



**Tomcat K8S**



**S2850**

**Revision 1.00**

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## Before you begin...

### Check the box contents!

The retail motherboard package should contain the following:



1 x Tomcat K8S S2850 motherboard



1 x CPU retention frame



1 x CPU back plate with insulation and screws



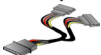
1 x 34-Pin floppy drive cable



1 x Ultra-DMA-133/100/66/33 IDE cable



2 x SATA cable (optional)



1 x SATA Driver Power Adapter (optional)



1 x 25-pin printer cable (optional)



1 x Tomcat K8S S2850 User's Manual



1 x Tomcat K8S S2850 Quick Reference



1 x TYAN driver CD



1 x Serial ATA driver diskette (optional)



1x I/O shield

If any of these items are missing, please contact your vendor/dealer for replacement before continuing with the installation process.

# Chapter 1: Introduction

## 1.00 – Congratulations!

You have purchased one of the most powerful AMD Opteron™ processor solutions, the Tomcat K8S S2850. The Tomcat K8S S2850 features a high bandwidth integrated memory controller for superior productivity, HyperTransport™ chipset technology to increase overall performance by removing or reducing I/O bottlenecks, and low profile I/O ports with strategically placed DIMM slots to allow maximum airflow across the motherboard for efficient system cooling. This platform offers convenient remote Intelligent Platform Management Interface (IPMI) monitoring through a Server Management Daughter Card. The Tomcat K8S S2850 also features an ATX form factor, Single or Dual Gigabit Ethernet port, an onboard ATI 8MB PCI RAGE XL VGA, and an onboard Quad channel Serial ATA, which provides an advanced and versatile solution for your server needs.

Remember to visit TYAN's Website at <http://www.tyan.com>. There you can find information on all of TYAN's products with FAQs, distributors list and BIOS setting explanations.

## 1.01 – Hardware Specifications

### Processor

- PGA 940-pin ZIF socket
- Supports one AMD Opteron™ processor
- Onboard 3-phase PWM Controller
- Integrated 128-bit DDR Memory Controller

### Chipset

- AMD-8111™ HyperTransport™ I/O Hub
- Winbond W83627HF Super I/O chip
- Winbond W83782D Hardware Monitor chip

### Memory

- 128-bit dual channel memory bus
- Total of four 184-pin 2.5-Volt DDR DIMM sockets
- Supports up to 8 Gigabytes Registered DDR \*
- Supports ECC type memory modules
- Supports PC1600, PC2100, & PC2700 DDR \*

### Expansion Slots

- Total of six 32-bit 33MHz (5-Volt) PCI slots

### Integrated Enhanced IDE Controller

- Provides two IDE dual-drive ports for up to four EIDE devices
- Supports UDMA 33/66/100/133 IDE drives and ATAPI compliant devices

### Integrated I/O

- One floppy connector supports up to two drives
- Two 9-pin serial ports (one connector and one header) and One 25-pin parallel port header (connector is optional)
- PS/2 mouse and keyboard connectors
- Four USB v1.1 ports (2 stacked rear connectors; 2 USB headers)

### BIOS

- AMI® BIOS 8.0 on 4Mbit LPC Flash ROM
- Supports ACPI 1.0b
- 48-bit LBA Support
- Supports PXE via Ethernet
- Supports USB device boot
- Watchdog timer

### System Management

- Total of six 3-pin fan headers
- All fan headers with tachometer monitoring
- One 2-pin Chassis Intrusion header
- Temperature, voltage and fan monitoring
- Supports Tyan Server Management Daughter card (SMDC \*) via Tyan-defined header

### **Integrated LAN Controllers**

- Dual Broadcom® BCM5705 GbE/100/10 LAN controllers
- Two RJ-45 LAN connectors with LEDs

### **Integrated PCI Graphics**

- ATI® Rage™ XL PCI graphics controller
- 8MB Frame Buffer of video memory

### **Integrated Serial ATA Controller (MFG Option)**

- Silicon Image SiI3114 SATA controller
- Supports four-channel SATA RAID (RAID 0, 1, 0+1)
- Total of four 7-pin SATA connectors
- Supports SATA 1.0 Specification

\* Not validated at the time of print, subject to change.

### **Form Factor**

- ATX footprint (12" x 8.2")
- 6-layer board
- ATX12V universal power connectors
- Serial (one) and VGA (one) connectors
- Stacked USB 1.1 (two) connectors
- Stacked PS/2 keyboard and mouse connectors
- Two RJ-45 LAN connectors with LEDs

### **Regulatory**

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

\* Tyan SMDC is a System Management Daughter Card. It enables you to access the hardware remotely and perform monitor, control, and diagnose activities effectively. See Appendix II (Pg 58) for details In Tyan SMDC.

## **Software Specifications**

### **OS (Operating System) Support**

Microsoft Windows NT 4 Service Pack 6A

Microsoft Windows 2000

Microsoft Windows XP

Microsoft Windows Server 2003

SuSE Server 8.0 for AMD-64

Red Hat 8.0, 9.0

Other distributions of Linux pending validation

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

## Chapter 2: Board Installation

### Installation

You are now ready to install your motherboard. The mounting-hole pattern of the Tomcat K8S S2850 matches the ATX specification. Before continuing with installation, confirm that your chassis supports an ATX motherboard.

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

The first thing you should do is read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

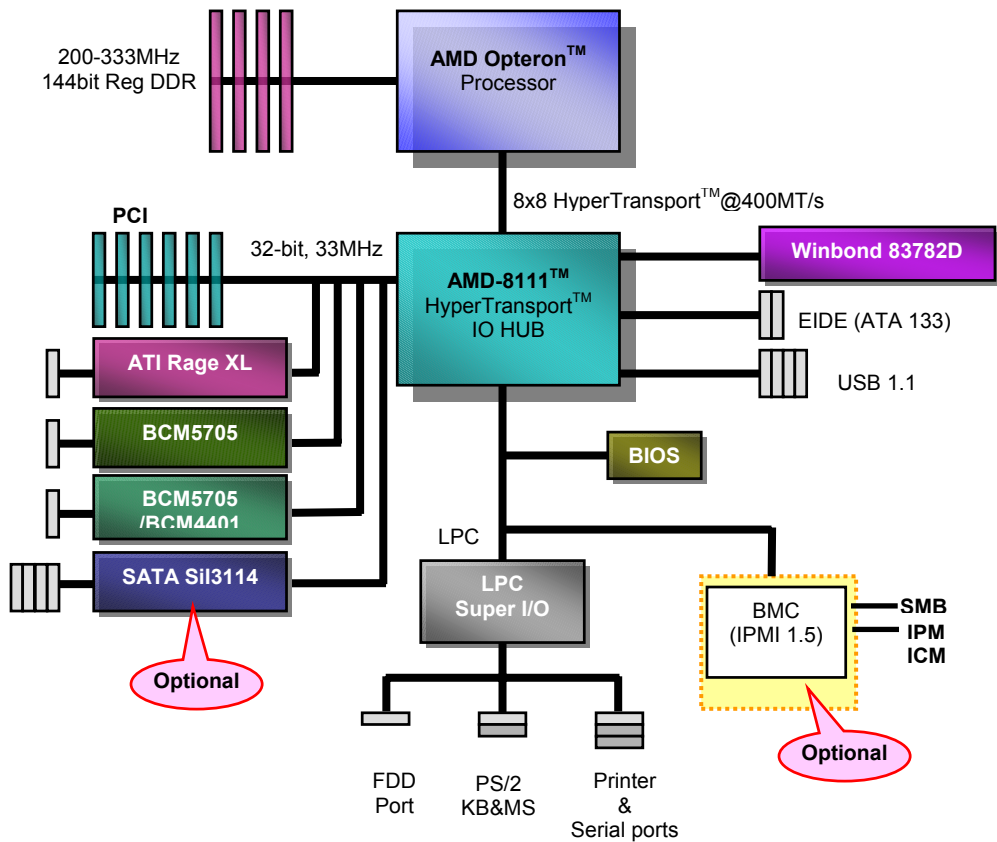
- (1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, Tyan recommends wearing a static safety wrist strap.
- (2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
- (3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
- (4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
- (5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

#### **NOTE**

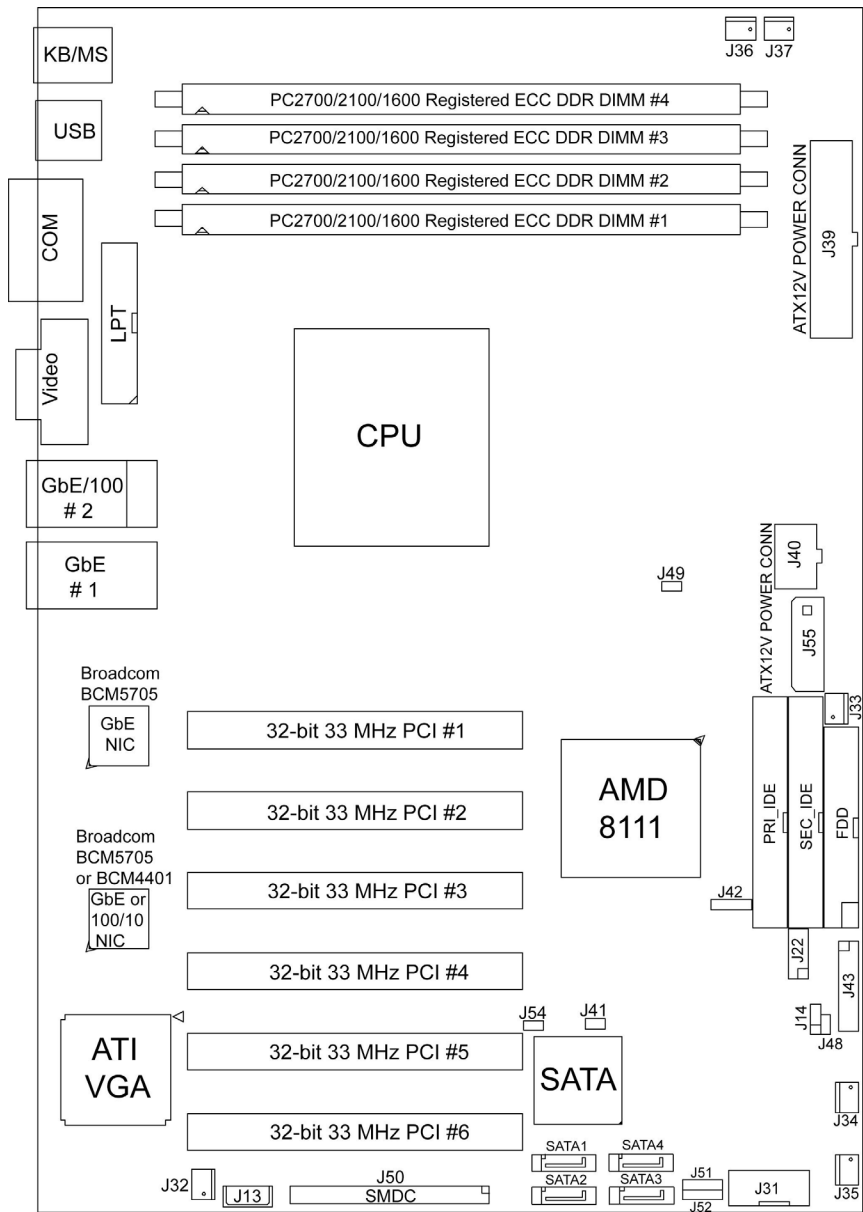
**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED**

2.00 – Block Diagram





2.01 – Board Parts, Jumpers and Connectors





Note: A □ depicts pin #1

This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.



