TYAN

Thunder n3600QE / / / S4980

Version 1.0

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Notice

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Check the box contents!

1x Thunder n3600QE motherboard

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

3 x Serial ATA power cable

6 x Serial ATA Cable

1 x USB2.0 cable
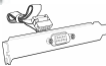
1 x COM Port Cable

1 x Thunder n3600QE user's manual

1 x Thunder n3600QE Quick Reference guide

1 x TYAN driver CD

1 x I/O shield

4 x CPU Retention Frame and Back Plate (pre-installed)

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

NOTE

Chapter 1: Introduction

1.1 - Congratulations

You have purchased the high performance server with four processors (can expand to eight). The Thunder n3600QE (S4980) is a flexible AMD® platform for multiple applications, based on NVIDIA® NFP3600 and SMSC SCH5017 chipsets.

Designed to support four AMD® Rev. F Opteron™ 8000 series processors and max 64GB DDR2-667/533/400 memory, and featured with integrated RJ-45 LAN connectors, one PCI-Express x16 slot plus six serial ATA ports, the S4980 offers exceptional performance and versatile solution for your server platform.

Remember to visit TYAN's Website at http://www.TYAN.com. There you can find information on all of TYAN's products with FAQs, online manuals and BIOS upgrades.

1.2 - Hardware Specifications

Processors
- Quad 1207-pin ZIF sockets
- Supports up to four AMD® Rev. F Opteron™ 8000 series CPU
- Up to 1.0GHz Hyper-Thansport link support

Chipset
- NVIDIA NFP3600 (MCP55 Pro)
- SMSC SCH5017

Memory
- Dual memory channels
- Supports up to sixteen DDR2 667/533/400 DIMMs
- Supports up to 64GB of registered, ECC memory
- Supports 4-rank memory

Integrated PCI IDE
- Single channel master mode supports up to two IDE devices
- Supports for ATA-133/100/66/33 IDE drives and ATAPI compliant devices

Integrated 2D/3D PCI Graphics
- XGI Volari Z7 (XG20)
16MB frame buffer memory

Integrated LAN Controllers
- Two (2) NFP3600 integrated MA C with two Marvell 88E1116 single port Gigabit Ethernet PHY
- Integrated TCP offload Engine (TOE)
- IEEE802.3 compliant, WOL/PXE support
- Front panel LAN LED support (TYFP2 header)

Server Management
- M3291, IPMI 2.0 Remote System Mgmt card
- Renesas H8S2167 BMC controller
- BT, KCS, Logging support
- IPMI-over-LAN
- Remote power on/off and reset
- 2-pin warning LED

Integrated Serial ATA II
- Three Serial ATA II Host controllers embedded
- Supports up to six serial ports running at 3.0Gb/s per direction per channel
- Serial ATA II specification compliant
- nVIDIA MediaShield^{TM} supports for RAID 0, 1,0+1, 5, JBOD
- HDD LED support (TYFP header)

Back Panel I/O Ports
- Stacked PS/2 Mouse & Keyboard ports
- One double-decked USB 2.0 port
- COM1 connector
- One 15-pin VGA port
- Two side-by-side RJ45 10/100/1000 Base-T port with link/activity LED

Integrated I/O Interfaces
- One IDE connector
- Two USB 2.0 ports (via cable)
- One COM port (via cable)
- Tyan 2x9 pin fan header (for Tyan barebone)
- Tyan 2x6 pin front panel header
- Tyan 2x25 pin SMDC header
- ID LED
- SMDC Warning LED header

BIOS
- AMI BIOS 8Mbit Flash
- Supports ACPI 2.0
- PnP, DMI2.0, WfM2.0 Power Management
- ACPI S1, S4, S5 supported

Power
- EPS 12V power with 24+8+8/4 power connectors
- One extra 2x2 power connector to support next-generation SSI PSU
- On board 5-phase digital VRD

Form Factor
- E-ATX footprint, 12"x13" (304.8mm x 330.2mm)

Regulatory
- FCC Class B (Declaration of Conformity)
- CE (Declaration of conformity)

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting hole pattern of the Thunder n3600QE S4980 matches the E-ATX specification. Before continuing with installation, confirm that your chassis supports an E-ATX motherboard.

How to install our products right… the first time

The first thing you should do is reading 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**

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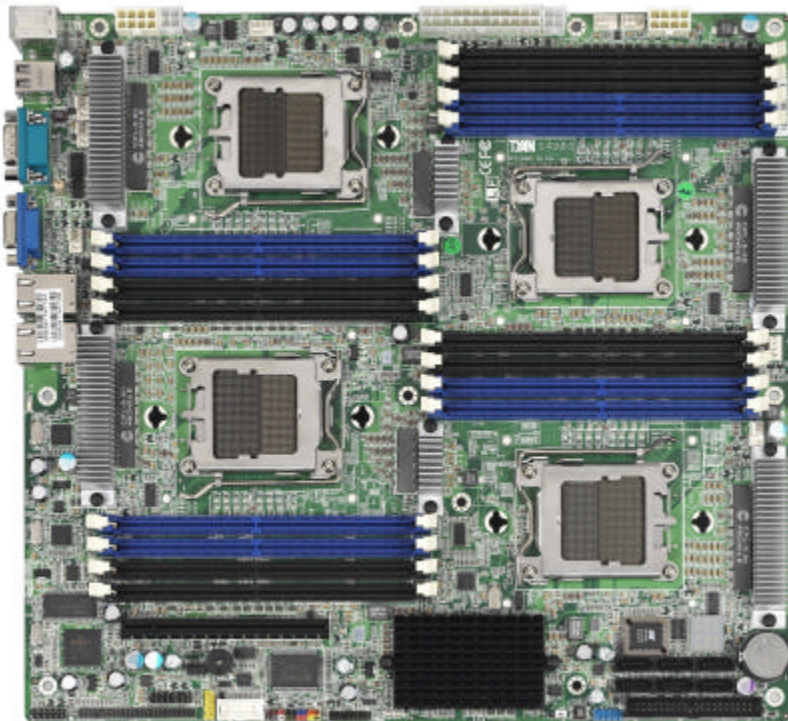
This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

2.2 - Block Diagram
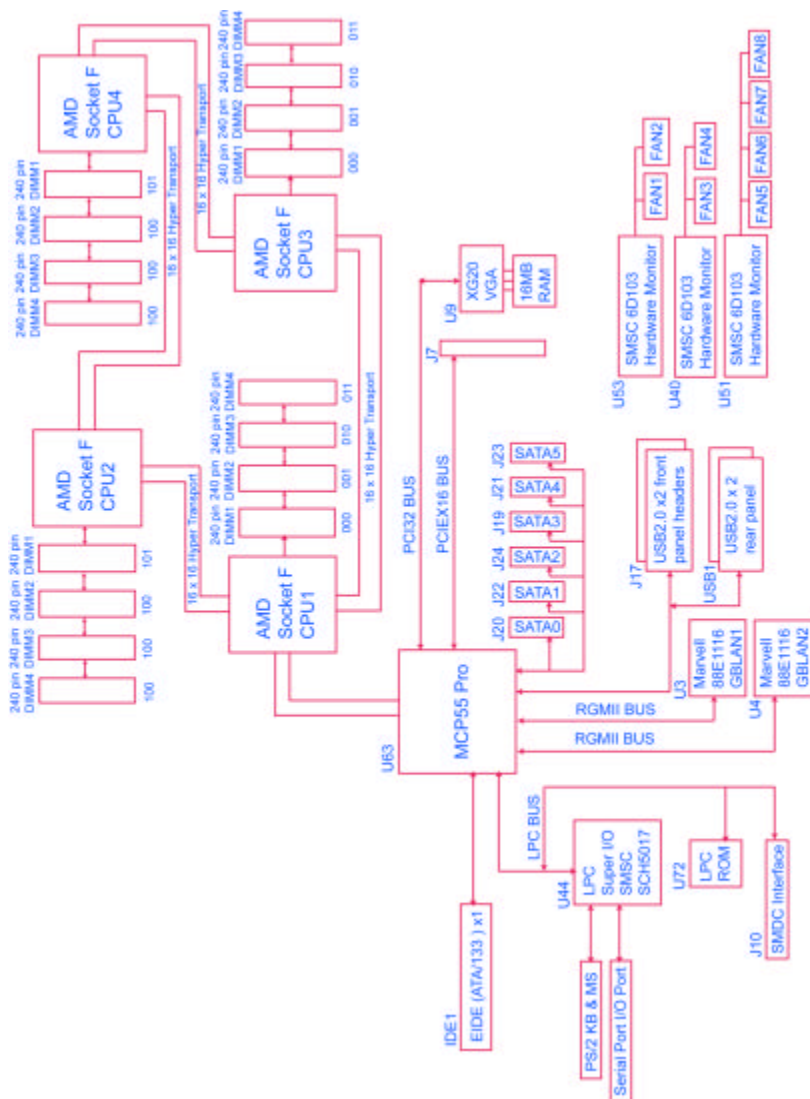
Thunder n3600QE S4980 Block Diagram

2.3 - Board Parts, Jumpers and Connectors
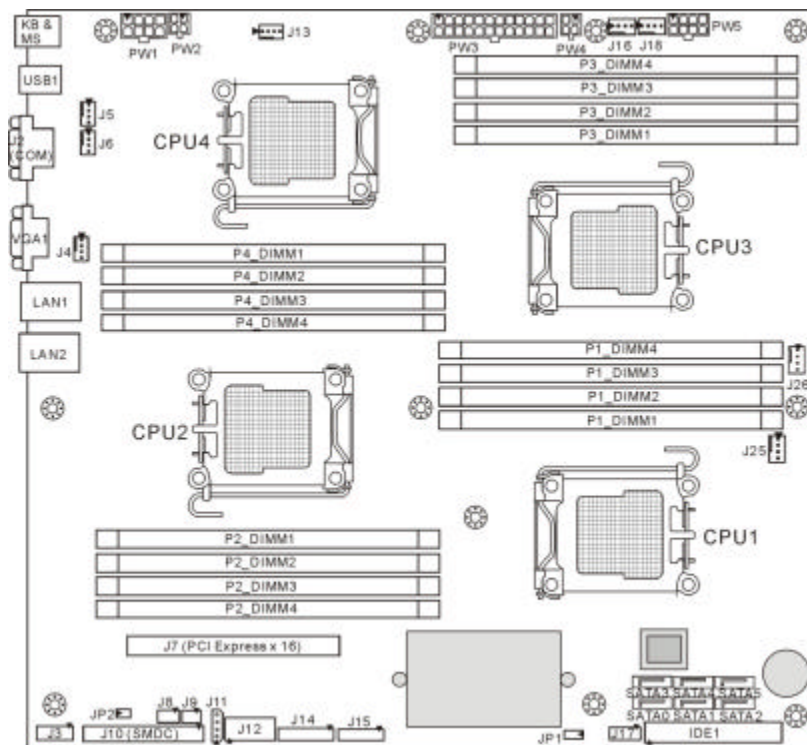
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.
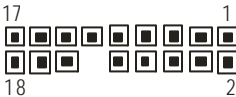
Jumper Legend

