



# Thunder HESl S2567

## Motherboard User's Manual Revision 1.01

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\* not verified at time of print, check Tyan website for updates: <http://www.tyan.com>

\*\* optional feature available on some Thunder HESl models

# Chapter 1: Introduction

## 1.1 Overview

The Thunder HES1™ is designed for mission critical applications that require the power of dual Intel® Pentium® III FC-PGA processors\*. This motherboard utilizes the ServerWorks ServerSet HE-SL chipset and can support CPU speeds of 500 MHz through 1 GHz and front side bus speeds\* of 100 MHz or 133 MHz. Please see Tyan's website for updates and information concerning CPU information and support:

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

This integrated performance board is supported in an ATX form factor. Some of the features included are onboard UltraDMA-compatible\*\* support, and hardware monitoring.

With I/O and drive controller support onboard, the one 2x mode AGP Pro slot, two 64-bit/66MHz^ 3.3V slots, four 64-bit/32-bit 33MHz 5.0V PCI slots, and one ISA slot (shared with a PCI slot) are free for numerous types of add-on expansion cards. The four 168-pin DIMM sockets can support up to 4GB of PC133 Registered SDRAM, with the option of ECC support.

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 settings explanations.

\* 66 MHz FSB is **NOT SUPPORTED** due to its technological limitations. For CPU compatibility updates and information check the Tyan website: **<http://www.tyan.com>**

\*\* UltraDMA-33/66 devices are supported although UDMA-33/66 transfer speeds are not reachable at this time

^ if 100MHz FSB CPU and/or 33MHz PCI card is used, the PCI bus will not run at 66MHz

## 1.2 Hardware Specifications

<b>Processor Information</b>	Dual ZIF PGA370 Socket Intel Pentium III FC-PGA* Two onboard VRMs Front side bus support* for 100 or 133MHz
<b>Expansion Slots<sup>^^</sup></b>	One 2x mode AGP Pro slot Two fully independent 64-bit PCI buses Two 64-bit/66MHz 3.3V PCI slots <sup>^^</sup> Four 64-bit/32-bit 33MHz 5.0V PCI slots One ISA slot (shared w/ a PCI slot)
<b>Chipset Information</b>	ServerWorks ServerSet HE-SL chipset Integrated IOAPIC supports full 32-APIC entries SMC FDC37B787 Super I/O chip
<b>System Management</b>	3-pin fan monitoring headers 2-pin chassis intrusion header CPU temperature and voltage monitoring 3-pin Wake on Modem header <sup>***</sup> 3-pin Wake on LAN header <sup>***</sup>
<b>Memory</b>	Four 168-pin 3.3V DIMM sockets Supports up to 4GB PC100/133 Registered SDRAM Supports ECC (72-bit) type memory modules
<b>Integrated PCI IDE</b>	Two channel master mode Supports up to four Enhanced IDE devices Support for UltraDMA-compatible <sup>**</sup> IDE devices and ATAPI compliant devices
<b>Integrated I/O</b>	One floppy connector supports up to two drives Two 9-pin 16550UART serial ports One 25-pin SPP/ECP/EPP parallel port Two USB ports PS/2 mouse and keyboard ports
<b>Integrated LAN Controller</b>	Intel 82559 LAN controller 10/100Mbps data transfer rate
<b>Integrated SCSI Controller<sup>^</sup></b>	LSI Symbios 53C1010 chipset Dual-channel Ultra160 SCSI support 160Mbps maximum data transfer rate Supports up to 15 LVD SCSI devices per channel Channel A: 68-pin connector Channel B: 68-pin connector

\* 66 MHz FSB is **NOT SUPPORTED** due to its technological limitations. For CPU compatibility updates and information check the Tyan website: <http://www.tyan.com>

\*\* UltraDMA-33/66 devices are supported although UDMA-33/66 transfer speeds are not reachable at this time

\*\*\* not verified at time of print, check Tyan website for updates: <http://www.tyan.com>

<sup>^</sup> SCSI limited to 33MHz

<sup>^^</sup> if 100MHz FSB CPU and/or 33MHz PCI card is used, the PCI bus will not run at 66MHz

**Integrated Audio  
(manufacturing option)**

Creative Labs PCI ES1373 sound  
AC'97 codec  
Line-in, Line-out, Mic-in, and Game/MIDI ports  
4-pin CD-ROM audio header (ATAPI)

**BIOS**

AMI BIOS 4 Mbit Flash  
Auto-detection of memory size  
Auto-configuration of IDE hard disk types  
User settings of hardware monitoring  
Multiple boot options  
DMI 2.0 compliant

**Form Factor**

Extended ATX 2.03 12" x 13" (304.8 x 330.2 mm)  
Dual 20-pin ATX power connectors  
Stacked mouse & keyboard ports  
Stacked two USB ports & one RJ-45 LAN port w/ LEDs  
Stacked two serial ports & one parallel port  
Stacked Line-in/Line-out/Mic-in ports & Game/MIDI port

**Regulatory**

FCC Class B (Declaration of Conformity)  
European Community CE (Declaration of Conformity)

## 1.3 Software Specifications

**OS**

Windows NT/2000

## 1.4 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)

## 1.5 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.**

## Chapter 2: Board Installation

### 2.1 Unpacking

The retail motherboard package should contain the following:

-  Thunder HESl motherboard
-  34-pin floppy cable
-  UDMA IDE cable
-  68-pin Ultra160 LVD SCSI cable (optional)
-  I/O shield\*
-  Thunder HESl user's manual
-  Tyan driver CD
-  (2) LSI SYM1010 SCSI Driver Disks

### 2.2 Installation

You are now ready to install your motherboard. The mounting hole pattern of the motherboard matches the ATX board specifications, so your chassis must be capable of supporting an Extended ATX board (check the motherboard dimensions provided on **p. 6**).

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

#### **Question: what's the first thing I should do?**

The first thing you should do is read the user's manual. It contains important information which will make configuration and setup much easier, as well as provide information on device installation and component set up.. By reading through the manual completely before installing your motherboard, you will have a complete overview on the installation.

\* if you require a different I/O shield solution, please contact your chassis vendor



## Here are some safety tips:

- (1) **Ground yourself properly before removing your motherboard from the antistatic bag.** Unplug the power from your computer power supply and touch any metal part on the computer case. (You might also want to wear a grounded wrist strap.)
- (2) **Hold the motherboard by its edges and do not touch the bottom of the board.**
- (3) **Avoid touching motherboard components, IC chips, connectors, and leads.**
- (4) **Avoid touching pins of memory modules and chips.**
- (5) **Place motherboard on a grounded antistatic surface or on the antistatic bag.**

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.

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

Press down on any of the socketed ICs if it appears that they are not properly seated (the board should still be on an antistatic mat). Do not touch the bottom of the board. Remember, don't take any electronic device out of its protective bag until you are ready to actually install it into the computer case. If you do not ground yourself, you risk zapping the motherboard or adapter card. Subsequent problems may not arise immediately because electrostatic discharge, unlike physical damage, causes the device to fail over time.

## Installation Steps

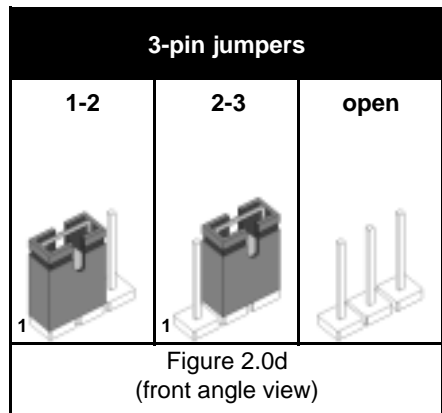
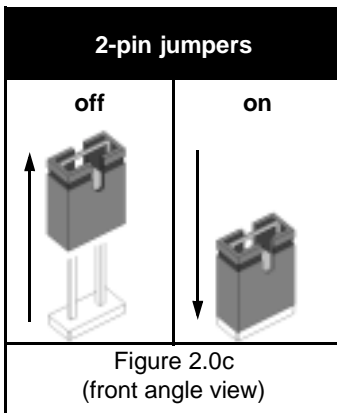
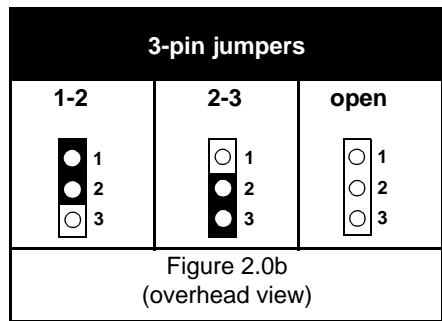
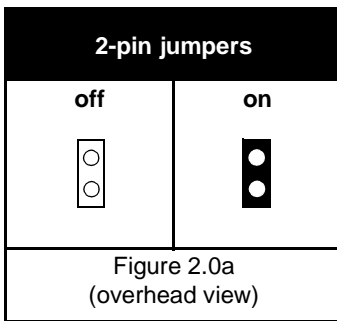
1. Set jumpers (if necessary)
2. Mount motherboard in chassis
3. Install memory
4. Install CPU and cooling fan(s)
5. Connect IDE and floppy drives
6. Install add-on cards
7. Connect PS/2, USB, and serial devices

## 2.4 Quick References for Jumpers

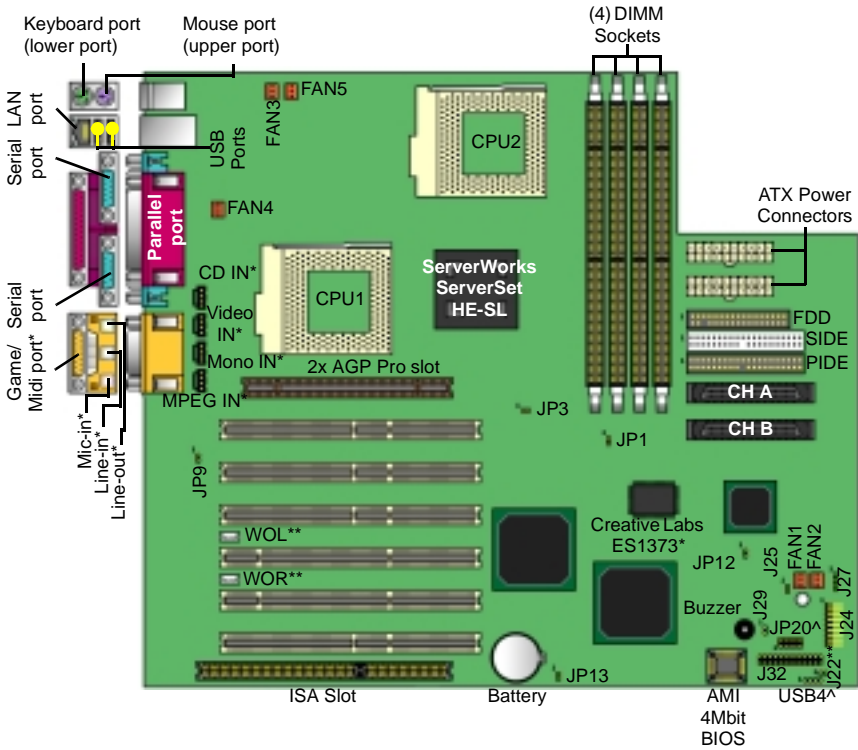
In this manual, the term “closed” and “on” are used when referring to jumpers (or jumper pins) that are active; “open” and “off” are used when referring to jumpers (or jumper pins) that are inactive. See **Figure 2.0a** and **Figure 2.0c** for examples of “on” and “off” pins and jumpers.