2.02 – Jumper Settings

Jumper	Function	Settings
J13	IPMI I2C Bus Connector	See Section 2.03
J14	Clear CMOS Jumper	See Section 2.04
J22	USB Header	See Section 2.05
J31	Serial Port Internal Header	See Section 2.06
J32	Chassis Fan Connector	See Section 2.07
J33	CPU Fan Connector	See Section 2.07
J34	Chassis Fan Connector	See Section 2.07
J35	Chassis Fan Connector	See Section 2.07
J36	Chassis Fan Connector	See Section 2.07
J37	Chassis Fan Connector	See Section 2.07
J41	Keyboard Lock Connector	See Section 2.08
J42	External Speaker Header	See Section 2.09
J43	Front Panel Connector	See Section 2.10
J48	Chassis Intrusion Header	See Section 2.11
J50	SMDC Header	See Appendix II
J51	LAN 1 LED Header	See Section 2.12
J52	LAN 2 LED Header	See Section 2.13
J57	Power LED Connector	See Section 2.14

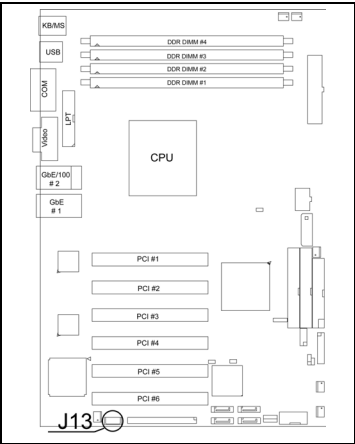
Jumper Legend


	<b>OPEN - Jumper OFF</b>	<b>Without jumper cover</b>
	<b>CLOSED - Jumper ON</b>	<b>With jumper cover</b>

	<b>To indicate the location of pin-1</b>
	<b>To indicate the location of pin-1</b>

2.03 – IPMI I<sup>2</sup>C Bus Connector (J13)

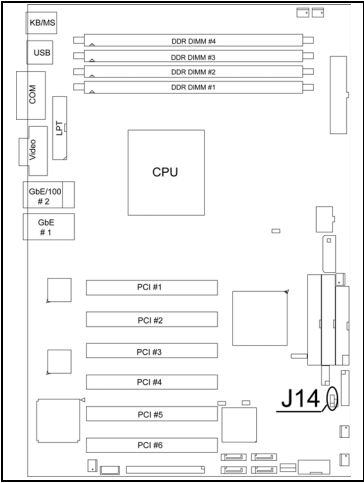






<b>Pin_4</b> : NC
<b>Pin_3</b> : SMBUSC_0
<b>Pin_2</b> : GND
<b>Pin_1</b> : SMBUSD_0

Use this connector to connect external IPMI I<sup>2</sup>C Bus devices

2.04 – Clear CMOS Jumper (J14)



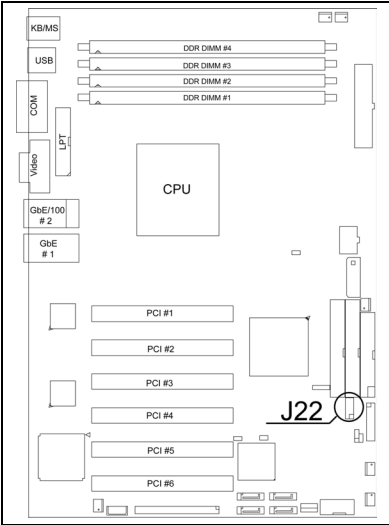
 Pin 3 Pin 1	Default	 Pin 3 Pin 1	Clear
---	---------	---	-------

You can reset the CMOS settings by using this jumper if you have forgotten your system/setup password or need to clear system BIOS setting.

- Power off system and **disconnect both power connectors from the motherboard**
- Use jumper cap to close Pin\_2 and Pin\_3 for several seconds to Clear CMOS
- Put jumper cap back to Pin\_1 and Pin\_2 (default setting)

Reconnect power & power on system

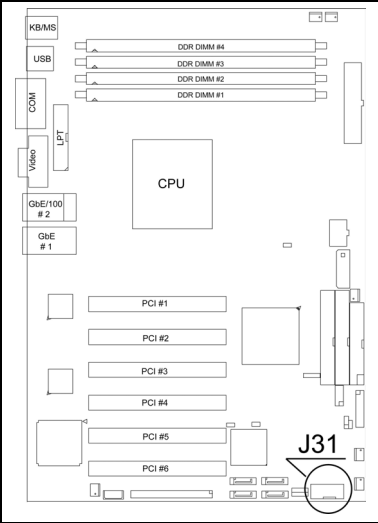
2.05 – USB Header (J22)











PIN-9						PIN-1
PIN-10						PIN-2

Signal Description	Pin #	Pin #	Signal Description
VCC	1	2	VCC
USB Channel_1 Data -	3	4	USB Channel_2 Data -
USB Channel_1 Data +	5	6	USB Channel_2 Data +
GND	7	8	GND
NC	9	10	GND

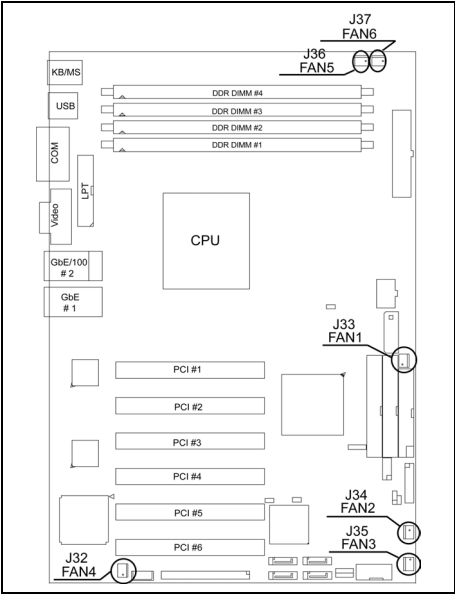
2.06 – Serial Port Internal Header (J31)




PIN-9					PIN-1
PIN-10					PIN-2

Signal Description	Pin #	Pin #	Signal Description
DCD (Data Carrier Detect)	1	2	DSR (Data-Set-Ready)
RXD (Receive-Data)	3	4	RTS (Request-to-Send)
TXD (Transfer-Data)	5	6	CTS (Clear-to-Send)
DTR (Data-Terminal-Ready)	7	8	RI (Ring-Indicator)
GND	9	10	NC

2.07 – FAN Connectors (J32~J37)

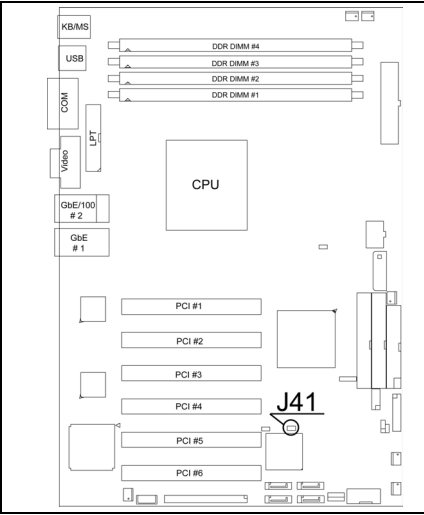






Speed +12V GND

#	FAN Description	Function	Amp Rated (Maximum)
J33	CPU FAN1	RPM Read	1.0A
J34	Chassis FAN2	RPM Read	1.0A
J35	Chassis FAN3	RPM Read	1.0A
J32	Chassis FAN4	RPM Read	1.0A
J36	Chassis FAN5	RPM Read	1.0A
J37	Chassis FAN6	RPM Read	1.0A

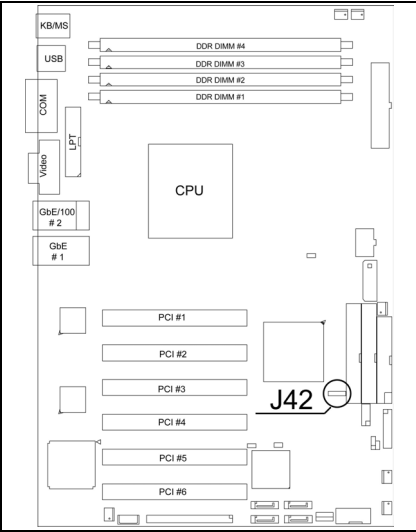
2.08 – Keyboard Lock Jumper (J41)






The diagram shows a motherboard layout with various components labeled: KB/MS, USB, COM, Video, LPT, GbE/100 #2, GbE #1, CPU, DDR DIMM #4, #3, #2, #1, PCI #1 through #6, and J41. J41 is a 2-pin header located near the PCI slots.

	<b>OPEN (Default)</b> To enable PS/2 keyboard
	<b>CLOSED</b> To disable PS/2 keyboard

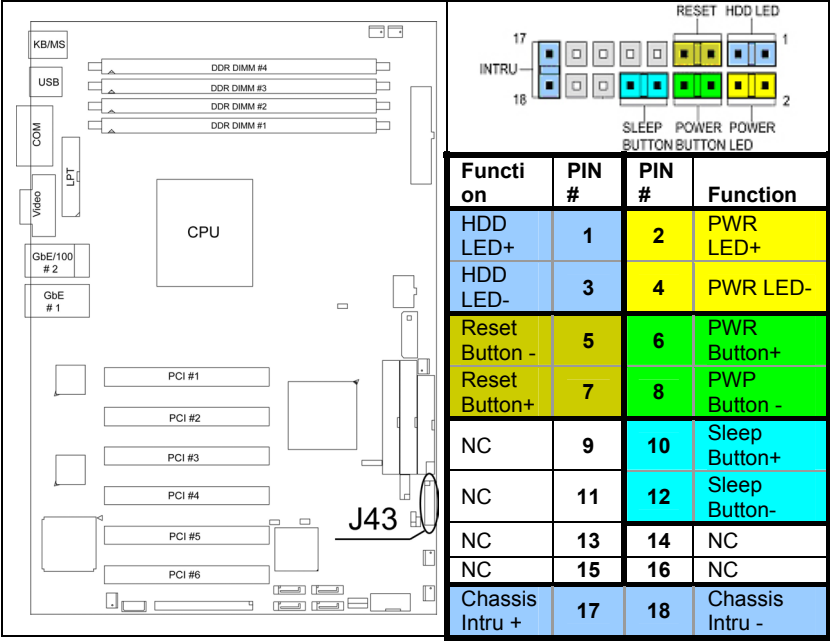
2.09 – External Speaker Header (J42)



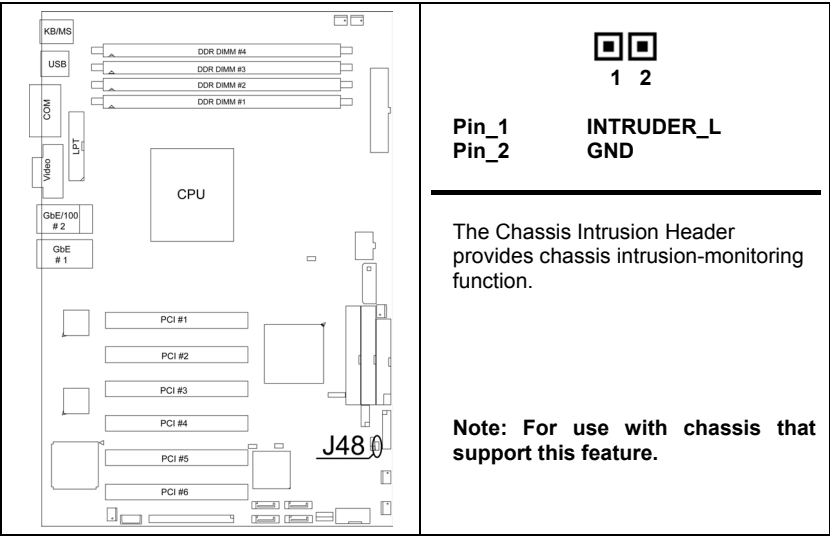
The diagram shows a motherboard layout with various components labeled: KB/MS, USB, COM, Video, LPT, GbE/100 #2, GbE #1, CPU, DDR DIMM #4, #3, #2, #1, PCI #1 through #6, and J42. J42 is a 4-pin header located near the PCI slots.

