



# Thunder i840 S2520

User's Manual  
Revision 1.01

Copyright © Tyan Computer Corporation, 2001. All rights reserved. No part of this manual may be reproduced or translated without prior written consent from Tyan Computer Corp.

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

Thunder i840 S2520 is a trademark of Tyan Computer Corporation.  
AMIBIOS is a trademark of American Megatrends, Inc.  
Windows is a trademark of Microsoft Corporation.  
IBM, PC, AT, PS/2 are trademarks of IBM Corporation.  
Intel, Pentium III are registered trademarks of Intel Corporation.  
Adaptec is a registered trademark of Adaptec, Inc.  
QLogic, Zircon are trademarks of QLogic Corp.  
ATI, Rage XL are trademarks of ATI Technologies, Inc.  
Winbond is a trademark of Winbond Electronics Corp.

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

# Table of Contents

<b>Chapter 1: Introduction</b>	<b>Page 4</b>
1.1 Overview	4
1.2 Hardware Specifications	5
1.3 Software Specifications	6
1.4 Technical Support	7
1.5 Returning Merchandise for Service	7
<b>Chapter 2: Board Installation</b>	<b>8</b>
2.1 Unpacking	8
2.2 Installation	8
2.3 How to install our products right... the first time	8
2.4 Quick Reference for Jumpers	10
2.5 Map of Motherboard Jumpers	11
2.6 Setting Jumpers	12
2.6-A Front Panel Connector	12
2.6-B CMOS Reset	12
2.6-C BIOS Boot Block	12
2.6-D Onboard VGA Enable/Disable	12
2.6-E Onboard SCSI Enable/Disable	13
2.6-F Onboard LAN Enable/Disable	13
2.6-G PCI Speed Jumper	13
2.6-H FAN Headers	13
2.6-I Chassis Intrusion Header	13
2.6-J USB/Serial Connector	13
2.6-K Speaker Connector	14
2.6-L SMB/IPMB Connector	14
2.6-M External HDD LED	14
2.6-N Soft Power Connector	14
2.6-O Hardware Reset Switch Connector Installation	14
2.6-P J13, J14	14
2.7 Mounting the Motherboard in the Chassis	15
2.8 Installing Memory	16
2.9 Installing the CPU and Cooling Fan	19
2.10 Connecting IDE and Floppy Drives	21
2.11 Installing Add-on Cards	23
2.12 Connecting PS/2, USB, and Serial Port 1	24
2.13 Connecting the Power Supply	24
2.14 Frequently Asked Questions (FAQ)	25
<b>Chapter 3: BIOS Setup</b>	<b>26</b>
3.1 Main Setup	28
3.2 Advanced Setup	28
3.2-A Configure SuperIO Configuration	29
3.2-B IDE Configuration	29
3.2-C Floppy Configuration	30
3.2-D Boot Settings Configuration	31
3.2-E Onboard Device Configuration	32
3.2-F Event Log Configuration	32

3.3	Chipset Setup .....	33
3.3-A	[MCH] .....	34
3.3-B	[ICH] .....	34
3.3-C	Multi-Processor Support Options .....	34
3.4	PCI/PnP Menu .....	35
3.5	Power Menu .....	36
3.6	Boot Menu .....	37
3.7	Security Menu .....	37
3.8	Exit Menu .....	37

**Chapter 4: System Resources ..... 38**

4.1	Beep Codes .....	38
4.2	Displayed Error Messages .....	38
4.3	Flash Utility .....	41

**Appendix I: SCSI Installation and LAN Information ..... 42**

Introduction .....	42
Support for Older SCSI Devices .....	42
Setting up SCSI Devices .....	42
Check the SCSI IDs .....	43
Terminate the ends .....	43
Connecting SCSI Devices .....	43
Connecting Internal Ultra160 and Ultra2 Devices .....	43
Connecting Wide SCSI Devices .....	43
More Information about Termination .....	46
Configuring the Adaptec 7899W SCSI with <i>SCSISelect</i> .....	47
Using <i>SCSISelect</i> .....	49
SCSI Bus Interface Definitions .....	49
Boot Device Options .....	49
SCSI Device Configuration Options .....	49
Advanced Configuration Options .....	50
LAN Information .....	51

**Appendix II: Glossary ..... 52**

# Chapter 1: Introduction

## 1.1 Overview

The Thunder i840™ is designed for high-end server applications requiring the power of dual Socket370 Pentium® III processors. This motherboard utilizes the Intel® i840™ chipset and can support CPU speeds of 500 MHz through 1 GHz and host bus speeds of 100 MHz to 133 MHz. Please see Tyan's website for updates and information concerning CPU information and support:

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

This integrated high-performance system board is supported in an extended ATX form factor. Some of the features included are onboard UltraDMA support, onboard Adaptec® Ultra160 LVD SCSI technology, and onboard dual 10/100 Mbps LAN controllers.

With I/O and drive controller support onboard, four 64-bit PCI slots are free for numerous types of add-on expansion cards. The (4) RIMM sockets can support up to 1GB\* PC800 ECC Registered RDRAM. 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.

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

## 1.2 Hardware Specifications

<b>Processor Information</b>	<p>Dual ZIF PGA370 Sockets          Intel Pentium III FC-PGA          Onboard VRM          Front Side Bus support for 100/133 MHz</p>
<b>Expansion Slots</b>	<p>One 2x/4x mode AGP Pro slot          Two 32-bit PCI v2.2 slots          Two 64-bit 5.0V PCI slots @ 66 MHz          Two 64-bit 3.3V PCI slots @ 66 MHz          Total seven usable slots</p>
<b>Chipset Information</b>	<p>Intel i840 + ICH2 AGPSet          MCH + ICH2 + P64H + FWB (4 Mb)          Intel P64H to support 64-bit/66 MHz slots          National PC87366 LPC Super I/O chip</p>
<b>Hardware Monitoring</b>	<p>WinBond W83782 hardware monitoring chip          3-pin Fan Monitoring headers          2-pin Chassis Intrusion header          Temperature and Voltage Sensing</p>
<b>Memory</b>	<p>Dual Channel Memory Bus          Four RIMM sockets          Up to 1GB* PC800 ECC Registered RDRAM</p>
<b>Integrated PCI IDE</b>	<p>Dual channel master mode          Up to four Enhanced IDE devices          Support for UDMA-33/66/100 IDE drives and ATAPI compliant devices</p>
<b>Integrated I/O</b>	<p>One floppy connector for up to two drives          Two 9-pin UART serial ports (one port via cable - <b>optional</b>)          One 25-pin ECP/EPP parallel port          PS/2 mouse and keyboard ports          Four USB ports (two ports via cable - <b>optional</b>)</p>
<b>Integrated PCI LAN</b>	<p>Two LAN controllers:              One Intel ICH2 w/ 82562ET "Kinnereth" controller              One Intel 82559 LAN controller          10/100 Mbps data transfer rate per controller</p>
<b>Integrated SCSI (manufacturing option)</b>	<p>Adaptec 7899W controller          Dual Channel Ultra160 LVD SCSI support          160 Mbps throughput and up to 15 devices per ch.          Channel A and B: 68-pin connectors</p>
<b>BIOS</b>	<p>AMIBIOS 4 Mbit Flash (FWB)          Supports APM 1.2 &amp; ACPI 1.0          User settings of HW monitoring          Auto-configuration of IDE hard disk types          User settings of hardware monitoring          Multiple boot options          DMI 2.0 compliant</p>

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

#### Form Factor

Ext. ATX 12" x 13" (304.8 x 330.2 mm)  
Two 20-pin ATX power connectors  
Stacked mouse & keyboard ports  
Stacked two USB ports  
Two RJ-45 ports w/ LEDs  
Stacked one serial/video/parallel ports

#### Regulatory

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

## 1.3 Software Specifications

#### OS

Operates with 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 can 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 i840 motherboard



34-pin floppy cable



ATA-66/100 IDE cable (with blue connector)



68-pin Ultra160 LVD SCSI cable (optional)



Thunder i840 I/O shield\*



(2) Continuity RIMMs



Thunder i840 user's manual



Tyan driver CD



Adaptec 7899W SCSI Driver Diskette (optional)

### 2.2 Installation

You are now ready to install your motherboard. The mounting hole pattern of the Thunder i840 matches the Extended ATX system board specifications, so your chassis must be capable of supporting an Extended ATX system 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

