TYAN

Thunder K7X /// S2468

Revision 1.00

All registered and unregistered trademarks and company names contained in this manual are property of their respective owners including, but not limited to the following.

TYAN, Thunder K7X S2468 are trademarks of TYAN Computer Corporation.
AMD, Athlon, and combinations thereof are trademarks of AMD Corporation.
Phoenix, PhoenixBIOS are trademarks of Phoenix Software Inc.
Microsoft, Windows are trademarks of Microsoft Corporation.
IBM, PC, AT, PS/2 are trademarks of IBM Corporation.
Winbond is a trademark of Winbond Electronics Corporation.
Portable Document Format (PDF) is a trademark of Adobe Corporation.

Information contained in this document is furnished by TYAN Computer Corporation and has been reviewed for accuracy and reliability prior to printing. TYAN assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TYAN products including liability or warranties relating to fitness for a particular purpose or merchantability. TYAN retains the right to make changes to product descriptions and/or specifications at any time, without notice. In no event will TYAN be held liable for any direct or indirect, incidental or consequential damage, loss of use, loss of data or other malady resulting from errors or inaccuracies of information contained in this document.

Table of Contents

Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

1x Thunder K7X motherboard

1x 34-Pin floppy drive cable

1x LVD SCSI cable (if optional SCSI included)

1x Ultra-DMA-100/66 IDE cable

1x Cable set: 9-pin Serial

1x Thunder K7X user's manual

1x Thunder K7X Quick Reference guide

1x TYAN driver CD

1x Adaptec 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 are now the owner of one of the most flexible TYAN dual AMD Athlon motherboards available. Utilizing the latest chipset technology for dual AMD multi-processing, the Thunder K7X is fully capable of handling all your heaviest software demands. But software isn't the only thing you'll be ready for; optional is onboard dual-channel Ultra160 or Ultra320 SCSI, handling all your storage needs. If networking is what you need, then the Thunder K7X has enough bandwidth for all your needs through the use of dual integrated 10/100Mbit Ethernet ports.

All this is done efficiently and conveniently as the Thunder K7X is ready to fit in even the tightest spots. Thoughtfully designed, all aspects of the Thunder K7X were designed from the ground up to support even the thinnest 1U chassis.

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

• Dual PGA462 ZIF sockets
• Supports up to two AMD Athlon MP
• Two onboard VRMs
• Front-Side Bus support for 200MHz and 266MHz

Chipset

• AMD 760 MPX chipset
• AMD 762 system controller (north bridge) and AMD 768 peripheral bus controller (south bridge)
• Winbond 83627HF Super I/O ASIC

Memory

• Four 184-pin 2.5v DDR DIMM sockets
• 25-degree angled sockets enable rackmount installation
• Supports up to 4GB of Registered PC2100/1600 DDR memory
• Also supports ECC (72-bit) memory modules

*The AMD-760 MPX requires a portion of memory to be reserved for PCI devices. Allocation for these devices is dependent on the number of PCI devices installed, and option ROM for each device. Common configurations will see 3.5GB to 3.8GB of available memory.

Integrated PCI IDE

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

Integrated SCSI (manufacturing option)

• Adaptec LVD SCSI Controller
• Dual-channel LVD SCSI support
• Supports up to 15 LVD SCSI devices per channel

Integrated Video (Manufacturing option)

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

Server Management (Daughter card Option)

• Tyan-defined header connects to Server Management Daughter Card (SMDC), which supports the Intelligent Platform Management Interface (IPMI)
• Q-Logic Zircon Baseboard Management Controller (BMC)
• Support for IPMI, SDR, SEL, FRU
• I^2C and IPMB

Integrated LAN

• Two 3COM 3C920 LAN controllers (with 3COM 3C980 server option ROM)
• 10/100Mbps data transfer rate per controller

compliant devices

Expansion Slots

• One AGP Pro 110/50 slot; supports 2X/4X AGP
• Two 64-bit 66MHz (one 5/3.3-volt; one 3.3-volt) PCI 2.2 slots and three 32-bit 33MHz (5-volt) PCI 2.2 slots
• Total of six usable slots
• Adaptec Zero-Channel RAID ready PCI slot (green colored for your convenience)

Integrated I/O

• One floppy connector supports up to two drives
• Two 9-pin 16550-based serial ports (Serial2 port provided by cable)
• One 25-pin SPP/ECP/EPP parallel port
• PS/2 keyboard and mouse ports
• Four USB ports (2 rear connectors and 2 front side USB headers)

USB front Pin-outs:

*Front side USB header is designed for chassis that supports front side USB. TYAN does not provide these cables.