 <p>Pin_1 Pin_4</p>	<b>Pin_1</b> : Speaker +  <b>Pin_2</b> : Buzzer + <b>Pin_3</b> : Speaker/ Buzzer -  <b>Pin_4</b> : Speaker -
	<b>Close Pin-2and Pin-3 (Default)</b> Enable onboard buzzer
	<b>Open Pin-1 ~ Pin-4</b> Disable onboard buzzer and can connect to chassis 1x4 speaker

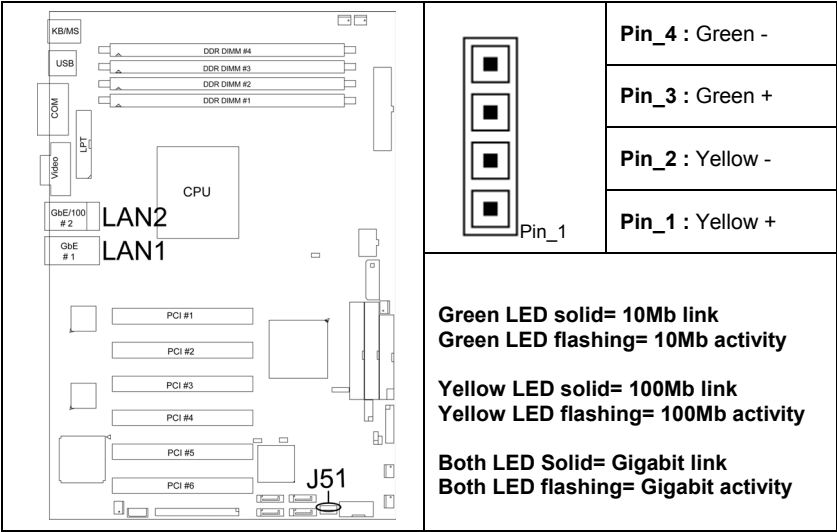
2.10 – Front Panel Connector (J43)



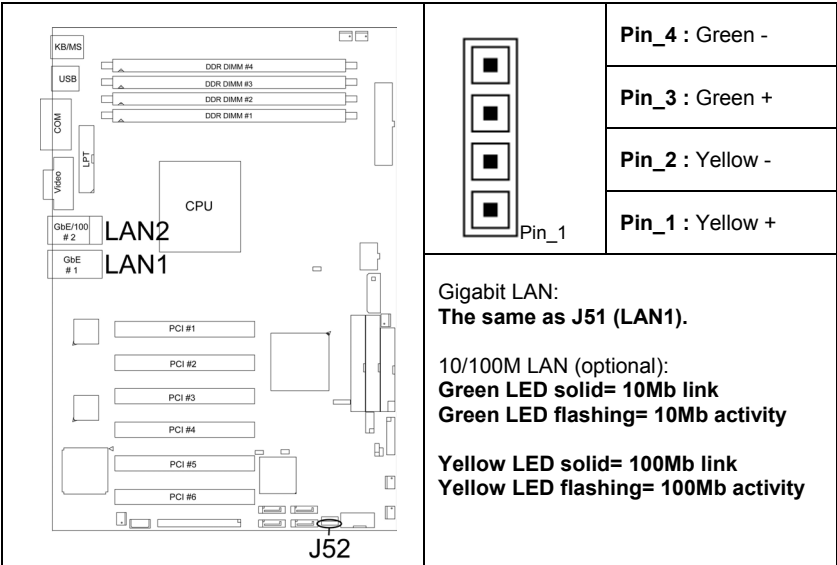
2.11 – Chassis Intrusion Header (J48)



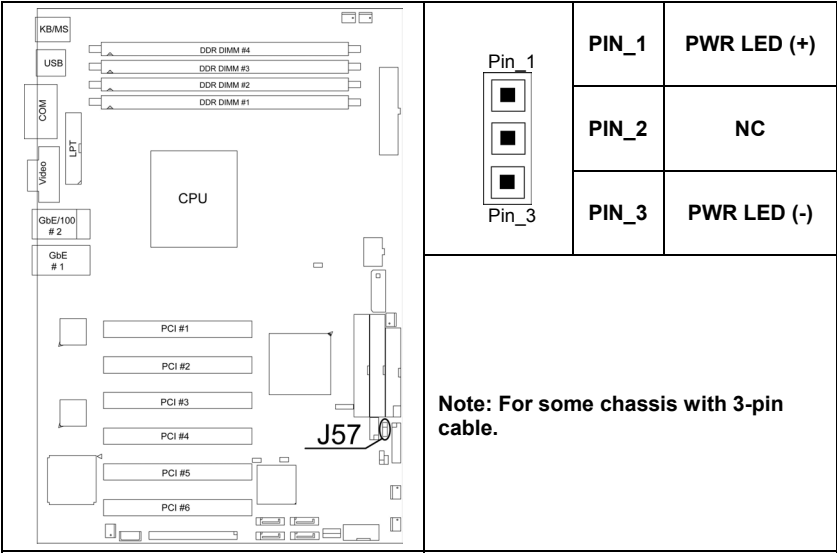
2. 12 – Gigabit LAN1 LED Header (J51)



2. 13 – Gigabit or 10/100M LAN2 LED Header (J52)



2.14 – Power LED Connector



2.15 – Tips on Installing the Motherboard in Chassis

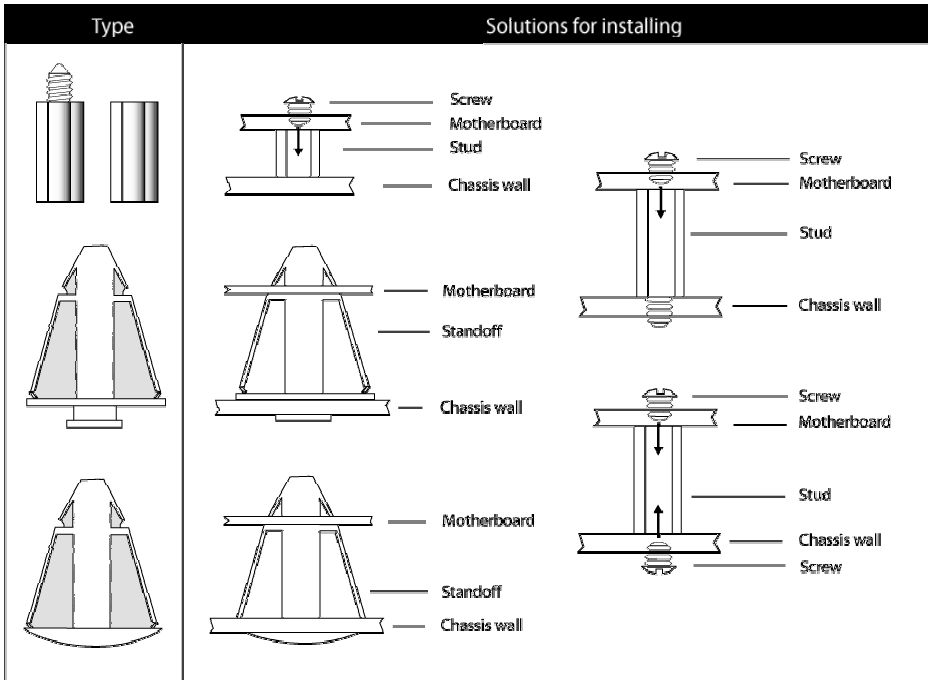
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you're unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

Some chassis include plastic studs instead of metal. Although the plastic studs are usable, Tyan recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.



## Mounting the Motherboard

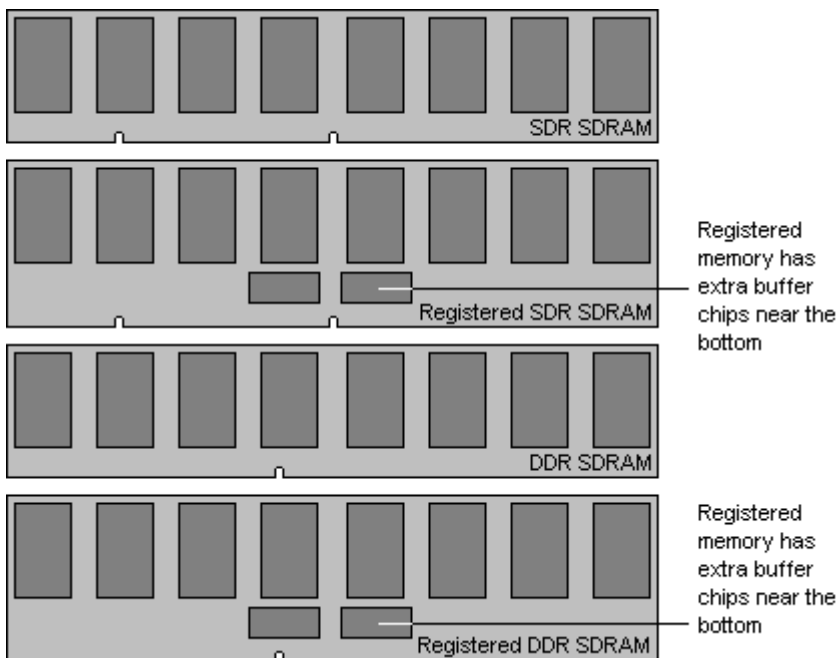


**TIP:** Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

### 2.16 – Installing the Memory

Before attempting to install any memory, make sure that the memory you have is compatible with the motherboard as well as the processor. For example, while PC1600 DDR modules are compatible with all DDR based motherboards, they **will not** work if you are required to run the motherboard and processor buses at 133MHz. For this, PC2100 DDR modules are required. Critically important is whether you're using the recommended memory for the current board you have. For this information, please check Tyan's web site at: [www.tyan.com](http://www.tyan.com)

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



Here are a few key points to note before installing memory into your Tomcat K8S:

- **AMD Opteron™ processors support 64bit (non-interleaved) or 128bit (interleaved) memory configurations**
- **At least ONE Registered DDR SDRAM module must be installed for the system to turn on and POST (power on self test)**
- 128MB, 256MB, 512MB, 1GB, and 2GB\* Registered PC2700/PC2100/PC1600 DDR SDRAM memory modules are supported
- All installed memory will be automatically detected
- The Tomcat K8S supports up to 8GB. \*

\* Not validated at the time of print, subject to change.