Jumpers and pins are connected by slipping the plastic jumper connector over the top of two adjacent jumper pins (indicated by 1-2 or 2-3). The metal rod inside the plastic shell bridges the gap between the two pins, completing the circuit. See **Figure 2.0b** and **Figure 2.0d** for more examples of 3-pin jumper connections. NOTE: The small number “1” indicates pin 1.

The tables and maps on the following pages will help you set the jumpers for CPU speed, infrared, and external connector pin assignments, among others. The miniature motherboard maps will help you locate the jumpers on your board. Full page maps of the motherboard can be found on the next two pages.



## 2.5 Map of Motherboard Jumpers



**INSTALL**

\* optional feature available on some Thunder HESl models

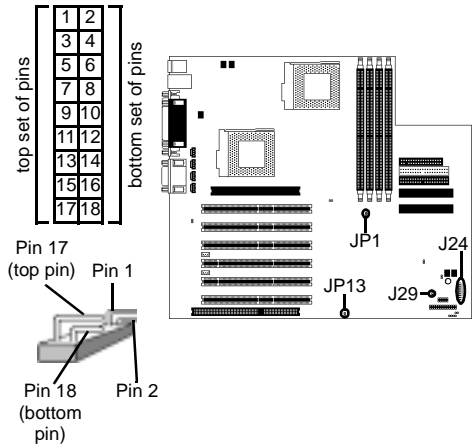
\*\* not verified at time of print, check Tyan website for updates: <http://www.tyan.com>

^ reserved feature

## 2.6 Setting Jumpers

### 2.6-A. Front Panel Connector (J24)

<b>HDD LED</b>	VCC	1	2	Pwr LED+
	LED	3	4	Slp LED+
<b>Reset Switch</b>	Ground	5	6	Switch
	Switch	7	8	Ground
<b>Infrared</b>	IR +5V	9	10	no connect
	IR RX	11	12	+5VCC
	Ground	13	14	no connect
	IR TX	15	16	no connect
	CHIN2	17	18	no connect
				<b>Power Pwr/Slp LEDs</b>
				<b>Power Switch</b>



### 2.6-B. CMOS Reset (JP13)

<b>JP13</b>	open	closed
	Normal	Clear

If you have been locked out of your system because you forgot your password or set the CMOS incorrectly, or have just finished flashing your BIOS follow the instructions below.

1. Power off the system, and disconnect the power supply
2. Close JP13 (see mini-map for location of JP13)
3. Wait about three seconds
4. Open JP13, then power on the system again

#### NOTE:

**IMPORTANT!** Check the Flash section on p.38 for update regarding flashing

By following this procedure, you will erase your password and reset the CMOS.

#### NOTE:

If you have a non-retail/engineering sample CPU, you will also need to close J29 (see mini-map for location of J29) as well as JP13.

Tyan takes no responsibility and will not be held liable for damage related to operation of the CPU using different settings from those of the CPU manufacturer's specified default settings

### 2.6-C. CPU Front Side Bus Jumper (JP1)

<b>JP1</b>	close	open
	100MHz	133MHz

With this jumper, the CPU's FSB can be set to either 100 or 133MHz.

#### NOTE:

Only non-retail/engineering sample CPUs are affected by this jumper. Retail CPUs have their FSB locked in. **If your CPU can only run at 100MHz, opening JP1 will not make the CPU run at 133MHz.**

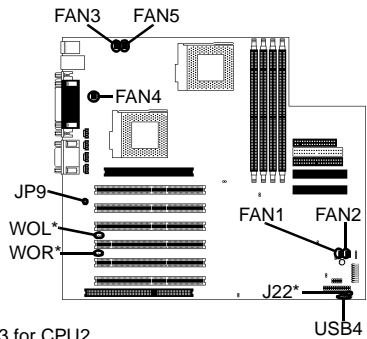
Tyan takes no responsibility and will not be held liable for damage related to operation of the CPU using different settings from those of the CPU manufacturer's specified default settings

### 2.6-D. Cooling Fans (FAN1, FAN2, FAN3, FAN4, FAN5)

FAN	1	2	3
	Ground	+12V	Speed

In addition to installing your CPU, Tyan highly recommends that you install a CPU fan/heatsink combination, and if needed, additional chassis fans. To this end Tyan has provided several connectors to power the fan(s), as well as the fan pinout (shown above). Here is some information you may find useful:

- We recommend you use FAN4 for CPU1 and FAN3 for CPU2
- All other fan connectors are left to the user's discretion



### 2.6-E. LAN Enable/Disable (JP9)

JP9	close	open
	disable LAN	enable LAN

With this jumper, you can enable or disable the onboard LAN.

#### NOTE:

Tyan strongly recommends that you disable onboard LAN through the BIOS, rather than using this jumper.

### 2.6-F. Wake on LAN (optional) (WOL)\*

WOL	1	2	3
	+5VSB	Ground	WOL

This is the connector for the Wake on LAN function.

### 2.6-G. Wake on Modem/Ring (optional) (WOR)\*

WOR	1	2	3
	+5VSB	Ground	WOR

This is the connector for the Wake on Modem/Ring function.

### 2.6-H. Chassis Intrusion (optional) (J22)\*

If your chassis supports a feature for chassis intrusion, you can use this connector to use that feature. If the chassis is opened while this feature is enabled, the user will be notified, depending on how the system is setup.

### 2.6-I. Internal USB (reserved) (USB4)

This is a reserved connector for USB functions.

\* not verified at time of print, check Tyan website for updates: <http://www.tyan.com>

### 2.6-J. Spread Spectrum (JP3)

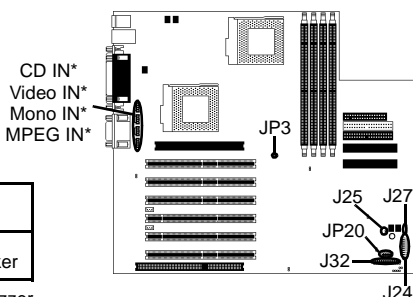
<b>JP3</b>	close	open
	disable	enable

This jumper is for EMI-related functions.

### 2.6-K. Speaker Connector (J27)

<b>SPK</b>	1	2	3	4
	+12V	no connect	no connect	speaker

This connector allows for connection of an external buzzer.



### 2.6-L. CD\*, Video\*, Mono\*, and MPEG Input Connectors\* (CD IN, Video IN, Mono IN, MPEG IN)

<b>INPUT</b>	1	2	3	4
	L	Ground	Ground	R

These four pin connectors are reserved for multimedia functions.

### 2.6-M. Server Management Connector (optional) (J32)\*

This is a reserved connector for server management functions.

### 2.6-N. Reserved Serial Connector (reserved, may or may not be available) (JP20)

### 2.6-O. External SCSI LED (J25)

Connecting an peripheral to J25 will cause its activity to be displayed on the front panel LED(s).

### 2.6-P. Soft Power Connector

The soft power connector is part of jumper block **J24** (pins 6 to 8). This board uses the chipset for power management, including turning on and off the system. If the power button function option in the BIOS Power Management menu is set to "On/Off" (which is the default), pressing the power button once after the BIOS has booted up will turn the system on and off. If the power button function is set to Suspend, pressing the power button once will wake up the system or send it to Suspend mode. In this case, you cannot turn the system off unless you shut down through the Windows operating system or you hold the power button down for four seconds (BIOS-dependent feature).

### 2.6-Q. Hardware Reset Switch Connector Installation

The reset switch on your chassis case provides you with the Hardware Reset function, which is the same as power on/off, except that the system will immediately execute a cold start after the reset button is pushed. The reset switch needs to be connected to jumper block **J24** (pins 5 to 7).

### 2.6-R. Flash Utility

You can upgrade the BIOS of this motherboard by using the Flash Utility (see p. 38). Check the Tyan website for details: <http://www.tyan.com>

\* optional feature available on some Thunder HESl models


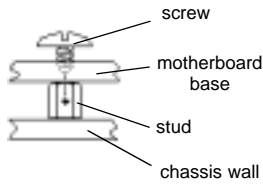
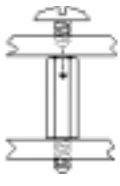
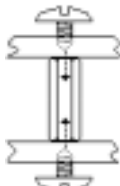

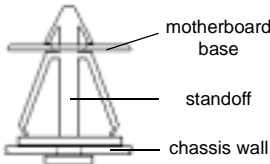

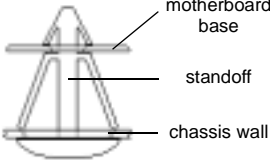
## 2.7 Mounting the Motherboard into the Chassis

Your chassis may include mounting hardware. If mounting hardware was included, you can use the following examples to help you in installing your motherboard into the chassis.

The chassis may have come with the studs integrated into the chassis wall, so in those cases you would only need to use screws (possibly included with your chassis) to install the motherboard. See the examples (**Figure 2.0**, shown below) for more details.

If the chassis includes mounting hardware without the studs pre-installed, then you will need to install the motherboard using the mounting hardware as shown in the examples **below**. Remember not to over-tighten any of the screws, or you might risk breaking internal traces in the surrounding area, or damage the motherboard in some other way.

Other examples of how to install your motherboard using other hardware (that may or may not have been included with your chassis) are shown below.

Type of hardware	One solution for installing motherboard	Another solution	Another solution
	 <ul style="list-style-type: none"> <li>screw</li> <li>motherboard base</li> <li>stud</li> <li>chassis wall</li> </ul>		
	 <ul style="list-style-type: none"> <li>motherboard base</li> <li>standoff</li> <li>chassis wall</li> </ul>		
	 <ul style="list-style-type: none"> <li>motherboard base</li> <li>standoff</li> <li>chassis wall</li> </ul>		

**Figure 2.0**

**NOTE:**





The diagrams above are only representative of a few solutions for installing a motherboard into the chassis. The installation procedure for installing your motherboard may differ.

## 2.8 Installing Memory

Please keep in mind that although some memory modules may appear to be high-quality, they may contain inferior or substandard parts. The type of memory you choose to install should be checked against the memory compatibility list, which is available from Tyan's website at <http://www.tyan.com>

### Memory Installation Procedure

Here are some details of memory installation for this board:

-  At least **two** registered DIMMs must be installed for the system to POST.
-  The motherboard supports 64MB, 128MB, 256MB, 512MB, and 1024MB PC133 SDRAM.
-  **DO NOT MIX BUFFERED AND UNBUFFERED MEMORY!**
-  The motherboard supports up to 4GB of registered PC133 memory.

The 168-pin DIMMs (Dual In-line Memory Modules) must be of the **3.3V PC133 registered** variety. The position of the notch in the SDRAM key position will tell you whether or not a DIMM is registered (see **Figure 2.1 below**). All installed memory will be automatically detected, so there is no need to set any jumpers.

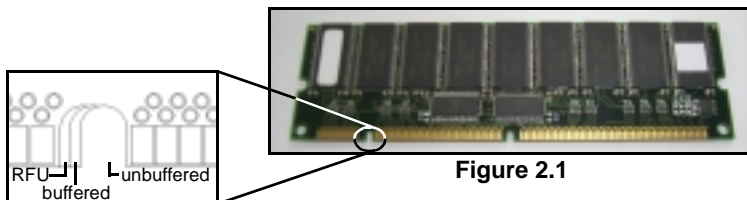
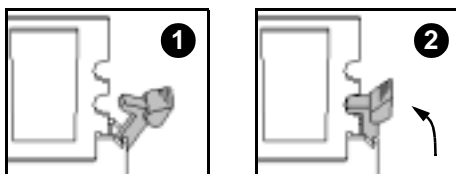


Figure 2.1

**Step 1** Insert the DIMM by pushing the module **with even force**. Do not insert one end and then the other: install the whole module at once or you might bend the DIMM pins. Make sure the DIMM is securely seated.

