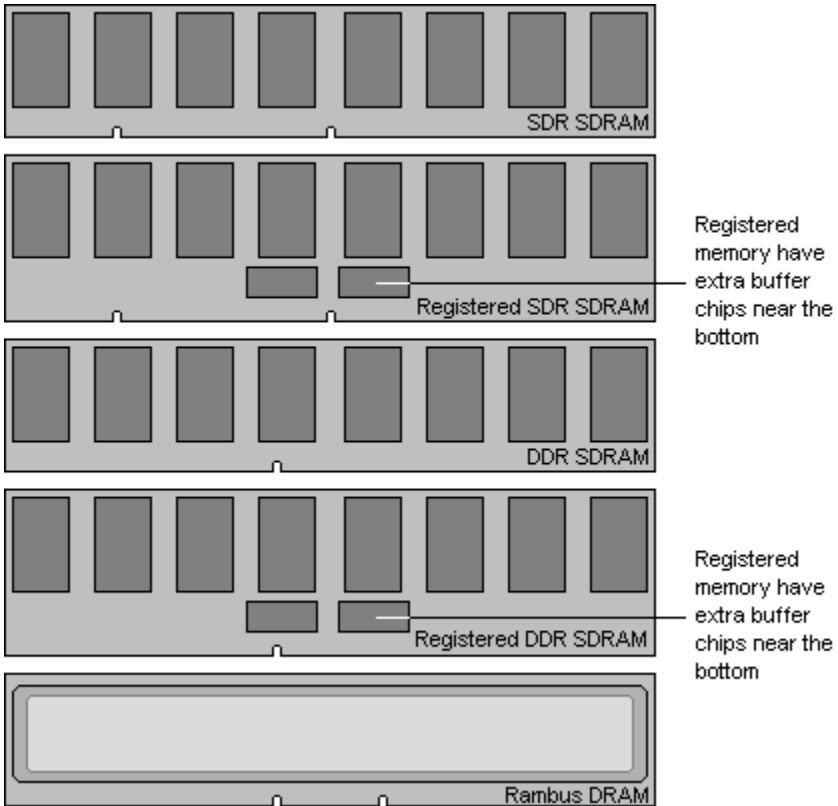
For more information on the SSI EEB (Entry-Level Electronics Bay) form factor v3.0, please visit the following website:

http://www.ssiforum.org/docs/entry_level_elebay_spec_v3_o.pdf

2.5 – Installing the Memory

Before attempting to install any type of memory, make sure that the memory you have is compatible with the motherboard as well as the processor. The Thunder i7500 supports the use of PC2100 DDR memory. However, the Intel E7500 chipset specifications will only allow memory to operate at PC1600. You may use either PC2100 and or PC1600. Critically important is whether you're using the recommended memory for the current board you have. For this information, please check TYAN's website at: www.tyan.com

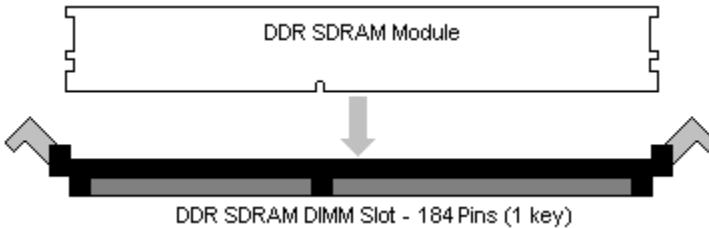
The following diagram shows the types of RAM modules you may encounter depending on your board:



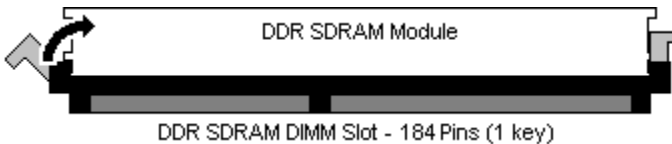
Memory Installation Procedure

The Thunder i7500 requires that memory modules be installed in pairs. Please refer to the next page for exact details on installing memory modules correctly.

When you install the memory modules, make sure the module aligns properly with the memory socket. There should be keys (small indents) on your memory modules that fit according to the keys in the memory socket. DDR SDRAM modules and sockets have only one key, which is slightly near the center of the module/socket. SDR SDRAM (also just referred to as PC100 or PC133) and their sockets have two keys and will not insert into DDR DIMM slots. The method of installing memory modules are detailed by the following diagrams.



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



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

TIP: When you're installing memory, it may require a considerable amount of force – although this is rare – to push the modules into their socket. To avoid bending and damaging your motherboard, place it on its anti-static bag and onto a flat surface, and then proceed to install the memory modules. This way you'll avoid motherboard damage even if you use too much force.

