Tomcat H1000S /// S3950

Revision 1.01

Table of Contents

Before you begin…

Check the box contents!

The retail motherboard package should contain the following:


1x Tomcat H1000S (S3950) motherboard


1 x 34-Pin floppy drive cable


4 x SATA cable


2 x SATA Drive Power Adapter


1 x Ultra-DMA-66/100 IDE cable


1 x USB2.0 cable


1 x COM Port cable


1 x Tomcat H1000S (S3950) User's Manual


1 x Tomcat H1000S (S3950) Quick Reference Guide


1 x TYAN driver CD


1 x I/O shield


1 x CPU Retention Frame

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 H1000S (S3950). The Tomcat H1000S (S3950) is a flexible AMD® platform for multiple applications, based on the HT-1000 chipset. The S3950 is designed to support the AMD Opteron™ processor on an AM2 socket. It features an integrated Dual Gigabit Ethernet LAN, built-in 16MB XGI XG20™ video plus four serial ATA ports. The S3950 offers exceptional performance and versatility for your server platform 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
- Single AM2 socket
- Supports AMD Opteron™ 1000 Series Processor
- Up to 800 MHz Hyper-Transport link support

Chipset
- Broadcom HT1000
- SMSC SCH4307 Super I/O chip

Memory
- Four 240-pin unbuffered DDR2 DIMM sockets
- Supports up to 8GB of unbuffered ECC DDR2 400,533,667
- Dual channel memory bus

Expansion Slots
- One 64-bit, 133MHz (3.3V) PCI-X slot
- Four 32-bit, 33MHz PCI v2.3 slots
- Tyan TARO™ SO-DIMM
- Total of five usable slots

Integrated I/O Interfaces
- One floppy connector supports up to two drives
- One IDE connectors for two IDE devices
- Two USB 2.0 Headers (via cable, 2 x 5pin)
- 2 x 25 connector for Tyan IPMI SMDC card (M3291)

Integrated 2D Graphics
- XGI XG20 graphics controller
- 16MB Frame Buffer of video memory (upgradeable to 32MB)

Back Panel I/O Ports
- One PS/2 Keyboard & Mouse ports
- Two RJ45 10/100/1000 Base-T port w/ activity LED
- Two USB 2.0 ports
- One 9-pin UART Serial port
- One 15-pin VGA port

Integrated LAN Controllers
- Two Intel i82541PI GbE LAN controllers
- Operating on PCI 32-bit/33MHz bus
- With ASF 2.0/WfM/Teaming support

BIOS
- AMI BIOS® on 8Mbit LPC Flash ROM
- Serial Console Redirect
- USB boot supported
- Supports ACPI
- PnP, DMI 2.0, WfM 2.0 Power Management

- Four SATA ports
- One COM2 header

System Management
- One Analog Device ADT7476
- Temperature and voltage monitoring
- One (1) 3+1-pin CPU fan header with tachometer monitoring and smart FAN control
- Six (6) 3+1-pin system fan headers with tachometer monitoring, all of them support smart FAN control
- One 2 x 7-pin fan con (reserve to support TYAN FAN Adapter Board---M1012)
- Watchdog timer support

Integrated SATA Controller
- Supports four SATA ports running at 1.5Gb/s with NCQ
- RAID 0, 1, 5 and 10 supported

Power
- Onboard 4-phase VRD
- EPS12V (24+8) power connectors

Form Factor
- ATX footprint
- 12" x 9.6"; 305mm x 244mm
- 6-layer board

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

Software Specifications

OS (Operating System) Support

Microsoft Windows Server 2003 + SP1 32-bit
Microsoft Windows Server 2003 64-bit
SuSE 9.3 Pro 32/64-bit
SuSE 9.0 + SP2 32/64-bit
SuSE 10 64-bit
RHEL3 Update 5 32-bit
RHEL4 Update 1 32/64-bit

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 H1000S (S3950) 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!

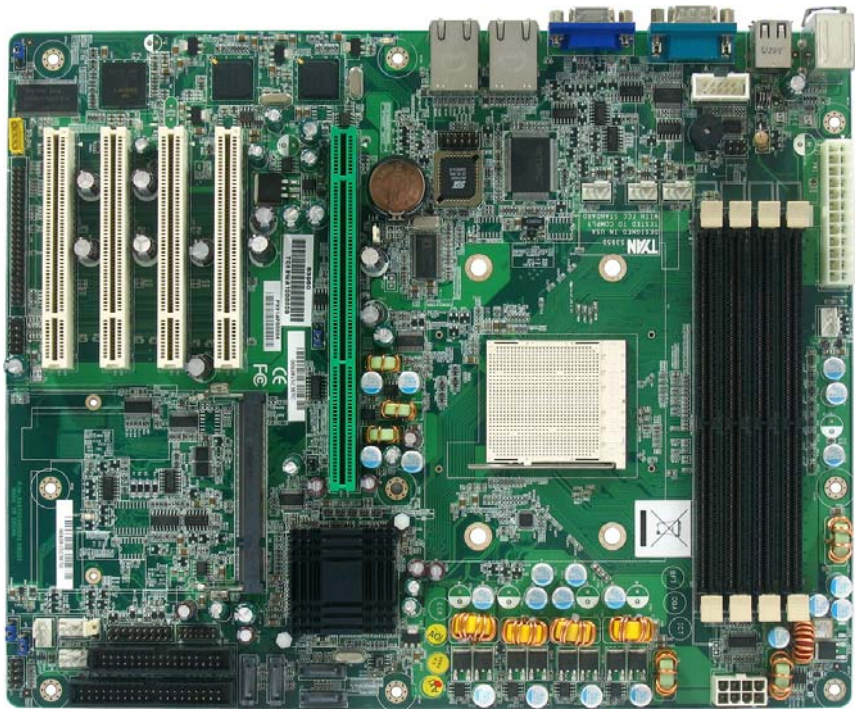
The first thing you should do is read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(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**

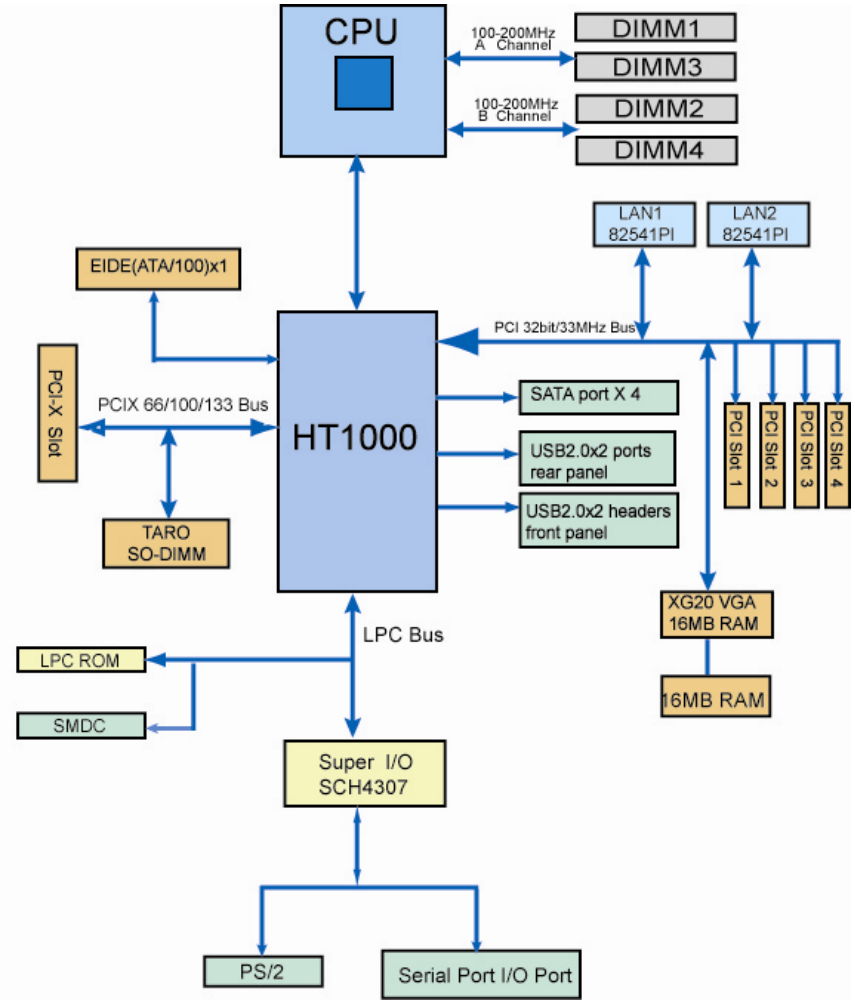
2.00 – Board Image

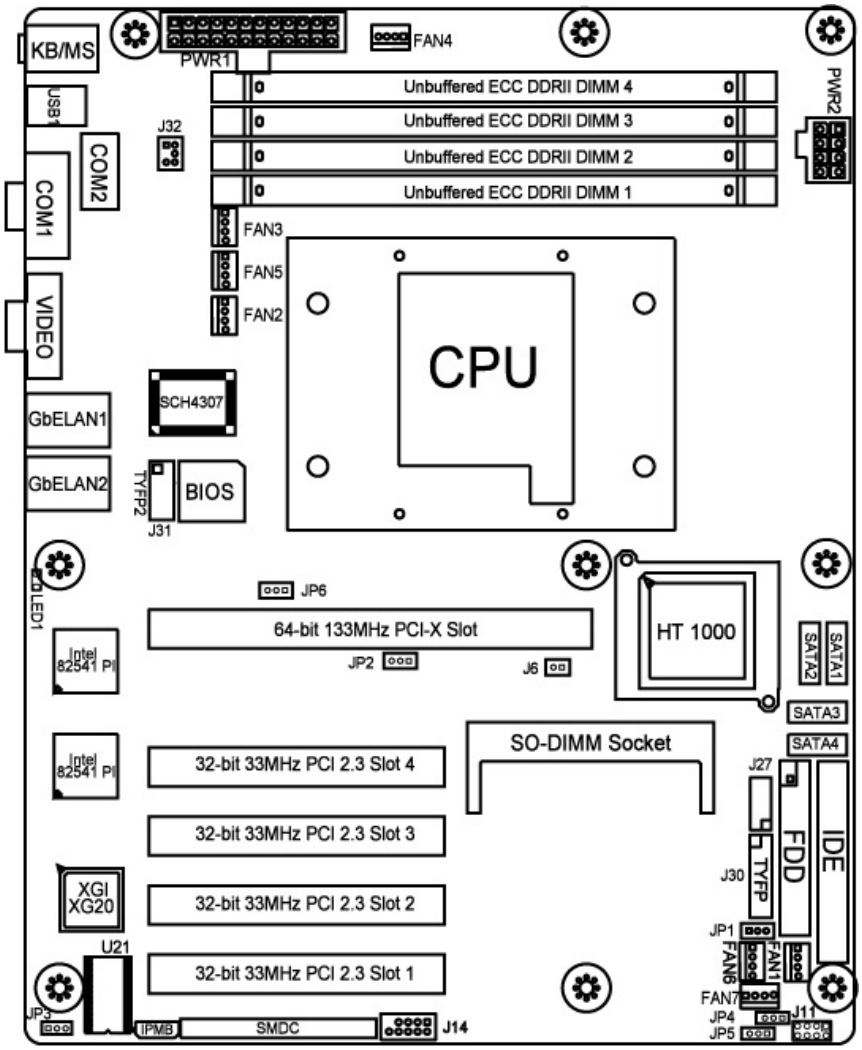


This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

The following page includes details on the vital components of this motherboard.

2.01--Block Diagram





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.

