Tyan S2060

Tomcat i815e

Motherboard User's Manual
Revision 1.01

Table of Contents

* Indicates an optional feature available on some models of Tomcat i815e.

chapter 1

Introduction

Overview

The Tomcat i815e is a quality, high performance motherboard designed for Socket 370 Type Intel Pentium III / Celeron microprocessors. The Tomcat i815e utilizes the Intel i815e Chipset with AMI BIOS and can support CPU speeds of 500 MHz through 800 MHz, and host bus speeds of 66MHz to 133MHz. For CPU speed support, please refer to the CPU Compatibility Chart in Tyan's website:

http://www.tyan.com/support/html/pentiumii_iii_ppga.html

The Tomcat i815e motherboard, provides high performance capabilities that are ideal for a wide range of demanding applications such as CAD, CAM, CAE, desktop publishing, 3D modeling, animation, and video production.

This integrated high-performance system board in an ATX form factor offers more features and expandability than other ATX boards in its class. Some of the features included are onboard UltraDMA 66 / 100, onboard digital link sound (optional) and built-in Intel 3D Graphics accelerator for enhanced graphics performance.

Flexibility and expandability have been designed into the Tomcat i815e. With I/O and drive controller support built onboard (along with the many onboard features previously mentioned), the AGP 2x / 4x slot and six PCI slots are free for more add-on expansion cards.

Remember to take a look at Tyan's web site located at **http://www.tyan.com**. There you can find information on all of Tyan's products along with FAQs, distributors list, drivers, and BIOS setting explanations.

Icons

In order to help you navigate this manual and set up your system, we have added several icons to our format.

This icon alerts you to particularly important details regarding the setup or maintenance of your system. This icon often appears next to information that may keep you from damaging your board or system. While we will often point out the most vital paragraphs in a chapter, you should always read every word in the text. Failing to do so can lead to exasperation and expense.

Wherever possible, we have included step-by-step instructions for setting up your system, which are indicated by this icon. However, it is in your best interest to read an entire section (and perhaps the entire manual) before you begin to install your motherboard.

While we have alerted you to potential dangers in several places in the manual with this icon, these warnings should not be regarded as the whole of your safety regimen. Never forget that computers are electrical devices, and are capable of delivering a shock. Prevent damage to yourself and to your board: always ensure that your system is turned off and unplugged whenever you are working with it, and that you are equipped with a static safety device. If a static safety device is not available to you, remember to touch any un-painted metal surface in your case before handling your board.

Hardware Specifications/Features

Processor Information
- Single PGA370 Socket
- Intel® Pentium III (FC-PGA) 500 mhz-800MHz*
- Intel® Celeron (FC-PGA) 533 mhz - 600 MHz*
- Intel® Celeron (PGA370) 300 mhz - 533 mhz*
- On-board VRM
- Frontside Bus support for 66 / 100 / 133 MHz

Expansion Slots
- One 2x / 4x mode 3.3V / 1.5V AGP slot
- Six 32-bit PCI slots
- Total seven usable slots

Chipset Information
- Intel® i815e AGPset
- MCH + ICH2 + FWH (4Mb)
- National PC87366 LPC Super I/O Chipset

Hardware Monitoring
- National PC87366 hardware monitoring chip
- 3-pin fan monitoring headers
- 2-pin Chassis intrusion header
- Flexible temperature and voltage sensing
- 3-pin Wake on LAN header (optional)
- 3-pin Wake on Ring header (optional)

Memory***
- Three 3.3V 168-pin DIMM sockets
- Supports up to 512 MB PC100 / PC133
  Unbuffered, non-ECC, non-registered SDRAM

Integrated PCI IDE
- Dual channel master mode
- Up to four Enhanced IDE devices
- Support for UDMA 33/66/100 IDE drives and
  ATAPI compliant devices

Integrated I/O
- One Floppy connector for up to two drives
- Two 9-pin UART serial ports
  (**one port is via cable -optional**)**
- One 25-pin ECP/PPP parallel port
- PS/2 keyboard and mouse ports
- Four USB ports (**two ports via cable -optional**)**

*** See Tyan website for Memory Compatibility details: **http://www.tyan.com**

Integrated LAN Controller
(Manfuacturing Option)
- One Intel® ICH2 s/82562M "Kinnereth"
  controller
- 10/100 Mbps data transfer rate
- 3-pin Wake on LAN (optional)

Integrated 2D/3D Graphics
- Intel i815e D.V.M. Technology graphics core
- Integrated 230 Mhz DAC
- Integrated H/W Motion Compensation
  engines
- Optional 4 MB PC133 SDRAM AGP In-Line
  Memory Module (AIMM) to improve graphics
  performance
- Standard 15-pin Analog VGA port

Integrated Audio
(Manufacturing Option)
- Software audio codec
- Line-in, line-out, mic and game / MIDI ports
- 4-pin CD-ROM audio header (ATAPI)

BIOS
- AMI BIOS 4 Mbit Flash
- Supports APM 1.2 & ACPI 1.0
- Auto detection of memory size
- Auto configuration of IDE hard disk types
- User settings of hardware monitoring
- Mutliple boot options
- DMI 2.0 compliant

Form Factor
- ATX 2.03 (12" x 8")
- One 20-pin ATX power connector
- Stacked mouse and keyboard ports
- Stacked two USB; one RJ-45 with LED
  ports (optional)
- Stacked one serial, one video, and one parallel
  port
- Stacked audio and game / MIDI ports (optional)

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

* See Tyan website for CPU Compatibility List:
    http://www.tyan.com/support/html/pentiumii_iii_ppga.html

** Extra cables available for sale at etyan: **http://www.etyan.com**

Software Specifications

O S   •Operates with Windows 98/ME,
                                       Windows 2000, and Red Hat Linux 6.2

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. Further, if you purchased your system from a dealer near you,
you can actually bring your system in to them to have it serviced, instead of attempt-
ing to do so yourself (which can have expensive consequences).

Help resources:
1. See FAQ and beep codes sections of this manual.
2. See Tyan web site for FAQ, bulletins, driver updates, etc: **http://www.tyan.com**
3. Contact your dealer or distributor for help BEFORE calling Tyan.
4. Check the Tyan user group: **alt.comp.periphs.mainboard.tyan**

Returning Merchandise for Service

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

For Resellers Only:
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 manufac-
turer 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, or hand-carried to the manufacturer. Tyan will pay to have
the board shipped back to you.

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chapter 2

Board Installation

Unpacking

The motherboard package should contain the following:
- (1) Tomcat i815e mainboard
- (1) 34-pin floppy cable
- (1) 80-wire, 40-pin ATA-66/100 IDE cable with blue connector included
- (1) Tomcat i815e User's Manual
- (1) Driver CD
- (1) I/O shield included (**optional**)

Installation

You are now ready to install your motherboard. The mounting hole pattern of the Tomcat i815e matches the ATX system board specifications. Your chassis should support a standard ATX mainboard form factor.

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

What's the first thing I should do?
The first thing you should do is read this user's manual. It contains important information which will make configuration and setup much easier.

Here are some precautions you should follow when installing your motherboard:

(1) **Ground yourself properly before removing your motherboard from the antistatic bag.** Unplug the power from your computer and then touch any unpainted metal part on the computer case. (Or wear a grounded static safety 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.

! important!

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

Press down on any of the socket 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 damage unlike physical damage, causes the device to fail over time.

1.
2.
3.

procedure

Installation Steps

1. Set Jumpers
2. Mount Motherboard in Chassis
3. Install Memory
4. Install CPU & Cooling Fan
5. Connect IDE and Floppy Drives
6. Install Add-on Cards
7. Connect PS/2, USB, Ethernet (optional), Serial and Parallel Devices
8. Connect Power Supply

Quick References for Jumpers

In this manual, the terms "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 the **Figure 2-1** for examples of "on" and "off" pins and jumpers. The square pin in the diagram is Pin 1.

Jumpers and pins are connected by slipping the blue plastic jumper connector overtop 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 2-2** for more example of pin connections.

Figure 2-1   **Figure 2-2**
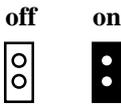
2 pin jumpers   **3 (or more) pin jumpers**

| off | on | | 1-2 | 2-3 | open |
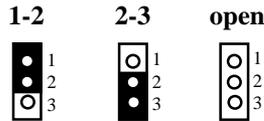
The tables and maps on the following pages will help you set the jumpers for CPU speed, Infrared, and external connector pin assignments, among others. The miniature motherboard maps will help you locate the jumpers on your board. A full-page map of the motherboard can be found on the next two pages.

Map of Motherboard Jumpers

Mouse
Keyboard
Power Supply
FAN1
LAN*
FDD
2 USB Ports
Com1 Port
Intel® PGA 370 FSB 66/100/133 MHz
S-IDE
LPT1 Printer Port
Video Out
Game Port*
Intel® i815e
FAN2
FAN4
Mic*
Line-in*
Line-out*
P-IDE
1 AGP 2x / 4x
3 DIMM Sockets (PC100/133)
PJ2
6 32-bit PCI slots
Audio Codec*
J29* J37*
Software audio codec*
Intel® i815e
1 J18
1 J13
1 J33
J15
J34*
J8*
J7 1
JP1
Battery
FAN3
JP2
Super I/O
J12
BIOS
1 J38
TYAN S2060

The tiny "1"s next to jumpers of 3 pins or more indicate the position of pin 1 for that jumper.