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
• 3-pin fan monitoring headers

BIOS

• Phoenix BIOS on 4Mbit Flash ROM
• Supports ACPI v1.0
• Auto-configuration of IDE hard drive types
• Multiple boot options
• DMI 2.0 compliant

Regulatory

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

Form Factor

• Extended ATX (13" x 12"; 330.2mm x 304.8mm)
• One 24-pin and one 8-pin ATXGES power connector
• Stacked parallel (one), serial (one) and VGA (one) ports
• Stacked USB (two) ports
• LAN (two) ports
• Stacked keyboard and mouse ports

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

Chapter 2: Board Installation

WARNING: The Thunder K7X only supports dual Athlon ATXGES power supplies (24-pin/8-pin) and will not operate with other types. Refer to section 2.10 for instructions on installing dual Athlon ATXGES power supplies.

DO NOT use ATX 2.x, ATX12V and EPS12V type supplies as they will damage the board and void your warranty.

Installation

You are now ready to install your motherboard. The mounting hole pattern of the Thunder K7X matches the E-ATX (Extended ATX) system board specifications. Your chassis should support a standard E-ATX 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 S2468 Thunder K7X.
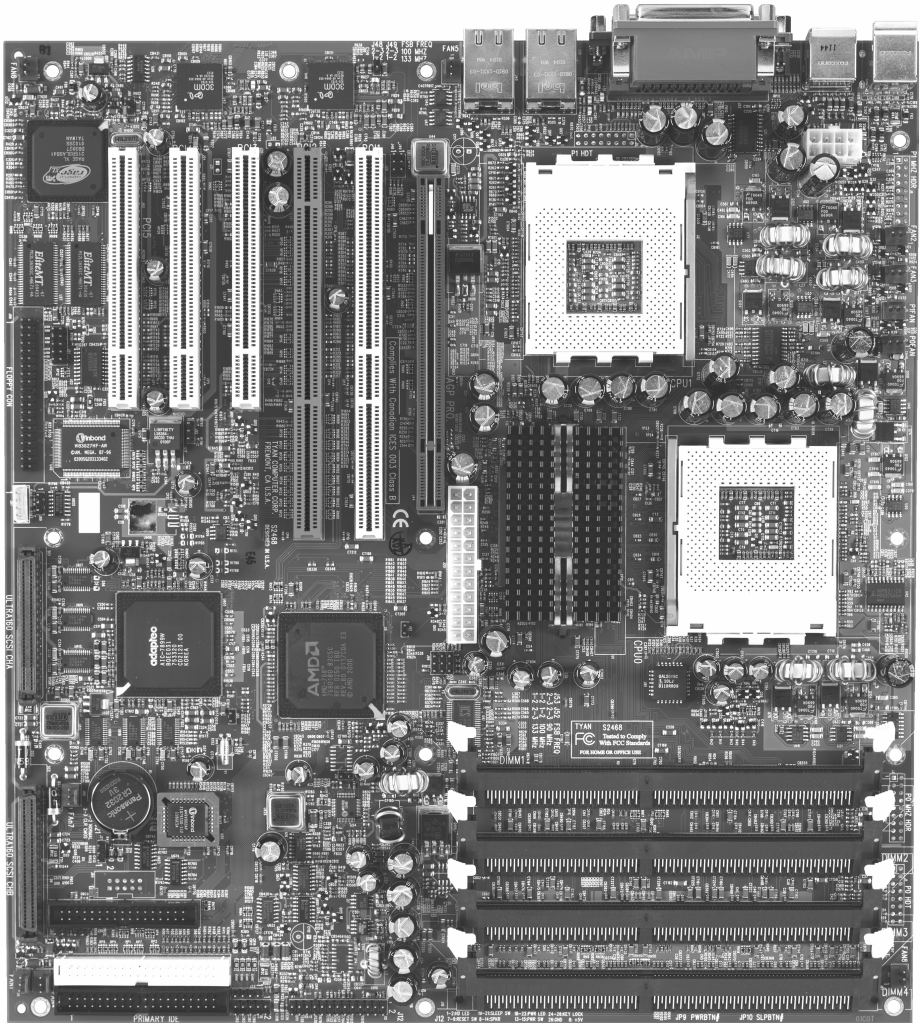
The above photograph is only a representation of the actual board. Because boards may be updated and go through different revisions, certain components may change and or be repositioned. The picture above may or may not look exactly like the board you received.

The following page will detail vital components of this board.

2.1 – Board Jumpers

The above jumper schematic diagram is representative of the latest board revision available at the time of this manual's publishing. The board you have received may or may not be like the above schematic.

Jumper Legend

▣▣ **Jumper OFF (disconnected)**

◼◼ **Jumper ON (connected)**

2.2 – Front Panel Connector (J12)

Your chassis will usually come with connectors to install onto the motherboard, such as HDD and Power LEDs. The Front Panel Connector (J12) has been implemented for such purposes.

2.3 – CMOS Reset (J21)

1 Clear CMOS **1** Default	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 – Front-side Bus Select 133MHz (DEFAULT)

1 J49 J48 J53 J52	Depending on the processor you have, you may need to adjust the processor front side bus speed in order have the processors operate correctly. The S2468 Thunder K7X supports processors that run at 100MHz (200DDR) and 133MHz (266DDR) front side bus speeds.