**Step 2** Line your module up so that the pins fit into the socket. There is only one way your DIMM can fit properly. Make sure that the short row of pins is lined up with the short gap in the DIMM socket.

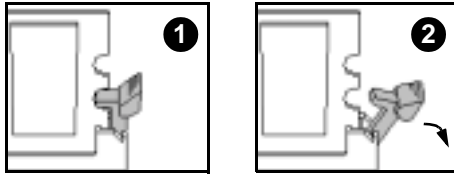
**Step 3** Lock the DIMM into place by pushing the clips back on either end of the socket onto the notches in the ends of the DIMM (see pictures below for details).





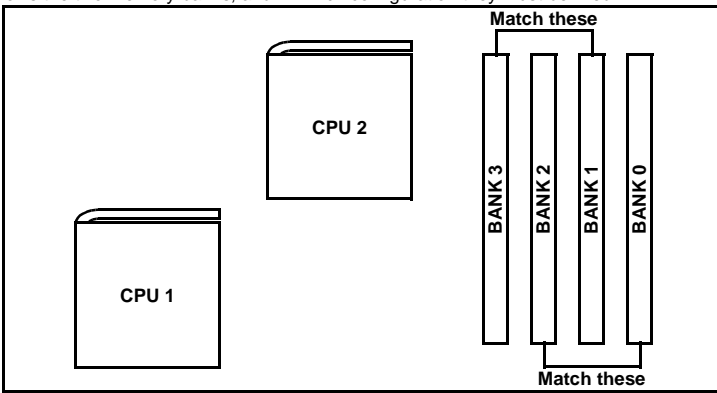
**Removing a DIMM**

Removing a DIMM is just the reverse: simply pull back the clips from the DIMM (see pictures below), and carefully pull the module straight out. Place the DIMMs in an anti-static bag as soon as you remove them to avoid static damage.



**Memory Configurations**

The DIMMs must be installed in a staggered configuration, with two DIMMs as a minimum. The diagram below shows the two memory banks, and in which configuration they must be filled.








The table below shows some of the possible memory configurations. **Not all possible configurations are listed.** Your memory configuration may differ from one or more of the combinations shown below.

4GB Total Memory Possible								
BANK 0	64MBx1	0	256MBx1	512MBx1	0	512MBx1	512MBx1	1024MBx1
BANK 1	0	128MBx1	0	0	512MBx1	512MBx1	1024MBx1	1024MBx1
BANK 2	64MBx1	0	256MBx1	512MBx1	0	512MBx1	512MBx1	1024MBx1
BANK 3	0	128MBx1	0	0	512MBx1	512MBx1	1024MBx1	1024MBx1
TOTAL	128MB	256MB	512MB	1024MB	1024MB	2048MB	3072MB	4096MB

## 2.9 Installing the CPU and Cooling Fan

Intel Pentium III FC-PGA processors\* (500 MHz through 1 GHz) can be used on this board. For more information on CPU compatibility, check Tyan's website at: <http://www.tyan.com>.

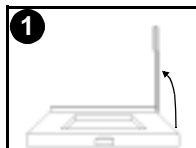
When installing your CPU, remember the following:

-  The CPU is a sensitive electronic component and can easily be damaged by static electricity
-  Do not touch the CPU pins with your fingers
-  You should be able to insert the CPU into the socket with virtually no force
-  Do not press down hard on the CPU as you might bend or break pins, or otherwise damage the CPU
-  The CPU voltage will automatically be detected by the motherboard, so there is no need to set any jumpers or BIOS setting.

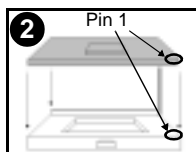
### Installing the Intel Pentium III FC-PGA CPU

Before installing the CPU, check it for any visible damage. Make sure none of the pins are bent or missing. Be sure where the Pin 1 holes are on both the CPU and the socket. The following steps each have a corresponding picture next to it to help guide you through the installation.

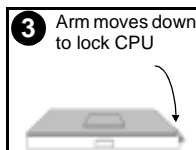
**Step 1** Carefully lift the arm of the ZIF socket until it is at a 90 degree angle pointing away from the motherboard. Be very careful not to damage any components that might be next to the socket.



**Step 2** There are two beveled corners on the CPU, which will match the two angled corners on the socket. Carefully install the CPU by lining both Pin 1 on the CPU and Pin 1 on the socket, making sure the pins actually fit into the socket. **Do not** force the CPU into the socket: check the pin alignment of CPU pins to socket holes.



**Step 3** Push down lightly on the CPU while lowering the arm on the socket to secure the CPU (see right). A squeaking noise may be heard while lowering the arm, or the socket may make a 'click' noise when the arm is locked into position: these noises are normal.



\* 66 MHz FSB is **NOT SUPPORTED** due to its technological limitations. For CPU compatibility updates and information check the Tyan website: <http://www.tyan.com>

## Installing the Cooling Fan

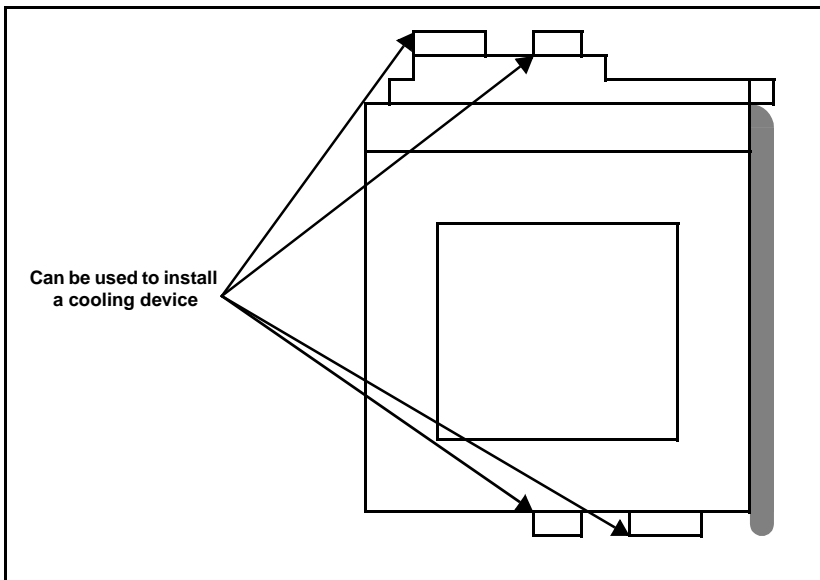
After the CPU has been installed, you will need to **install the proper cooling device** for the CPU. This device, a heatsink/fan combination, can be purchased at many computer retail stores. Installation of the cooling device may vary depending on the fan manufacturer's design. You should also take space into consideration when install a cooling device: make sure the cooling device is not too big, or else you may end up damaging components around the CPU socket. Also pay attention to the shape of the bottom of the CPU fan(s): some are built **specifically to fit only one way**.

Tyan **highly recommends** that you use some type of thermal compound (available from computer retail stores), between the CPU and heat sink, to maximize distribution of heat away from the CPU. Please use extra caution when installing any type of clamp-style fan, or else damage may occur to the CPU socket, and/or the CPU itself. See **Figure 2.2** (see right) for an example of how to connect the cooling fan's power supply. Another diagram has also been provided below, to aid in CPU fan installation onto the socket.



**INSTALL**

**Figure 2.2**



Can be used to install  
a cooling device

**Mounting points on the CPU socket**

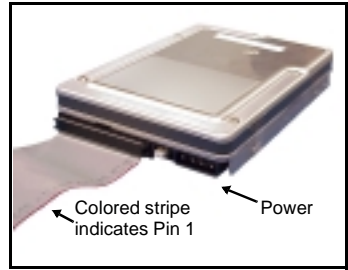
## Installing Chassis Fans

Alternatively, if you wish to also install chassis fans for increased cooling, we have provided headers to power those fans as well (see **p. 13, section 2.6-D**). Chassis fan installation will vary depending on your chassis manufacturer's design. Please check with your chassis manufacturer for details on proper chassis fan installation.

## 2.10 Connecting IDE and Floppy Drives

A variety of IDE and ATAPI-compliant devices\* can be installed on this motherboard, such as hard disk drives (HDDs) and CD-ROMs.

Please keep in mind that on this motherboard, the primary IDE connector is **BLACK**, and the secondary IDE connector is **WHITE**. Consult the documentation that came with your IDE/ATAPI device, or contact the device's manufacturer for more details on installation. Also see **Figure 2.3** (see right) for an example of the HDD with the IDE cable installed.



**Figure 2.3**

**NOTE:**

Only Tyan-approved cables are recommended for this motherboard. If you are using an existing configuration with older cables, your system might not function properly. Use only Tyan-approved cables (i.e. the ones included with your motherboard).

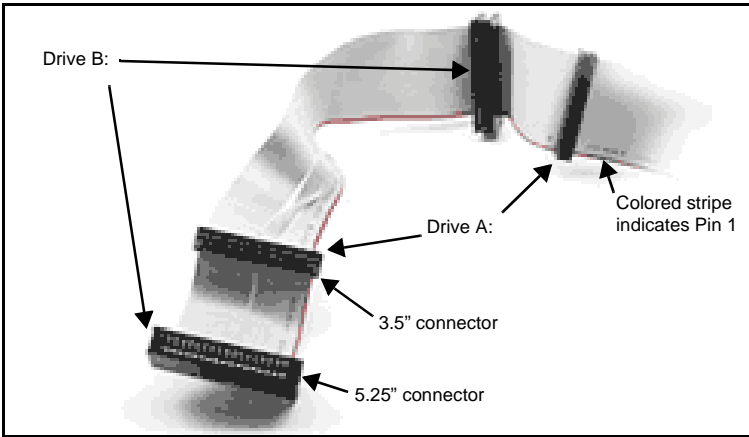
**Some symptoms of incorrectly installed HDDs are...**

<b>HDDs are not auto-detected</b>	May be a Master/Slave configuration problem, bad IDE cable, or BIOS mis-configuration. Consult the HDD documentation or contact your HDD vendor.
<b>Hard Disk Drive Fail message at bootup</b>	May be a bad cable or lack of power going to the drive. Check the cables for damage and bad connections.
<b>No video or beeps during bootup</b>	Usually means the cable has been installed backwards.
<b>HDD lights are constantly on</b>	Bad IDE cable or defective drives/motherboard. Try another HDD, or contact your HDD vendor.
<b>HDD does not power on</b>	Check power cables and cabling. May be a bad power supply or IDE drive problem.

\* UDMA-33/66 IDE devices are although UDMA-33/66 transfer speeds are not reachable at this time

## Connecting Floppy Drives

Pin 1 on the floppy cable is usually denoted by a red or colored stripe down one side of the cable. See **Figure 2.4** (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.



**Figure 2.4**

The first floppy (denoted as A:) is usually attached to the end of the cable with the twist in it. See **Figure 2.4** (above) for an example. Drive B: is usually connected to the middle of the cable. Refer to your floppy drive's installation instructions, 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.

### Some symptoms of incorrectly installed FDDs are...

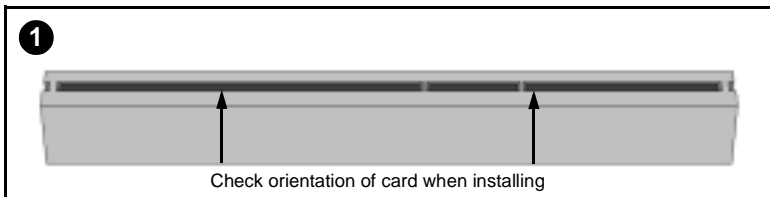
<b>FDDs are not auto-detected</b>	Usually caused by faulty cables, cables put in backwards, or a bad floppy or motherboard. Try another floppy drive to verify the problem or try another cable. Also check to see if the onboard floppy is enabled in the BIOS.
<b>Floppy Drive Fail message at bootup</b>	The cable, floppy, or motherboard may be faulty. Try another cable or floppy drive to verify.
<b>FDD does not power on</b>	Check power cables and cabling. May be a bad power supply or IDE drive problem.
<b>FDD light is constantly on</b>	Usually signifies that the cable is on backwards. Reverse the cable at the floppy drive end and try again.