* Indicates an optional feature available on some models of Tomcat i815e.

Map of Tomcat i815e Features

Ethernet*, 2 USB ports

PS/2 Mouse & Keyboard ports

Socket 370 Type for Celeron/PIII CPU

ATX Power Supply Header

3 DIMM slots

Floppy connector

Parallel, COM1, VGA ports

Primary IDE

Secondary IDE

Joystick port*, mic*, line-in*, line-out*

Intel i815e AGPset

USB

Internal Buzzer

Battery

Software audio codec*

6 PCI slots

AGP 2x / 4x slot

National hardware monitoring chip

AMI (BIOS)
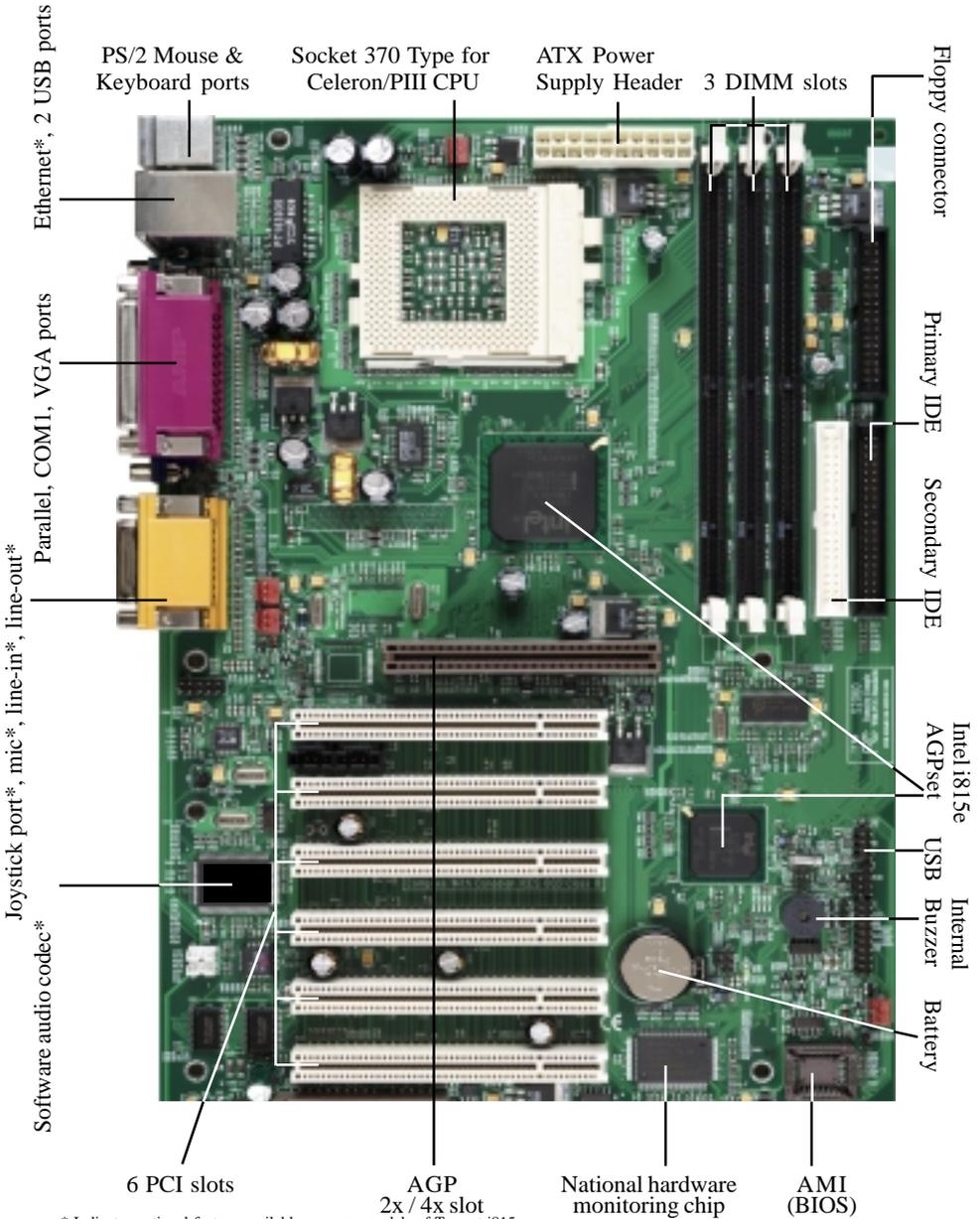
* Indicates optional feature available on some models of Tomcat i815e.

1. Setting Jumpers

Note: There are no Jumper settings for CPU bus speed or clock multiplier on the Tomcat i815e board. The Tomcat i815e is designed to automatically detect the socketed Pentium III / Celeron CPU and its proper speed settings.

INSTALL

1-A. J15 External Pin Assignments

HDD LED	VCC+	1	2	Power LED+	Pwr/Slp LEDs
	Ground	3	4	Sleep LED+	
Reset Switch	Ground	5	6	Power On/Off	Power (Sleep) Switch
	Switch	7	8	Pwr On/Off GND	
Infrared	IR +5V	9	10	NO CONNECT	
	IR RX	11	12	Ground	
	IR GND	13	14	NO CONNECT	
	IR TX	15	16	NO CONNECT	
	IR RX2	17	18	NO CONNECT	

J15, J33

JP1 (clear CMOS)   JP2
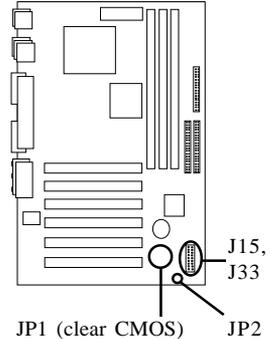
1-B. Power LED (J33)

Pin	1	2	3
	+5 VSB LED YEL	Ground	VCC LED GRN

Jumper J33 is a 3-pin ACPI LED header. If you need a 2-pin Power LED header, use jumper J15 above.

1-C. Clear CMOS and Reset Password (JP1)

	Default	Reset
JP1	1-2	2-3

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

       1. Power off the system and unplug power cable from the motherboard.
       2. Set jumper JP1 to pins 2 and 3.
       3. Wait for 10 seconds, then return jumper JP1 to pins 1 and 2.
       4. Plug in power cable and power on the system again.

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

1-D. BIOS Flash TL (JP2)

	Close	Open
JP2	Unlock	Lock Flash TL

By default, this jumper is set to **OPEN** (locked) position. Having the Top Lock (TL) protection "locked" will allow normal system operation. Closing jumper JP2 (un-locked) will allow the BIOS to be flashed. **NOTE: If the jumper JP2 is closed (unlocked), and if failure occurs during a new BIOS flash, you run the risk of rendering your entire system unbootable. The "backup" protection of the Boot Block will be lost.**

! important!

1-E. Wake-On Ring Connector (optional) (J34)

Pin	1	2	3
	+5 VSB	Ground	WOR

1-F. Wake-On LAN Connector (optional) (J8)

Pin	1	2	3
	+5 VSB	Ground	WOL

1-G. Chassis Intrusion Alarm Connector (J7)

The jumper J7 connector is an intrusion alarm connector. When attached to the chassis, this alarm will alert the system administrator when someone opens the system's case.

1-H. Fan Connectors (FAN1,FAN2,FAN3,FAN4)

Pin	1	2	3
	Ground	+12V	Speed

Fan1 is for the CPU fan. **Fan2**, **Fan3**, and **Fan4** connectors are for the Chassis Fans. You can monitor the status of three of these Fans by using Intel's LANDesk system management software.

1-I. External Speaker Connector (J13)

The external speaker should be connected to pins 1-4 of jumper J13.

Pin	1	2	3	4
	VCC	~	Buzzer	SpkDrv

1-J. CD Audio Connector (optional) (J29)

Pin	1	2	3	4
	CD-L	Ground	Ground	CD-R

1-K. AUX Audio Connector (optional) (J37)

Pin	1	2	3	4
	L	Ground	Ground	R

1-L. COM2 port header (PJ2)

This is the connector header for the COM2 Port (see **p. 30** for availability of cable).

1-M. LAN EEPROM Enable/Disable (optional) (J38)

	Enable	Disable
J38	1-2	2-3

By default, jumper J38 is set to ENABLE (close pins 1-2). Disabled settings are reserved and settings should remain default. The LAN EEPROM contains the configuration data for the LAN controller. Enabling J38 will allow normal operation of the LAN EEPROM.
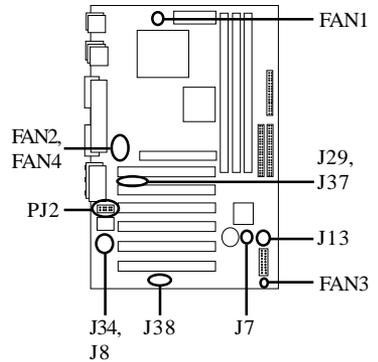
1-N. Front Side USB Header (J18)

Certain computer chassis allow for two front-end USB port connections. This board provides a front side USB header should you decide to set up a USB connector at the front side of your computer. **Note: The front side USB header supports a seperate channel from the rear USB ports.***

1-O. External HDD LED (J12)

Connecting J12 to an external device (i.e. SCSI card) will result in the LED output of the device to be redirected to the front panel HDD LED.
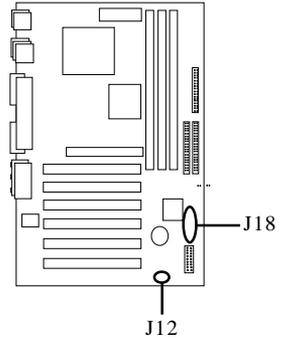
Soft Power Connector

The Soft Power Connector is part of jumper block J15 (pins 6-8). The Tomcat i815e uses the chipset for power management, including turning on and off the system. If the Power Button Function option in the BIOS Power

J18

J12

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 option is set to Suspend, pressing the power button once will wake 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.