2.5 – Front-side Bus Select 100MHz

1 J49 J48 J53 J52	Depending on the processor you have, you may need to adjust the processor front side bus speed in order have the processors operate correctly. The S2468 Thunder K7X supports processors that run at 100MHz (200DDR) and 133MHz (266DDR) front side bus speeds.

2.6 – Onboard ATI Rage XL (J85)

■■	**Enabled**	**OPEN (default) the jumper to enable** the onboard ATI Rage XL graphics controller. You can also use the onboard video in conjunction with another AGP or PCI graphics card for multiple monitor support. **CLOSE the jumper to disable** the onboard ATI Rage XL.
■■	**Disabled**	

2.7 – Onboard LAN 1 (J86) and LAN 2 (J88)

■■	**Enabled**	**OPEN (default) the jumper(s) to enable** the respective LAN port(s) you want to use. **Close the jumper(s)** to disable the LAN port(s).
■■	**Disabled**	

2.8 – Onboard SCSI (J80)

■■	**Enabled**	**OPEN (default) the jumper to enable** the onboard SCSI feature. **CLOSE the jumper to disable**. This switch affects both channel A and channel B on the SCSI controller.
■■	**Disabled**	

2.9 – Primary PCI Speed (J92)

■■	**Enabled**	**OPEN (default**) the jumper to have the primary PCI bus operate at 66MHz (default). **CLOSE the jumper to force the primary PCI bus to operate at 33MHz.**
■■	**Disabled**	

2.10 – Chassis Intrusion Header (J15)

Certain chasses have a switch that detects whether or not they are being opened. This switch connects to the Chassis Intrusion Header to sound an alarm when the chassis is being opened without authorization. Simply connect the two-pin switch to the J15 header to enable.
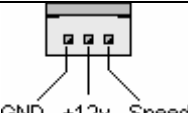
2.11 – PCI I/O Voltage (J99)

1 ■■■ 3.3v - Default ■■■ 5.v	Using this jumper you can set **PCI slot 1** to operate either in 5 volt mode or 3.3 volt mode.

2.12 – LAN LED

■■ ■■ **1** **LAN2 LAN1**	This header is provided as a visual alert of when the on-board Ethernet ports are active. Simply connect up to two 2-pin LEDs to the LAN LED header for active monitoring of the on-board Ethernet ports.

2.13 – FAN connectors

▪ ▪ ▪ GND +12v Speed	Use these headers to connect cooling fans, both chassis and processor fans, to your motherboard. Cooling fans help keep the system more stable and operating reliably for its product life. **+12v (1.2A) fans supported**

2.14 – 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 E-ATX (Extended ATX) 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.
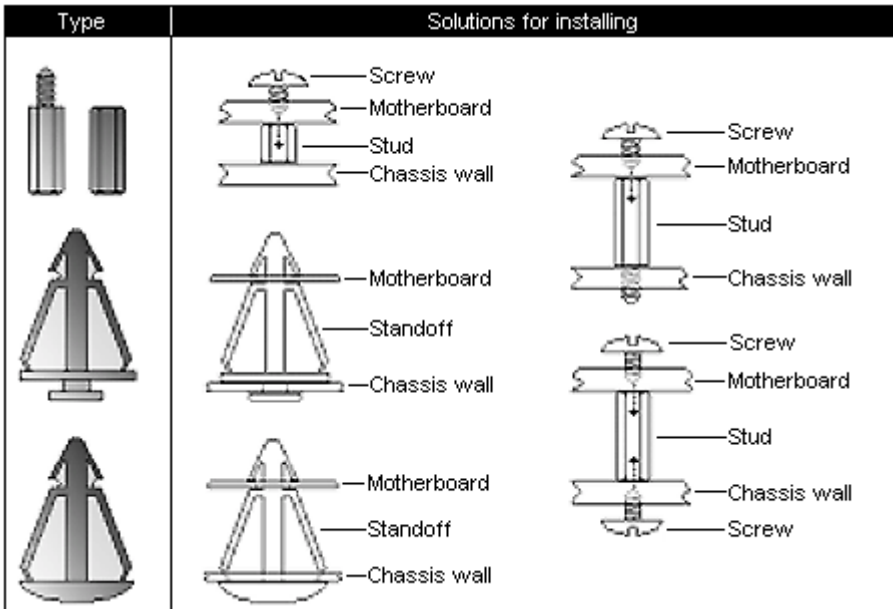
TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.15 – 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. For example, PC1600 DDR is designed for a maximum of 100MHz (200DDR) Front Side bus. PC2100 modules are required for 133MHz (266DDR) FSB. 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:
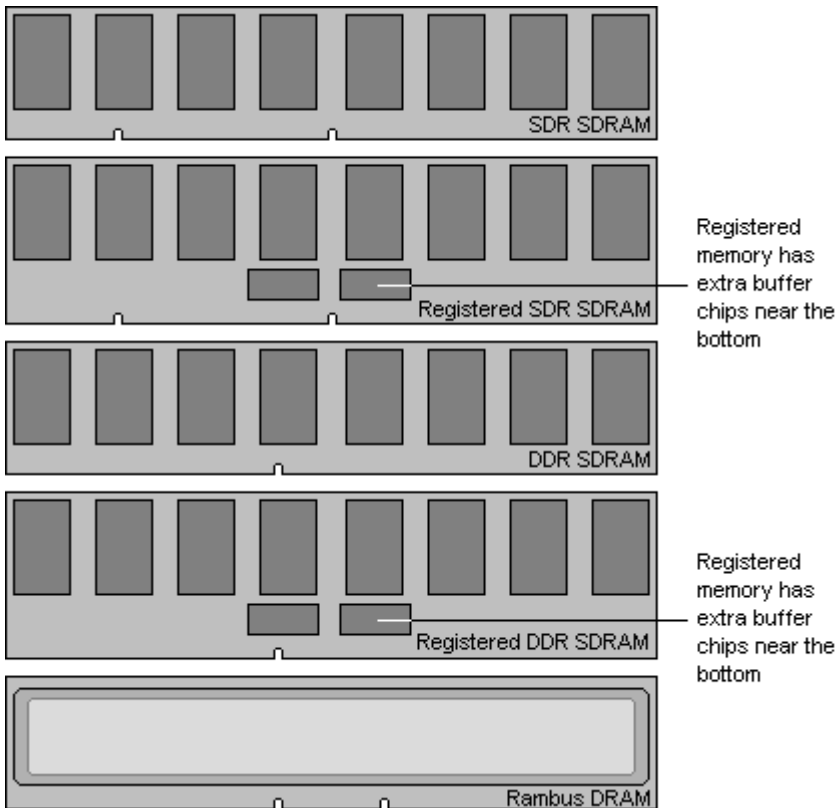
Here are a few key points to note before installing memory into your Thunder K7X:

