

Thunder K8QW

/// S4881G2NR

Revision 1.01

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Before you begin...

Check the box contents!

The retail motherboard package should contain the following:



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

Congratulations

You are now the owner of the ideal solution for rackmount servers, large computer clusters, or pedestal server needs. The Tyan Thunder K8QW features support for Quad AMD Opteron processors, dual channel GbE Network Adapters and SATA devices. The Thunder K8QW also offers the option to upgrade to eight-level processing capabilities through the use of the HT4881 and the M4881 add-on modules.

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

Hardware Specifications

Processor

- Quad µPGA 940-pin ZIF sockets
- Supports up to four Single/Dual Core AMD Opteron[™] 800 series processors
- Four onboard 4-phase VRMs
- Integrated 128-bit DDR Memory controller

Chipset

- NVIDIA CrushK8-04 Professional
- AMD-8131[™] HyperTransport I/O Hub
- Winbond W83627HF Super I/O chip
- Three Analog Devices ADT7476 Hardware Monitoring IC

Memory

- 128-bit dual channel memory bus
- Sixteen 184-pin DDR DIMM sockets (Four per CPU)
- Supports up to 64 GB Reg/ECC DDR
- Supports DDR266, DDR333, or DDR400
- Supports Single/Dual and Quad Rank
 memory

Expansion Slots

- Two x16 PCI Express slot, one with x4 signals
- Two independent 64-bit PCI-X buses
- One 133 MHz max 3.3V PCI-X slot from Bridge B
- Two 100 MHz max 3.3V PCI-X slots from Bridge A
- Total of five usable slots

Integrated Enhanced IDE Controller

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

Integrated I/O

- One floppy connector supports up to two drives
- Two 9-pin serial ports (one connector and one header) and One 25-pin parallel port pinheader
- Eight USB 2.0 EHCI ports (two rear connectors & three headers with two ports each)
- PS/2 mouse and keyboard connectors

System Management

- Modular BMC 2x25pin header for SMDC support
- Ten 4-pin fan headers support tachometer monitoring and smart FAN control (PWM)
- Temperature and voltage monitoring
- One 2-pin Chassis Intrusion header
- Port 80h LED display

Integrated SATA Controller (Mfg. option)

- Four SATA 2.0 ports
- Supports up to Four SATA drives
- Supports RAID 0,1 and 10

Intelligent Platform Management Interface Header

- Tyan Server Management Daughter card (Optional) supports features listed below via IPMI header
- QLogic[™] Zircon Baseboard Management Controller (BMC) based on powerful ARM7 technology
- Tailored for IPMI 1.5 Spec
- Supports KCS and BT styles
- Flexible Windows and Linux based Management Solution
- Supports RMCP and SNMP
 protocols
- Supports ASF standard and EMP
- I²C serial multi-master controllers and UARTs
- Built-in IPMB connector
- Remote power on/off and reset support (IPMI-over-LAN)

Hyper Transport[™] Connectors

 Two PCI Express x16 slots with TYAN private signal definition which uses the Hyper Transport to connect two HT cards to the M4881. (CPU Board specifically designed by TYAN).

Integrated PCI Graphics

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

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

Integrated LAN Controllers

- Broadcom[®] BCM5704C dualchannel Gigabit Ethernet controller
- Two RJ-45 LAN connectors with LEDs
- Connected to PCI-X Bridge A
- Two Front Panel LED headers

BIOS

- Phoenix BIOS with 4Mbit LPC Flash ROM
- Watchdog timer
- USB boot support
- 48-bit LBA Support
- Supports PXE via Ethernet
- Power management:S0, S1, S4 and S5
- ACPI 2.0 & 1.0B support

Form Factor

- SSI MEB footprint (13" x 16" / 330.2mm x 406.4mm)
- EPS12V power connectors
- One serial port and one VGA connector
- Stacked USB 2.0 (two) connectors
- Stacked PS/2 keyboard and mouse connectors
- Two RJ-45 side-by-side LAN connectors with LEDs

Regulatory

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

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Software Specifications

OS (Operating System) Support Microsoft Windows 2003 Enterprise Server (32/64-bit) Microsoft Windows 2003 Server (32/64 bit) SuSE Enterprise 10.0 64-bit RHEL 3 Update 4 64-bit RHEL 4 64-bit Other distributions of Linux pending validation

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



Precaution: The Thunder K8QW supports EPS12V power supplies (24-pin/8-pin) and will not operate with any other types.