## 2.11 Installing Add-on Cards\*\*

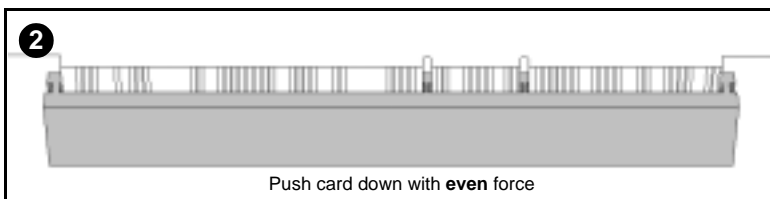
There are a few rules you need to follow when installing add-on cards. In order to assure proper operation and a quick installation, adhere to the following guidelines:

- ➡ If you are going to install a PCI-bus interface card in your system, be aware that any one of the six PCI slots can support a Master or Slave device.
- ➡ NEVER force a card into a slot. If it doesn't fit, look at the socket on the motherboard to make sure there are no wires or other obstructions to the slot.
- ➡ NEVER plug an ISA card into a PCI slot, or vice versa. You will void your warranty and damage your system board if you do this.
- ➡ When plugging the card in, especially when installing long cards, try to push the entire card in at one time. Don't force one end of the card into the socket first and then the other, or a rocking motion between the card and the slot might occur, and could damage the pins within the socket.
- ➡ Make sure the cards are seated securely into their slots.
- ➡ Before turning on the system, make sure no cards are touching.

When installing the add-on cards\*\*, make sure the cards are installed with **even** force; do not insert one end and then the other. See the before (**Figure 2.5a**) and after (**Figure 2.5b**) example installation images below for details.



**Figure 2.5a\***



**Figure 2.5b\***

\* diagrams are provided as an example for installation, and may not represent an actual slot

\*\* if 100MHz FSB CPU and/or 33MHz PCI card is used, the PCI bus will not run at 66MHz

### About the AGP Pro slot

If you are planning to install an AGP Pro-compliant card, a small plastic retention piece must be removed from the AGP Pro slot before the card can be installed.

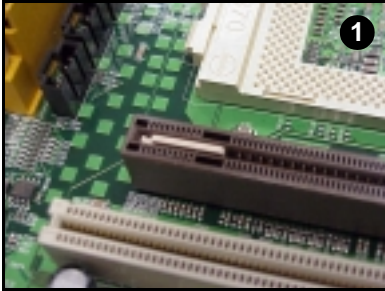


Figure 2.6a

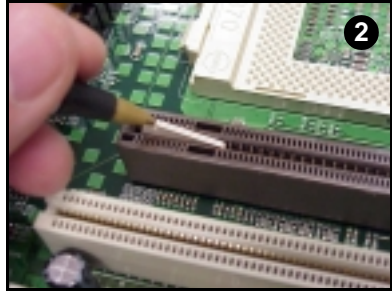


Figure 2.6b

First, make sure the card you're installing is an AGP Pro-compliant card. Locate the small plastic retention piece in the AGP Pro slot (**Figure 2.6a**, above), and use a tool with a small hard tip (such as a pen) to remove the retention piece (**Figure 2.6b**, above). **Tyan recommends you save this piece for future use (e.g. in case a regular AGP card is installed later on).**

#### NOTE:

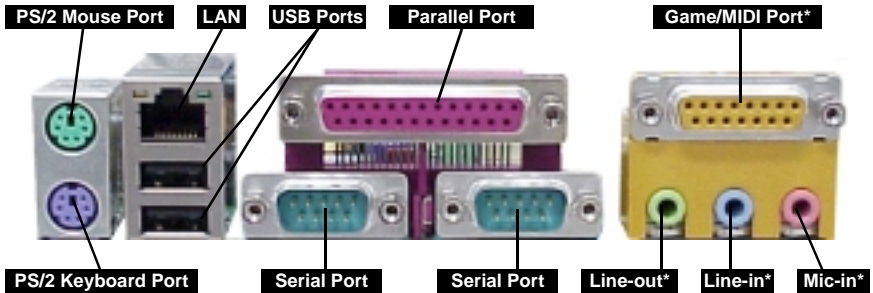
Only remove the small plastic retention piece if you are going to install an AGP Pro-compliant card. Installing a regular AGP card without the retention piece can cause the card to rock back and forth, possibly damaging the card and/or motherboard.

Tyan takes no responsibility and will not be held liable for damage related to use of regular AGP cards without the retention piece installed.

## 2.12 Connecting PS/2, USB, Serial and Parallel Ports

This motherboard includes ports for PS/2 mouse and keyboard, Universal Serial Bus (USB) devices, and serial and parallel devices. Please note that the upper PS/2 port is the mouse port, and the lower PS/2 port is for the keyboard (see **Figure 2.7** below).

The PS/2 connectors are probably quite familiar to you, while the USB connectors may not be. A USB port can function as a serial, parallel, mouse, keyboard, display, or joystick port. It is capable of supporting up to 127 daisy-chained peripheral devices. All external ports are labeled in **Figure 2.7**, shown below.



**Figure 2.7**

### Connecting Serial and Parallel Ports

The serial and parallel ports can be used to connect various devices such as a mouse or printer. The connectors can only be connected one way: be sure and check the orientation of the connector before installing it into the port.

**NOTE:**

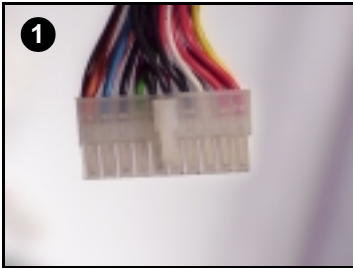
When plugging in your keyboard and mouse, or when plugging in anything into a serial or parallel port, make sure that the power is off. Connecting these devices and ports while the power is on is called **hot plugging** and may damage your system and/or external devices that you are trying to install.

\* optional feature available on some Thunder HESl models

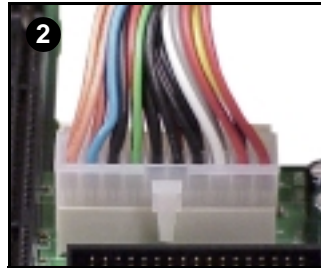


## 2.13 Connecting the power supply

This motherboard requires an ATX power supply. Tyan recommends using a **250W or higher** power supply that also conforms to industry standard Revision 2.01. The images below show the ATX power connector before (**Figure 2.8a**) and after (**Figure 2.8b**) it has been plugged in. The clip on the power connector should lock over the tab on the onboard connector. You shouldn't be able to plug the power connector in any other way but just to be safe, make sure it looks like **Figure 2.8b**. Make certain that you do not miss connecting any of the pins because if you do, you will void your warranty and possibly cause damage to yourself and/or your motherboard when the power is turned on. After connecting the power, make sure the connector is seated firmly into its socket so it will not become loose or fall off when the computer is jostled or moved.



**Figure 2.8a**



**Figure 2.8b**

### **You are done!**

Other than checking the jumper settings and cable connections, and putting the case back on, you are done. Installing a new motherboard may seem difficult, but by following these directions, you should have a fairly uneventful time installing our products. If you do encounter problems, your dealer will be able to help you, or you can consult one of our many technical support resources (see p. 7).

## 2.14 Frequently Asked Questions (FAQ)

**Q: My system sometimes becomes unstable. How should I check the system?**

**A:** The first thing to do is to check and see if you have any device conflicts related to the IRQ, or DMA. If you are using Microsoft Windows, the Control Panel is a good place to start investigating the conflict. Please consult your operating system documentation for details. Secondly, slowing down the memory timing in the BIOS' chipset setup section will help the situation as well. Many memory modules are not suitable for high performance systems and are probably the main source of your problem. Also check to make sure you are using a **dual Athlon approved or better power supply**, and also make sure the power supply has adequate output (**Tyan recommends a 300W or better power supply**). Lastly, make sure the motherboard is receiving adequate cooling.

**Q: I have a question about memory compatibility; what memory will work on my motherboard?**

**A:** Memory compatibility information can be found on Tyan's website at: <http://www.tyan.com>

**Q: Where can I get additional accessories for my Tyan motherboard?**

**A:** You can purchase additional accessories such as USB cables\*, as well as other Tyan-approved accessories at the Tyan Computer Online Store: <http://www.etyan.com>

**Q: Where do I get pinout information for my motherboard?**

**A:** Pinouts of certain headers are available on the Tyan website: <http://www.tyan.com>

**Q: My motherboard is dead, how do I return it?**

**A:** Contact the place of purchase or your distributor for assistance to return the motherboard for service. RMA issues will **NOT** be handled via e-mail by Tyan Tech Support. Please refer to the URL link here for more details: [http://www.tyan.com/support/html/rma\\_faq.html](http://www.tyan.com/support/html/rma_faq.html)

**Q: How do I upgrade my BIOS?**

**A:** Check the section about the Flash Utility (see **p.38**) for information on upgrading your BIOS. BIOS update files, flash utilities, and instructions on how to install them are also available from the Tyan website at: <http://www.tyan.com>

**Q: Why do I get a "CMOS checksum invalid" error message during POST?**

**A:** If you get the above error message or "Invalid configuration, run Setup" message, it is an indication that the CMOS battery needs to be changed. Contact your dealer for assistance. Once you've replaced your battery, don't forget to check the Clear CMOS section (see **p.12**) so that you can reset your CMOS.

**Q: Why can't I get into the BIOS right after pressing [DEL] when asked by the system?**

**A:** After the system displays the memory information, and then asks the user to press [DEL], the system will then run the SCSI BIOS (if enabled, see **p.33**), and finally go into the system BIOS. This is a normal boot up process.

\* If your chassis supports frontside USB connectors, it will usually come with the necessary cables. Check that your chassis is frontside USB capable. Please check with your chassis vendor for details.

# Chapter 3: BIOS Setup

## Introduction to the BIOS setup

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 AMIBIOS 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 AMIBIOS 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 AMIBIOS in your computer is a customized version of an industry-standard BIOS for IBM PC AT-compatible personal computers. It supports Intel x86 and compatible processors. The BIOS provides critical low-level support for the system central processing, 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 the AMIBIOS setup program.

## Starting Setup

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

When these preliminaries are finished, the BIOS seeks an operating system on one of the data storage devices (HDD, floppy drive, etc.) If one is found, the BIOS will launch that operating system and hand control of system operations to it. During POST, you can start the setup program by pressing the **[DEL]** key when the "Press DEL key to enter BIOS setup" message appears on the screen.

## Setup Keys

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 setting

## 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 booting the computer after making and saving changes with the BIOS setup program, you can restart the computer by either:

-  Pressing **[CTRL]+[ALT]+[DEL]** (all three keys at the same time)
-  Holding the power button down until the computer shuts off

The best advice is to alter only settings that you thoroughly understand. In particular, do not change settings in the Chipset screen unless you absolutely sure that 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 may cause the system to become unstable.

## 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 system, the appearance of your Setup screen may differ from the screens shown here. Each system design and chipset combination require custom configurations. In addition, the final appearance of the setup program depends on your system designer. You system designer can decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

### 3.1 Main Setup

In this menu, you can alter general features such as the date and time.