NOTE

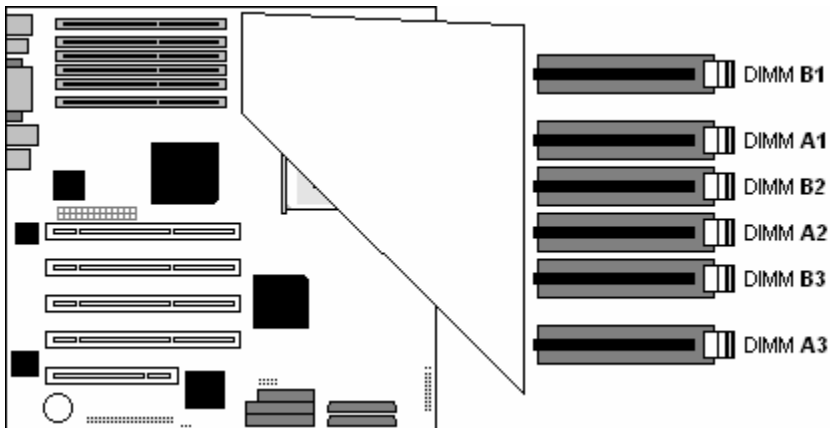
YOU MUST unplug the power connector to the motherboard before performing system hardware changes, to avoid having your motherboard boot-up automatically, due to the PCI v2.2 spec.

Memory Pair Installation

You must install the first two memory modules in DIMM B1 and DIMM A1.

Both modules must be the same in both size and density. Modules must also use the same chip configuration, as in each module that is installed must physically have the same number of memory chips on them.

All memory sockets must be populated by the same memory type, either x4 modules or x8 modules. You cannot mix and match x4 and x8 modules together. The Thunder i7500 will not support any other type of memory configuration.



A few things to remember:

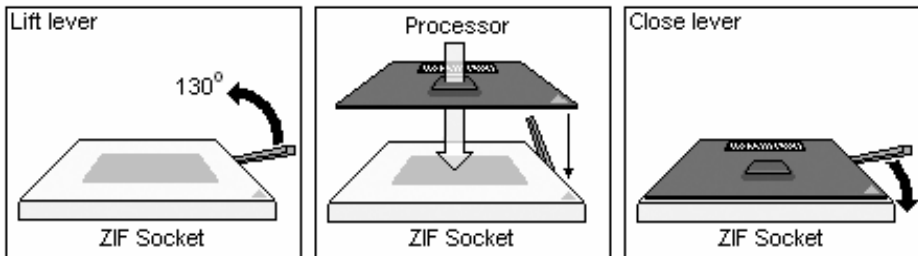
- **At least TWO Registered DDR SDRAM module must be installed for the system to turn on and POST (power on self test) and DIMM modules must be installed in pairs.**
- **Use ONLY x8 or x4 type memory modules. Mixing memory types affects stability.**
- **When installing modules, install them in this order: B1, A1, B2, A2, etc.**
- **128MB, 256MB, 512MB and 1GB Registered PC2100/PC1600 DDR SDRAM memory modules are supported in x4 or x8 configuration.**
- **The Thunder i7500 supports up to 12GB of memory**

2.6 – Installing the Processor(s) and Heatsinks

Your brand new Thunder i7500 supports the latest processor technologies from Intel. Check the following page on TYAN's website for latest processor support:

<http://www.tyan.com>

The following diagrams will detail how to install your processor(s):



NOTE

The CPU Voltage Mismatch (LED) – Page 8, will light up **red** if there is a mismatch in CPU voltage. **Only identical CPUs** can be used.

Also, when installing only 1 processor, ensure to install it in CPU socket 1.

The processors you choose to use may not look exactly like the one pictured above, nor will the socket look exactly the same. For example, your processor may appear to be in a different color and have different markings on it. The diagram is provided as a visual guide to help you install socket processors.

1. **Lift the lever on the socket until it is approximately 130° or as far back as possible to the socket.**
2. Align the processor with the socket. There are keys underneath the processor just like on memory modules to ensure that they insert the correct way.
3. Seat the processor firmly into the socket by gently pressing down until the processor sits flush with the socket.
4. Place the socket lever back down until it snaps into place.
5. Your processor is installed.
6. Repeat these steps for the second processor if you are using two processors.

Take care when installing Xeon processors as they have very fragile connector pins below the processor and can bend and break if inserted improperly.