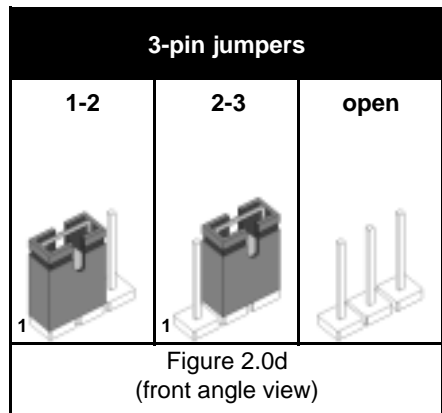
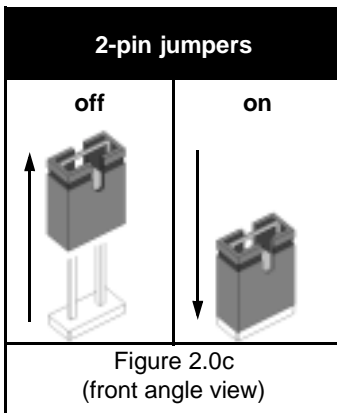
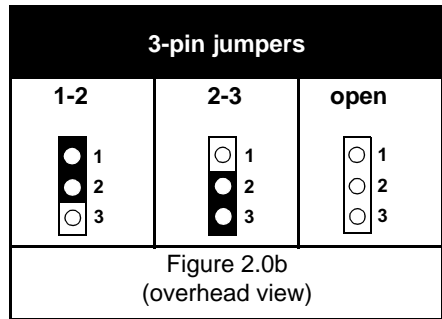
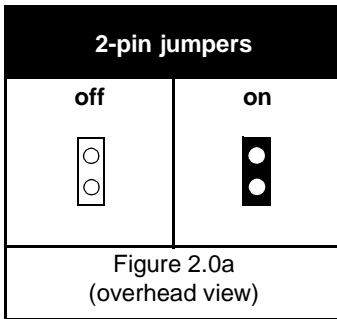
1. Set jumpers (if necessary)
2. Mount motherboard in chassis
3. Install memory
4. Install CPU and cooling fan(s)
5. Connect IDE and floppy drives
6. Install add-on cards
7. Connect PS/2, USB, serial, and parallel devices

## 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.



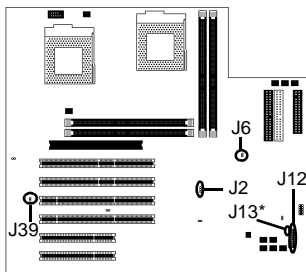


## 2.6 Setting Jumpers

### 2.6-A. Front Panel Connector (J12)

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

\*Power LED: for 3-pin (bi-color/single-color) mini-map) use **J13\***



### 2.6-B. CMOS Reset (J2)

<b>J2</b>	1-2	2-3
	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 pins 2-3 on J2 (see mini-map for location of J2)
3. Wait about three seconds
4. Move jumper back to 1-2, then power on the system again

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

### 2.6-C. BIOS Boot Block (J6)

<b>J6</b>	open	close
	locked	unlocked

This jumper allows for the BIOS Boot Block to either be written to or write-protected.

**NOTE:**

If the jumper J6 is unlocked and failure occurs during a BIOS flash, you run the risk of rendering your entire system unbootable. The backup protection of the Boot Block will be lost. Tyan will not be held responsible in such related events.

### 2.6-D. Onboard VGA Enable/Disable (J39)

<b>J39</b>	open	close
	enable	disable

You can enable or disable the onboard VGA capability with this option.

\* indicates an optional feature

**2.6-E. Onboard SCSI Enable/Disable (J43)**

<b>J43</b>	open	close
	enable	disable

You can enable or disable the onboard SCSI capability with this option.

**2.6-F. Onboard LAN Enable/Disable (J32)**

<b>J32</b>	open	close
	enable	disable

You can enable or disable the onboard 82559 LAN controller with this jumper.

**2.6-G. PCI Speed Jumper (J34)**

<b>J34</b>	open	close
	66 MHz	33 MHz

This jumper allows for the PCI speed to be set to either 66 MHz or 33 MHz.

<b>NOTE:</b>	Tyan takes no responsibility and will not be held liable for damage related to the alteration of J34 from the correct setting corresponding to your PCI card manufacturer's designated operating speed.
--------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**2.6-H. FAN Headers\* (CPU FAN's [J35 for CPU1, J36 for CPU2], J38[A,B,C], J41[A,B,C], J56[A,B])**

<b>FAN</b>	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:

- The connectors labeled "CPU FAN" (J35 & J36)\* correspond to CPU1 and 2, respectively
- J38/J41/J56 are for the optional chassis fan(s) (should you decide to add one/several)
- All other fan connectors are left to the user's discretion

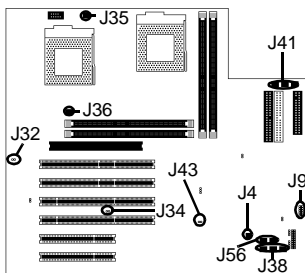
**2.6-I. Chassis Intrusion Header (J4)**

This header for the chassis intrusion connector (if your chassis has one).

**2.6-J. USB/Serial Connector (J9)**

This is the connector for a USB or Serial external connector.

\* fan numberings listed may differ from actual board markings



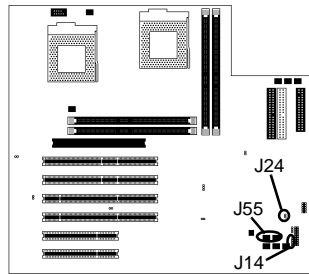
### 2.6-K. Speaker Connector (J14\*)

J14	1	2	3	4
	Power in	no connect	no connect	Speaker

This is the connector for an external speaker.

### 2.6-L. SMB/IPMB Connector\* (J55)

This is the connector reserved for server management functions.



### 2.6-M. External HDD LED (J24)

This is the connector for display of status of an external HDD device. Should you decide to connect it, the LED output will be shown using the chassis' external HDD LED, alongside with the board's own LED output.

### 2.6-N. Serial Port 2 (COM2)

This is the header for a optional Serial Port 2.

### 2.6-N. Soft Power Connector

The soft power connector is part of jumper block J12 (pins 6 to 8, see **section 2.6-A, p.12**). 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.

### 2.6-O. 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.

### 2.6-P. J13\*, J14\*

These jumpers are reserved. Check the Tyan website for updates: <http://www.tyan.com>

\* indicates an optional feature


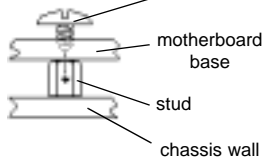

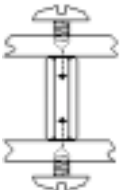

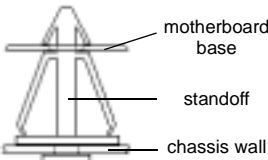

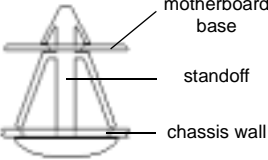
## 2.7 Mounting the Motherboard into the Chassis

Your chassis may or may not 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
	 <p>screw</p> <p>motherboard base</p> <p>stud</p> <p>chassis wall</p>		
	 <p>motherboard base</p> <p>standoff</p> <p>chassis wall</p>		
	 <p>motherboard base</p> <p>standoff</p> <p>chassis wall</p>		

**Figure 2.0**

**NOTE:**

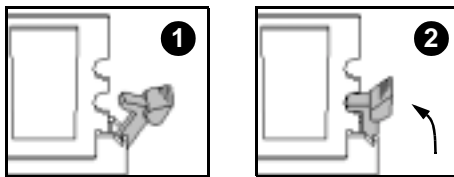
The diagrams above are only representative of a few solutions for installing a motherboard into the chassis. The installation procedure for installing your motherboard may differ. If you require assistance, contact your chassis vendor.

## 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>

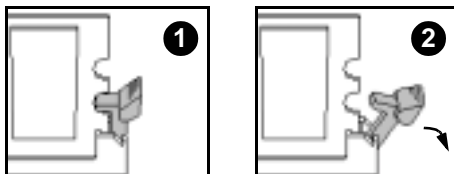
### Memory Installation Procedure

- Step 1** Line up your module so that the pins fit into the slot. There is only one way your memory module can fit properly. Make sure that the short row of pins is lined up with the short gap in the RDRAM socket. See **Figure 2.1** (on p.17) for graphic details on how the memory should be installed.
- Step 2** Insert the memory module by pushing it into the socket with **even force**. Do not insert one end and then the other: install the whole module at once or you might damage the memory module and/or the socket.
- Step 3** Lock the memory into place by pushing the clips back on either end of the socket onto the notches in the ends of the memory module, as shown **below**.



