



Thunder n4250QE



S4985G3NR-E

Version 1.0

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Table of Contents

Check the box contents!	3
Chapter 1: Introduction	
1.1 Congratulations.....	5
1.2 Hardware Specifications.....	5
Chapter 2: Board Installation	
2.1 Board Image.....	8
2.2 Block Diagram.....	9
2.3 Board Parts, Jumpers and Connectors.....	10
2.4 Tips on Installing Motherboard in Chassis.....	20
2.5 Installing the Processor(s).....	21
2.6 Installing the Memory.....	24
2.7 Attaching Drive Cables.....	26
2.8 Installing Add-in Cards.....	28
2.9 Connecting External Devices.....	29
2.10 Installing the Power Supply.....	30
2.11 Finishing up.....	30
Chapter 3: BIOS Setup	
3.1 About the BIOS.....	31
3.2 BIOS Main Menu.....	33
3.3 Advanced Menu.....	41
3.4 Security Menu.....	54
3.5 Power Menu.....	55
3.6 Boot Menu.....	56
3.7 Exit Menu.....	57
Chapter 4: Diagnostics	
4.1 Beep Codes.....	59
4.2 Flash Utility.....	59
4.3 BIOS Post Code.....	60
Appendix I: SMDC Information	
Appendix II: How to Make a Driver Diskette	
Glossary	

Check the box contents!

	1x S4985-E motherboard
	1x 34-Pin floppy drive cable
	2 x Ultra-DMA-133/100/66/33 IDE cable
	2 x Serial ATA power cable
	4 x Serial ATA Cable
	1 x COM Port Cable
	1 x S4985-E user's manual
	1 x S4985-E Quick Reference guide
	1 x TYAN driver CD
	1 x I/O shield

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

Chapter 1: Introduction

1.1 - Congratulations

You have purchased the high performance server with four processors (can expand to eight). The Thunder n4250QE (S4985G3NR_E) is a flexible AMD® platform for multiple applications, based on NVIDIA® nForce Professional 2200 (CK804pro) and NVIDIA nForce Professional 2050 (IO4) chipsets.

Designed to support four AMD® Opteron processors and max 64GB DDR2-667/533/400 memory, and featured with integrated RJ-45 LAN connectors, PCI-Express x16 slots plus eight serial ATA ports, the S4985 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

- Supports AMD® Opteron TM Rev. F 8000 series Santa Rosa Dual Core/ Barcelona Quad-core processor (Support Split Power Plane)
- Four onboard 5-phase digital VRMs

Chipset

- NVIDIA nForce Professional 2200 (CK804pro)
- NVIDIA nForce Professional 2050 (IO4)
- Winbond W83627HF Super I/O
- Three Analog Devices ADT7476 Hardware Monitoring IC

Memory

- Dual channel memory bus
- Sixteen DDR2 DIMM sockets (Four per CPU)
- Supports up to 64GB Registered DDR2 memory
- Supports ECC type memory

Integrated LAN Controller

- Two (2) Marvell 88E1111 GbE PHY
 - Each one has RJ-45 LAN connector with LEDs
 - Each one has front panel LED header
- One Intel 82541PI GbE LAN controller
 - RJ-45 LAN connector with LED

Integrated Video Controller

- XGI XG20
- PCI interface
- 16MB DDR memory

Intelligent Platform

Management Interface Header

- Tyan Server Management Daughter card (optional) supports features listed below via IPMI header
 - Renesas Baseboard Management Controller (BMC)
 - Tailored for IPMI 2.0 spec.

- modules
- Supports DDR2-667/533/400
- Supports four rank memory

Expansion Slots

- Two (2) x16 PCI Express slots with x16 signal
- Two (2) x16 PCI Express slots with x4 signal
- One 32bit/33MHz PCI v2.3 slot
- Total of five usable slots

Integrated I/O

- One (1) floppy connector supports up to two drives
- One (1) parallel port header and two (2) serial ports (one connector, one header)
- Six (6) USB 2.0 EHCI ports (two rear connectors & four headers)
- PS/2 mouse and keyboard connectors

System Management

- Modular BMC 2x25 pin header for SMDC support
- Six (6) 4-pin fan headers support tachometer monitoring and smart FAN control (PWM), four (4) 3-pin fan headers support tachometer monitoring
- Temperature and voltage monitoring
- Port 80h LED display

Integrated ATA-133

- Two (2) ATA-133 channels for up to four (4) ATA-133 devices

Integrated SATA Controllers

- Four (4) integrated dual port SATA controllers (two from CK804pro and two from IO4)
- Supports up to eight (8) SATA drives
- Supports up to 3.0Gb/s
- Supports four (4) independent

- Supports KCS and BT styles
- Flexible Windows or Linux Management Solution
- Supports RMCP and SNMP protocols
- Supports ASF standard and EMP -1²C serial multi-master controllers and UARTs
- Built-in IPMB connector
- Remote power on/off and reset support (IPMI-over-LAN)

BIOS

- PhoenixBIOS on 8Mbit LPC Flash ROM
- ACPI 2.0
- Serial Console Redirect
- USB device boot
- 48-bit LBA support
- Power management: S0, S1, S4 and S5

Form Factor

- SSI MEB Footprint (13" x 16")
- EPS12V/SSI v3.5 (24+8+8) power connectors
- One (1) serial connector and one (1) VGA port
- Stacked USB 2.0 connectors
- Stacked PS/2 keyboard and mouse connectors
- Three (3) RJ-45 LAN connectors with LEDs

Power Supply

- EPS 12V Power Supply

- SATA ports
- Supports RAID 0, 1, 0+1, 5

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting hole pattern of the Thunder n4250QE S4985G3NR matches the SSI MEB specification. Before continuing with installation, confirm that your chassis supports an SSI MEB 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:

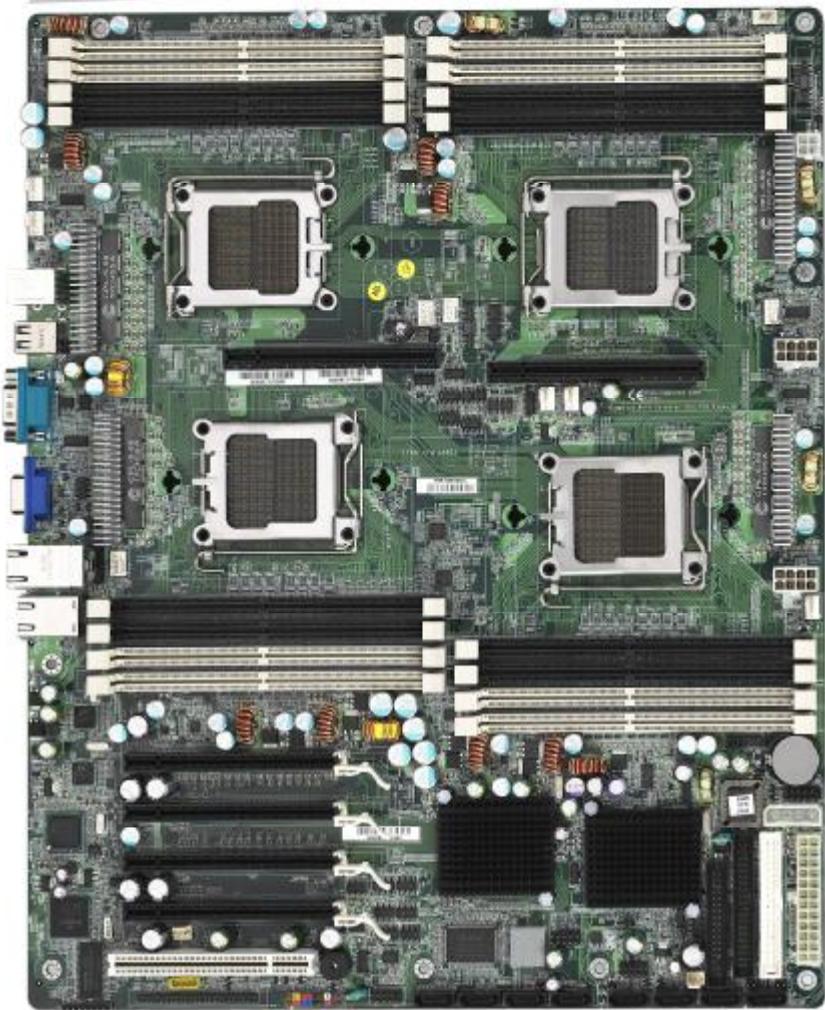
- (1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist 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

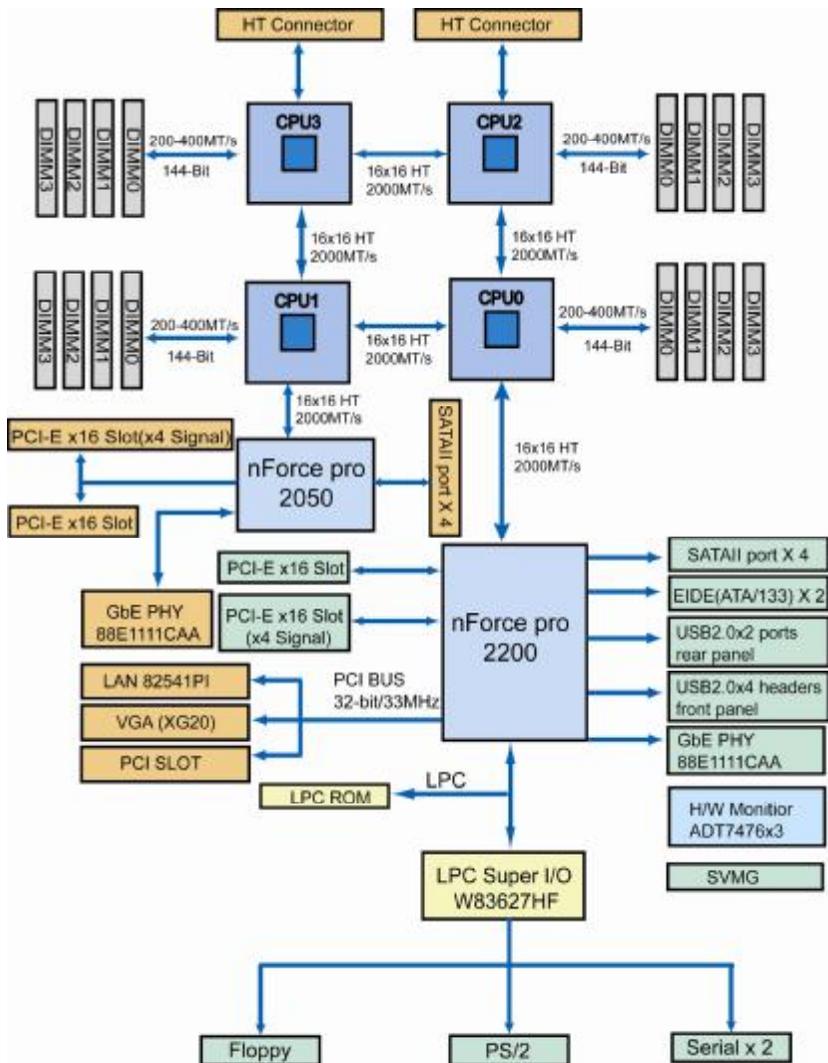
DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED

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

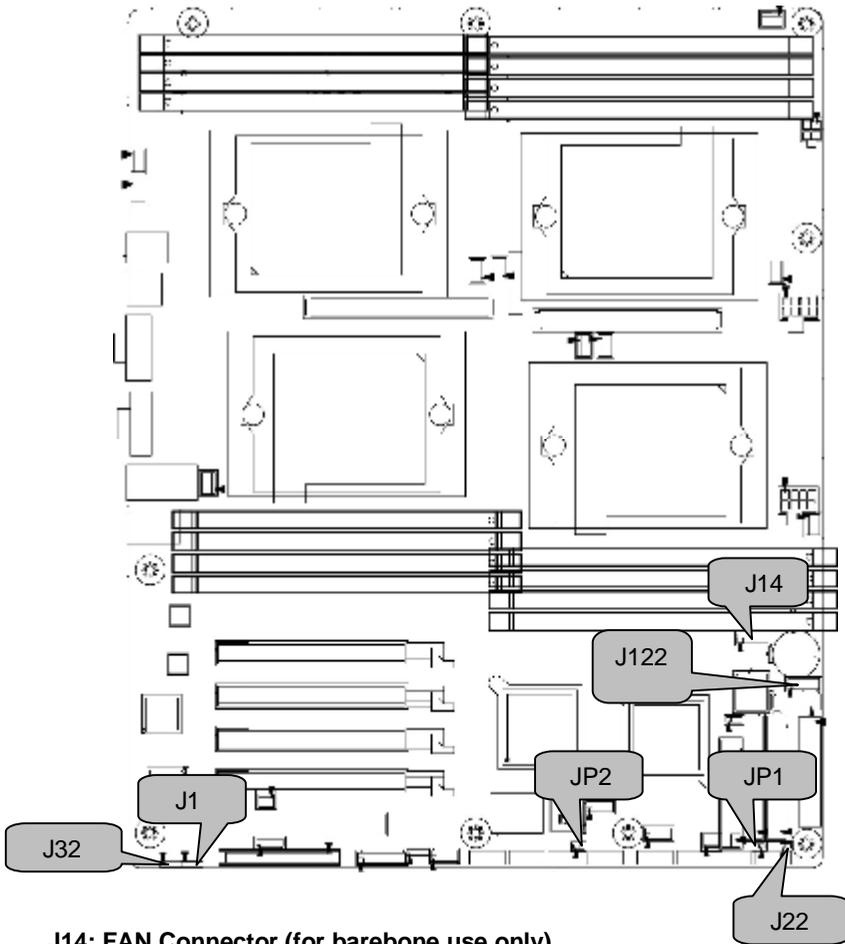


Thunder n4250QE S4985G3NR Block Diagram

Jumper Legend

⊖ ⊖	OPEN - Jumper OFF, without jumper cover
⊕ ⊕	CLOSED – Jumper ON, with jumper cover

Jumper/Connector	Function
J1	SMBUS Connector
J14	Fan Connector (for barebone use only)
J20	Clear CMOS Jumper - Pin 2-3 closed: Normal (Default) - Pin 1-2 closed: Clear
J22	NMI Header
J30/J95	USB Front Panel Headers J30: USB2 J95: USB3
J101	COM2 Header
J115	Front Panel Header
JP1	RI Header
JP2	Intruder Header
CPUFAN0/1/2/3	CPU Fan Connectors
SYSFAN0/1/2/3/4/5/6/7	Chassis Fan Connectors
SATA0/1/2/3/4/5/6/7	Serial ATA RAID Connectors
J122	Front panel LED headers for the LAN



J14: FAN Connector (for barebone use only)

Use these pin definitions to connect to the barebone fans.

Signal	Pin	Pin	Signal
CPUFAN0_TACH	1	2	CPUFAN2_TACH
CPUFAN1_TACH	3	4	CPUFAN3_TACH
SYSFAN0_TACH	5	6	CPU_FAN_TACH2
SYSFAN4_TACH	7	8	SYSFAN5_TACH
NC	9	10	NC
GND	11	12	Key
GND	13	14	CPUFAN0_PWM

JP1: RI Header



Use this header to connect to the external device of wake on ring.

JP2: Intruder Header



Use this header to connect to the device for intruder function .

J22: NMI Header



Use this header to issue a non-maskable interrupt.

J1: SMBUS Connector



Use this header to connect to the external SMBUS devices.

J32: External SCSI LED Connector



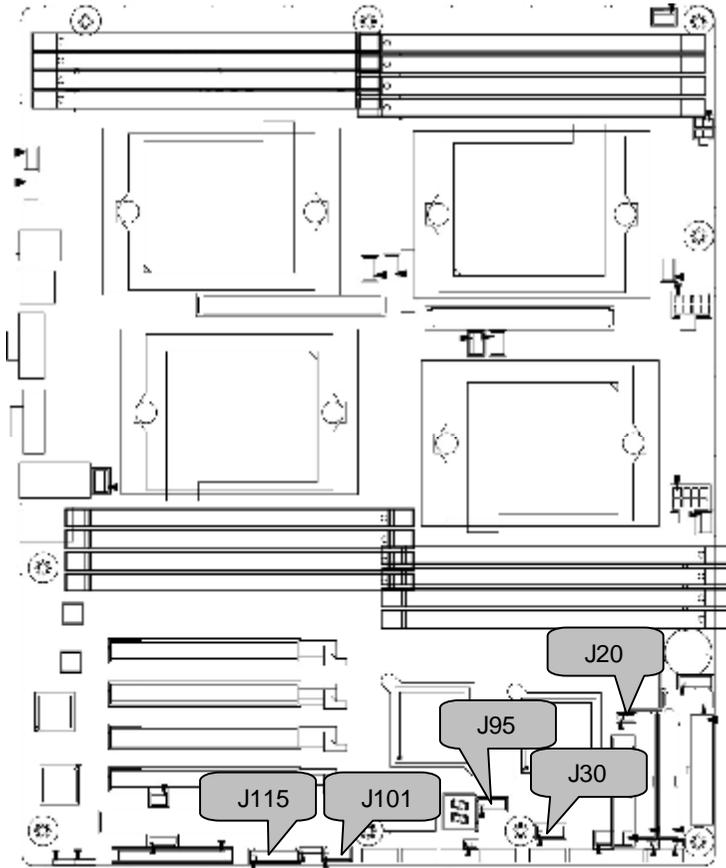
Use this header to connect to the external SCSI LED.

J122: Front panel LED headers for the LAN



Use this header to connect to the Front panel LED.

Signal	Pin	Pin	Signal
LAN1_LED+	1	2	LAN1_LED-
LAN2_LED+	3	4	LAN2_LED-
LAN3_LED+	5	6	LAN3_LED-
ID_LED+	7	8	ID_LED-
ID_SW+	9	10	ID_SW-
RSVD	11	12	Key



J115: Front Panel Header

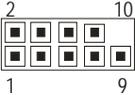
The Front Panel Header is used to connect some control or signal wires from motherboard to chassis, such as HDD LED, power LED, power button, and reset button.

HDDLED+	1%	2%	PWR LED+
HDDLED-	3%	4%	PWR LED-
Reset SW	5%	6%	PWR SW
Reset SW	7%	8%	PWR SW
VCC	9%	10%	NC
IRRX	11%	12%	VCC
GND	13%	14%	key
IRTX	15%	16%	GND
NC	17%	18%	Speaker

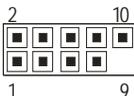
J20: Clear CMOS Jumper

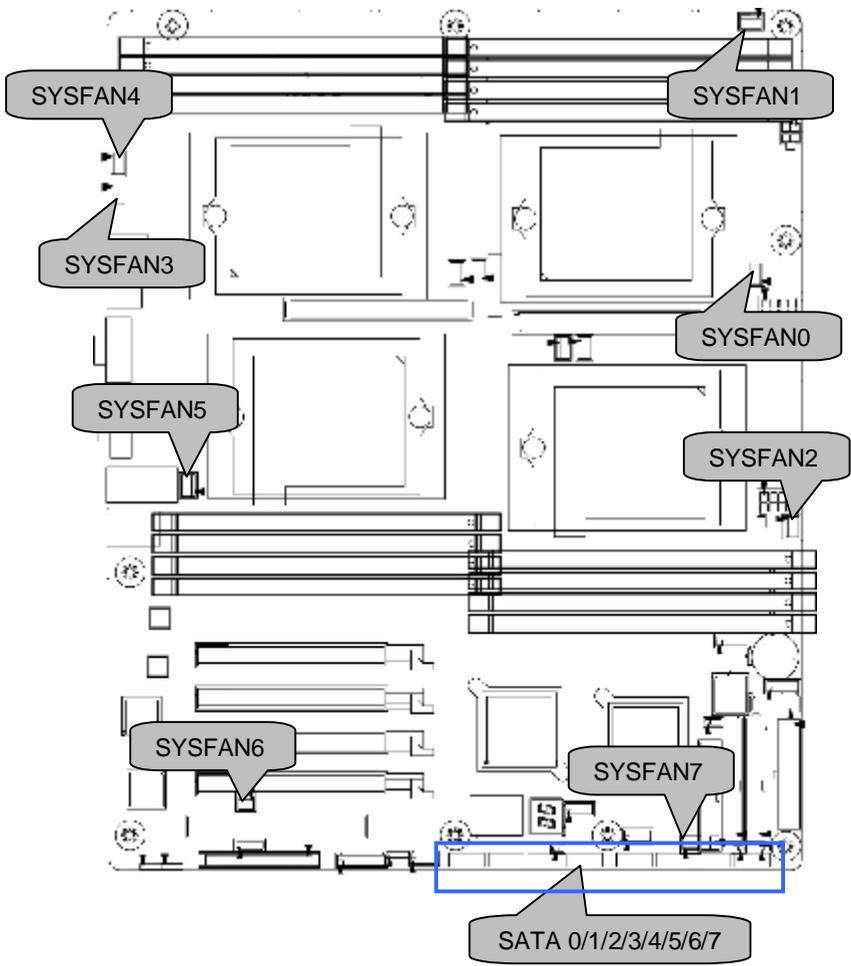
 <p>Normal (Default)</p>	<p>Use this jumper when you forgot your system/setup password or need to clear system BIOS setting.</p> <p>How to clear the CMOS data</p> <ul style="list-style-type: none"> - Power off system and disconnect power supply from AC source
 <p>Clear</p>	<ul style="list-style-type: none"> - Use jumper cap to close Pin_1 and 2 for several seconds to Clear CMOS - Replace jumper cap to close Pin_2 and 3 <p>Reconnect power supply to AC source Power on system</p>