Heatsink Installation

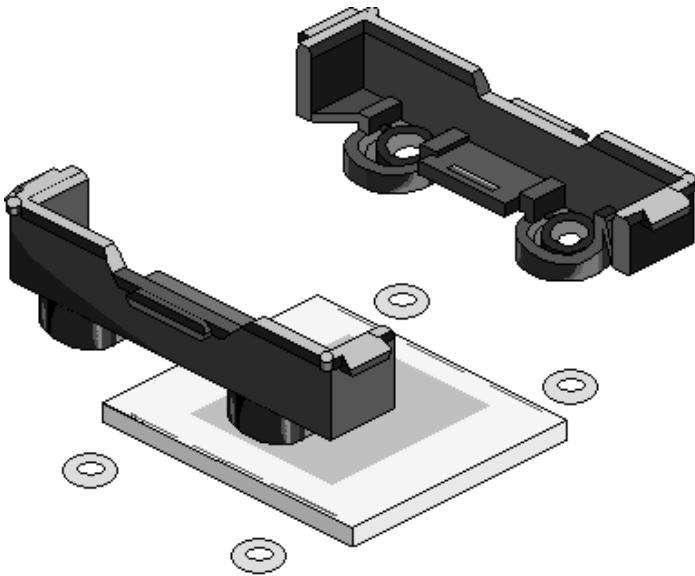
After you are done installing the processor(s), you should proceed to installing their heatsinks. Heatsinks will ensure that the processors do not overheat and continue to operate at maximum performance for as long as you own them. Overheated processors are also dangerous to the health of the motherboard.

Because there are many different types of heatsinks available from many different manufacturers, a lot of them have their own method of installation. For the safest method of installation and information on choosing the appropriate heatsink, please refer to Intel's certified heatsinks webpage at the following Internet address:

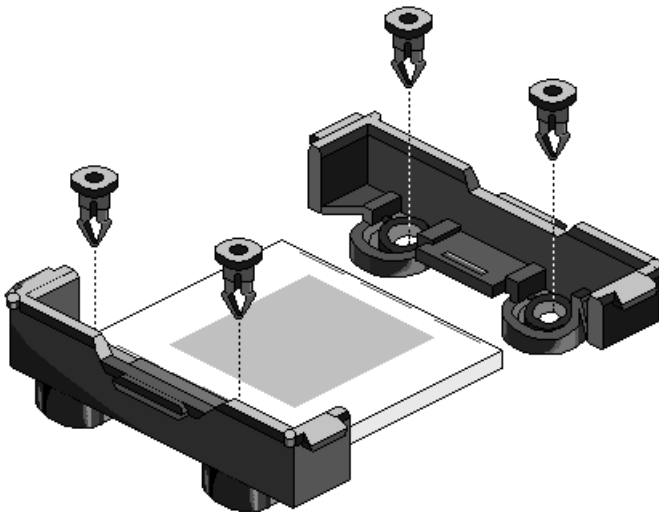
<http://support.intel.com/support/processors/xeon/thermal.htm>

The following diagram will illustrate how to install the most common heatsinks:

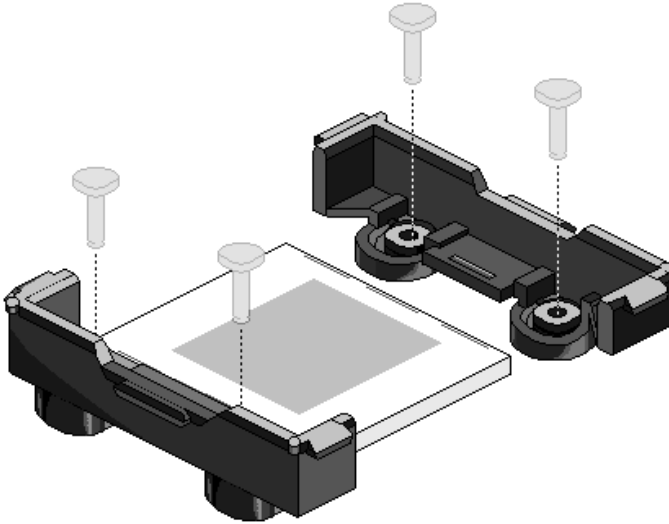
- 1) Align the heatsink mounting bracket to the holes around the processor socket



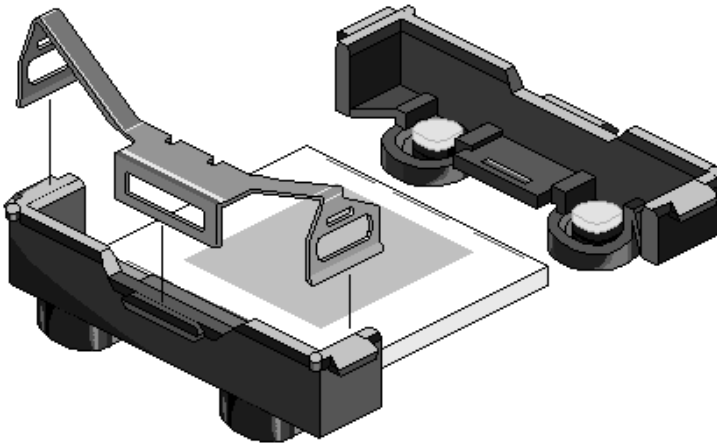
- 2) Insert Black securing peg into bracket holes