### Memory Uninstallation Procedure

Removing the RIMM is just the reverse: simply pull back the clips from the memory module (as shown **below**), and carefully pull the module straight out. Place the memory modules in an anti-static bag as soon as you remove them to avoid static damage.



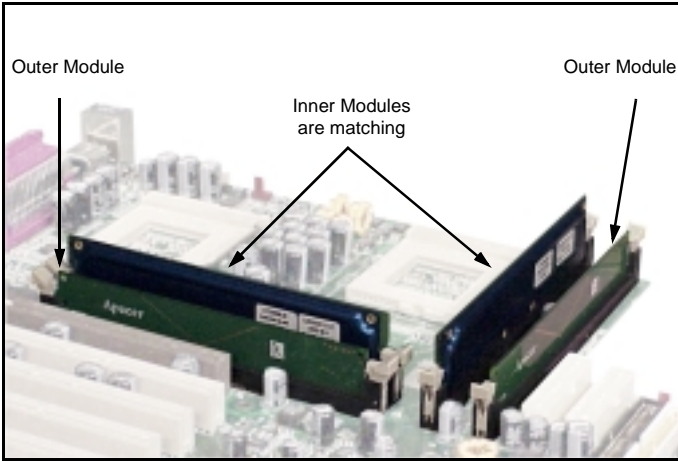
**NOTE:**

Also take care that you do not cause yourself injury if you are removing the memory modules after using the motherboard, since the module(s) may be hot.



**Here are some details of memory installation for this board:**

- Inner and outer RIMM sockets must be matching (e.g. if you have one RIMM module in the inner socket, another RIMM module must be installed in the other inner socket, and so on). See p. 18 and **Figure 2.1** (below) for an example.



**Figure 2.1**

- Any empty slots must be filled with C-RIMM Continuity modules. Tyan has included (2) C-RIMM modules for your convenience (examples\*\* are shown above in **Figure 2.1**).
- This motherboard supports up to 2GB\* PC800 ECC Registered RDRAM. Check the Tyan memory compatibility section of the website for more details: <http://www.tyan.com>

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

\*\* note: the examples may not necessarily represent the actual C-RIMMs included with the board.

## Memory Configuration Examples

Figure 2.2 and the table below should be used in conjunction to determine possible memory configurations. Not all possible configurations are listed. (NOTE: C-RIMM means Continuity RIMM)

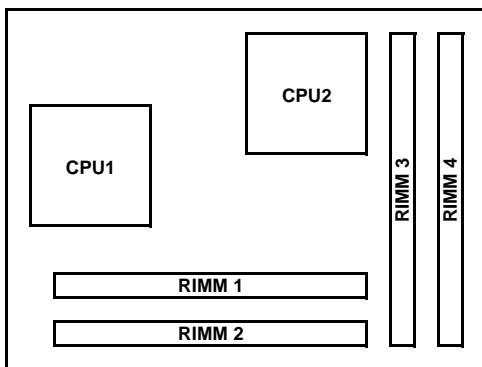


Figure 2.2 - Overhead view of memory banks\*

Total of 2GB PC800 RDRAM possible								
<b>RIMM 1</b>	64MBx1	C-RIMM	128MBx1	128MBx1	C-RIMM	256MBx1	512MBx1	512MBx1
<b>RIMM 2</b>	C-RIMM	128MBx1	128MBx1	C-RIMM	256MBx1	256MBx1	C-RIMM	512MBx1
<b>RIMM 3</b>	64MBx1	C-RIMM	128MBx1	128MBx1	C-RIMM	256MBx1	512MBx1	512MBx1
<b>RIMM 4</b>	C-RIMM	128MBx1	128MBx1	C-RIMM	256MBx1	256MBx1	C-RIMM	512MBx1
<b>TOTAL</b>	128MB	256MB	512MB	256MB	512MB	1024MB	1024MB	2048MB**

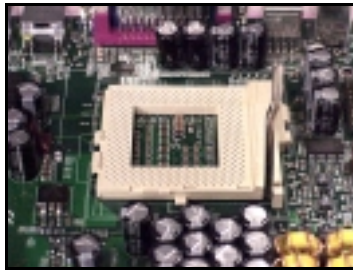
\* RIMM sockets are numbered in the diagram only, as an aid to proper memory installation

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

## 2.9 Installing the CPU and Cooling Fan

Socket370 type Pentium III processors **ONLY** (500 MHz through 1 GHz) can be used on the Thunder i840. For more information on CPU compatibility, check Tyan's website: <http://www.tyan.com>.

Remember the following: The CPU is a sensitive electronic component and it 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 the pins.

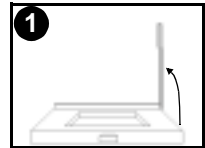


**Socket370 CPU socket**

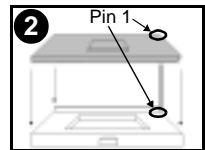
### Installing the Socket370 type CPU

Before installing the CPU, check it for damaged. Make sure that none of the pins are bent. Pin 1 on the CPU is denoted by a small dot on one of the corners, and Pin 1 on the ZIF socket is denoted by one of the angled corners (left bottom-most angle from the Intel logo).

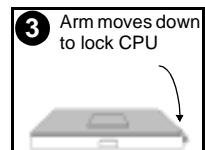
**Step 1** Carefully lift the arm of the ZIF socket until it is at a 90-degree angle pointing away from the motherboard. be very careful not to damage any components that might be next to the CPU socket. Please note that each picture for this section (see **right**) corresponds to the step.



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

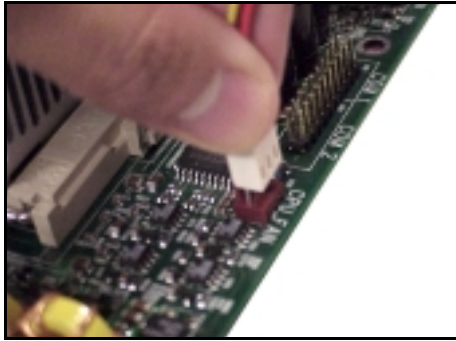


**Step 3** Push down lightly on the CPU while lowering the arm of the socket to secure the CPU (see **right**). A squeaking noise may be heard while lowering the arm, or the socket may make a 'click' noise when the arm is locked into position: these noises are normal.

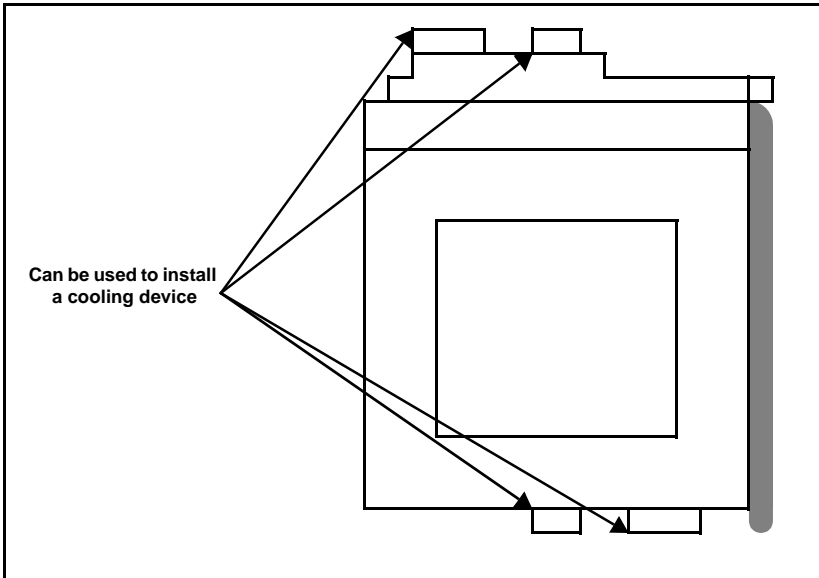


### Installing the Cooling Fan

After the CPU has been installed, you will need to **install the proper cooling device** for the CPU. This device, a heatsink/cooling fan combination, can be purchased from many computer technology vendors. Connection of the cooling device may vary depending on the fan manufacturer's design. You should take space into consideration when installing a cooling device into the CPU1 and/or CPU2 socket(s). Tyan **highly recommends** that you use some type of thermal compound between the CPU and heatsink, to maximize cooling. Please take extra caution when installing any kind of clamp-style fan, or else damage may occur to the CPU socket. See **Figure 2.3** for an example of how the fan power connector is installed.