2.03 – Jumper Settings

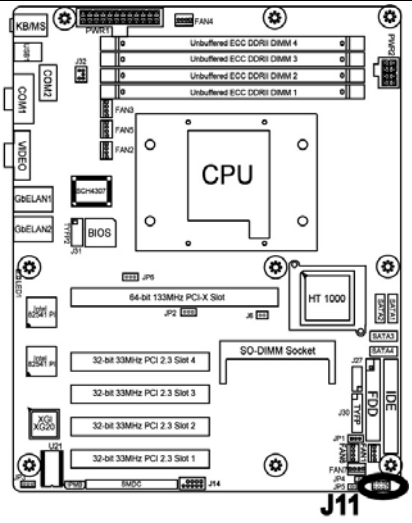
Jumper	Function	Settings
J11	Front Panel SATA LED Pin Header	See Section 2.04
J14	USB Front Panel	See Section 2.05
J20	COM PORT Pin Header	See Section 2.06
J21~J25, J33, J34	FAN Connectors with speed control	See Section 2.07
J27	2 x 7 Pin Fan Connector	See Section 2.08
J28	IPMB Pin Header	See Section 2.09
J29	SMDC Connector	See Section 2.10
J30	Front Panel Connector	See Section 2.11
J31	TYFP2 For Barebone	See Section 2.12
J32	LCM Pin Header	See Section 2.13
J6	PCI-X Bus Frequency Configuration Header	See Section 2.14
JP1	Clear CMOS Jumper by Software	See Section 2.15
JP2	PCI/PCIX Mode Select	See Section 2.16
JP3	VGA Enable	See Section 2.17
JP6	Clear CMOS Jumper by Hardware	See Section 2.18

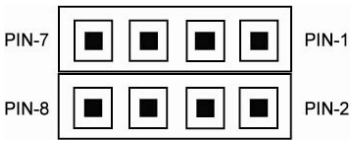
Jumper Legend

	**OPEN - Jumper OFF**	**Without jumper covered**
	**CLOSED - Jumper ON**	**With jumper covered**

	**To indicate the location of pin-1**
	**To indicate the location of pin-1**

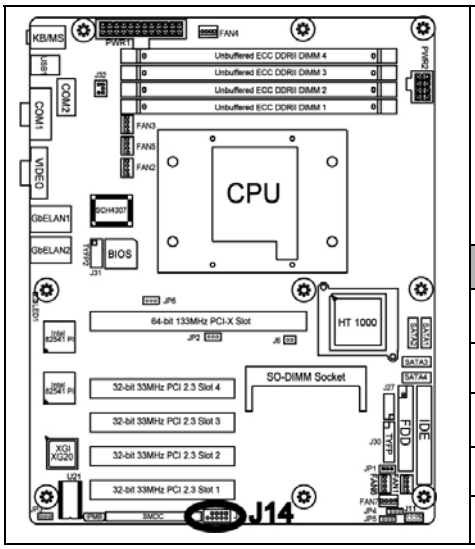
2.04 – Front Panel SATA LED Pin Header (J11)

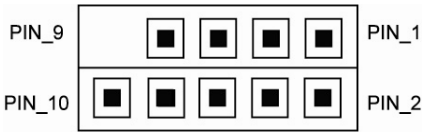




Signal Description	Pin #	Pin #	Signal Description
SATA1 LED+	**1**	**2**	SATA1 LED--
SATA2 LED+	**3**	**4**	SATA2 LED--
SATA3 LED+	**5**	**6**	SATA3 LED--
SATA4 LED+	**7**	**8**	SATA4 LED--

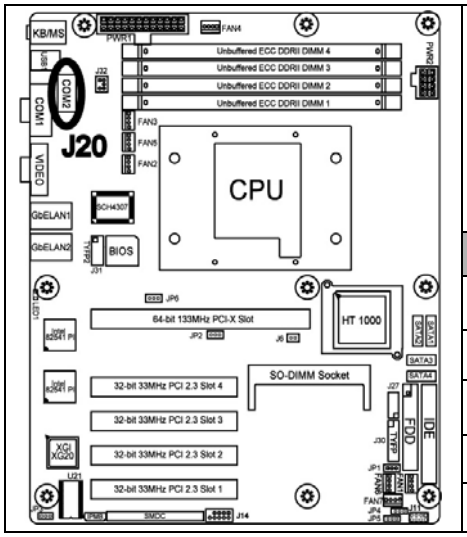
2.05 – USB2.0 Header (J14)

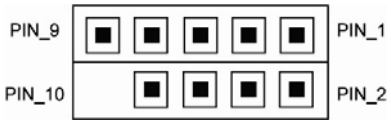




Signal Description	Pin #	Pin #	Signal Description
USB PWR	**1**	**2**	USB PWR
USB 3 - -	**3**	**4**	USB 4 - -
USB 3 +	**5**	**6**	USB 4 +
GND	**7**	**8**	GND
KEY	**9**	**10**	GND

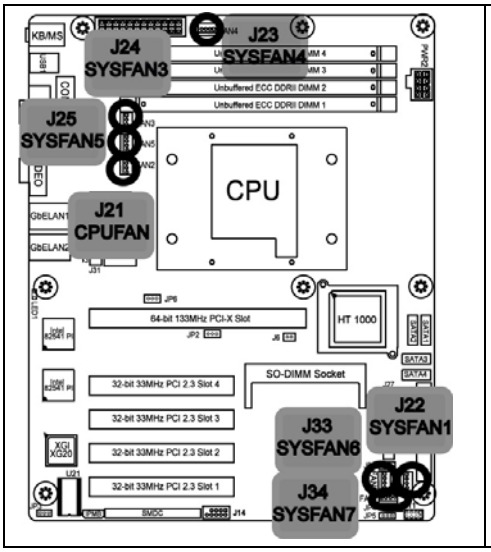
2.06 – COM2 PORT Pin Header (J20)





Signal Description	Pin #	Pin #	Signal Description
DCD	**1**	**2**	DSR
RXD	**3**	**4**	RTS
TXD	**5**	**6**	CTS
DTR	**7**	**8**	RI
GND	**9**	**10**	KEY

2. 07 – FAN Connectors with Speed Control (J21~J25, J33, J34)



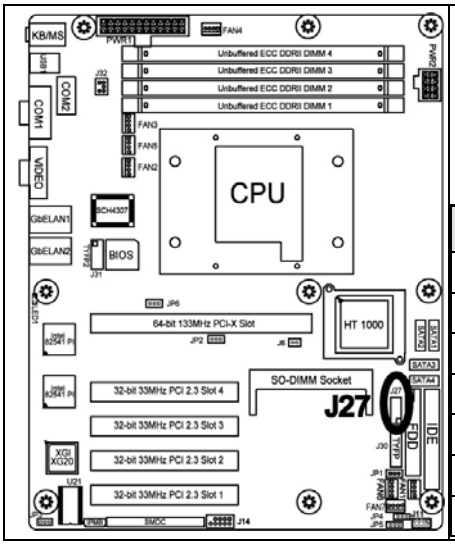
Pin_4: Speed control

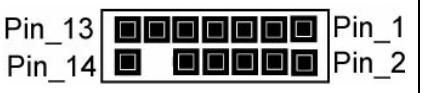
Pin_3 : Tachometer

Pin_2 : +12V

Pin_1 : GND

2.08 – 2 x 7 Pin Fan Connector (J27)

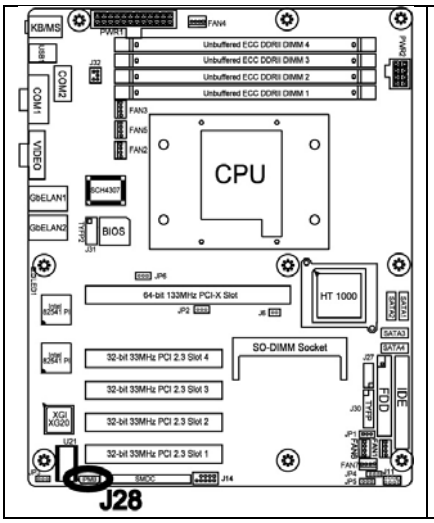




NOTE: This 2 x 7 Pin Fan Connector is for Tyan Barebone use only.

Signal	Pin	Pin	Signal
BB_FAN1_TACH	1	2	NC
BB_FAN2_TACH	3	4	NC
BB_FAN3_TACH	5	6	NC
BB_FAN4_TACH	7	8	NC
BB_FAN5_TACH	9	10	NC
GND	11	12	Key
GND	13	14	FAN1_PWM

2.09 – IPMB Pin Header (J28)



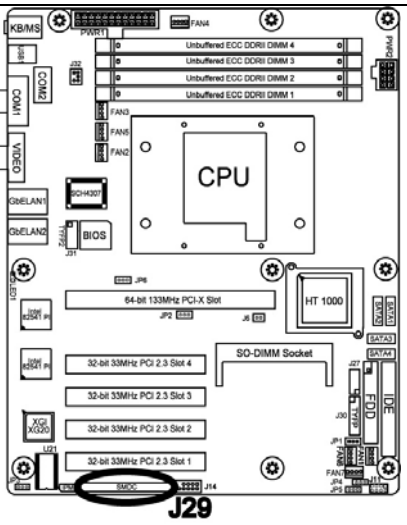
Pin_4 : NC

Pin_3 : IPMB CLK

Pin_2 : GND

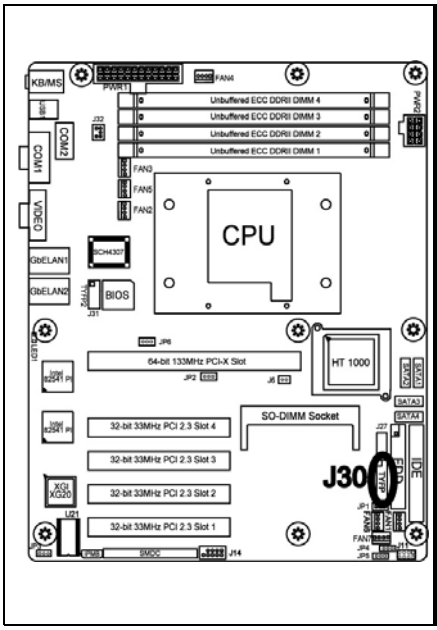
Pin_1 : IPMB DATA

2.10 – SMDC Connector (J29)



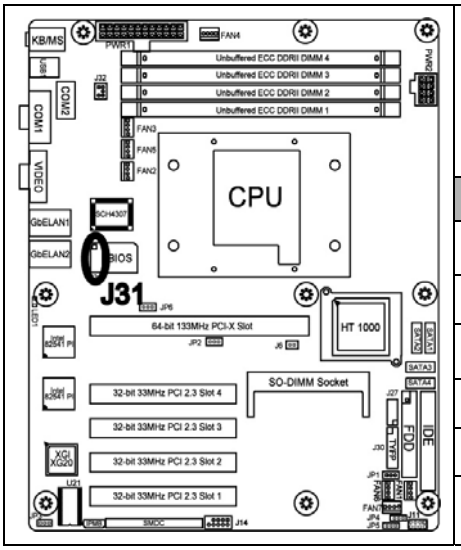
For connection with Tyan Server Management Daughter Card (SMDC). The SMDC connector is compatible only with the Tyan M3291 (SMDC).

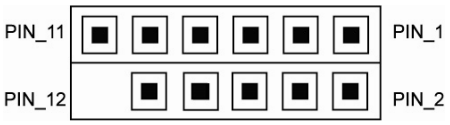
2.11 – Front Panel Connector (J30)



Signal	PIN #	PIN #	Signal
HDD LED+	1	2	PWR LED+
HDD LED-	3	4	PWR LED-
Reset Button -	5	6	POWER S/W
Reset Button+	7	8	POWER S/W
NMI	9	10	FANFAIL LED
NMI	11	12	FANFAIL LED
5VSB	13	14	NC
SDA	15	16	GND
SCL	17	18	Intruder

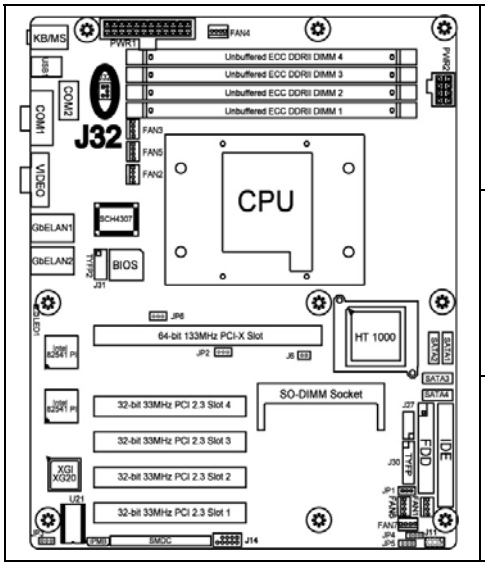
2.12 – TYFP2 For TYAN Barebone (J31)





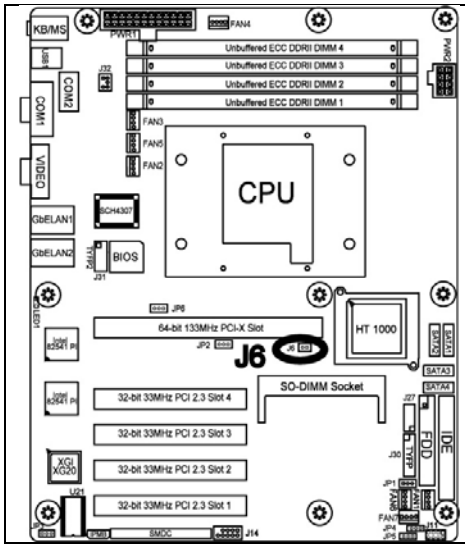
Signal Description	Pin #	Pin #	Signal Description
LAN1 LED+	1	2	LAN1 LED--
LAN2 LED+	3	4	LAN2 LED--
NC	5	6	NC
ID LED+	7	8	ID LED--
ID BUTTON+	9	10	ID BUTTON--
NC	11	12	KEY