Hardware Reset Switch Connector Installation

The Reset switch on your case's display panel provides you with the Hardware Reset function, which is the same as power on/off. The system will do a cold start after the Reset button is pushed.

CMOS RTC

The Real Time Clock (RTC) circuit, which provides the date and time for the system is integrated into the i815e chipset. If the external battery for the RTC is low, it will prevent your system from POSTing, and you will not get a display. Normally the life span of an external battery is 2 years. If yours is running low, you will need to replace it with a new 3V lithium battery (Sony CR2032).

Flash EEPROM

The Tomcat i815e uses flash memory to store BIOS firmware. It can be updated as new versions of the BIOS become available. You can upgrade your BIOS easily using the Flash Writer Utility (see page 50). **NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. Tyan does not have a policy of replacing BIOS chips directly with end users. In no event will Tyan be held responsible for damage done to the BIOS by the end user.**

⚠ **important!**

* Extra cables available at etyan: **http://www.etyan.com**

2. Mounting the Motherboard in the Chassis

Follow the instructions provided by the case manufacturer for proper installation
guidelines. Tyan recommends that you make use of all mounting holes to screw down
the motherboard. The adapter cards and the screws holding them down will keep your
board flat. The fastening screws should not short / touch any of the traces on the
motherboard. Make certain that you do not overtighten the screws, as that will damage
the motherboard and possibly break internal traces in the surrounding area. The hole
you should use is located at the top-center of the board where the adapter cards are
fastened to the case.

3. Installing Memory

Since Tyan boards are manufactured with performance in mind, you should use add-in
components that match. Some DIMM modules may seem to be high quality because of
name or feel but that does not guarantee real-world usability. Some cheaper or OEM
memory may have brand-name components, but they may contain inferior or substan-
dard parts which do not meet the critical tolerances our products require. Because of
this, your memory may not work correctly in a Tyan board though it may work well in
a competitor's board. This is because many of our competitors do not adhere to the
strict tolerances required for high performance. If you buy a Tyan board, you are
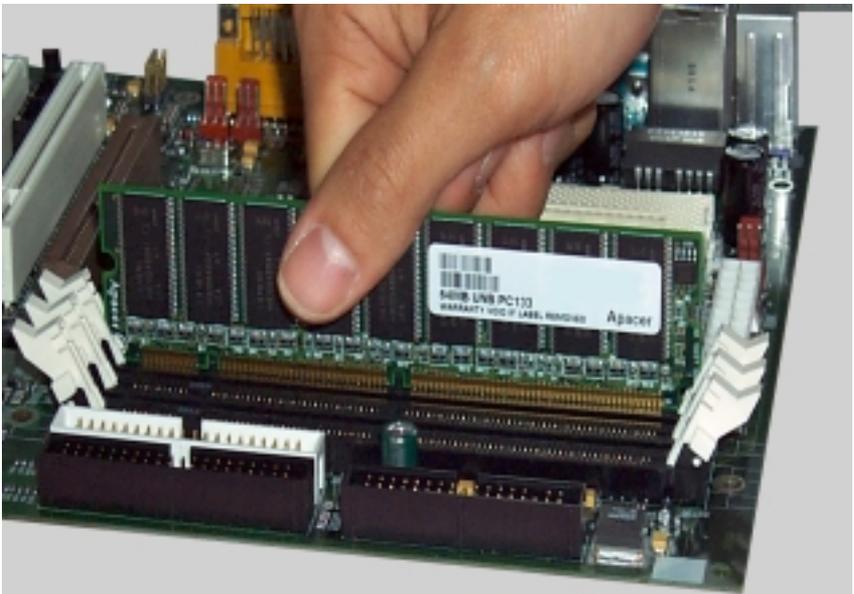
Figure 2-3

getting the best system available. To make installation easy and trouble free, get high quality parts. For a list of recommended memory vendors, please visit Tyan's website at **www.tyan.com** - go to the "Memory Support" area in the Support Section. The website memory compatibility lists include DIMMs that have proven to be very stable on our boards and perform extremely well.

To install your DIMMs, line your module up so that the pins fit into the slot.   There is only one way that your DIMM can fit properly. Make sure that the short row of pins is lined up with the short gap in the DIMM slot. **Figure 2-3** (previous page) shows how to sit the DIMM into its slot. To insert the DIMM, push down vertically on the module with even force, as shown in the photo. Do not shove one end in first; doing so will bend the DIMM pins.

To lock the DIMM into place, push the plastic clips on either end of the slot onto the notches in the ends of the DIMM (see **Figure 2-4** below). In some cases, pushing the memory module into the DIMM slot will move the plastic clips inward, automatically locking the module into place. To remove your DIMM, simply pull the clips back, and pull up on the module.

INSTALL

Figure 2-4

Place the DIMMs in an anti-static bag as soon as you remove them to avoid static damage.

The Tomcat i815e uses a 64-bit data path from memory to CPU and can accommodate up to 512MB of SDRAM. The 168-pin DIMMs (Dual In-line Memory Modules) must be of the 3.3V, **unbuffered** variety. The position of the notch in the SDRAM key position will tell you whether or not a DIMM is unbuffered (see the Figure 2-5 below). All installed memory will be automatically detected, so there is no need to set any jumpers.

!
important!

EEPROM

RFU ⎯⎯ Unbuffered   **168-pin DIMM**
Buffered
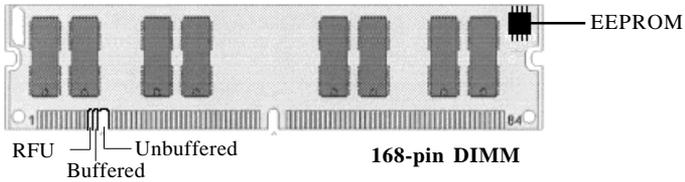
Figure 2-5

Some details of memory installation:

• The mainboard supports 32MB, 64MB, 128MB, and 256MB unbuffered DIMMs.
• There is a limit of two double-sided PC-133 DIMMS that can be installed.
• No ECC type memory can be used.

warning
• **Warning! DO NOT use registered DIMMs. (Check with your memory dealer for more information).** See www.tyan.com for the latest memory compatibility information.

The table below shows some of the possible memory configurations. Not all possible configurations are listed.

DIMM Bank 1	DIMM Bank 2	DIMM Bank 3	Total
32MBx1	32MBx1	0	64MB
0	32MBx1	32MBx1	64MB
64MBx1	32MBx1	0	96MB
32MBx1	32MBx1	32MBx1	96MB
64MBx1	64MBx1	0	128MB
0	64MBx1	64MBx1	128MB
64MBx1	128MBx1		192MB
0	128MBx1	64MBx1	192MB
128MBx1	128MBx1	0	256MB
0	128MBx1	128MBx1	256MB
128MBx1	256MBx1	0	384MB
0	256MBx1	128MBx1	384MB
256MBx1	256MBx1	0	512MB
0	256MBx1	256MBx1	512MB

4. Installing the CPU and Cooling Fan

Socket 370 type Pentium III / Celeron processors can be used on the Tomcat i815e. Remember:

- 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.
- Before the CPU is installed, the mainboard must be placed on a flat surface. You should be able to insert the CPU into the socket with minimal, but firm pressure. Do not press down hard on the CPU.

Figure 2-6*

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 an angled corner (see **Figure 2-6**). Never force a CPU into a socket. Forcing a CPU to seat will bend the pins on the CPU and possibly damage the motherboard.

Push down lightly on the CPU, and lower the arm on the ZIF socket to secure the CPU. A squeaking noise is normal as the arm lowers. After the CPU is securely seated, you **must** install an appropriate cooling device (otherwise damage will occur to your CPU). Tyan strongly recomends a heatsink / fan combination. Consult with your case manufacturer for other cooling options.

important!

Locate the cooling fan connector (e.g. FAN1) on the motherboard. Plug the CPU's cooling fan cable into the cooling fan connector on the board. There will be a plastic clip assembly similar to that of the ATX power connector that will force you to connect the fan cable correctly (see **Figure 2-7** to the right).
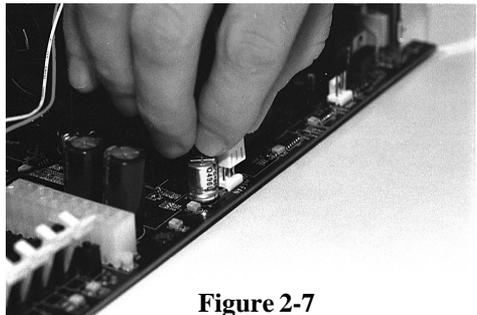
Figure 2-7

* Image not representative of actual Tomcat i815e socket. It is provided as an example only.