DO NOT USE ATX 2.x, ATX12V or ATXGES power supplies as they will damage the board and void your warranty.

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

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

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

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

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

2.00 – Board Image



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

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





S4881 Thunder K8QW Block Diagram

Note: The Hyper Transport speed between HT CON & CPU can reach up to 2000MT/S

2.02 – Board Parts, Jumpers and Connectors



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



	Function	Settings	
J115	Front Panel Connector	See Section 2.03 for pin out configuration	
J20	Clear CMOS Jumper	Close Pin-2 and Pin-3 (Default) Normal mode Close Pin-1 and Pin-2 Clear CMOS mode	
J1	SMBus Connector	See Section 2.05 for pinout configuration	
J30, J31, J95	USB 2.0 Header	For front or rear chassis mount USB connectors	
JP2	Chassis intrusion	See Section 2.07 for pin out configuration	
J101	Serial Port Internal Header	See Section 2.08 for pin out configuration	
J11	PCI-X channel A frequency configure	See Section 2.09 for adjusting speed	
J12	PCI-X channel B frequency configure	See Section 2.10 for adjusting speed	
JP1	RI Header	For external Wake on Ring	
JP4, JP5	GbE LAN1, LAN2 LED Header	See Section 2.12 for pin out	
J27, J28	IEEE 1394A Pin Header	See Section 2.13	
J118, J119	ID Switch & ID LED	See Section 2.14, 2.15	
J22	NMI	See Section 2.16	
	CPU Fan Connectors	See Section 2.17	
	System Fan Connectors	See Section 2.18, 2.19	
	Parallel Header(LPT CONN)	See Section 2.20	
	PWR CON	See Section 2.21, 2.22	

	OPEN - Jumper OFF	Without jumper cover		
	CLOSED - Jumper ON With jumper co			
	[
↓ ↑ Pin-1	To indicate the location of pin-1			
↑ Pin-1	To indicate the location of pin-1			

2.03 – Front Panel Connector (J115)





2.05 – SMBus Connector (J1)





2.07 - Chassis intrusion (JP2)





2.09 – PCI-X channel A frequency configure (J11)



2.10 – PCI-X channel B frequency configure (J12)



2.11 - RI Header (JP1)



2. 12– GbE LAN1, LAN2 LED Header (JP4, JP5)



2. 13- FireWire(IEEE 1394A) Pin Header (J27,J28)





2.15- ID LED (J119)



2.16-NMI (J22)



2.17- CPU FAN Connectors (J117, J116, J108, J109)



2.18- Chassis 4PIN FAN Connectors (J103, J104, J105, J106, J107, J110)



2.19 – Chassis 3PIN FAN Connectors (J111, J112)



2.20- Parallel Header (LPT CONN)



2.21-PWR CON (PWR3)



2.22-PWR CON (PWR4)



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2.23 – OEM Reserved Connectors and Jumpers

The connectors and jumpers, which are not listed, are reserved for OEM use only.

2.24– Installing the Processor(s)

Your brand new Thunder K8QW supports the latest 64-bit processor technologies from AMD. Only AMD Opteron[™] processor 800 series are certified and supported with this motherboard. *

* Your S4881 will not be fully functional unless at least 2 CPU's or more are used at the same time. The system will POST with 1 CPU but other functions such as GbE or PCI-X bus will be none functional.

Check **our** website for latest processor support. <u>http://www.tyan.com</u>

TYAN is not liable for damage as a result of operating an unsupported configuration.



The diagram is provided as a visual guide to help you install socket processors and may not be an exact representation of the processors you have.

Lift the lever on the socket until it is approximately 90° or as far back as possible to the socket.

Align the processor with the socket. There are keyed pins underneath the processor to ensure that the processor's installed correctly.

Seat the processor firmly into the socket by gently pressing down until the processor sits flush with the socket.

Place the socket lever back down until it locks into place.

Your processor is installed.

Repeat these steps for the second, third and fourth processor if you are using four processors.