- **At least ONE Registered DDR SDRAM module must be installed for the system to turn on and POST (power on self test)**
- 128MB, 256MB, 512MB and 1GB Registered PC2100/PC1600 DDR SDRAM memory modules are supported
- All installed memory will be automatically detected so there is no need to set any jumpers or settings.
- The Thunder K7X supports up to 4GB

Memory Installation Procedure

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.
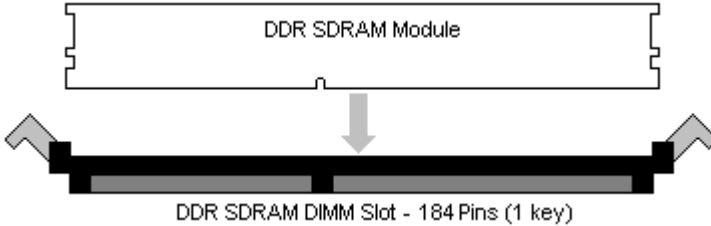
Once the memory modules are firmly seated in the socket, two clamps on either side will close and secure the module into the socket. Sometimes you may need to close the clamps yourself.
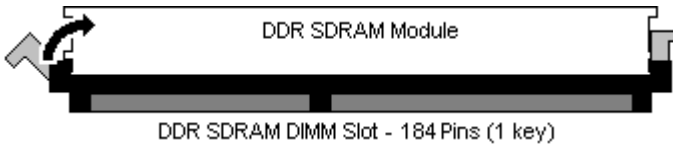
To remove the memory module, simply push the clamps outwards until the memory module pops up. Then, remove the module.

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.

2.16 – Installing the Processor(s) and Heatsinks

Your brand new Thunder K7X supports the latest processor technologies from AMD. However, **only Athlon MP processors are certified and supported with this motherboard.**

Check our website for latest processor support.

NOTE If using a single processor, we recommend it be installed in socket CPU2

Duron processors, Athlon C (Thunderbird), and Athlon XP processors are not certified or supported in single or dual mode. Also, mixing different types of processors together is not supported as damage to your processors, motherboard or both may occur. TYAN is not liable for damage as a result of operating an unsupported configuration.
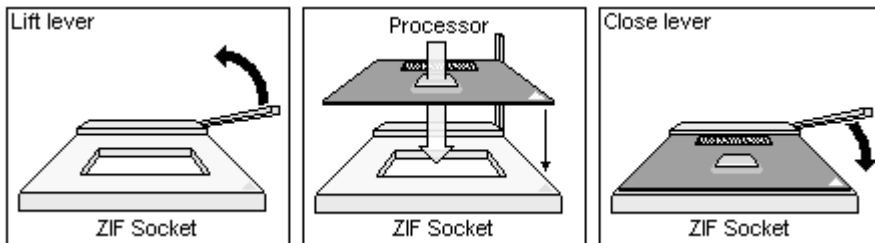
The diagram is provided as a visual guide to help you install socket processors and may not be an exact representation of the processors you have.