2.13 – LCM Pin Header (J32)



VCC	**PIN 1**	**PIN 2**	RXD2
KEY	**PIN 3**	**PIN 4**	GND
5VSB	**PIN 5**	**PIN 6**	TXD2

2.14 – PCI-X Bus Frequency Configuration Header (J6)



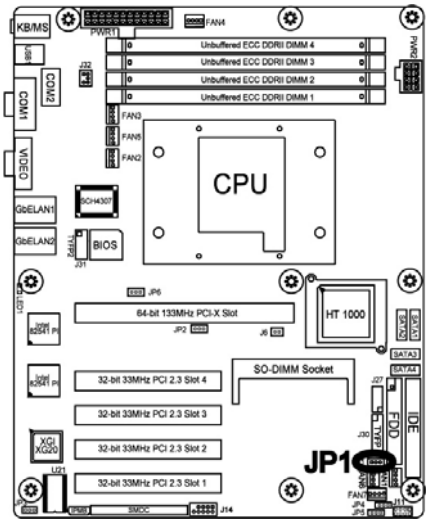
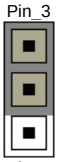
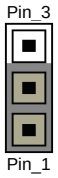
OPEN - Jumper OFF

CLOSED - Jumper ON

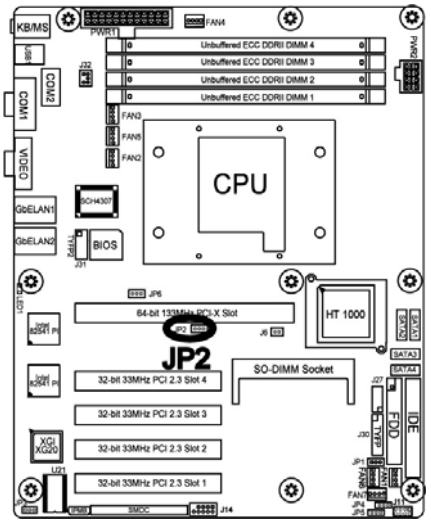
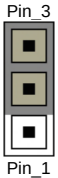
J6 is used to adjust PCI-X frequency

Open(Default): 66MHz/100MHz;
Closed: 133MHz

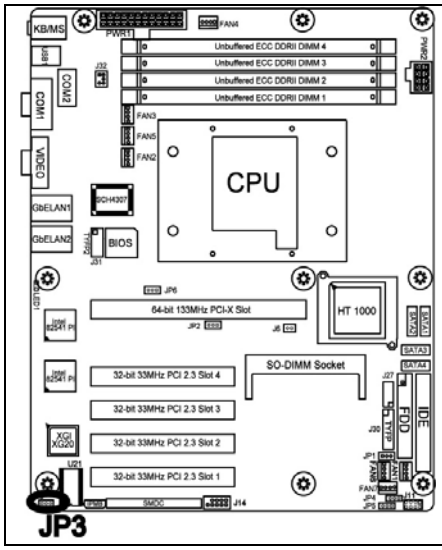
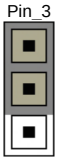
2.15 – Clear CMOS Jumper by Software (JP1)

		**DEFAULT**
		**Clear CMOS By Software** **NOTE: BIOS will clear CMOS during the POST process automatically when selected.**

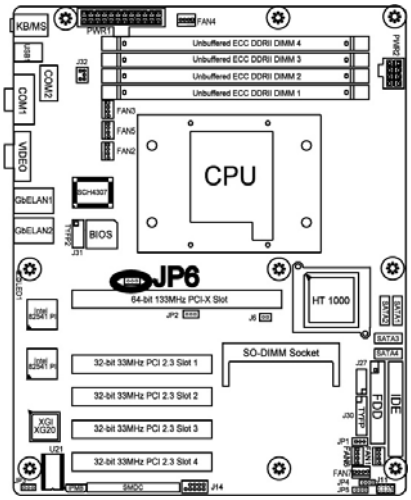
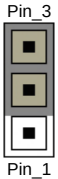
2.16 - PCI/PCI-X Mode Select (JP2)

		**Auto Detect PCI-X Device**
		**Force to PCI Mode**

2.17 – VGA Enable (JP3)

	 	**DEFAULT** **VGA Enable** **Disable** **XG20 VGA**

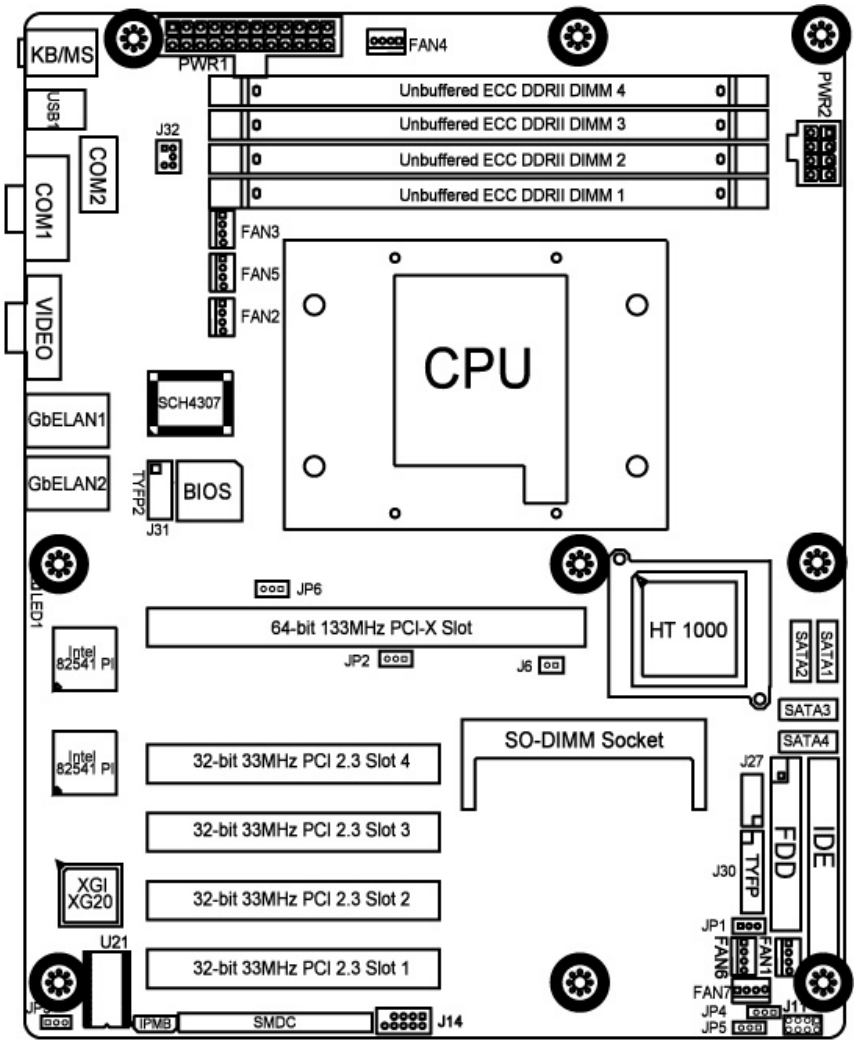
2.18 – Clear CMOS Jumper by Hardware (JP6)

	 	**DEFAULT** You can reset the CMOS settings by using this jumper or if you have forgotten your system/setup password. - 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 and power on the system

2.19 – 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.

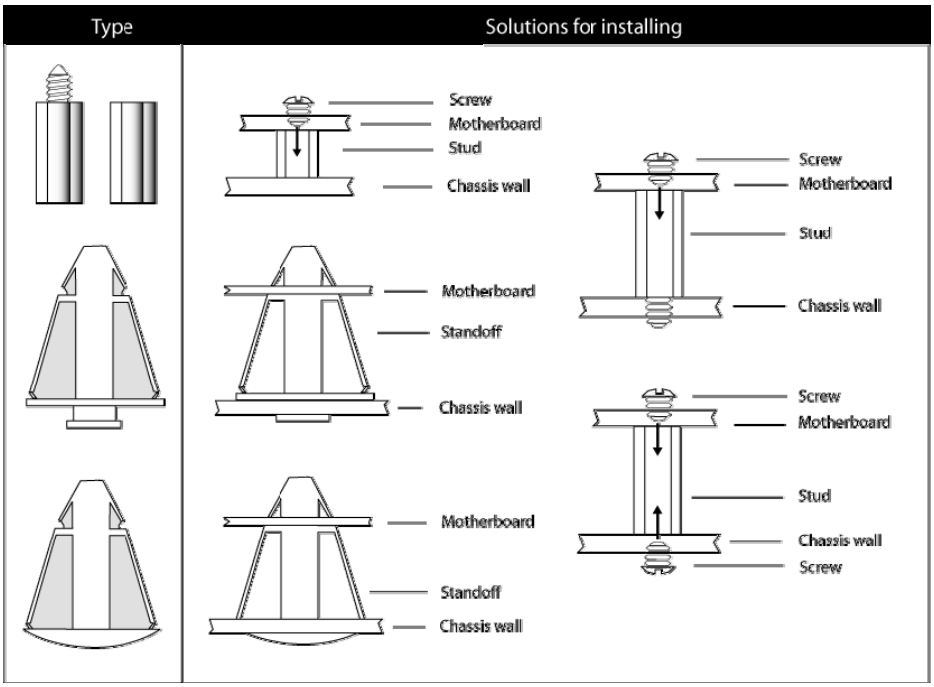
Thunder H1000S (S3950) Mounting Hole Placement



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



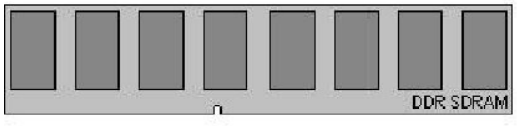
TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.20 – 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*. A Critical aspect to system building is whether you're using the recommended memory for the motherboard that you have. For compatibility information, please check Tyan's web site at: **www.tyan.com**

* Not all stepping's of AMD Opteron CPU's support the same type of memory speeds. Consult with AMD for clarification.

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 h1000S:

- AMD Opteron™ processors support 64bit (non-interleaved) or 128bit (interleaved) memory configurations
- At least ONE Unbuffered DDR2 SDRAM module must be installed for the system to turn on and POST (power on self test)
- 128MB, 256MB, 512MB, 1GB and 2GB* Unbuffered ECC DDR2 400,533,667 SDRAM memory modules are supported
- All installed memory will be automatically detected
- The Tomcat H1000S supports up to 8GB*.

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

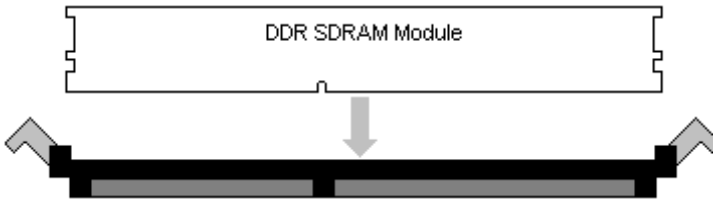
Valid DIMM Configurations

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 are 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**.

DIMM Number	64-Bit Width	128-Bit Width	Bank Interleave
DIMM0	Bank 0	Bank 0, low 64	Bank 0, low 64, even
DIMM1	Not Used	Bank 0, high 64	Bank 0, high 64, even
DIMM2	Bank 1	Bank 1, low 64	Bank 0, low 64, odd
DIMM3	Not Used	Bank 1, high 64	Bank 0, high 64, odd

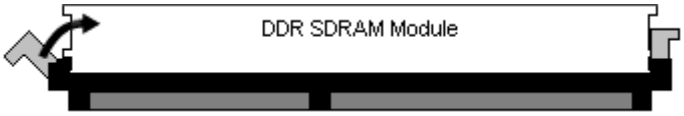
Memory Installation Procedure

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. DDR2 modules and sockets have only one key, which is slightly near the center of the module/socket. The method of installing memory modules is detailed in the following diagrams.



DDR SDRAM DIMM Slot – 240 Pins (1 Key)

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.



DDR SDRAM DIMM Slot – 240 Pins (1 Key)

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

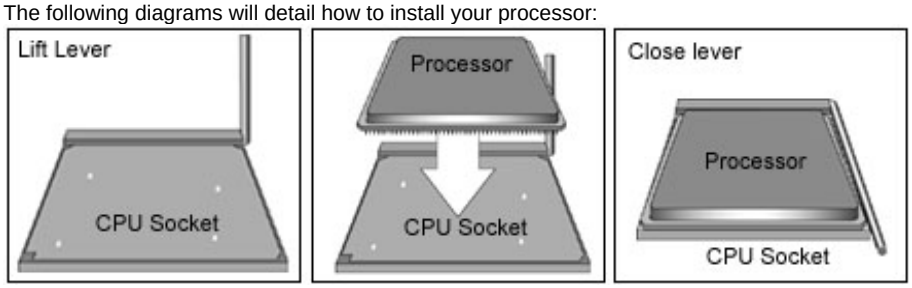
TIP: When installing memory, a module may require a considerable amount of force to seat properly, although this is very rare. To avoid bending and damaging your motherboard, place it on its anti-static bag and onto a flat surface, and then proceed with memory installation.