### Valid DIMM Configurations

The processor supports 64-bit mode and 128-bit mode configurations of the DIMMs. In 64-bit mode, only DIMMs 1 and 3 can be populated. Possible combinations of DIMMs in 64-bit mode are listed in the table as below. In 128-bit mode, a minimum of two DIMMs is required to create the 128-bit bus; therefore, DIMMs can only be populated in even numbered pairs in slots 1 & 2, and 3 & 4. The following table shows some possible combinations of DIMMs for 128-bit mode. **Not all possible combinations are listed in the table.**

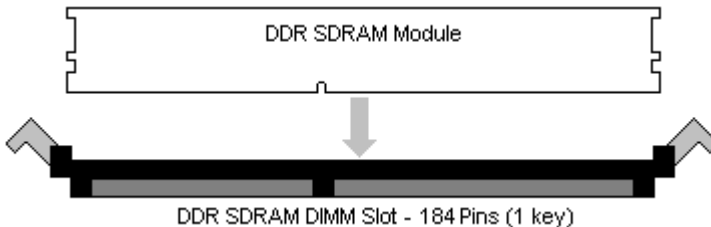
## This chart outlines the rules for populating memory

(Note: X = Do not populate)

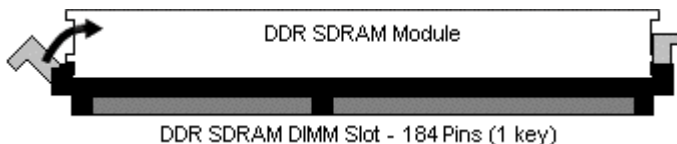
DIMM Slot	DIMM1	DIMM2	DIMM3	DIMM4
<b>64-bit Mode (MB)</b>	X	X	256	X
	256	X	256	X
	X	X	512	X
	512	X	512	X
	X	X	1024	X
	1024	X	1024	X
	X	X	2048	X
	1024	X	2048	X
	2048	X	2048	X
	X	X	4096	X
<b>128-bit Mode (MB)</b>	4096	X	4096	X
	X	X	256	256
	256	256	256	256
	X	X	512	512
	512	512	512	512
	X	X	1024	1024
	1024	1024	1024	1024
	X	X	2048	2048
	2048	2048	2048	2048
	X	X	4096	4096
	4096	4096	4096	4096

## Memory Installation Procedure

When installing memory modules, make sure the modules align properly with the memory socket. There should be keys (small indents) on your memory modules that fit according to the keys in the memory socket. DDR modules and sockets have only one key, which is slightly near the center of the module/socket. SDRAM modules (also referred to as PC100 or PC133) and their sockets have two keys and will not insert into DDR DIMM sockets. The method of installing memory modules is detailed in the following diagrams.



Once the memory modules are firmly seated in the socket, two clamps on either side will close and secure the module into the socket. Sometimes you may need to close the clamps manually.



To remove the memory module, simply push the clamps outwards until the memory module pops up. Then simply remove the module.

**TIP:** When installing memory, a module may require a considerable amount of force to seat properly, although this is very rare. To avoid bending and damaging your motherboard, place it on its anti-static bag and onto a flat surface, and then proceed with memory installation.

#### NOTE

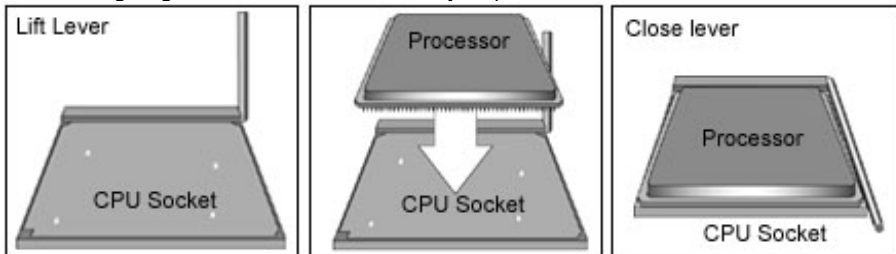
**YOU MUST ALWAYS** unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion device.

## 2.17 – Installing the Processor and Heatsink

Your Tomcat K8S S2850 supports the latest 64-bit processor technologies from AMD. However, **only AMD Opteron™ processor are certified and supported with this motherboard.** Check the following page on TYAN's website for latest processor support:

<http://www.Tyan.com>

The following diagrams will detail how to install your processor:



The processors you choose to use may not look exactly like the one pictured above, nor will the socket look exactly the same. The diagram is provided as a visual guide to help you install socket processors.

1. Lift the lever on the socket until it is approximately 130° or as far back as possible to the socket.
2. Align the processor with the socket. There are keys underneath the processor just like on memory modules to ensure that they insert the correct way.
3. Seat the processor firmly into the socket by gently pressing down until the processor sits flush with the socket.
4. Place the socket lever back down until it snaps into place.
5. Your processor is installed.

**Take care when installing processor as it has very fragile connector pins below the processor and can bend and break if inserted improperly.**

### **Heatsink Retention Frame and Back Plate Installation**

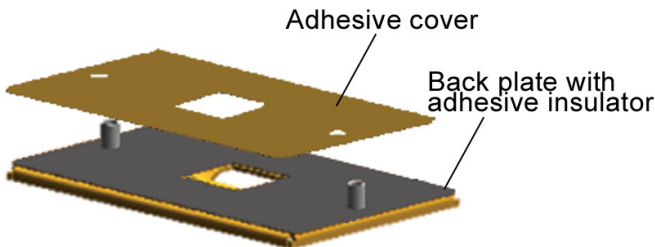
After you are done installing the processor, you should proceed to installing the heatsink. Heatsink will ensure that the processor does not overheat and continues to operate at maximum performance for as long as you own it. Overheated processor may damage the motherboard.

The back plate assembly prevents excessive motherboard flexing in the area near the processor and provides a base for the installation of the heatsink retention frame and heatsink.

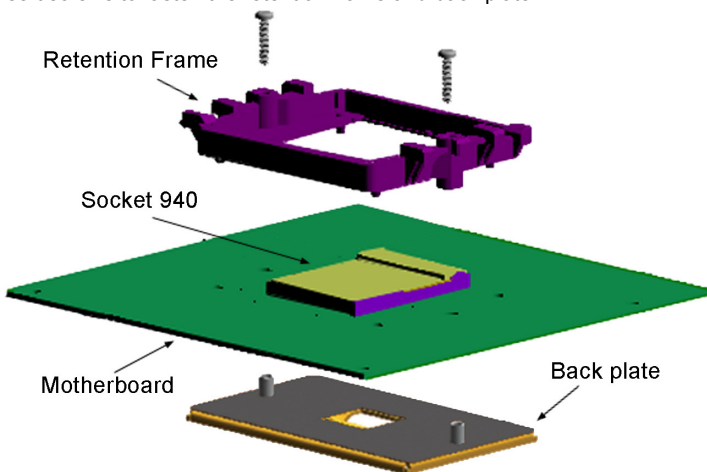
Because there are many different types of heatsinks available from many different manufacturers, a lot of them have their own method of installation. For the safest method of installation and information on choosing the appropriate heatsink, please refer to AMD's website at <http://www.amd.com>.

The following diagram will illustrate how to install the most common CPU heatsink retention frame and back plates:

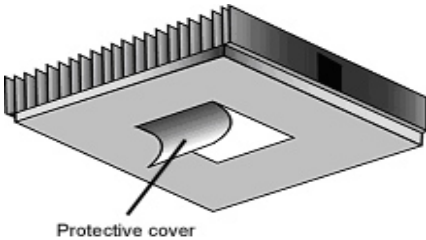
- 1) Remove the adhesive cover from the back plate.



- 2) Align the back plate screw bolts to the holes around processor socket on the back of motherboard.
- 3) Align the heatsink retention frame to the back plate screw bolts on the front of motherboard.
- 4) Insert screws to fasten the retention frame and back plate.



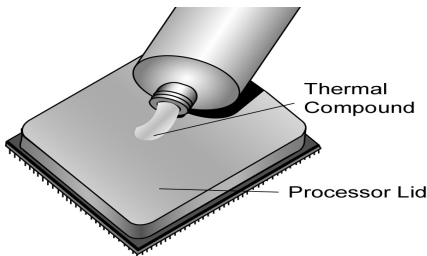
## 2.18 -- Thermal Interface Material



There are two types of thermal interface materials designed for use with the AMD Opteron processor.

The most common material comes as a small pad attached to the heatsink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material.

Simply remove the protective cover and place the heatsink on the processor.



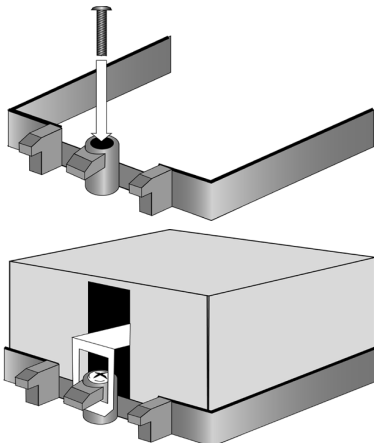
The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

### NOTE

Always check with the manufacturer of the heatsink & processor to ensure the Thermal Interface material is compatible with the processor & meets the manufacturer's warranty requirements

## 2.19 Heatsink Installation Procedures

### Type A: CAM LEVER (TYPE) INSTALLATION

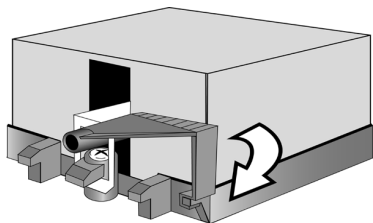


1. After placing backplate and interface material under motherboard place heatsink retention frame on top of motherboard. Align plastic retention bracket screw hole with CPU back-plate standoffs.

Tighten screws to secure plastic retention bracket. Repeat for on other side.

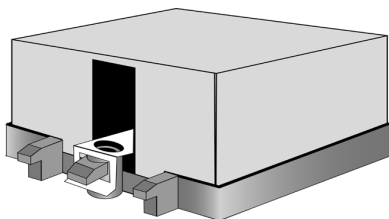
**DO NOT OVER TIGHTEN.**

2. After tightening screws secure metal clip to plastic retention bracket center tab. Repeat for on other side of heatsink.

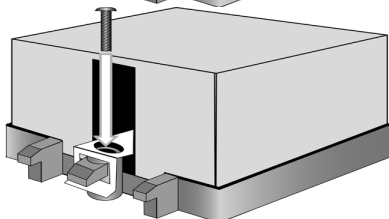


3. After securing metal clip to plastic retention bracket center tab, push down on plastic clip to lock plastic clip to side tab.

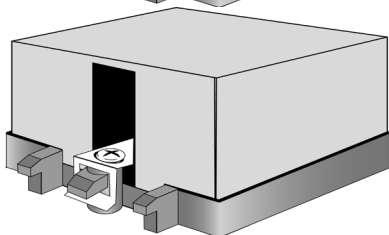
## Type B: SCREW RETENTION TYPE HEATSINK



1. After placing CPU back-plate and adhesive interface material under motherboard, place heatsink retention frame on top of motherboard. Align heatsink retention frame screw hole with backplate assembly standoffs. Place heatsink inside plastic retention bracket. Place metal clip over retention frame tab. Repeat for other side.



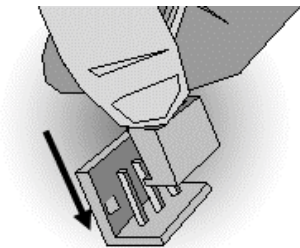
2. Insert screw through metal clip.  
**BE SURE METAL CLIP IS LOCKED ONTO RETENTION FRAME TAB.**



3. Tighten screw through metal clip. Repeat on other side.  
**DO NOT OVER TIGHTEN.**

## Finishing Installing the Heatsink

After you finish installing the heatsink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heatsink) to the motherboard. The following diagram illustrates how to connect fans onto the motherboard.