#### 3.1-A. System Date/Time

You can type in the date and time directly, or select the portion of the date or time that you want to modify and adjust it using the ↑ ↓ cursor keys. The clock runs on a 24-hour cycle (i.e 1:00 PM is 13:00).

#### 3.1-B. General Help

At any time, you can press [F1] to bring up a General Help screen in case you want to learn the shortcut commands. There are two settings you should be aware of (listed below).

Key	Function
Load Failsafe Defaults	If your system is experiencing configuration problems, you can choose this option to reset all settings.
Load Optimal Defaults	This will load preset options that are designed for maximum system performance, but may not work for all computer applications. You should not use this option if you are experiencing configuration problems.

### 3.2 Advanced Setup

In the Advanced setup, you can setup your system devices, boot options, and more. Each option has a configuration sub-screen (denoted by the ► symbol).

BIOS SETUP UTILITY

Main    Advanced    Chipset    PCIPnP    Power    Boot    Security    Exit

**Setup Warning**  
Setting items on this screen to incorrect values may cause the system to malfunction!

- SuperIO Configuration
- IDE Configuration
- Floppy Configuration
- Event Log Configuration\*
- Boot Settings Configuration
- Peripheral Device Configuration
- Remote Access Configuration

← → Select Screen  
 ↑ ↓ Select Item  
 Enter Go to Sub Screen  
 F1 General Help  
 F10 Save and Exit  
 ESC Exit

v02.02 (C) Copyright 1985-2000, American Megatrends, Inc.

\* not verified at time of print, please check Tyan website for updates: <http://www.tyan.com>

### 3.2-A. Configure SuperIO Configuration

In this sub screen you can configure the different hardware ports available, and change the status of the floppy controller.

<b>Onboard Floppy Controller</b>	This device handles communication between the floppy drive and the motherboard. [Default setting is <b>Enabled</b> ]
<b>Serial Port Address</b>	The address of Serial Port 1 can be changed if a hardware conflict occurs. [Default setting is <b>Normal</b> ]
<b>Serial Port 2 Address</b>	You can set the address for Serial Port 2 by using this option [Default is <b>2F8/IRQ3</b> ]
<b>Serial Port 2 Mode</b>	Depending on your needs, the mode of Serial Port 2 can be altered. [Default is <b>Normal</b> ]
<b>Parallel Port Address</b>	You can set the address for the Parallel Port by using this option. [Default is <b>Disabled</b> ]

### 3.2-B. IDE Configuration

On bootup, the BIOS will auto-detect the existence of IDE devices such as hard drives and CD-ROMs. You can also check the status of those IDE devices and change other IDE-related options. There are also configuration sub screens for each IDE device (denoted by the ► symbol). Depending on what devices you set up, some options may or may not be available. In most cases, the default settings that appear when the device is detected by the BIOS will be sufficient. To absolutely sure that your settings are correct, always check the documentation for each device you set up.

<b>Onboard PCI IDE Controller</b>	The PCI IDE controller is essential for communication between the IDE devices and the motherboard. [Default setting is <b>Both</b> ]
<b>Hard Disk Protect</b>	This option disables or enables write protection to the IDE devices. This option is only effective if the devices are being accessed through the BIOS. [Default setting is <b>Disabled</b> ]
<b>ATA(PI) Detect Time Out</b>	The BIOS will spend a preset amount of time to detect any IDE devices before it continues to the next stage of bootup. The amount of time can be changed using this option. [Default is <b>35</b> ]
<b>ATA(PI) 80Pin Cable Detection</b>	Selects the process that the BIOS will use to detect 80Pin ATA(PI) cables. [Default is <b>Host &amp; Device</b> ]

An explanation of possible options in the IDE configuration sub-screens is shown on the next page.

<b>Type</b>	The type of IDE device installed can be configured using this option. [Default setting is <b>Auto</b> for auto-detect]
<b>LBA/Large Mode</b>	These modules make it possible for the BIOS to take advantage of the additional space on drives which are larger than 504MB. This can be auto-detected (when you select <b>Auto</b> for <b>Type</b> ), or you can manually set this mode to Disabled. [Default setting is <b>Auto</b> ]
<b>Block (Multi-sector Transfer)</b>	When set to Auto, the block mode auto-detects the optimal number of block read/writes per section that the drive supports. [Default is <b>0</b> ]
<b>PIO Mode</b>	Programming input/output is a method of transmitting data between devices that use the system's CPU as part of the data path. There are 6 modes: 5 with their own transmission speed and 1 auto mode. To use modes 3 and 4, you must use an Enhanced IDE drive. [Default is <b>Auto</b> ]
<b>DMA Mode</b>	This option specifies the Direct Memory Access mode for the IDE device. If set to Auto, the BIOS will determine the DMA mode. [Default is <b>Auto</b> ]
<b>S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology)</b>	This option allows the S.M.A.R.T. protocol to report server system information over a network. [Default is <b>Auto</b> ]
<b>32Bit Data Transfer</b>	If set to On, this option allows for the transmission of 32-bits in parallel (e.g. at the same time). If set to Off, only 16-bits will be transmitted in parallel. [Default is <b>Enabled</b> ]
<b>ARMD Emulation Type</b>	Specifies the type of emulation used for a non-disk device attached as the primary master IDE device. If set to Auto, the BIOS will determine the emulation type. [Default is <b>Auto</b> ]

### 3.2-C. Floppy Configuration

In this configuration sub-screen you can change options for your floppy drive(s). If you are unsure what kind of floppy drive you have, you should consult the documentation that came with your drive, or consult your vendor.

<b>Floppy A</b>	The settings are 360KB 5.25", 1.2MB 5.25", 720KB 3.5", 1.44MB 3.5", or 2.88MB 3.5".
<b>Floppy B</b>	The options are the same as listed for Floppy A. [Default setting is <b>Disabled</b> ]
<b>Diskette Write Protect</b>	Sets whether or not the drive can be written to. [Default is <b>Disabled</b> ]
<b>Floppy Drive Seek</b>	Sets whether or not the BIOS should check for the drive at bootup. [Default is <b>Disabled</b> ]

### 3.2-D. Boot Settings Configuration

In the Boot Settings Configuration sub-screen, several options are available to change how the system boots up.

<b>Quick Boot</b>	When Enabled, the BIOS will save time during bootup by skipping certain items. [Default is <b>Enabled</b> ]
<b>Quiet Boot</b>	When Disabled, the normal POST messages are displayed. [Default setting is <b>Disabled</b> ]
<b>AddOn ROM Display Mode</b>	Specifies the system display mode that is set at the time that AMIBIOS post initializes an optional ROM. If set to Force BIOS, the current mode used by AMIBIOS is used. If set to Keep Current, the current display mode is used. [Default is <b>Force BIOS</b> ]
<b>Bootup Num-Lock</b>	Sets whether or not the NumLock key should be turned on at bootup. [Default is <b>On</b> ]
<b>Bootup CPU Speed</b>	Sets the initial CPU speed to high or low at bootup. [Default is <b>High</b> ]
<b>PS/2 Mouse Support</b>	Sets whether or not the PS/2 ports should support a mouse device. If set to Enabled, IRQ12 will be reserved for the mouse device. [Default is <b>Enabled</b> ]
<b>Typematic Rate</b>	Sets how fast the keyboard will accept input. [Default is <b>Fast</b> ]
<b>System Keyboard</b>	Sets whether or not the keyboard exists. [Default is <b>Present</b> ]
<b>Primary Display</b>	Sets the type of monitor that is being used. [Default is <b>VGA/ EGA</b> ]
<b>Parity Check</b>	Sets whether or not the memory will be checked for parity. [Default is <b>Disabled</b> ]
<b>Boot to OS/2</b>	Set this option to 'Yes' if you are using OS/2 and are using more than 64MB of system memory. [Default is <b>No</b> ]
<b>Wait for 'F1' if error</b>	If an error occurs during bootup, the BIOS will ask the user to press 'F1' to enter the BIOS Setup Utility to repair the problem. [Default is <b>Enabled</b> ]
<b>Hit 'DEL' Message Display</b>	If Enabled, the BIOS will display an option to enter the BIOS Setup Utility at bootup. [Default is <b>Enabled</b> ]
<b>Internal Cache</b>	Sets the type of caching algorithm that will be used for the L1 internal cache memory. [Default is <b>Write-Back</b> ]
<b>System BIOS Cacheable</b>	Sets the type of caching algorithm that will be used for the L2 external cache memory. [Default is <b>Enabled</b> ]



### 3.2-E. Event Log Configuration\*

In this sub-screen you can access the log that is created when bootup errors occur. This log will help you troubleshoot any configuration problems you might experience. The status of the Event Log is shown on the top half of the screen.

<b>Event Logging*</b>	If set to Enabled, bootup error events will be logged. [Default is <b>Enabled</b> ]
<b>ECC Event Logging*</b>	If set to Enabled, ECC events will be logged. [Default setting is <b>Disabled</b> ]
<b>Clear All Event Logs*</b>	If set to Yes, the event log will be cleared on saving of BIOS settings followed by reboot. [Default is <b>No</b> ]
<b>View Event Log*</b>	Shows you the Event Log.
<b>Mark All Events As Read*</b>	By using this option, the events in the Event Log can be organized to help troubleshoot configuration problems.

### 3.2-F. Peripheral Device Configuration

In this sub-screen, you can enable or disable certain devices/functions as your needs require.

<b>Onboard SCSI</b>	Enables or disables the onboard SCSI controller [Default setting is <b>Enabled</b> ]**
<b>Onboard LAN</b>	The operating status of the onboard LAN controller can be changed using this option. [Default is <b>Enabled</b> ]
<b>Onboard Audio*</b>	The onboard audio option can be enabled and disabled by using this option. [Default is <b>Enabled</b> ]
<b>Power Lost Control</b>	If this function is set to Always On, and there is a sudden power loss to the system, then the system will automatically boot up once power is restored to the system. [Default is <b>Always On</b> ]

### 3.2-G. Remote Access Configuration

This menu allows for setting up options related to the console redirection functions of this motherboard.

<b>Remote Access</b>	<b>If this option is set to Disabled, the following two options will not appear (listed below).</b> [Default setting is <b>Disabled</b> ]
<b>Serial Port #</b>	Sets the serial port number that will be connected for console redirection functions. [Default is <b>COM1</b> ]
<b>Serial Port Mode</b>	Sets the mode for the serial port chosen for console redirection functions. [Default is <b>115200 8,n,1</b> ]

\* optional feature available on some Thunder HESl models

^\* SCSI limited to 33MHz

### 3.3 Chipset Setup

The Chipset Setup is for advanced configuration of the motherboard attributes.

<b>C000 - CC00, 16k Shadow</b>	<p>Specifies how the 16k of video ROM is treated at the listed address.</p> <p><b>Disabled:</b> contents of video ROM are not copied to RAM</p> <p><b>Enabled:</b> contents of video ROM at listed address segment is copied (shadowed) from ROM to RAM for faster execution.</p> <p><b>Cached/WP:</b> contents of video ROM from listed address segment are copied from ROM to RAM and can be written to or read from cache memory.</p> <p>[Default is <b>Cached</b>]</p>
<b>D000 - DC00, 16k Shadow</b>	[Default is <b>Disabled</b> ]
<b>Write Caching from P6-to-PC1</b>	[Default is <b>Disabled</b> ]
<b>Act to Deact</b>	[Default is <b>6CIks</b> ]
<b>Act to Read/Write</b>	[Default is <b>3CIks</b> ]
<b>RAS Precharge Time</b>	Sets length of RAS precharge part of DRAM system memory access cycle when SDRAM system memory is installed. [Default is <b>3CIks</b> ]
<b>RA Cycle Time</b>	[Default is <b>10CIks</b> ]
<b>SDRAM CAS Latency</b>	[Default is <b>CAS Latency 3</b> ]
<b>Memory Auto Precharge</b>	[Default is <b>Enabled</b> ]
<b>SDRAM Fast Timing</b>	[Default is <b>11-1-1-1</b> ]
<b>ISA IO Cycle Delay</b>	[Default is <b>FULL Delay</b> ]
<b>MPS 1.4 Support</b>	[Default is <b>Enabled</b> ]
<b>Scrubbing Enable</b>	[Default is <b>Disabled</b> ]
<b>AGP Device Address Space Size</b>	[Default is <b>32MB</b> ]
<b>AGP Operations</b>	[Default is <b>Disabled</b> ]

### 3.4 PCI/PnP Menu\*

The PCI/PnP Setup lets you configure the onboard PCI Plug-n-Play (PnP) devices available.