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

2.21 – Installing the Processor and Heatsink

Your Tomcat H1000S (S3950) supports the latest 64-bit processor technologies from AMD. However, **only AMD Opteron™ processor are certified and supported with this motherboard.** Reference the Tyan website for further details: **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 in 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

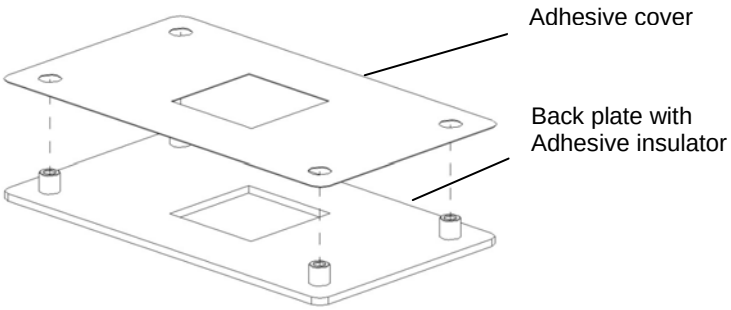
After you have installed the processor, you should proceed to installing the heatsink. Heatsink will ensure that the processor does not overheat and continues to operate at maximum performance for as long as you own it. And overheated processor may damage the motherboard.

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.

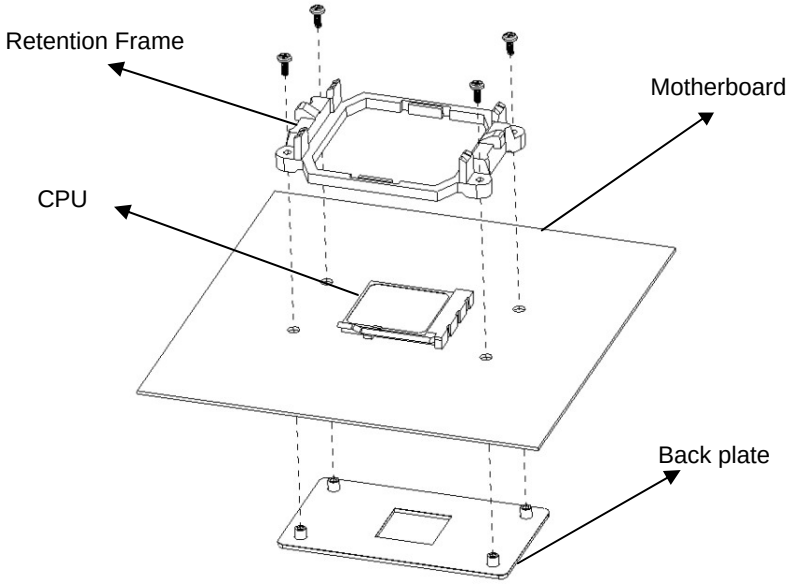
Because there are many different types of heatsinks available from many different manufacturers, a lot of them have their own method of installation. For the safest method of installation and information on choosing the appropriate heatsink, please refer to AMD's website at **http://www.amd.com**.

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

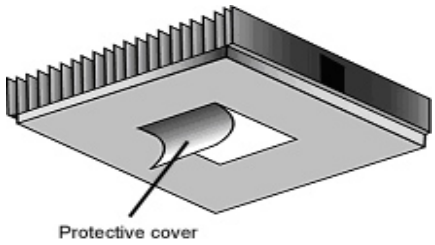
1) Remove the adhesive cover from the back plate.



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.

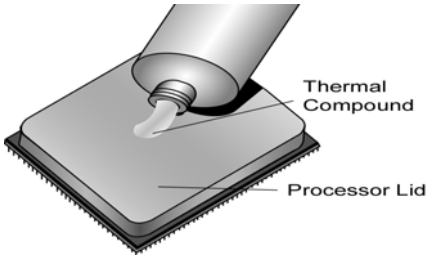


2.22 -- Thermal Interface Material



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.

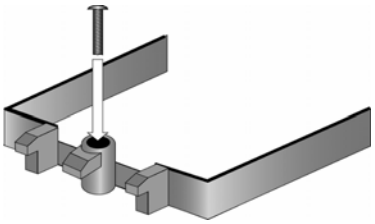


The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

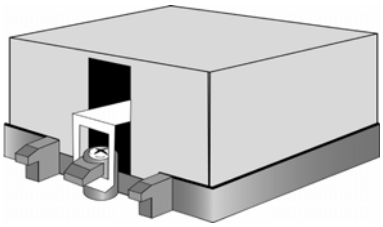
NOTE Always check with the manufacturer of the heatsink & processor to ensure the Thermal Interface material is compatible with the processor & meets the manufacturer's warranty requirements

2.23 Heatsink Installation Procedures

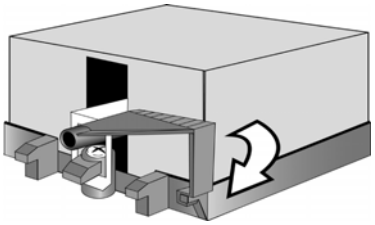
Type A: CAM LEVER (TYPE) INSTALLATION



1. After placing back plate 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 this action on the other side.
DO NOT OVER TIGHTEN.

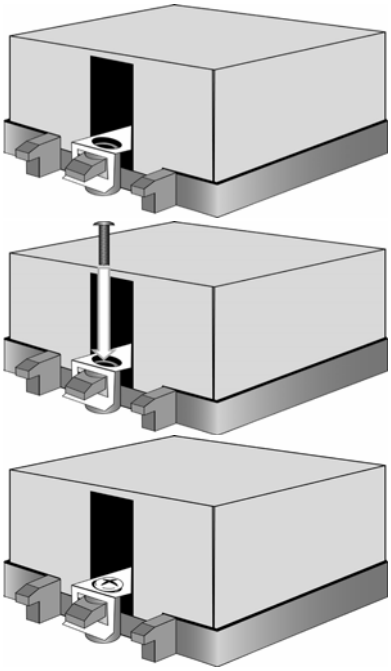


2. After tightening screws secure metal clip to plastic retention bracket center tab. Repeat this action on the other side of heatsink.



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



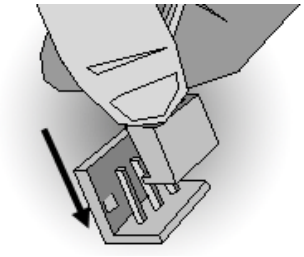
1. After placing CPU back-plate and adhesive interface material under motherboard, place heatsink retention frame on top of motherboard. Align heatsink retention frame screw hole with backplate assembly standoffs. Place heatsink inside plastic retention bracket. Place metal clip over retention frame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

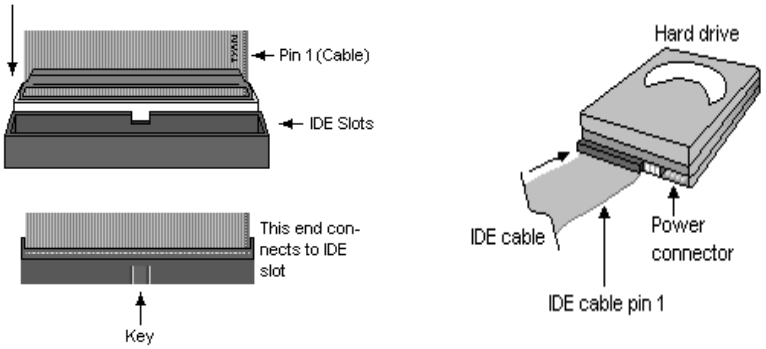


After you've finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.24 – Attaching Drive Cables

IDE Drives

Attaching IDE drive cabling is simple. The cable is “keyed” to only allow it to be connected in the correct manner. Tyan Tomcat h1000S has one on-board IDE connector, supporting two drives.
The way to attach IDE cables to the IDE connector is illustrated below:

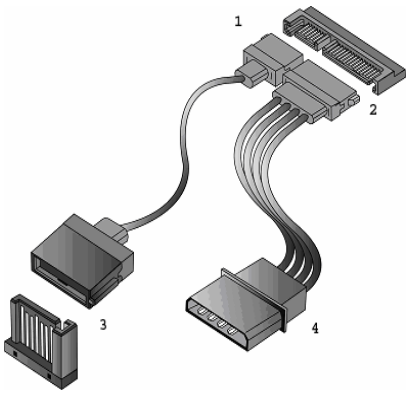


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard.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

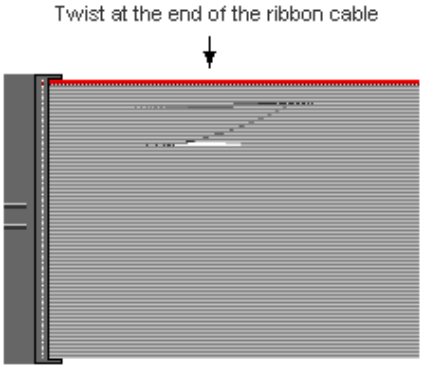
The Tomcat H1000S is equipped with 4 Serial ATA (SATA) channels. Connections for these drives are also very simple. There is no need to set Master/Slave jumpers on SATA drives.
Tyan has supplied two SATA cables and one SATA power adapter for boards equipped with the SATA option. If you are in need of other cables or power adapters please contact your vendor/distributor. The following picture illustrates how to connect a SATA drive:



1. **SATA drive cable connection**
2. **SATA drive power connection**
3. **SATA cable motherboard connector**
4. **SATA drive power adapter**

Floppy Drives

Attaching a floppy drive can be done in a similar manner to that of an IDE drive. Refer to 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:**).

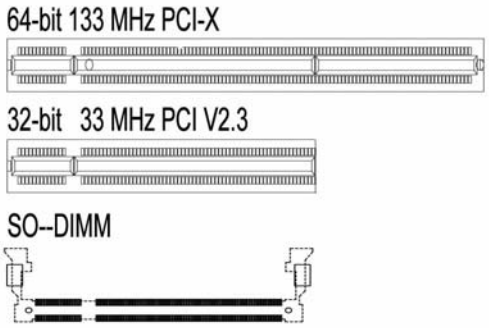
Refer to your floppy drive's installation instructions (if available), or contact your dealer if you are unsure about how to attach the floppy drive(s). Remember, you can only have 2 floppy drives connected at any given time.

Below are some symptoms of incorrectly-installed floppy drives. Though minor, installing them incorrectly doesn't cause severe problems, it may lead 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 bootup	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.

2.25 – 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 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 making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving 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.

2.26 - Installing Optional SO-DIMM Modules

Your Tomcat H1000S (S3950) motherboard is equipped with an optional proprietary SO-DIMM connector. The SO-DIMM connector can be used for expansion cards to provide such features as, additional SAS/SATA or SCSI support. For details of available expansions cards, visit the TYAN website at http://www.tyan.com. To install a SO-DIMM expansion card:

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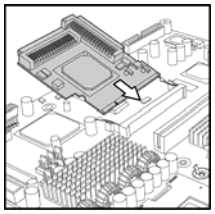
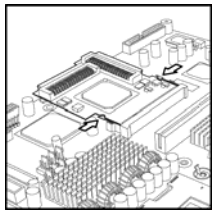
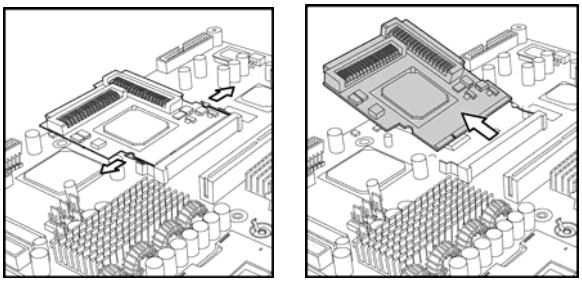
1. Insert the SO-DIMM card as shown, making sure that the card is the right way up. The card will fit in only one way and the screw holes in the card should line up exactly with the mounting posts on the motherboard.



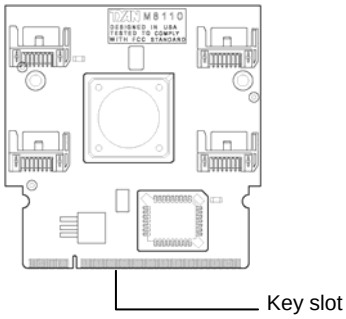
2. Push the SO-DIMM card down into place and make sure the spring levers click into place as shown.
3. Screw the board into place using one or two screws as required.



Removal of a SO-DIMM card is a reversal of the installation procedure. Push out the spring levers as shown and pull the card out of the socket.