Installing the Cooling Fan



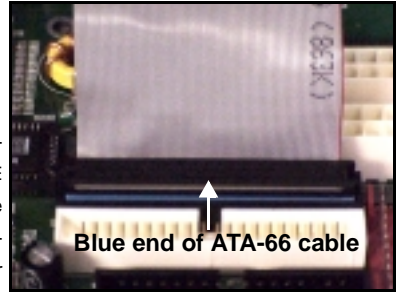
Can be used to install  
a cooling device

Mounting points on the CPU socket

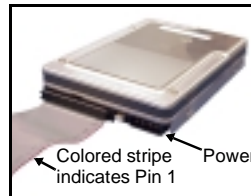
## 2.10 Connecting IDE and Floppy Drives

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**. **Figure 2.4** (see right) shows the IDE cable properly connected to the motherboard. Consult the documentation that came with your device, or contact the device's manufacturer for details on its installation. Also see **Figure 2.5** (see picture to the right) for an example of an HDD with the IDE cable installed. ATA-66 IDE HDDs require a special 80-wire, 40-pin IDE cable which has additional grounding wires, and may or may not have a notch near the blue connector. The cable is included in the Thunder i840 motherboard package. The ATA-66 cable is also upwards compatible with ATA-100 devices, and backwards compatible with ATA-33 and Legacy IDE HDDs.



**Figure 2.4**



**Figure 2.5**

**NOTE:**

The **BLUE** end of the ATA-66 cable must connect to the motherboard. The black connector on the ATA-66 cable is for the master HDD, and the grey connector is for the slave HDD. See Figure 2.4 for an example of cable installation on the motherboard.

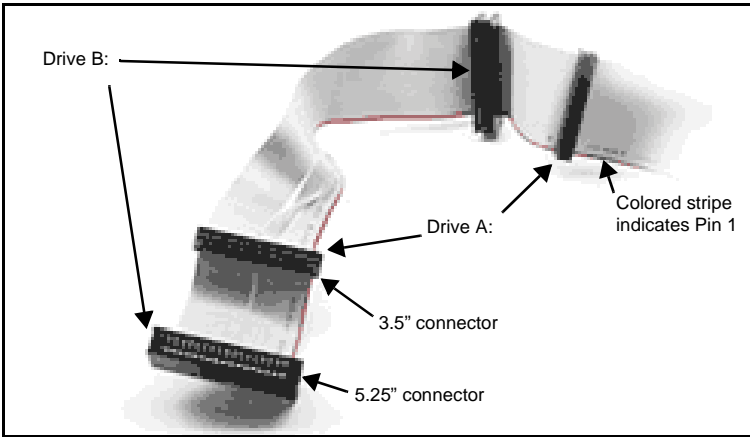
Only Tyan-approved cables are recommended for this motherboard. If you are using an existing configuration with older cables, your system might not function properly. Use only Tyan-approved cables (i.e. the ones that were included with your motherboard).

**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.

## 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 2.6 below**). 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 you to connect the cable properly.



**Figure 2.6**







The first floppy drive (denoted as A:) is usually attached to the end of the cable with the twist in it (see **Figure 2.6** above). Drive B: is usually connected to the middle of the cable. Refer to your installation instructions or call your dealer if you are unsure about attaching floppy drives. 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 plugging in a card. 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 on your system, be aware that any one of the 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. You will void your warranty and damage your system board if to 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.
-  Check speed of your **PCI add-on card** and check **p. 13** for details on setting the PCI speed.
-  Before turning on the system, make sure the cards are seated securely into their slots, and that no cards are touching.

If you follow these basic guidelines, there shouldn't be any problems with installation. However, if you do encounter any problems with your add-on cards, consult their documentation, or have a qualified professional install/troubleshoot your cards for you, otherwise contact the card's manufacturer. Remember, always read the manuals and installation notes that come with the adapter cards. They contain important information which will help you install the components right, the first time.

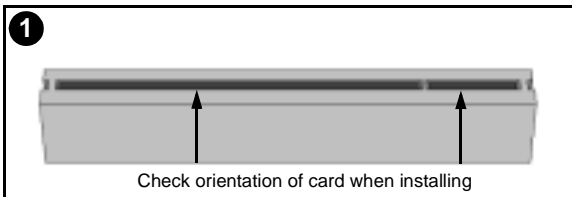


Figure 2.6a

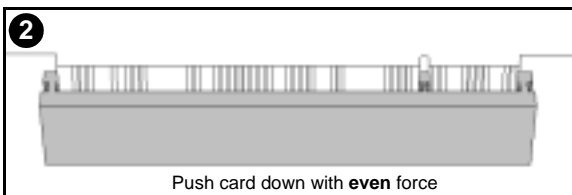
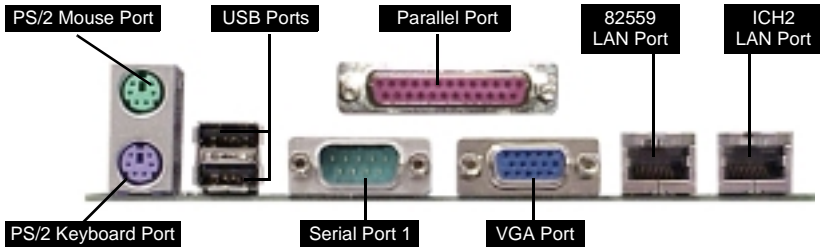


Figure 2.6b

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

This board includes ports for PS/2 mouse and keyboard, USB, video, serial and parallel ports. 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, or joystick port. It is capable of supporting up to 127 daisy-chained peripheral devices. **Figure 2.7** (below) shows the ATX double row connectors on this board. Serial Port 1, as well as the other ports, are labeled in the image below.



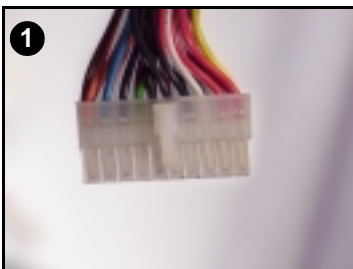
**Figure 2.7**

### A note of caution about installing external devices

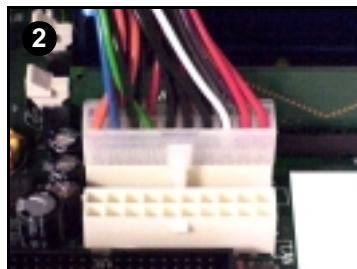
When plugging in the keyboard and mouse, or when plugging anything into any external port, make sure that the power is off. Connecting these devices and ports while the power is on is called “hot plugging”, and may damage your system.

## 2.13 Connecting the power supply

This motherboard requires an ATX power supply. Tyan recommends using one that conforms to industry standard Revision 2.01, and is **300 watts or higher**. The photos 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 more than one way, but just to be safe, make sure it looks like **Figure 2.8b**. Make certain 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. 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 check and see if you have any device conflicts related to the IRQ, or DMA. If you are using Microsoft Windows NT/2000, the Control Panel is a good place to start investigating the conflict. Please consult your operating system's 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 **300W or higher** power supply (ATX 2.01 specification or better). Lastly, make sure the motherboard is receiving adequate cooling.

**Q: I have a question about memory compatibility...**

**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 can 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/rma\\_faq.html](http://www.tyan.com/support/rma_faq.html)

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

**A:** Check the section about the Flash Utility (see p. 41) 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're replaced your battery, don't forget to check the Clear CMOS section (see p. 41) so that you reset your CMOS.

\* 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.**

The 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, FDD, etc.) and 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 AMI 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

The AMIBIOS allows you to select from several setup functions and two exit choices.