- 3) Insert White locking peg into Black securing peg



- 4) Repeat process to mount all other brackets
- 5) Seat heatsink between brackets on the processor
- 6) Attach heatsink clips

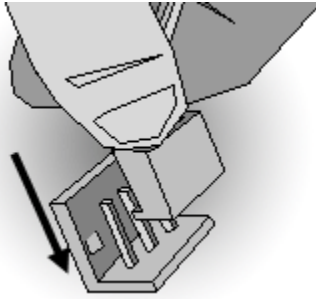


NOTE

Currently the default Intel Retail wind tunnel cover that installs on top of the heatsink will NOT fit on the Thunder i7500. With appropriate chassis cooling fans installed, the Intel wind tunnel thermal solution is not needed. However, a heatsink is still required for proper operation. Please consult your chassis vendor for cooling solutions.

Finishing Installing the Heatsink

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

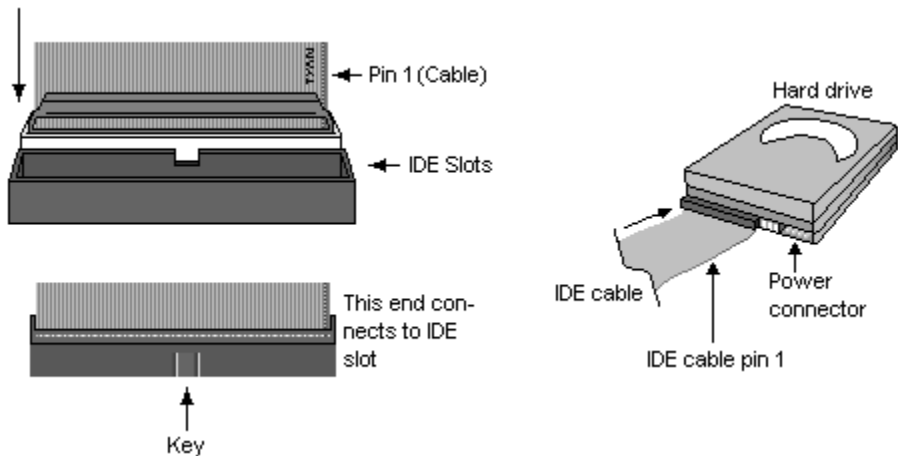


After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.7 – Attaching Drive Cables

Attaching IDE cables to your drives is simple because they only go in one way. TYAN motherboards have two on-board IDE channels for you to use, each supporting two drives. There is a white and a black IDE connector on your motherboard. **The black connector is the Primary IDE channel and the white connector is the Secondary IDE channel.**

Attaching IDE cables to the IDE connectors is illustrated below:

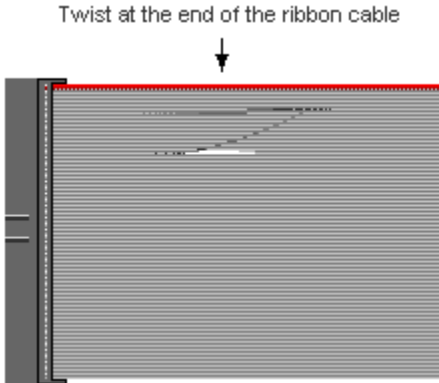


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other ends into the drive(s). Each standard IDE cable has three connectors, two being close to each other. The BLUE connector that is far on its own is the end that plugs into the motherboard whereas the other two connectors are used to connect to drives.

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

Floppy Drives

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.