5. Connecting IDE and Floppy Drives

The colored stripe on a ribbon cable should face toward the ATX Power Connector on the motherboard. In **Figure 2-8** (below), you can see how the IDE cables should look when they are connected to your hard drive. Notice how Pin 1 (denoted by a colored stripe) is connected so that it is next to the power connector of the drive. The primary IDE connector is black; the secondary IDE connector is white. In most cases, this is the proper way of connecting your IDE cable to the hard drive. **Figure 2-9** on the next page shows the IDE cable properly connected to the motherboard. Contact your hard disk drive manufacturer or documentation for more information.

Figure 2-8

Pin 1   Power
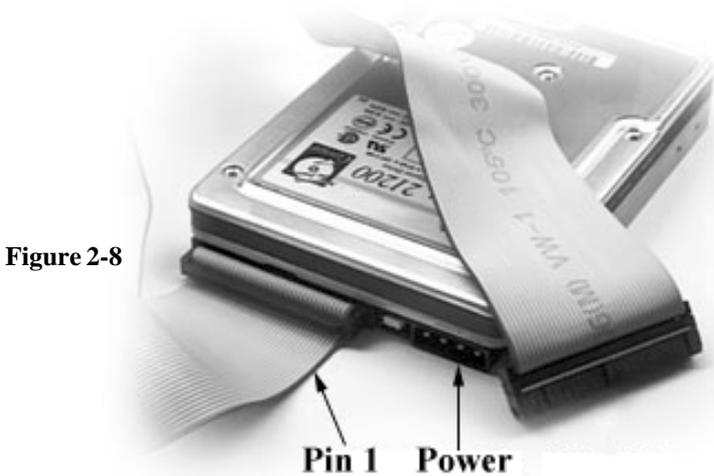
ATA-66/100 IDE hard drives require a special 80 pin IDE cable which has additional grounding wires. The cable is included in the motherboard package, and is required when using ATA-66/100 drives. This cable will also support all legacy IDE drives. **(Note: The BLUE end of the ATA-66 cable must connect to the motherboard.)** Some symptoms of incorrectly installed HDDs are:

important!

• Hard disk drives are not auto-detected: may be a Master / Slave problem or a bad IDE cable. Contact your vendor.
• Hard Disk Drive Fail message at bootup: may be a bad cable or lack of power going to the drive.
• No video or beeps on bootup: usually means the cable is on backwards.
• Hard drive lights are constantly on: usually means bad IDE cable or defective drives / motherboard. Try another HDD.
• Hard drives do not power up: check power cables and cabling. May also be a bad power supply or IDE drive.

INSTALL
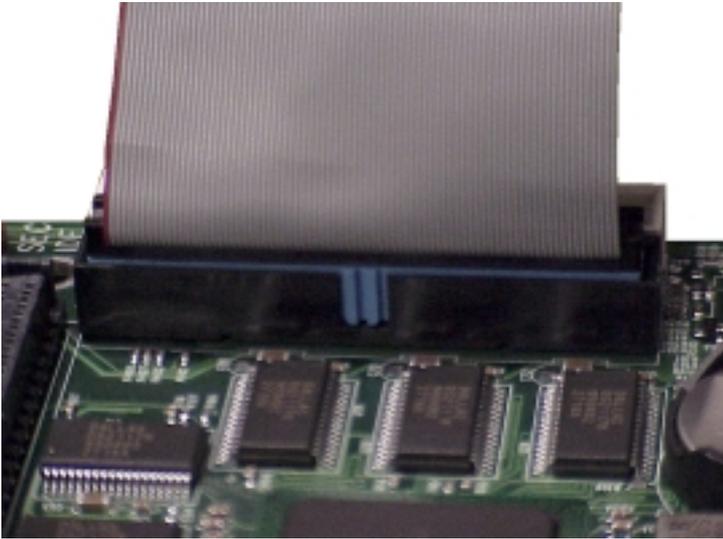
Figure 2-9

*Note: The images above is used to illustrate a concept and may not represent the actual image of your motherboard.

warning **Note: Only Tyan-approved cables will work on this motherboard. If you are using an existing case with old cables, your system may not function properly. Use only Tyan-approved cables.**

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 2-10** below). Most of the current floppy drives on the market require that the colored stripe be positioned so that it is right 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.
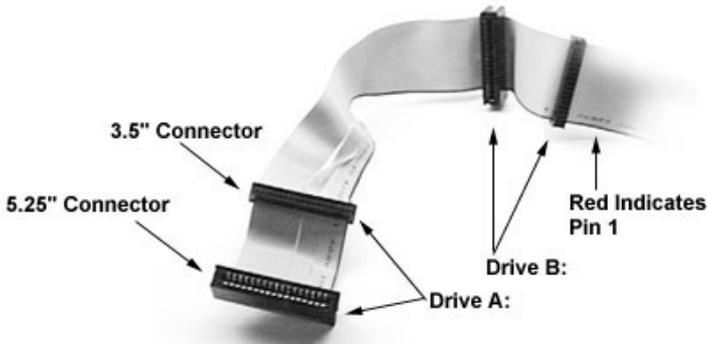
Figure 2-10

Drive A: is always attached to the end of the cable with the twist in it. Drive B: is always connected to the middle of the cable. Refer to your installation instructions or call your dealer if you are unsure about attaching floppy drives. Refer to **Figure 2-10** for a detailed anatomy of the floppy cable.

Remember, you can only have 2 floppy drives connected at any given time. Some symptoms of incorrectly installed floppy drives are:

•   Floppy drives are not detected: usually caused by faulty cables, backward cables, or a bad floppy or motherboard. Try another single floppy drive to verify the problem or try another cable. Also, check to see if the onboard floppy is enabled in the BIOS.
•   Floppy Drive Fail message at bootup: the cable, floppy, or motherboard may be faulty. Try another cable or floppy drive to verify.
•   Light on the floppy is on constantly: normally signifies that the cable is on backwards. Reverse the cable at the motherboard end and try again.

6. 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 these guidelines:

•   Installing an AGP card will automatically disable the onboard VGA.
•   If you are going to install a soundcard, the onboard sound must be manually disabled through the BIOS first.

!
important!

•   NEVER force a card into a slot. If it doesn't fit, look at the socket on the computer to make sure there are no wires or other obstructions to the slot.

AGP slot

•   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. This will create a rocking motion between the card and the slot and it will damage the pins within the socket.
•   Make sure that the cards are seated securely into the slots.
•   Before turning on the system, make sure no cards are touching each other.

warning

•   **NOTE: This mother board operates on a 3.3V standby for PCI v2.2. Because of this, you need to UNPLUG the AC power cord before installing your card. Otherwise, the motherboard may automatically power up when the card is inserted into the slot.**
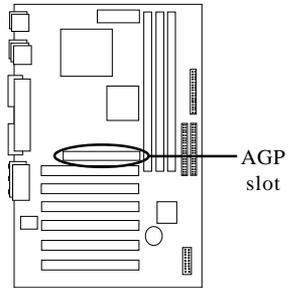
If you follow these basic guidelines, there shouldn't be any problems with installation. However, if you do encounter any problems, have a qualified professional install your cards for you or contact your card manufacturer.

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.

7. Connecting PS/2, USB, Ethernet*, Serial and Parallel Devices

This board includes ports for USB, Ethernet*, PS/2 mouse, and PS/2 keyboard devices. Note that, for this board, the mouse port is the upper PS/2 port, and the keyboard port is the lower PS/2 port.

The PS/2 connectors are probably quite familiar to you, while the Universal Serial Bus (USB) connectors, may not be. The USB port can function as a serial, parallel, mouse, keyboard, or joystick port. It is fast enough to support video transfers, and is capable of supporting up to 127 daisy-chained peripheral devices. **Figure 2-11** (below) shows the ATX double row connectors on this board. The Ethernet*, Serial, and Parallel ports, as well as the other ports, are labeled.
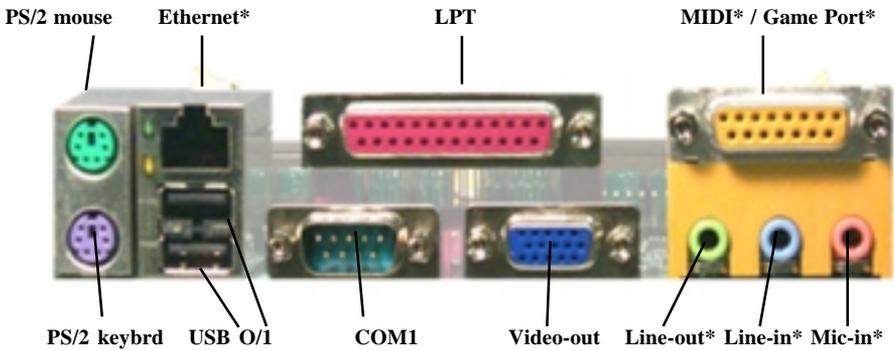
Figure 2-11

Connecting Serial and Printer Ports
Warning: When plugging in your keyboard and mouse, or when plugging anything into a serial or parallel port, make sure that the power is off. Connecting these devices and ports while the power is on is called "hot plugging," and may damage your system.