◙◙	OPEN **- Jumper OFF, without jumper cover**
◙◙	CLOSED **– Jumper ON, with jumper cover**

Jumper/Connector	Function
J4/J5/J6/J13/J16/J18/J25/J26	**Fan connector with speed control**
J12	**COM Port Pin Header**
J17	**USB Front Panel Pin Header**
J14	**Front Panel Pin Header**
J11	**IPMB Pin Header**
J10	**SMDC Connector**
J9	**LCM Pin Header**
J8	**SGPIO Pin Header**
IDE1	**Hard Drive Connector**
JP2	**SMDC Warning LED Header (for M3291)**
JP1	**Clear CMOS Jumper**
SATA0/1/2/3/4/5	**Serial ATA RAID Connectors**
J3/J15	**Reserved for Barebone only**
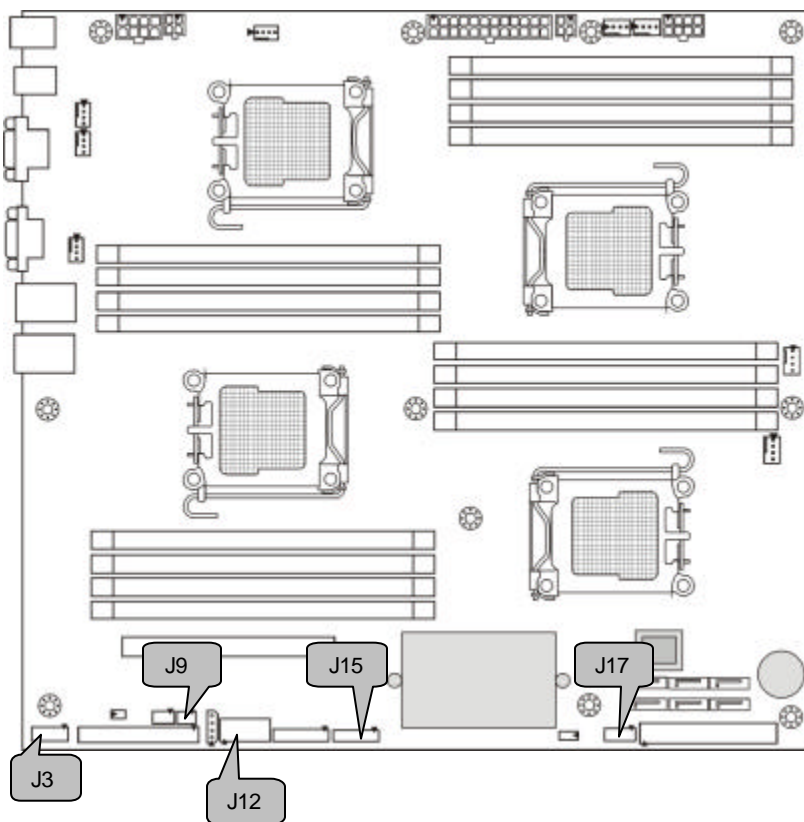
J15: FAN Tachometer Pin Header (for TYAN barebone use only)

17   1

18   2

Use these pin definitions to connect to the barebone fans.

Pin 1	F1_TACH	Pin 2	F6_TACH
Pin 3	F2_TACH	Pin 4	F7_TACH
Pin 5	F3_TACH	Pin 6	F8_TACH
Pin 7	F4_TACH	Pin 8	F9_TACH
Pin 9	F5_TACH	Pin 10	F10_TACH
Pin 11	GND	Pin 12	KEY
Pin 13	PWM2	Pin 14	PWM1
Pin 15	F13_TACH	Pin 16	F11_TACH
Pin 17	F14_TACH	Pin 18	F12_TACH
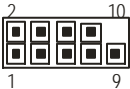
J3: TYAN FP2 Connector (for TYAN barebone use only)

11   1

12   2

Pin 1	LAN1 LED+	Pin 2	LAN1 LED-
Pin 3	LAN2 LED+	Pin 4	LAN2 LED-
Pin 5	NC	Pin 6	GND
Pin 7	ID LED+	Pin 8	ID LED1-
Pin 9	ID_LED S/W+	Pin 10	ID_LED S/W-
Pin 11	KEY	Pin 12	NC

J17: USB Front Panel Connector

9   1

10   2

Pin 1	USBPWR	Pin 2	USBPWR
Pin 3	USB 4-	Pin 4	USB 2-
Pin 5	USB 4+	Pin 6	USB 2+
Pin 7	GND	Pin 8	GND
Pin 9	KEY	Pin 10	GND

J12: COM2 Header

2   10

1   9

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

J9: LCM Pin Header

5   1

6   2

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

J8

J14

J11

SATA3/SATA4/SATA5
SATA0/SATA1/SATA2

J14: Front Panel Header

The Front Panel Header is used to connect some control or signal wires from motherboard to chassis, such as HDD LED, power LED, power button, and reset button.

SMB US Clock	SMB US Data	5VSB	Non-mask	Interrupt (NMI)	RESET		HLED-	HLED+
17	15	13	11	9	7	5	3	1
▣	▣	▣	▣	▣	▣	▣	▣	▣
▣	▣	☐	▣	▣	▣	▣	▣	▣
18	16	14	12	10	8	6	4	2
Intruder	GND	Key	Warning LED-	Warning LED+	POWER	S / W	PLED-	PLED+

J8: SGPIO Pin Header

```
7        1
▣ ▣ ▣ ▣
▣ ▣ ▣ ▣
8        2
```

Pin 1	SDATA TX0	Pin 2	SDATA RX0
Pin 3	SCLOCK	Pin 4	SLOAD
Pin 5	SDATA TX1	Pin 6	SDATA RX1
Pin 7	GND	Pin 8	NC

SATA0/1/2/3/4/5: Serial ATA RAID Connector

7	GND	Connects to the Serial ATA ready drives via the Serial ATA cable.
6	RXP	
5	RXN	
4	GND	
3	TXN	
2	TXP	
1	GND	

J11: IPMB Pin Header

Pin 1	IPMB DATA	Pin 2	GND
Pin 3	IPMB CLK	Pin 4	NC
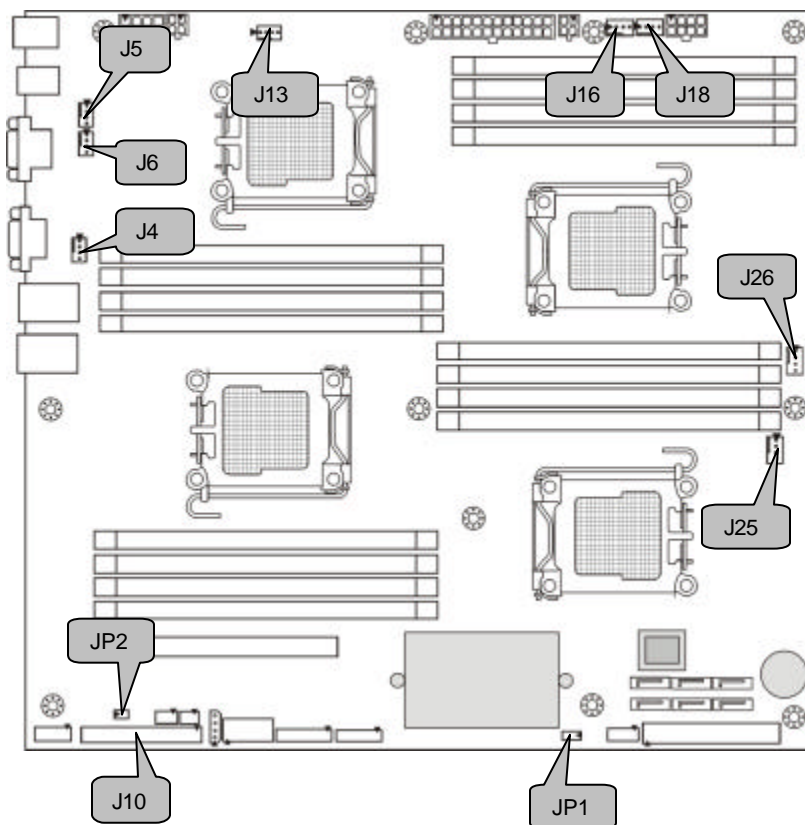
JP2: Warning LED Pin Header for M3291

1 ▪ ▪	Pin 1	WLED_CTL	Pin 2	NC

J4/J5/J6/J13/J16/J18/J25/J26: 4-pin Fan Connector with speed control

+12V Tachometer
GND   Speed Control
 	
1
 	
1   GND
    +12V
    Tachometer
    Speed Control
	Use this header to connect the cooling fan to your motherboard to keep the system at optimum performance levels.
	