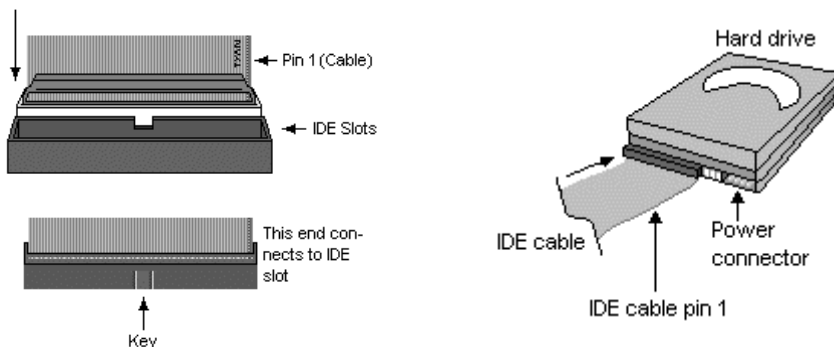
After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

## 2.20 – Attaching Drive Cables

### IDE Drives

Attaching IDE drive cabling is simple. These cables are “keyed” to only allow them to be connected in the correct manner. Tyan motherboards have two on-board IDE channels, each supporting two drives.

Attaching IDE cables to the IDE connectors is illustrated below:



Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

Note: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

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

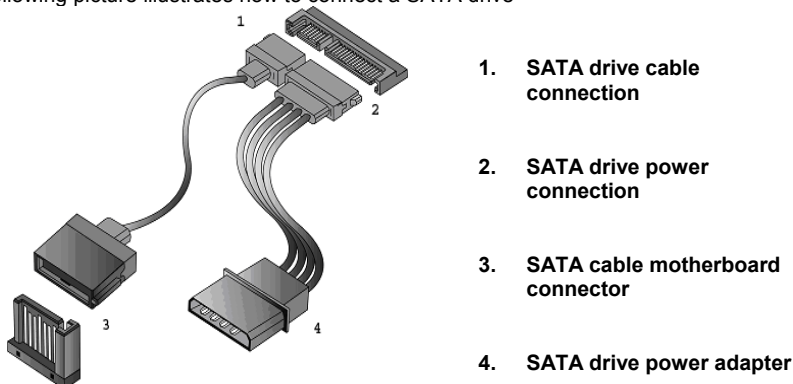
### SATA Drivers

The Tomcat K8S may be also equipped with 4 Serial ATA (SATA) channels. Connections for these drives are also very simple.

There is no need to set Master/Slave jumpers on SATA drives.

Tyan has supplied two SATA cables and one SATA power adapter for boards equipped with SATA" since this is a BOM option. If you are in need of other cables or power adapters please contact your place of purchase.

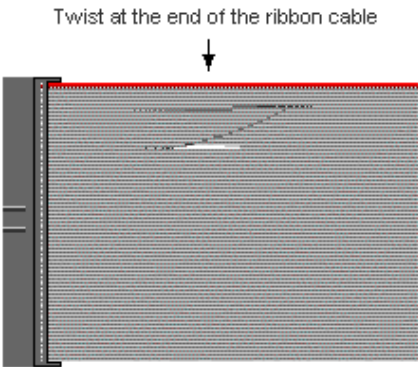
The following picture illustrates how to connect a SATA drive





Floppy Drives

Attaching a floppy drive can be done in a similar manner to an IDE drive. See the diagram below for an example of a floppy cable. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there will be a key pin on the cable, which will force proper connection of the cable.



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

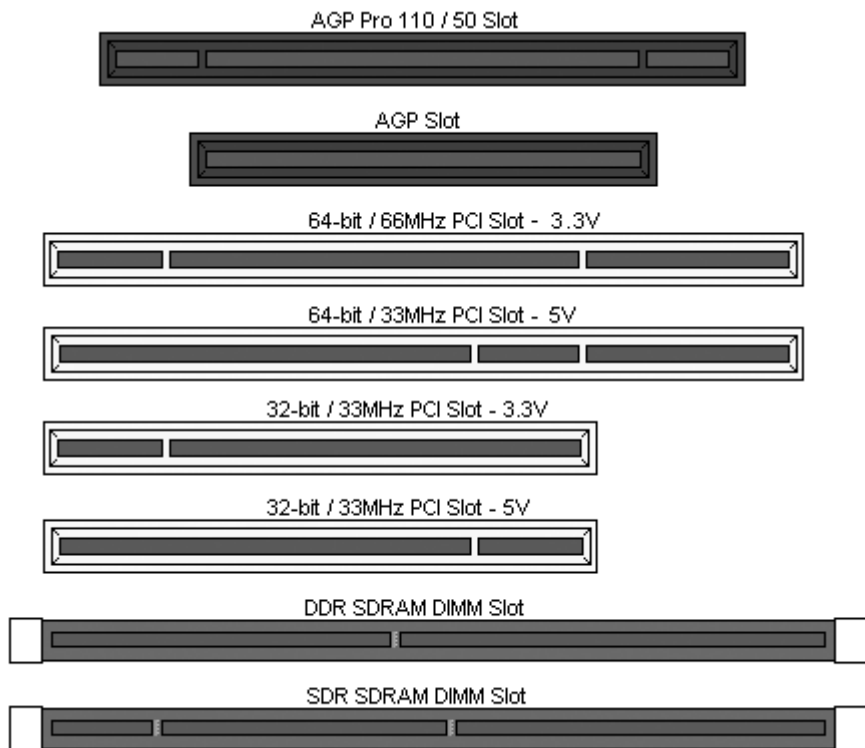
Refer to your floppy drive's installation instructions (if available), or contact your dealer if you are unsure about how to attach the floppy drive(s). Remember, you can only have 2 floppy drives connected at any given time.

Below are some symptoms of incorrectly installed floppy drives. While they are minor and installing them incorrectly doesn't cause severe problems, it may cause your system to freeze or crash when trying to read and/or write to diskettes.

Symptoms of incorrectly installed floppy drives	
Drive is not automatically detected	Usually caused by faulty cables, cables put in backwards or a bad floppy drive or motherboard. Try another floppy drive to verify the problem if the cable is properly installed or try replacing the actual cable. Also check to see if the onboard floppy controller is enabled in the BIOS setup.
Drive Fail message at startup	The cable, floppy drive or motherboard may be faulty. Try another drive or cable to verify.
Drive does not power on	Check power cable and cabling. Maybe a bad power supply or drive cable problem.
Drive activity light is constantly on	Usually signifies that the cable on the drive is on backwards, which is a common issue. Reverse the cable at the floppy drive end and try again.

2.21 – Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the most common slots that may appear on your motherboard. Not all of the slots shown will necessarily appear on your motherboard, however, there will be combinations of what you see here.





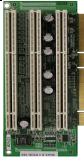
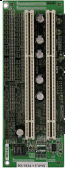
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards (or anything else) into any slots if they won't seat in place. It's better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

**TIP:** It's good practice to install add-in cards in a staggered manner, rather than directly adjacent to each other. This allows air to more easily circulate within the chassis, providing improved cooling for all installed devices.

**NOTE**

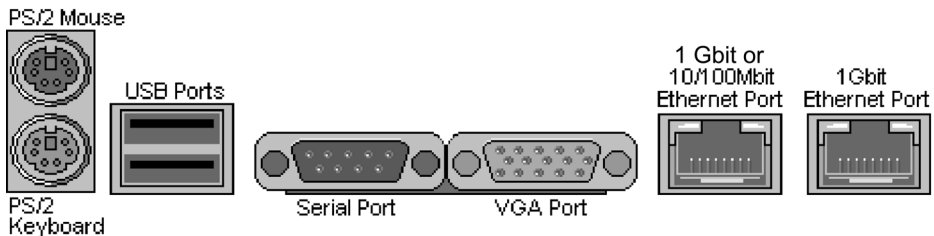
**YOU MUST ALWAYS** unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion device.

2.22 – PCI Riser Cards Supported on Tomcat K8S S2850

			
<b>Model Number</b>	<b>M2037</b>	<b>M2043</b>	<b>M2043X</b>
<b>What speeds can support</b>	ALL SPEEDS	66MHz 33MHz	100MHz 66MHz 33MHz
<b>Form Factor</b>	1U	2U	2U
<b>What kind of Gold Finger</b>	3.3V and 5V	3.3V and 5V	3.3V and 5V
<b>How many slots</b>	1	3	2
<b>What kinds of slots</b>	5V	3.3V	3.3V
<b>UPC Code</b>	635872-007255	635872-006906	635872-007095

2.23 – Connecting External Devices

Connecting external devices to the motherboard is an easy task. The standard devices you should expect to plug into the motherboard are keyboards, mice, and printer cables. The following diagram will detail the ATX port stack for the following board:

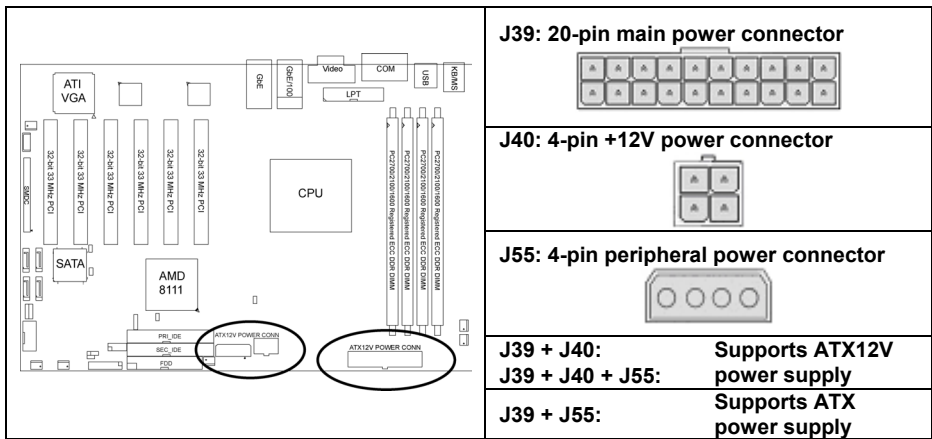


Besides being used primarily to connect printers, the Printer Port is also used for devices such as Zip drive, some external CD-RW drives and or other external devices. More on the uncommon side these days are the Serial Ports. They were primarily used to connect external modems, but most modems today are using USB or are installed internally.

**TIP:** While the ports have been created to accept connectors in only one direction, make sure to be careful when inserting connectors. At times, attaching connectors in the incorrect orientation can damage, bend and or break the pins.

## 2.24 – Installing the Power Supply

This motherboard is an ATX12V product but is also capable of using a standard ATX power supply.



**If you use a standard ATX12V power supply you will only need to use J39 and J40. You can also plug in J55 for an additional pathway for current distribution but is not a necessity. However J55 is a necessity if you plan on using an ATX power supply.**

**If you use a standard ATX power supply, you need to plug J39+J55, or else system can't boot up.**

We suggest using a 250W or higher power supply; this is of course dependent on how many devices you attach. However, 250W is sufficient for systems without many devices (i.e. 1 hard drive, 1 optical drive, and 1 or 2 expansion cards).

**NOTE:** The S2850 Tomcat K8S peripheral drive power connector must be independent of any other devices. A device such as a DVD/CD-ROM drive, hard drive, or any other devices cannot be attached onto the same power line. If connected, system stability is compromised.