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

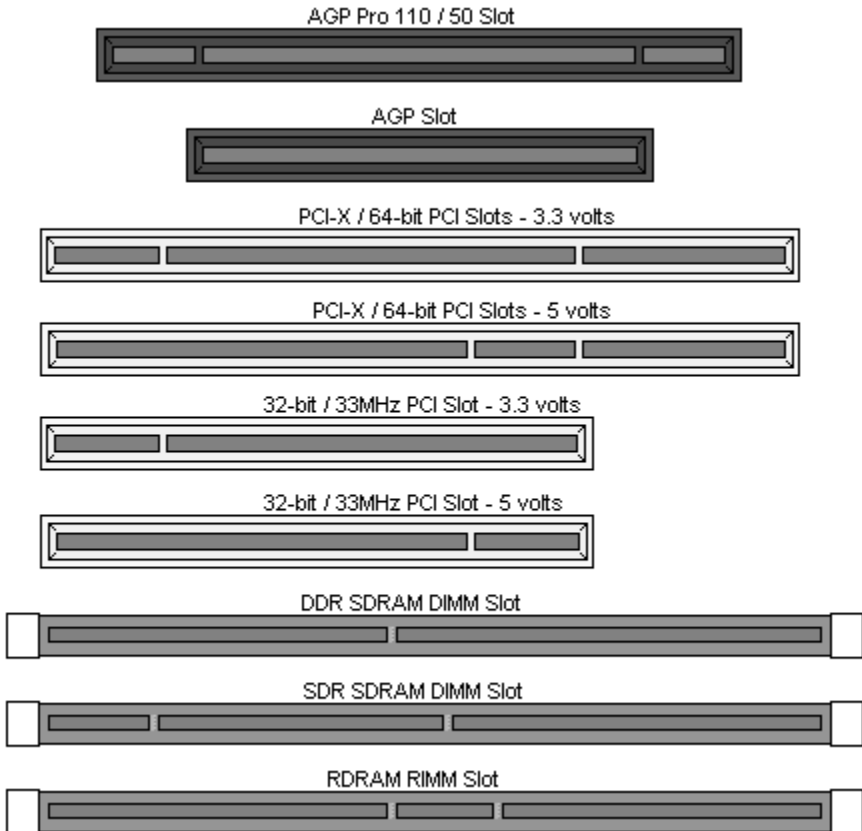
Refer to your floppy drive's installation instructions (if available), or contact your dealer if you are unsure about how to attach the floppy drive(s). Remember, you can only have 2 floppy drives connected at any given time.

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

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

2.8 – Installing Add-in Cards

Before installing add-in cards, it's good to be aware if they're fully compatible with your motherboard. For this reason, we've provided a chart, listing the most common slots that may appear on your motherboard. Not all the slots in this diagram will be on the same board though, but there will be combinations. See below for the way the slots look and what each one means.



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

TIP: It's good practice to spread out cards as far apart from each other as possible if you can. This gives more breathing room and sensitive electronics will cool better and perform more reliably.

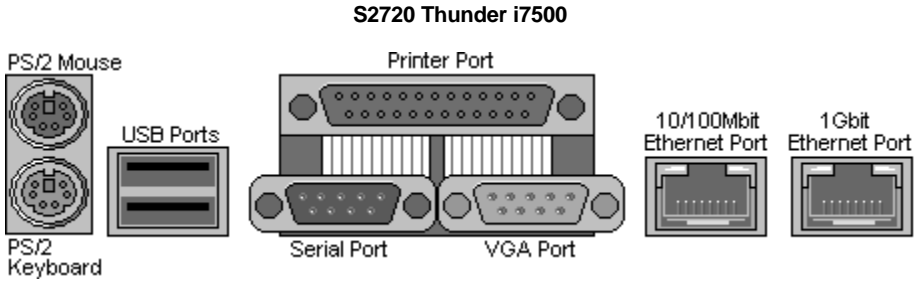
NOTE

YOU MUST unplug the power connector to the motherboard before performing system hardware changes, to avoid having your motherboard boot-up automatically, due to the PCI v2.2 spec.

Before Continuing onto section **2.9 – Connecting External Devices**, make sure everything is properly connected. Things like jumpers and case wiring are the most common causes of troubleshooting frustrations, both for the end-user and for any company doing technical support.

2.9 – Connecting External Devices

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



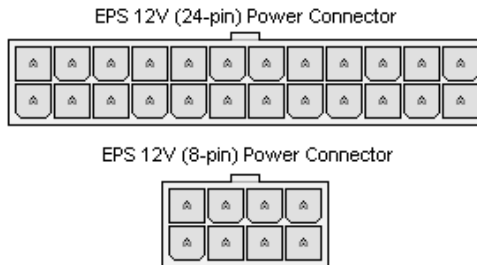
At times, the PS/2 ports for keyboard and mice may be mixed up. Simply remember that the port that is closest to the motherboard belongs to the keyboard and the one on top belongs to the mouse.

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

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

2.10 – Installing the Power Supply

There are two power connectors on your Thunder i7500. By default, the Thunder i7500 requires that you have an EPS12V power supply that has a 24-pin and an 8-pin power connector. Please be aware that ATX 2.x, ATX12V and dual AMD (24+8-pin) power supplies are **not compatible** with the board nor would they supply enough power.



1. **Disconnect power supply from electrical outlet**
2. **Connect EPS 12V 8-pin power connector**
3. **Connect EPS 12V 24-pin power connector**
4. **Connect power cable to power supply to power outlet**

Make sure you have connected BOTH the 24-pin and 8-pin connectors before attempting to apply power to the board.

