



**Trinity i845DDR // // S2095**

**Revision 1.00**

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## Before you begin...

### Check the box contents!

The retail motherboard package should contain the following:



1x Trinity i845DDR S2095 motherboard



1x 34-Pin floppy drive cable



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



1x Trinity i845DDR user's manual



1x TYAN driver CD



1x I/O shield with 1 LAN/Audio port (optional)

**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 one of the most compelling Intel processor solutions – Trinity i845DDR. Based on the Intel i845 B-stepping chipset, the Trinity i845DDR offers you all the latest features and stability of a cutting-edge Intel chipset along with the blistering performance of Double Data Rate memory. Supporting Intel Pentium 4 processors, the Trinity i845DDR delivers an unprecedented experience for Pentium 4 users. In critical situations where stability is paramount, but performance cannot be sacrificed, the Trinity i845DDR delivers performance you can trust.

Trinity i845DDR is an integrated motherboard with features such as dual channel UltraATA-100, optional 10/100Mbit Ethernet and optional AC'97 audio.

Offering features that supercede the competition, Trinity i845DDR enables connectivity right out of the box. Using the optionally equipped 10/100Mbit Ethernet port, you're able to get connected in no time at all. Whether connecting to the Internet or a LAN, or listening to your favorite tunes via the optional onboard sound, the Trinity i845DDR has you covered in virtually all directions.

The Trinity i845DDR supports up to 2GB of PC2100/1600 DDR SDRAM.

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

- Single PGA478 ZIF socket
- Supports one Intel Pentium 4 Processor
- Onboard VRM
- Front-Side Bus support for 400MHz

### Chipset

- Intel i845 B-stepping
- Intel 82845 MCH and 82801BA ICH2
- Winbond W83627HW LPC I/O ASIC

### Memory

- Two 2.5v 184-pin DDR DIMM sockets
- Supports up to 2GB of PC2100/1600 DDR RAM
- Supports Unbuffered memory

### Expansion Slots

- One AGP slot supporting 4X cards (1.5v slot design)
- Six 32-bit 33MHz (5-volt) v2.2 PCI slots
- Total of seven usable slots

### Integrated PCI IDE

- Dual-channel UltraATA-100
- Up to four E-IDE drives
- Support for PIO/DMA/ATAPI 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
- Four USB ports (two via optional cable)
- PS/2 keyboard and mouse ports
- Audio (Out, Mic, In) ports (optional)
- One RJ-45 LAN port with LEDs (optional)

### Integrated LAN (Optional)

- Intel 82562 LAN controller
- 10/100Mbps max data rate
- Wake-on-LAN (WoL) support

### Integrated Audio (Optional)

- AC'97 Codec
- Line-In, Line-Out, Mic-In ports
- CD-In, Aux-In ports

### Form Factor

- ATX footprint 12" x 9.6" (304.8mm x 243.8mm)
- 20-pin ATX power connector
- Two Serial ports
- One Parallel Port
- Stacked USB (two) ports
- One RJ-45 LAN port with LEDs (optional)

### Hardware Monitoring

- Winbond W83627HF hardware monitoring ASIC
- CPU Temp, voltage and fan monitoring

### BIOS

- Award Plug-N-Play 4Mb BIOS Flash ROM
- Supports APM v1.2 and ACPI v1.0
- Auto-configure IDE drive types
- User settings for hardware monitoring
- Multiple boot options
- DMI 2.0 compliant

### Regulatory

- FCC DoC (declaration of Conformity)\*
  - European Community of CE (declaration of Conformity)\*
- \*Pending at time of print. Please check the TYAN website for updates – [www.tyan.com](http://www.tyan.com)

## 1.3 Software Specifications

### OS (Operating System) Support

- Microsoft Windows 98
- Microsoft Windows ME
- Microsoft Windows NT 4
  - Workstation
  - Server
- Microsoft Windows 2000
  - Professional
  - Server
  - Advanced Server
  - Datacenter
- Microsoft Windows XP
  - Home
  - Professional

The following OSes have **not** been tested with this motherboard:

Any distribution of Linux (RedHat, Suse, etc)  
Any distribution of UNIX  
Any distribution of BSD (FreeBSD, etc)  
Sun Microsystems Solaris  
Microsoft Windows 3.x  
Microsoft Windows NT 3.x  
Be BeOS

While any of the OSes above **may** work with this motherboard, TYAN does **not** and will **not** support issues with this motherboard if any or all of the above OSes are used.\*

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

# Chapter 2: Board Installation

## Installation

You are now ready to install your motherboard. The mounting hole pattern of the Trinity i845DDR matches the ATX system board specifications. Your chassis should support a standard 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.