## 2.25 – Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line.**

# Chapter 3: BIOS

## 3.00 – BIOS Setup Utility

With the BIOS setup utility, you can modify BIOS settings and control the special features of your computer. The setup utility uses a number of menus for making changes and turning the special features on or off.

**NOTE**

All menus are based on a typical system. The actual menus displayed on your screen may be different and depend on the hardware and features installed in your computer.

To start the BIOS setup utility:

- a. Turn on or reboot your system
- b. Press <Del> during POST (F4 on remote console) to start BIOS setup utility

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
System Overview						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.	
AMIBIOS							
Version : 08.00.xx						+/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit	
Build Date : xx/xx/xxxx							
ID : 0ABCFxxx							
Processor							
Type : AMD Opteron Model xxx							
Speed : xxxx MHz							
Count : x							
System Memory							
Size : xxxx MB							
System Time		[xx:xx:xx]					
System Date		[xx/xx/xxxx]					

**To select an item**

Use the left/right (← →) arrow keys to make a selection

**To display a sub-menu** (A pointer “▶” marks all sub menus)

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>.

### 3.01 – BIOS Menu Bar

The menu bar at the top of the windows lists these selections:

Main	To configure basic system setups
Advanced	To configure the advanced chipset features
PCI/PnP	To configure legacy Plug & Play or PCI settings
Boot	To configure system boot order
Security	To configure user and supervisor passwords
Chipset	To configure chipset management features
Power	To configure power management features
Exit	To exit setup utility

**NOTE**

Options written in **bold type** represent the BIOS setup default

### 3.02 – BIOS Legend Bar

The chart describes the legend keys and their alternates:

Key	Function
<F1> or <Alt-H>	General help window
<ESC>	Exit current menu
← → arrow keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> or <Shift-Tab>	Cycle cursor up/down
<Home> or <End>	Move cursor to top/bottom of the window
<PgUp> or <PgDn>	Move cursor to next/previous page
<F5> or <->	Select the previous value/setting of the field
<F6> or <+> or <Space>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F9>	Load the Optimal default configuration values of the menu
<F10>	Save and exit
<Enter>	Execute command or select submenu

### 3.03 – BIOS Main Menu

The Main BIOS Menu is the first screen that you can navigate. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured, options in blue can be changed.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often, a text message will accompany it.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
System Overview						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field	
AMIBIOS						Use [+] or [-] to configure system time.	
Version : 08.00.xx							
Build Date : xx/xx/xxxx							
ID : 0ABCFxxx							
Processor							
Type : AMD Opteron(tm) Model xxxx						+/- Change Field	
Speed : xxxx MHz						Tab Select Field	
Count : x						F1 Help	
System Memory						F10 Save and Exit	
Size : xxxx MB						ESC Exit	
System Time		[xx:xx:xx]					
System Date		[xx/xx/xxxx]					

Feature	Option	Description
<b>Main</b>		
System Time	HH : MM : SS	Set the system time
System Date	MM : DD : YYYY	Set the system date

### 3.04 – BIOS Advanced Menu

You can select any of the items in the left frame of the screen, such as Super I/O Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.

BIOS Setup Utility							
Main	<b>Advanced</b>	PCI/PnP	Boot	Security	Chipset	Power	Exit
Advanced Settings					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
WARNING: Setting wrong values in below sections May cause system to malfunction.					Use [+] or [-] to configure system time.		
<ul style="list-style-type: none"> <li>▶ IDE Configuration</li> <li>▶ Floppy Configuration</li> <li>▶ Super I/O Configuration</li> <li>▶ Hardware Health Function</li> <li>▶ Event Log Control</li> <li>▶ Remote Access Configuration</li> <li>▶ USB Configuration</li> <li>▶ Onboard Devices Configuration</li> <li>▶ Watchdog Timer Configuration</li> </ul>					+/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		

Feature		Description
<b>Advanced Settings</b>		
IDE Configuration	<b>Menu Item</b>	Configures devices connected to AMD8111 IDE controller
Floppy Configuration	<b>Menu Item</b>	Configures devices connected to the floppy controller
Super I/O Configuration	<b>Menu Item</b>	Configures devices connected to the Super I/O Configuration
Hardware Health Function	<b>Menu Item</b>	Configures & views Hardware Monitor
Event Log Control	<b>Menu Item</b>	Views & controls Event Log
Remote Access Configuration	<b>Menu Item</b>	Configures Console Redirect
USB Configuration	<b>Menu Item</b>	Configures USB controller & legacy device support
Onboard Devices Configuration	<b>Menu Item</b>	Option with on board devices
Watchdog Timer Configuration	<b>Menu Item</b>	Watchdog Timer Enable/Disable

### 3.04.1 – IDE Configuration Sub-Menu

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
IDE Configuration					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
Onboard PCI IDE Controller			[Both]				
▶ Primary IDE Master			[xxxx]				
▶ Primary IDE Slave			[xxxx]				
▶ Secondary IDE Master			[xxxx]				
▶ Secondary IDE Slave			[xxxx]				
Hard Disk Write Protect			[Disable]				
IDE Detect Time Out (Sec)			[xx]				
ATA (PI) 80Pin Cable Detection Device]			[Host &				

Feature	Option	Description
<b>IDE Configuration</b>		
Onboard PCI IDE Controller	<b>BOTH</b>	This setting determines whether the AMD 8111 primary and secondary IDE channels are activated.
	Primary	
	Secondary	
	Disabled	
Primary/Secondary Master	<b>Auto</b>	Auto - To determine the IDE drive type by system BIOS
	User	User - To set IDE drive type by user
	ATAPI Removable	ATAPI Removable – Read/write media (e.g. IDE ZIP)
	CD-ROM	CD-ROM - Readable CD-ROM drive
	None	
Hard Disk Write Protect	<b>Disabled</b>	This option protects the first sector of the IDE HDD from being written
	Enabled	
IDE Detect Time Out (Sec)	<b>35 ~ 0</b>	Configure the time (in Seconds) before the BIOS times out on detecting an IDE Device
ATA (PI) 80Pin Cable Detection	<b>Host</b>	Configures how the BIOS detects an 80pin IDE cable is attached. Host = Use chipset to detect Device = Use IDE Device to detect
	Device	
	Host & Device	



### 3.04.2 – Floppy Configuration Sub-Menu

You can use this screen to specify options for the Floppy Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
Floppy Configuration					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
Floppy A [1.44 MB]							
Floppy B [1.44 MB]					Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		

Feature	Option	Description
<b>Floppy Configuration</b>		
Floppy A	Disabled	This setting selects the type of the floppy disk drive installed in system.
	1.3MB	
	720KB	
	<b>1.44/1.25MB</b>	
Floppy B	2.88MB	This setting selects the type of the floppy disk drive installed in system.
	<b>Disabled</b>	
	1.3 MB	
	720 KB	
	1.44/1.25 MB	
	2.88 MB	

### 3.04.3 – Super I/O Configuration Sub-Menu

You can use this screen to select options for the Super I/O settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Super I/O Configuration</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
Keyboard Controller clock rate					[12Mhz]	Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit	
Serial Port_1 Address					[3F8/IRQ4]		
Serial Port_2 Address					[3E8/IRQ3]		
Parallel Port Address					[378]		
Parallel Port Mode					[Normal]		
Parallel Port IRQ					[IRQ7]		

Feature	Option	Description
<b>Super I/O Configuration</b>		
Keyboard Controller clock rate	<b>12MHz</b> 8MHz	Select clock rate for Keyboard Controller
Serial Port1 Address	<b>3F8/IRQ4</b>	Sets the serial port 1 (COM1) base I/O address and an interrupt number Disabled –turn off port
	2F8/IRQ3	
	3E8/IRQ4	
	2E8/IRQ3	
	Disabled	
Serial Port2 Address	<b>2F8/IRQ3</b>	Sets the serial port 2 (COM2) base I/O address and an interrupt number Disabled –turn off port
	3E8/IRQ4	
	2E8/IRQ3	
	3F8/IRQ4	
	Disabled	
Parallel Port Address	<b>378</b>	Assigns the Parallel Port base I/O address Disabled –turn off port
	278	
	3BC	
	Disabled	
Parallel Port Mode	<b>Bi-Directional</b>	Configures Parallel port mode. Bi-Directional= send & receive data Normal= can send data EPP= Enhanced Parallel Port ECP=Extended Capability port
	Normal	
	EPP	
	ECP	
	Disabled	
Parallel Port Interrupt	<b>7</b>	Assigns IRQ to parallel port
	5	
Parallel Port DMA Channel	<b>0~3</b>	Assigns DMA channel for port

### 3.04.4 – Hardware Health Configuration Sub-Menu

You can use this screen to view the Hardware Health Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Hardware Health Function</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
▶ Temperature and Fan Speed Report ▶ Motherboard Voltages Report							

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
Temperature and Fan Speed Report					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
CPU Temperature :xx C/ xx F PWM Temperature :xx C/ xx F  CPU Fan Speed :xx RPM System Fan 2 Speed :xx RPM System Fan 3 Speed :xx RPM System Fan 4 Speed :xx RPM System Fan 5 Speed :xx RPM System Fan 6 Speed :xx RPM							

BIOS Setup Utility							
Main	<b>Advanced</b>	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Motherboard Voltage Report</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
CPU Vcore				:xx V			
+3.3Vin				:xx V			
+5Vin				:xx V			
+12Vin				:xx V			
DDR 1.25V				:xx V			
DDR 2.5V				:xx V			
Southbridge 1.8V				:xx V			
USB 1.8V				:xx V			
3.3V Standby				:xx V			
5V Standby				:xx V			
1.2V Hyper Transport				:xx V			
3V Battery				:xx V			

Feature	Option	Description
<b>Hardware Health Configuration</b>		
CPU Temperature		Displays CPU & Ambient System Temperatures
System Temperature		
CPU1 Fan Speed		Displays speed of fans connected to appropriate Fan headers
System Fan 2 Speed		
System Fan 3 Speed		
System Fan 4 Speed		
System Fan 5 Speed		
System Fan 6 Speed		
CPU V_core		Displays Voltage for CPU, memory, & other devices
+3.3Vin		
+5Vin		
+12Vin		
DDR1.25V		
DDR2.5V		
Southbridge 1.8V		
USB 1.8V		
3.3V Standby		
5V Standby		
1.2V Hyper Transport		
3V Battery		

### 3.04.5 – Event Log Control Sub-Menu

You can use this screen to view the Event Log Control Menu. This logs system events (such as CMOS clear, ECC memory errors, etc) and writes the log into NVRAM. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility							
Main	<b>Advanced</b>	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Event Log Control</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
View Event Log Mark All Event Log as Read Clear Event Log Event Log Statistics					Use [+] or [-] to configure system time.		
					+/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		

Feature	Option	Description
<b>Event Log Control</b>		
View Event Log		View all unread events on the Event Log
Mark All Event Log as Read		Marks all events as read
Clear Event Log		Clear Event Log
Event Log Statistics		Displays the storage capacity & usage of the Event Log

### 3.04.6 – Remote Access Configuration Sub-Menu

You can use this screen to view the Remote Access Configuration Menu. This feature allows access to the Server remotely via serial port. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility							
Main	<b>Advanced</b>	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Remote Access Configuration</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
Remote Access [Serial]					Use [+] or [-] to configure system time.		
Terminal Type [ANSI]					+/- Change Field		
Serial Port Number [COM1]					Tab Select Field		
Serial Port Mode [115200 8,n,1]					F1 Help		
Flow Control [Hardware]					F10 Save and Exit		
Post-Boot Support [Disabled]					ESC Exit		