#### 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).

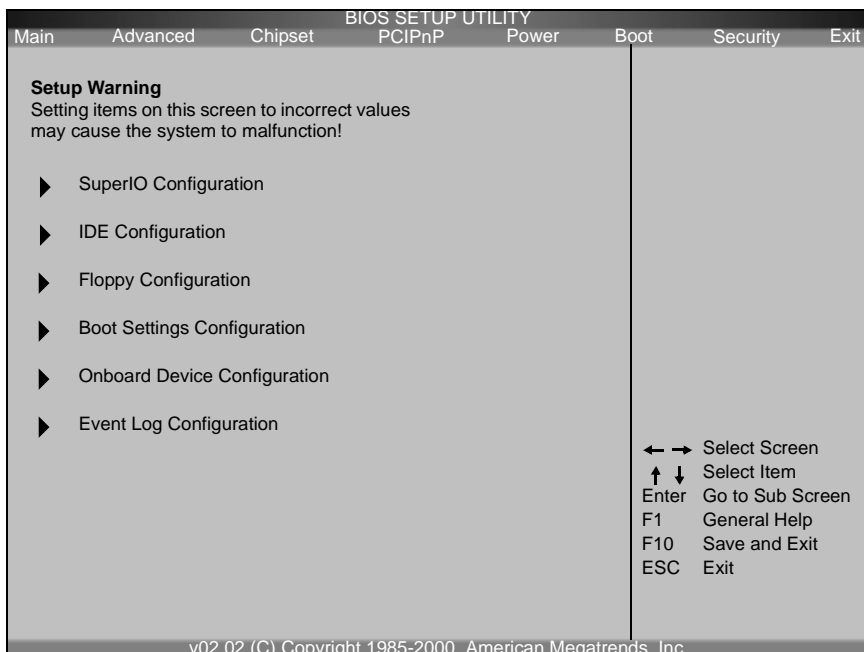
#### General Help

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).

Setting	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
- ▶ Boot Settings Configuration
- ▶ Onboard Device Configuration
- ▶ Event Log 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.

### 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 Mode</b>	Depending on your needs, the mode of Serial Port 2 can be altered. [Default is <b>Normal</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>Auto</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>0</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>Normal</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>FORCEBIOS</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. Onboard Device Configuration

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

<b>Onboard SCSI</b>	Enable or disable the integrated SCSI controller. [Default setting is <b>Enabled</b> ]
<b>Onboard SCSI Option ROM</b>	Allow for optional ROM features. [Default is <b>Enabled</b> ]

### 3.2-F. 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.



### 3.3 Chipset Setup

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

<b>Processor Serial Number</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>C000 - C400, 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>C800 - DC00, 16k Shadow</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>Write to Deact</b>	[Default is <b>3CIks</b> ]
<b>SDRAM CAS Latency</b>	[Default is <b>CAS Latency 3</b> ]
<b>ISA IO Cycle Delay</b>	[Default is <b>1.5 Bclk</b> ]
<b>MPS 1.4 Support</b>	[Default is <b>Enabled</b> ]

### 3.3-A. [MCH]

<b>RAMBUS</b>	Sets clock speed of Rambus memory. [Default is <b>400 MHz</b> ]
<b>Graphics</b>	Sets memory aperture for onboard graphics. [Default is <b>64MB</b> ]
<b>Search for MDA Resources</b>	Reserved memory function. [Default is <b>Yes</b> ]
<b>Memory Hole</b>	Enable or disable memory hole. [Default is <b>Disabled</b> ]
<b>Memory ECC Mode</b>	Engage memory's ECC capabilities. [Default is <b>Disabled</b> ]

### 3.3-B. [ICH]

<b>CPU Frequency</b>	Sets CPU frequency ratio. [Default is <b>1:2</b> ]
<b>LPC 4Eh-4Fh Decode</b>	Reserved function. [Default is <b>Enabled</b> ]
<b>LPC 2Eh-2Fh Decode</b>	Reserved function. [Default is <b>Enabled</b> ]
<b>ICH Positive Decode</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>ICH Dev31 Func3 Enable</b>	Reserved function. [Default is <b>Enabled</b> ]
<b>ICH Dev31 Func5 Enable</b>	Reserved function. [Default is <b>Enabled</b> ]
<b>ICH Dev31 Func6 Enable</b>	Reserved function. [Default is <b>Enabled</b> ]
<b>CPU BIST Enable</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>ICH DCB Enable</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>DMA-0... 7</b>	Set DMA status. [Default is <b>LPCDMA</b> ]
<b>PC/PCIB Select Enable</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>BIOS Write Protect</b>	Enable or disable BIOS write access. [Default is <b>Disabled</b> ]

### 3.3-C. Multi-Processor Support Options

<b>ICH IOAPIC</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>P64H IOAPIC</b>	Reserved function. [Default is <b>Disabled</b> ]
<b>APIC Operation in ACPI</b>	Reserved function. [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>Disabled</b> ]
<b>Legacy USB Support</b>	Enables legacy USB device support. [Default is <b>Disabled</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> ]

### 3.5 Power Menu

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

<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>Suspend</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.

## Chapter 4: System Resources

First things to check when theres an error: memory, video, and CPU. Since this board has built-in video, you will only need to check memory and CPU if there is a problem.

### 4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through a series of audible beeps. If AMI-BIOS POST can initialize the system video display, it displays the error message. Displayed error messages, in most cases, allow the system to continue to boot. Displayed error messages are described on p. 39-41. See below for the beep code explanations.

### Troubleshooting System Problems

#### If the computer beeps...

#### then...

5 times...\*

re-seat the memory. If the system still beeps, replace the memory.

6 times...\*

try a different keyboard. If the error occurs again, return the board to your dealer for a replacement.

### 4.2 Displayed Error Messages

If an error occurs after the system display has been initialized, the error message will be displayed in the following format:

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

and the system will halt. The system will not half of the "Wait for <F1> If Any Error" option in Advanced Setup is set to Disabled.

```
RUN SETUP UTILITY
```

may also appear. Press **[F1]** to run WINBIOS Setup if this message appears.

\* beep codes subject to change without notice

The table below can be used to troubleshoot error messages.

Error Message	Possible Reason For Error	Possible Solution
<b>8042 Gate-A20 Error</b>	Gate A20 on the keyboard controller (8042) is not working.	Replace the 8042
<b>Address Line Short!</b>	Error in the address decoding circuitry.	Return the board to dealer for a replacement.
<b>C: Drive Error</b>	No response from drive C:	Check the C: hard disk type in CMOS Setup.
<b>C: Drive Failure</b>	No response from hard disk drive C:	Replace the drive
<b>Cache Memory Bad, Do Not Enable Cache!</b>	Cache memory is defective.	Return the board to dealer for a replacement.
<b>CH-2 Timer Error</b>	An AT system has two timers. There is an error in timer 2.	Return the board to dealer for a replacement.
<b>CMOS Battery State Low</b>	CMOS RAM is powered by a battery. This error message indicates low battery power.	Replace the battery
<b>CMOS Checksum Failure</b>	CMOS RAM checksum is different than the previous value.	Run CMOS Setup
<b>CMOS System Options Not Set</b>	The values stored in the CMOS RAM have been destroyed.	Run CMOS Setup
<b>CMOS Display Type Mismatch</b>	The video type set in CMOS RAM does not match the type detected.	Run CMOS Setup
<b>CMOS Memory Size Mismatch</b>	The amount of memory found by AMI-BIOS is different than the amount in CMOS RAM.	Run CMOS Setup
<b>CMOS Time and Date Not Set</b>	The date and time need to be set.	Run CMOS Setup
<b>D: Drive Error</b>	No response from drive D:	Check the hard disk type in CMOS Setup
<b>D: Drive Failure</b>	No response from drive D:	Check the hard disk type in CMOS Setup
<b>Diskette Boot Failure</b>	The boot diskette in drive A: cannot be used to boot the system.	Use another boot disk
<b>Display Switch Not Proper</b>	Some systems require a video switch to be set to either color or monochrome.	Turn system off, set switch properly, then power back on