Take care when installing processors as they have very fragile connector pins below the processor and can bend and break if inserted improperly.



2.25 - Heatsink Retention Frame Installation

After you are done installing the processor(s), you should proceed to installing the retention frame and heatsink. The CPU heatsink will ensure that the processors do not overheat and continue to operate at maximum performance for as long as you own them. Overheated processors are also dangerous to the health of the motherboard.

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

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

The following diagram will illustrate how to install the most common CPU back plates:



- 1. Mounting screws
- 2. Heatsink retention frame
- 3. CPU socket
- 4. Motherboard PCB
- 5. Adhesive insulator material
- 6. Backplate assembly

NOTE: Please see next section for specific instructions on how to install mounting bracket.



2.26 -- Thermal Interface Material

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

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

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



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

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2.27 Heatsink Installation Procedures

Type A: CAM LEVER (TYPE) INSTALLATION



1. After placing backplate and interface material under motherboard place heatsink retention frame on top of motherboard. Align plastic retention bracket screw hole with CPU back-plate standoffs. Tighten screws to secure plastic retention bracket. Repeat this on the other side. **DO NOT OVER TIGHTEN.**

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



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



Type B: SCREW RETENTION TYPE HEATSINK



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



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



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

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2.28 -- Finishing Installing the Heatsink

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



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

2.29 – 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.



Thunder K8QW S4881 Mounting Hole Placement

http://www.TYAN.com

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



2.30 – Installing the Memory

Before attempting to install any memory, make sure that the memory you have is compatible with the motherboard as well as the processor.

The following diagram shows common types of DDR SDRAM modules:



Here are a few key points to note before installing memory into your Thunder K8QW:

- Always install memory beginning with CPU0_DIMM0 or CPU0_DIMM2
- In order to access memory that is associated with each CPU socket you must also have a CPU installed in that corresponding socket. Memory installed into dimm sockets that do not have a CPU installed with it will be non-functional.
- AMD Opteron[™] processors support 64-bit (non-interleaved) or 128bit (interleaved) memory configurations
- At least ONE Registered DDR SDRAM module must be installed for the system to turn on and POST (power on self test)
- 128MB, 256MB, 512MB, 1GB, 2GB and 4GB Registered PC2100 / PC2700 / PC3200 DDR SDRAM memory modules are supported
- All installed memory will be automatically detected

The Thunder K8QW Pro supports up to 32GB / 64GB.*

The eight-way system (S4881+M4881) supports up to 64GB /128 GB.

* For Quad Rank memory compatibility please reference the Tyan website

Modifying the memory configuration for a S4881 is fairly simple by following a few basic steps. The following terms are used in the memory modification description:

- **Bank** One or more DIMM's logically arranged to form a given memory bus access width (64-bit or 128-bit).
- Node A Single processor, its memory controller and all of its associated memory DIMM's and DIMM sockets. A node represents a given processor's memory array as viewed from the HyperTransport [™] link.
- **Bank Interleave** This form of interleaving causes the memory controller to group two 128-bit DIMM banks into one large array. Every other 128-bit word is stored in a given DIMM bank. Even word addresses are stored in the bank composed of slots DIMM0 and DIMM1. Odd word addresses are stored in the



bank composed of slots DIMM2 and DIMM3. If enabled in BIOS setup, each node with four identical DIMM's is setup to use bank interleave.

• Node Interleave – Node based interleaving causes the system to group even numbers of nodes into one large array. In the case of two-way node interleaving (2 processors present), every other 128-bit word is stored on a given node. Four-way node interleaving (four processors present) results in every 4th 128-bit word being stored on a given node. Node interleave is not compatible with Microsoft's SRAT table or Linux NUMA. If enabled in BIOS setup and if all loaded nodes have the same amount of memory.

Rules for populating memory:

<u>64-bit support</u>: Choose DIMM slots 0 or 2 by themselves or use 0 and 2 together for every CPU socket that corresponds to those DIMM slots.

<u>128-bit support</u>: Choose DIMM slots 0 and 1 or 2 and 3 or all 4 together for every CPU socket that corresponds to those DIMM slots.