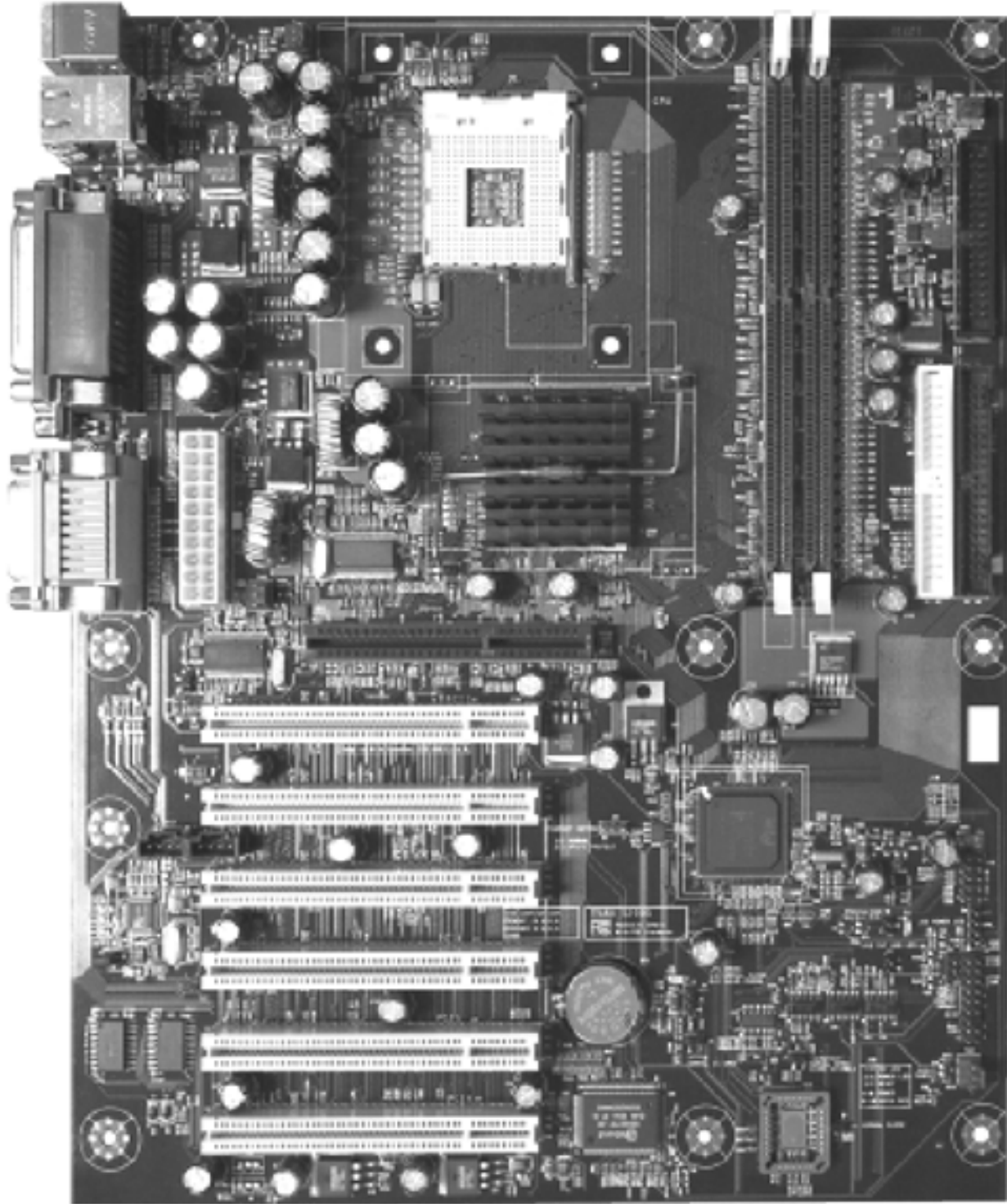
Having reviewed the precautions above, the next step is to take the motherboard out of the cardboard box and static bag, hold it by its edges and place it on a grounded antistatic surface, component side up. Inspect the board for damage.

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

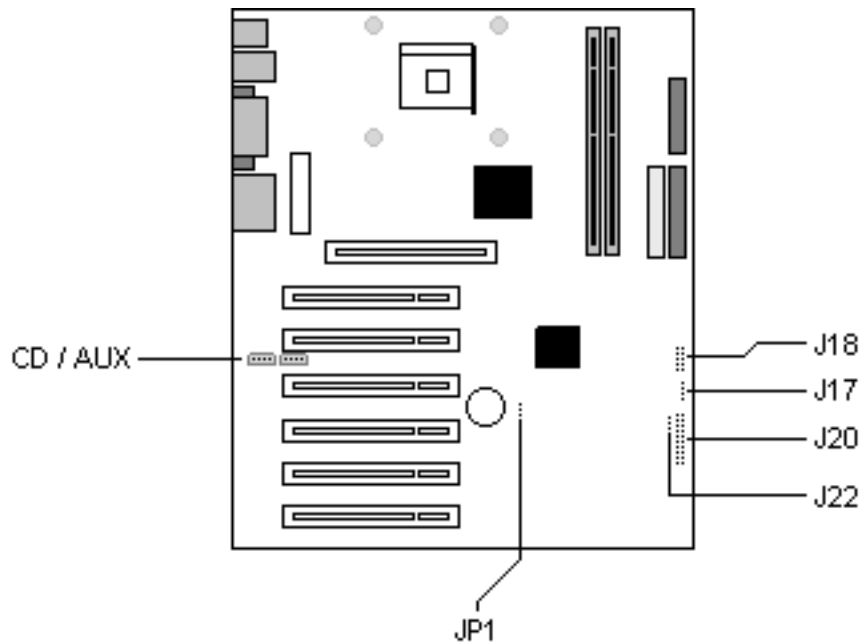
The following is an image of the S2095 Trinity i845DDR.



**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



### 2.2 Front Panel Connector (J20)

Your chassis will usually come with connectors to install onto the motherboard, such as HDD and Power LEDs. The Front Panel Connector (J20) has been implemented for such purposes.

1	2	
3	4	
5	6	1,3: Hard drive LED
7	8	2,4: Power LED
9	10	5,7: Reset Switch
11	12	6,8: Power Switch
13	14	9,11,13,15: InfraRed
15	16	
17	18	

### 2.3 – CMOS Reset (JP1)

**3** 1,2: Default  
2,3: Clear CMOS

**2** Connect pins 2 and 3 together to 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.

**1** Power off the system and disconnect the power supply.

Close pins 2 and 3 on JP1

- Wait about 5 seconds
- Close pins 1 and 2 on JP1
- Reconnect the power supply and power on the system



## 2.4 – Power LED (J22, optional)



Use this connector to attach the front panel Power LED (if your Power LED cable is 3-pin).

## 2.5 – PC Speaker (J17)



Use this connector for your chassis' internal PC speaker. With it, the motherboard can report to you using sequences of beeps to identify any errors that you may encounter.

## 2.6 – Secondary USB connector (J18)



Use this connector to attach a rear panel or front chassis USB ports. Front chassis USB ports are dependant on the chassis used and the manufacturer that makes them. Check your chassis manufacturer's website for models that include front USB ports.