J101: COM2 Header

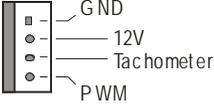
	<p>Use these pin definitions to connect a port to COM2. *TYAN does not provide cable for this header. It is designed for OEM use only.</p> <table border="1" data-bbox="396 671 852 858"> <thead> <tr> <th>Signal</th> <th>Pin</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>DCD</td> <td>1</td> <td>2</td> <td>DSR</td> </tr> <tr> <td>RXD</td> <td>3</td> <td>4</td> <td>RTS</td> </tr> <tr> <td>TXD</td> <td>5</td> <td>6</td> <td>CTS</td> </tr> <tr> <td>DTR</td> <td>7</td> <td>8</td> <td>RI</td> </tr> <tr> <td>GND</td> <td>9</td> <td>10</td> <td>Key</td> </tr> </tbody> </table>	Signal	Pin	Pin	Signal	DCD	1	2	DSR	RXD	3	4	RTS	TXD	5	6	CTS	DTR	7	8	RI	GND	9	10	Key
Signal	Pin	Pin	Signal																						
DCD	1	2	DSR																						
RXD	3	4	RTS																						
TXD	5	6	CTS																						
DTR	7	8	RI																						
GND	9	10	Key																						

J30/J95: USB Front Panel Headers

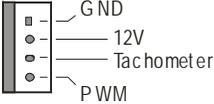
 <p>J30: USB2 J95: USB3</p>	<table border="1" data-bbox="396 986 852 1173"> <thead> <tr> <th>Signal</th> <th>Pin</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>VCC</td> <td>1</td> <td>2</td> <td>VCC</td> </tr> <tr> <td>Data-</td> <td>3</td> <td>4</td> <td>Data-</td> </tr> <tr> <td>Data+</td> <td>5</td> <td>6</td> <td>Data+</td> </tr> <tr> <td>GND</td> <td>7</td> <td>8</td> <td>GND</td> </tr> <tr> <td>Key</td> <td>9</td> <td>10</td> <td>NA</td> </tr> </tbody> </table> <p>Use these headers to connect to the USB devices via the enclosed USB cable.</p>	Signal	Pin	Pin	Signal	VCC	1	2	VCC	Data-	3	4	Data-	Data+	5	6	Data+	GND	7	8	GND	Key	9	10	NA
Signal	Pin	Pin	Signal																						
VCC	1	2	VCC																						
Data-	3	4	Data-																						
Data+	5	6	Data+																						
GND	7	8	GND																						
Key	9	10	NA																						



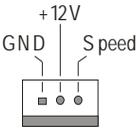
CPUFAN0/CPUFAN1/CPUFAN2/CPUFAN3: CPU Fan Connectors

	<p>Use this header to connect the processor cooling fan to your motherboard to keep the system at optimum performance levels.</p>
---	---

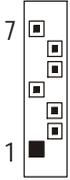
SYSFAN0/SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4/SYSFAN5: Chassis Fan Connectors

	<p>Use this header to connect the chassis cooling fan to your motherboard to keep the system at optimum performance levels.</p>
---	---

SYSFAN6/SYSFAN7: Chassis Fan Connectors

	<p>Use this header to connect the chassis cooling fan to your motherboard to keep the system at optimum performance levels.</p>
---	---

SATA0/1/2/3/4/5/6/7: Serial ATA RAID Connectors

	7	GND	<p>Connects to the Serial ATA ready drives via the Serial ATA cable</p> <p>You may use these eight Serial ATA ports to have the support of RAID 0, 1, 0+1 or 5 through the on board NVIDIA nForce Professional chipset (CK804pro & IO4).</p>
	6	RXP	
	5	RXN	
	4	GND	
	3	TXN	
	2	TXP	
	1	GND	

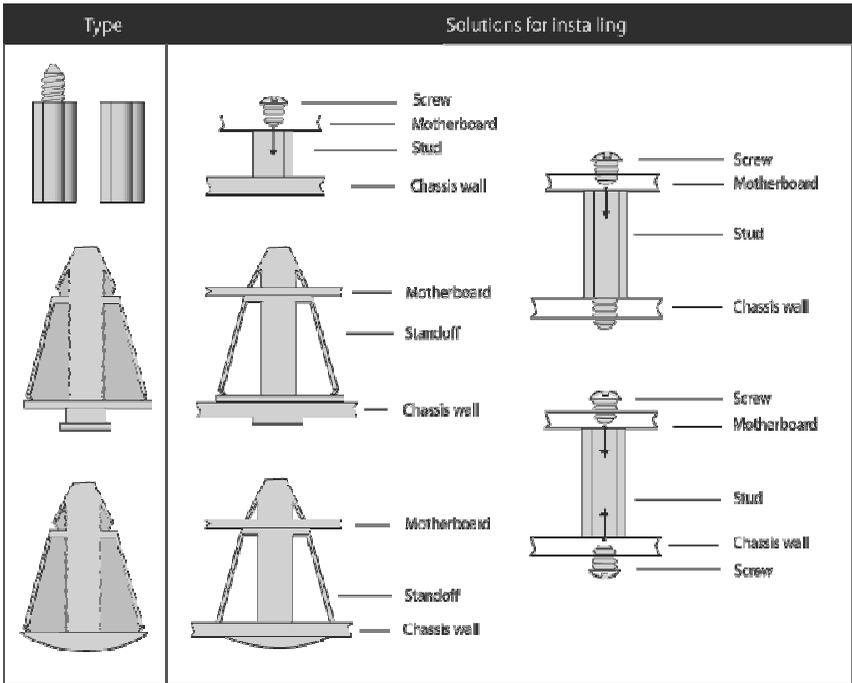
2.4 - Tips on Installing Motherboard in Chassis

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



2.5 - Installing the Processor(s) & Heatsink(s)

Your Thunder n4250QE S4985G3NR supports the latest processor technologies from AMD. Check the TYAN website for latest processor support:

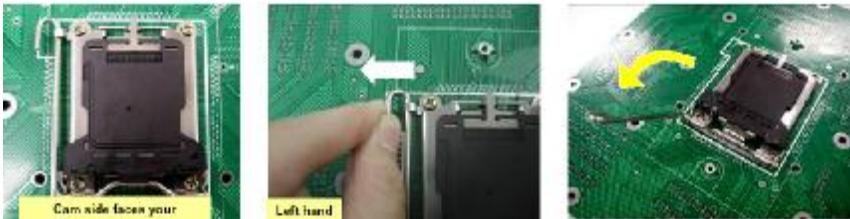
<http://www.tyan.com>

Processor Installation

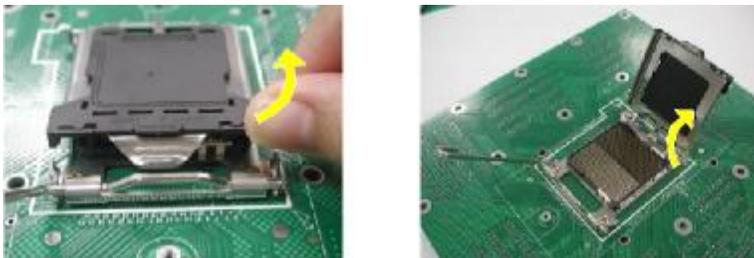
The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.

Follow these instructions to install your processor:

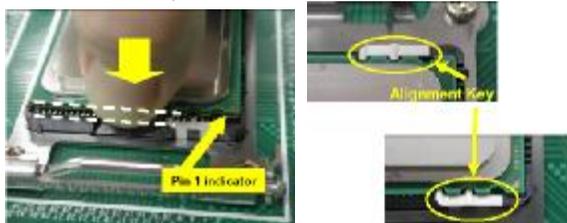
1. Place the PCB such that the socket cam side faces you. Make sure the lever hook is on your top-left side.
2. Use your left thumb and forefinger to hold the lever hook, then pull it to the left side to clear the retention tab.
3. Rotate the lever to a fully open position.



4. Lift the load plate to a fully open position.

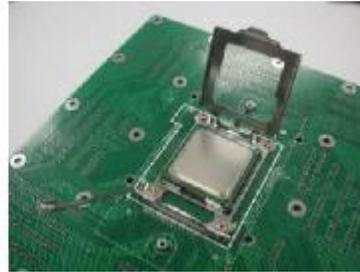


5. Locate the Pin 1 indicator of the package. Align the package with the socket and carefully insert the package into the socket with vertical motion only. Vertically check if the CPU is seated well in the socket housing. If not, take out the CPU, with vertical motion only, and repeat the above steps.

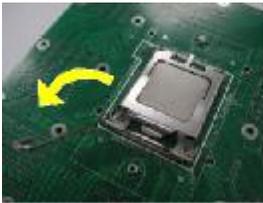


NOTE: The alignment keys must be located in the notches of the package.

6. Remove the PnP cap. Use your left hand to hold the load plate. Then use your right thumb to remove the PnP cap from the load plate. With the package in the socket, the PnP cap removal process will not damage the contacts.



7. 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.