	J4: FAN2 (CPU2 fan)
	J5: FAN3 (system fan3)
	J6: FAN4 (system fan4)
	J13: FAN5 (CPU4 fan)
	J16: FAN7 (system fan7)
	J18: FAN8 (system fan8)
	J25: FAN1 (CPU1 fan)
	J26: FAN6 (CPU3 fan)

J10: SMDC Connector

J32 1 LAD0 LAD1 2 3 LAD2 LAD3 4 5 GND1 LFRAME# 6 7 GND2 PCI_CLK 8 9 GND3 PCIRST# 10 11 GND4 I2C1CLK 12 13 I2C1DA GND5 14 15 I2C4CLK I2C4DA 16 17 GND6 I2C3CLK 18 19 I2C3DA 5VSB1 20 21 I2C2CLK I2C2DA 22 23 5VSB2 GND7 24 25 PWRBTN# PCIPME# 26 27 RSTBTN# SVM_IRQ# 28 29 SLPBTN# SVM_WOL# 30 31 EXTSMI# SVM_THERM# 32 33 CPUNMI GND8 34 35 GPIO1 GPIO2 36 37 GND9 GPIO4 38 PS_PWRGD 40 41 GND10 43 RSVD3 GND11 44 45 RSVD5 RSVD6 46 47 GND12 SMALERTA# 48 49 SMALERTB# GND13 50 CON25X2_SVM_A	**For connection with Tyan Server Management Daughter Card (SMDC).** **The SMDC connector is only compatible with Tyan M3291 (SMDC).**

JP1: Clear CMOS Jumper

3 1 ▣▣▣ Normal (default) 3 1 ▣▣▣ **Clear CMOS**	Use this jumper when you forgot your system/setup password or need to clear system BIOS setting. How to clear the CMOS data - Power off system and **disconnect power supply from AC source** - Use jumper cap to close Pin_2 and 3 for several seconds to Clear CMOS - Replace jumper cap to close Pin_1 and 2 Reconnect power supply to AC source Power on system

2.4 - Tips on Installing 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 are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

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

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

Mounting the Motherboard

Type	Solutions for installing
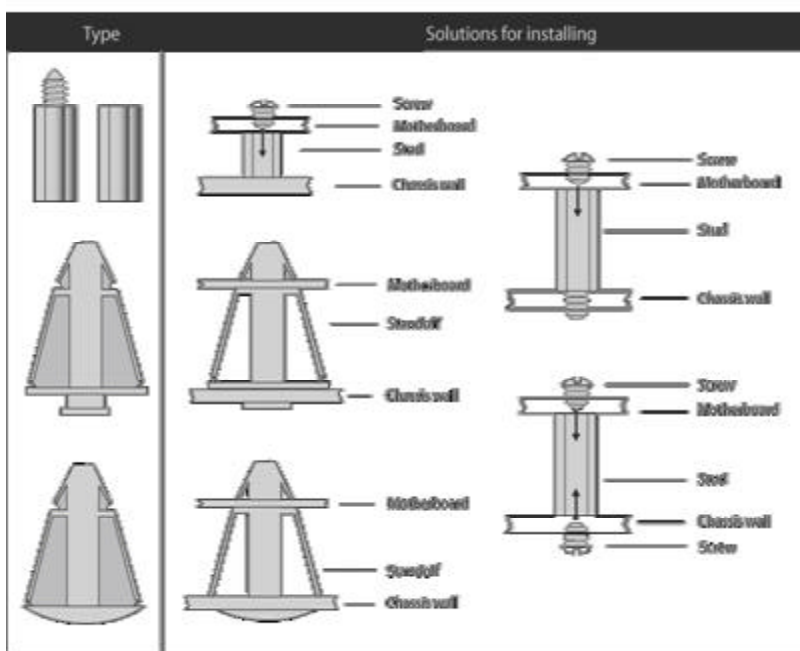
2.5 - Installing the Processor(s)

Your S4980 ports the latest processor technologies from AMD. Check the TYAN website for latest processor support:

http://www.tyan.com

Heat Sink and Fan

Screws

Two-Piece Retention Frame

Socket

Motherboard

Insulator

Backplate

pre-installed
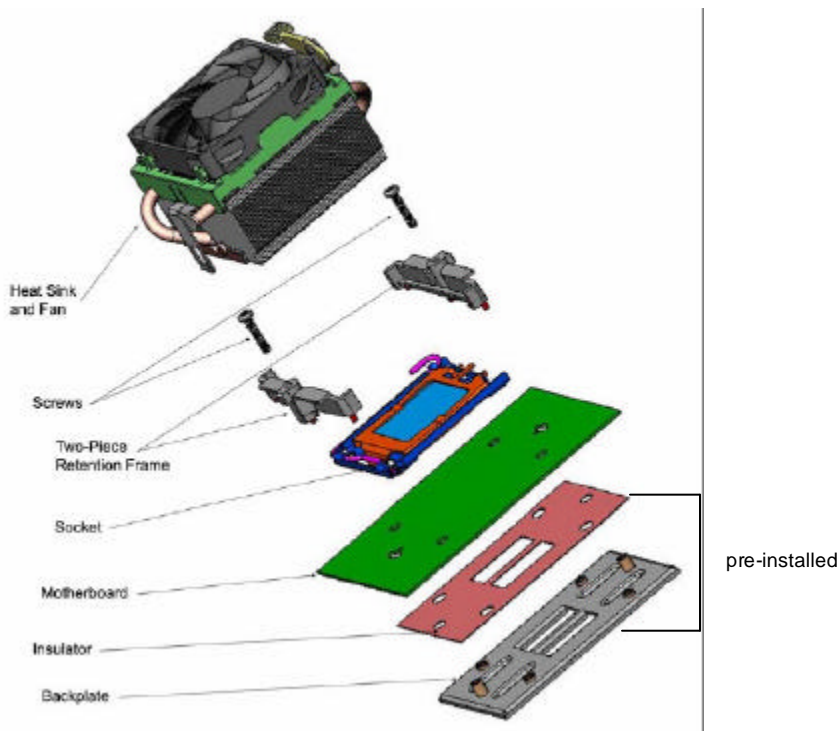
Figure 1.   Exploded View of Thermal Solution AMD PIB Platforms based on AMD Socket F Processor

Back plate Assembly

The back plate is mounted on the backside of the motherboard and enhances local stiffness to support shock and vibration loads acting on the heat sink. The back plate assembly prevents excessive motherboard warpage in the area near the processor. Without a back plate, excessive warpage could cause serious damage to electrical connections of the processor socket and integrated circuit packages surrounding the processor. The back plate also serves as a stiffener plate for the LGA socket.

While doing the installation, be careful in holding the components. Follow these instructions to install your back plate:

1. Remove the release liner from the back plate.

2. Align the PEM nuts on the back plate to the holes on the reverse side of the PCB.

3. First, insert the taller upper & lower middle PEM nuts through the holes of the PCB. The remaining four shorter PEM nuts should automatically fit the 4 holes on the PCB as shown in the following pictures.

Let 2 upper & lower-middle PEM nuts pass through the holes.

4 PEM nuts should fit 4 holes.
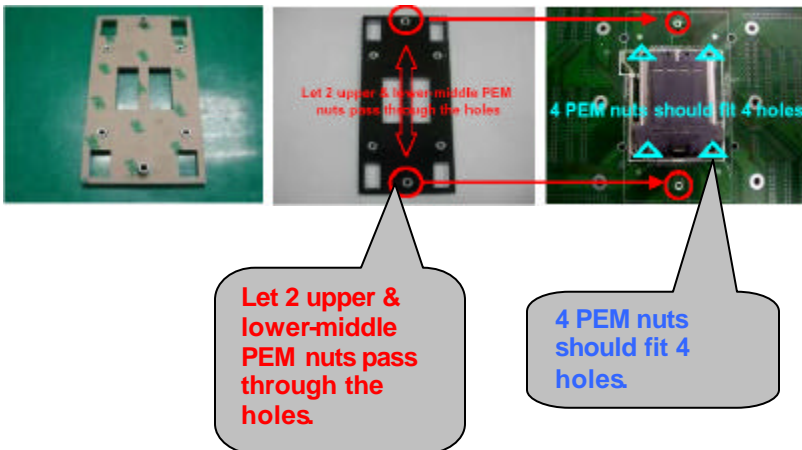
4. Locate four screw holes on socket and screw the socket to the PCB board.
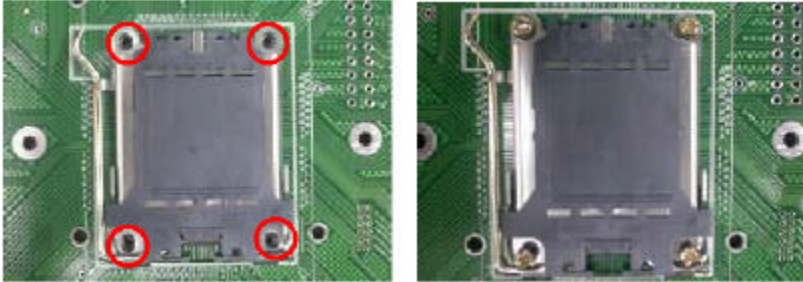
NOTE: Do not assemble CPU before securing socket with screws.

5. Inspect Socket F assembly to PCB. The Socket F must be tightly attached onto the PCB. There must NOT be any gap between stand off the PCB.