1. **Lift the lever on the socket until it is approximately 90° 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 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 AMD's certified heatsinks webpage at the following Internet address:

www1.amd.com/products/athlon/thermals/

The following diagram will illustrate how to install the most common heatsinks:
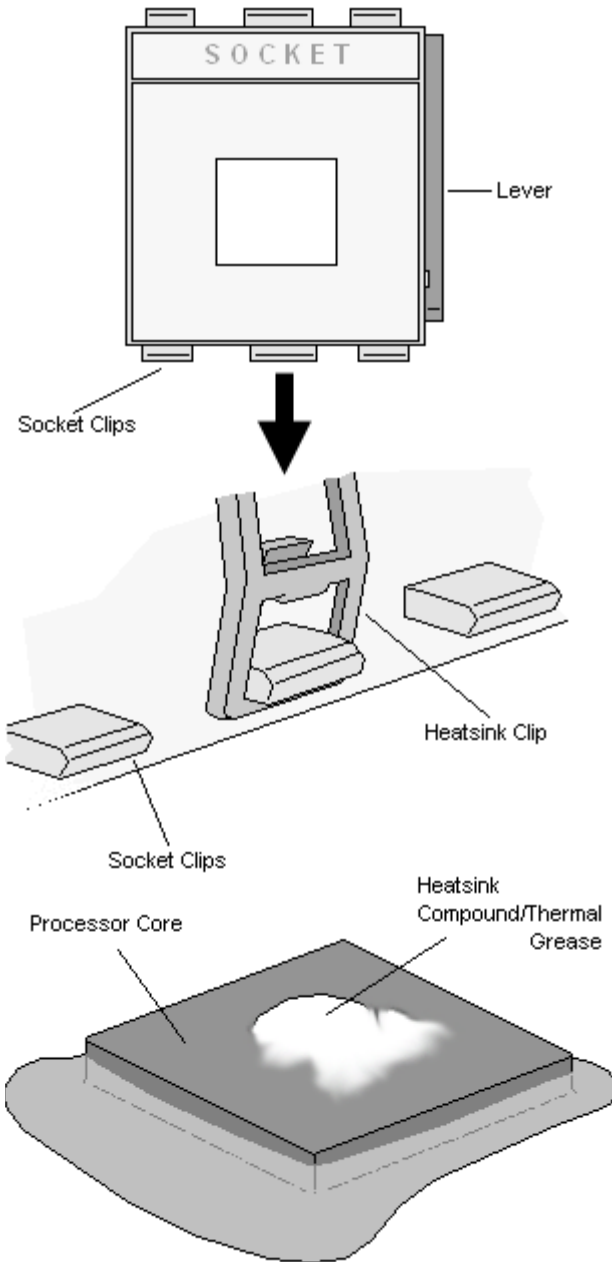
First, use thermal compound (also called heatsink compound or thermal grease) and apply a small amount on to the processor's core (applying too much will actually reduce the cooling) – the small shiny square in the center of the processor.

You may then use a small soft plastic tool, like a credit card to gently smear a thin layer of heatsink compound as evenly as you can across the core.

Because one side of the socket is raised (and usually has "SOCKET" imprinted into it) heatsinks have an indent on one side to secure flush with the raised side of the socket.

Then clip one side of the heatsink onto the socket and then lay the heatsink flat onto the processor. Then clip the other end of the heatsink down either with your finger or by using a flathead screw driver.

Be sure to carefully observe which side your heatsink is seated before securing it down to avoid damaging the processor, the heatsink or both. This is will probably be the most difficult of setting up your computer so please exercise caution. TYAN will not accept responsibility and no warranty will be given for damage due to improperly installed heatsinsks.

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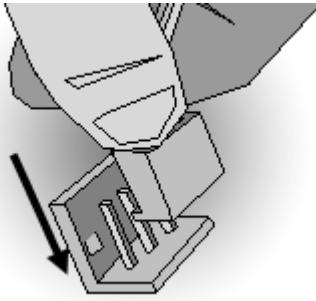
After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.17 – Attaching Drive Cables

Attaching IDE cables to your drives is simple because they only go in one way. The motherboard IDE connectors are colored coded. The Black connector is Primary and the White connector is Secondary. Attaching IDE cables is simple because most are keyed to only go in one way. Make sure to attach the blue end of the cable to the motherboard.