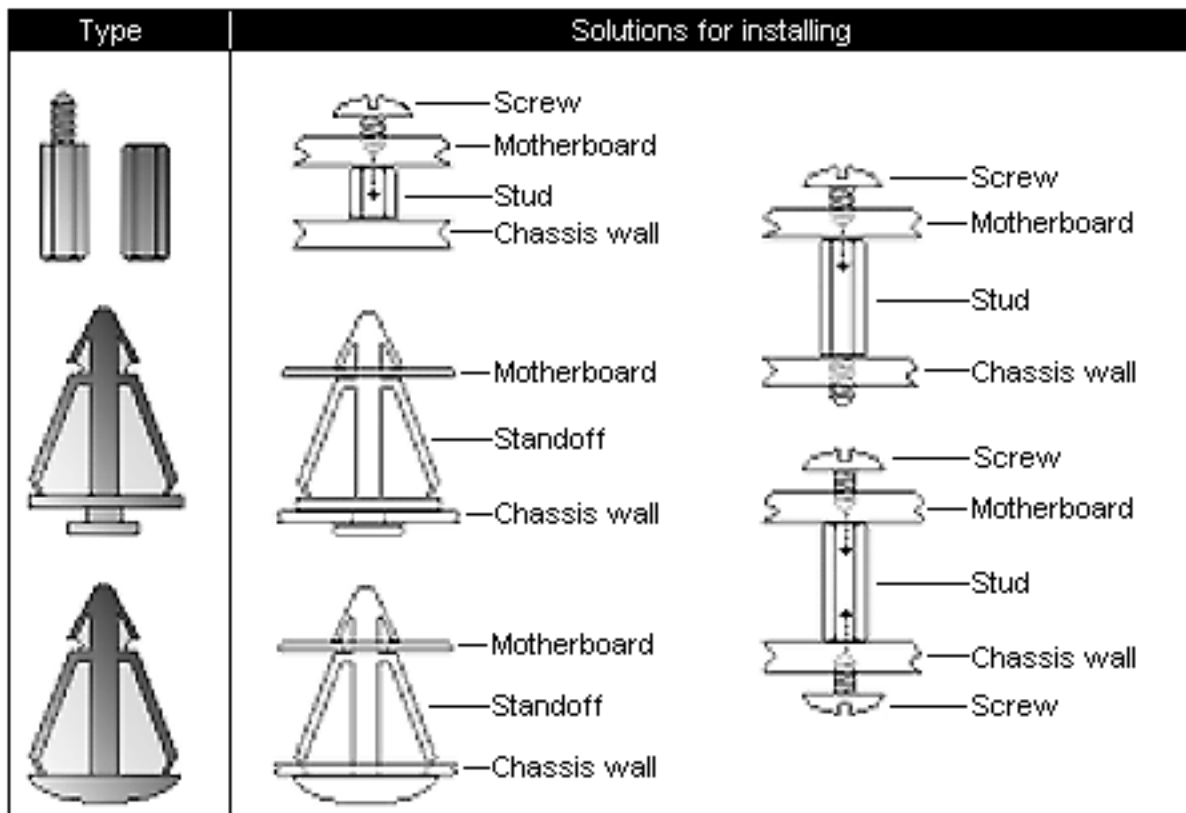
**TIP:** For convenience, look for a compatible chassis that also includes USB connectors. This will provide a convenience if you should ever need to connect devices like digital cameras or other USB devices.

## 2.7 – 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 ATX form factor. While this ensures general compatibility, your TYAN product is specialized and may require you to install a few extra studs. 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.