No gap between stand off and PCB

Gap between stand off and PCB
REJECT!
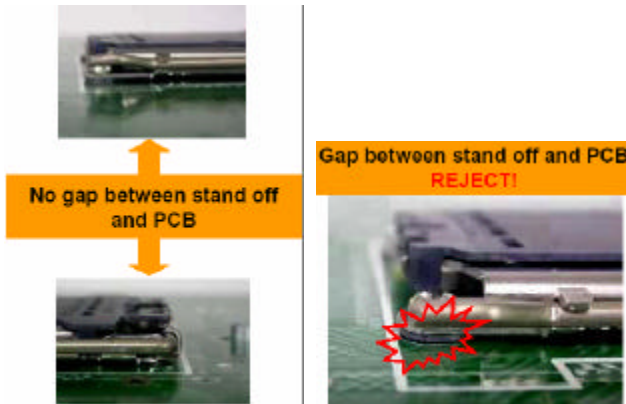
Processor Installation

The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.
Follow these instructions to install your processor:

1. Place the PCB such that the socket cam side faces you. Make sure the lever hook is on your top-left side.
2. Use your right thumb to push the latches of PnP cap and remove the PnP cap from the load plate.
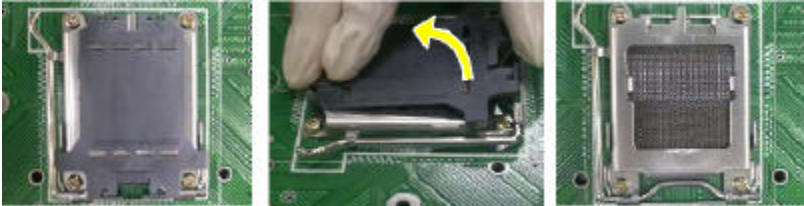
3. Use your left thumb and forefinger to hold the lever hook, and then pull it to the left side to clear the retention tab.
4. Rotate the lever to a fully open position.
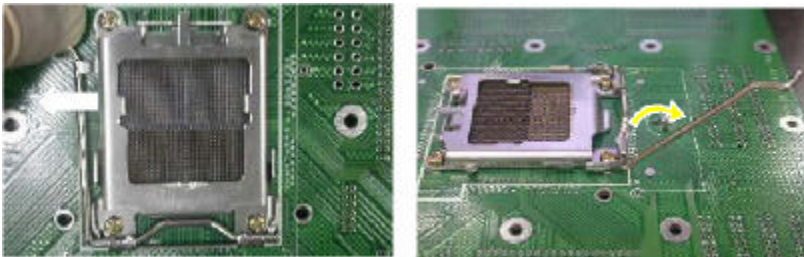
5. Put your right thumb on the bottom-right side of the load plate to open it.
6. Rotate the load plate to a fully open position.
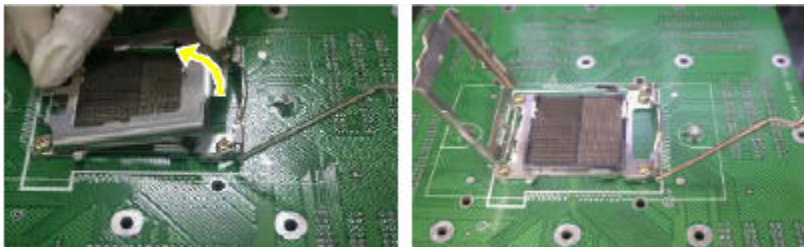
7. Locate the Pin 1 indicator of the package. Align the package with the socket and carefully insert the package into the socket with vertical motion only. Vertically check if the CPU is seated well in the socket housing. If not, take out the CPU, with vertical motion only, and repeat the above steps.
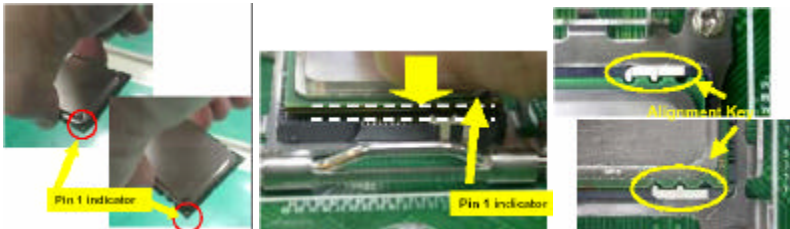
NOTE: The alignment keys must be located in the notches of the package.

8. Close the socket. Rotate the load plate onto the package lid. Engage the load lever while pressing down lightly onto the load plate. Secure the lever near the hook end under the retention tab.

9. Repeat this procedure for the second processor if necessary.

Attention!
1. TYAN recommends that reengaging the PnP cap after operating or testing, whenever the package is not in the socket.
2. Please note that the cap must be replaced when returning the MB to TYAN for repair service. Failure to do so will void your warranty and may cause damage to the board.

2.6 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Only DDR2-667/533/400 registered ECC DIMM modules are required. Check the TYAN Web site at: **www.tyan.com** for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR2 memory modules.

- All installed memory will automatically be detected and no jumpers or settings need changing.
- The Thunder n3600QE S4980 supports up to 64GB of memory.

The following chart outlines the suggested rules for populating memory.

CPU / Memory Population Rules

CPU / DIMM	Single (CPU 1 only)		Dual (CPU 1 & CPU2)		Four (CPU 1, CPU2, CPU3 & CPU4)	
CPU1 DIMM1		x		x		x
CPU1 DIMM2		x		x		x
CPU1 DIMM3	x	x	x	x	x	x
CPU1 DIMM4	x	x	x	x	x	x
CPU2 DIMM1				x		x
CPU2 DIMM2				x		x
CPU2 DIMM3			x	x	x	x
CPU2 DIMM4			x	x	x	x
CPU3 DIMM1						x
CPU3 DIMM2						x
CPU3 DIMM3					x	x
CPU3 DIMM4					x	x
CPU4 DIMM1						x
CPU4 DIMM2						x
CPU4 DIMM3					x	x
CPU4 DIMM4					x	x

NOTE: Please always install memory beginning with CPU1 DIMM1. You can choose to install single, dual or four memory modules.

Memory Installation Procedure

Follow these instructions to install memory modules into the Thunder n4250QE S4985G3NR.

1. Press the locking levers in the direction shown in the following illustration.
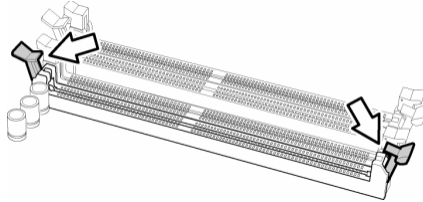
2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.

Key slot
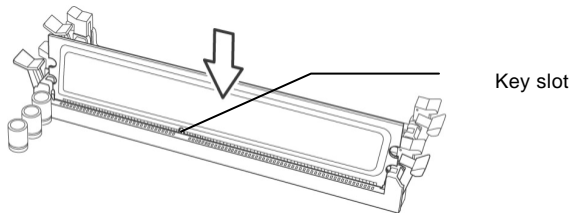
3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.
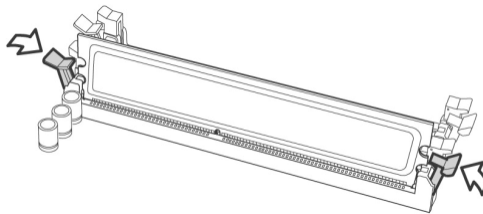
2.7 - Attaching Drive Cables

Attaching IDE Drive Cable
Attaching the IDE drive cable is simple. These cables are "keyed" to only allow them to be connected in the correct manner. TYAN motherboards have two on-board IDE channels, each supporting two drives. **The black connector designates the Primary channel, while the white connector designates the Secondary channel.**

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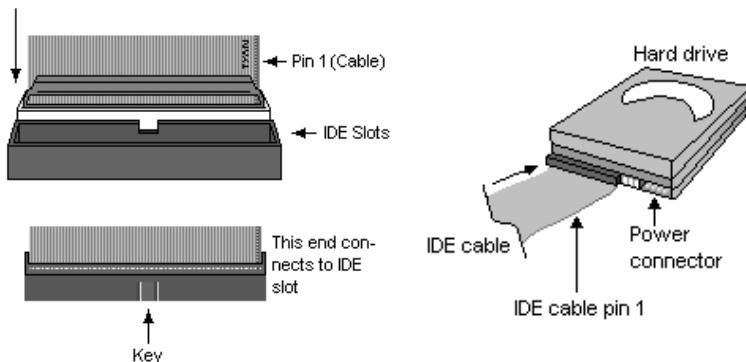
Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard.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

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

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

Attaching Serial ATA Cables
The Thunder n3600QE S4980 is also equipped with 6 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. If you are in need of other cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive

1. **SATA drive cable connection**

2. **SATA drive power connection**

3. **SATA cable motherboard connector**

4. **SATA drive power adapter**
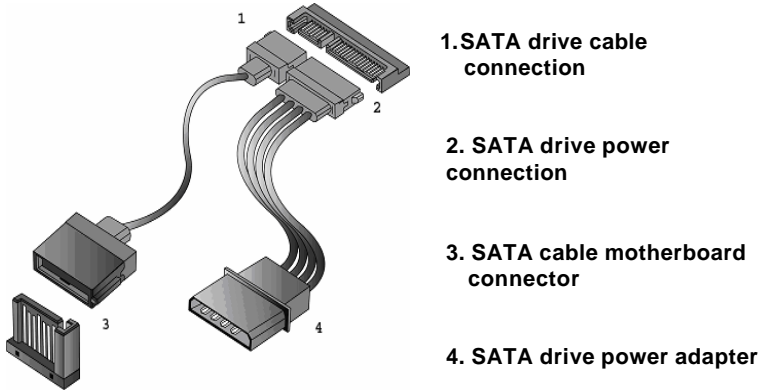
Attaching Floppy Drive Cables
Attaching floppy diskette drives are done in a similar manner to hard drives. See the picture below for an example of a floppy cable. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there will be a key pin on the cable which will force a proper connection of the cable.

Twist at the end of the ribbon cable
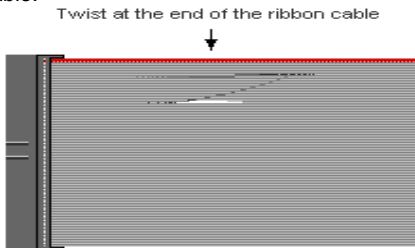
Attach first floppy drive (drive **A:**) to the end of the cable with the twist in it. Drive **B:** is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

2.8 - 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 slot that appear on your motherboard.

PCI- Express x16 slot

Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

PCI IDESELs and IRQ Assignments

	Device	Bus	IDSEL	INT	REQ	GNT	CLK
XG20 (U9)	6	1	AD22	PCI_IRQZ_L	NC	NC	PCI_CLK_VGA

NOTE	**YOU MUST ALWAYS** unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

2.9 - Connecting External Devices

Your motherboard supports a number of different interfaces for connecting peripherals. Some I/O ports may not be available with the board due to the different configurations.