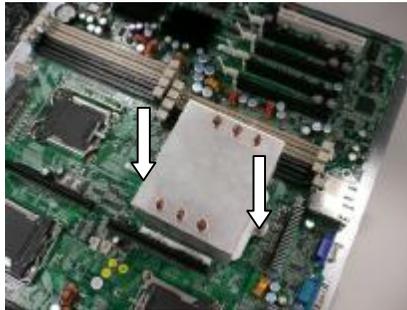
8. Repeat this procedure for the second processor if necessary.

Heatsink Installation

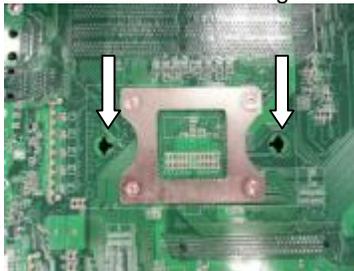
While installing the heatsink, be careful in **mounting the heatsink into the chassis to enhance the support of shock and vibration acting on the heatsink**. Do not mount the heatsink into the back plate only to prevent excessive pressure on the PCB that will cause serious damage to processor socket and mainboard.

Follow these instructions to install your heatsink:

1. Put the heatsink onto the CPU socket after installing CPU. Secure the heatsink with two screws as illustrated onto the chassis.



NOTE: The back plate is already mounted on the backside of mainboard. You don't need to pay additional attention on mounting the back plate.



Attention! Install the heatsink into the two holes as indicated from the front side of mainboard.

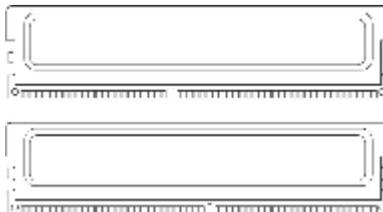
NOTE: There are eight mounting holes for the heatsinks on the chassis. Locate the two mounting holes for each heatsink before mounting the heatsink into the chassis (example as indicated).



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 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 n4250QE S4985G3NR supports up to 64GB of memory.

The following chart outlines the suggested rules for populating memory.

Memory Population Rules

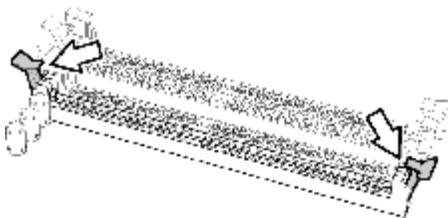
CPU DIMM	Single (CPU 0 only)		Dual (CPU 0 & CPU1)		Four (CPU 0, CPU1, CPU2 & CPU3)	
CPU0DIMM0		x		x		x
CPU0DIMM1		x		x		x
CPU0DIMM2	x	x	x	x	x	x
CPU0DIMM3	x	x	x	x	x	x
CPU1DIMM0				x		x
CPU1DIMM1				x		x
CPU1DIMM2			x	x	x	x
CPU1DIMM3			x	x	x	x
CPU2DIMM0						x
CPU2DIMM1						x
CPU2DIMM2					x	x
CPU2DIMM3					x	x
CPU3DIMM0						x
CPU3DIMM1						x
CPU3DIMM2					x	x
CPU3DIMM3					x	x

NOTE: Please always install memory beginning with CPU0DIMM0. You can choose to install single, dual or four memory modules.

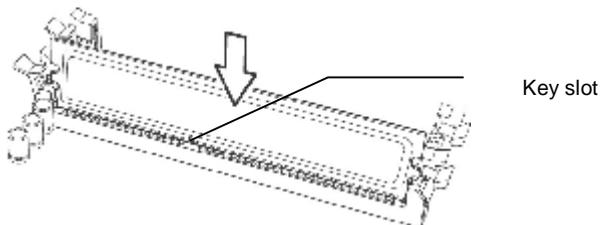
Memory Installation Procedure

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

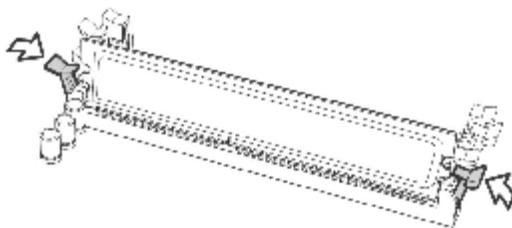
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



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.

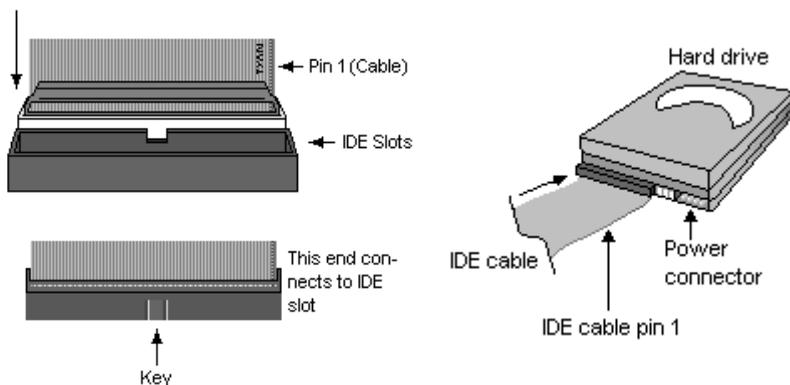


2.7 - Attaching Drive Cables

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.

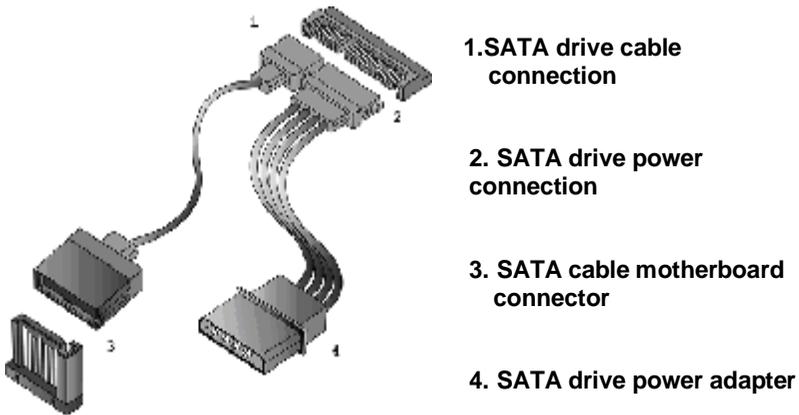
Attaching Serial ATA Cables

The Thunder n4250QE S4985G3NR is also equipped with 8 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.

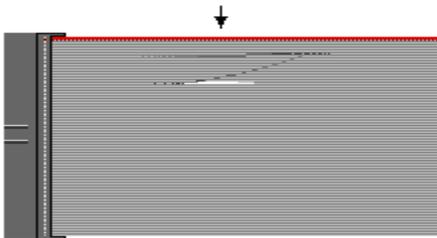
The following pictures illustrate how to connect an SATA drive



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

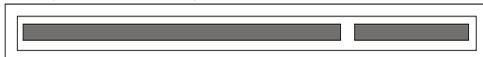


Attach first floppy drive (drive **A:**) to the end of the cable with the twist in it. Drive **B:** is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

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 slots that appear on your motherboard.

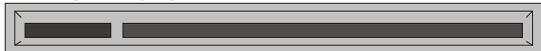
PCI (32-bit 33MHz)



PCI Express (x16)



PCI Express (x4)



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

Slot or Device	IDSEL#	Bus#	PIRQ	PIRQ	PIRQ	PIRQ
PCI Slot	PCI AD20	PCI Bus	T0_PCI_ INTA_L	T0_PCI_ INTB_L	T0_PCI_ INTC_L	T0_PCI_ INTD_L
XG20 Video	PCI AD25	PCI Bus	T0_PCI_ INTC_L			
82541 LAN	PCI AD22	PCI Bus	T0_PCI_ INTB_L			

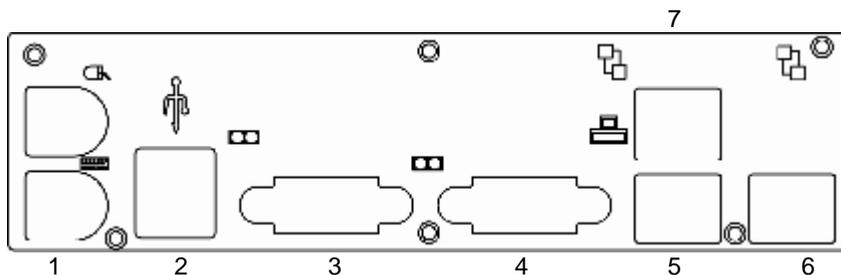
NOTE

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

The following diagrams will detail the rear port stack for this S4985 motherboard:

- | | |
|--------------------------|-------------------|
| 1. PS/2 Mouse & Keyboard | 2. USB x2 |
| 3. Serial Port | 4. VGA Port |
| 5. RJ-45 LAN Port | 6. RJ-45 LAN Port |
| 7. RJ-45 LAN Port | |



NOTE: 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 three 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 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 n4250QE S4985G3NR. The Thunder n4250QE S4985G3NR requires that you have an EPS12V power supply that has a 24-pin and two 8-pin power connectors. Except the 24-pin and 8-pin power supplies, **you also need to connect the two 4-pin power supply for the power of processor if you want to use Quad Rand memory.**

24-Pin EPS/12V Power Connector



8-Pin EPS12V Power Connector



4-Pin 12V Power Connector



4-Pin IDE 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**.

Chapter 3: BIOS Setup

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 <F2> during POST (F4 on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

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

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Moves between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Changes settings.

3.1.2 Getting Help

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

3.1.3 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.

3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

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 ones when this manual is written. Please visit Tyan's website at <http://www.tyan.com> for the information of BIOS updating.

3.2 BIOS Main Menu

In this section, you can alter general features such as the date and time, as well as access to the IDE configuration options. Note that the options listed below are for options that can directly be changed within the Main Setup screen.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
BIOS Date: BIOS Version:					Item Specific Help	
QuickBoot Mode:			[Enabled]	[Tab], [Shift-Tab], or [Enter] selects field.		
Boot-time Diagnostic Screen:			[Disabled]			
Summary screen:			[Disabled]			
Onboard port 80:			[Enabled]			
Extended Memory Testing			[None]			
System Memory:			[xxxx KB]			
Extended Memory:			[xxxx KB]			
System Time:			[xx:xx:xx]			
System Date:			[xxxx-xx-xx]			
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select	u Sub-Menu F10 Previous Values

BIOS Date/Version

This displays the date/version of BIOS build.