Error Message	Possible Reason For Error	Possible Solution
<b>DMA Error</b>	Error in the DMA controller.	Return the board to dealer for a replacement.
<b>DMA 1 Error</b>	Error in first DMA channel.	Return the board to dealer for a replacement.
<b>DMA 2 Error</b>	Error in second DMA channel.	Return the board to dealer for a replacement.
<b>FDD Controller Failure</b>	AMIBIOS cannot communicate with the floppy disk drive controller.	Check all appropriate connections after the system is powered down.
<b>HDD Controller Failure</b>	AMIBIOS cannot communicate with the hard disk drive controller.	Check all appropriate connections after the system is powered down.
<b>INTR1 Error</b>	Interrupt channel 1 failed POST.	Return the board to dealer for a replacement.
<b>INTR2 Error</b>	Interrupt channel 2 failed POST.	Return the board to dealer for a replacement.
<b>Invalid Boot Diskette</b>	AMIBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it.	Use another boot disk
<b>Keyboard is locked... Unlock it</b>	The keyboard lock on the system is engaged.	The system must be unlocked to continue the boot sequence
<b>Keyboard Error</b>	The keyboard has a timing problem.	Make sure a keyboard controller is installed. Set Keyboard in Advanced Setup to Not Installed to skip the keyboard POST routines.
<b>KB/Interface Error</b>	There is an error in the keyboard connector.	Check the keyboard connector when the system has powered down
<b>No ROM BASIC</b>	Cannot find a proper bootable sector on either drive A: or C:.	Check the disks for boot files
<b>Off Board Parity Error</b>	Parity error in memory installed on an adapter card in an expansion slot.  The format is: OFF BOARD PARITY ERROR ADDR = (XXXX)  XXXX is the hex address where the error occurred.	Check memory in adapter card



Error Message	Possible Reason For Error	Possible Solution
<b>On Board Parity Error</b>	Parity error in motherboard memory.  The format is: OFF BOARD PARITY ERROR ADDR = (XXXX)  XXXX is the hex address where the error occurred.	Check memory onboard
<b>Parity Error ????</b>	Parity error in system memory at an unknown address.	Reseat memory; if error occurs again change memory

### 4.3 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>

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

# Appendix I: SCSI Installation and LAN Information

## Introduction

The Adaptec 7899W enables you to connect up to 30 SCSI devices—such as very large arrays of high-performance HDDs, external storage subsystems, clustered configurations, Ultra160 hard disk drives, scanners, and CD-ROM drives.

The Adaptec 7899W can support up to two independent SCSI channels, each with a maximum throughput of 160 MBytes/sec. SCSI Channel A (marked\* either as “CH 1” or “CH A” on the board) has one internal connector. SCSI Channel B (marked\* either as “CH 2” or “CH B” on the board) has one internal connector.

You can connect Ultra160 and Ultra2 SCSI devices to the 68-pin Low Voltage Differential/Single-Ended (LVD/SE) connectors on both SCSI channels. Or you can operate the newer Ultra160 and Ultra2 devices at their maximum speed on Channel B while at the same time using legacy SCSI devices on Channel A.

This installation guide explains how to

- Set up SCSI devices
- Connect SCSI devices

## Support for Older SCSI Devices

We recommend that if you have single-ended Ultra SCSI and earlier SCSI devices you connect them to Channel A of the Adaptec 7899W SCSI and that you connect newer Ultra2 and Ultra160 SCSI devices to Channel B. This allows the Adaptec 7899W to support newer Ultra160 and Ultra2 SCSI devices at speeds up to 160 MBytes/sec while at the same time supporting Ultra (legacy) devices at speeds up to 40 MBytes/sec. It also allows you to use longer cable lengths for the newer SCSI devices.

### NOTE:

If you connect Wide Ultra/Ultra SCSI devices to the same SCSI channel as Ultra160 and Ultra2 SCSI devices, the data transfer rate for the Ultra160 and Ultra2 SCSI devices will drop to Ultra SCSI performance levels. To achieve maximum data transfer rates for the newer SCSI devices, be sure to connect them on their own SCSI channel.

## Setting up SCSI devices

There are several things you may need to do to your SCSI devices before you connect them to the Adaptec 7899W SCSI:

- Check the SCSI IDs
- Set the termination
- Connect the power cables

\* subject to change without notice

Since setup can vary from device to device, always refer to the device's documentation for specific instructions. Below are some guidelines for setting SCSI IDs and termination on your devices.

### Check the SCSI IDs

The Adaptec 7899W and each device you connect to it must have a unique SCSI ID number ranging from 0 to 15 on each channel. No two devices on the same SCSI channel can have the same SCSI ID.

The Adaptec 7899W is preset to ID 7 for each channel and should not be changed. If you boot from a SCSI hard disk, make sure the hard disk SCSI ID is set to 0. (Most SCSI hard disks are preset to SCSI ID 0 at the factory.) The SCSI IDs for internal devices are usually set with jumpers; SCSI IDs for external devices are usually set with a switch on the back of the device.

### Terminate the Ends

To ensure reliable communication on the SCSI bus, the device at the end of each cable, or the end of the cable itself, must have a terminator installed (or enabled). Terminators must be removed, or termination must be disabled, on devices between the ends of each cable.

#### NOTE:

When connecting Ultra160 or Ultra2 SCSI devices, the SCSI bus must be terminated either on the end of the cable (with a permanent terminator) or with a separate terminating connector. Ultra SCSI and earlier single-ended devices can terminate the bus directly from the device. If you use an Ultra SCSI terminator on an LVD Ultra160 and Ultra2 SCSI bus you will force the bus to Single-ended mode, limiting the speed and cable distance. For this reason be sure that you have the necessary Ultra160 or Ultra2 cable or terminator before installing the Ultra160 SCSI devices.

### Connecting SCSI Devices

You can connect a total of 30 SCSI devices to the Adaptec 7899W, with up to 15 devices on each SCSI channel. Before connecting devices, be sure to review **Setting up SCSI Devices** on p. 42.

### Connecting Internal Ultra160 and Ultra2 Devices

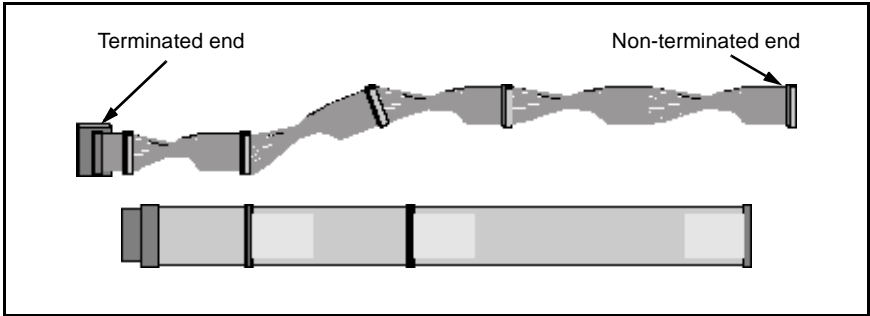
A special 68-pin internal LVD cable is needed to connect internal Ultra160 or Ultra2 SCSI devices. If your cables are not marked, you can identify most LVD cables as having twisted pairs of the flat ribbon cable between the device connectors. Some cables are laminated so that they lay flat. Internal LVD cables usually have a terminator built into the end of the cable.

The Adaptec 7899W has two separate Ultra160 SCSI channels, as shown on the board map on p. 11. Each channel has an internal LVD/SE connector to which you can connect internal SCSI devices. Follow these steps to connect your internal Ultra160 and Ultra2 devices:

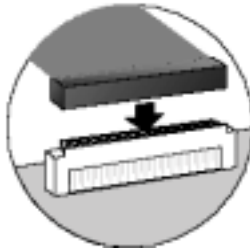
**NOTE:**

We recommend that you keep your Ultra160 and Ultra2 SCSI devices on a separate SCSI channel from your Ultra SCSI devices. This allows the newer Ultra160 and Ultra2 SCSI devices to transfer data at their maximum speed.

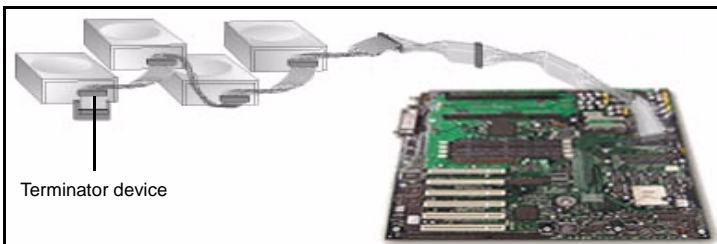
- Step 1** Locate a 68-pin internal LVD SCSI cable, which may have either twisted wires or flat wires, as shown here.



- Step 2** Plug the non-terminated end of the cable(s) to the LVD/SE SCSI connector(s) (shown below).



- Step 3** Plug the internal Ultra160 and Ultra2 SCSI devices to the other cable connectors, starting with the connector at the terminated end of the cable (note: example installation below may not identically represent installation).