PS/2 Mouse/Keyboard
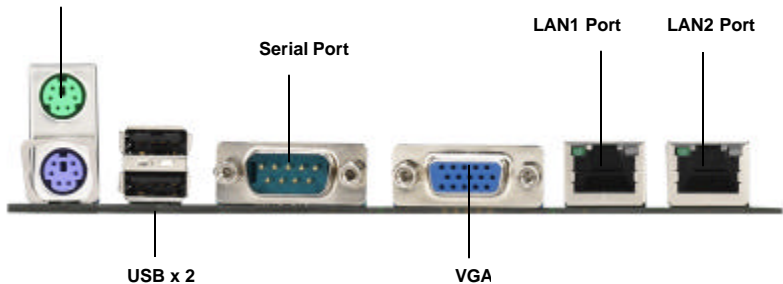
Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

Onboard LAN LED Color Definition
The onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
LEFT RIGHT		Left LED	Right LED
10 Mbps	Link	Green	Off
	Active	Blinking Green	Off
100 Mbps	Link	Green	Green
	Active	Blinking Green	Green
1000 Mbps	Link	Green	Yellow
	Active	Blinking Green	Yellow
No Link		Off	Off

2.10 - Installing the Power Supply

There are five power connectors on your Thunder n3600QE S4980. The
Thunder n3600QE S4980 requires that you have an EPS12V power supply that
has one 24-pin, two 8-pin and two 4-pin power connectors.

S4980 is designed with 5x 12V input:
a. For PSU compliant with SSI EPS v2.92 and beyond, with 24+8+4+4 pin
   power connectors
PW3 (24-pin): 12V1
PW5 (8-pin): 12V2, 12V3
PW2 (4-pin): 12V4
PW4 (4-pin): 12V5 (for add-on PCI-E device)

b. For proprietary PSU with 24+8+8 pin power connectors
PW3 (24-pin): 12V1
PW5 (8-pin): 12V2, 12V3
PW1(8-pin): 12V4, 12V5

24-Pin EPS/12V Power Connector

8-Pin EPS12V Power Connector

4-Pin 12V Power Connector

NOTE: Please be aware that ATX 2.x, ATX12V and ATXGES power supplies
may **not** be compatible with the board and can damage the motherboard and/or
CPU(s).

Applying power to the board
1. Connect the 12V 8-pin power connector.
2. Connect the EPS/12V 24-pin power connector.
3. Connect the 4-pin power connector.
4. Connect power cable to power supply and power outlet

NOTE	**YOU MUST** unplug the power supply before plugging the power cables to motherboard connectors.

2.11 - Finishing up

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

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

NOTE

Chapter 3: BIOS

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:
1. Turn on or reboot your system.
2. Press <Del> during POST (<F4> on remote console) to start the BIOS setup utility.

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

3.3 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

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

3.4 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**].

3.5 In Case of Problems

If you have trouble booting your 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 what you are doing. The Chipset defaults have been carefully chosen either by TYAN or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

NOTE: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated when this manual is written. Please visit Tyan's website at http://www.tyan.com for the information of BIOS updating.

3.6 BIOS Main Menu

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

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

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

  System Overview                               Use [ENTER], [TAB] or
                                                [SHIFT-TAB] to select a
                                                field
  AMIBIOS
  Version    : 08.00.xx                         Use [+] or [-] to
  Build Date : 02/08/07                         configure system time.
  ID         : 0AAAA000

  Processor
  Dual-Core AMD Opteron™ Processor 2214
  Speed    : xxxx MHz
  Count    : x                                      Select Screen
                                                    Select Item
  System Memory                               + -   Change Field
  Size     : xxxx MB                          Tab   Select Field
                                              F1    General Help
  System Time              [22:21:21]         F10   Save and Exit
  System Date             [Tue 01/01/2002]    ESC   Exit
```

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

3.7 Advanced Menu

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

BIOS Setup Utility	
Main **Advanced** PCI/PnP Boot Security Chipset Exit	
Advanced Settings	Configure CPU
WARING: Setting wrong values in below sections may cause system to malfunction.	
▸ CPU Configuration	Select Screen
▸ IDE Configuration	Select Item
▸ Super IO Configuration	Enter Go to Sub Screen
▸ ACPI Configuration	F1 General Help
▸ APM Configuration	F10 Save and Exit
▸ Event Log Configuration	ESC Exit
▸ Hardware Health Configuration	
▸ Remote Access Configuration	
▸ USB Configuration	
▸ AMD PowerNow Configuration	
▸ Onboard Devices Configuration	

Feature	Option	Description
Advanced Settings		
CPU Configuration	**Menu Item**	Configure CPU
IDE Configuration	**Menu Item**	Configure the IDE device(s)
Super IO Configuration	**Menu Item**	Configures Super IO Chipset SCH5017
ACPI Configuration	**Menu Item**	Section for Advanced ACPI Configuration
APM Configuration	**Menu Item**	Section for APM 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
Remote Access Configuration	**Menu Item**	Configure Remote Access

Feature	Option	Description
Advanced Settings		
USB Configuration	**Menu Item**	Configure the USB support
AMD PowerNow Configuration	**Menu Item**	Configure AMD PowerNow support
Onboard Devices Configuration	**Menu Item**	Configure onboard devices

3.7.1 CPU Configuration

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.

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

CPU Configuration Module Version : XX.XX AGESA Version : XXXXXX Physical Count : X Logical Count : X	This option should remain disabled for normal operation. The driver developer may disable it for testing purpose.
Dual Core AMD Opteron (tm) Processor xxxxxxxx Revision : xx Cache L1: xxxx Cache L2: xxxx Speed: xxxx Current FSB Multiplier : xxxx Maximum FSB Multiplier: xxxx Able to change Freq.: Yes uCode Patch Level: None required GART Error Reporting [Disabled] Microcode Update [Enabled] SVM uCode Option [Enabled] Runtime Legacy PSB [Disabled]	Select Screen Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
CPU Configuration		
Module Version		
AGESA Version	Read only	Displays information about CPU
Physical Count		
Logical Count		
Revision		
Cache L1		
Cache L2		
Speed	Read only	Displays information about CPU
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	
Microcode Update	**Enabled**	CPU Microcode update
	Disabled	
SVM uCode Option	**Enabled**	Processor Assisted Virtualization
	Disabled	
Runtime Legacy PSB	**Disabled**	Enable/disable the generation of Power State Block for use of PowerNow driver in a single core system.
	Enabled	

3.7.2 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.

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

IDE Configuration		While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.
Onboard IDE Controller	[Enabled]	
Serial-ATA Devices	[Device 0/1/2]	
▸ nVidia RAID Setup		
▸ Primary IDE Master		Select Screen
▸ Primary IDE Slave		Select Item
▸ SATA0 (Dev5, Func0)		+ - Change Option
▸ SATA1 (Dev5, Func0)		F1 General Help
▸ SATA2 (Dev5, Func1)		F10 Save and Exit
▸ SATA3 (Dev5, Func1)		ESC Exit
▸ SATA4 (Dev5, Func2)		
▸ SATA5 (Dev5, Func2)		
Hard Disk Write Protect	[Disabled]	
IDE Detect Time Out (Sec)	[35]	
ATA(PI) 80Pin Cable Detection	[Host & Device]	

Feature	Option	Description
IDE Configuration		
Onboard IDE Controller	**Enabled**	Enable/Disable onboard IDE controller.
	Disabled	
Serial-ATA Devices	**Device 0/1/2**	Configure serial ATA devices.
	Disabled	
	Device 0	
	Device 1/1	
Hard Disk Write Protect	**Disabled**	Enable/Disable device write protection. This will be effective only if device is accessed through BIOS.
	Enabled	
IDE Detect Time Out (Sec)	**0~35** (at 5 interval)	Select the time out value for detecting ATA/ATAPI device(s).
ATA(PI) 80Pin Cable Detection	**Host & Device**	Select the mechanism for detecting 80pin ATA(PI) cable.
	Host	
	Device	

3.7.2.1 nVidia RAID Setup

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

RAID Setup

nVidia RAID Function   [Disabled]

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.

     Select Screen
     Select Item
+ -   Change Option
F1   General Help
F10   Save and Exit
ESC   Exit

Feature	Option	Description
nVidia RAID Setup		
nVidia RAID Function	**Disabled**	While entering setup, you can choose enabled/disabled RAID mode for each ATA channel.
	Enabled	

3.7.2.2 Primary IDE Master/Slave Sub-Menu

```
                        BIOS Setup Utility
    Main    Advanced    PCI/PnP    Boot    Security    Chipset    Exit
┌─────────────────────────────────────────────┬──────────────────────────┐
│  Primary IDE Master                          │                          │
│                                              │    Select Screen         │
│  Device: Not Detected                        │    Select Item           │
│                                              │ + -  Change Option       │
│                                              │ F1   General Help        │
│  Type                          [Auto]        │ F10  Save and Exit       │
│  LBA /Large Mode               [Auto]        │ ESC  Exit                │
│  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
Primary IDE Master/Slave		
Type	**Auto**	Selects the type of device connected to the system.
	Not Installed	
	CD/DVD	
	ARMD	
LBA/Large Mode	**Auto**	Auto: Enabled LBA Mode if the device supports it and the device i s not already formatted with LBA Mode disabled.
	Disabled	Disabled: Disabled LBA Mode.
Block (Multi -Sector Transfer)	**Auto**	Disabled: The Data transfer from and to the device occurs one sector at a time.
	Disabled	Auto: The Data transfer from and to the device occu rs multiple sectors at a time if the device supports it.
PIO Mode	**Auto**	Selects the PIO Mode. Select Auto to enhance hard disk performance by optimizing the hard disk timing.
	0~4 (at 1 interval)	
DMA Mode	**Auto**	Selects DMA Mode. Auto: Auto detected.
S.M.A.R.T.	**Auto**	S.M.A.R.T (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.
	Disabled	
	Enabled	
32Bit Data Transfer	**Enabled**	Enables 32-bit to maximize the IDE hard disk data transfer rate.
	Disabled	

3.7.2.3 SATA0/1/2/3/4/5 Sub-Menu

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

Third IDE Master

Device: Not Detected

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]	

Select Screen
Select Item
+ -   Change Option
F1   General Help
F10 Save and Exit
ESC Exit