Quick Boot Mode

This BIOS feature allows you to decrease the time it takes to boot up the computer by shortening or skipping certain standard booting procedures. If enabled, the BIOS will shorten the booting process by skipping some tests and shortening others. In addition, it will also perform the following to further speed up the booting process:

- Spin up the hard disks as soon as power is supplied (or as soon as possible)
- Initialize only critical parts of the chipset
- Read memory size from the SPD (Serial Presence Detect) chip on the memory modules
- Eliminate logo delays

If disabled, the BIOS will run the whole gamut of boot-up tests.

It is recommended that you disable this feature when you boot up a new computer for the first time or whenever you install a new piece of hardware.

This allows the BIOS to run full diagnostic tests to detect any problems that may slip past Quick Boot's abbreviated testing scheme. After a few error-free test runs, you should enable this feature for much faster booting.

Enabled / Disabled

Boot-time Diagnostic Screen

This feature is used to display the diagnostic screen during the boot process.

Enabled / **Disabled**

Summary Screen

Enables or disables the display of the summary screen during boot up.

When Summary Screen is Enabled, a Phoenix BIOS Setup Utility summary screen appears during system boot after the power-on self-test (POST). The summary screen lists many of the system setup settings. When this option is set to Disabled, the summary screen does not appear.

Enabled / **Disabled**

Onboard Port 80

This feature is used to enable/disable onboard port 80.

Enabled / Disabled

Extended Memory Testing

Determines the tests that will be run on extended memory (memory above 1MB) during boot up.

Normal / Just zero it / **None**

System Memory

This display allows you to change the amount of system memory present on the system.

Extended Memory

This displays/allows you to change the amount of extended memory present on the system.

System Time / Date setup

System Time: Adjusts the system clock.

HHHours (24hr. format)

MMMinutes

SSSeconds

System Date: Adjusts the system date.

MMMonths

DDDays

YYYYYears

3.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Installed O/S: [Win2K/KP]					Item Specific Help	
Secured Setup Configurations [No]						
Reset Configuration Data: [No]						
<ul style="list-style-type: none"> u Hammer Configuration u Integrated Devices u FirstWare Configuration u PCI Configuration u IDE Configuration u Floppy Configuration u I/O Device Configuration u Hardware Monitor: u Console Redirection IPMI u Watchdog Timer Option [Enabled] Intruder Support 						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Installed OS

Select the operating system installed on the PC.

Note: An incorrect setting can cause the operating system to behave unpredictably.

Win2K/KP / Other / Win95 / Win98 / WinMe

Secured Setup Configurations

Yes prevents a plug and play operating system from changing system settings.

No / Yes

Reset Configuration Data

If you install a new piece of hardware or modify your computer's hardware configuration, the BIOS will automatically detect the changes and reconfigure the ESCD (Extended System Configuration Data). Therefore, there is usually no need to manually force the BIOS to reconfigure the ESCD.

However, sometimes, the BIOS may not be able to detect the hardware changes. A serious resource conflict may occur and the operating system may not even boot as a result. This is where the Reset Configuration Data BIOS feature comes in.

This BIOS feature allows you to manually force the BIOS to clear the previously saved ESCD data and reconfigure the settings. All you need to do is enable this BIOS feature and then reboot your computer. The new ESCD should resolve the conflict and allow the operating system to load normally.

Please note that the BIOS will automatically reset it to the default setting of No after reconfiguring the new ESCD. So, there is no need for you to manually disable this feature after rebooting.

Yes / **No**

Intruder Support

This feature is used to set the chassis intruder function.

Enabled / Disabled

3.3.1 Hammer Configuration

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Hammer Configuration					Item Specific Help	
u ECC Options SW Mem Hole Remap: [Enabled] DRAM Bank Interleave [Auto] Node Interleave [Disabled] ACPI SRAT Table [Enabled] Online Spare [Disabled] Auto DOS Training [Enabled] Set FID to MaxFID [Auto] HT Link Speed [xxxMHz] IOMMU: [Disabled]						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

SH Mem Hole Remap:

Recover Dram lost to PCI address space below 4GB.

Enabled / Disabled

DRAM Bank Interleave

Interleave memory blocks across the DRM chip selects. Auto will set this enabled when possible.

Enabled / **Auto**

Node Interleave

Interleave memory blocks across nodes. Auto will set this enabled when possible.

Auto / **Disabled**

ACPI SPAT Table

Enable ACPI 2.0 static resources affinity table for CCNUMA systems.

Enabled / Disabled

Online Spare

Enable the DRAM controller to designate a DIMM bank as a spare for logical swap during runtime.

Enabled / **Disabled**

Auto DQS Training

[Disabled]: Do DQS training on every cold boot.

[Enabled]: Train DQS only when the installed DIMMs are changed.

Enabled / Disabled

Set FID to MaxFID

Enable this option to set the FID to MaxFID on fused, non-server parts. It also sets the VID to 50mV less than the MaxFID. Disable this option to leave the FID alone. For unfused parts or server parts, enabled will do nothing.

Auto / Disabled

IOMMU

IOMMU is supported on LINUX based systems to convert 32bit PCI IO address to 64 bits.

Enabled / **Disabled**

3.3.1.1 ECC Options Sub-Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
ECC Options Sub Menu					Item Specific Help	
ECC Mode			[Disabled]			
ECC Error Checking			[Disabled]			
ECC Error Log			[Disabled]			
DCache ECC Scrub Control			[Disabled]			
L2 ECC Scrub Control			[Disabled]			
DRAM ECC Scrub Control			[Disabled]			
ECC Scrub Redirection			[Disabled]			
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select Sub-Menu	F10 Previous Values

ECC Mode

Set the level of ECC protection. If User is selected, individual ECC options may be changed. Other options besides Disabled serve as presets. For super mode, all of memory is scrubbed every 8 hours.

Disabled / Basic / Good / Super / Max / User

ECC Error Checking

Enable the DRAM controller to read/write ECC check-bits on the DIMMs and it allows the north bridge to check and correct ECC errors on the DRAM bus during normal CPU or bus master read requests.

Enabled / **Disabled**

ECC Error Log

Enable the MCA to log or report ECC errors on the DRAM bus.

NOTE: The MCA must still be programmed according to the desired MCE outcome.

Enabled / **Disabled**

DCare ECC Scrub Control

Set the rate of background scrubbing for the DCache.

Enabled / **Disabled**

L2 ECC Scrub Control

Set the rate of background scrubbing for the L2 cache.

Enabled / **Disabled**

DRAM ECC Scrub Control

Set the rate of background scrubbing for DRAM.

Enabled / **Disabled**

ECC Scrub Redirection

This feature is used to enable ECC scrubber to correct errors detected in DRAM during normal CPU requests.

Enabled / **Disabled**

3.3.2 Integrated Devices

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Integrated Devices					Item Specific Help	
USB Control			[Enabled]			
USB BIOS Legacy Support:			[Enabled]			
MAC LAN:			[Enabled]			
MAC LAN Bridge:			[Enabled]			
MAC Address:						
SATA0 Controller:			[Disabled]			
SATA1 Controller:			[Disabled]			
Interrupt Mode:			[APIC]			
<ul style="list-style-type: none"> u Slave Devices Configuration u NV RAID Configuration 						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

USB Control

This option enables or disables IRQ allocation for the USB (Universal Serial Bus) controller. Enable this if you are using a USB device. If you disable this while using a USB device, you may have problems running that device.

Enabled/ Disabled

USB BIOS Legacy Support

This option allows you to configure support for USB keyboards or mice. (Enable for use with a non-USB aware Operating System such as DOS or UNIX)

Enabled/ Disabled

MAC LAN

This option allows the auto selection of MAC Lan (nVidia CK804) support.

Enabled/ Disabled

MAC LAN Bridge

This option allows you to configure MAC LAN Bridge.

Enabled/ Disabled

SATA0/1 Controller

This option allows you to configure First Serial ATA Device on **CK804**.

NOTE: Mobile platform, please enable SATA, SAVE and EXIT BIOS SETUP. Then, you must do a power cycle during next POST.

Disabled/ Enabled

Interrupt Mode

This option allows you to select interrupt mode between 8259/PIC mode or APIC mode.

APIC/ PIC

3.3.2.1 Slave Devices Configuration Sub-Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Slave Devices Configuration					Item Specific Help	
MAC LAN:		[Enabled]				
MAC LAN Bridge:		[Enabled]				
MAC Address:						
SATA0 Controller:		[Disabled]				
SATA1 Controller:		[Disabled]				
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select	u Sub-Menu
						F10 Previous Values

MAC LAN

This option allows the auto selection of MAC Lan (nVidia IO4) support.

Enabled/ Disabled

MAC LAN Bridge

This option allows you to configure MAC LAN Bridge.

Enabled/ Disabled

SATA0/1 Controller

This option allows you to configure First Serial ATA Device on IO4.

NOTE: Mobile platform, please enable SATA, SAVE and EXIT BIOS SETUP.

Then, you must do a power cycle during next POST.

Disabled/ Enabled

3.3.2.2 NV RAID Configuration Sub-Menu

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
NV RAID Configuration					Item Specific Help	
NV RAID Configuration:		[Disabled]				
IDE Primary Master		[Disabled]				
IDE Primary Slave		[Disabled]				
IDE Secondary Master		[Disabled]				
IDE Secondary Slave		[Disabled]				
Master SATA0 Primary		[Disabled]				
Master SATA0 Secondary		[Disabled]				
Master SATA1 Primary		[Disabled]				
Master SATA1 Secondary		[Disabled]				
Slave SATA0 Primary		[Disabled]				
Slave SATA0 Secondary		[Disabled]				
Slave SATA1 Primary		[Disabled]				
Slave SATA1 Secondary		[Disabled]				
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

NV RAID Configuration

This option allows you to enable/disable the Nvidia RAID control.

Disabled/ Enabled

3.3.3 FirstWare Configuration

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
FirstWare Configuration					Item Specific Help	
FirstWare Language:			[English]			
FirstWare Authentication Level			[High]			
FirstWare Video Mode			[800x600]			
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

FirstWare Language

This option allows you to set the current FirstWare language to the selected language.

English / Spanish / French / German / Italian / Japanese / Chinese (S)
/ Korean / Chinese (T)

FirstWare authentication Level

This option allows you to select FirstWare authentication level.