* Indicates an optional feature available on some models of Tomcat i815e.

8. Connecting the Power Supply

The Tomcat i815e requires an ATX power supply. Tyan recommends using one that conforms to industry standard revision 2.01. The photos below show the ATX power connector before (**Figure 2-12**) and after (**Figure 2-13**) it has been plugged in. The plastic clip on the power connector should lock over the plastic tab on the onboard connector. You shouldn't be able to plug the power connector in any other way but just to be safe, make sure it looks like **Figure 2-13** below.

Make certain that you do not miss connecting any pins because if you do, you will void your warranty and cause damage to yourself or your motherboard when you turn the system on. After connecting the power, make sure the connector is seated firmly into its socket so it will not become loose or fall off when the computer is jostled or moved. **NOTE: When installing your power supply, make sure the power supply switch is turned 'OFF'. You may turn the switch back 'ON' once you've finished building your system.**
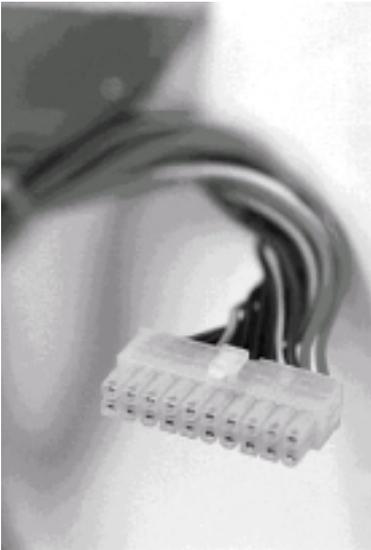
Figure 2-12
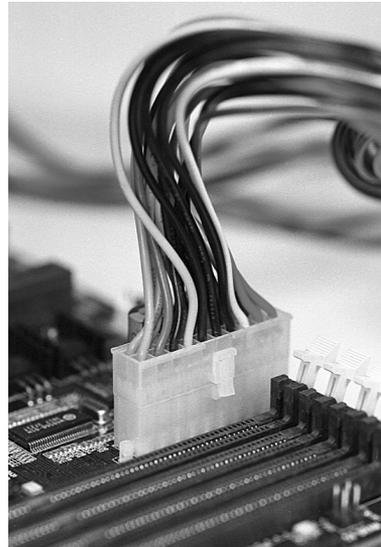
Figure 2-13

Ethernet Setup and Use*

Cetain models of the Tomcat i815e motherboards have the optional Intel 82562ET 10/100 Ethernet controller onboard. For more information, data sheets, white papers, or demos, visit the Intel Network Products web site at: **http://www.intel.com/network**

* Indicates an optional feature available on some models of Tomcat i815e.

INSTALL

Configuration and Drivers
The Ethernet driver **cannot** be installed directly from the TYAN Driver CD. Before installing the Intel 82562 Ethernet drivers, the complete LAN 82562 directory and all it's contents must first be copied from the TYAN Driver CD onto your hard drive. The 82562 driver can then be installed from your hard drive.

Connecting the Network Cable
Connect a single network cable to the Ethernet adapter (see **Figure 2-14**). The cable will only fit one way. For 100BASE-TX, your network cable must be category 5, twisted-pair wiring. If you plan on running the adapter at 100 Mbps, it must be connected to a 100BASE-TX hub (not a 100BASE-T4 hub). For 10BASE-T, use category 3, 4, or 5 twisted-pair wiring.

100BASE-T Wiring: Twisted Pair Ethernet (TPE)

! important!

Use category 5 cable and an RJ-45 connector for this adapter. Do not use category 3 wiring at 100 Mbps. At 100 Mbps, connect to a TX hub, not a T4 hub. **NOTE: To configure the adapter for your operating system, please refer to your operating system's documentation.**

Troubleshooting
If the adapter can't connect to the network:

· Make sure the cable is installed properly. The network cable must be securely attached at both RJ-45 connections (adapter and hub). If the cable is attached but the problem persists, try a different cable. The maximum allowable distance from adapter to hub is 100 meters. If you're directly connecting two computers (no hub), use a crossover cable. Most hubs require a straight-through cable, while most switches require a crossover cable (see your hub or switch documentation to verify).

· Check the LED lights on the adapter. The onboard cable connector has two diagnostic LEDs. These lights help indicate if there's a problem with the connector, cable, or hub. The table below describes the LEDs, and the drawing on the previous page shows their location (see **Figure 2-14**).

100 Mbps LED   Link LED

Y   G

Figure 2-14

· Make sure you're using the correct drivers. Make sure you're using the drivers that come with this adapter.

warning

· Make sure the hub port and the adapter have the same duplex setting. If you configured the adapter for full duplex, make sure the hub port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.
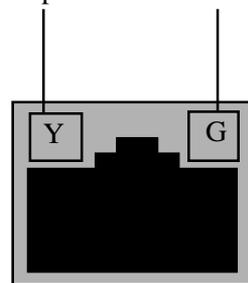
Testing the adapter

Test the adapter by running Intel diagnostics. For Windows 95/98/2000 and Windows NT run Intel PROSet by double-clicking the Intel PROSet Icon in the Control Panel. Click Help from the main PROSet window to get complete diagnostics information and instructions.

LED	Indication	Function
LNK	On	The adapter and hub have acknowledged a connection; the link between the hub and adapter is good.
(green)	Off	The cable connection between the hub and adapter is faulty, or you have a driver configuration problem.
100	On	Network connection operating at 100Mbps.
(yellow)	Off	Network connection operating at 10Mbps.

Ethernet Technical Information

Fast Ethernet Wiring

100BASE-TX Specification: The 100BASE-TX specification supports 100Mbps transmission over two pairs of category 5 twisted-pair Ethernet (TPE) wiring. One pair is for transmit operations and the other for receive operations. Segment lengths are limited to 100 meters with 100BASE-TX for signal timing reasons. This complies with the EIA-568 wiring standard.

Fast Ethernet Hub and Switches

The two basic types of hubs are shared hubs and switching hubs. Intel PRO/100+ adapters can be used with either type of hub for 10Mbps. At 100Mbps, a TX hub or switch is required.

Shared hubs

In a shared network environment, computers are connected to hubs called repeaters. All ports of the repeater hub share a fixed amount of bandwidth, or data capacity. On a 100Mbps shared hub, all nodes on the hub must share the 100Mbps of bandwidth. As stations are added to the hub, the effective band-width available to any individual station gets smaller. Shared hubs do not support full duplex. Think of a shared repeater hub as a single-lane highway that everyone shares. As the number of vehicles on the highway increases, the traffic becomes congested and transit time increases for individual cars.

INSTALL

On a shared hub all nodes must operate at the same speed, either 10Mbps or 100Mbps. Fast Ethernet repeaters provide 100Mbps of available bandwidth, ten times more than what's available with a 10BASE-T repeater.

Repeaters use a well-established, uncomplicated design, making them highly cost effective for connecting PCs within a workgroup. These are the most common type of Ethernet hubs in the installed base.

Switching hubs
In a switched network environment, each port gets a fixed, dedicated amount of bandwidth. In the highway scenario, each car has its own lane on a multi-lane highway and there is no sharing. In a switched environment, data is sent only to the port that leads to the proper destination station. Network bandwidth is not shared among all stations, and each new station added to the hub gets access to the full bandwidth of the network.

If a new user is added to a 100Mbps switching hub, the new station receives its own dedicated 100Mbps link and doesn't impact the 100Mbps bandwidth of another station. Switching hubs can effectively increase the overall bandwidth available on the network, significantly improving performance. Switching hubs can also support full duplex.

For more information on Fast Ethernet, visit the Intel Network Products website: **http://www.intel.com/network**

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 sound 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 page 8).

Frequently Asked Questions

Q: My system sometimes becomes unstable. How should I check the system?
A: The first thing to do is to check and see if you have any device conflicts in IRQ, or DMA. If you are using Windows 98/2000, the Control Panel is a good place to start. Please consult your operating system manual for details. Second of all, slowing down the memory timing in the BIOS's 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.

Q: How do I find out what memory will work with my motherboard?
A: Memory compatibility information can be found on Tyan's web site at:
http://www.tyan.com

Q: Where can I get USB and flat serial cables for my motherboard?
A: You can purchase USB and serial cables from **www.etyan.com**. USB cables are also available at **www.wiretekusa.com** (Tyan USB Cable Part #S1606-001-01)

Q: What is the USB pin out information for Tyan motherboards?
A: Please refer to URL link here: **http://www.tyan.com/techref/html/io_usb.html**

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 email by Tyan Tech Support.** Please refer to URL link here for more details:
http://www.tyan.com/support/html/rma_faq.html

Q: How do I upgrade my BIOS?
A: BIOS update files and instructions on how to install them are available from the Tyan web site at: **http://www.tyan.com**

Q: Is my motherboard Y2K compliant?
A: Please refer to URL link here: **http://www.tyan.com/support/html/year2000.html**

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, the it is an indication that the CMOS battery may need to be changed, or simply reset the CMOS and see if that solves the problem. If all else fails, contact your dealer for assistance.

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chapter 3

BIOS Configuration

Introduction to Setup

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

⚠ important!