Feature	Option	Description
SATA 0/1/2/3//4/5		
LBA/Large Mode	**Auto**	Auto: Enabled LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled.
	Disabled	Disabled: Disabled LBA Mode.
Block (Multi -Sector Transfer)	**Auto**	Disabled: The Data transfer from and to the device occurs one sector at a time.
	Disabled	Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.
PIO Mode	**Auto**	Selects the PIO Mode. Select Auto to enhance hard disk performance by optimizing the hard disk timing.
	0~4 (at 1 interval)	
DMA Mode	**Auto**	Selects DMA Mode. Auto: Auto detected.
S.M.A.R.T.	**Auto**	S.M.A.R.T (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.
	Disabled	
	Enabled	
32Bit Data Transfer	**Enabled**	Enables 32-bit to maximize the IDE hard disk data transfer rate.
	Disabled	

3.7.3 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 SCH5017 Super IO Chipset	Allows BIOS to select Serial Port1 Base Addresses
Serial Port1 Address [3F8/IRQ4] Serial Port2 Address [2F8/IRQ3] Chassis Intrusion Detect [Disabled] Watchdog Mode [Disabled] Watchdog Timer []	Select Screen Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
Configure SCH5017 Super IO Chipset		
Serial Port1 Address	**3F8 IRQ4** 3E8 IRQ4 2E8 IRQ3 Disabled	Allow BIOS to select Serial Port1 Base Addresses.
Serial Port2 Address	**2F8 IRQ3** 3F8 IRQ4 2E8 IRQ3 Disabled	Allow BIOS to select Serial Part2 Base Addresses.
Chassis Intrusion Detect	**Disabled** Enabled	Enable/Disable the function of chassis intrusion detecti on. When chassis open event is detected, BIOS will record the event.
Watchdog Mode	**Disabled** POST OS PowerON	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.
Watchdog Timer	**2** 4 6 8 10 12	Watchdog timer sets 2/4/6/8/10/12 minutes. When WD time-out occurs, system will auto reboot.

3.7.4 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

ACPI Settings

▸ Advanced ACPI Configuration
▸ Chipset ACPI Configuration

Advanced ACPI Configuration settings

Use this section to configure additional ACPI options.

　　　Select Screen
　　　Select Item
Enter Go to Sub Screen
F1　General Help
F10 Save and Exit
ESC Exit

3.7.4.1 Advanced ACPI Configuration Sub-Menu

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

Advanced ACPI Configuration

ACPI Version Features   [ACPI v2.0]
ACPI APIC support   [Enabled]
AMI OEMB table   [Enabled]
Headless mode   [Disabled]
ACPI SRAT Table   [Enabled]

Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some

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 v3.0	Set this value to allow or prevent the system to be complaint with the ACPI 2.0 specification.
	ACPI v2.0	
	ACPI v1.0	
ACPI APIC Support	**Enabled**	This option allows you to define whether or not to enable APIC features.
	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	
ACPI SRAT Table	**Enabled**	ACPI SRAT Table
	Disabled	

3.7.4.2 Chipset ACPI Configuration Sub-Menu

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

MCP55 ACPI HPET TABLE   [Enabled]

> Select Screen
> Select Item
> +/-   Change Option
> F1   General Help
> F10   Save and Exit
> ESC   Exit

Feature	Option	Description
Chipset ACPI Configuration		
MCP55 ACPI HPET TABLE	**Enabled**	High Precision Event Timer
	Disabled	

3.7.5 APM Configuration

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

Resume On PME# [Disabled] Resume On PCIE Wake# [Disabled] Resume On LAN (MAC) [Disabled] Resume On RTC Alarm [Disabled]		Disable/Enable PME to generate a wake event.
Restore on AC Power Loss [Last State]		Select Screen Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
APM Configuration		
Resume On PME#	**Disabled**	Disable/Enable PME to generate a wake event.
	Enabled	
Resume On PCIE Wake#	**Disabled**	Disable/Enable PME to generate a wake event.
	Enabled	
Resume On LAN (MAC)	**Disabled**	Enable/Disable LAN (MAC) to generate a wake event.
	Enabled	
Resume On RTC Alarm	Disabled	Enable/Disable RTC event to wake after a power failure.
	Enabled	
Restore on AC Power Loss	Last State	Power state after power failure recovery
	Power on	
	Power off	

3.7.6 Event Log Configuration Sub-Menu

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

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

Event Logging details	View all unread events on the Event Log.
View Event Log Mark All Events as Read Clear Event Log	Select Screen Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

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.

3.7.7 Hardware Health Configuration Sub-Menu

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

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

   Hardware Health Configuration
   H/W Health Function               [Enabled]        Enables Hardware
   Auto FAN Power Control            [Disabled]       Health Monitoring
   FAN Fail LED Indicator            [Disabled]       Device.


   Hardware Health Event Monitoring

    ▶ Mainboard Voltages Report

   CPU1 Temperature                  :xx C/ xxx F
   CPU2 Temperature                  :xx C/ xxx F
   CPU3 Temperature                  :xx C/ xxx F           Select Screen
   CPU4 Temperature                  :xx C/ xxx F           Select Item
   Ambient (Near LAN, VGA) Temp      :xx C/ xxx F    + -    Change Option
   Ambient (Near MCP55) Temp         :xx C/ xxx F    Enter Go to Sub Screen
                                                     F1     General Help
   CPU1 FAN1 Speed (TACH1)           :xxxx RPM       F10  Save and Exit
   CPU2 FAN2 Speed (TACH2)           :xxxx RPM       ESC  Exit
   CPU3 FAN6 Speed (TACH14)          :xxxx RPM
   CPU4 FAN5 Speed (TACH13)          :xxxx RPM
   System FAN3 Speed (TACH5)         :xxxx RPM
   System FAN4 Speed (TACH6)         :xxxx RPM
   System FAN7 Speed (TACH15)        :xxxx RPM
   System FAN8 Speed (TACH16)        :xxxx RPM
```

Feature	Option	Description
Hardware Health Configuration		
H/W Health Function	**Enabled**	Enables Hardware Health Monitoring Device.
	Disabled	
Auto FAN Power Control	Enabled	FAN power duty cycle is auto dynamic programmed in selected temperature range.
	Disabled	
FAN Fail LED Indicator	Enabled	Enabled: Any FAN speed less than 800 RPM, the FAN Fail LED will be lighted.
	Disabled	
Hardware Health Event Monitoring		Read only

3.7.7.1 Mainboard Voltages Report Sub-Menu

You can use this screen to monitor mainboard's voltages. 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

---Board Voltages Event Monitoring---                                 Select Screen
                                                                      Select Item
CPU1, 2 Vdimm                            : x.xxx V          F1     General Help
CPU3, 4 Vdimm                            : x.xxx V          F10    Save and Exit
CPU1 Vcore                               : x.xxx V          ESC    Exit
CPU2 Vcore                               : x.xxx V
CPU3 Vcore                               : x.xxx V
CPU4 Vcore                               : x.xxx V
+3.3V (SB)                               : x.xxx V
3VDU                                     : x.xxx V
+5V (SB)                                 : x.xxx V
VCC                                      : x.xxx V
+12V (for cpu1 vcore)                    : x.xxx V
+12V (for cpu2, 3 vcore)                 : x.xxx V
+12V (for cpu4 vcore)                    : x.xxx V
```

The mainboard voltage report submenu is **read only.**

3.7.8 Remote Access Configuration Sub-Menu

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

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

  Configure Remote Access type and parameters          Select remote access
                                                        type.

  Remote Access                     [Disabled]
                                                            Select Screen
  Serial Port Number                [COM1]                  Select Item
    Base Address, IRQ               [3F8h, 4]         + -   Change Option
  Serial Port Mode                  [115200  8, n, 1]  F1    General Help
  Flow Control                      [None]            F10   Save and Exit
  Redirection After BIOS POST       [Always]          ESC   Exit
  Terminal Type                     [ANSI]
  VT-UTF8 Combo Key Support         [Enabled]
  Sredir Memory Display Delay       [No Delay]
```

Feature	Option	Description
Configure Remote Access type and parameters		
Remote Access	**Disabled**	Enables remote access to system through serial port.
	Enabled	
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	Boot Loader: Redirection is active during POST and during Boot Loader.
	Always	Always: Redirection is always active. <Some OSs may not work if set to 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	

3.7.9 USB Configuration Sub-Menu

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

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

USB Configuration	Enables USB host controllers.
Module Version – X.XX.X-XX.X	
USB Devices Enabled: None	Select Screen Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
Legacy USB Support [Enabled] USB 2.0 Controller Mode [HiSpeed] BIOS EHCI Hand-Off [Enabled]	

Feature	Option	Description
USB Configuration		
Legacy USB Support	Disabled	Enables support for legacy USB.
	Enabled	
USB 2.0 Controller Mode	**Hi Speed**	Configure the USB 2.0 controller in Hi Speed (480Mbps) or Full Speed (12Mbps).
	Full Speed	
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	

3.7.10 AMD PowerNow Configuration Sub-Menu

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

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

AMD PowerNow Configuration

PowerNow   [Enabled]

Enabled/Disabled PowerNow

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

Feature	Option	Description
AMD PowerNow Configuration		
PowerNow	**Enabled**	Enabled/Disabled PowerNow
	Disabled	

3.7.11 Onboard Devices Configuration Sub-Menu

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

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

Onboard Device and PCI Slots Configuration		If NO display exist, ACPI Headless Mode need [Enabled].
Onboard VGA	[Enabled]	
Primary Graphics Adapter	[PCI Express PCI]	Select Screen
		Select Item
USB 1.1 Controller	[Enabled]	+ - Change Option
USB 2.0 Controller	[Enabled]	F1 General Help
LAN1	[Auto]	F10 Save and Exit
LAN2	[Auto]	ESC Exit

Feature	Option	Description
MPS Configuration		
Onboard VGA	Disabled / **Enabled**	Enabled/Disabled VGA controller
Primary Graphics Adapter	PCI Express PCI / PCI PCI Express	Configure primary graphics adapter.
USB 1.1/2.0 Controller	Disabled / **Enabled**	Enabled/Disabled LAN controller
LAN1/LAN2	**Auto** / Disabled	Configure LAN1/LAN2

3.8 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.

  WARING: Setting wrong values in below sections may
  cause system to malfunction.                        Select Screen
                                                       Select Item
  Clear NVRAM                      [No]            + -   Change Option
  Plug & Play O/S                  [No]            F1    General Help
  PCI Latency Timer                [64]            F10   Save and Exit
  Allocate IRQ to PCI VGA          [Yes]           ESC   Exit
  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	
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	

3.9 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                Select Screen
                                                Select Item
   ▶ Boot Device Priority                   Enter Go to Sub Screen
   ▶ Hard Disk Drives                       F1    General Help
   ▶ Network Drives                         F10  Save and Exit
                                            ESC  Exit
```