Refer to the diagram below if there are further questions on how to populate memory in 64-bit, 128-bit orientations or Bank Interleaving:

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

Memory Installation Procedure

When you install the memory modules, make sure the module aligns properly with the memory slot. The modules are keyed to ensure that it is inserted only one way. The method of installing memory modules are detailed by the following diagrams.



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



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



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.

2.31 – Attaching Drive Cables

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.



The Thunder K8QW is also equipped with 4 Serial ATA (SATA) channels. Connections for these drives are also very simple.

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

Tyan has supplied four SATA cables and two SATA power adapter. If you are in need of other cables or power adapters please contact your place of purchase.



The following pictures illustrate how to connect an SATA drive

1. SATA drive cable connection

2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

Floppy Drives

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**:).
2.32 - Installing Add-In Cards

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



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.

Note: Only PCI Express slots are usable with 1 CPU installed in the CPU0 slot. Add a second CPU in the CPU1 slot to use PCI-X slots. This is because the PCI-X 8131 chip is only connected to the CPU1 HT bus.

HT SLOT brief introduction

The two HT Slots are actually two PCI-Ex16 slots with TYAN private signal definition and use Hyper Transport to connect two HT cards to the M4881 (CPU Board specially designed by TYAN).

HT SLOT1

HT SLOT2

Note: All 4 CPUs need to be installed before you can add the M4881 CPU daughter board since only the CPU2 and CPU3 sockets have an HT connection to the M4881.

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.



2.33 – PCI Riser Cards Supported on Thunder K8QW S4881

Model Number	M2037	M2043	M2043X	M2044
What speeds can support	ALL SPEEDS	66MHz 33MHz	66MHz 33MHz	66MHz 33MHz
Form Factor	1U	2U	2U	2U
What kind of Gold Finger	3.3V and 5V	3.3V and 5V	3.3V and 5V	3.3V and 5V
How many slots	1	3	2	3
What kinds of slots	5V	3.3V	3.3V	3.3V
UPC Code	635872-007255	635872- 006906	635872- 007095	635872- 008368

You can use J11&J12 to adjust the frequency of PCI-X Channel A and PCI-X Channel B to fit different kinds of Riser Cards supported on Thunder K8QW S4881. See section 2.09 & 2.10 for detail.

2.34 – Connecting External Devices

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



PS/2 KEYBOARD

2.35– Installing the Power Supply

There are three power connectors on your Thunder K8QW. Tyan recommends that you have an EPS12V power supply that has one 24-pin and two 8-pin power connectors.



The Thunder K8QW is standard EPS 12V compatible, please take following combination for reference. Please be aware that ATX 2.x, ATX12V and ATXGES power supplies are **not compatible** with the board and can damage the motherboard and/or CPU(s).

39 http://www.TYAN.com

Power Supply Connection Matrix (w/ 2-rank memory)			
Model #	Model # Connector on EPS12V PWR Supply MB Power Connector		
	24-pin Connector	PWR0: 24-pin EPS 12V Connector	
# 1 8-pin Connector		PWR1: 8-pin EPS12V Connector	
	8-pin Connector	PWR2: 8-pin EPS12V Connector	

Power Supply Connection Matrix (w/ 4-rank memory)			
Model #	odel # Connector on EPS12V PWR Supply MB Power Connector		
	24-pin Connector	PWR0: 24-pin EPS 12V Connector	
	8-pin Connector	PWR1: 8-pin EPS12V Connector	
#1 8-pin Connector PWR2: 8-pin EPS12V Condition 4-pin Connector PWR3:2x2 pin ATX12V Condition		PWR2: 8-pin EPS12V Connector	
		PWR3:2x2 pin ATX12V Connector	
	4-pin Connector	PWR4: 1x4 pin 5V Connector	

Disconnect power supply from electrical outlet

- a. Connect the EPS12V 8-pin power connectors
- b. Connect the EPS12V 24-pin power connector
- c. Connect power cable to power supply to power outlet Make sure you have connected both connectors before attempting to apply power to the board.

* w/ 4-rank memory: please connect total 5 power connectors before connect power cable to power supply to power outlet.