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.

You can select a Setup option by using the following keyboard keys:

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Move betw een selections
Enter	Opens highlighted selection
PgUp/PgDn	Change setting

The pages which follow contain explanations of the settings for the AMIBIOS Setup menus. Drawings have been included for ease of reference. Overall, the AMIBIOS Setup program is easy to use, and fairly intuitive. Note that the graphics in the manual are simpler than those that appear on your screen.

Main Setup

Select the AMIBIOS Setup options by choosing Main Setup from the AMIBIOS Setup main menu. The other sub screens (e.g. Main, Advanced, Chipset, PCIPnP, Power, Boot, Security, and Exit) are accessible by using the ← → keys.

System Date/Time
You can type the date and time in 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.

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 your is experiencing configuration problems.

Advanced Menu

In the Advanced setup (shown below) 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                                         Configure SuperIO
  Setting items on this screen to incorrect values      Chipset Nat366
  may cause the system to malfunction!


  ►    SuperIO Configuration
  ►    IDE Configuration
  ►    Floppy Configuration
  ►    Boot Settings Configuration
  ►    Event Log Configuration




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

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```

S2060 Tomcat i815e

Configure Nat366 Serial Port(s) and Parallel Port (Super I / O)

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

Onboard Floppy Controller	This device handles communication between the floppy drive and the motherboard. [Default is **Enabled**]
Serial Port Address	The addresses of Serial Ports 1 and 2 can be changed if a hardware conflict occurs. [Default is **Disabled**]
Serial Port 2 Mode	Default is **Normal**
Parallel Port Address	The address and IRQ of the Parallel Port can be changed if a hardware conflict occurs. The Parallel Port Mode relates to your printer's mode of communication (check your printer documentation for details). [Default is **Disabled**]
Parallel Port IRQ	Default is **7**
Parallel Port Mode	Default is **Normal**
Onboard MIDI Port*	The address and IRQ of the Onboard MIDI Port can be changed if a hardware conflict occurs. [Default is **330**]
Onboard Game Port*	The address of the game port can be changed if a hardware conflict occurs. [Default is **Enabled**]

IDE Configuration

On bootup, the BIOS will auto-detect the existence of IDE devices such as hard drives and CD-ROMs. You also can 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).

Onboard PCI IDE Controller	The PCI IDE Controller is essential for communication between the IDE devices and the motherboard. [Default is **Both**]
Hard Disk Protect	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 is **Disabled**]
ATA(PI) Detect Time Out	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 **0**]
ATA(PI) 80Pin Cable Detection	Selects the process that the BIOS will use to detect 80Pin ATA(PI) cables. [Default is **Host & Device**]

BIOS SETUP UTILITY

Main	Advanced	Chipset	PCIPnP	Power	Boot	Security	Exit

IDE Configuration

Onboard PCI IDE Controller		[Enabled]
► Primary IDE Master	:	[Hard Disk]
► Primary IDE Slave	:	[Not Detected]
► Secondary IDE Master	:	[Not Detected]
► Secondary IDE Slave	:	[Not Detected]
Hard Disk Protect		[Disabled]
ATA(PI) Detect Time Out		[35]
ATA(PI) 80Pin Cable Detection		[Host & Device]

DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers

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

BIOS

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When you enter one of the **IDE configuration** sub screens (by highlighting one of the options preceded by a ► symbol, and pressing <ENTER>, example shown below), you will be presented with a status on the IDE device, and a set of configuration options for the IDE device (shown on the next page).

BIOS SETUP UTILITY

Main	Advanced	Chipset	PCIPnP	Power	Boot	Security	Exit

Primary IDE Master

Device	:	Hard Disk
Vendor	:	IBM-DTLA-307075
Size	:	65.5 GB
LBA Mode	:	Supported
Block Mode	:	16 Sectors
PIO Mode	:	4
Async DMA	:	MultiWord DMA-2
Ultra DMA	:	Ultra DMA-2
S.M.A.R.T.	:	Supported

Type	[Auto]
LBA / Large Mode	[Auto]
Block (Multi-Sector Transfer)	[Auto]
PIO Mode	[Auto]
DMA Mode	[Auto]
S.M.A.R.T.	[Auto]
32Bit Data Transfer	[Disabled]
ARMD Emulation Type	[Auto]

DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers

← →   Select Screen
↑ ↓   Select Item
F1   General Help
F10   Save and Exit
ESC   Exit

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* Indicates an optional feature not available on all Tomcat i815e models.

S2060 Tomcat i815e

Type	The type of IDE device installed can be configured using this option. [Default is **Auto**]
LBA/Large Mode	These modes 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 Auto for Type), or you can manually set this mode to Disabled. [Default is **Auto**]
Block (Multi-Sector Transfer)	When set to Auto, the Block mode auto-detects the optimal number of block read / writes per sector that the drive supports. Default is **Auto**]
PIO Mode	Programming Input / Output is a method of transmitting data between devices that uses 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 **Auto**]
DMA Mode	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 **Auto**]
S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology)	This option allows the S.M.A.R.T. protocol to report server system information over a network. [Default is **Auto**]
32Bit Data Transfer	If set to On, this options 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 **Disabled**]
ARMD Emulation Type	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 **Auto**]

Floppy Configuration

In this configuration sub screen you can change options for your floppy drive(s).

Floppy A	The settings are 360KB 5¼ inch, 1.2 MB 5¼ inch, 720KB 3½ inch, 1.44MB 3½ inch, or 2.88MB 3½ inch. If you are not sure what type of floppy drive you have, consult the documentation that came with your drive.
Floppy B	The options are the same as listed for Floppy A.
Diskette Write Protect	Sets whether or not the drive can be written to. [Default is **Disabled**]
Floppy Drive Seek	Sets whether or not the BIOS should check for the drive at bootup. [Default is **Disabled**]

Boot Settings Configuration

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

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

BIOS

Event Log Configuration

The Event Log Configuration sub screen (shown below), the log of errors during bootup can be viewed to help you troubleshoot any configuration problems you might experience. The status of the Event Log is shown on the top half of the screen.

```
                          BIOS SETUP UTILITY
  Main      Advanced      Chipset      PCIPnP      Power      Boot        Security      Exit

  Event Log Configuration                                           ENABLED: Allow logging
                                                                    of events.
  Event Log Area            :               Space Available
  Event Log Data            :               Valid

  Event Logging             :               [Enabled]
  ECC Event Logging         :               [Disabled]
  Clear All Event Logs      :               [No]

  ►    View Event Log
  ►    Mark All Events As Read


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

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```

Event Logging	If set to Enabled, events will be logged. [Default is **Enabled**]
ECC Event Logging	If set to Enabled, ECC events will be logged. On the Tomcat i815e, ECC events are not logged. [Default is **Enabled**]
Clear All Event Logs	If set to Yes, the event log will be cleared. [Default is **No**]
View Event Log	Shows you the Event Log.
Mark All Events As Read	By using this option, the events in the Event Log can be organized to help troubleshoot configuration problems.

Chipset Menu

The Chipset Setup is for advanced configuration of the motherboard attributes. There are also two sub screens available (denoted by the ▶ symbol).

Processor Serial Number	Identifies the CPU.
CPU Frequency	Sets the ratio for the CPU frequency. [Default is **1:2**]
CPU Latency Timer	Reserved for debugging. [Default is **Disabled**]
C000 - C4000, 16k Shadow	Specifies how the 16k of Video ROM is treated at the listed address. Disabled: contents of video ROM are not copied to RAM. Enabled: contents of video ROM at listed address segment is copied (shadowed) from ROM to RAM for faster execution. Cached / WP: contents of video ROM from listed address segment are copied from ROM to RAM and can be written to or read from cache memory. [Default is **Cached/WP**]
C800 - DC00, 16k shadow	[Default is **Cached/WP**]

GMCH Configuration

The graphics chipset can be configured in the GMCH sub screen.

Primary Video Device	Sets the primary device for video output. [Default is Auto]
Internal Graphics Mode Select	Enables / disables the internal video device. [Default is Enabled, 1MB]
Display Cache Window Size	Specifies amount of cache available for the graphics local memory window. [Default is 64MB]
Display VBIOS Message	Enable / disable video BIOS message. [Default is Enabled]
Internal Graphics Scaling	Sets scaling for internal video device. [Default is Auto]
Internal Graphics TV Format	Sets TV video standard (depends on your country location). [Default is NTSC]
Output Device Sync / Non-sync	Sets this depending on your video monitor. See your monitor documentation for details. [Default is Non-Synchronous]
Digital Device Priority	Sets order of priority for video output devices. [Default is CRT / FP / TV]
AGP Graphics Aperture Size	Sets maximum memory aperture for onboard AGP port. [Default is 64MB]
Init Display Cache Memory	If enabled, the display cache will be initialized at time of system boot. See the table on the next page for more details. [Default is Enabled]

System Memory Frequency	Sets frequency of onboard DIMM memory. [Default is **Auto**]
SDRAM Refresh	Sets interval between Refresh signals to SDRAM. [Default is **Auto**]
DRAM Cycle Time (SCLKs)	Sets length of DRAM cycle time in SCLKs. [Default is **Auto**]
CAS Latency (SCLKs)	Sets number of SCLKs between time when the Read command is sampled by DRAM, and the Whitney Sample reads data from SDRAM. [Default is **Auto**]
RAS# to CAS# Delay (SCLKs)	Sets length of delay inserted between the RAS and CAS signals of the DRAM system memory access cycle if SDRAM is installed. [Default is **Auto**]
RAS# Precharge (SCLKs)	Sets length of RAS precharge part of DRAM system memory access cycle when SDRAM system memory is installed. [Default is **Auto**]
DRAM Page Closing Policy	Sets whether DRAM pages should be closed after use, or left open. [Default is **Open**]
Memory Hole	Sets the location of an area of memory that cannot be address on the ISA bus. [Default is **Disabled**]

If the **Init Display Cache Memory** is enabled, the following options will appear.

Paging Mode Control	Enable / disable paging mode. [Default is **Closed**]
RAS-to-CAS Override	Sets delay override. [Default is **Disabled**]
CAS Latency	Sets number of SCLKs between the time when Read command is sampled by DRAM and the Whitney Sample reads data from SDRAM. [Default is **Slow**]
RAS Timing	Sets clock frequency for RAS and RC. [Default is **Slow**]
RAS Pre-charge	Sets clock frequency for RAS and RP. [Default is **Slow**]

ICH Configuration

The interface chipset can be configured in the ICH sub screen.

Moon ISA Device Enable	Enable / disable Moon ISA device. [Default is **Disabled**]
ICH Positive Decode*	Sets type of ICH decode used. [Default is **Disabled**]
CPU BIST Enable*	Enable / disable CPU BIST. [Default is **Disabled**]
ICH DCB Enable*	Enable / disable DCB. [Default is **Disabled**]
ICH Dev31 Func(3,5,6)Enable*	Enable / disable ICH device listed. [Default is **Enabled**]
Sound Blaster Decode*	Specifies address used for Sound Blaster devices. [Default is **Disabled**]
Microsoft Sound Decode*	Specifies address used for Microsoft Sound System (MSS) devices. [Default is **Disabled**]
MIDI Decode	Sets I / O address range for MIDI devices. [Default is **Disabled**]
Adlib Range 388h-35Bh*	Allows Adlib-compatible sound devices to use address listed. [Default is **Enabled**]
Game Port (A, B)*	Enable / disable Game Port listed. [Default is **Enabled**]
LPC 4Eh-4Fh Decode*	Enable / disable LPC devices to use address range listed. [Default is **Enabled**]
DMA-(0,1,2,3,5,6,7) Type*	Specifies the bus that the specified DMA channel can be used on. [Default is **LPC DMA**]

PCI / PnP Menu

In this sub screen you can configure the onboard PCI Plug-n-Play devices available.