3.9.1 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
   Quick Boot                [Disabled]     booting.  This will
   Quiet Boot                [Disabled]     decrease the time
   Add On ROM Display Mode    [Force BIOS]  needed to boot the
   Boot up Num-Lock          [On]           system.
   PS/2 Mouse Support         [Auto]
   Wait for 'F1' if Error     [Enabled]         Select Screen
   Hit 'DEL' Message Display  [Enabled]         Select Item
   Interrupt 19 Capture       [Enabled]     + -    Change Option
                                            F1    General Help
   Endless Boot              [Disabled]     F10  Save and Exit
                                            ESC  Exit
```

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	Enabled: displays OEM log instead of POST messages.
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	
Endless Boot	**Disabled**	Endless loop boot from BBS table.
	Enabled	

3.9.2 Boot Device Priority

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.

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

   Boot Device Priority                                 Specifies the boot
                                                        sequence from the
   1st Boot Device              [xx,xxx-xxxxx:xxx]      available devices.
   2nd Boot Device              [xx,xxx-xxxxx:xxx]
                                                        A device enclosed in
                                                        parenthesis has
                                                        been disabled in the
                                                        corresponding type
                                                        menu.

                                                             Select Screen
                                                             Select Item
                                                        + -  Change Option
                                                        F1   General Help
                                                        F10  Save and Exit
                                                        ESC  Exit
```

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

3.9.3 Hard Disk Drives

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.

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

Hard Disk Drives		Specifies the boot sequence from the available devices.
1st Drive	[xx,xxx-xxxxx:xxx]	
		Select Screen
		Select Item
		+ - Change Option
		F1 General Help
		F10 Save and Exit
		ESC Exit

Feature	Option	Description
Hard Disk Drives		
1st Drive	**xx,xxx-xxxxx:xxx**	Specifies the boot sequence from the available devices. These can be customized depending on your preference.
	xx,xxx-xxxxx:xxx	
	Disabled	

3.9.4 Network Drives

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.

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

   Network Drives                                   Specifies the boot
                                                    sequence from the
   1st Drive                    [xx,xxx-xxxxx:xxx]  available devices.


                                                       Select Screen
                                                       Select Item
                                                    + -   Change Option
                                                    F1    General Help
                                                    F10  Save and Exit
                                                    ESC  Exit
```

Feature	Option	Description
Network Drives		
1st Drive	**xx,xxx-xxxxx:xxx**	Specifies the boot sequence from the available devices.
	xx,xxx-xxxxx:xxx	These can be customized depending on your preference.
	Disabled	

3.10 Security Menu

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

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

Security Settings	Install or change the password.
Supervisor Password : Not Installed User Password : Not Installed	Select Screen Select Item
Change Supervisor Password Change User Password	Enter Change F1 General Help
Boot Sector Virus Protection [Disabled]	F10 Save and Exit ESC Exit

Feature	Option	Description
Security Settings		
Supervisor Password:	**Not Installed**	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
User Password:	**Not Installed**	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
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**	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.
	Enabled	

3.11 Chipset Menu

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

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

Advanced Chipset Settings	Options for NB
WARNING: Setting wrong values in below sections may cause system to malfunction. ▸ Northbridge Configuration	Select Screen Select Item Enter Go to Sub Screen F1　General Help F10　Save and Exit ESC　Exit

3.11.1 Northbridge Configuration Sub-Menu

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

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

  NorthBridge Chipset Configuration
                                                           Select Screen
                                                           Select Item
   ▶ Memory Configuration                            + -   Change Field
   ▶ ECC Configuration                               Tab   Select Field
   ▶ IOMMU Option Menu                               F1    General Help
   Power Down Control              [Auto]            F10   Save and Exit
                                                     ESC   Exit
   Memory Timing Parameters        [CPU Node 0]

   Memory CLK                      :XXX MHz
   CAS latency (Tcl)               :XX
   RAS/CAS Delay (Trcd)            :X CLK
   Min Active RAS (Tras)           :X CLK
   Row Precharge Time (Trp)        :X CLK
   RAS/RAS Delay (Trrd)            :X CLK
   Row Cycle (Trc)                 :XX CLK
   Asynchronous Latency            :X ns
```

Feature	Option	Description
NorthBridge Chipset Configuration		
Power Down Control	**Auto**	Allow DIMMs to enter power down mode by deasserting the clock enable signal when DIMMs are not in use.
	Disable	
Memory Timing Parameters	CPU Node 0	Reports CPU1, CPU2, CPU3 or CPU4 DRAM timing.
	CPU Node 1	
	CPU Node 2	
	CPU Node 3	
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.

Feature	Option	Description
NorthBridge Chipset Configuration		
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.
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.

3.11.1.1 Memory Configuration Sub-Menu

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

```
                        BIOS Setup Utility
     Main    Advanced    PCI/PnP    Boot    Security    Chipset    Exit
                                              MEMCLK can be set by
   Memory Configuration                       the code using AUTO, or
                                              if you use LIMIT, you can
                                              set one of the standard
                                              values.
   Memclock Mode                  [Auto]
   MCT Timing Mode                [Auto]
   Bank Interleaving              [Auto]          Select Screen
   Node Interleaving              [Disabled]      Select Item
   Enable Clock to All DIMMs      [Disabled]   + -   Change Option
   MemClk Tristate C3/ATLVID      [Disabled]   F1    General Help
   CS Sparing Enable              [Disabled]   F10   Save and Exit
   DQS Signal Training Control    [Enabled]    ESC   Exit
   Memory Hole Remapping          [Enabled]
```

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	
Node Interleaving	**Disabled**	Enable Node Memory Interleaving
	Enabled	
Enable Clock to All DIMMs	**Disabled**	Enable Unused Clocks to DIMMs
	Enabled	
MemClk Tristate C3/ATLVID	**Disabled**	Enable/Disable MemClk Tri-Stating during C3 and Alt VID
	Enabled	

CS Sparing Enable	**Disabled**	Reserve a spare memory rank in each node.
	Enabled	
DQS Signal Training Control	**Enabled**	Turning off will require custom memory timing programming.
	Disabled	
Memory Hole Remapping	**Enabled**	Enable Memory Remapping around Memory Hole
	Disabled	

3.11.1.2 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
DRAM ECC Enable              [Enabled]         system integrity.
   4-Bit ECC Mode            [Disabled]
   DRAM SCRUB REDIRECT       [Disabled]           Select Screen
   DRAM BG Scrub             [Disabled]           Select Item
L2 Cache BG Scrub            [Disabled]       + -  Change Option
Data Cache BG Scrub          [Disabled]       F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit
```

Feature	Option	Description
ECC Configuration		
DRAM ECC Enable	**Enabled**	DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity.
	Disabled	
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	
	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	

3.11.1.3 IOMMU Option 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.

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

  IOMMU Mode                        [128MB]            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.


                                                           Select Screen
                                                           Select Item
                                                       + -   Change Option
                                                       F1    General Help
                                                       F10  Save and Exit
                                                       ESC  Exit
```

Feature	Option	Description
IOMMU Configuration		
IOMMU Mode	AGP Present	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.
	Disabled	
	32 MB	
	64 MB	
	128 MB	
	256 MB	
	512 MB	
	1 GB	

3.12 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.
Save Changes and Exit Discard Changes and Exit Discard Charges Load Optimal Defaults Load Failsafe Defaults	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
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.

NOTE

Chapter 4: Diagnostics

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

Memory, Video, CPU

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

4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.
•A single long beep followed by eight short beeps: It indicates that a video error has occurred and the BIOS can't initialize the video screen to display and additional info.
•A single long beep repeatedly: This indicates that a DRAM error has occurred.
The most common type of error is a memory error.

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.

4.3 AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.

Checkpoint	Description
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

Appendix I: SMDC Information

Overview

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

Tyan SMDC is a snap-in card that provides essential server management solution. It enables any IT Manager by providing multi-interfaces to access the hardware remotely and perform **monitor**, **control** and **diagnose** activities effectively.

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

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

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

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

More detailed information on Tyan's SMDC card can be found on our website: http://www.tyan.com

Features of Tyan Server Management

Monitor various system components remotely
-such as fans, processor temperature, and more

Remote power on and power off

Console redirect
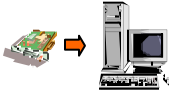-the ability to view system remotely

Alert and error actions
-such as audible beep, e-mail, power down and reboot

SMDC runs on stand-by power
-the SMDC will continue to function, even if the system is
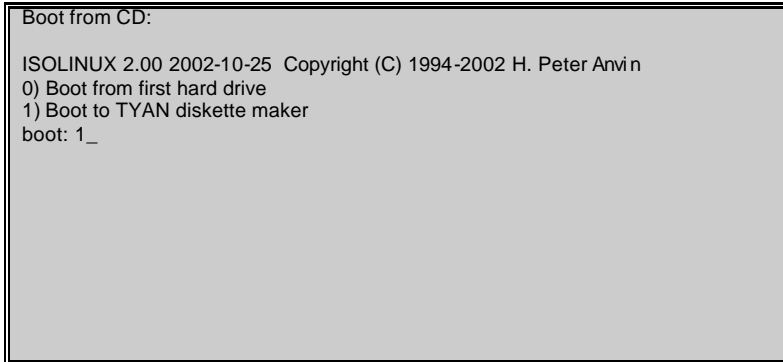not powered on

How SMDC and TSO Work

The brief descriptions below will help explain how these items function.