Attaching IDE cables to the IDE connectors is illustrated below:
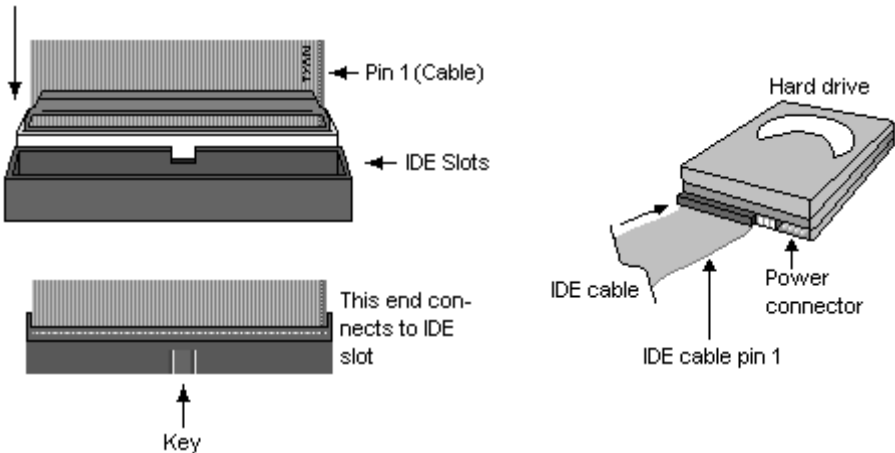
TIP: Pin 1 on the IDE cable (usually denoted by a colored wire) faces the drive's power connector.

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.

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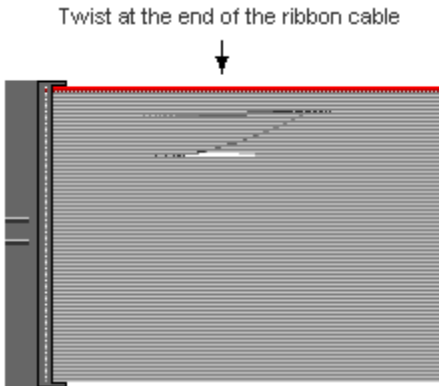
The first floppy drive (sometimes denoted as **A:**) is usually attached to the end of the cable with the twist in it. Drive B: is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

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.

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.

2.18 – 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.

AGP Pro 110 / 50 Slot

AGP Slot

PCI-X / 64-bit PCI Slots - 3.3 volts

PCI-X / 64-bit PCI Slots - 5 volts

32-bit / 33MHz PCI Slot - 3.3 volts

32-bit / 33MHz PCI Slot - 5 volts

DDR SDRAM DIMM Slot

SDR SDRAM DIMM Slot

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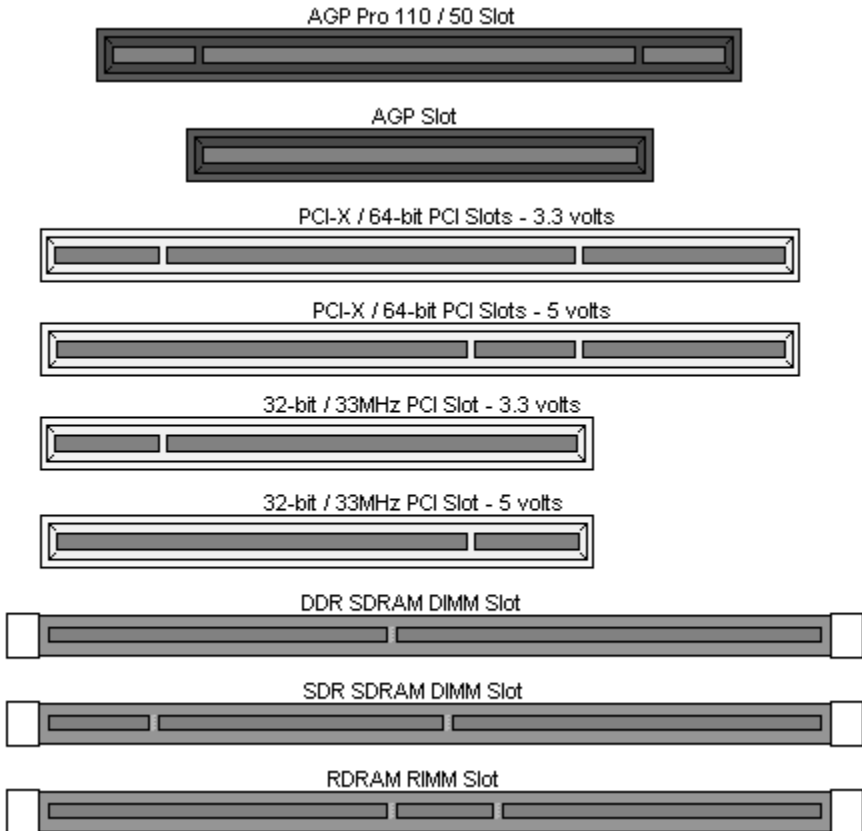
Simply find the appropriate slot for your expansion card and insert the card in firmly. Do not force any expansion cards (or anything else) into any slots if they refuse to go in. It's better to try another slot or return the faulty card rather than damaging both the motherboard and the card.