NOTE: We suggest using a 850W or higher power supply; this is dependent on how many devices you have installed. However, 700W is sufficient for system without many devices (i.e. 4 x AMD Opteron 875 CPU, 16 x 1G DDR 333 Memory, 1 x HDD, 2 or 3 expansion cards). We suggest using a 1350W or higher power supply to support a 8-way system (S4881+M4881).

2.36 – 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.**

3.00 - BIOS Setup Utility

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



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

To start the BIOS setup utility:

- a. Turn on or reboot your system
- Press <F2> during POST (F4 on remote console) to start BIOS setup utility

To select an item

Use the left/right ($\leftarrow \rightarrow$) arrow keys to make a selection

To display a sub-menu (A pointer " ▶ " marks all sub menus)

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

3.10 - BIOS Menu Bar

Main	To configure basic system setups
Advanced	To configure the advanced chipset features
Memory	To configure system memory features
Boot	To configure system boot order
Exit	To exit setup utility

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

NOTE

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

3.20 - BIOS Legend Bar

The chart describes the legend keys and their alternates:

Кеу	Function
<f1> or <alt-h></alt-h></f1>	General help window
<esc></esc>	Exit current menu
$\leftarrow \rightarrow$ arrow keys	Select a different menu
\uparrow or \downarrow arrow keys	Select different item
<+> 0r <->	Change values
<f9></f9>	Load the Optimal default configuration values of the
	menu
<f10></f10>	Select the previous value/setting of the field
<enter></enter>	Execute command or select submenu

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 [F1] key again.

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3.30 - BIOS Main Menu

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

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

PhoenixBIOS Setup Utility			
Main			
BIOS Date BIOS Version:	DD/MM/YY XXXX	Item Specific Help	
CPU Type CPU Speed	AMD xxxx MHz		
System Memory Extended Memory Extended Memory Testing	[XXXX KB] [XXXX MB] [None]		
Installed O/S System Time System Date	[Other] [HH:MM:SS] [MM:DD:YYYY]		
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ➤ Sub-Menu F10: Previous Values			

Feature	Option	Description
	None	Determines which type of test
Extended Memory Testing	Just Zero it	will be performed on extended
	Nomal	memory (above 1M).
System Time	HH:MM:SS	Set the system time.
System Date	MM:DD: YYYY	Set the system date.

3.40 - BIOS Advanced Menu

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

PhoenixBIOS Setup Utility			
Advanced			
Secured Setup Configurations Reset Configuration Data:	[No] [No]	Item Specific Help	
 Hammer Configuration Integrated Devices PCI Configuration IDE Configuration Floppy Configuration Floppy Configuration I/O Device Configuration Hardware Monitor Auto Fan control FanPwmDuty Console Redirection Watchdog Timer Option Intruder Support 	[Enabled] [40%] [Enabled]		
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Menu Enter: Select ► Sub-Menu F10: Previous Values			

Feature	Option	Description	
Secured Setue Configurations	No	Choosing "Yes" will prevents a Plug and Play Operation	
Secured Setup Configurations	Yes	System from changing system settings.	
Poset Configuration Data	Νο	Select "Yes" if you want to cleat the Extended System	
Neser Configuration Data	Yes	Configuration Data (ESCD) area.	

Hammer Configuration	Menu Item	Set Hammer Configuration.	
Integrated Devices	Menu Item	Set integrated devices.	
PCI Configuration	Menu Item	Configure PCI devices.	
IDE Configuration	Menu Item Configure IDE interface.		
Floppy Configuration	Menu Item	Configure floppy interface.	
I/O Device Configuration	Menu Item	Peripheral configuration	
Hardware Monitor	Menu Item	Enable/disable the onboard Hardware monitor device	
Auto Fon control	Enabled	Choosing "Enabled" will do auto	
Auto Pari control	Disabled	fan control to reduce fan noise.	
	30%		
FanDwmDuty	40%	Select Auto fan control's PWM	
Tank whibuty	50%	duty to reduce fan speed	
	60%		
Console Redirection	Menu Item	Additional setup menus to configure console.	
Watchdog Timer Option	Menu Item	Watchdog Timer configuration	
la tau de a Oura a est	Enabled	Enabled/disabled the chassis	
Intruder Support	Disabled	intrude function	