<b>Plug &amp; Play O/S</b>	Indicates if you are using a PnP O/S. [Default is <b>No</b> ]
<b>Reset Config Data</b>	If set to Yes, PCI/PnP data will be stored in Flash on next boot. [Default setting is <b>No</b> ]
<b>PCI Latency Timer</b>	Specifies latency timings for PCI devices. [Default is <b>64</b> ]
<b>Allocate IRQ to PCI VGA</b>	Informs PCI devices that an ISA graphics device is installed in the system so the card will function correctly. [Default is <b>Yes</b> ]
<b>Palette Snooping</b>	If set to Enabled, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. [Default is <b>Disabled</b> ]
<b>PCI IDE Bus Master</b>	Specifies that the IDE controller on the PCI bus has bus mastering capability. [Default is <b>Disabled</b> ]
<b>Offboard PCI/ISA IDE Card</b>	Specifies if an offboard PCI or ISA IDE controller card is installed. [Default is <b>Auto</b> ]
<b>USB Function</b>	Enables USB. [Default is <b>Enabled</b> ]
<b>Legacy USB Support</b>	Enables legacy USB device support. [Default is <b>Auto</b> ]
<b>IRQ (3,4,5,7,9,10,11,14,15)</b>	Allows listed IRQ to be used by PCI/PnP devices. [Default is <b>Available</b> ]
<b>DMA Channel (0,1,3,5,7)</b>	Allows listed DMA to be used by PCI/PnP devices. [Default is <b>Available</b> ]
<b>Reserved Memory Size</b>	Specifies size of memory area reserved for legacy ISA adapter cards. [Default is <b>Disabled</b> ]

\* if 100MHz FSB CPU and/or 33MHz PCI card is used, the PCI bus will not run at 66MHz

### 3.5 Power Menu

The Power Setup lets you configure how the BIOS handles power management.

<b>ACPI Aware OS</b>	Tells system whether OS is ACPI aware. [Default is <b>No</b> ]
<b>Power Management</b>	Enables Power functions on this screen. [Default is <b>Disabled</b> ]
<b>Power Button Mode</b>	Changes how the power button will function. [Default setting is <b>On/Off</b> ]
<b>Sleep Button Enable</b>	Changes the function of the sleep button. [Default is <b>Suspend</b> ]
<b>Green PC Monitor Power State</b>	Changes option for the Green PC compatible monitors. [Default is <b>StandBy</b> ]
<b>Video Power Down</b>	Changes the event that occurs when the video powers down. [Default is <b>StandBy</b> ]
<b>Hard Disk Power Down Mode</b>	Changes the event that occurs when the HDD powers down. [Default is <b>Disabled</b> ]
<b>Inactivity Timer</b>	Changes the amount of time the BIOS will wait before activating system power functions as set by the user. [Default is <b>Off</b> ]
<b>Suspend Time Out (Minutes)</b>	Changes the amount of time the BIOS will wait before activating the suspend mode. [Default is <b>Off</b> ]
<b>IRQ (3,4,5,7,9,10,11,14,15)</b>	Changes how the BIOS will treat each IRQ in terms of power management.
<b>USB Controller Resume*</b>	Changes how the BIOS will handle the USB controller power function. [Default is <b>Disabled</b> ]
<b>PME Resume</b>	Changes the PME power function. [Default is <b>Disabled</b> ]
<b>RI Resume</b>	Changes the RI power function. [Default is <b>Disabled</b> ]

### 3.6 Boot Menu

The Boot Setup lets you configure options set for each device during boot. The options available will depend on what devices you have installed in your computer.

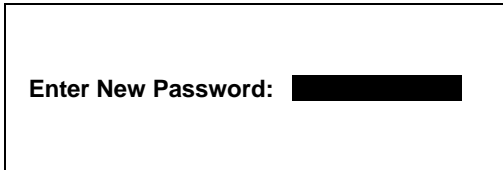
<b>Boot Device Priority</b>	Sets the order of devices that BIOS will attempt to boot from.
<b>Hard Disk Drives</b>	Shows the available HDDs and allows changes to the order in which each is booted (e.g. which boot firsts, second, and so on).
<b>Removeable Drives</b>	Shows the available removable drives and allows changes to the order in which each is booted (e.g. which boot firsts, second, and so on).
<b>ATAPI CDROM Drives</b>	Shows the available CD-ROM drives and allows changes to the order in which each is booted (e.g. which boot firsts, second, and so on).

### 3.7 Security Menu

The Security Setup lets you configure security options such as passwords and boot sector virus protection. The status of the Supervisor and User Passwords are shown at the top, and options can be set through the rest of the configuration sub-screen.

<b>Change Supervisor Password</b>	Install or change the password.
<b>Change User Password</b>	Install or change the password.
<b>Clear User Password</b>	Immediately clears the User password.
<b>Boot Sector Virus Protection</b>	Protect against boot sector viruses. [Default is <b>Disabled</b> ]

A password screen (such as the example screen below) will appear when you select one of the Change Password functions. To set a password, enter a unique set of 6 letters and/or numbers.



### 3.8 Exit Menu

Before you exit the BIOS, a set of options will be presented to you.

<b>Exit Saving Changes</b>	Save changes and exit setup.
<b>Exit Discarding Changes</b>	Do not save changes and exit setup.
<b>Load Optimal Defaults</b>	Load optimal settings. <b>Note: May not work with all applications.</b>
<b>Load Failsafe Defaults</b>	Load failsafe settings. <b>Note: May not work with all applications.</b>
<b>Discard Changes</b>	Disregard all changes you made.

### 3.9 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>

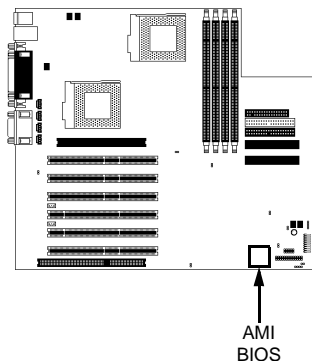
**IMPORTANT!** If you have a BIOS chip with part number **SST 28SF040A** (see **Figure 3.1 below**), **DO NOT** flash with a BIOS that is **below v1.04**. Otherwise, you will render your system inoperable. In order to find out if you have the SST 28SF040A, you will need to peel back the sticker (see **Figure 3.0\* below**). **If you have a different chip other than the SST 28SF040A, this information does not affect you.**

**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.



Figure 3.0\* - Peeling back the sticker



\* image provided as an example, and may not be representative of your motherboard

## Chapter 4: System Resources

**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 AMI BIOS POST can initialize the video but an error occurs, an error message will be displayed. If it cannot display video, it will convey 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.