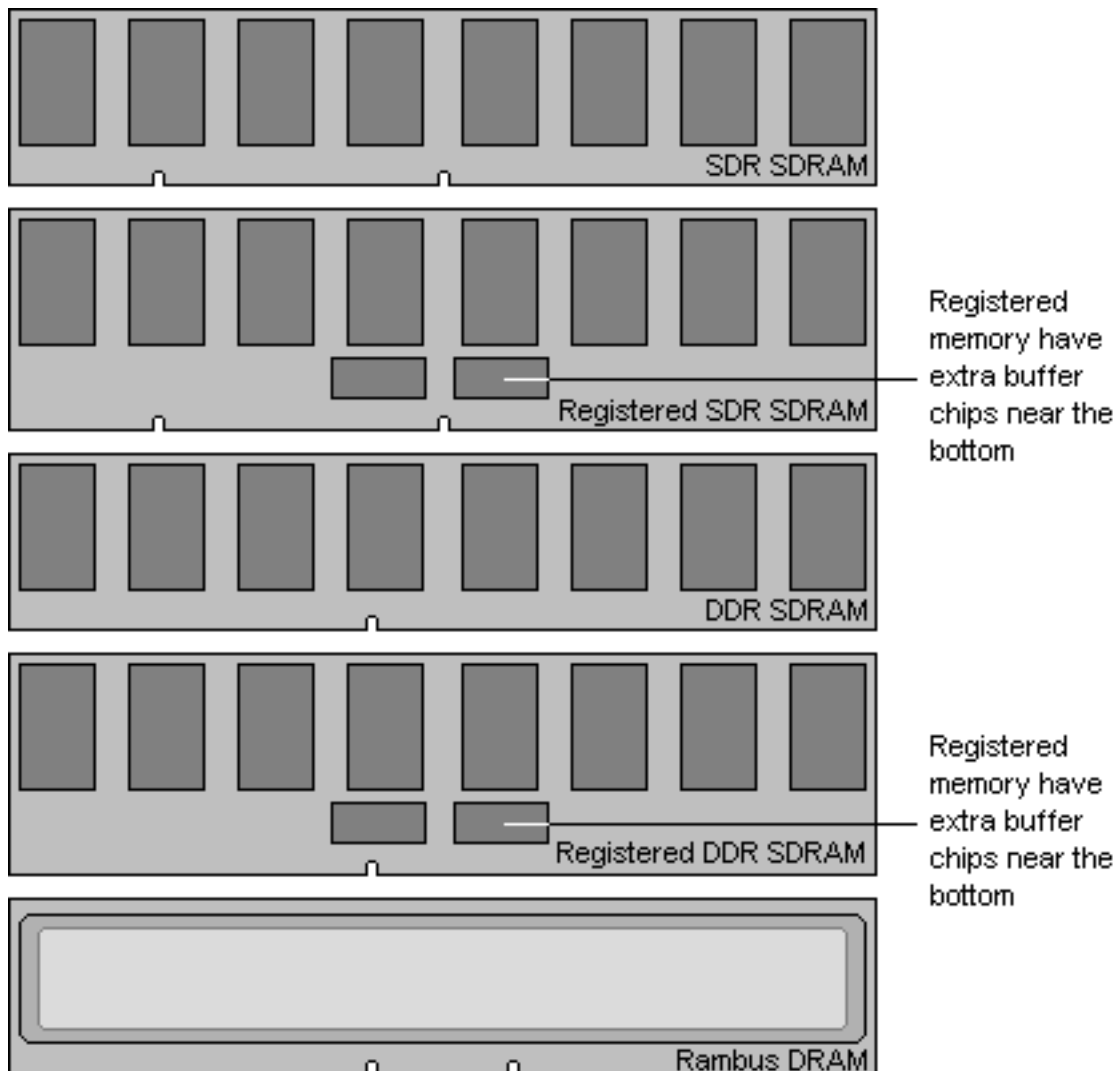


**TIP:** Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

## 2.8 – 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, while PC1600 DDR SDRAM modules are compatible with all DDR based motherboards, they will not work if you are required to run the motherboard and processor at 133MHz. For this, PC2100 DDR modules are required. 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](http://www.tyan.com)

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

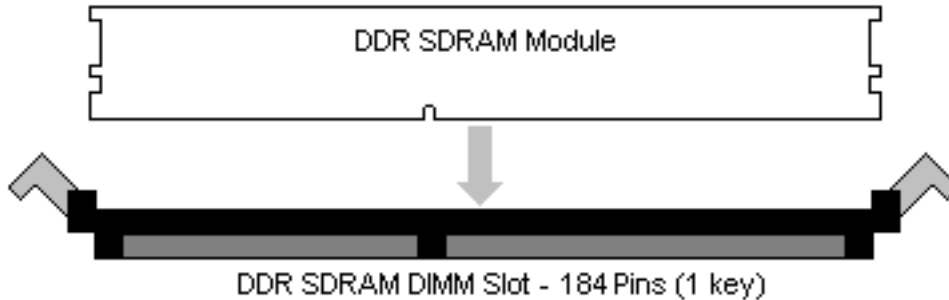


Here are a few key points to note before installing memory into your Trinity i845DDR:

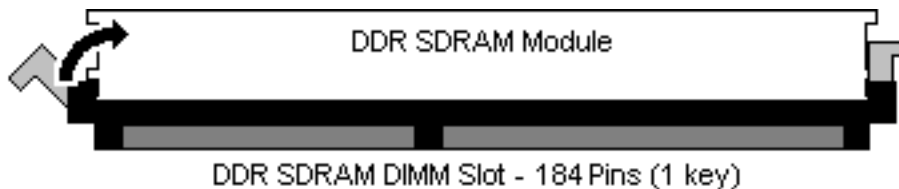
- At least ONE DDR SDRAM module must be installed for the system to turn on and POST (power on self test).
- 128MB, 256MB, and 512MB, 1024MB PC2100/PC1600 DDR SDRAM memory modules are supported.
- All installed memory will be automatically detected so there is no need to set any jumpers or settings.
- The Trinity i845DDR supports up to 2GB of memory.

## 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. The way memory modules are installed 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.

### NOTE

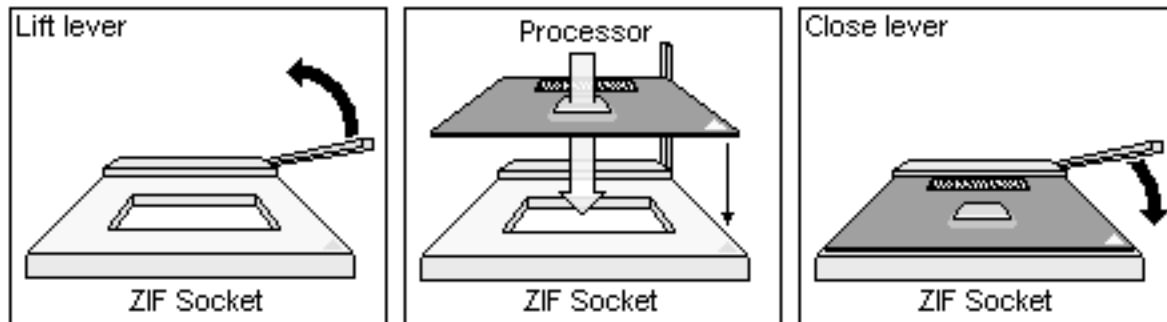
**YOU MUST** unplug the power connector to the motherboard before performing system hardware changes, to avoid having your motherboard boot-up automatically, due to the PCI v2.2 spec.

**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.

## 2.9 – Installing the Processor(s) and Heatsinks

Your brand new Trinity i845DDR supports the latest processor technologies from Intel. All the latest Pentium 4 (socket 478) processors from 1.5GHz to 2.2GHz (check the Tyan website for updates) can be used on this board.

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



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 perpendicular 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.