```
                           BIOS SETUP UTILITY
 Main        Advanced       Chipset     PCIPnP      Power       Boot      Security     Exit

    Plug & Play O / S                        [No]
    Reset Config Data                        [No]
    PCI Latency Timer                        [64]
    Allocate IRQ to PCI VGA                  [Yes]
    Palette Snooping                         [Disabled]
    PCI IDE BusMaster                        [Disabled]
    OffBoard PCI / ISA IDE Card              [Auto]

    USB Function                             [Enabled]
    Legacy USB Support                       [Auto]

    IRQ3                                     [Available]
    IRQ4                                     [Available]
    IRQ5                                     [Available]
    IRQ7                                     [Available]
    IRQ9                                     [Available]
    IRQ10                                    [Available]          ← →      Select Screen
    IRQ11                                    [Available]          ↑ ↓      Select Item
    IRQ14                                    [Available]          F1       General Help
                                                                 F10      Save and Exit
                                                                 ESC      Exit




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```

* Indicates an optional feature available on some models of Tomcat i815e.

S2060 Tomcat i815e

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

Power Menu

In this sub screen you can configure how the BIOS handles power management. Note that the screen shown below is has Power Management / APM **enabled**, which will allow for more options to appear.

ACPI Aware O / S	Indicates whether or not the O / S has power management capabilities. [Default is **Yes**]
Repost Video on S3 Resume	Sets whether or not to repost the video on S3 power state (hibernation). [Default is **Yes**]
Power Management / APM	Enable / disable power management functions. [Default is **Enabled**]
Standby Time Out	Sets time that system will wait during inactivity before the system will enter Standby mode. [Default is **Disabled**]
Suspend Power Saving Type	Set type of power saving mode for Suspend. [Default is **S1**]
Suspend Time Out	Sets time that system will wait in Standby before the system will enter Suspend mode. [Default is **Disabled**]
Power Button Mode	Sets how power button mounted externally on the case will be used. On / Off: Power button turns system on / off. Suspend: Power button places computer in Suspend or Full On power mode. [Default is **On / Off**]
After G3 Enable	Enable / disable After G3 function. [Default is **Disabled**]
Green PC Monitor Power State	Sets power state for green PC-compliant monitor. [Default is **Suspend**]
Video Power Down Mode	Sets power state for video subsystem. [Default is **Suspend**]
Hard Disk Power Down Mode	Sets what power state hard disk will enter after period of inactivity. [Default is **Suspend**]
Hard Disk Time Out (Minute)	Sets time that system will wait before hard disk goes into power saving mode. [Default is **Disabled**]
Display Activity	Sets event monitoring on video display. [Default is **Ignore**]
Manual Throttle Ratio	Sets speed at which the system clock runs in Standby mode. Setting is expressed as a percentage between normal speed and speed when CPU is in power saving mode. [Default is **50%**]

BIOS

THRM Throttle Ratio	Adjusts THRM throttle ratio. [Default is **50%**]
Intruder Sel	Sets Intruder Sel [Default is **SMI**]
Thermal SMI Enable	Enable / disable Thermal SMI. [Default is **Disabled**]
PME SMI Enable	Enable / disable PME SMI. [Default is **Disabled**]
SW SMI Timer Enable	Enable / disable SW SMI. [Default is **Disabled**]
TCO Logic SMI Enable	Enable / disable TCO Logic SMI. [Default is **Disabled**]
SLP SMI Enable	Enable / disable SLP SMI. [Default is **Disabled**]
RTC Resume	Enable / disable Real Time Clock resume. [Default is **Disabled**]
AC97 Logic Resume	Enable / disable AC'97 Logic resume. [Default is **Disabled**]
USB Controller Resume	Enable / disable USB controller resume. [Default is **Disabled**]
PME Resume	Enable / disable PME resume. [Default is **Disabled**]
RI Resume	Enable / disable RI resume. [Default is **Disabled**]
SMBUS Resume	Enable / disable System Management Bus resume. [Default is **Disabled**]

Boot Menu

In this sub screen you can configure options set for each device during boot. The options available will depend on what devices you have installed in your computer.

Boot Device Priority	Sets the order of devices that the BIOS will attempt to boot from.
Hard Disk Drives	Shows the Hard Disk Drives available.
Removeable Drives	Shows the Removeable Drives
ATAPI CDROM Drives	Shows the CDROM drives available.

Security Menu

In this sub screen you can 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.

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

If you decide to change the Supervisor or User Password, the following box will appear.

Enter New Password:

To set the password, enter a unique set of 6 letters and / or numbers.

Exit Menu
Before you exit the BIOS Setup a set of options will be presented to you.

Exit Saving Changes	Save changes and exit setup
Exit Discarding Changes	Do not save changes and exit setup
Load Optimal Defaults	Load optimal settings NOTE: May not work with all applications
Load Failsafe Defaults	Load failsafe settings NOTE: May not be the optimal configuration
Discard Changes	Disregard all changes you made

chapter 4

System Resources

Beep Codes

Fatal errors, which halt the boot process, are communicated through a series of audible beeps. If AMIBIOS 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 pages 48-49. See the top of the next page for the beep code chart.

Beeps	Error Message	Description
1	Refresh Failure	The memory refresh circuitry is faulty.
2	Parity Error	Parity error in the base memory (the first 64 KB block) of memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.
4	Timer Not Operational	A memory failure in the first 64 KB of memory, or Timer 1 is not functioning.
5	Processor Error	The CPU generated an error.
6	8042 - Gate A20 Failure	Cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU on the CPU Card generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in AMIBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed.
11	Cache Memory Bad — Do Not Enable Cache	The cache memory test failed. Cache memory is disabled. Do not press <Ctrl> <Alt> <Shift> <+> to enable cache memory.

Troubleshooting System Problems

If the computer beeps...	then...
1, 2, or 3 times...	reseat the memory DIMMs or DIPs. If the system still beeps, replace the memory.
6 times...	try a different keyboard, or replace the keyboard fuse, if there is one. If the error occurs again, return the board to your dealer for a replacement.
8 times...	there is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter (applies only to external video adapters). If the error occurs again, return the board to your dealer for a replacement.
9 times...	the BIOS ROM chip is bad. The system probably needs a new BIOS ROM chip.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	for 5 or 7 beeps, first test with a new CPU - if that does not solve the problem, then motherboard must be replaced.

SYSTEM

Displayed Error Messages

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

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

and the system will halt. The system will not halt if the Wait for <F1> If Any Error option in Advanced Setup is Disabled.

```
RUN SETUP UTILITY
```

may also appear. Press <F1> to run WINBIOS Setup if this message appears.