**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.

**Step 4** Connect a power cable from your computer's internal power supply to each internal SCSI device.

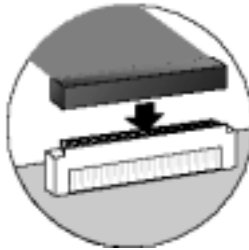
### Connecting Wide SCSI Devices

You can connect Wide SCSI devices to the internal LVD/SE connectors. If you do this, we recommend that you connect them to the SCSI Channel A LVD/SE connector and that you connect all Ultra160 and Ultra2 devices to the SCSI Channel B connector. Follow these steps to connect Wide SCSI devices:

**Step 1** Locate a 68-pin internal Wide SCSI cable.



**Step 2** Plug one end of the cable to one of the SCSI connectors.



**Step 3** Plug the other end of the cable to a **terminated** Ultra/Fast Wide SCSI device.

**Step 4** If you have other Ultra/Fast Wide SCSI devices, attach them to the connectors between the two ends of the cable. Be sure these other devices are **unterminated**.

**Step 5** Connect a power cable from your computer's internal power supply to each internal device.

### More information about termination

The last SCSI device on the end of each SCSI bus cable must be terminated, and termination must be **disabled** for all other devices in the middle of the cables. Ultra160 and Ultra2 SCSI devices are automatically un-terminated, but Ultra SCSI and Fast/Wide SCSI devices do have termination that you must check. For more information, refer to the documentation for each SCSI device. If you are using external Ultra2 or Ultra160 devices, be sure to use an LVD terminator to terminate the last device in the chain. If you use a single-ended, active terminator (sometimes called an Ultra terminator) the SCSI devices will not operate at their maximum speed.

If you have any problems while setting up SCSI devices, check the following items first:

- Are all SCSI devices powered on?
- Are all SCSI cables and power cables properly connected?
- Does each device on each SCSI bus have a unique SCSI ID?
- Does the total SCSI cable length exceed the maximum allowable length? (See table below.)
- Is the SCSI bus properly terminated?

If you are still unable to resolve a problem, contact your vendor for help.

### Maximum Cable Lengths

Maximum Cable Length	Data Transfer Rate	Maximum Devices Supported
25 m (82.0 ft)	Ultra160 SCSI (160 MBytes/sec) and Ultra2 SCSI (80 MBytes/sec)	1
12 m (39.4 ft)	Ultra160 SCSI (160 MBytes/sec)* and Ultra2 SCSI (80 MBytes/sec)	15
3 m (9.8 ft)	Fast Wide SCSI (20 MBytes/sec)	15
3 m (9.8 ft)	Fast SCSI (10 MBytes/sec)	7
3 m (9.8 ft)	Ultra SCSI (40 MBytes/sec for 16-bit, 20 MBytes/sec for 8-bit)	4
1.5 m (4.9 ft)	Ultra SCSI (40 MBytes/sec for 16-bit, 20 MBytes/sec for 8-bit)	5-7**

\* Mixing Fast/Ultra devices with Ultra160 and Ultra2 SCSI devices causes the entire SCSI bus to default to Ultra SCSI speeds and cable length requirements.

\*\* Ultra SCSI data transfer rates do not currently support more than seven devices connected to the SCSI card.

## Configuring the Adaptec 7899W SCSI with SCSISelect

SCSISelect enables you to change SCSI settings without opening the computer or handling the card. SCSISelect also enables you to low-level format or verify the disk media of your SCSI hard disk drives. The following table lists the available and default settings for each SCSISelect option. The settings that are marked as "Auto-sync" are automatically synchronized for both SCSI channels—for example, if you change the Boot Channel option to **B First** on Channel A, the change will apply to Channel B as well. All other options can be set separately for each of the two SCSI channels.

The default settings are appropriate for most systems and should not be changed. Run SCSISelect if you need to change or view current settings, or if you need to use the SCSI disk utilities.

SCSISelect Options	Available Settings	Default Setting
<b>SCSI Bus Interface Definitions:</b>		
Host Adapter SCSI ID	0-15	7
SCSI Parity Checking	Enabled Disabled	Enabled
Host Adapter SCSI Termination: Ch. A	Automatic Low On/High On Low Off/High Off Low Off/High On	Automatic
Ch. B	Automatic, Enabled, Disabled	Automatic
<b>Boot Device Options:</b>		
Boot Channel <i>[Auto-sync]</i>	A First, B First	A First
Boot SCSI ID	0-15	0
Boot LUN Number <sup>a</sup>	0-7	0
<b>SCSI Device Configuration:</b>		
Sync Transfer Rate (MBytes/sec)	160, 80.0, 53.4, 40.0, 32.0, 26.8, 20.0, 16.0, 13.4, 10.0, ASYN	160
Initiate Wide Negotiation	Yes, No	Yes (Enabled)
Enable Disconnection	Yes, No	Yes (Enabled)
Send Start Unit Command	Yes, No	Yes (Enabled)
Enable Write Back Cache <sup>b</sup>	Yes, No, N/C (No Change)	N/C (No Change)
BIOS Multiple LUN Support <sup>b</sup>	Yes, No	No (Disabled)
Include in BIOS Scan <sup>b</sup>	Yes, No	Yes (Enabled)
<b>Advanced Configuration Options:</b>		
Reset SCSI Bus at IC Initialization	Enabled, Disabled	Enabled
Display <Ctrl> <A> Messages during BIOS Initialization <i>[Auto-sync]</i>	Enabled, Disabled	Enabled
Extended BIOS Translation for DOS Drives > 1 GByte	Enabled, Disabled	Enabled
Verbose/Silent Mode <i>[Auto-sync]</i>	Verbose, Silent	Verbose

SCSISelect Options	Available Settings	Default Setting
Host Adapter BIOS [ <i>Auto-sync</i> ]	Enabled Disabled: Scan Bus Disabled: Not Scan	Enabled
Domain Validation <sup>b</sup> [ <i>Auto-sync</i> ]	Enabled, Disabled	Enabled
Support Removable Disks Under BIOS as Fixed Disks <sup>b</sup>	Disabled, Boot Only, All Disks	Disabled
BIOS Support for Bootable CD-ROM <sup>b</sup>	Enabled, Disabled	Enabled
BIOS Support for Int 13 Extensions <sup>b</sup>	Enabled, Disabled	Enabled

a. Setting is valid only if Multiple LUN Support is enabled.

b. Settings are valid only if host adapter BIOS is enabled.

### Follow these steps to start SCSISelect:

**Step 1** Turn on or restart your system.

**Step 2** During the startup process, pay careful attention to the messages that appear on your screen. When the following message appears on your screen, press the **[Ctrl]+[A]** keys simultaneously (this message appears for only a few seconds):

Press <Ctrl><A> for SCSISelect (TM) Utility!

**Step 3** Select SCSI Channel **A** or **B**. Most SCSISelect options can be set separately for each SCSI channel.

**Step 4** From the menu that appears, use the arrow keys to move the cursor to the option you want to select, then press **[Enter]**.

---

Note: If you have difficulty viewing the display, press **F5** to toggle between color and monochrome modes. (This feature may not work on some monitors.)

---

### Exiting SCSISelect

Follow these steps to exit SCSISelect:

**Step 1** Press **Esc** until a message prompts you to exit (if you changed any settings, you are prompted to save the changes before you exit).

**Step 2** At the prompt, select **Yes** to exit, then press any key to reboot the computer. Any changes you made in SCSISelect take effect after the computer boots.



## Using SCSISelect Settings

To select an option, use the arrow keys to move the cursor to the option, then press **[Enter]**.

In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing **[Esc]**.

To restore the original SCSISelect default values, press **[F6]** from the main SCSISelect screen.

## SCSI Bus Interface Definitions

- **Host Adapter SCSI ID**—(Default: 7) Sets the SCSI ID for the SCSI controller. The Adaptec 7899W is set at 7, which gives it the highest priority on the SCSI bus. We recommend that you do not change this setting.
- **SCSI Parity Checking**—(Default: *Enabled*) When set to **Enabled**, verifies the accuracy of data transfer on the SCSI bus. Leave this setting enabled unless any SCSI device connected to the Adaptec 7899W does not support SCSI parity.
- **Host Adapter SCSI Termination**—(Default: *Automatic*) Determines the termination setting for the SCSI controller. The default setting is *Automatic*, which allows the SCSI controller to adjust the termination as needed depending on the configuration of the connected SCSI devices. We recommend that you do not change this setting.