### **Heatsink Installation**

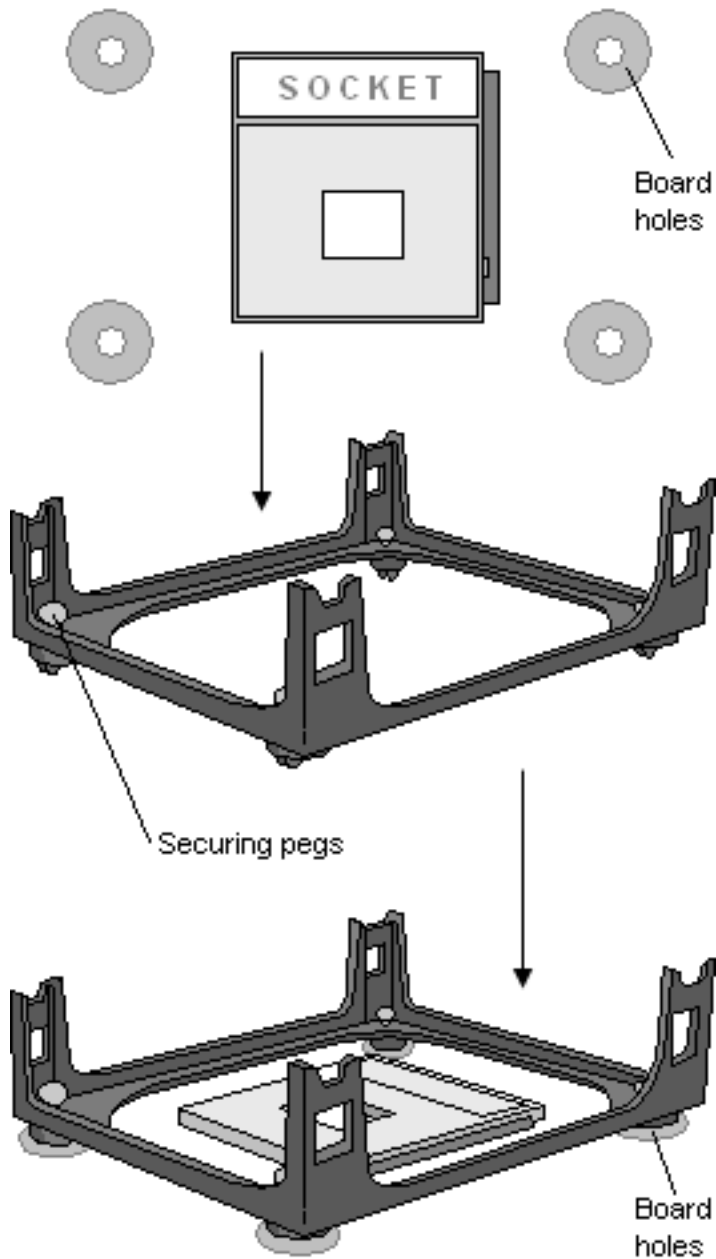
After you are done installing the processor(s), you should proceed to installing their heatsinks. Heatsinks will ensure that the processors do not overheat and continue to operate at maximum performance for as long as you own them. Overheated processors are also dangerous to the health of the motherboard.

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/pentium4/therma1.htm>**

The above page lists all of the recommended heatsink solutions for Pentium 4 processors.

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



Install the mounting bracket onto the motherboard by aligning the bracket with the four holes around the processor socket. Once the bracket is aligned, press down on the four white pegs on the bracket until they insert securely, locking the bracket onto the motherboard. Then proceed to installing the heatsink. Instructions on how to install heatsinks should be provided with the heatsink itself.

First, use thermal compound (also called heatsink compound or thermal grease) and apply a small amount on to the processor's core – 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. In most cases, you don't need to do this but it may help.

Then, at an angle, 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.

Some heatsinks have a small clip on the inside of one of the clips which you can insert a small flathead screw driver into to secure the heatsink.

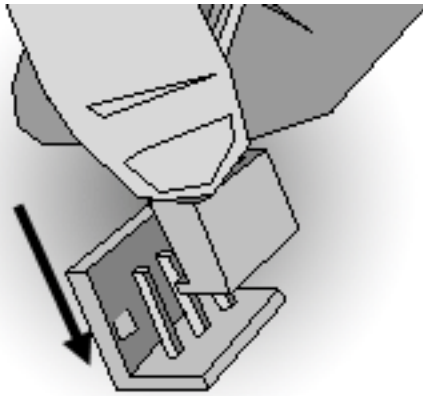
In most cases, either side of the heatsink can be clipped down last, but usually, the side of the socket where it is raised, secures last.

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.

Be sure to carefully observe which side your heatsink is seated before securing it down to avoid damaging the processor, the heatsink or both.

## **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.

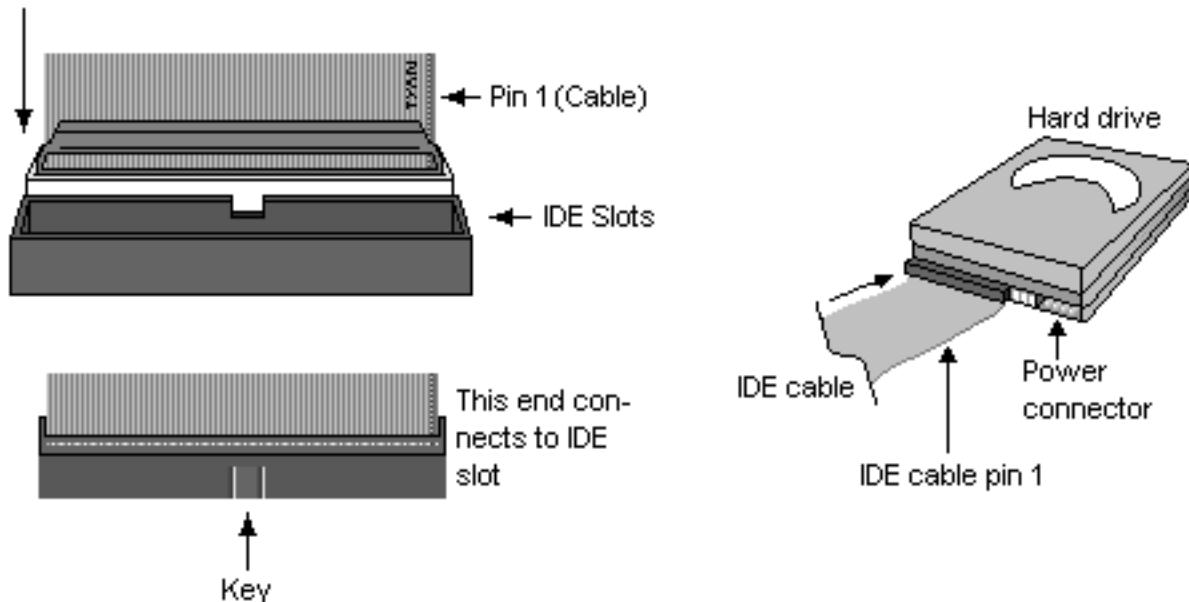


After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

## **2.10 – Attaching Drive Cables**

Attaching IDE cables to your drives are 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 one end of the IDE cable into the IDE connector and the other ends into the drive(s). Each standard IDE cable has three connectors, two being close to each other. The 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.