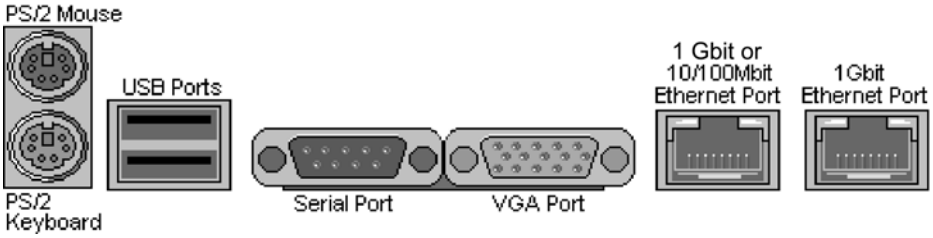


The SO-DIMM expansion cards will fit in the slot only one way. Make sure that you align the slot in the card with the key in the card slot.



2.27 – Connecting External Devices

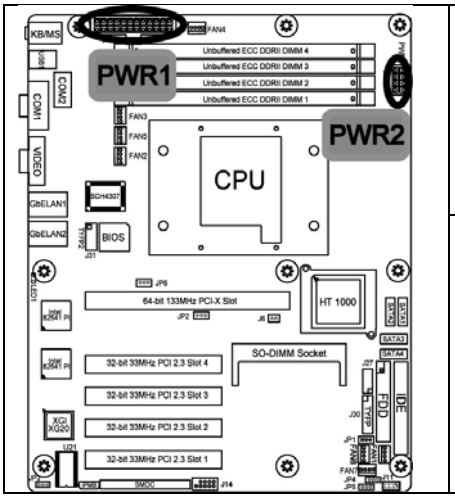
Connecting external devices to the motherboard is an easy task. The standard devices you should expect to plug into the motherboard are keyboards, mice, and printer cables. The following diagram will detail the ATX port stack for the following board:



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.

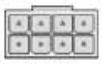
TIP: While the ports have been created to accept connectors in only one direction, make sure to be careful when inserting connectors. At times, attaching connectors in the incorrect orientation can damage, bend or break the pins.

2.28 – Installing the Power Supply



PWR1: 24-pin EPS 12V power connector

PWR2: 8-pin EPS 12V power connector



We suggest using a 400W or higher power supply; this of course depends on how many devices you attach. A 400W is sufficient for systems without many devices (i.e. 1 hard drive, 1 optical drive, and 1 or 2 expansion cards) however a higher wattage solution may be needed if the system is fully loaded. Look to the www.tyan.com website for further information.

NOTE: The Tomcat H1000S (S3950) 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.

2.29 – Finishing Up

Congratulations on making it this far! You've 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 rare circumstance that you have experienced difficulty, you can find ask 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

3.1 – 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
			Exit		

System Overview	Use [ENTER], [TAB] or [SHIFT-TAB] to select a field
AMIBIOS Version : 08.00.xx Build Date : MM/DD/YY ID : 0AAAA000	Use [+] or [-] to configure system time.
Processor Type : AMD Opteron(tm) Model xxx Speed : xxxx MHz Count : x	← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
System Memory Size : xxxx MB	
System Time [xx:xx:xx] System Date [Day MM/DD/YYYY]	

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>.

3.2 – 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
Exit	To exit setup utility

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

3.3 – BIOS Legend Bar

The chart describes the legend keys and their alternates:

Key	Function
<F1>	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
<->	Select the previous value/setting of the field
<+>	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

Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**F1**] key again.

In Case of Problems

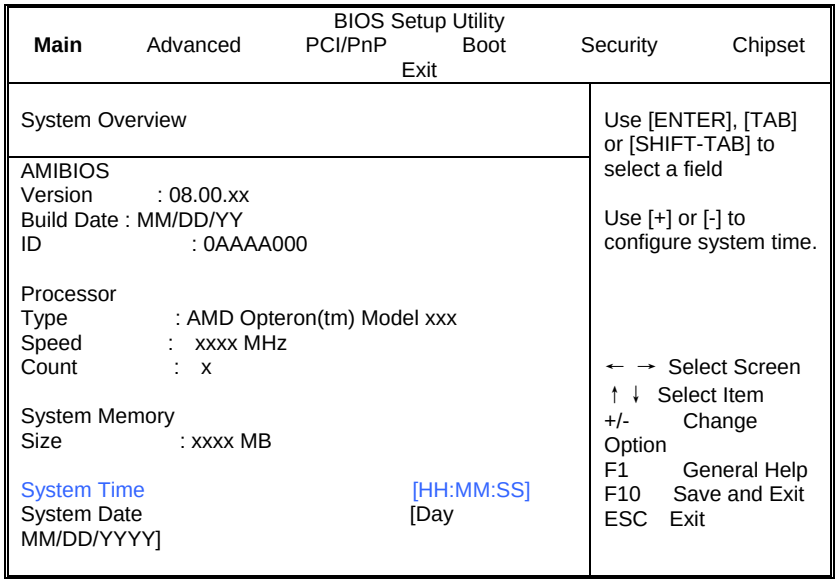
If you discover that you have trouble booting the computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.

The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of the outcome. The Chipset defaults were carefully chosen by TYAN or your system manufacturer for the best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

3.4 – 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.

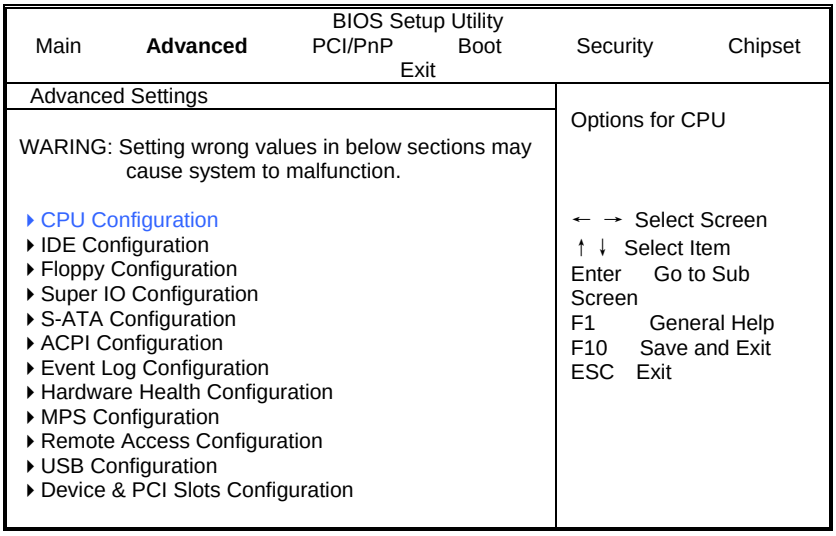
The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often, a text message will accompany it.



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

3.5 – 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.

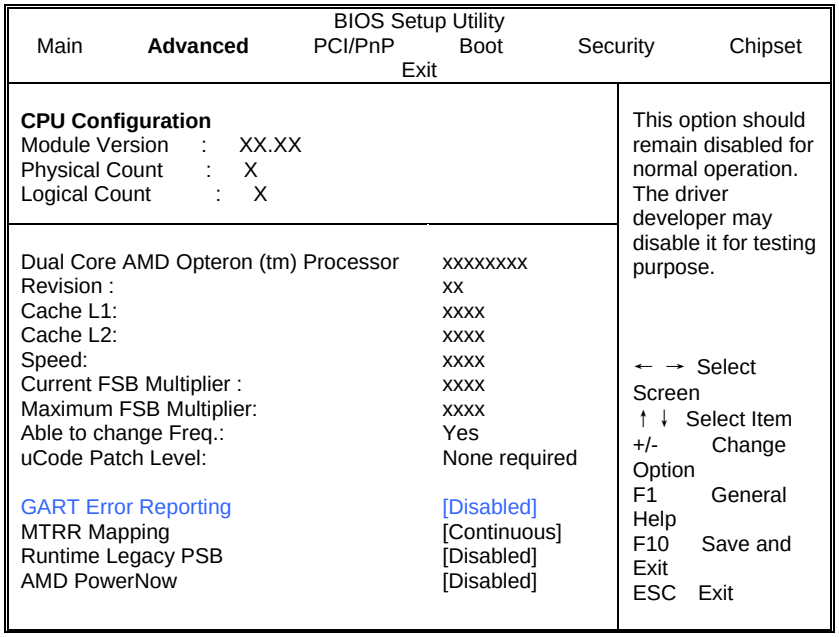


Feature	Option	Description
Advanced Settings		
CPU Configuration	**Menu Item**	Options for CPU
IDE Configuration	**Menu Item**	Configure the IDE device(s)
Floppy Configuration	**Menu Item**	Configure the Floppy drive(s)
Super IO Configuration	**Menu Item**	Configures Super IO Chipset
S-ATA Configuration	**Menu Item**	Configure ServerWorks HT1000 S-ATA
ACPI Configuration	**Menu Item**	Section for Advanced ACPI Configuration
Event Log Configuration	**Menu Item**	Mark as read, Clear or View Event Log statistics
Hardware Health Configuration	**Menu Item**	Configure/monitor the Hardware Health

Feature	Option	Description
Advanced Settings		
MPS Configuration	**Menu Item**	Configure the Multi-Processor Table
Remote Access Configuration	**Menu Item**	Configure Remote Access
USB Configuration	**Menu Item**	Configure the USB support
Device & PCI Slots Configuration	**Menu Item**	Onboard Devices and PCI Add-On Cards Enabled/Disabled

3.5.1 CPU Configuration Sub-Menu

You can use this screen to view CPU 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.

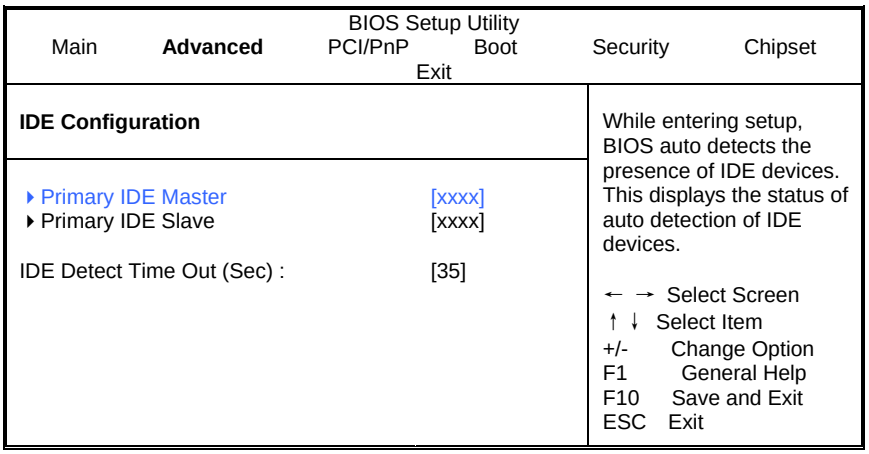


Feature	Option	Description
CPU Configuration		
Module Version	Read only	Displays information about CPU
Physical Count		
Logical Count		
Revision	Read only	Displays information about CPU
Cache L1		
Cache L2		
Speed		
Current FSB Multiplier		
Maximum FSB Multiplier		
Able to change Freq.		
uCode Patch Level		

Feature	Option	Description
CPU Configuration		
GART Error Reporting	**Disabled**	This option should remain disabled for normal operation. The driver developer may enable it for the purpose of testing.
	Enabled	
MTRR Mapping	**Continuous**	This option determines the method used for programming CPU MTRRs when 4GB or more of memory is preset. Discrete leaves the PCI hole below the 4GB boundary undescribed. Continuous explicitly describes the PCI hole as non-cacheable.
	Discrete	
Runtime Legacy PSB	**Disabled**	Enable/disable the generation of Power State Block for use of PowerNow(tm) driver in a single core system.
	Enabled	
AMD PowerNow	**Disabled**	Enable/disable the generation of ACPI_PPC, _PSS, and _PCT objects.
	Enabled	

3.5.2– 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.



Feature	Option	Description
IDE Configuration		
Primary IDE Master/Slave	**Auto** XXXX Not Detected Enabled	While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.
IDE Detect Time Out (Sec)	**0~35** (at 5 interval)	Selects the time out value for detecting ATA/ATAPI device(s).