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 the next section on 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.

2.19 – 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:

S2468 Thunder K7X
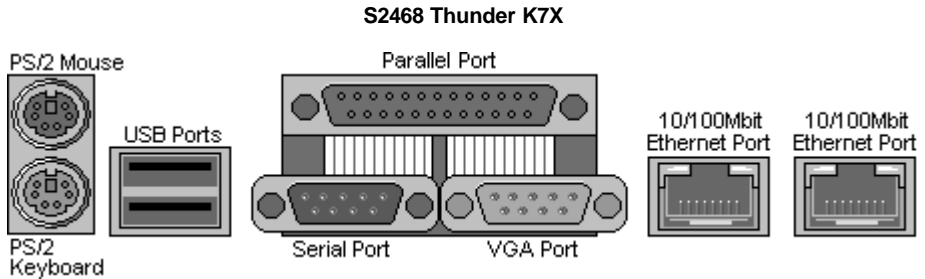
2.20 – Installing the Power Supply

There are two power connectors on your Thunder K7X. By default, the Thunder K7X requires that you have an ATXGES (Dual AMD) certified power supply that has a 24-pin and an 8-pin power connector.

Please be aware that ATX 2.x, ATX12V and EPS12V (24+8-pin) power supplies are **not compatible** with the board nor would they supply the correct power.

ATXGES (24-pin) Power Connector

ATXGES (8-pin) Power Connector
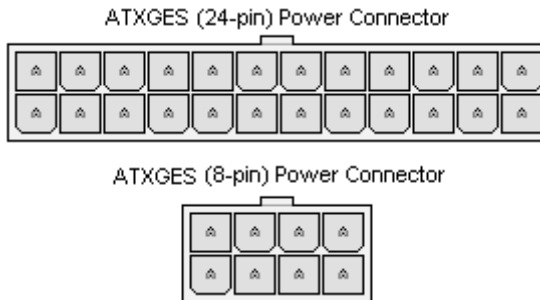
1. **Disconnect power supply from electrical outlet**
2. Connect ATXGES (dual AMD) 8-pin power connector
3. Connect ATXGES (dual AMD) 24-pin power connector
4. Connect power cable to power supply to power outlet

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

2.21 – 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.

Setting up your computer on a hardware level will probably be one of the easiest things to do if you carefully followed these instructions.

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 check the support section at our website.

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 AMD Athlon 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 [**F2**] 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); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS (see p.9).

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	HH = Hours MM = Minutes SS = Seconds	The system clock operates in 24-hour format.
System Date	MM/DD/YYYY	
Legacy Diskette A (…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.
Primary Master/Slave	Press [Enter]	
Secondary Master/Slave	Press [Enter]	
Keyboard Features	Press [Enter]	
System/Extended Memory		Displays the total memory the system contains.

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 Setup

Options such as I/O device interfaces can be altered through this screen.

Large Disk Access Mode	**DOS** Other	This option denotes that a hard drive with more than 1024 cylinders, more than 16 heads and or more than 64 tracks per sector is present. Choose **Other** when using OSes such as UNIX.
Reset Configuration Data	Erases all configuration data in a section of memory for ESCD (Extended System Configuration Data) which stores the configuration settings for non-PnP plug-in devices.	
Secured Setup Configurations	This option allows you to prevent the OS from changing system settings.	
PS/2 Mouse	Toggles the use of the PS/2 mouse port.	
Advanced Chipset Configuration	Press [Enter]	
PCI Configuration	Press [Enter]	
I/O Device Configuration	Press [Enter]	
Boot-time diagnostics Screen	This option toggles the diagnostics screen that appears during bootup.	
Summary Screen	This option toggles the boot summary screen before OS load.	
CPU SDRAM Frequency	This option allows you to set the operating frequency of system memory. Leave as default for best stability.	
Console Redirect	This option allows you to pass the display console through a LAN for control on another computer.	

3.3 – Chipset Configuration

Options such as graphics and memory settings can be altered in this section.

Graphics Aperture	32MB **64MB** 128MB 256MB 512MB None	Defines the size of system memory reserved for AGP graphics data such as textures. Usually, the higher the setting, the better AGP performance, regardless of how much actual RAM you have installed on your motherboard.
SERR Signal Condition	**None** Single bit Multiple bits Both	Toggles the ERR signal in the listed conditions. Leave at default setting.
ECC Config	**Disabled** EC (Single bit) ECC (multiple bits) ECC Scrub	Toggles memory correction. EC – Error checking and status reporting enabled. Data is not corrected. ECC – EC but data is corrected. ECC Scrub – ECC with memory contents corrected after all reads with errors.

3.4 – Keyboard Configuration screen

Options related to keyboard setup can be altered in this section.