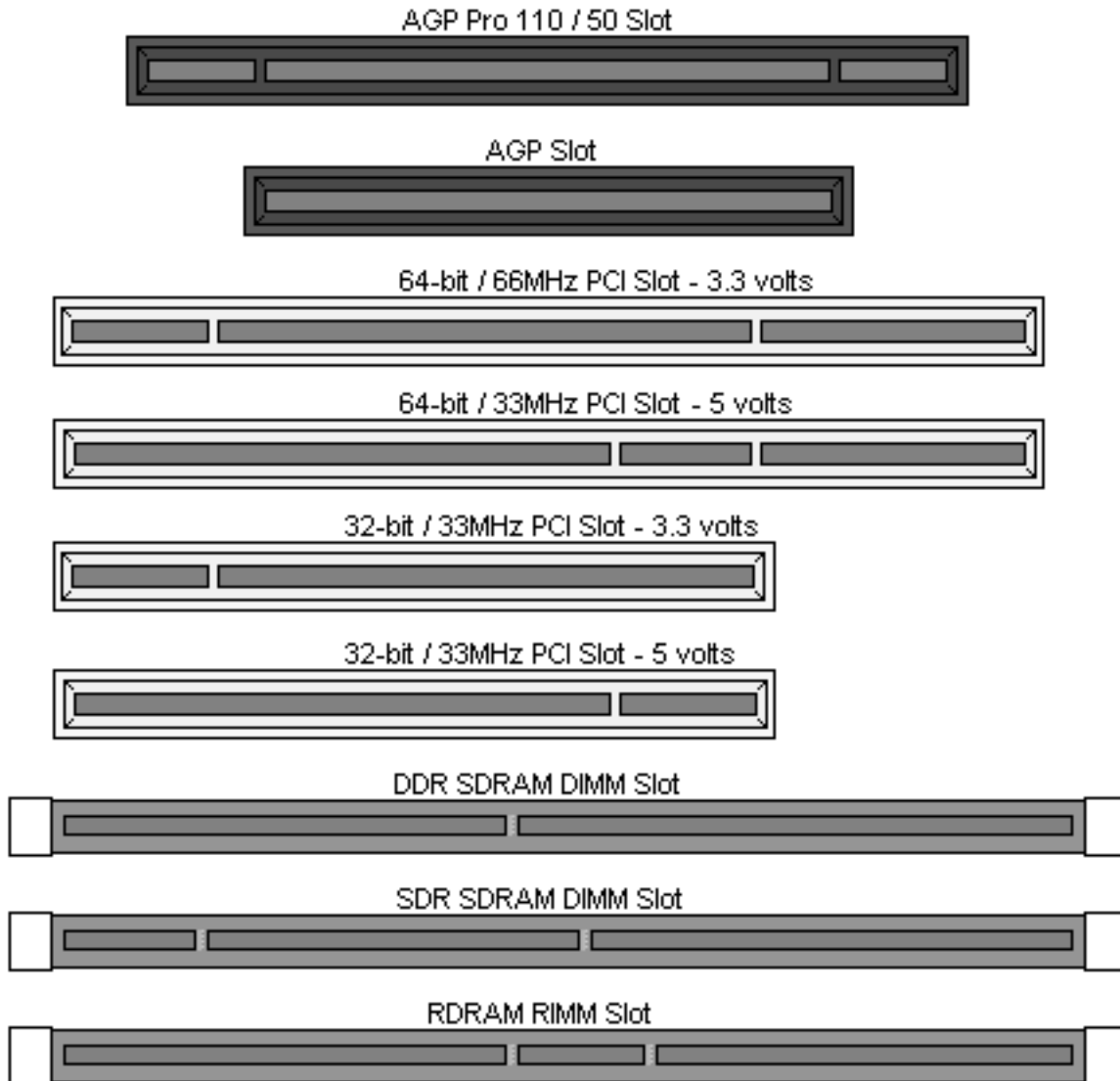
**TIP: Pin 1 on the IDE cable (usually denoted by a colored wire) faces the drive's power connector.**

## 2.11 – Installing Add-in Cards

### NOTE

Your motherboard may not have some of the slots below as they are just examples.

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

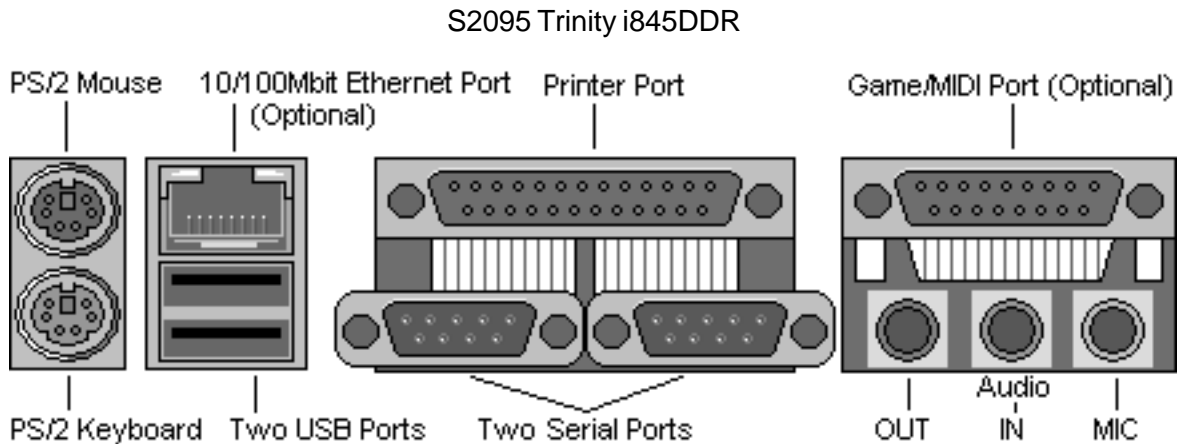
**YOU MUST** unplug the power connector to the motherboard before performing system hardware changes, to avoid having your motherboard boot-up automatically, due to the PCI v2.2 spec.



Before Continuing onto section 2.15, 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.

## 2.12 – 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.

## 2.13 – Installing the Power Supply.

There is one power connector on your Trinity i845DDR. By default, the Trinity i845DDR only requires that you have a standard ATX 2.03 power supply unlike other Pentium 4 boards that require the small 4-pin square connector as well as the standard 20-pin ATX connector.