#### 4.2 Displayed Error Messages

If an error occurs after the system display has been initialized, an error message will be displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to continue
```

and the system will halt. Depending on how the Halt On setting was configured in the Standard CMOS Setup menu, the system may or may not display the error message.

### RUN SETUP UTILITY

may also appear. Press **[F1]** to run the Award BIOS Setup if this message appears. The following two pages show the possible error messages and explanations.

<b>8042 Gate-A20 Error</b>	Gate A20 on the keyboard controller (8042) is not working.
<b>Address Line Short!</b>	Error in the address decoding circuitry.
<b>C: Drive Error</b>	No response from drive C:
<b>C: Drive Failure</b>	No response from drive C:
<b>Cache Memory Bad, Do Not Enable Cache!</b>	Cache memory is defective.
<b>CH-2 Timer Error</b>	Timer 2 has failed.
<b>CMOS Battery State Low</b>	The battery is running low and needs to be replaced.
<b>CMOS Checksum Failure</b>	The CMOS data is different than previous data. Run BIOS setup to enter new data.
<b>CMOS System Options Not Set</b>	CMOS RAM values were destroyed. Run BIOS setup to enter new data.
<b>CMOS Display Type Mismatch</b>	Video type set in BIOS does not match actual video display. Run BIOS setup to enter new data.
<b>CMOS Memory Size Mismatch</b>	Memory size does not match actual detected memory size. Run BIOS setup to enter new data.
<b>CMOS Time and Date Not Set</b>	Time and Date have not been set. Run BIOS setup to enter new data.
<b>D: Drive Error</b>	No response from drive D:
<b>D: Drive Failure</b>	No response from drive D:
<b>Diskette Boot Failure</b>	Diskette cannot be used to boot system.
<b>Display Switch Not Proper</b>	Some systems require a video switch to be set to either color or monochrome. Power down the system and set the switch.
<b>DMA Error</b>	Error in the DMA controller.
<b>DMA 1 Error</b>	Error in the first DMA channel.
<b>DMA 2 Error</b>	Error in the second DMA channel.



<b>FDD Controller Failure</b>	FDD controller is not responding.
<b>HDD Controller Failure</b>	HDD controller is not responding.
<b>INTR1 Error</b>	Interrupt channel 1 failed POST.
<b>INTR2 Error</b>	Interrupt channel 2 failed POST.
<b>Invalid Boot Diskette</b>	Diskette is not bootable.
<b>Keyboard is Locked... Unlock it</b>	Keyboard lock is engaged. Power down and unlock it.
<b>Keyboard Error</b>	Keyboard appears to have a timing problem.
<b>KB/Interface Error</b>	Error in keyboard connection.
<b>No ROM BASIC</b>	System cannot find a bootable sector on any boot drive.
<b>Off Board Parity Error</b>	Parity error in external memory.
<b>On Board Parity Error</b>	Parity error in internal memory.
<b>Parity Error ???</b>	Parity error at unknown address.

# Appendix I: SCSI Installation\* and LAN Information

## Introduction

With the dual channel onboard Ultra160 LVD SCSI option\*, you can connect up to 30 SCSI peripherals such as hard drives, CD-ROMs, and tape drives. Please note that this guide only provides basic instructions on connecting SCSI devices to your motherboard. For more detailed SCSI installation instructions, refer to your SCSI device documentation or to LSI Logic's website: <http://www.lsillogic.com>

## Features\* of the LSI Symbios SCSI BIOS

- Configuration for up to 256 adapters - any 4 can be chosen for INT13 (bootrom) support
- SPI-3 Parallel Protocol Request (PPR)
- Basic Domain Validation

## Legacy support for non-Ultra160 SCSI devices

The LVD signaling used for Ultra160 devices operates differently than single-ended signaling used on Ultra, Fast, and Fast Wide SCSI devices. Ultra160 LVD SCSI devices are designed with multi-mode capability so that if a single-ended device is connected to the Ultra160 LVD SCSI bus, the Ultra160 devices automatically switch to single-ended mode. When an Ultra160 LVD SCSI device operates in single-ended mode it is subject to the cable distance limitations and signal noise problems of that interface. LSI recommends that single-ended Ultra and earlier devices be kept on a separate channel than the Ultra160 LVD SCSI devices. This will permit the Ultra160 devices to operate at full speed and cable distances.

## Setting up internal SCSI peripherals

Its very important that SCSI peripherals be set up before installing them to the SCSI connector. The setup for SCSI peripherals usually involves setting SCSI IDs, checking for termination, mounting the peripherals inside the chassis, and then hooking up power to each peripheral. Since setup can vary from peripheral to peripheral, always refer to the peripherals documentation for specific instructions. Below are some guidelines for setting SCSI IDs and termination on your peripherals.

## Checking SCSI IDs

Both the motherboard SCSI connectors and each peripheral you connect need to have a unique ID, ranging from 0 to 15. IDs do not have to be sequential, as long as each connector and each peripheral has a different number for each channel. Each SCSI channel on the motherboard is preset to SCSI ID and should not be changed. If you will be booting from a SCSI HDD, its best to set the disk's ID at 0 or 1. Most SCSI HDDs come from the factory preset to ID 0. The IDs for internal peripherals are usually set with jumpers; external peripherals are usually set with a switch on the back of the peripheral. Check your peripheral's documentation for more details.

## Terminating SCSI devices

To ensure reliable communication on the SCSI bus, the peripheral on the end of each cable, or the end of the cable itself, must have a terminator installed (or enabled). The peripherals between the ends of each cable must have the terminator removed (or disabled). Check your peripheral's documentation for more details.

## Connecting SCSI peripherals

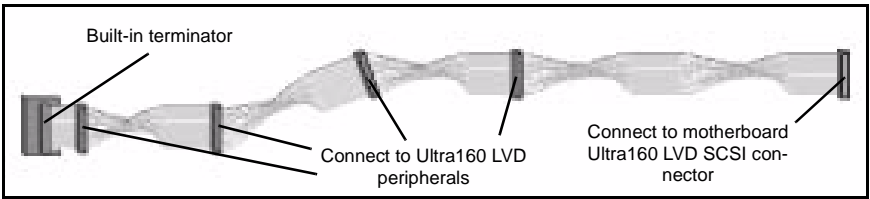
A total of 30 SCSI peripherals can be connector to the onboard SCSI connectors (15 devices per channel/connector). Before connecting peripherals, be sure to also review **Setting up internal SCSI peripherals** above.

## Connecting internal cables for Ultra160 LVD SCSI devices

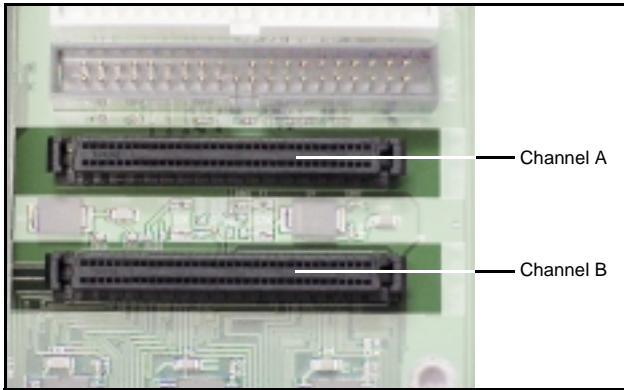
When connecting internal Ultra160 LVD peripherals there are special SCSI cables necessary to sustain the higher speeds of LVD signaling. If your cables are not marked, you can identify most Ultra160 LVD SCSI cables as having twisted pairs of the flat ribbon cable in between the device connectors. These cables will usually have a terminator built into the end of the cable.

\* SCSI limited to 33MHz

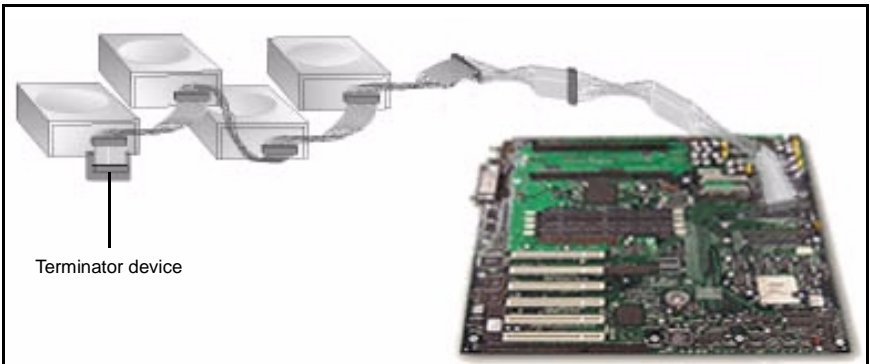
**Step 1** Locate the 68-pin internal Ultra160 LVD SCSI cable (it should look similar to the one shown directly below).



**Step 2** Plug the long end of the cable(s) to the Ultra160 LVD SCSI connector(s) on the motherboard (either channel A or channel B). Note that the image(s) below may not be completely representative of your motherboard.



**Step 3** Plug the remaining connectors to the internal Ultra160 LVD SCSI peripherals.



**NOTE:**

Internal Ultra160 SCSI peripherals come from the factory without termination. Proper termination is provided by the built-in terminator at the end of the Ultra160 internal SCSI cable.

### Information on the LSI Symbios 53C1010 SCSI BIOS

The SCSI BIOS is the bootable ROM code that manages SCSI hardware resources. It is also specific to the family of Symbios SCSI controllers or processors. By integrating with the standard system BIOS, the Symbios SCSI BIOS extends the standard disk service routine through INT13h.

During boot time initialization, the SCSI BIOS will determine if there are other hard disks, such as an IDE drive, that are already installed by the system BIOS. If there are, the SCSI BIOS will map any detected SCSI drives **behind** the drive(s) already installed. Otherwise, the SCSI BIOS will install drives starting with the system boot drive. In this case, the system boots from a drive controlled by the SCSI BIOS. For 4.05 versions and higher, LSI Logic supports the BIOS Boot Specification (BBS).

### Boot Initialization with BIOS Boot Specification (BBS)

The Symbios SCSI BIOS provides support for the BIOS Boot Specification (BBS), which allows you to choose which device to boot from by selecting the priority.

In the system BIOS setup, the Boot Connection Devices menu appears with a list of available boot options. Use that menu to select the device and rearrange the order. Then exit to continue the boot process.

### CD-ROM Boot Initialization

The SCSI BIOS supports boot initialization from a CD-ROM drive.

The five types of emulation are:

- No emulation disk
- Floppy 1.2MB emulation disk
- Floppy 1.44MB emulation disk
- Floppy 2.88MB emulation disk
- Hard Disk Emulation

The type of emulation assigns the drive letter for the CD-ROM. For example, if a 1.44MB Floppy emulation CD was loaded, then the CD-ROM drive would become the designated A: drive, and the existing floppy (if any) would become drive B:.

### Starting the SCSI BIOS Configuration Utility

This motherboard comes with the SCSI BIOS version 4.xx, and it includes the Symbios SCSI BIOS Configuration Utility so that you can change the default configuration of your SCSI host adapters. You may need to change the default configuration due to conflicts between device settings or if you are looking to optimize system performance.

If you have the LSI SCSI BIOS enabled (see **p. 33**), the following message will appear on your screen after the system BIOS boots:

**Press CTRL-C to start Symbios Configuration Utility...**

This message remains on your screen for about 5 seconds, giving you a short amount of time to start the utility. When you press **[CTRL-C]** to start the utility, the system will pause while it loads the utility, then the main menu for the utility will appear.

## Error Messages

The following error messages may appear if something goes wrong during the boot process.

Error Message	Possible Reason For Error
Adapter removed from boot order, parameters will be updated accordingly	This appears when an adapter is removed from the system or relocated behind a PCI bridge.
Configuration data invalid, saving default configuration!	This appears if none of the information in the NVRAM is valid.
Found SCSI Controller not in following Boot Order List, to Add: Press Ctrl-C to start Symbios Configuration Utility...	This appears when less than four adapters are in the boot order and more adapters exist than are shown.

### NOTE:

The SCSI BIOS Configuration Utility is a powerful tool. If you somehow disable all of your controllers, pressing **CTRL-A** (or **CTRL-E** on BIOS version 4.04 or later) after memory initialization during reboot allows you to re-enable and reconfigure. \*

### NOTE:

Not all devices detected by the Configuration Utility can be controlled by the BIOS. Devices such as tape drives and scanners require that a device driver specific to that peripheral be loaded. The SCSI BIOS Configuration Utility does allow parameters to be modified for these devices.

## Using the Configuration Utility

Throughout the setup, selections that are not selectable are greyed out. Listed below are keys that you can use throughout the setup.

Key	Function
F1	Accesses the context sensitive help for the cursor-resident field.
F2	Sets cursor content to the menu selection area. Select a menu item and press [ENTER].
Arrow Keys	Select item
Home/End	Select item; use Up/Down/Left/Right keys to position the cursor.
+/-	Changes item value to next relative value.
Enter	Press [ENTER] to execute the field's associated function.
ESC	Abort/exit the current operating and/or exits the current screen. User confirmation may occur.

\* under qualification at time of print, check Tyan website for updates: <http://www.tyan.com>

## Main Menu

This is the Main Menu setup that displays the Host Bus Adapters and their corresponding settings. Below are the fields available along with their descriptions.

Field	Details on field
Adapter	Indicates the specific Symbios Host Adapter
PCI Bus	The PCI Bus number (range 0x00 - 0xFF, 0 - 255 decimal) assigned by the system BIOS to an adapter
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter.  An 8-bit value mapped as follows: Bit # 7 6 5 4 3 2 1 0  Bits 7-3: Device (range 0x00 - 0x1F, 0-31 decimal) Bits 2-0: Function (range 0 - 7)
Port Number	Indicates the I/O Port Number that communicates with an adapter. The system BIOS also assigns this number.
IRQ	Indicates the Interrupt Request Line used by an adapter. The system BIOS also assigns this value.
NVM	Indicates whether an adapter has non-volatile memory (NVM) associated with it. An adapter's configuration is stored in its associated NVM. NVM can refer to NVRAM that is resident on a host adapter or to system NVS.
Boot Order	Indicates the relative boot order (0 to 3) of an adapter. The Symbios SCSI BIOS traverses up to four adapters in the specified order in search of bootable media. Access the "Boot Adapter List" Menu to modify this item.

The next page describes the Boot Adapter List menu, available from the Main Menu.

### Boot Adapter List

The adapter boot order specifies the order in which adapters will boot when more than one Symbios adapter is in a system.

Up to four of the total adapters in a system may be selected as bootable.

To add an adapter to the boot list, press [INSERT] while on the Boot Adapter List. This puts the cursor on the adapter select list. Use the arrow keys to select the desired adapter and press [ENTER] to add it to the end of the Boot Adapter List. Below are the fields available along with their descriptions.

Field	Details on field
Adapter	Indicates the specific Symbios Host Adapter
PCI Bus	The PCI Bus number (range 0x00 - 0xFF, 0 - 255 decimal) assigned by the system BIOS to an adapter
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter.  An 8-bit value mapped as follows: Bit # 7 6 5 4 3 2 1 0 └───┬───┘ Bits 2-0: Function (range 0 - 7)   └───┬───┘ Bits 7-3: Device (range 0x00 - 0x1F, 0-31 decimal)
Boot Order	Specifies the relative boot order (0 to 3) of an adapter. - : decreases an adapter's relative boot order + : increases an adapter's relative boot order
Current Status	Indicates whether an adapter in the boot list was enabled during the most recent boot. Disabled adapters and their attached devices are ignored by the Symbios PCI SCSI BIOS., they are still visible to the Configuration utility.