3.4.1 – Hammer Configuration Sub-Menu

You can use this screen to select options for the Hammer 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			
Hammer Configuration Sub-Menu			
Item Specific Help			

HT-LDT Frequency	[800Mhz]	
ECC	[Enabled]	
ECC Scrub Redirection	[Disabled]	
Dram ECC Scrub CTL	[Disabled]	
Chip-Kill	[Disabled]	
DDR Data Transfer Rate	[200M]	
Node Memory Inter Leave	[Disabled]	
Dram Bank Inter Leave	[Disabled]	
4GB Memory Hole Adjust	[Auto]	
4GB Memory Hole Size	[64M]	
DDR Clock Jitter	[Disabled]	
Memory Hole Mapping	[Hardware]	
Enable All Memory Clocks	[Populated]	
Controller Config Mode	[Auto]	
Timing Config Mode	[Auto]	
Swizzle Memory Banks	[Disabled]	
MTRR Mapping	[Continues]	
F1: Help ↑ ↓ : Select Item -/+: Change Va	lues F9: Setup D	efaults
Esc: Exit ← →: Select Screen Enter: Select	t 🕨 Sub-Menu	
F10: Previous Values		

Feature	Option	Description
	800Mhz	Set HT-LDT link between
	1000Mhz	CK8←→CK804
	Enabled	ECC check/correct mode.
ECC	Disabled	function for all blocks within CPU core and North Bridge.
ECC Scrub Redirection	Disabled	Enable ECC Scrubber to correct errors detected in
	Enabled	Dram during normal CPO requests (Foreground scrubbing).
	Disabled	Sets the rate of
	1.31ms	BACKGROUND scrubbing for
	2.62 ms	FCC scrubbing from system
	5.24 ms	requests).
Diam ECC Scrub CTE	10.49 ms	NOTE: BACKGROUND agent
	20.97 ms	works independently of CPU
	42.0 ms	cannot be enabled without first
	84.0 ms	enabling Dram ECC.
Chip-Kill	Disabled	Enable Chip Kill ECC on

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	enabled	nodes with all x4 ECC	
	200M	เล่าสุดภาษาแทกการ.	
	100M	-	
DDR Data Transfer Rate	133M	The rate of DDR data transfer	
	166M	-	
	Disabled	Inter leave memory blocks	
Node Memory Inter Leave	Auto	across Processor Nodes	
	Auto	Inter leave memory blocks	
Dram Bank Inter Leave	Disabled	across Dram chip.	
		4GB Memory Hole Adjust	
		, ,	
	Auto	Auto - Adjust the memory hole	
		size automatically according	
4GB Memory Hole Adjust		to the memory space used by	
		PCI devices.	
	Manual		
		Manual - Memory hole size is	
		determined manually.	
	64MB	-	
	128MB	_	
	256MB	_	
	512MB	-	
	768IVIB	-	
	1024MB	_	
	1280IVIB	4GB Memory Hole Size	
4GB Memory Hole Size	1530IVIB		
	1792IVIB	-	
		-	
	2504IVID	-	
	2300MB 2816MB	-	
	2010MD 3072MB	-	
	3328MB	-	
	3584MB	-	
	Disabled	Eliminate dithering for DDR	
DDR Clock Jitter	Enabled	auto compensation	
	Hardware		
Memory Hole Mapping	Disabled	Remapping scheme for PCI	
	Software	memory noie.	
		Enable all memory clocks	
	Dopulated		
	ropulated	Populated: Only enable	
Enable All Memory Clocks		those clocks where	
		populated	
	All	All: Enable all memory	
		clocks, whether populated or	
	A 4 a	not	
Controller Config Mode	Auto	Controller Config Mode	
-	wanual	-	
	Δ7		

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Timing Config Mode	Auto Manual	Timing Config Mode	
Swizzle Memory Banks	Disabled	Swizzle memory banks for performance gain (XORs Dram bank selects)	
	Enabled		
MTRR Mapping	Continues	Configure MTRP mode	
	Discrete	Compare writter mode.	