Simply connect the ATX power cable from your power supply into the corresponding connector on the motherboard.



**The S2095 requires an ATX 2.01 power supply with 30A on the +5V rail at the minimum.**

## 2.14 – 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 technical support line.

**Website: <http://www.tyan.com>**

# 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 x86 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.

### NOTE

**THE FOLLOWING SECTION DETAILS MOST IF NOT ALL OF THIS BOARD'S BIOS FEATURES.**

**HOWEVER, YOUR ACTUAL BIOS SETUP MAY NOT BE EXACTLY AS THE ONE DETAILED IN THIS MANUAL.**

**PLEASE REFER TO THE TYAN WEBSITE FOR UP TO DATE FEATURES CONCERNING BIOS AND OTHER DATA.**

## Setup Basics

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

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

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

### **Getting Help**

Press **F1** to 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 starting the computer after making and saving changes with the BIOS setup program, you can restart the computer by either:

- ***Holding the Power button down until the machine turns off.***

The best advice is to alter only settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you're absolutely sure you need to. The Chipset defaults were carefully chosen by Tyan and or your system manufacturer for the best performance and reliability. Even a seemingly small change to anyone of the Chipset options without consideration, can cause your system to become unstable immediately or progressively.

### **Setup Variations**

Not all systems have the same setup program. While the basic look and function of the setup program remains more or less the same for all systems, the appearance of your Setup options may or may not follow the same order listed in this manual. In addition, the final layout of all Setup options depends on your system designer. They can decide that certain items that are listed in the following pages remain hidden from user alteration.

### 3.1 Main Setup

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

System Time	HH: Hours (24 hour format) MM: Minutes SS: Seconds	Adjusts the system clock.
System Date	MM: Month DD: Day YYYY: Year	Adjusts the system date.

### 3.2 Advanced BIOS Features

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

Virus Warning	Disabled Auto	This settings toggles virus protection on or off for boot sector writes.
CPU L1 & L2 Cache	<b>Enabled</b> Disabled	Toggles the use of CPU L1 and L2 cache
Quick Power On Self Test	<b>Enabled</b> Disabled	This option allows the system to skip self tests for faster startup.
First, Second, Third, Other Boot Device	Options Dependant on system.	Selects the startup device sequence.
Swap Floppy Drive	Enabled <b>Disabled</b>	This option switches A: to B: drive.
Boot Up Floppy Seek	<b>Enabled</b> Disabled	This option causes the floppy drives to be detected at startup.
Boot Up NumLock Status	<b>On</b> Off	Sets the Num Lock on or off.
Gate A20 Option	Enabled <b>Disabled</b>	Leave as default.
Typematic Rate Setting	Enabled <b>Disabled</b>	Toggles control of keyboard key repeat rate.
Typematic Rate (chars/Sec)	<b>6</b> , 8, 10, 12, 15, 20, 24, 30	Defines how many characters are repeated per second when holding down a key on the keyboard.
Typematic Delay (MSec)	<b>250</b> , 500, 750, 1000	Defines the delay that occurs at key stroke before that key will start to repeat.
Security Option	<b>Setup</b> System	Sets the password on either just the BIOS setup or the entire system (BIOS setup included).
OS Select for DRAM > 64MB	<b>Non-OS2</b> OS2	Select OS2 only if you are running OS/2 operating system with more than 64MB of RAM.
Small Logo(EPA) Show	Enabled <b>Disabled</b>	Toggles the display of the EPA Energy Star logo at POST.

### 3.3 Advanced Chipset Features

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

DRAM Timing Selectable	Manual <b>SPD</b>	Leave as Default.
DRAM Read Thermal Mgmt	Enabled <b>Disabled</b>	Leave as Default.
System BIOS Cacheable	<b>Enabled</b> Disabled	Toggles BIOS caching on and off. For performance, use <b>Enabled</b> .
Video BIOS Cacheable	Enabled <b>Disabled</b>	Toggles video card BIOS caching. Leave as <b>Default</b> .
Video RAM Cacheable	Enabled <b>Disabled</b>	Toggles video card RAM caching. Leave as <b>Default</b> .
Memory Hole At 15M-16M	Enabled <b>Disabled</b>	Creates a memory reserve at 15 to 16MB address in RAM for ISA devices that require it. Leave as <b>Default</b> .
Delayed Transaction	<b>Enabled</b> Disabled	Leave as Default.
AGP Aperture Size (MB)	4, 8, 16, 32, <b>64</b> , 128, 256	Sets a RAM amount used for AGP functions.
Delay Prior to Thermal	4, <b>8</b> , 16, 32	Leave as Default.

### 3.4 Integrated Peripherals

Options related to integrated peripheral features can be altered through the following.

OnChip IDE Channel0	<b>Enabled</b> Disabled	Enables/Disables IDE controller 0.
OnChip IDE Channel1	<b>Enabled</b> Disabled	Enables/Disables IDE controller 1.
IDE Prefetch Mode	<b>Enabled</b> Disabled	Leave this setting as is.
Primary/Secondary Master/Slave PIO	<b>Auto</b> PIO 1,2,3,4	Changes PIO (Programmed I/O) interface mode for HDD.
Primary/Secondary Master/Slave UDMA	<b>Auto</b> UDMA 1, 2, 3, 4, 5	Changes UDMA (Ultra Direct Memory Access) interface mode for HDD.
Super IO Device	Press Enter	
Init Display First	<b>PCI Slot</b> AGP Slot	Defines which graphics device to start first.
OnChip USB Controller	<b>All Enabled</b> None	Toggles the use of onboard USB ports.
USB Keyboard Support	Enabled <b>Disabled</b>	Toggles the use of a USB keyboard under DOS.
IDE HDD Block Mode	<b>Enabled</b> Disabled	Leave this setting as is.