2.11 – 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, jumper cables. You may have difficulty powering on your system if you properly connect motherboard jumpers.

Setting up your computer on a hardware level will probably be one of the easiest things to do if you carefully followed these instructions. Hopefully, by the time you're reading this, you should already have enough experience to set up another computer without much aid of a manual.

In the rare circumstance that you experienced difficulty even though the instructions herein were followed, 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

Installation

The BIOS is the basic input/output system, required by the computer to perform functions such as CPU and hard drive support. This chapter describes different settings for the BIOS that can be used to configure your system.

The BIOS section of the manual is subject to change without notice and is provided here for reference purposes only. The settings and configurations of the BIOS are current at the time of print, and therefore they may not be exactly the same as that displayed on your screen.

This manual 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.

The BIOS in your motherboard is customized version of industry-standard BIOS for IBM PC AT-compatible personal computers. It supports the Intel Xeon family of processors, and other compatible processors. The BIOS provides critical low-level support for the system central processing component, memory, and I/O subsystems.

The BIOS has been customized by adding important, but non-standard features such as virus and password protection, power management, and detailed fine-tuning of the chipset controlling the system. The rest of this manual is intended to guide you through the process of configuring your system using this BIOS setup program.

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 Tests (POST).

When these preliminary tests are complete, the BIOS seeks an operating system on one of the data storage devices (hard drive, CD-ROM, etc) which you can define. 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 [DEL] key when the machine first starts and shows the memory count.

Setup Basics

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

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

Getting Help

Pressing **[F1]** will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press **[ESC]** or 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, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds).

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

Setup Variations

Not all systems 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 screen shown here. Each system design and chipset combination requires custom configurations. In addition, the final appearance of the Setup program depends on your system designer. Your system designer can decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

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

3.1 – Main BIOS Setup

In this screen, you can alter general features such as the date and time, as well as access the IDE configuration screens. Note that the options listed below are for options that can directly be changed within the **Main Setup** screen.

System Time	The System Time will always display the current time in a 24 hour format. You may adjust the System Time according to your location. Adjusting the clock in your operating system will also change the System Time inside BIOS setup.
System Date	System Date displays the current date and can be changed just like System Time.

Master/Slave Setup

All the options in this section are automatically detected by the motherboard chipset and BIOS. You do not need to configure this section.

3.2 – Advanced Settings

IDE Configuration	All settings discussed in following sections.
Floppy Configuration	
Boot Settings Configuration	
SuperIO Configuration	
Remote Access Configuration	
Onboard Device Configuration	
USB Configuration	

3.3 – IDE Configuration

Options related to the IDE controller can be altered through the following.

Onboard PCI IDE Controller	Both Primary Secondary	Leave as Default. This setting toggles the onboard IDE drive controller on or off.
Primary Master/Slave	Auto	Leave as Default. This setting toggles the detection of drives attached to the IDE controller
Secondary Master/Slave	Disabled	
Hard Disk Write Protect	Enabled Disabled	Toggles the use of boot sector protection. This ensures that no viruses can damage the hard drive.
ATAPI Detect Time Out	0, 5, 10, 15, 2.0x, 2.5x, 3.0x, 3.5x	Defines how long the system will try to detect ATAPI devices for.
ATAPI 80pin Cable Detect	Host & Device Host Device	Toggles the detection of 80wire IDE cables.

3.4 – Floppy Configuration

Options related to floppy drives can be altered through the following.

Floppy A Floppy B	360KB, 5 ¼" 1.2MB, 5 ¼" 720KB, 3 ½" 1.44MB, 3 ½" 2.88MB, 3 ½" Disabled	Defines the floppy drive type.
Diskette Write Protect	Enabled Disabled	Toggles write protection. This will be effective only if device is access through BIOS.
Floppy Drive Seek	Enabled Disabled	Toggles floppy drive seeking during POST.

3.5 – Boot Settings Configuration

Options related to startup settings can be altered through the following.

Quick Boot	Enabled Disabled	When set to Enabled, some self tests will be skipped during POST.
Quiet Boot	Enabled Disabled	If set to Enabled, OEM logo will be displayed instead of POST messages.
Add-On Rom Display Mode	Force BIOS Keep Current	Leave as Default. This setting toggles the Add-On ROM video display mode.
Boot up Num-Lock	On Off	Specifies whether Num-Lock will be on or off during bootup.
Boot up CPU Speed	High Low	Specifies the CPU speed during startup.
PS/2 Mouse Support	Enabled Disabled	Toggles the use of the PS/2 mouse port.
Typematic Rate	Fast Slow	Changes speed of key repeat rate.
System Keyboard	Present Unavailable	Will allow continual boot even if the keyboard is not attached.