Feature	Option	Description
Remote Access	<b>Disabled</b>	Enables remote access to system through serial port
	Serial	
Terminal Type	<b>ANSI</b>	Sets the type of terminal used for remote access
	VT100	
Serial Port Number	<b>COM1</b>	Determines which serial port will be used for remote access
	COM2	
Serial Port Mode	<b>115200 8n1</b>	Sets the speed of data to terminal
	57600 8n1	
	19200 8n1	
	9600 8n1	
Flow Control	<b>Hardware</b>	Enables hardware flow control to protect buffer overflow
	None	
Post-Boot Support	<b>Disabled</b>	Keeps redirection active after booting to DOS
	Enabled	

### 3.04.7 – USB Configuration Sub-Menu

You can use this screen to view the USB Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
USB Configuration						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field	
USB Devices Enabled :						Use [+] or [-] to configure system time.	
Legacy USB Support				[Auto]			
USB Beep Message				[Disabled]			
						+/- Change Field	
						Tab Select Field	
						F1 Help	
						F10 Save and Exit	
						ESC Exit	

Feature	Option	Description
USB Devices Enabled		USB Devices detected
Legacy USB Support	<b>Auto</b>	Enables support for legacy USB devices such as keyboards, mice, & bootable USB devices
	Disabled	
	Enabled	
	Floppy Hard Disk	
USB Beep Message	<b>Disabled</b>	Enables beep during USB Device Enumeration
	Enabled	

### 3.04.8 Onboard Device Sub-Menu

You can use this screen to view Device & PCI Slot Configuration Menu. This menu allows the user to enable or disable integrated devices, option ROM, and PCI cards added. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility		
Main	Advanced	PCI/PnP    Boot    Security    Chipset    Power    Exit
<b>Onboard Devices Configuration</b>		Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time. +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit
Onboard ATI Video Onboard LAN1 Onboard LAN2 Onboard Serial ATA	Enabled Enabled Enabled Enabled	
<b>Onboard Devices Optrom Configuration</b>		
Onboard LAN 1 Option Rom Onboard LAN 2 Option Rom Serial ATA Option Rom	Enabled Enabled Enabled	

Feature	Option	Description
<b>Onboard Devices Configuration</b>		
Onboard ATI Video, LAN1,LAN2,& Serial ATA	<b>Enabled</b>	Allows user to enable or disable onboard ATI video, Serial ATA controller, and Onboard LAN individually
	Disabled	
Onboard LAN1,LAN2,& Serial ATA Option Rom	<b>Enabled</b>	Allows user to enable or disable onboard ATI video, Serial ATA controller, and Onboard LAN Option Rom individually
	Disabled	

### 3.04.9 Watchdog Timer Sub-Menu

You can use this screen to view Watchdog Timer Configuration Menu. This menu allows the user to enable or disable watchdog timer. Use the up and down arrow (↑/↓) keys to select a value.

BIOS Setup Utility		
Main	Advanced	PCI/PnP    Boot    Security    Chipset    Power    Exit
<b>Watchdog Timer Configuration</b>		Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time. +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit
Watchdog Timer Timer-Out Value(minutes):	Enabled 2	

Feature	Option	Description
<b>Watchdog Timer Configuration</b>		
Watchdog Timer	<b>Disabled</b>	Allows user to enable or disable Watchdog timer
	Enabled	
Timer-Out Value(minutes)	2	Allows user to select Watchdog timer
	<b>4</b>	
	6	
	8	
	10	

### 3.05 – BIOS PCI/PnP Menu

You can use this screen to view PnP (Plug & Play) BIOS Configuration Menu. This menu allows the user to configure how the BIOS assigns resources & resolves conflicts. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>PCI/PnP Setting</b>						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field	
Plug & Play OS				[No]	Use [+] or [-] to configure system time.		
PCI Latency Timer				[64]			
Allocate IRQ to PCI VGA				[Yes]			
Palette Snooping				[Disabled]			
PCI IDE BusMaster				[Disabled]			
IRQ3				[Available]	+/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
IRQ4				[Available]			
IRQ5				[Available]			
IRQ7				[Available]			
IRQ9				[Available]			
IRQ10				[Available]			
IRQ11				[Available]			
IRQ14				[Available]			
IRQ15				[Available]			
DMA Channel_0				[Available]			
DMA Channel_1				[Available]			
DMA Channel_3				[Available]			
DMA Channel_5				[Available]			
DMA Channel_6				[Available]			
DMA Channel_7				[Available]			
Reserved Memory Size				[Disabled]			



Feature	Option	Description
<b>PCI PnP Configuration</b>		
<b>Plug &amp; Play OS</b>	<b>Yes</b>	The Yes setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.
	No	Set No for operating systems that do not meet the Plug and Play specifications. It allows the BIOS to configure all the devices in the system.
<b>PCI Latency Timer</b>	<b>96</b>	This setting controls how many PCI clocks each PCI device can hold the bus before another PCI device takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth.
	128	
	160	
	192	
	224	
	248	
<b>Allocate IRQ to PCI VGA</b>	<b>Yes</b>	Allows or restricts the system from giving the VGA adapter an IRQ.
	No	
<b>Palette Snooping</b>	<b>Disabled</b>	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled.
	Enabled	
<b>IRQ3 ~ IRQ15</b>	<b>Available</b>	Allows user to reserve a specific IRQ for a legacy device (Note: most hardware devices & OS used do not support manual assigned )
	Reserved	
<b>DMA0 ~ 7</b>	<b>Available</b>	Allows user to reserve a specific DMA for a legacy device
	Reserved	
<b>Reserved Memory Size</b>	<b>Disabled</b>	Allows user to reserve a specific size in memory for a legacy device
	16K ~64K	
<b>Reserved Memory Address</b>	<b>Disabled</b>	Allows user to reserve a specific address in memory for a legacy device
	C0000 ~ DC000	

### 3.06 – BIOS Boot Menu

You can display Boot Setup option by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Boot Setting</b>				Use [ENTER], [TAB] or [SHIFT_TAB] to select a field			
<ul style="list-style-type: none"> <li>▶ Boot Settings Configuration</li> <li>▶ Boot Device Priority</li> <li>▶ Removable Drives</li> </ul>				Use [+] or [-] to configure system time.			
				+/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit			

### 3.06.1 – Boot Settings Configuration Sub-Menu

Use this screen to select options for the Boot Settings Configuration. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
Boot Settings Configuration					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
Quick Boot			[Disabled]				
Quiet Boot			[Disabled]		Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
Quick Boot Add On ROM Display Mode			[Force BIOS]				
Boot up Number-Lock			[On]				
PS/2 Mouse Support			[Enabled]				
Typematic Rate			[Fast]				
System Keyboard			[Present]				
Parity Check			[Disabled]				
Boot To OS/2			[No]				
Wait for "F1" If Error			[Enabled]				
Hit "Del" Message Display			[Enabled]				
Interrupt 19 Capture			[Enabled]				

Feature	Option	Description
Quick Boot Mode	<b>Enabled</b>	This option allows user bypass BIOS self test during POST
	Disabled	
Quiet Boot	<b>Disabled</b>	Enable this option to hide BIOS Post messages during POST
	Enabled	
Quick Boot Add On ROM Display Mode	<b>Force BIOS</b>	Allows user to force BIOS/Option ROM of add on cards to be displayed during quiet boot
	Keep Current	
Boot up Number-Lock	<b>On</b>	Choose status of keyboard NUM LOCK key
	Off	
PS/2 Mouse Support	<b>Enabled</b>	Allows user to choose status of PS/2 mouse support
	Disabled	
Typematic Rate	<b>Fast</b>	Choose the speed at which keys are repeated
	Slow	
System Keyboard	<b>Present</b>	Allows user to disable all system keyboards
	Not-Present	
Parity Check	<b>Disabled</b>	Enables system parity check
	Enabled	
Boot To OS/2	<b>No</b>	Set this option to yes only if booting to OS/2
	Yes	
Wait for "F1" If Error	<b>Enabled</b>	Allows user to disable the "Press F1 to Continue" error message when error is detected
	Disabled	
Hit "Del" Message Display	<b>Enabled</b>	Allows user to disable the "Press DEL to enter setup" message during POST
	Disabled	
Interrupt 19 Capture	<b>Disabled</b>	Allows devices (such as network card) to capture INT19 for booting
	Enabled	

### 3.07 – BIOS Security Menu

The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is entered, using either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
Security Setting					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field		
Supervisor Password:					Use [+] or [-] to configure system time.		
User Password:							
Change Supervisor Password							
Change User Password							
Clear User Password							
Boot Sector Virus Protection					+/- Change Field		
					Tab Select Field		
					F1 Help		
					F10 Save and Exit		
					ESC Exit		

Feature	Option	Description
Supervisor Password:	<b>Not Installed</b>	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
User Password:	<b>Not Installed</b>	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
Change Supervisor Password		Select this option to change Supervisor Password
Change User Password		Select this option to change User Password
Clear User Password		Select this option to clear User Password
Boot Sector Virus Protection	<b>Disabled</b>	Protects the first sector of the Hard Drive from being written
	Enable	

### 3.08 – BIOS Chipset Setting Menu

This menu allows the user to customize functions of the AMD Chipsets. North Bridge configuration contains options for Memory & CPU settings. South Bridge configuration contains options for SM Bus & USB. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Chipset Setting</b>						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit	
▶ North Bridge Configuration ▶ South Bridge Configuration  Clock Gen. Spread Spectrum [Disabled]							

3.08.1 – North Bridge Chipset Configuration Sub-Menu

This menu gives options for customizing memory & HyperTransport settings. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>North Bridge Chipset Configuration</b>						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit	
<ul style="list-style-type: none"><li>▶ Memory Configuration</li><li>▶ ECC Configuration</li><li>▶ IOMMU Configuration</li></ul>							

3.08.1.1 – Memory Configuration Sub-Menu

This menu has options for memory speed & latency. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Memory Configuration</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
Bank Interleaving				[Disabled]			
Node Interleaving				[Disabled]			
Burst Length				[8beats]			

Feature	Option	Description
Bank Interleaving	<b>Disabled</b> Enabled	Allows memory access to be spread across memory banks
Node Interleaving	<b>Disabled</b> Enabled	Allows memory access to be spread across memory nodes
Burst Length	<b>8beats</b> 4beats	Burst length must be set to 8beats for 128bit memory support

### 3.08.1.2 –ECC Configuration Sub-Menu

This menu allows the user to configure ECC setup for system & DRAM. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>ECC Configuration</b>					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
Master ECC Enable				[Enabled]			
DRAM ECC Enable				[Enabled]			
L2 Cache BG Scrub				[Disabled]			
Data Cache BG Scrub				[Disabled]			

Feature	Option	Description
Master ECC Enable	<b>Enabled</b>	Enables support on all nodes for ECC error checking and correction
	Disabled	
DRAM ECC Enable	<b>Enabled</b>	Enables support on all banks for ECC error checking and correction
	Disabled	
L2 Cache BG Scrub	<b>Disabled</b>	Enables support for ECC when L2 cache is idle
	Enabled	
Data Cache BG Scrub	<b>Disabled</b>	Enables support for ECC when L1 cache is idle
	Enabled	

### 3.08.1.3 –IOMMU Configuration Sub-Menu

This menu allows the user to enable IOMMU for LINUX. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
IOMMU Configuration						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit	
IOMMU Mode [Disabled]							

Feature	Option	Description
IOMMU	<b>Disabled</b>	IOMMU is supported for LINUX systems to convert 32bit IO addresses to 64bit addresses
	Enabled	

### 3.08.2 – South Bridge Chipset Configuration Sub-Menu

This menu allows the user to enable SM Bus 2.0 controller. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility					
Main	Advanced	PCI/PnP	Boot	Security	Chipset
South Bridge Chipset Configuration					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field
2.0 SM Bus Controller					[Enabled]
HT Link 0 P-Comp Mode					[Auto]
HT Link 0 N-Comp Mode					[Auto]
HT Link 0 RZ-Comp Mode					[Auto]
					Use [+] or [-] to configure system time.
					+/- Change Field
					Tab Select Field
					F1 Help
					F10 Save and Exit
					ESC Exit

Feature	Option	Description
2.0 SM Bus Controller	Enabled	Enables/disables the SM Bus 2.0 controller in the AMD8111 I/O Hub
	Disabled	
HT Link 0 P-Comp Mode	Auto	Auto uses hardware compensation values. Other values add to or subtract from hardware generated value. Recommended setting is <b>Auto</b> .
	Data	
	CalComp +Data	
	CalComp -Data	
HT Link 0 N-Comp Mode	Auto	Auto uses hardware compensation values. Other values add to or subtract from hardware generated value. Recommended setting is <b>Auto</b> .
	Data	
	CalComp +Data	
	CalComp -Data	
HT Link 0 RZ-Comp Mode	Auto	Auto uses hardware compensation values. Other values add to or subtract from hardware generated value. Recommended setting is <b>Auto</b> .
	Data	
	CalComp +Data	
	CalComp -Data	

### 3.09 BIOS – Power Menu

Use this screen to select options for power management & ACPI. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.



BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Power Setting</b>						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field	
ACPI Aware O/S				[Yes]	Use [+] or [-] to configure system time.		
▶ Advanced ACPI Configuration							
Restore on AC/Power Loss				[Power Off]	+/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit		
Power Management/APM				[Enabled]]			
▶ Global Timer Reload							
▶ Wakeup Events							
Power Button Mode				[On/Off]			
Suspend Power Saving Type				[ S1]			
Suspend Time Out				[Disabled]			
Hard Disk Time Out (Minute)				[Disabled]			
Green PC Monitor Power State				[Suspend]			
Video Power Down Mode				[Suspend]			
Hard Disk Power Down Mode				[Suspend]			

Feature	Option	Description
ACPI Aware O/S	Yes	Yes allows the system to utilize ACPI (Advanced Configuration and Power Interface) specification
	No	
Restore on AC/Power	Power off	Configures how the system board responds to a power failure
	Power On	
Power Management/APM	Disabled	Disabled prevents the chipset power management and APM (Advanced Power Management) features. Enabled allows the chipset power management and APM features
	Enabled	
Power Button Mode	On/Off	Specifies how the externally mounted power button on the front of the chassis is used
	Standby	
	Suspend	
Suspend Power Saving Type	S1	S1: In this state, the CPU is not executing instructions, RAM context is maintained, devices that reference power resources that are on, are actually on, and devices that can wake the system can cause the CPU to continue to execute from where it left off C3: Allows the CPU to be put in a low power state. In this state, incoming interrupts wake the CPU
	C3	

Suspend Time Out	<b>Disabled</b> 0 ~ 60	Specifies the length of time the system waits before it enters suspend mode
Hard Disk Time Out (Minute)	<b>Disabled</b> 0 ~ 15	Specifies the amount of time the hard disk drive can be inactive before the computer enters a power-conserving state specified in the Hard Disk Drive Power Down Mode
Green PC Monitor Power	<b>Suspend</b> Standby Off	Specifies the power state that the Green PC-compliant video monitor enters when the BIOS places it in a power saving state after the specified period of display inactivity has expired
Video Power down Mode	<b>Suspend</b> Standby Off	Specifies the Power State that the video subsystem enters when the BIOS places it in a power saving state after the specified period of display inactivity has expired
HDD Power down Mode	<b>Suspend</b> Standby Off	Specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired

### 3.09.1 – Advanced ACPI Configuration Sub-Menu

Use this screen to select options for the ACPI Advanced Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.

BIOS Setup Utility	
Main	Advanced
PCI/PnP	Boot
Security	Chipset
<b>Power</b>	Exit
<b>Advanced ACPI Configuration</b>	
ACPI APIC Support	[Enabled]
BIOS → AML ACPI table	[Enabled]
Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/- Change Field Tab Select Field F1 Help F10 Save and Exit ESC Exit	

Feature	Option	Description
ACPI APIC Support	Enabled	
	Disabled	
BIOS → AML ACPI table	Enabled	Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table. Note: OEMB table is used to pass POST data to the AML code during ACPI O/S operations
	Disabled	

### 3.09.2 -- Global Timer Reload Sub-Menu

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
Global Timer Reload					Use [ENTER], [TAB] or [SHIFT_TAB] to select a field  Use [+] or [-] to configure system time.  +/-    Change Field Tab    Select Field F1     Help F10    Save and Exit ESC    Exit		
Monitor IRQ 3				[Monitor]			
Monitor IRQ 4				[Ignore]			
Monitor IRQ 5				[Ignore]			
Monitor IRQ 7				[Monitor]			
Monitor IRQ 9				[Ignore]			
Monitor IRQ 10				[Ignore]			
Monitor IRQ 11				[Ignore]			
Monitor IRQ 13				[Ignore]			
Monitor IRQ 14				[Monitor]			
Monitor IRQ 15				[Ignore]			

Feature	Option	Description
Monitor IRQ 3 ~15	Ignore	When set to Monitor, this option allows BIOS to monitor devices assigned to these specific IRQ for a PME# Event. Defaults IRQ 3,7,15 are set to monitor all others are ignored.
	Monitor	

### 3.10 – BIOS Exit Menu

You can display an Exit BIOS Setup option by highlighting it Arrow (↑/↓) keys and pressing Enter.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Power	Exit
<b>Exit Setting</b>						Use [ENTER], [TAB] or [SHIFT_TAB] to select a field	
Save Changes and Exit						Use [+] or [-] to configure system time.	
Discard Changes and Exit							
Discard Charges							
Load Optimal Defaults							
Load Failsafe Defaults							
						+/- Change Field	
						Tab Select Field	
						F1 Help	
						F10 Save and Exit	
						ESC Exit	

#### Save Changes and Exit

Use this option to exit setup utility and re-boot.  
All new selections you have made are stored into CMOS.  
System will use the new settings to boot up.

#### Discard Changes and Exit

Use this option to exit setup utility and re-boot.  
All new selections you have made are not stored into CMOS.  
System will use the old settings to boot up.

#### Discard Changes

Use this option to restore all new setup values that you have made but not saved into CMOS.

#### Load Optimal Defaults

Use this option to load default performance setup values.  
Use this option when system CMOS values have been corrupted or modified incorrectly.

#### Load Failsafe Defaults

Use this option to load all default failsafe setup values.  
Use this option when troubleshooting

## Chapter 4: Diagnostics

Note: if you experience problems with setting up your system, always check the following things in the following order:

### CPU, Memory, Video

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the Tyan website at: <http://www.tyan.com>.

#### 4.00 Beep Codes

Fatal errors which halt the boot process are communicated through a series of audible beeps.

- (1) Memory module initialization failed
  - (a) memory modules might not be plugged in correct configuration
  - (b) wrong type of memory
  - (c) bad memory modules
- (2) Graphics initialization failed

Before contacting your vendor or Tyan Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

#### 4.01 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, please check the Tyan web site: <http://www.tyan.com>

#### NOTE

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

## Appendix I: 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 only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

**ATAPI (AT Attachment Packet Interface):** also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

**ATX:** the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

**Bandwidth:** refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

**BBS (BIOS Boot Specification):** a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

**BIOS (Basic Input/Output System):** the program that resides in the ROM chip, which 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 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 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 information is stored in SRAM instead of 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 4GB of regular memory.

**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):** a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

**DIMM (Dual In-line Memory Module):** faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

**DIMM bank:** sometimes called DIMM socket 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.

**DRAM (Dynamic RAM):** widely available, very affordable form of RAM which loses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

**ECC (Error Correction Code or Error Checking and Correcting):** allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

**EEPROM (Electrically Erasable Programmable ROM):** also called Flash BIOS, it 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.

**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.

**Global timer:** onboard hardware timer, such as the Real-Time Clock (RTC).

**HDD:** stands for Hard Disk Drive, a type of fixed drive.

**H-SYNC:** controls the horizontal synchronization/properties of the monitor.

**HyperTransport™:** a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

**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.

**Latency:** the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

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

**Parallel port:** transmits the bits of a byte on eight different wires at the same time.

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

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

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

**Pipeline burst SRAM:** a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

**PnP (Plug-n-Play):** a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**PXE (Preboot Execution Environment):** one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

**RAID (Redundant Array of Independent Disks):** a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and 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.

**RAIDIOS:** RAID I/O Steering (Intel)



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

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

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

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

**SCSI Interrupt Steering Logic (SISL):** Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic ( LSI ) (only on LSI SCSI boards)

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

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

**Standby mode:** in this mode, the video and hard drives shut down; all other devices continue to operate normally.

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

**USB (Universal Serial Bus):** a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

**VGA (Video Graphics Array):** the PC video display standard

**V-SYNC:** controls the vertical scanning properties of the monitor.

**ZCR (Zero Channel RAID):** PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

**ZIF Socket (Zero Insertion Force socket):** these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

## Appendix II: SMDC Information

Tyan Server Management Daughter Card (SMDC) is a powerful yet cost-efficient solution for high-end server management hardware packages. Tyan's goal is to provide remote system monitoring and control even when the operating system is absent or simply fails. This empowers Tyan's server board with advanced industrial-standard features.

Tyan SMDC enables any IT Manager by providing multi-interfaces to access the hardware remotely and perform **monitor**, **control** and **diagnose** activities effectively.

Tyan SMDC is powered by an intelligent controller known as Baseboard Management Control (BMC). BMC is a standalone mini-CPU and runs on its own Real Time Operating System (RTOS) to complete all different kinds of tasks. Backed by QLogic's ARM7 technology, IT manager can rest assured his server machines are always taken care of.

Tyan SMDC is not a peripheral card. Unlike regular peripheral cards such as AGP card, Network card or SCSI card, SMDC does not require any hardware-specific driver. As long as a standby power comes into the system, SMDC will begin looking after the system.

Tyan SMDC provides diversified methods to communicate with the hardware. IT manager has the flexibility to choose among *Keyboard Controller Style* (KCS), *Block Transfer* (BT) style, Intelligent Chassis Management Bus (ICMB), Intelligent Platform Management Bus (IPMB), Emergency Management Port (EMP) and standard IPMI-Over-LAN communication as defined in latest IPMI 1.5 specification.

Tyan SMDC is compatible with all IPMI-compliance software as well as Tyan System Operator™ (TSO) software package.

By adding SMDC, Tyan's server board becomes a highly manageable and IPMI-compatible system with all the advanced features suggested in IPMI Spec.

More detailed information on Tyan's SMDC card can be found on our website:

<http://www.Tyan.com>

# 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. Furthermore, if you purchased your system from a dealer near you, you can 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 beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: <http://www.tyan.com>
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: [alt.comp.periphs.mainboard.TYAN](mailto:alt.comp.periphs.mainboard.TYAN)

## Returning Merchandise for Service

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

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



#### **Notice for the USA**

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

Operation is subject to the following conditions:

This device may not cause harmful interference, and

This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Plug the equipment into an outlet on a circuit different from that of the receiver.

Consult the dealer 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.

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