Next Boot	Specifies whether to enable an adapter upon the next boot. The Symbios SCSI BIOS ignores disabled adapters and their attached devices although they are still visible to the Configuration Utility.

The next page describes the Global Properties menu, available from the Main Menu.

## Global Properties

The Global Properties option on the Main Menu allows you to set Display and Video modes as well as a pause if an alert message has been displayed. Below are the fields available along with their descriptions.

Field	Details on field
Pause When Boot Alert Displayed	<p>This option specifies whether to pause for user acknowledgement after displaying an alert message during boot. The Boot Alert setting can be either No or Yes.</p> <p><b>To continue after displaying a message, specify No.</b></p> <p><b>To wait for any key after displaying a message, specify Yes.</b></p>
Boot Information Display Mode	<p>This option specifies the information display mode of the BIOS during boot. It controls how much information about adapters and devices are displayed during boot. The Display Mode setting can be either Terse or Verbose.</p>
Negotiate with devices	<p>This option sets the default value for synchronous and wide negotiations with specified devices. Options are: All, None, or Supported.</p>
Video Mode	<p>This option specifies the default video mode for the Configuration Utility. The Video Mode setting can be either Color or Monochrome. The monochrome setting enhances readability on a monochrome monitor.</p>
<Restore Defaults>	<p>Select this option to restore all default settings.</p>

The next page describes the Adapter Properties menu, available from the Main Menu.



## Adapter Properties

The Adapter Properties menu allows you to view and modify adapter settings, and provides access to an adapter's device settings. Below are the fields available along with their descriptions.

Field	Details on field
<Device Properties>	To view and modify device properties, press [ENTER].
SCSI Parity	This field indicates whether SCSI parity is enabled for an adapter. When disabled, it is also necessary to disable disconnects for all devices, as parity checking for the reselection phase is NOT disabled. If a non-parity generating device disconnects, its operation will never complete because the reselection fails due to parity error.
Host SCSI ID	This field indicates the SCSI identifier of an adapter [0-7] or [0-15]. It is recommended that this field be set to the highest priority SCSI identifier, which is 7.
SCSI Bus Scan Order	This field indicates the order in which to scan SCSI identifiers on an adapter. Changing this item will affect drive letter assignment(s) if more than one device is attached to an adapter. <b>Note: Changing this item may conflict with an operating system that automatically assigns drive order.</b>
Removeable Media Support	This field specifies the removable media support option for an adapter. Three settings are allowed:  <b>None</b> indicates no removable media support whether the drive is selected as first (BBS), or is first in the scan order (non-BBS).  <b>Boot Drive Only</b> provides removable media support for a removable harddrive if it is first in the scan order.  <b>With Media Installed</b> provides removable media regardless of the drive ordering.
CHS Mapping	This field defines how the Cylinder Head Sector values are mapped onto a disk without pre-existing partition information. CHS Mapping allows two settings: SCSI Plug-and-Play Mapping (default value), and Alternate CHS Mapping.  SCSI Plug-and-Play Mapping automatically determines the most efficient and compatible mapping. Alternate CHS Mapping utilizes an alternate, possibly less efficient mapping that may be required if a device is moved between adapters from different vendors.  <i>Note: Neither of these options has any effect after a disk has been partitioned using FDISK*. To change the CHS Mapping on a partitioned disk, use FDISK* to delete all partitions. Then reboot the system to clear memory or the old partitioning data will be reused, thus nullifying the previous operation.</i>

\* CAUTION: Use care to ensure that the correct disk is the target of the FDISK.

## Adapter Properties (continued)

Field	Details on field
<b>Spinup Delay (secs)</b>	This field indicates the number of seconds to wait between spinups of devices attached to an adapter. Staggered spinups will balance the total electrical current load on the system during boot. The default value is 2 seconds with choices between 1 and 10 seconds.
<b>Secondary Cluster Server</b>	<p>This field indicates whether an adapter has one or more devices attached that are shared with one or more other adapters and therefore, the Symbios PCI SCSI BIOS should avoid SCSI Bus resets as much as possible.</p> <p>This option allows the user to enable an adapter to join a cluster of adapters without doing any SCSI bus resets. This is a requirement for Microsoft Cluster Server. The default value is No with an alternate option of Yes.</p>
<b>Termination Control</b>	<p>This field indicates whether an adapter has automatic termination control, and if so, its current status. Two settings are:</p> <p>Auto: The adapter automatically determines whether it should enable or disable its termination.</p> <p>Off: Termination at the adapter is off, the devices at the ends of the SCSI bus must terminate the bus.</p> <p>Note: If Auto is greyed out, it means the termination is automatic, not programmable.</p>
<b>&lt;Restore Defaults&gt;</b>	Select this option to restore all default settings.

The next page describes the Device Properties.

## Device Properties

The Device Properties screen provides viewing and updating individual device settings for an adapter. Changing a setting for the host device (for example, SCSI ID 7) changes the setting for all devices. Below are the fields available along with their descriptions.

Field	Details on field																								
<b>SCSI ID</b>	This field indicates the device's SCSI identifier.																								
<b>Device Identifier</b>	This field indicates the ASCII device identifier string extracted from the device's Inquiry Data.																								
<b>Sync Rate</b>	<p>This field indicates the maximum synchronous data transfer rate, in Mega Transfer per second.</p> <table border="1"> <thead> <tr> <th>Mega Trans- fers/sec</th> <th>Data Width= 8 MB/s</th> <th>Data Width= 16 MB/s</th> <th>Synchronous Period (nsec)</th> </tr> </thead> <tbody> <tr> <td>0=Async</td> <td>0=Async</td> <td>0=Async</td> <td>0=Async</td> </tr> <tr> <td>5</td> <td>5</td> <td>10</td> <td>200</td> </tr> <tr> <td>10</td> <td>10</td> <td>20</td> <td>100</td> </tr> <tr> <td>20</td> <td>20</td> <td>40</td> <td>50</td> </tr> <tr> <td>40</td> <td>40</td> <td>80</td> <td>25</td> </tr> </tbody> </table>	Mega Trans- fers/sec	Data Width= 8 MB/s	Data Width= 16 MB/s	Synchronous Period (nsec)	0=Async	0=Async	0=Async	0=Async	5	5	10	200	10	10	20	100	20	20	40	50	40	40	80	25
Mega Trans- fers/sec	Data Width= 8 MB/s	Data Width= 16 MB/s	Synchronous Period (nsec)																						
0=Async	0=Async	0=Async	0=Async																						
5	5	10	200																						
10	10	20	100																						
20	20	40	50																						
40	40	80	25																						
<b>Data Width</b>	This field indicates the maximum data width in bits.																								
<b>Scan ID</b>	<p>This field indicates whether to scan for this SCSI identifier at boot time. This item can be used to ignore a device and to decrease boot time by disabling the inquiry of unused SCSI identifiers.</p> <p>Set this option to "No" if there is a device that you do not want to be available to the system. Also, on a bus with only a few devices attached, the user can speed up boot time by changing this setting to "No" for all unused SCSI IDs.</p>																								
<b>Scan LUNs &gt; 0</b>	<p>This field indicates whether to scan for Logical Unit Numbers (LUNs) greater than 0 for a device. LUN 0 is always queried. This option should be used if a multi-LUN device responds to unoccupied LUNs or if it is desired to reduce the visibility of a multi-LUN device to LUN zero only.</p> <p>Set this option to "No" if you have problems with a device that responds to all LUNs whether they are occupied or not. Also, if a SCSI device with multiple LUNs exists on your system but you do not want all of those LUNs to be available to the system, then set this option to "No". This will limit the scan to LUN 0 only.</p>																								
<b>Disconnect</b>	This field indicates whether to allow a device to disconnect during SCSI operations. Some (mostly newer) devices run faster with disconnect enabled, while some (mostly older) devices run faster with disconnect disabled.																								

(continued on next page)

## Device Properties (continued)

Field	Details on field
SCSI Timeout	<p>This field indicates the maximum amount of time [0 to 9999] in seconds to wait for a SCSI operation to complete.</p> <p>Since timeouts provide a safeguard that allows the system to recover should an operation fail, it is recommended that a value greater than 0 be used. A value of 0 allows unlimited time for an operation to complete and could result in the system hanging (waiting forever) should an operation fail.</p> <p>Press [ENTER], type in a value, and then press [ENTER] again to specify a new timeout value.</p>
Queue Tags	<p>This field indicates whether to allow the use of queue tags for a device. Currently the BIOS does not use queue tags. This item specifies queue tag control to higher level device drivers.</p>
Boot Choice	<p>This field indicates whether this device may possibly be selected as the boot device. This option is only applicable to devices attached to adapter number 0 (in the boot list) on non-BBS systems. It provides primitive BBS flexibility to non-BBS systems.</p>
Format	<p>Select this option to low-level format the device.</p> <p>If enabled, this option allows low-level formatting on a disk drive. Low-level formatting will completely and irreversibly erase all data on the drive.</p> <p>Note: Formatting will default the drive to a 512-byte sector size even if the drive had previously been formatted to another sector size.</p>
Verify	<p>Select this option to verify all sectors on the device and to reassign defective Logical Block Addresses (LBAs).</p>
<Restore Defaults>	<p>Select this option to restore all default settings.</p>

### Quitting the SCSI BIOS Configuration Utility

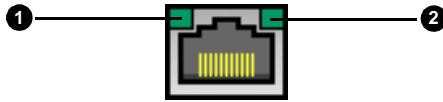
Since some changes go into effect only after the system reboots, it is very important that you exit this utility properly. To exit, press [ESC] (escape key) and respond to the prompts that follow.

**NOTE:**

If you reboot the system without properly exiting from this utility, some changes may not take effect.

### LAN Information

Your motherboard has an onboard Intel 82559 LAN controller, with 10/100 MBits/s transfer speed. For more information regarding the onboard LAN controllers, check the Intel website: <http://www.intel.com>



Below are some explanations of what the LEDs mean, and how they display the LAN's status.

LAN Status	LED (1) - Orange Light	LED (2) - Green Light
Good connection @ 10 Mbps	OFF	ON
Good connection @ 100 Mbps	ON	ON
No connection	OFF	OFF
Data being transferred	ON (10Mbps) Orange (100Mbps)	LED is blinking

## Appendix II: 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.

**AMR** (Audio Modem Riser): a modem that can be used on Intel Reference Motherboard platforms using Intel's core logic chipsets supporting AC-link 2.1. It supports fax and all data feedback modes. It provides high speed communications between your personal computer and a remote location, such as an Internet Service Provider (ISP).

**AT**: the original form factor of IBM's PC.

**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** (Bulletin Board System): a computer system with a number of modems hooked up to it which acts a center for users to post messages and access information.

**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 1GB 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): improves RAM speed to at least 200 MHz. 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.

**EDO RAM** (Extended Data-Qut RAM): speeds access to memory locations by assuming that memory addresses are static; the next time it looks for a bit of data, it will be at the same spot, or one nearby.

**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.)

**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-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** (**P**ower **M**anagement 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** (**P**lug-**n**-**P**lay): 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** (**P**reboot **E**xecution **E**nvironment): 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.

**Striping**: see **RAID**.

**RAID** (**R**edundant **A**rray of **I**ndependent **D**isks): 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** (**R**andom **A**ccess **M**emory): 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** (**R**ead-**O**nly **M**emory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

**SDRAM** (**S**ynchronous **D**ynamic **R**AM): 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).

**SIMM** (**S**ingle **I**n-line **M**emory **M**odule): formerly 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 DIMMs.

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

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

**Standby mode:** in this mode, the video and fixed disk drive (usually the HDD) shuts down; all other devices continue to operate normally.

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

**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 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 the metal level is pulled down. This shifts the processor over and down, guiding it into place on the board.



### 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 receiver.
  - Plug the equipment into an outlet on a circuit different from that of the receiver.
  - Consult the dealer or an experienced radio/television technician for help.

### Notice for Canada

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



### Notice for Europe (CE Mark)

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

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