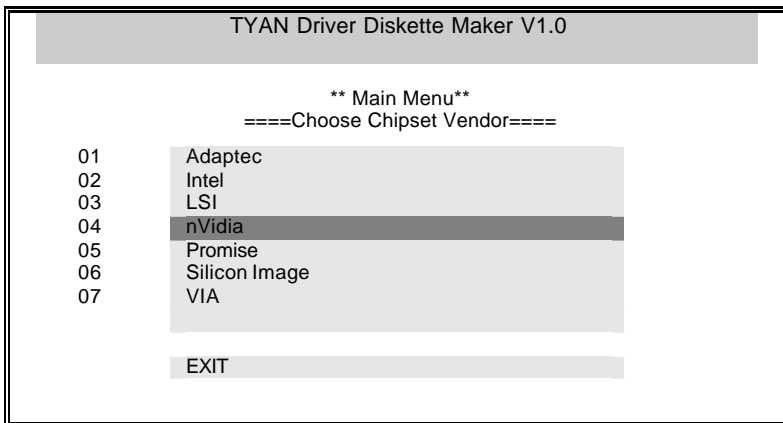|	
	Agent – a system with SMDC installed The SMDC is installed in the Agent system that uses a compatible/supported Tyan motherboard.
	Manager – manages the Agent The Manger is set up to manage the Agent that has the SMDC. The Manager and Agent should be located in the same place.
	Console – communicates with Manager The Console is used to monitor and control the Agent through the Manager.

Appendix II: How to Make a Driver Diskette

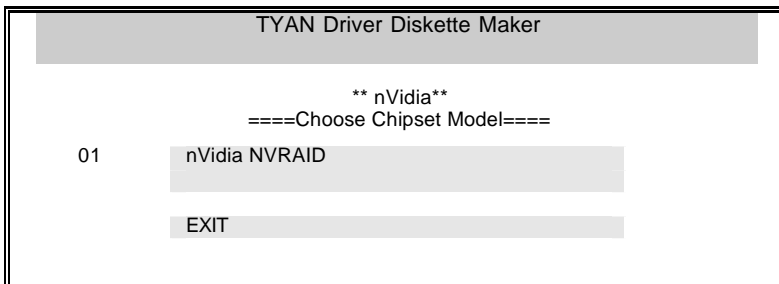Follow the steps below to make a driver diskette from the TYAN driver CD provided.

1. Start the system and insert the TYAN CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to TYAN diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from hard disk.).

```
Boot from CD:

ISOLINUX 2.00 2002-10-25  Copyright (C) 1994-2002 H. Peter Anvin
0) Boot from first hard drive
1) Boot to TYAN diskette maker
boot: 1_
```

2. Choose the chipset vender which you need from the main menu.

```
                  TYAN Driver Diskette Maker V1.0


                         ** Main Menu**
                   ====Choose Chipset Vendor====
        01         Adaptec
        02         Intel
        03         LSI
        04         nVidia
        05         Promise
        06         Silicon Image
        07         VIA


                   EXIT
```

3. The following picture pops up after selecting the chipset model.

```
┌────────────────────────────────────────────────────────────┐
│                  TYAN Driver Diskette Maker                  │
│                                                              │
│                        ** nVidia**                           │
│                 ====Choose Chipset Model====                 │
│      01        nVidia NVRAID                                 │
│                                                              │
│                EXIT                                          │
│                                                              │
└────────────────────────────────────────────────────────────┘
```

4. After selecting the chipset model, select the OS to start the diskette making.

```
┌────────────────────────────────────────────────────────────┐
│                  TYAN Driver Diskette Maker                  │
│                                                              │
│            ====nVidia NVRAID SATA and RAID Driver====        │
│                                                              │
│  Diskette  =01=   Microsoft Windows 2000 32-bit             │
│  Diskette  =02=   Microsoft Windows XP 32-bit               │
│  Diskette  =03=   Microsoft Windows XP 64bit                │
│  Diskette  =04=   Microsoft Windows 2003 64-bit             │
│                                                              │
│                  Back                                       │
│                                                              │
└────────────────────────────────────────────────────────────┘
```
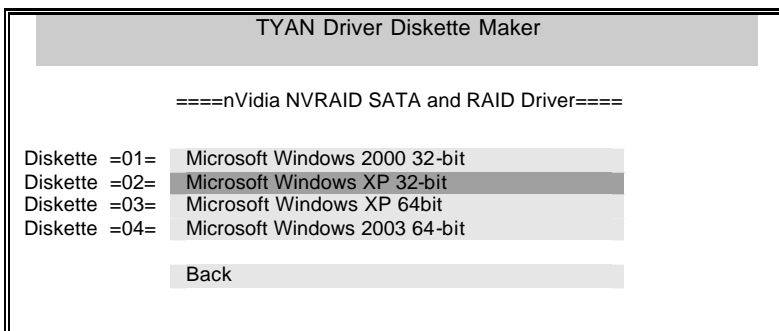
5. Follow the instruction on menu to insert a diskette and press [ENTER].

```
┌────────────────────────────────────────────────────────────┐
│ \Please insert a formatted diskette into A:/ and press [ENTER] │
│ Writing image to drive A:                                    │
│ Track: 36  Hoad: 8 Sector: 1                                 │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
└────────────────────────────────────────────────────────────┘
```
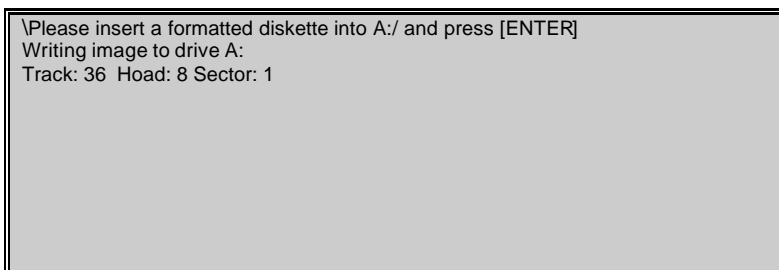
6. Using "ESC" key to quit the TYAN diskette maker. The system will automatically restart.

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs at only 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

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

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

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

BBS (BIOS Boot Specification): is 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 for some reason. 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, and provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data, usually from an application, though it is also used when printing, and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it, all at once, to a disk drive. While this improves system performance --- reading to or writing from a disk drive a single time is much faster than doing so repeatedly --- there is also the possibility of losing your data should the system crash. Information stored in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times, since the needed information is stored in the SRAM instead of in the slow DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Cache size: refers to the physical size of the cache onboard. This should not be confused with the cacheable area, which is the total amount of memory which can be scanned by the system in search of data to put into the cache. A typical setup would be a cache size of 512KB, and a cacheable area of 512MB. In this case, up to 512KB of the main memory onboard is capable of being cached. However, only 512KB of this memory will be in the cache at any given moment. Any main memory above 512MB could never be cached.

Closed and open jumpers: jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): is 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 sockets, because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with

IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

Doze mode: in this mode, only the CPU's speed is slowed.
DRAM (Dynamic RAM): widely available, very affordable form of RAM which has the unfortunate tendency to lose data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

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, 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

EMRL: Embedded RAID Logic. An Adaptec specific RAID technology.

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Fault-tolerance: a term describing a system where one component can quickly be replaced without causing a loss of service, such as in a RAID system.

Firmware: low-level software that controls the system hardware.

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

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

Handshaking: a process where two devices initiate communications. One device, typically the server, sends a message to another device, typically a client, in order to request establishment of a communications channel. The two devices will then exchange messages back and forth in order to settle on a communications protocol.

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

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

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

Initial Program Load (IPL): a feature built into BBS-compliant devices, describing those devices as capable of loading and executing an OS, as well as being able to provide control back to the BIOS if the loading attempt fails.

IPL: see Initial Program Load.

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

ISA (Industry Standard Architecture): a slower 8- or 16-bit bus (data pathway).

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This is most common when the system sends data out to a peripheral device, and it waiting for the peripheral to send some data back (peripherals tend to be slower than onboard system components).

Mirroring: see RAID.

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

OEMs (Original Equipment Manufacturers): Compaq or IBM package other companies' motherboards and hardware inside their case and sell them.

Parallel port: transmits the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

PCI (Peripheral Component Interconnect): a 32 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 type of RAM that can maintain it's data as long as power is provided to the memory chips. In this configuration, SRAM requests are pipelined, which means that larger packets of data are sent to the memory at one time, and acted upon quickly. This type of SRAM operates at bus speeds higher than 66MHz.

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

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

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

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, towards 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, also the multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: stands for RAID I/O Steering, a type of RAID technology from Intel. RAIDIOS is a specification used to enable an embedded I/O controller, embedded on the motherboard, to be used as just an I/O controller or to be the I/O component of a hardware RAID subsystem. The RAIDIOS circuit allows an I/O Processor (either embedded on the motherboard or on an add-in card) to configure the I/O controller and service the I/O controller's interrupts. The I/O controller and the I/O

Processor together are two of the primary components of a hardware RAID subsystem.

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

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

SATA (Serial ATA): is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is a drop-in solution in that it is compatible with today's software and operating systems. It will provide for systems which are easier to design, with cables that are simpler to route and install, smaller cable connectors, and lower voltage requirements.

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)

SIMM (Single In-line Memory Module): formally the most common form of RAM for motherboards. They must be installed in pairs, and do not have the carrying capacity or the speed of DIMM modules.

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

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

SSI (Server System Infrastructure): an industry initiative intended to provide ready-to-use design specifications for common server hardware elements (chassis, power supplies, and racks) to promote and support server industry growth.

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

Striping: see RAID

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without 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 shift the processor over and down, guiding into the board and locking it into place.

Technical Support

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

Help Resources:
>
> 1. See the beep codes section of this manual.
> 2. See the TYAN website for FAQ' s, bulletins, driver updates,
> and other information: http://www.tyan.com
> 3. Contact your dealer for help BEFORE calling TYAN.
> 4. Check the TYAN user group:
> alt.comp.periphs.mainboard.TYAN

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 #: D1873-100