3.5.2.1 – Primary/Secondary IDE Master/Slave Sub-Menu

BIOS Setup Utility					
Main	Advanced	PCI/PnP	Boot	Security	Chipset
		Exit			

Primary IDE Master	
Device: Not Detected	← → Select Screen ↑ ↓ Select Item +/- Change Option Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Type [Auto] LBA /Large Mode [Auto] Block (Multi-Sector Transfer) [Auto] PIO Mode [Auto] DMA Mode [Auto] S.M.A.R.T. [Auto] 32 Bit Data Transfer [Enabled]	

Feature	Option	Description
Configure Nat417 Super IO Chipset		
Type	**Auto** Not Installed CD/DVD ARMD	Selects the type of device connected to the system.
LBA/Large Mode	**Auto** Disabled	Auto: Enabled LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled. Disabled: Disabled LBA Mode.
Block (Multi-Sector Transfer)	**Auto** Disabled	Disabled: The Data transfer from and to the device occurs one sector at a time. Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.
PIO Mode	**Auto** 0~4 (at 1 interval)	Selects the PIO Mode. Select Auto to enhance hard disk performance by optimizing the hard disk timing.
DMA Mode	**Auto**	Selects DMA Mode. Auto: Auto detected.
S.M.A.R.T.	**Auto** Disabled Enabled	S.M.A.R.T (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.
32Bit Data Transfer	**Enabled** Disabled	Enables 32-bit to maximize the IDE hard disk data transfer rate.

3.5.3 – 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
		Exit			

Floppy Configuration	Select the type of floppy drive connected to the system.
Floppy A [1.44 MB $3^1/_2$"] Floppy B [Disabled]	← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
Floppy Configuration		
Floppy A Floppy B	Disabled 360 KB $5^1/_4$" 1.2 MB $5^1/_4$" 720 KB $3^1/_2$" **1.44 MB $3^1/_2$"** 2.88 MB $3^1/_2$"	Selects the type of floppy drive connected to the system.

3.5.4 – Super IO Configuration Sub-Menu

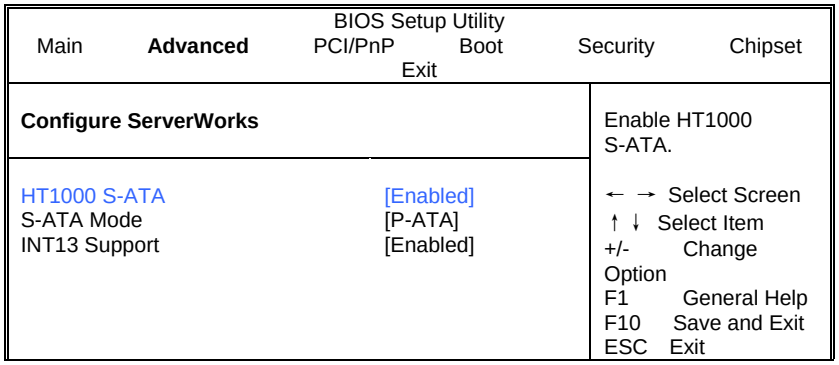
You can use this screen to select options for the Super I/O settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
Configure SCH4307 Super IO Chipset	Allows BIOS to enable or disable Floppy Controller.
Onboard Floppy Controller [Enabled] Serial Port1 Address [3F8/IRQ4] Serial Port2 Address [2F8/IRQ3]	← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
Configure SCH4307 Super IO Chipset		
Onboard Floppy Controller	**Enabled**	Allows BIOS to enable or disable the floppy controller.
	Disabled	
Serial Port1 Address	**3F8/IRQ4**	Allows BIOS to select Serial Port1 Base Addresses.
	3E8/IRQ4	
	2E8/IRQ3	
	Disabled	
Serial Port2 Address	**2F8/IRQ3**	Allows BIOS to select Serial Part2 Base Addresses.
	3E8/IRQ4	
	2E8/IRQ3	
	Disabled	

3.5.5 S-ATA Configuration Sub-Menu

You can use this screen to view S-ATA 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.



Feature	Option	Description
Configure ServerWorks		
HT1000 S-ATA	**Enabled**	Allows user to enable or disable HT1000 S-ATA controller.
	Disabled	
S-ATA Mode	**P-ATA**	Sets S-ATA mode as P-ATA emulation native S-ATA, or S-ATA RAID.
	S-ATA	
	S-ATA RAID	
INT13 Support	**Enabled**	Enables or disables INT13 support.
	Disabled	

3.5.6 –ACPI Configuration Sub-Menu

Use this screen to select options for 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.

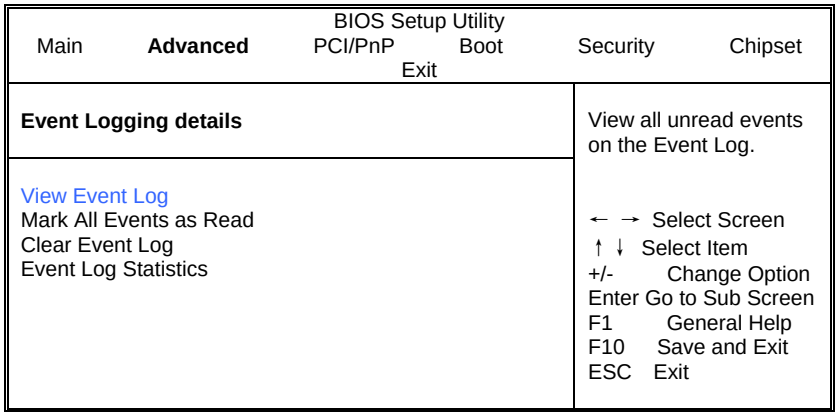
BIOS Setup Utility					
Main	**Advanced**	PCI/PnP	Boot	Security	Chipset
		Exit			

Advanced ACPI Configuration		Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some
ACPI Version Features	[ACPI v2.0]	
ACPI APIC Support	[Enabled]	
ACPI SRAT Table	[Enabled]	
AMI OEMB table	[Enabled]	
Headless mode	[Disabled]	
		← → Select Screen
		↑ ↓ Select Item
		+/- Change Option
		F1 General Help
		F10 Save and Exit
		ESC Exit

Feature	Option	Description
Advanced ACPI Configuration		
ACPI Version Features	ACPI v1.0	Set this value to allow or prevent the system to be complaint with the ACPI 2.0 specification.
	ACPI v2.0	
	ACPI v3.0	
ACPI APIC Support	**Enabled**	This option allows you to define whether or not to enable APIC features.
	Disabled	
ACPI SRAT Table	**Enabled**	Enable or disable the building of ACPI SRAT Table.
	Disabled	
AMI OEMB 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 AMI code during ACPI O/S operations.
	Disabled	
Headless mode	Enabled	Enable or disable Headless operation mode through ACPI.
	Disabled	

3.5.7 – Event Logging details Sub-Menu

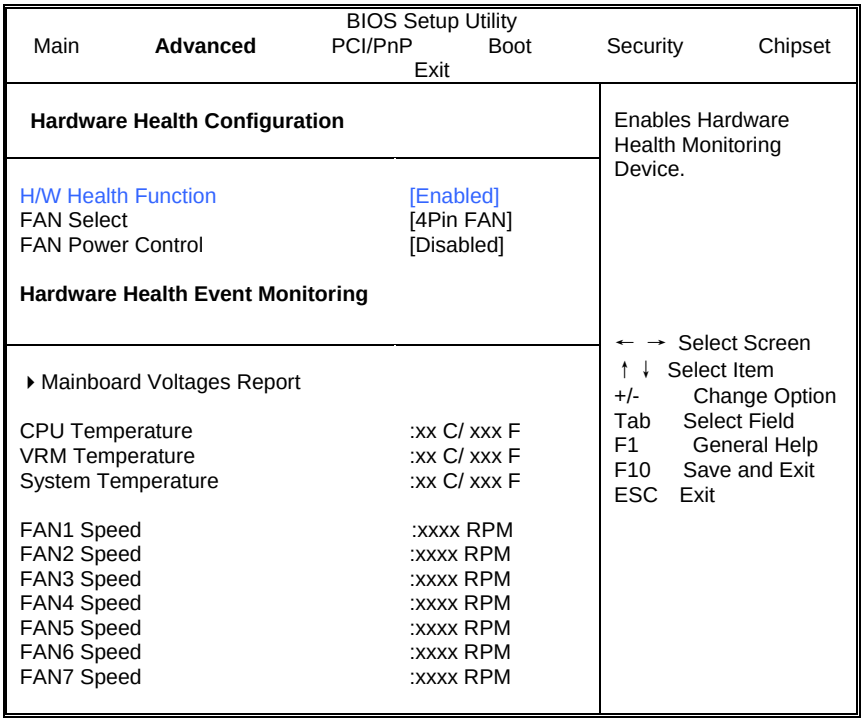
You can use this screen to view the Event Log Control Menu. This logs system events (such as CMOS clear, ECC memory errors, etc) and writes the log into NVRAM. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings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



Feature	Option	Description
Event Logging details		
View Event Log		Views all unread events on the Event Log.
Mark All Events as Read	OK Cancel	Marks all unread events as read.
Clear Event Log	OK Cancel	Erases all of events.
Event Log Statistics		View details on the count of total unread events. Other stats include size occupied and size free. (in terms of event units)

3.5.8 – 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.



Feature	Option	Description
Hardware Health Configuration		
H/W Health Function	**Enabled**	Enables Hardware Health Monitoring Device.
	Disabled	
FAN Select	**4Pin FAN**	Selects the FAN type.
	3Pin FAN	
FAN Power Control	Enabled	FAN power duty cycle is auto dynamic programmed in selected temperature range. Disabled: Fan Power On. Enabled: Fan Power Duty Cycle=30%(40˚C)-100%(60˚C), see mainboard temp.
	Disabled	

Feature	Option	Description
Hardware Health Event Monitoring		
Mainboard Voltages Report	Read only	Displays Voltage for CPU, memory, & other devices.
CPU Temperature	Read only	Displays CPU Temperature and FAN Speed.
VRM Temperature		
System Temperature		
FAN1/2/3/4/5/6/7 Speed		

3.5.8.1 – Mainboard Voltages Report Sub-Menu

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

Board Voltages Report

+2.5V	: x.xxx V
CPU Vcore	: x.xxx V
+5V	: x.xxx V
+12V	: x.xxx V

← → Select Screen
↑ ↓ Select Item
+/- Change Option
Tab Select Field
F1 General Help
F10 Save and Exit
ESC Exit

3.5.9 MPS Configuration Sub-Menu

You can use this screen to select MPS revision. Use the up and down arrow (↑/↓) keys to select an item. The settings are described on the following pages.

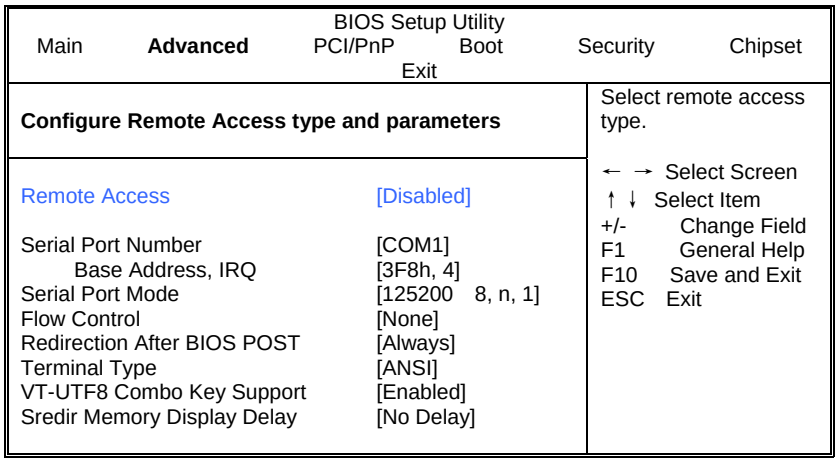
BIOS Setup Utility					
Main	**Advanced**	PCI/PnP	Boot	Security	Chipset
Exit					

MPS Configuration	Select MPS Revision.
MPS Revision [1.4]	← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
MPS Configuration		
MPS Revision	1.1 **1.4**	Allows user to select MPS revision.

3.5.10 – 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.