Parity Check	Enabled Disabled	Toggles checking of system memory for corruption.
Wait for F1 if "error"	Enabled Disabled	If Enabled, you will have to press F1 for the system to continue booting if an error is detected during POST.
Hit "Del" Message	Enabled Disabled	Toggles display of pressing DEL key to enter BIOS.

3.6 – Super IO Configuration

Options related to the IO interface can be altered through the following.

Serial Port 1, 2 Address	Enabled Disabled Auto	Toggles use of serial ports 1 and or 2. Enabling ports also requires you to enter the I/O address for that port unless you select Auto .
Onboard CIR Port	Enabled Disabled	Toggles the onboard Serial 2 port.
Parallel Port Address	3F8, 2F8 3E8, 2E8	These options are dependent on the IRQ and vice versa.
Parallel Port Mode	Output Only	Standard one-way protocol for parallel devices.
	Bi-directional	Two-way protocol
	EPP	Enhanced Parallel Port may provide higher bandwidth if an EPP compliant device is used (e.g. parallel Zip drive).
	ECP	Enhanced Compatibility Port may provide higher bandwidth if an ECP compliant device is used (e.g. parallel Zip drive).
Parallel Address	378 278 3BC	These options appear when the parallel port is set to Enabled .

3.7 – Onboard Device Configuration

Options related to onboard devices can be altered through the following.

Onboard ATI RageXL Video	Enabled Disabled	Toggles the onboard ATI video graphics.
Onboard 82550	Enabled Disabled	Toggles 100Mbit LAN port.
Onboard 82544GC	Enabled Disabled	Toggles 1Gbit LAN port.
Onboard SCSI	Enabled Disabled	Toggles the onboard SCSI controller.

3.8 – USB Configuration

Options related to USB can be altered through the following.

USB Function	Enabled Disabled	Toggles the onboard USB ports.
Legacy USB Support	Enabled Disabled Auto	Toggles the use of onboard USB ports in DOS.
USB Zip Emulation Type	Enabled Disabled Auto	Toggles Zip drive emulation on USB ports when in use.
USB Beep Message	Enabled Disabled	Toggles USB beep error messaging.

3.9 – PCIPnP

Options related to the Plug and Play PCI settings interface can be altered through the following.

Plug & Play OS	Yes No	Toggles the option of letting the OS take care of IRQ routing or the BIOS. Select Yes to let the OS manage IRQ settings.
Reset Config Data	Yes No	Resets BIOS area where IRQ and DMA settings are stored.
PCI Latency Timer	32, 64 , 96, 128, 160, 192, 224, 248	Leave on 64 for best combination of performance and stability.
Allocate IRQ to PCI VGA	Yes No	Assigns an IRQ to PCI video card.
Palette Snooping	Enabled Disabled	Palette Snooping can fix color problems associated with non-standard video cards such as MPEG decoders.
PCI IDE BusMaster	Enabled Disabled	Toggles the onboard IDE controllers to operate in BusMaster mode.
Offboard PCI/ISA IDE Card	Auto Enabled Disabled	Enables the system to recognize and boot from an add-in IDE controller card.
IRQ 3, 4, 5, 7, 9, 10, 11, 14, 15	These settings enable you to set which IRQs will be reserved for other devices other than the ones that use them by default.	
DMA Channel 0, 1	These settings enable DMA channel 0 and 1 to be enabled or disabled.	

3.10 – Chipset

Options related to the chipset can be altered through the following.

CPU Configuration	All settings discussed in following sections.
North Bridge	
ICH3 South Bridge	
Intel PCI-64 Hub 2	

3.11 – CPU Configuration

Options related to the processor setup can be altered through the following.

CPU Core Ratio	With this setting you can adjust the clock ratio of the processors. Use the Backspace key to change CPU ratio settings. You must power off the system completely when changing this setting for it to take affect. A reboot will not work.
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3.12 – North Bridge Configuration

Options related to the north bridge chipset settings can be altered through the following.

Back2Back WriteRead Turnaround	This setting allows you to adjust the speed at which WriteRead function occurs. Leave on defaults for best results.
Back2Back ReadWrite Turnaround	This setting allows you to adjust the speed at which ReadWrite function occurs. Leave on default for best results.
Back2Back Read Turnaround	This setting allows you to adjust the speed of Read turnaround.
Read Delay (tRD)	This setting changes the read delay time.
Activate2Precharge Delay (tRAS)	This setting changes the memory precharge delay.
CAS# Latency (tCL)	This setting changes the CAS memory latency.
Write RAS# to CAS# Delay (tRCD)	This setting changes the write memory delay timing.
Read RAS# to CAS# Delay (tRCD)	This setting changes the read memory delay timing.
DRAM RAS# Precharge (tRP)	This setting changes memory precharge delay timing.