Error Message	Explanation
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry.
C: Drive Error	No response from drive C:. Run the AMIDiag Hard Disk Utility. Check the C: hard disk type in Standard Setup.
C: Drive Failure	No response from hard disk drive C:. Replace the drive.
Cache Memory Bad, Do Not Enable Cache!	Cache memory is defective. Run AMIDiag.
CH-2 Timer Error	An AT system has two timers. There is an error in timer 2.
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	CMOS RAM checksum is different than the previous value. Run WINBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM have been destroyed. Run WINBIOS Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected. Run WINBIOS Setup.
CMOS Memory Size Mismatch	The amount of memory found by AMIBIOS is different than the amount in CMOS RAM. Run WINBIOS Setup.
CMOS Time and Date Not Set	Run Standard Setup to set the date and time.
D: Drive Error	No response from drive D:. Run the AMIDiag Hard Disk Utility. Check the hard disk type in Standard Setup.

Error Message	Explanation
D: drive failure	No response from hard disk drive D:. Replace the drive.
Diskette Boot Failure	The boot diskette in drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch Not Proper	Some systems require a video switch be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	Error in the DMA controller.
DMA 1 Error	Error in the first DMA channel.
DMA 2 Error	Error in the second DMA channel.
FDD Controller Failure	AMIBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	AMIBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR1 Error	Interrupt channel 1 failed POST.
INTR2 Error	Interrupt channel 2 failed POST.
Invalid Boot Diskette	AMIBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked...Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue to boot.
Keyboard Error	The keyboard has a timing problem. Make sure a Keyboard Controller AMIBIOS is installed. Set Keyboard in Advanced Setup to Not Installed to skip the keyboard POST routines.
KB/Interface Error	There is an error in the keyboard connector.
No ROM BASIC	Cannot find a proper bootable sector on either drive A: or C:. AMIBIOS cannot find ROM Basic.
Off Board Parity Error	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. Run AMIDiag to find and correct memory problems.
On Board Parity Error	Parity error in motherboard memory. The format is: ON BOARD PARITY ERROR ADDR = (XXXX) XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

SYSTEM

TYAN

Flash Utility

Note: You need to download the Flash Utility from the Tyan web site at:
http://www.tyan.com

1. If you want to flash BIOS without updating the boot block, do this:

> Boot to DOS, and type "flash4mb" followed by the BIOS file name.

> Example: FLASH4MB BIOSFILE.ROM

2. If you want to flash BIOS with boot block update, do this:

i.	Shutdown system, close JP2 to disable the boot block protection. Then boot system to DOS.
ii.	Type "flash4mb" followed by <Enter> key.
iii.	To save or not save the old BIOS by you choice.
iv.	Type in the BIOS file name, like "BIOSFILE.ROM".
v.	Flash utility will auto-complete the flash, include boot block at this point.
vi.	Shutdown the system, open jumper JP2 again. Then restart the system.

For more information and updates about the Flash Utilities, check the Tyan web site at: **http://www.tyan.com**

! important!

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

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Appendix

Glossary

ACPI (**A**dvanced **C**onfiguration and **P**ower **I**nterface) is 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 (**A**ccelerated **G**raphics **P**ort) is 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 66MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133MHz.

AIMM (AGP Inline Memory Module) is intended to provide 4MB of addressable SDRAM (arranged as 1Mx32), which resides on a module in a 3.3V or universal AGP slot.

AMR (**A**udio **M**odem **R**iser) is 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 feeback modes. It provides high speed communicstions between your perosnal computer and a remote location, such as an Internet Service Provider (ISP).

AT was the original form factor of IBM's PC.

ATAPI (**AT A**ttachment **P**acket **I**nterface), also known as IDE or ATA, is 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 hard drives.

ATX form factor was designed to replace the AT form factor. It improves on the AT design by rotating the board ninety 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, serial, USB, 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.

A **BBS** (**B**ulletin **B**oard **S**ystem) is a computer system with a number of modems hooked up to it which acts as a center for users to post messages and access information.

The **BIOS** (**B**asic **I**nput/**O**utput **S**ystem) program 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.

A **buffer** is 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 the possibility of losing your data should the system crash. Information stored in a buffer is temporarily stored, not permanently saved.

A **bus** is 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).

A **cache** is 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 slower 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 512MB 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.

GLOSSARY

CMOS Complementary **M**etal-**O**xide **S**emiconductors are chips that hold the basic start-up information for the BIOS.

Communication and Networking Riser (CNR) provides interfaces to support multichannel audio, V.90 analog modem, telephone line-based home networking, and 10/100 Ethernet-based networking, as well as expandability for future technologies.

The **COM port** is another name for the serial port, which is so-called 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).

DIMM (**D**ual **I**n-line **M**emory **M**odules) are a faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank DIMM banks are 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 (**D**irect **M**emory **A**ccess) channels are similar to IRQs. DMA channels allow hardware devices (like sound cards 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 and Play devices will take care of this for you.

In **Doze mode**, only the CPU's speed is slowed.

DRAM Dynamic **RAM** is a 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 (**E**xtended **D**ata-**O**ut **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/html/drivers.html**

ESCD (**E**xtended **S**ystem **C**onfiguration **D**ata) is a format for storing information about Plug and Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware is low level software that controls the system hardware.

Form factor is an industry term for the size, shape, power supply type, and external connector type of the PCB (personal computer board) or motherboard. The standard form factors are the AT and ATX, although TYAN also makes some Baby-AT boards.

A**Global timer** is an onboard hardware timer, such as the Real Time Clock.
Handshaking is 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 **H**ard **D**isk **D**rive.

H-SYNC controls the horizontal properties of the monitor.

IC (**I**ntegrated **C**ircuit) is the formal name for the computer chip.

IDE Integrated **D**evice (or Drive) **E**lectronics is a simple, self-contained hard drive interface. It can handle drives up to 8.4GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs).

IDE INT (**IDE Int**errupt) is a hardware interrupt signal that goes to the IDE.

I/O (**I**nput/**O**utput) is the connection between your computer and another piece of hardware (mouse, keyboard, etc.).

IRQ An Interrupt Request is 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. Happily, Plug and Play operating systems take care of these details for you.

ISA (**I**ndustry **S**tandard **A**rchitecture) is a slower 8- or 16-bit bus (data pathway).

Latency is 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 is waiting for the peripheral to send some data back (peripherals tend to be slower than onboard system components).

NVRAM ROM and EEPROM are both examples of **N**on-**V**olatile **RAM**, memory that holds its data without power. DRAM, in contrast, is volatile.

OEMs (**O**riginal **E**quipment **M**anufacturers) like Compaq or IBM package other companies' motherboards and hardware inside their case and sell them.

The **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 (**P**eripheral **C**omponent **I**nterconnect) is 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).

GLOSSARY

PCI PIO (**PCI P**rogrammable **I**nput/**O**utput) modes are the data transfer modes used by IDE drives. These modes use the CPU for data transfer (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 is a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

Pipelining improves system performance by allowing the CPU to begin executing a second instruction before the first is completed. A pipeline can be likened to an assembly line, with a given part of the pipeline repeatedly executing a set part of an operation on a series of instructions.

PM timers (**P**ower **M**anagement **timers**) are software timers that count down the number of seconds or minutes until the system times out and enters sleep, suspend, or doze mode.

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

The term **RAM** (**R**andom **A**ccess **M**emory), while technically referring to a type of memory where any byte can be accessed without touching the adjacent data, is often used to refer to the system's main memory. This memory is available to any program running on the computer.

ROM (**R**ead-**O**nly **M**emory) is a storage chip which contains the BIOS, the basic instructions required to boot the computer and start up the operating system.

SDRAM (**S**ynchronous **D**ynamic **RAM**) is so-called 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.

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

SIMM (**S**ingle **I**n-line **M**emory **M**odules) are the most common form of RAM. They must be installed in pairs, and do not have the carrying capacity or the speed of DIMMs.

TYAN

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

In **Sleep / Suspend mode**, all devices except the CPU shut down.

SRAM (**S**tatic **RAM**), unlike DRAM, does not need to be refreshed in order to prevent data loss. Thus, it is faster, and more expensive.

In **Standby mode**, the video and fixed disk drive shut down; all other devices operate normally.

UltraDMA 33 / 66 / 100 is a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without UltraDMA your system cannot take advantage of the higher data transmission rates of the new UltraATA hard drives.

USB (**U**niversal **S**erial **B**us) is a versatile port type that 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 (**V**ideo **G**raphics **A**rray) is the PC video display standard.

V-SYNC controls the vertical properties of the monitor.

ZIF (**Z**ero **I**nsertion **F**orce) sockets make it possible to insert CPUs without damaging the sensitive pins. The CPU is lightly placed in an open ZIF socket, and the metal lever pulled down. This shifts the processor over and down, guiding it into place on the board.

GLOSSARY

TYAN

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' interference radio tel que spécifié par
le Ministére Canadien des Communications dans les réglements 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 Batteries included with this board. Danger of explosion if battery
is incorrectly replaced. Replace only with the same or equivalent type recommended
by manufacturer. Dispose of used batteries according to manufacturer instructions and
your local county regulations.

Note: The joystick port (optional) maximum output rating is 9 amperes at 5 volts.

Document # D1419-101