Serial Port 1, 2	<b>Enabled</b> Disabled Auto	Toggles use of serial ports A and or B. <b>Enabling</b> ports also requires you to enter the I/O address for that port unless you select <b>Auto</b> .
Serial 2 Mode	<b>Enabled</b> Disabled	Toggles the onboard Serial 2 port.
Serial Base I/O	<b>3F8, 2F8</b> 3E8, 2E8	These options are dependent on the IRQ and vice versa.
Serial Interrupt	<b>IRQ3</b> IRQ4	These IRQs are paired with the Base I/O option. Recommended config: 2F8 & IRQ3 3F8 & IRQ4
Parallel Port	Enabled Disabled <b>Auto</b>	<b>Enabled</b> requires manual input of port parameters. We recommend you leave this option on <b>Auto</b> .
	<b>Output Only</b>	Standard one-way protocol for parallel devices.
	Bi-directional	Two-way protocol
Parallel Port Mode	EPP	Enhanced Parallel Port may provide higher bandwidth if an <b>EPP</b> compliant device is used (e.g. parallel Zip drive).
	ECP	Enhanced Compatibility Port may provide higher bandwidth if an <b>ECP</b> compliant device is used (e.g. parallel Zip drive).
Parallel Address	<b>378</b> 278 3BC	These options appear when the parallel port is set to <b>Enabled</b> .
Parallel IRQ	<b>IRQ5</b> IRQ7	These options appear when the parallel port is set to <b>Enabled</b> .
ECP DMA Channel	<b>DMA1</b> DMA2	These options appear when parallel port is set to <b>Enabled</b> .
Game Port Address	<b>201</b>	Leave this setting as is. (optional feature)
MIDI Port Address	<b>330</b>	Leave this setting as is. (optional feature)
MIDI Port IRQ	<b>10</b>	Leave this setting as is. (optional feature)



### 3.5 Power Management Setup

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

ACPI function	<b>Enabled</b> Disabled	Toggles advanced power and configuration done by OS.
ACPI Suspend Type	<b>S1 (POS)</b>	Defines ACPI system suspend mode.
Power Management Option	User Define Maximum Saving Minimum Saving	Defines the type of power saving features the system should follow.
HDD Power Down	<b>Disabled</b> 1,5,10,20,30,45,60 minutes	Defines hard drive power down delay.
Suspend Mode	<b>Disabled</b> Standby Sleep	Defines the method used to power off the system.
Video Off Option	<b>Suspend -&gt; Off</b> <b>Standby</b>	Defines the method used to power off video.
Video Off Method	<b>V/H SYNC+Blank</b> Blank Off	Defines the method used to power off graphics.
Soft-Off by PWRBTN	<b>Instant-Off</b> 4-seconds	Defines the action of the power button when pressed.
PWRON After PWR-Fail	<b>Off</b> On	Defines whether the system will remain off if power fails or turn on when power is restored.
IEQ/Event Activity Detect	<b>Press Enter</b>	

VGA	<b>Off</b> On	Defines whether the device will remain active if system enters Suspend mode.
LPT & COM	<b>LPT/COM</b> LPT COM	
HDD & FDD	<b>On</b> Off	
PCI Master	On <b>Off</b>	
Power On by PCI Card	<b>Disabled</b> Enabled	Defines whether the system can be powered on by a PCI Card.
Modem Ring Resume	<b>Disabled</b> Enabled	Defines whether the system will wake up if the modem is dialed into.
RTC Alarm Resume	<b>Disabled</b> Enabled	Defines the time/date when the system will wake up.
IRQs Activity Monitoring	<b>Press Enter</b>	Leave all settings as is.

### 3.6 PCI Configuration

Rest Configuration data <b>Default: Disabled</b>	Enabled <b>Disabled</b>	Leave as Default.
Resources Controller by <b>Default: Auto(ESCD)</b>	<b>Auto(ESCD)</b> Manual	Defines whether system resources are controller by BIOS or by user.
PCI/VGA Palette Snoop <b>Default: Enabled</b>	Enabled <b>Disabled</b>	Leave as Default.

### 3.7 Frequency/Voltage Control

Options related to Frequency and voltages can be altered through the following.

**Warning: The following options are to be changed only by a certified technician or at Tyan's discretion. Damage to your processor, motherboard, memory, or any other device in your system can be caused by mishandling the following settings.**

CPU Clock Ratio	<b>Auto</b> 16X... 22x	Sets the CPU multiplier. TYAN does not recommend changing this setting from the default setting.
Auto Detect PCI/DIMM Clk	<b>Enabled</b> Disabled	Sets the BIOS to automatically adjust CPI and memory bus speeds accordingly.
Spread Spectrum	Enabled <b>Disabled</b>	Reduces interference on the motherboard. Leave as default if your system works correctly.
CPU Clock	100 – 132MHz	Enter a decimal number to set the front side bus speed of the motherboard. For all purposes and to maintain stability, please keep this setting at its default setting.

CPU Voltage Regulator	This option allows you to change the default core voltage of the processor. Please always leave at default settings.
AGP Voltage Regulator	This option allows you to change the voltage of the AGP slot. Some graphics cards may operate better at a slightly higher voltage than default. For all purposes, please leave this setting at its default.
DRAM Voltage Regulator	This option allows you to change the voltage supplied to main memory (your memory slots). Because memory modules are sensitive, please leave this option as default.

### 3.8 Exit

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

Save & Exit		Exit and save options.
Exit Without Saving		Exit but don't save options.
Load Setup Defaults		Discard any changes made.
Load Fail-Safe Defaults		Discard any changes made but use stable options.
Load Optimized Defaults		Discard any changes made but use optimal options.

# 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.

If you hear one long beep followed by two short beeps, then a video problem has probably occurred and the BIOS is having difficulty initializing the video display. Any other beep sequences that may or may not occur are probably due to memory problems. If 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 event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy 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). Par allel 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 BIOS-compliant devices, describing those devices as capable of loading and executing an OS, as well as being able to provide control back to the BIOS if the loading attempt fails.

**IPL:** see Initial Program Load.

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

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

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

**Mirroring:** see RAID.

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

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

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

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

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

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

**Pipeline burst SRAM:** a 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 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](mailto:alt.comp.periphs.mainboard.TYAN)

## Returning Merchandise for Service

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

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



### Notice for the USA

Compliance Information Statement (Declaration of Conformity Procedure) DoC  
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

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

### Notice for Canada

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux normes de Classe B d'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.

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