High / Medium / Low

FirstWare Video Mode

This option allows you to select FirstWare Video Mode.

640 x 480 / **800 x 600** / 1024 x 768 / 1280 x 1024

3.3.4 PCI Configuration

This screen contains the additional setup menu to configure PCI devices.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
PCI Configuration					Item Specific Help	
<ul style="list-style-type: none"> ⌵ PCI Device, Slot #1 Onboard VGA [Enabled] Default Primary Video Adapter: [Add on] 						
<ul style="list-style-type: none"> ⌵ PCI/PNP ISA UHB Region Exclusion ⌵ PCI/PNP ISA IRQ Region Exclusion 						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select ⌵ Sub-Menu	F10 Previous Values

Onboard VGA

Enable/Disable onboard VGA.

Enabled / **Disabled**

Default Primary Video Adapter

Select "Add on" to have an installed video card; if installed, used for the boot display device. Select "Onboard VGA" to have the onboard video card, used for the boot display device.

Onboard / **Add on**

3.3.4.1 PCI Device, Slot#1 Sub-Menu

This screen contains the setup items for configuring the specific PCI device.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
PCI Device, Slot#1					Item Specific Help	
Option ROM Scan:		[Enabled]				
Enable Master:		[Enabled]				
Latency Timer:		[0040h]				
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Option ROM Scan

This feature is used to initialize the device expansion ROM.

Enabled / Disabled

Enable Master

This feature allows you to configure specified device as a PCI bus master.

Disabled / **Enabled**

Latency Timer

This feature is used to configure the minimum guaranteed time slice allotted for bus master in units of PCI bus clocks.

Default / 0020h / 0040h / 0060h / 0080h / 00A0h / 00C0h / 00E0h

3.3.4.2 PCI/PNP ISA UHB Region Exclusion Sub-Menu

You can use this screen to select options for the PCI/PNP ISA UHB Region Exclusion 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.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
PCI/PNP ISA UHB Region Exclusion					Item Specific Help	
C800-CBFF			[Available]			
CC00-CFFF			[Available]			
D000-D3FF			[Available]			
D400-D7FF			[Available]			
D800-D8FF			[Available]			
DC00-DFFF			[Available]			
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

C800-CBFF/ CC00-CFFF/ D000-D3FF / D400-D7FF / D800-D8FF/ DC00-DFFF

These items allow you to reserve the specified block of upper memory for use by legacy ISA devices.

Available / Reserved

3.3.4.3 PCI/PNP ISA IRQ Resource Exclusion Sub-Menu

You can use this screen to select options for the PCI/PNP IRQ Resource Exclusion 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.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
PCI/PNP ISA IRQ Resource Exclusion					Item Specific Help	
IRQ 3:		[Available]				
IRQ 4:		[Available]				
IRQ 5:		[Available]				
IRQ 7:		[Available]				
IRQ 9:		[Available]				
IRQ 10:		[Available]				
IRQ 11:		[Available]				
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

IRQ3/4/5/7/9/10/11

These items allow you to reserve the specified IRQ for use by legacy ISA devices.

Available / Reserved

3.3.5 IDE Configuration

This section allows you to fine tune the IDE configuration.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
IDE Configuration					Item Specific Help	
HDD Detect				[Enabled]		
Large Disk Access Mode:				[DOS]		
Local Bus IDE adapter				[Both]		
<ul style="list-style-type: none"> u Primary Master u Primary Slave u Secondary Master u Secondary Slave 						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

HDD Detect

This feature allows you to enable/disable the HDD detect.

Enabled / Disabled

Large Disk Access Mode

UNIX, Novell Netware or other operating systems, select [Other]. If you are installing new software and the drive fails, change this selection and try again. Different operating systems require different representations of drive geometries.

DOS / Other

Local Bus IDE Adapter

Enable the integrated local bus IDE adapter.

Both / Disabled / Primary / Secondary

3.3.5.1 Primary Master/Slave, Secondary Master/Slave Sub-Menu

Computer detects IDE drive type from drive C to drive F.
 Press **Enter** on any of the Primary/Master, Primary/Slave, Secondary/Master, Secondary/Slave options to view advanced details of the corresponding drive. The system displays advanced details like the number of heads/cylinders/sectors on the detected disk and the maximum storage capacity of the disk.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Primary Master					Item Specific Help	
Type: CHS Format: Cylinders: Cylinders: Heads: [1] Heads: Sectors: Sectors: Maximum Capacity: Maximum Capacity: LBA Format Total Sectors: Maximum Format: Multi-Sector Transfers: [Disabled] LBA Mode Control: [Disabled] 32 Bit I/O: [Disabled] Transfer Mode: [Disabled] Ultra DMA Mode: [Disabled]						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Type

Selects the type of device connected to the system.

Auto / CD/DVD / Not Installed / ARMD

Multi-Sector Transfers

This option allows you to specify the number of sectors per block for multiple sector transfers.

16 Sectors / 2 Sectors / 4 Sectors / 8 Sectors / **Disabled**

LBA Mode Control

Enables or disables LBA Mode.

When LBA is turned on, the BIOS will enable geometry translation. This translation may be done in the same way that it is done in Extended CHS or large mode, or it may be done using a different algorithm called LBA-assist translation. The translated geometry is still what is presented to the operating system for use in Int 13h calls. The difference between LBA and ECHS is that when using ECHS the BIOS translates the parameters used by these calls from the translated geometry to the drive's logical geometry. With LBA, it translates from the translated geometry directly into a logical block (sector) number.

Disabled / Enabled

32 Bit I/O

Enables or disables 32 bit data transfer mode.

Enabling this option causes the PCI hard disk interface controller to bundle together two 16-bit chunks of data from the drive into a 32-bit group, which is then transmitted to the processor or memory. This results in a small performance increase.

Enabled / **Disabled**

Transfer Mode

These modes determine the speed at which data is transferred to and from the drive. The Auto option automatically determines the correct transfer rates.

Auto / **Standard** / Fast PIO 1 / Fast PIO 2 / Fast PIO 3 / Fast PIO 4 / FPIO 3 / DMA 1 / FPIO 4 / DMA 2 ???

Ultra DMA Mode

Enables or disables Ultra DMA Mode.

Ultra DMA (UDMA, or, more accurately, Ultra DMA/33) is a protocol for transferring data between a hard disk drive through the computer's data paths (or bus) to the computer's random access memory (RAM). The Ultra DMA/33 protocol transfers data in burst mode at a rate of 33.3 MBps (megabytes per second), twice as fast as the previous Direct Memory Access (DMA) interface. Ultra DMA support in your computer means that it will boot (start) and open new applications more quickly. It will also help users of graphics-intensive and other applications that require large amounts of access to data on the hard drive. Ultra DMA uses Cyclical Redundancy Checking (CRC), offering a new level of data protection.

Disabled / Mode 0 / Mode 1 / Mode 2 / Mode 3 / Mode 4 / Mode 5

3.3.6 Floppy Configuration

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

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Floppy Configuration					Item Specific Help	
Large Diskette A:		[1.44/1.25 MB 3				
I						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Legacy Diskette A

This feature allows you to select the floppy type.

Disabled / 360kb 5 1/4" / 1.2MB 5 1/4" / 720kb 3 1/2" / 2.88MB 3 1/2"

3.3.7 I/O Device Configuration

This setting allows you to configure I/O devices.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
I/O Device Configuration					Item Specific Help	
Serial port A:		[Enabled]				
Base I/O address:		[3F8]				
Interrupt:		[IRQ4]				
Serial port B:		[Enabled]				
Mode:		[Normal]				
Base I/O address		[2F8]				
Interrupt:		[IRQ3]				
Parallel port:		[Auto]				
Mode:		[ECP]				
Floppy Disk Controller:		[Enabled]				
Base I/O address:		[Primary]				
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Serial Port A

This defines how the serial port is detected and configured.

Enabled / Disabled / Auto

Base I/O Address

This sets the base I/O address for serial port A.

3F8 / 2F8 / 3E8 / 2E8

Interrupt

This sets the interrupt for serial port A.

IRQ4 / IRQ3

Serial Port B

This defines how the serial port is detected and configured.

Enabled / Disabled / Auto

Mode

This feature is used to set the mode for serial port B.

Normal / IR / ASK-IR

Base I/O Address

This sets the base I/O address for serial port B.

2F8 / 3F8 / 3E8 / 2E8

Interrupt

This sets the interrupt for serial port B.

IRQ3 / IRQ4

Parallel port:

This defines how the parallel port is detected and configured.

Auto / Disable / Enabled

Mode

This feature is used to set the mode for parallel port.

ECP / Output Only / Bi-directional / EPP

Floppy Disk Controller

This defines how the floppy disk controller is detected and configured.

Enabled / Disabled / Auto

Base I/O Address

This sets the base I/O address for floppy disk controller.

Primary / Secondary

3.3.8 Hardware Monitor

This displays critical system parameters like CPU speed, fan speeds, voltage levels and CPU temperature.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Hardware Monitor					Item Specific Help	
CPU0 Temperature CPU1 Temperature CPU2 Temperature CPU3 Temperature Sys1 Temperature Sys2 Temperature Sys3 Temperature Sys4 Temperature Sys5 Temperature CPU0 Fan Speed CPU1 Fan Speed CPU2 Fan Speed CPU3 Fan Speed System Fan0 Speed System Fan1 Speed System Fan2 Speed System Fan3 Speed System Fan4 Speed System Fan5 Speed System Fan6 Speed System Fan7 Speed CPU0 VDD voltage CPU1 VDD voltage +12V +5V HT1.2V 3.3VSB CK804 Vcore 1.5V						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

3.3.9 Console Redirection

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Console Redirection					Item Specific Help	
Com Port Address		[Disabled]				
Baud Rate		[19.2K]				
Console Type		[PC ANSI]				
Flow Control		[CTS/RTS]				
Console connection:		[Direct]				
Continue C.R. after POST:		[Off]				
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Com Port Address

If enabled it will use a port on the motherboard.

Disabled / On-board COM A / On-board COM B

Baud Rate

This feature is used to enable the specified baud rate.

300 / **19.2K** / 1200 / 2400 / 9600 / 38.4K / 57.6K / 115.2K

Console Type

This feature is used to enable the specified console type.