Boot up Num-Lock	**Auto** On Off	Toggles the Num-lock keyboard function to be turned on at startup or be disabled at startup.
Keyboard auto-repeat rate	**30/sec** 26.7/sec 21.8/sec 18.5/sec 13.3/sec 10/sec 6/sec 2/sec	Defines the rate at which characters are repeated on screen when holding down keys on the keyboard.
Keyboard auto-repeat delay	1/4 sec 1/2 sec 3/4 sec 1 sec	Defines the delay when holding down a key before characters begin to repeat.
KB error	This option toggles whether the system will pause if a keyboard error is detected or continue to boot.	

3.5 – I/O Configuration

Options related to I/O setup can be altered in this section.

PS/2 Mouse	Toggles the PS/2 mouse port. Enabled will use system resources.	
Floppy disk controller	Toggles the onboard floppy disk controller. Leave as Enabled or set to Auto if you plan to use a floppy disk drive.	
Serial Port A (..B)	**Enabled** Disabled Auto	Toggles the use of the onboard Serial Ports. Enabling the ports will require system resources such as IRQs.

Base I/O	**3F8, 2F8** 3E8, 2E8	These options are dependant on the IRQ settings below and vice versa. They set the I/O address for the serial ports.
Interrupt	IRQ3 IRQ4	These options are dependant on the Base I/O settings and vice versa. They set the IRQ for the serial ports.
Parallel Port	**Enabled** Disabled Auto	Toggles the Parallel Port. Use this port for devices such as printers or Zip drives.
Mode		Defines the mode that the Parallel port will operate in. Leave on default setting for most compatibility.
Base I/O		These options appear when the Parallel Port is enabled and allows you to set the Base I/O address.
Interrupt	**IRQ5** IRQ7	These options appear when the Parallel Port is enabled.
DMA Channel	**Enabled** Disabled Auto	Toggles the Parallel Port. Use this port for devices such as printers or Zip drives.

3.6 – PCI Configuration

Options related to PCI slot features can be altered in this section.

Primary Video		Defines which slots the system will attempt to initiate video on first.
PCI Device, Slot 1 (..2, 3, 4, 5)	**Option ROM Scan**	Enables or disables device expansion ROM.
PCI Device, Slot 1 (..2, 3, 4, 5)	**Enable Master**	Enables or disables PCI bus mastering. Not every device can operate as a PCI master. However, PCI bus mastering allows devices that can, to access other devices on the PCI bus directly for increased performance.
PCI Device, Slot 1 (..2, 3, 4, 5)	**Latency Timer**	Defines the PCI response time delay. Certain devices such as sound cards, which require the most PCI access time, may benefit from a higher latency time.

3.9 – Security Setup

Options related to system security can be altered in this section.

Set Supervisor Password	[Press Enter]	Enter up to seven alphanumeric characters. You will be asked to confirm by entering the password a second time. If defined, access to BIOS setup features is only available upon entering the correct password.
Password on boot	**Disabled** Enabled	Toggles the password to be entered before the system boots.
Fixed disk boot sector	**Normal** Write Protect	Toggles the protection of the hard drive boot sector from being written to by accident or by a computer virus.
Diskette Access	**Disabled** Enabled	Toggles the request for Supervisor password if the floppy drive is accessed.

3.10 – Power Setup

Options related to system power saving features can be altered in this section.

ACPI Enabled	**Yes** No	Toggles the use of Advanced Configuration and Power Interface features. ACPI enables the OS to manage system resources and power saving features that would otherwise be handled by the BIOS.
Power Savings	**Customized** Maximum Power savings Maximum Performance Disabled	Defines power saving features.
Standby Timeout	**Off** 1, 2, 4, 6, 8, 10, 12, 16 min	Toggles and defines the amount of time given before the system will go into Standby power saving mode.
Auto Suspend Timeout	**Off** 5, 10, 15, 20, 30, 40, 60 min	Toggles and defines the amount of time given before the system goes into Suspend mode after going into Standby mode. This option can saves the most energy.
Resume on modem ring	On **Off**	Toggles system wake up when the modem (if installed) is dialed into.
Resume on time	On **Off**	Toggles system wake up at a certain time.

	Month	Defines the date when the system
Resume Date	Day	will wake up.
	Year	

3.11 – Boot Setup

Options related to boot devices and their order can be altered in this section.

	(Options dependent on devices detected/installed)	Each item detected as a removable device, will be listed in this section.
(Menu dependent on devices detected/installed)	This sets the boot order device. The system will boot with the top-most device on the list and continue to descend the list if it finds that certain devices are not bootable.	As the + key is pressed, the item highlighted will move up in priority and down with the - key. The item at the top will take first boot priority, and the second one will boot if the first device fails, and so on.

Press the D key to remove the device from the order. |

3.12 – 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		Loads the factory-set default options.
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 Error: 1-3-3-1 beep order.

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. TYAN's 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 willl appear as a single drive to the operating system. RAID level 0 is 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 shift the processor over and down, guiding 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'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 #: D1479 - 100