## Boot Device Options

- **Boot Channel**—(Default: *A First*) Specifies which of the two SCSI channels the boot device is connected to (if the computer boots from a SCSI device). If you change this setting, the change automatically applies to both SCSI channels.
- **Boot SCSI ID**—(Default: 0) Specifies the SCSI ID of your boot device. We recommend that you do not change the default setting.
- **Boot LUN Number**—(Default: 0) Specifies which LUN (Logical Unit Number) to boot from on your boot device. This setting is not valid unless Multiple LUN Support is Enabled

## SCSI Device Configuration Options

SCSI Device Configuration options can be set individually for each connected SCSI device.

---

Note: To configure settings for a SCSI device, you must know its SCSI ID.

---

- **Sync Transfer Rate**—(Default: 160) Determines the maximum synchronous data transfer rate that the SCSI controller supports. We recommend that you leave the maximum (default) value of 160 MBytes/sec.
- **Initiate Wide Negotiation**—(Default: Yes) When set to **Yes**, the SCSI controller attempts 16-bit data transfer (wide negotiation). When set to **No**, the SCSI controller uses 8-bit data transfer unless the SCSI device requests wide negotiation.

---

Note: Set Initiate Wide Negotiation to **No** if you are using an 8-bit SCSI device that hangs or exhibits other performance problems with 16-bit data transfer rate enabled.

---

- **Enable Disconnection**—(Default: Yes) When set to **Yes**, allows the SCSI device to disconnect from the SCSI bus. Leave the setting at **Yes** if two or more SCSI devices are connected to the SCSI chip. If only one SCSI device is connected, changing the setting to **No** results in slightly better performance.
- **Send Start Unit Command**—(Default: Yes) When set to **Yes**, the Start Unit Command is sent to the SCSI device at bootup.

The following three options have no effect if the SCSI BIOS is disabled. (The SCSI BIOS is normally enabled by default.)

- **Enable Write Back Cache**—(Default: *N/C*) Can be used to enable or disable the write-back cache on SCSI disk drives connected to the host adapter. Leave this option at its default setting of *N/C* (no change), which usually allows for optimum drive performance.
- **BIOS Multiple LUN Support**—(Default: *No*) Leave this setting at **No** if the device does not have multiple Logical Unit Numbers (LUNs). When set to **Yes**, the SCSI controller BIOS provides boot support for a SCSI device with multiple LUNs (for example, a CD “juke box” device in which multiple CDs can be accessed simultaneously).
- **Include in BIOS Scan**—(Default: *Yes*) When set to **Yes**, the SCSI controller BIOS includes the device as part of its BIOS scan at bootup.

### Advanced Configuration Options

---

Note: *Do not change the Advanced Configuration Options unless absolutely necessary.*

---

- **Reset SCSI Bus at IC Initialization**—(Default: *Enabled*) When set to **Enabled**, the SCSI controller generates a SCSI bus reset during its power-on initialization and after a hard reset.
- **Display <Ctrl> <A> Messages during BIOS Initialization**—(Default: *Enabled*) When set to **Enabled**, the SCSI BIOS displays the Press <Ctrl> <A> for SCSISelect (TM) Utility! message on your screen during system bootup. If this setting is disabled, you can still invoke the SCSISelect utility by pressing <Ctrl> <A> after the SCSI BIOS banner appears. If you change this setting, the change automatically applies to both SCSI channels.
- **Extended BIOS Translation for DOS Drives > 1 GByte**—(Default: *Enabled*) When set to **Enabled**, provides an extended translation scheme for SCSI hard disks with capacities greater than 1 GByte. This setting is necessary only for MS-DOS 5.0 or above; it is not required for other operating systems.

---

Caution: Changing the translation scheme destroys all data on the drive. Be sure to back up your disk drives before changing the translation scheme.

---

Use the MS-DOS Fdisk command to partition a disk larger than 1 GByte controlled by the SCSI BIOS, when using DOS.

- **Verbose/Silent Mode**—(Default: *Verbose*) When set to **Verbose**, the SCSI BIOS displays the host adapter model on the screen during system buildup. When set to **Silent**, the message will not be displayed during bootup. If you change this setting, the change automatically applies to both SCSI channels.
- **Host Adapter BIOS (Configuration Utility Reserves BIOS Space)**—(Default: *Enabled*) Enables or disables the SCSI BIOS. If you change this setting, the change automatically applies to both SCSI channels.
  - Leave at **Enabled** to allow the SCSI BIOS to scan and initialize all SCSI devices at initial bootup.
  - Set to **Disabled: Not scan** if the devices on the SCSI bus (e.g. CD-ROM drives) are controlled by software drivers and do not need the BIOS, and you do not want the BIOS to scan the SCSI bus.
  - Set to **Disabled: Scan Bus** if you don't need the BIOS, but want to scan SCSI devices on the bus.

The following four options on the next page have no effect when the SCSI BIOS is disabled. (The SCSI BIOS is normally enabled by default.)

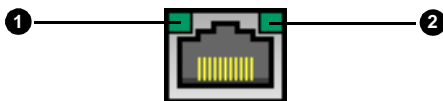
- **Domain Validation**—(Default: *Enabled*) Determines what kinds of SCSI devices are connected and reduces data transfer speed if it detects older legacy SCSI devices. Displays the resulting data transfer rate. If you change this setting, the change automatically applies to both SCSI channels.
- **Support Removable Disks Under BIOS as Fixed Disks**—(Default: *Disabled*) Determines which removable-media drives are supported by the SCSI controller BIOS. The options are as follows:
  - **Disabled**— No removable media drives are treated as hard disk drives. Software drivers are then required from the vendor, because the drives themselves are not controlled at all by the BIOS.

**NOTE:** *You may lose data* if you remove a removable-media cartridge from a SCSI drive controlled by the SCSI controller BIOS while the drive is on. If you want to be able to remove the media while the drive is on, install the removable-media software driver and set Support Removable Disks Under BIOS as Fixed Disks to **Disabled**.

  - **Boot Only**—Only the removable media drive designated as the boot device is treated as an HDD
  - **All Disks**—All removable media drives supported by the BIOS are treated as HDDs
  - **BIOS Support for Bootable CD-ROMs**—(Default: *Enabled*) When set to **Enabled** the SCSI controller BIOS allows the computer to boot from a CD-ROM drive.
  - **BIOS Support for Int 13 Extensions**—(Default: *Enabled*) When set to **Enabled**, the SCSI controller BIOS supports Int 13h extensions as required by Plug-and-Play. The setting can be either enabled or disabled if your system is not Plug-and-Play

#### LAN Information

Your motherboard has (1) onboard Intel 82559 LAN controller and (1) ICH2 82562ET LAN controller. LAN capabilities including 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/Green Light	LED (2) - Yellow Light
Good connection @ 10 Mbps	LED (1) is GREEN	ON
Good connection @ 100 Mbps	LED (1) is ORANGE	ON
No connection	Orange or green*	OFF
Data being transferred	Orange (10Mbps) or Green (100Mbps)	LED is blinking

\* Depends on last connection made. For example, if the last connection was 100 Mbps and then the connection was broken, the light may stay orange.

## 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-Out 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** (Power Management timers): software timers that count down the number of seconds or minutes until the system times out and enters sleep, suspend, or doze mode.

**PnP** (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Novice end users can simply plug them into a computer that is running on a Plug-n-Play aware operating system (such as Windows 98), and go to work. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**Striping**: see RAID.

**RAID** (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly, also the multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

**RAM** (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data, is often used to refer to the system's main memory. This memory is available to any program running on the computer.

**ROM** (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

**SCSI** (Small Computer Systems Interface): pronounced "scuzzy". SCSI is an industry-standard computer interface for connecting SCSI devices such as HDDs, CD-ROMs, etc. to a common SCSI bus. There are several variations of SCSI, including UltraSCSI, Ultra2 SCSI, Ultra Wide, and so on.

**SDRAM** (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

**Serial port**: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

**SIMM** (Single In-line Memory Module): 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.



**SIMM bank/socket:** SIMM sockets are the physical slots into which you install SIMM modules. A pair of SIMM sockets form a SIMM bank, and act as one unit. If only one socket is filled, the bank will not operate.

**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.