3.4.2 - Integrated Devices Sub-Menu

You can use this screen to select options for the Integrated Devices 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		
Integrated Devices Sub-Menu		
USB Control USB BIOS Legacy Support : SATA0 Controller SATA1 Controller	[USB1.1+USB2] [Enabled] [Enabled] [Enabled]	Item Specific Help
Interrupt Mode:	[APIC]	
► NV RAID Configuration		
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description	
	Disabled		
USB Control	USB1.1	Set USB controllers.	
	USB1.1+USB2		
USB BIOS Legacy Support	Enabled	Set support for USB	
	Disabled	Keyboard/Mouse.	
SATA0 Controller	Enabled	Sat First Sarial ATA dovias	
	Disabled	Set First Senar ATA device.	
SATA1 Controller	Enabled	Set Second Serial ATA device.	

	Disabled	
	APIC	Select Interrupt Mode between
Interrupt Mode	PIC	8259/PIC mode or APIC mode.
NV RAID Configuration	Menu Item	Set Nvidia RAID control.

NV RAID Configuration

You can use this screen to select options for the NV 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		
NV RAID Configuration		
NV RAID Configuration Channel 0 SATA Primary Channel 0 SATA Secondary Channel 1 SATA Primary Channel 1 SATA Secondary	[Enabled] [Disabled] [Disabled] [Disabled] [Disabled]	Item Specific Help
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description	
NV Configuration	Enabled	Sat Nyidia PAID control	
	Disabled	Set Nindia RAID control.	
Channel O SATA Brimony	Disabled	Set the SATA RAID port at	
Channel 0 SATA Filmary	Enabled	CK804.	
Channel 0 SATA Secondary	Disabled	Set the SATA RAID port at	
	Enabled	CK804.	
Channel 1 SATA Primary	Disabled	Set the SATA RAID port at	
	Enabled	CK804.	
Channel 1 SATA Secondary	Disabled	Set the SATA RAID port at	
	Enabled	CK804.	
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3.4.3 - PCI Configuration Sub-Menu

You can use this screen to select options for the PCI 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		
PCI Configuration Sub-Menu		
Note PCI Slot Layout Convention in Help Window	Item Specific Help	
 PCI Device, Slot # 1 PCI Device, Slot # 2 Lan Control 1394 Device Control [Enabled] Onboard VGA [Enabled] Default Primary Video Adapter [Add On] Option ROM Placemnet [Disabled] PCI/PNP ISA UMB Region Exclusion PCI/PNP ISA IRQ Resource Exclusion 		
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description
PCI Device, Slot #1 & 2	Menu Item	Select PCI slot configuration.
PCI/PNP ISA UHB Region Exclusion	Menu Item	Reserve specific upper memory blocks for use by legacy ISA devices.
PCI/PNP ISA IRQ Resource Exclusion	Menu Item	Reserve the specific IRQs for use by legacy ISA devices.

PCI Device, Slot # 1 & 2

You can use this screen to select options for the PCI Device, Slot # 1 & 2 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		
PCI Device, Slot # 1 & 2	2	
Option ROM Scan: Enable Master: Latency Timer	[Enabled] [Disabled] [0040h]	Item Specific Help
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description	
Ontion DOM Coon	Enabled	Initialize device expansion	
Option ROM Scan	Disabled	ROM.	
Enable Master	Enabled	Enable selected device as a	
	Disabled	PCI bus master.	
Latency Timer	0020h		
	0040h		
	0060h	Minimum guaranteed time	
	0080h	slice allotted for bus master in	
	00A0h	units of PCI bus clocks.	
	00C0h		
	00E0h		

LAN Control

You can use this screen to enable/disable Onboard LAN and their $\ensuremath{\mathsf{Option}}\xspace$ ROMs .

PhoenixBIOS Setup Utility		
LAN Control		
Enable LAN	[Enabled]	Item Specific Help

Enab Enab	le LAN1 OPROM le LAN1 OPROM	[Enabled] [disabled]	
F1: Help Esc: Exit F10: Previ	1 ↓ : Select Item -/+ ← →: Select Screen ious Values	: Change Values F9: Enter: Select ► Sub-M	Setup Defaults lenu

PCI/PNP ISA UMB Region Exclusion

You can use this screen to select options for the PCI/PNP ISA UMB 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		
PCI/PNP ISA UMB	Region Exclusion	
C800-CBFF: CC00-CFFF:	[Available] [Available]	Item Specific Help
D000-D3FF: D400-D7FF: D800 DBEE:	[Available] [Available] [Available]	
DC00-DFFF:	[Available]	
F1: Help $\uparrow \downarrow$: Select Item Esc: Exit $\leftarrow \rightarrow$: Select Scr F10: Previous Values	r -/+: Change Values F9: Setup E reen Enter: Select ▶ Sub-Menu	Defaults

Feature	Option	Description
C800-CBFF, CC00-CFFF	Available	Reserves the specified block
D800-D8FF, DC00-DFFF	Reserved	legacy ISA devices.