VT100 / VT100.8bit / PC-ANSI, 7bit / **PC ANSI** / VT100+ / VT-UTF8

Flow Control

This feature is used to enable the flow control.

None / XON/XOFF / **CTS/RTS**

Console Connection

This feature is used to indicate whether the console is connected directly to the system or a modem is used to connect.

Direct / Via modem

Continue C.R. after POST

This feature is used to enable console redirection after OS has loaded.

Off / On

3.3.10 Watchdog Timer option

PhoenixBIOS Setup Utility			
Main	Advanced	Memory	Security
		Boot	Power
			Exit
Watchdog Timer option			Item Specific Help
Watchdog Timer		[Disabled]	
Timer_out Minutes		[1]	
F1	Help	↑ ↓ Select Item	-/+ Change Values
F9	Setup Defaults		
Esc	Exit	← → Select Menu	Enter Select
		u Sub-Menu	F10 Previous Values

Watchdog Timer

This feature is used to enable the watchdog timer function.

Disabled / Enabled

Timer_out Minutes

This feature is used to set the watchdog timer.

1-255 Minutes

3.4 Memory

This setting allows you to tweak the various cache settings for optimal performance of your system. Press Enter to display the various cache settings.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Cache Ram					Item Specific Help	
System Memory:			[xxxx KB]			
Extended Memory:			[xxxx KB]			
Memory Cache:			[Enabled]			
Cache Video BIOS area:			[Write Back]			
Cache Base 0-512K:			[Write Back]			
Cache Base 512K-640K:			[Write Back]			
Cache Extended Memory Area:			[Write Back]			
Cache A000 – AFFF:			[Disabled]			
Cache B000 – BFFF:			[Disabled]			
Cache C800 – CBFF:			[Disabled]			
Cache CC00 – CFFF:			[Disabled]			
Cache D000 – D3FF:			[Disabled]			
Cache D400 – D7FF:			[Disabled]			
Cache D800 – DBFF:			[Disabled]			
Cache DC00 – DFFF:			[Write Back]			
Cache E000 – E3FF:			[Write Protect]			
Cache E400 – E7FF:			[Write Protect]			
Cache E800 – EBFF:			[Write Protect]			
Cache EC00 – EFFF:			[Write Protect]			
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

Memory Cacahe

This feature is used to set the state of memory cache.

Enabled / Disabled

Cache System BIOS Area

This feature is only available when the system BIOS is shadowed. It enables or disables the caching of the system BIOS ROM at F0000h-FFFFFFh via the L2 cache. This greatly speeds up accesses to the system BIOS. However, this does not necessarily make the system perform better because the OS does not need to access the system BIOS often.

As such, it would be a waste of L2 cache bandwidth to cache the system BIOS instead of data that are more critical to the system's performance. In addition, if

any program writes into this memory area, it will result in a system crash. So, it is recommended that you write protect this area for optimal system performance.

Uncached / **Write Back**

Cache Video BIOS Area

This feature is only valid when the video BIOS is shadowed. It enables or disables the caching of the video BIOS ROM at C0000h-C7FFFh via the L2 cache. This greatly speeds up accesses to the video BIOS. However, this does not necessarily make the system perform better because the OS bypasses the BIOS and uses the graphics driver to access the video card's hardware directly. As such, it would be a waste of L2 cache bandwidth to cache the video BIOS instead of data that are more critical to the system's performance. In addition, if any program writes into this memory area, it will result in a system crash. So, it is recommended that you write protect this area for optimal system performance.

Uncached / **Write Back**

Cache Base 0-512K

This feature allows you to control caching of 512K base memory.

Uncached / **Write Back** / Write Through / Write Protect

Cache Base 512K-640K

This feature allows you to control caching of 512K-640K base memory.

Uncached / **Write Back** / Write Through / Write Protect

Cache Extended Memory Area

This feature allows you to control caching of system memory above one megabyte.

Uncached / **Write Back** / Write Through / Write Protect

Cache A000-AFFF/B000-BFFF

These features allow you to control caching of A000-AFFF/B000-BFFF memory.

USMC Caching / **Disabled** / Write Through / Write Protect / Write Back

Cache C8000-CBFF/Cache CC00-CFFF

These features allow you to control caching of C8000-CBFF/CC00-CFFF memory.

Disabled / Write Through / Write Protect / Write Back

Cache D000-D3FF/Cache D400-D7FF/Cache D800-DBFF/Cache DC00-DFFF

These features allow you to control caching of D000-D3FF/D400-D7FF/D800-D8FF/DC00-DFFF memory.

Disabled / Write Through / Write Protect / Write Back

Cache E000-E3FF/Cache E400-E7FF/Cache E800-EBFF/Cache EC00-EFFF

These features allow you to control caching of Cache E000-E3FF/Cache E400-E7FF/Cache E800-EBFF/Cache EC00-EFFF memory

Disabled / Write Through / **Write Protect** / Write Back

3.5 Security

These settings allow you to configure the security options for your system.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Supervisor Password Is: User Password Is:					Item Specific Help	
Set Supervisor Password Set User Password						
Password on boot: [Disabled]						
Fixed disk boot sector: [Normal]						
Diskette access: [Supervisor]						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select	u Sub-Menu
						F10 Previous Values

The system displays the current supervisor and user passwords.

Set Supervisor Password

This option allows the supervisor to set the supervisor password to restrict access to the BIOS settings.

Set User Password

This option allows the user to set the user password.

Password on boot

When enabled, the system will ask for a password at every boot. The system will continue booting only if the correct password is entered. If the wrong password is entered three times, the system will automatically shut down.

Disabled / Enabled

Fixed disk boot sector

This option allows the user to write protect boot sector on hard disk to protect against viruses.

Diskette access

This option allows the user to control access to diskette drives.

Supervisor / Disabled

3.6 Boot Menu

Use this screen to select options for the Boot Settings Configuration.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
POST Error: [Enabled]					Item Specific Help	
Boot priority order:						
Excluded from boot order:						
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select u Sub-Menu	F10 Previous Values

The boot menu will list all bootable devices. Use <Enter> to expand or collapses devices with a '+' or '-'. Use <+> or <-> to arrange the priorities of all bootable devices.

POST Error

If enabled, system pauses and displays SETUP entry or resume boot prompt if error occurs on boot. If disabled, system always attempts to boot.

Enabled / Disabled

3.8 Power Menu

These settings allow you to configure the power options for your system.

PhoenixBIOS Setup Utility						
Main	Advanced	Memory	Security	Boot	Power	Exit
Enable ACPI: [Yes] AMD PowerNow [Disabled] C State Configuration [Disabled] CPU Throttle [Disabled] Resume On Time [Off] Resume Time [00:00:00] Resume Date [00/00/0000] Power Button Off [Enable] Spread Spectrum [Disabled] After Power Failure [Stay Off]					Item Specific Help	
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9 Setup Defaults
Esc	Exit	← →	Select Menu	Enter	Select	u Sub-Menu F10 Previous Values

Enable ACPI

This allows you to enable or disable ACPI BIOS (Advance Configuration and Power Interface).

No / **Yes**

AMD PowerNow

This allows you to enable or disable AMD PowerNow.

Enabled / **Disabled**

C State Configuration

This allows you to enable or disable C2/C3 CPU power states.

Disabled / C2 / C3 / C2+C3

CPU Throttle

This allows you to enable or disable CPU Throttle.

Enabled / **Disabled**

Resume On Time

This allows you to enable or disable RTC wakeup function.

Off / On

Resume Time

This allows you to set RTC wakeup time.

Hour:Minute:Second

Resume Date

This allows you to set RTC wakeup Date.

Month:Day:Century

Power Button Off

This allows you to let Power button possibly shutdown the system in legacy OS without holding for 4 seconds

Enabled / Disable

Spread Spectrum

When enabled, this option modulates the frequency of the CPU clock rate (and hence all clock driven mainboard components), so that any EMI interference generated is not always at the same constant frequency, but instead is spread over a small band of frequencies, therefore reducing problems with equipment that may be particularly sensitive to certain fixed frequencies.

Enabled / **Disabled**

After Power Failure

This allows you to set the mode of operation if an AC power loss occurs.

Stay Off / Power On

3.7 Exit Menu

These settings set the exit options on your system.

PhoenixBIOS Setup Utility									
Main	Advanced	Security	Power	Boot	Exit				
Exit Saving Changes				Item Specific Help					
Exit Discarding Changes				Exit system Setup and save your changes to CMOS.					
Load Setup Defaults									
Discard Changes									
Save Changes									
F1	Help	↑ ↓	Select Item	-/+	Change Values	F9	Setup Defaults		
Esc	Exit	← →	Select Menu	Enter	Select	u	Sub-Menu	F10	Previous Values

Exit Saving Changes

This exits BIOS setup after saving the changes made.

Exit Discarding Changes

This exits BIOS setup after discarding the changes made.

Load Setup Defaults

Loads the factory default values.

Discard Changes

Discards all changes made without exiting BIOS setup.

Save Changes

Saves all changes made without exiting BIOS.