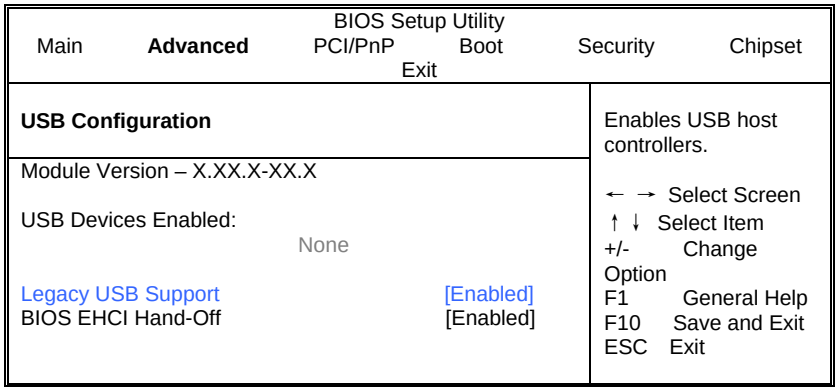


Feature	Option	Description
Configure Remote Access type and parameters		
Remote Access	Enabled	Enables remote access to system through serial port.
	Disabled	
Serial Port Number	**COM1**	Select Serial Port for console redirection. Make sure the selected port is enabled.
	COM2	
Base Address, IRQ	Read only	
Serial Port Mode	**115200 8,n,1**	Select Serial Port settings.
	57600 8,n,1	
	19200 8,n,1	
	9600 8,n,1	
Flow Control	**None**	Select Flow Control for console redirection.
	Hardware	
	Software	

Feature	Option	Description
Configure Remote Access type and parameters		
Redirection After BIOS POST	**Disabled**	Disable: Turns off the redirection after POST Boot Loader: Redirection is active during POST and during Boot Loader. Always: Redirection is always active. <Some OSs may not work if set to Always>
	Boot Loader	
	Always	
Terminal Type	**ANSI**	Select the target terminal type.
	VT100	
	VT-UTF8	
VT-UTF8 Combo Key Support	**Enabled**	Enable VT-UTF8 Combination key Support for ANSI/VT100 terminals.
	Disabled	
Sredir Memory Display Delay	**No Delay**	Gives the delay in seconds to display memory information
	Delay 1 Sec	
	Delay 2 Sec	
	Delay 4 Sec	

3.5.11 – USB Configuration Sub-Menu

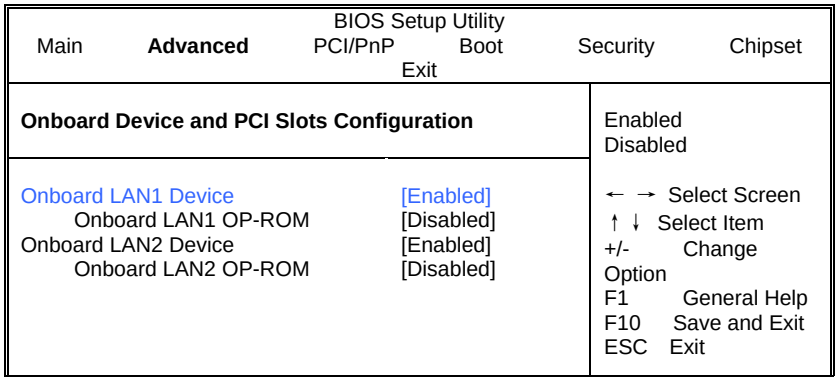
You can use this screen to view the USB Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
USB Configuration		
Legacy USB Support	Disabled	Enables support for legacy USB.
	Enabled	
BIOS EHCI Hand-Off	**Enabled**	This is a work around for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
	Disabled	

3.5.12 Device & PCI Slots Configuration Sub-Menu

You can use this screen to enable the onboard devices and PCI slots. Use the up and down arrow (↑/↓) keys to select an item. The settings are described on the following pages.



Feature	Option	Description
MPS Configuration		
Onboard LAN1 / LAN2 Device	Disabled	Enabled/Disabled LAN controller
	Enabled	
Onboard LAN1 OP-ROM Onboard LAN2 OP-ROM	**Disabled**	Executed LAN OPROM or not
	Enabled	

3.6 –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
		Exit			

Advanced PCI/PnP Settings		Clear NVRAM during System Boot.
WARNING: Setting wrong values in below sections may cause system to malfunction.		← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
Clear NVRAM	[No]	
Plug & Play O/S	[No]	
PCI Latency Timer	[64]	
PCI Bus Scan Order	[Ascent]	
Allocate IRQ to PCI VGA	[Yes]	
Palette Snooping	[Disabled]	
PCI IDE BusMaster	[Disabled]	

Feature	Option	Description
Advanced PCI/PnP Settings		
Clear NVRAM	**No**	Clears NVRAM during system Boot.
	Yes	
Plug & Play OS	Yes	No: lets the BIOS configure all the devices in the system. Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
	No	
PCI Latency Timer	32	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. Values in units of PCI clocks for PCI device latency timer register.
	64	
	96	
	128	
	160	
	192	
	224	
	248	
PCI Bus Scen Order	**Ascent**	Ascent: Scan PCI bus from bus 0 to maximum. Descent: Scan PCI bus from maximum to bus 0.
	Descent	
Allocate IRQ to PCI VGA	**Yes**	Yes: assigns IRQ to PCI VGA card if card requests IRQ.
	No	
Palette Snooping	**Disabled**	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled. Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.
	Enabled	
PCI IDE BusMaster	**Disabled**	Enabled: BIOS uses PCI bus mastering for reading / writing to IDE drives.
	Enabled	

3.7 – 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 Exit	
Boot Settings	Configures settings during System Boot.
▸ Boot Settings Configuration ▸ Boot Device Priority ▸ Hard Disk Drives ▸ Removable Drives	← → Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

3.7.1 – Boot Settings Configuration Sub-Menu

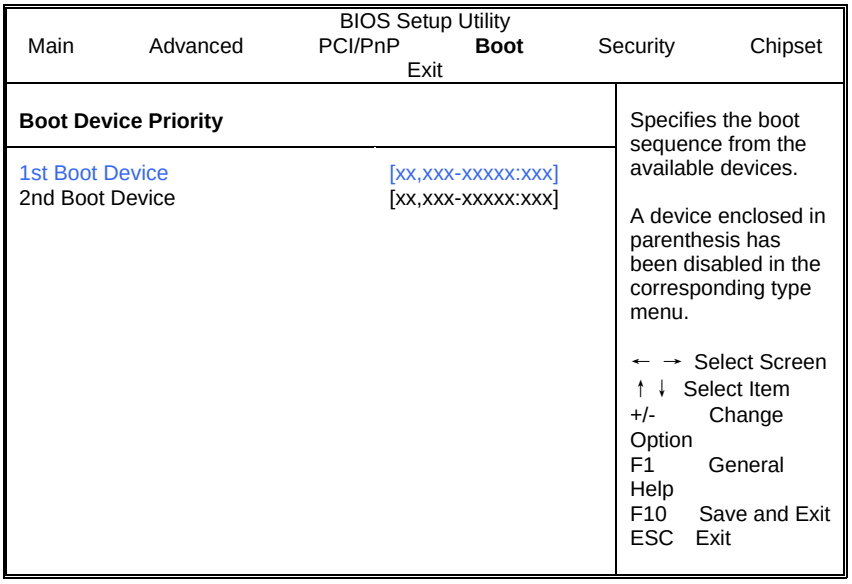
Use this screen to select options for the Boot Settings Configuration. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility Main Advanced PCI/PnP **Boot** Security Chipset Exit		
Boot Settings Configuration		Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system. ← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
Quick Boot Quiet Boot Add On ROM Display Mode Boot up Num-Lock PS/2 Mouse Support Wait for 'F1' if Error Hit 'DEL' Message Display Interrupt 19 Capture	[Disabled] [Disabled] [Force BIOS] [On] [Auto] [Enabled] [Enabled] [Enabled]	

Feature	Option	Description
Boot Settings Configuration		
Quick Boot	Enabled	This option allows user bypass BIOS self test during POST.
	Disabled	
Quiet Boot	**Disabled**	Disabled: displays normal POST messages. Enabled: displays OEM log instead of POST messages.
	Enabled	
Add On ROM Display Mode	**Force BIOS**	Allows user to force BIOS/Option ROM of add-on cards to be displayed during quiet boot.
	Keep Current	
Boot up Num-Lock	**On**	Selects Power-on state for Numlock.
	Off	
PS/2 Mouse Support	Enabled	Selects support for PS/2 Mouse.
	Disabled	
	Auto	
Wait for 'F1' If Error	**Enabled**	Waits for F1 key to be present if error occurs.
	Disabled	
Hit 'DEL' Message Display	**Enabled**	Displays "Press DEL to run Setup" in POST.
	Disabled	
Interrupt 19 Capture	Disabled	Enabled: allows option ROMs to trap interrupt 19.
	Enabled	

3.7.2 – Boot Device Priority Sub-Menu

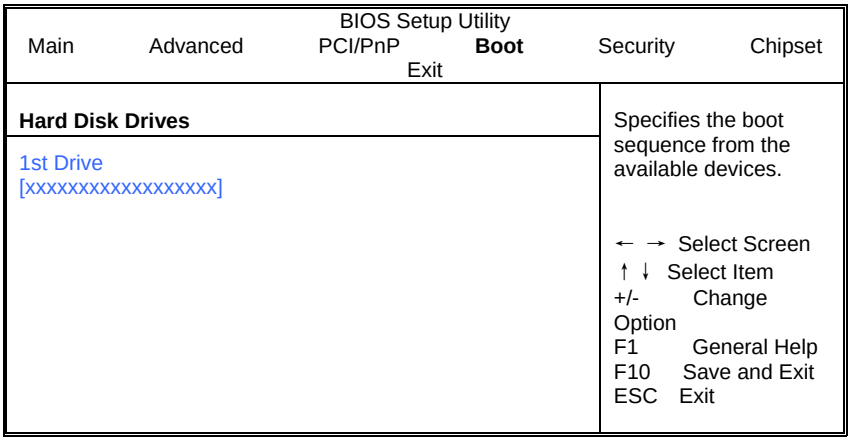
Use this screen to select options for the Boot Device Priority. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Boot Device Priority		
1st Boot Device 2nd Boot Device	**xx,xxx-xxxxx:xxx** xx,xxx-xxxxx:xxx Disabled	Settings for boot priority. These can be customized depending on your preference.

3.7.3 – Hard Disk Drives Sub-Menu

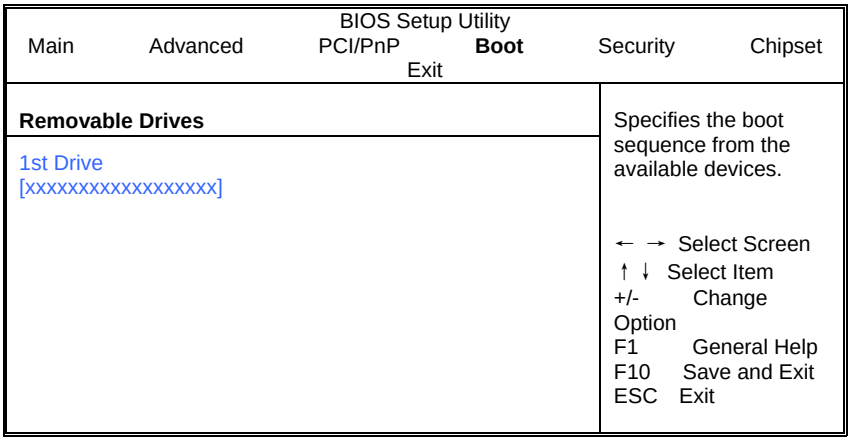
Use this screen to select options for the hard disk Drives. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Removable Drives		
1st Drive	**xx,xxx-xxxxx:xxx** Disabled	Specifies the boot sequence for the available devices.

3.7.4 – Removable Drives Sub-Menu

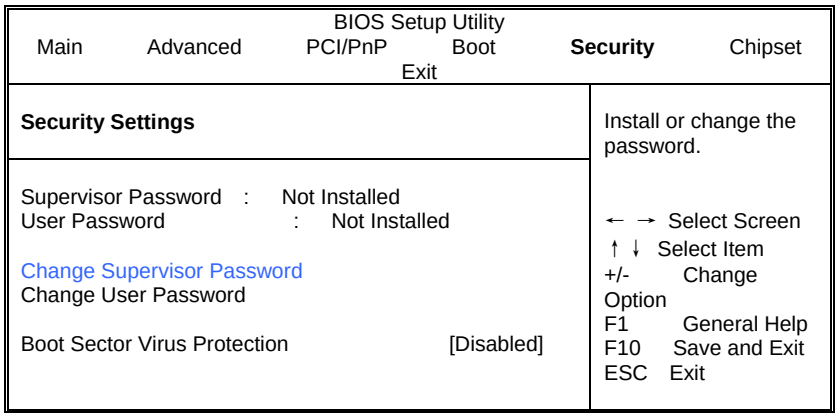
Use this screen to select options for the Removable Drives. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Removable Drives		
1st Drive	**xx,xxx-xxxxx:xxx** Disabled	Specifies the boot sequence for removable drive booting. This option will show all removable devices.

3.8 – BIOS Security Menu

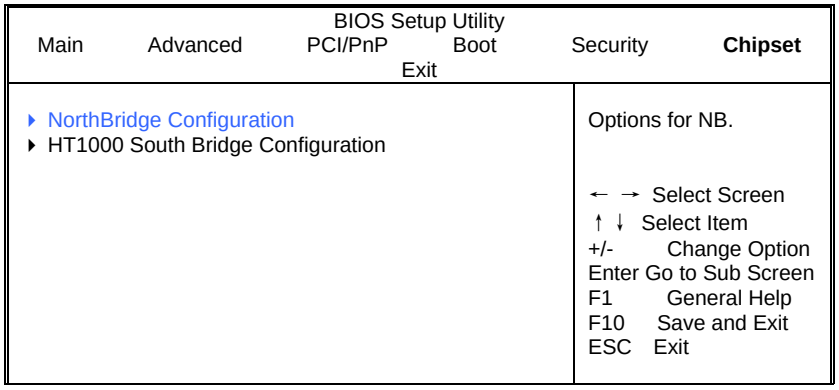
The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is entered, using either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, 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.