HyperThreading Enable	This setting allows you to take advantage of HyperThreading enabled Xeon processors. Enabling HyperThreading allows a compatible Xeon processor to process applications that are written for a multi-processor system even if you are using only one Xeon processor.
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With HyperThreading, one Xeon processor that supports HyperThreading is capable of processing data as though there were two Xeon processors. Depending on what operating system is being used, it may recognize two Xeon processors as four processors when HyperThreading is enabled because of the multi-processor characteristics of HyperThreading technology. If an operating system is used that is only dual processor capable, it will display 2 processors when using two Xeon processors regardless of whether or not HyperThreading is enabled.

3.13 – ICH3 Chipset Configuration

Please leave all options in this section at their default setting because they are crucial to the stability of the system.

3.14 – Intel PCI-64 Hub 2 Chipset Configuration

Options related to the Intel PCI-64 hub and its settings can be altered through the following.

I/O Port Decode	This option allows you to adjust the decode size of the I/O ports.
RAS Sticky Error Handling	This option allows you to define how RAS errors are handled and whether they are corrected or left as is.
IOAPIC Support in MP Table	This option allows you to adjust settings for IOAPIC functions that relate to multi-processor handling.
VGA Decode	Please leave this option at its default setting.

3.15 – ACPI

Options related to power management settings can be altered through the following options.

ACPI Aware O/S	Yes No	Defines whether the OS can manage IRQs, DMAs, and other system settings on its own.
ACPI Advanced	All settings discussed in following sections	

3.16 – ACPI Advanced

Options related to advanced power management settings interface can be altered through the following options.

ACPI APIC Support	This option allows you to define whether or not to enable ACPI management features.
BIOS -> AML ACPI Stable	Please leave this option at its default setting. This setting toggles BIOS control of ACPI power features.
Headless Mode	Please leave this option at its default setting. This setting is for testing and diagnostics purposes.

3.17 – Boot

Options related to boot devices can be altered through the following.

Boot Device Priority	1st Boot Device 2nd Boot Device 3rd Boot Device	Settings for boot priority. These can be customized depending on your preference.
Hard Disk Drives	Specifies the boot sequence for hard drive booting. This option will show all storage devices.	
Removable Devices	Specifies the boot sequence for removable drive booting. This option will show all removable devices.	
ATAPI CDROM Drives	Specifies the boot sequence for CD-ROM drive booting. This option will show all CD-ROM devices.	
Hard Disk Drives	Dependent on system	Specifies the boot sequence for hard drive booting. This option will show all storage devices.
Interrupt 19 Capture	This option allows removable devices to act as non-removable devices.	

3.18 – Security

Options related system security can be altered through the following.

Change Supervisor Password	Changes system password.	
Change User Password	Changes boot password.	
Clear User Password	Clears boot password.	
Boot Sector Virus Protection	Enabled Disabled	Toggles protection of boot sector on the hard drive from being modified.

3.19 – Exit

Options related exiting and saving can be done using the following.

Exit Saving Changes	Exit and save options.
Exist Discarding Changes	Exit but don't save options.
Load Setup Defaults	Load the BIOS setup default settings.
Discard Changes	Discard any changes made.
Save Changes	Save changes.

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 memory error:

Memory not installed or memory not seated in the socket properly. If this occurs, the board will beep continuously and will not stop until power off. Please ensure that the correct type of memory is installed in the correct location.

Only x4 -OR- x8 modules can be installed and NOT both. Ensure that the first two modules are installed in socket's A3 and B3.

If you get this error, please check your memory configuration, order, type, and check for faulty modules. Please check our website for memory compatibility.

Before calling your vendor or calling TYAN Tech Support, be sure that you know how many beeps your board made, and how long the beeps were. Also have other information such as your attached add-in cards, drives and OS to help speed up the support process and come to a possible solution faster.

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, you must check the TYAN website: <http://www.TYAN.com/>

NOTE

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

Appendix: 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. TYANs BIOS updates can be found at <http://www.TYAN.com>

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 form of encryption. One system, typically the server, sends an encryption scheme to another agent, typically a client. Thus, the client's data is protected during transmittal to the server.

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 BBS-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 fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

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.

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.

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.

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.

SDRAM (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.

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.

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

Technical Support

If a problem arises with your system, you should turn to your dealer for help first. Your system has most likely been configured 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. Furthermore, if you purchased your system from a dealer near you, you can actually bring your system to them to have it serviced, instead of attempting to do so yourself (which can have expensive consequences).

Help Resources:

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

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