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 two 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 - BIOS Post Code

Code	Beeps / Description	Code	Beeps / Description
02h	Verify Real Mode	32h	Test CPU bus-clock frequency
03h	Disable Non-Maskable Interrupt (NMI)	33h	Initialize Phoenix Dispatch Manager
04h	Get CPU type	36h	Warm start shut down
06h	Initialize system hardware	38h	Shadow system BIOS ROM
08h	Initialize chipset with initial POST values	3Ah	Autosize cache
09h	Set IN POST flag	3Ch	Advanced configuration of chipset registers
0Ah	Initialize CPU registers	3Dh	Load alternate registers with CMOS values
0Bh	Enable CPU cache	42h	Initialize interrupt vectors
0Ch	Initialize caches to initial POST values	45h	POST device initialization
0Eh	Initialize I/O component	46h	2-1-2-3. Check ROM copyright notice
0Fh	Initialize the local bus IDE	48h	Check video configuration against CMOS
10h	Initialize Power Management	49h	Initialize PCI bus and devices
11h	Load alternate registers with initial POST values	4Ah	Initialize all video adapters in system
12h	Restore CPU control word during warm boot	4Bh	QuietBoot start (optional)
13h	Initialize PCI Bus Mastering devices	4Ch	Shadow video BIOS ROM
14h	Initialize keyboard controller	4Eh	Display BIOS copyright notice
16h	1-2-2-3. BIOS ROM checksum	50h	Display CPU type and speed
17h	Initialize cache before memory autosize	51h	Initialize EISA board
18h	8254 timer initialization	52h	Test keyboard
1Ah	8237 DMA controller initialization	54h	Set key click if enabled
1Ch	Reset Programmable Interrupt Controller	58h	2-2-3-1. Test for unexpected interrupts
20h	1-3-1-1. Test DRAM refresh	59h	Initialize POST display service
22h	1-3-1-3. Test 8742 KBD Controller	5Ah	Display prompt "Press F2 to enter SETUP"
24h	Set ES segment register to 4 GB	5Bh	Disable CPU cache
26h	Enable A20 line	5Ch	Test RAM between 512 and 640 KB
28h	Autosize DRAM	60h	Test extended memory
29h	Initialize POST Memory Manager	62h	Test extended memory address lines
2Ah	Clear 512 KB base RAM	64h	Jump to UserPatch1
2Ch	1-3-4-1. RAM failure on address	66h	Configure advanced cache registers
2Eh	1-3-4-3. RAM failure on data bits of low byte of memory bus	67h	Initialize Multi Processor APIC
2Fh	Enable cache before	68h	Enable external and CPU

system BIOS shadow		caches	
30h	1-4-1-1. RAM failure on data bits of high byte of memory bus	69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size	A2h	Check key lock
6Bh	Load custom defaults (optional)	A4h	Initialize Typematic rate
6Ch	Display shadow-area message	A8h	Erase F2 prompt
6Eh	Display possible high address for UMB recovery	AAh	Scan for F2 key stroke
70h	Display error messages	ACH	Enter SETUP
72h	Check for configuration errors	Aeh	Clear Boot flag
76h	Check for keyboard errors	B0h	Check for errors
7Ch	Set up hardware interrupt vectors	B2h	POST done - prepare to boot operating system
7Eh	Initialize coprocessor if present	B4h	One short beep before boot
80h	Disable onboard Super I/O ports and IRQs	B5h	Terminate QuietBoot (optional)
81h	Late POST device initialization	B6h	Check password (optional)
82h	Detect and install external RS232 ports	B9h	Prepare Boot
83h	Configure non-MCD IDE controllers	BAh	Initialize DMI parameters
84h	Detect and install external parallel ports	BBh	Initialize PnP Option ROMs
85h	Initialize PC-compatible PnP ISA devices	BCh	Clear parity checkers
86h.	Re-initialize onboard I/O ports.	BDh	Display MultiBoot menu
87h	Configure Motherboard Devices	BEh	Clear screen (optional)
88h	Initialize BIOS Data Area	BFh	Check virus and backup reminders
89h	Enable Non-Maskable Interrupts (NMIs)	C0h	Try to boot with INT 19
8Ah	Initialize Extended BIOS Data Area	C1h	Initialize POST Error Manager (PEM)
8Bh	Test and initialize PS/2 mouse	C2h	Initialize error logging
8Ch	Initialize floppy controller	C3h	Initialize error display function
8Fh	Determine number of ATA drives (optional)	C4h	Initialize system error handler
90h	Initialize hard-disk controllers	C5h	PnPnd dual CMOS (optional)
91h	Initialize local-bus hard-disk controllers	C6h	Initialize notebook docking (optional)
92h	Jump to UserPatch2	C7h	Initialize notebook docking late
93h	Build MPTABLE for multi-processor boards	C8h	Force check (optional)
95h	Install CD ROM for boot	C9h	Extended checksum (optional)
96h	Clear huge ES segment register	D2h	BIOS Boot Block

97h	Fixup Multi Processor table	E0h	BIOS Boot Block
98h	1-2. Search for option ROMs.	E1h	BIOS Boot Block
99h	Check for SMART Drive (optional)	E2h	Initialize the CPU
9Ah	Shadow option ROMs	E3h	Initialize system timer
9Ch	Set up Power Management	E4h	Initialize system I/O
9Dh	Initialize security engine (optional)	E5h	Check force recovery boot
9Eh	Enable hardware interrupts	E6h	Checksum BIOS ROM
9Fh	Determine number of ATA and SCSI drives	E7h	Go to BIOS
A0h	Set time of day	E8h	Set Huge Segment
E9h	Initialize Multi Processor	F1h	Initialize Run Time Clock
EAh	Initialize OEM special code	F2h	Initialize video
EBh	Initialize PIC and DMA	F3h	Initialize System Management Mode
ECh	Initialize Memory type	F4h	Output one beep before boot
EDh	Initialize Memory size	F5h	Boot to Mini DOS
EEh	Shadow Boot Block	F6h	Clear Huge Segment
EFh	System memory test	F7h	Boot to Full DOS
F0h	Initialize interrupt vectors		

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 absent 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

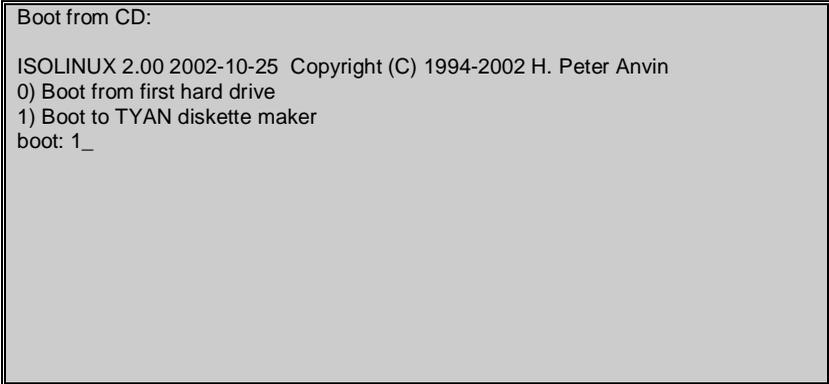
The brief descriptions below will help explain how these items function.

	<p>Agent – a system with SMDC installed The SMDC is installed in the Agent system that uses a compatible/supported Tyan motherboard.</p>
	<p>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.</p>
	<p>Console – communicates with Manager The Console is used to monitor and control the Agent through the Manager.</p>

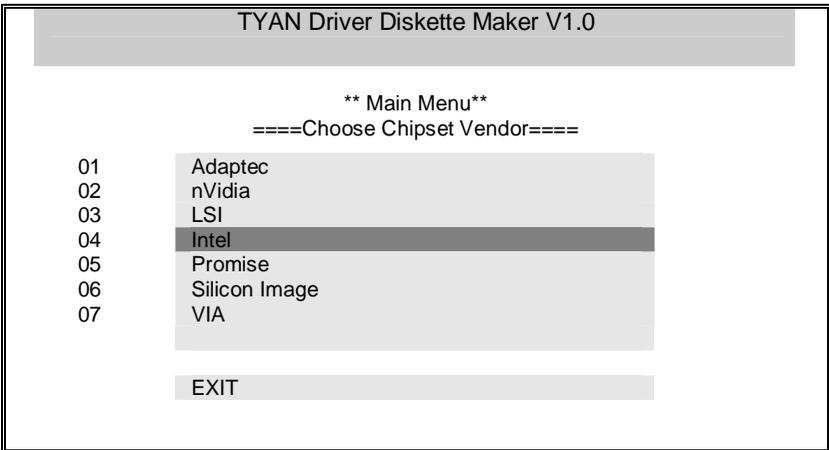
Appendix II: How to Make a Driver Diskette

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

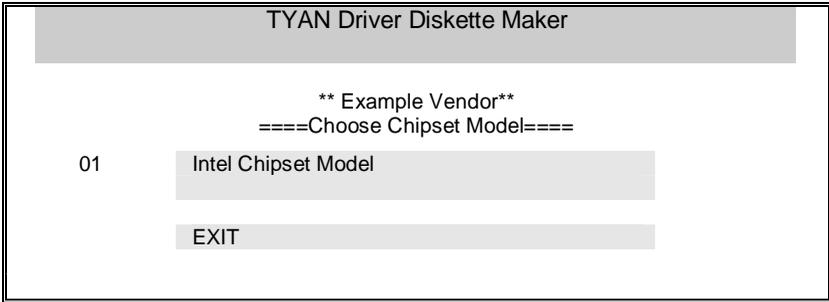
1. Start the system and insert the TYAN CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to Tyan diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from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



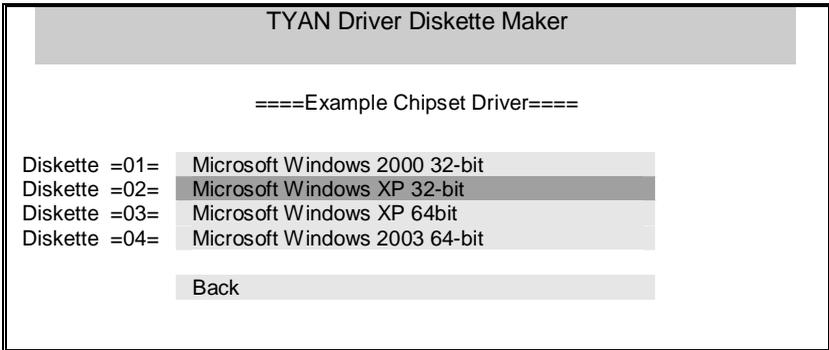
2. Choose the chipset vendor which you need from the main menu.



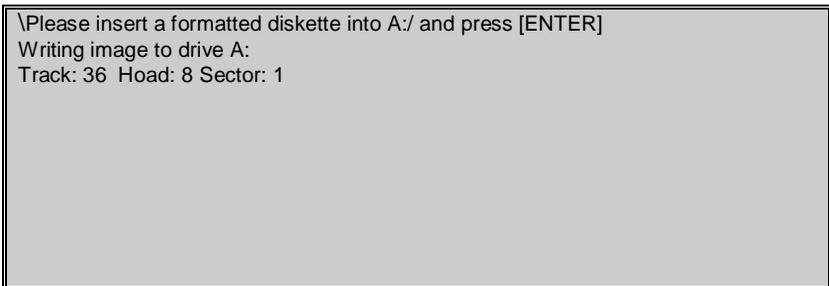
3. The following picture pops up after selecting the chipset model.



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



5. Follow the instruction on menu to insert a diskette and press [ENTER].



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 BIOS-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 its 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'interference radio.)



Notice for Europe (CE Mark)

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

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

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