Feature	Option	Description
Security Settings		
Supervisor Password:	**Not Installed** Installed	If the password has been set, Installed displays. If no password is set, Not Installed displays.
User Password:	**Not Installed** Installed	If the password has been set, Installed displays. If no password is set, Not Installed displays.
Change Supervisor Password		Selects this option to change or install Supervisor Password.
Change User Password		Selects this option to change or install User Password.
Boot Sector Virus Protection	**Disabled** Enabled	When it is set to [Enabled], BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted.

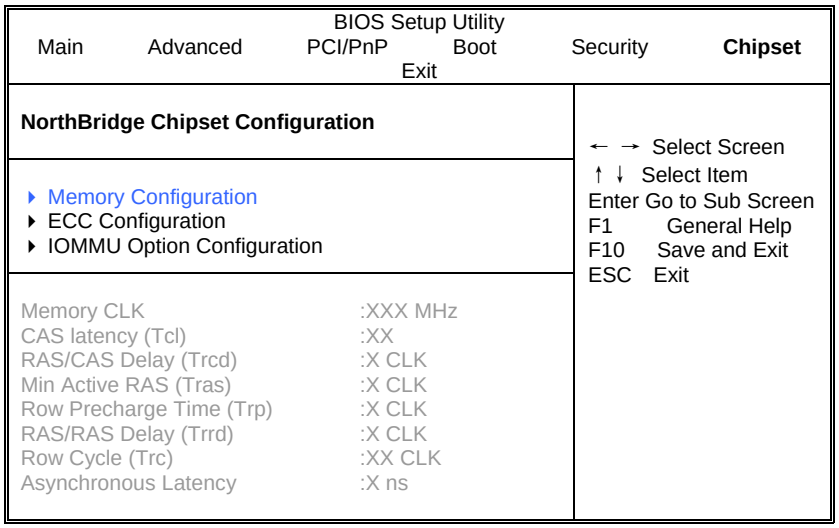
3.9 – BIOS Chipset Menu

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. Additional configuration for the AMD8131 PCI-X Tunnel is available in the PCI-X Configuration Menu. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.



3.9.1 – 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.

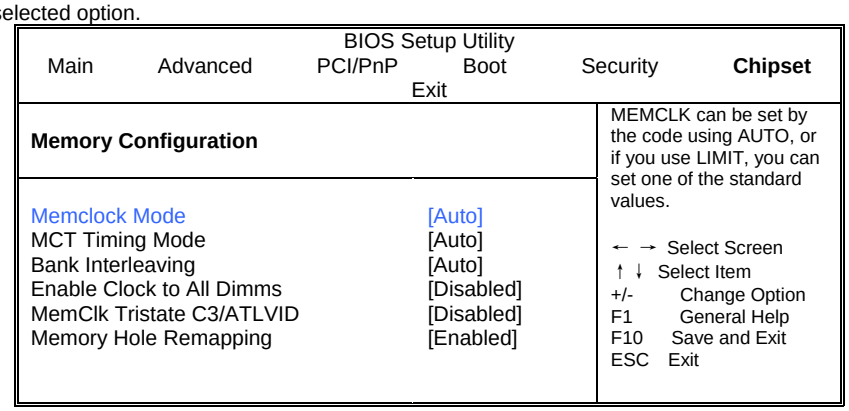


Feature	Option	Description
NorthBridge Chipset Configuration		
Memory CLK	Read only	It shows the clock frequency of the installed SDRAM.
CAS Latency (Tcl)	Read only	This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.
RAS/CAS Delay (Trcd)	Read only	When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.

Feature	Option	Description
NorthBridge Chipset Configuration		
Min Active RAS (Tras)	Read only	This setting allows you to select the number of clock cycles allotted for the RAS pulse width, according to DRAM specifications. The less the clock cycles, the faster the DRAM performance.
Row Precharge Time (Trp)	Read only	This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its chage before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.
RAS/RAS Delay (Trrd)	Read only	Auto uses hardware compensation values. Other values add to or subtract from hardware generated value. Recommended setting is Auto.
Row Cycle (Trc)	Read only	Bits 7-4. RAS#-active to RAS#-active or auto refresh of the same bank.
Asynchronous Latency	Read only	Bits 3-0. This filed should be loaded with a 4-bit value equal to the maximum asynchronous latency in the DRAM read round-trip loop.

3.9.1.1 – 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.



Feature	Option	Description
Memory Configuration		
Memclock Mode	Limit	Select the DRAM Frequency programming method. If Auto, the DRAM speed will be based on SPDs. If Limit, the DRAM speed will not exceed the specified value. If Manual, the DRAM speed specified will be programmed by users.
	Auto	
	Manual	
MCT Timing Mode	Manual	Allows user to configure the MCT Timing Mode manually.
	Auto	
Bank Interleaving	Disabled	Enable Bank Memory Interleaving
	Auto	
Enable Clock to All Dimms	**Disabled**	Enable unused clocks to Dimms even memory slots are NOT populated.
	Enabled	
MemClk Tristate C3/ATLVID	**Disabled**	Enable/Disable MemClk Tri-Stating during C3 and Alt VID
	Enabled	
Memory Hole Remapping	**Enabled**	Enable Memory Remapping around Memory Hole
	Disabled	

3.9.1.2 –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.

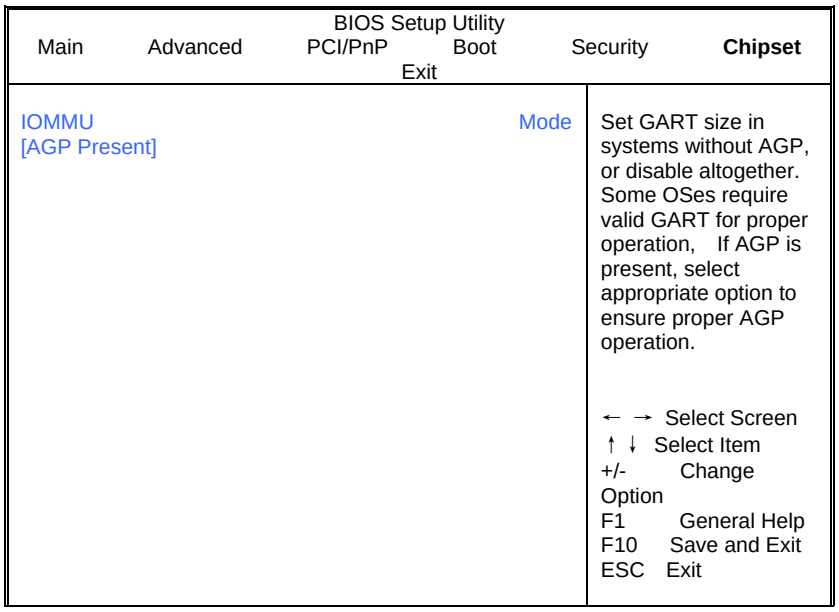
BIOS Setup Utility Main Advanced PCI/PnP Boot Security **Chipset** Exit	
ECC Configuration	DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity. ← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
DRAM ECC Enable [Enabled] ECC MCA Enable [Enabled] 4-Bit ECC Mode [Disabled] DRAM SCRUB REDIRECT [Disabled] DRAM BG Scrub [Disabled] L2 Cache BG Scrub [Disabled] Data Cache BG Scrub [Disabled]	

Feature	Option	Description
ECC Configuration		
DRAM ECC Enable	**Enabled**	DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity.
	Disabled	
ECC MCE Enable	Disabled	Enables MCE DRAM ECC Logging / Reporting.
	Enabled	
4-Bit ECC Mode	**Disabled**	Enable 4-Bit ECC Mode. Note: Also known as CHIPKILL ECC Mode
	Enabled	
DRAM SCRUB REDIRECT	**Disabled**	DRAM SCRUB REDIRECT allows the system to correct DRAM ECC errors immediately when they occur, even if background scrubbing is on.
	Enabled	
DRAM BG Scrub	**Disabled**	DRAM scrubbing corrects memory errors so later reads are correct. Doing this while memory is not being used improves performance. Note: When AMD's node interleave feature is enabled, BIOS will force DRAM scrub off.
	40ns	
	80ns	
	160ns	
	320ns	
	640ns	
	1.28us	
	2.56us	
	5.12us	
	10.2us	

Feature	Option	Description
ECC Configuration		
	20.5us	
	41.0us	
	81.9us	
	163.8us	
	327.7us	
	655.4us	
L2 Cache BG Scrub	**Disabled**	Allows the L2 Data Cache RAM to be corrected while idle.
	40ns	
	80ns	
	160ns	
	320ns	
	640ns	
	1.28us	
	2.56us	
	5.12us	
	10.2us	
	20.5us	
	41.0us	
	81.9us	
	163.8us	
	327.7us	
	655.4us	
Data Cache BG Scrub	**Disabled**	Allows the L1 Data Cache RAM to be corrected while idle.
	40ns	
	80ns	
	160ns	
	320ns	
	640ns	
	1.28us	
	2.56us	
	5.12us	
	10.2us	
	20.5us	
	41.0us	
	81.9us	
	163.8us	
	327.7us	
	655.4us	

3.9.1.3 – IOMMU Configuration Sub-Menu

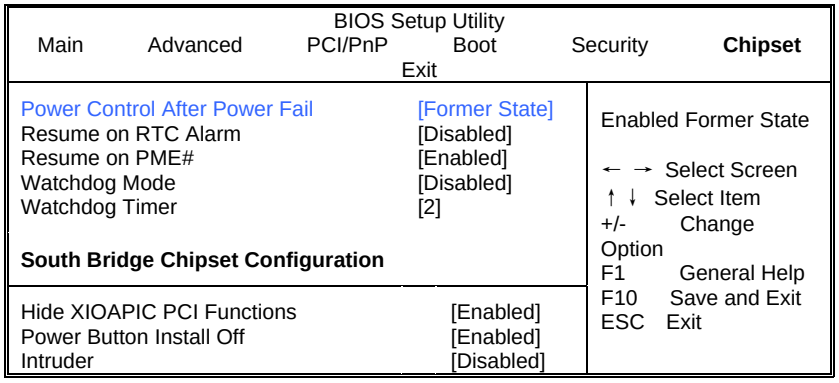
This menu has options for IOMMU. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
IOMMU Configuration		
IOMMU Mode	**AGP Present** Disabled 32 MB 64 MB 128 MB 256 MB 512 MB 1 GB	Set GART size in systems without AGP, or disable altogether. Some OSes require valid GART for proper operation. If AGP is present, select appropriate option to ensure proper AGP operation.

3.9.2 – HT1000 SouthBridge Chipset Configuration Sub-Menu

This menu allows the user to configure SouthBridge setup. 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.



Feature	Option	Description
Chipset Configuration		
Power Control After Power Fail	**Former State**	Configure the power state when motherboard connected to power supply cable.
	Off	
	On	
Resume on RTC Alarm	Enabled	Enable/disable the resume on RTC alarm.
	Disabled	
Resume on PME#	**Enabled**	Enable/disable the resume on PME#
	Disabled	
Watchdog Mode	**Disabled**	POST: BIOS POST Watchdog timer counting. Start at PowerON. Stop at OS boot. OS: OS boot Watchdog. Start at OS boot. PowerON: Start at PowerON.
	POST	
	OS	
	PowerON	
Watchdog Timer	2	Watchdog timer sets 2/4/6/8/10/12 minutes. When WD time-out occurs, system will auto reboot.
	4	
	6	
	8	
	10	

	12	

Feature	Option	Description
South ridge Chipset Configuration		
Hide XIOAPIC PCI Functions	**Enabled**	Hide XIOAPIC PCI functions.
	Disabled	
Power Button Install Off	**Enabled**	Disable or enable power button instant off.
	Disabled	
Intruder	Enabled	Disable or enable intruder function.
	Disabled	

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
Exit					
Exit Options				Exit system setup after saving the changes. F10 key can be used for this operation. ← → Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit	
Save Changes and Exit Discard Changes and Exit Discard Charges Load Optimal Defaults Load Failsafe Defaults					

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.

4.1 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.

4.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, 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: 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 looses 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.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assitance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then Tyan Computer Corporation can help. Besides designing innovative and quality products for over a decade, Tyan has continuously offered customers service beyond their expectations. Tyan's website (**www.tyan.com**) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. Tyan also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, Tyan serves multiple market segments with the industry's most competitive services to support them.

"Tyan's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Please feel free to contact us directly for this service at **techsupport@tyan.com**

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**

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 on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

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

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

Document #: D1745-100