PCI/PNP ISA IRQ Resource Exclusion

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		
PCI/PNP ISA IRQ Resource Exclusion		
IRQ3 IRQ4 IRQ5: IRQ7 IRQ9 IRQ10 IRQ11 IRQ15 Indicates a DMA, interrupt, I/O, or memory resource conflict with another device.	[Available] [Available] [Available] [Available] [Available] [Available] [Available] [Available]	Item Specific Help
F1: Help ↑ ↓ : Select Item -/+ Esc: Exit ← →: Select Screen F10: Previous Values	: Change Values F9: Setup D Enter: Select > Sub-Menu	Defaults

Feature	Option	Description
	Available	Reserves the specified IRQ for
IRQ3/4/5/7/9/10/11/15	Reserved	use by legacy ISA devices.

3.4.4 - IDE Configuration Sub-Menu

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

PhoenixBIOS Setup Utility		
IDE Configuration Sub-Menu		
Large Disk Access Mode:	[Dos] [Disabled]	Item Specific Help
Local Bus IDE adapter:	[Both]	
 Primary Master Primary Slave Secondary Master Secondary Slave 		
Indicates a DMA, interrupt, I/O, or memory resource conflict with another device.		
F1: Help ↑ ↓ : Select Item -/+: Char Esc: Exit ← →: Select Screen Enter: F10: Previous Values	nge Values F Select ▶ Sub	9: Setup Defaults o-Menu

Feature	Option	Description
Larga Disk Agages Made	DOS	Solast the IDE seeses made
Large Disk Access Mode	Other	Select the IDE access mode.
SMART Dovice Monitoring	Disabled	IDE failure prediction
SMART Device Molilioning	Enabled	IDE failure prediction.
	Both	-
Local Bus IDE adapter	Disabled	Enable the integrated local
	Primary	bus IDE adapter.
	Secondary	
Primary Master/Slave	Menu Item	Configure the IDE channel.
Secondary Master/Slave	Menu Item	Configure the IDE channel.

Primary Master/Slave, Secondary Master/Slave

The following screen shows the information of IDE device.



Primary Master/Slave, Secondary Master/Slave		
Туре:	[Auto]	Item Specific Help
Multi-Sector Transfers: LBA Mode Control: 32 Bit I/O: Transfer Mode: Ultra DMA Mode:	[Disabled] [Disabled] [Disabled] [Standard] [Disabled]	
F1: Help ↑↓: Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description	
Multi Contor Tropoforo	Disabled	Specify the number of sectors	
	Enabled	transfer.	
L BA Mada Control	Disabled	Enabling LBA causes Logical Block Addressing to be used	
LBA Mode Control	Enabled	in place of Cylinders, Heads_Sectors.	
32 Bit I/O	Disabled	This setting enables or disciples 22 bit IDE data	
	Enabled	transfers.	
Standard Standard		Select the method for moving	
	Fast PIO 1	data to/from the drive.	
Liltro DMA Mode	Disabled	Select the Ultra DMA mode	
	Enabled	the drive.	

3.4.5 - Floppy Configuration Sub-Menu

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		
Floppy Configuration Sub-Me	enu	
Legacy Diskette A: Legacy Diskette B:	[1.44/1.25MB 3 ¹ / ₂ "] [Disabled]	Item Specific Help
Indicates a DMA, interrupt, I/O, or memory resource conflict with another device.		
F1: Help ↑↓: Select Item -/+: Cl Esc: Exit ← →: Select Screen En F10: Previous Values	nange Values F9: Setu ter: Select ► Sub-Menu	ıp Defaults

Feature	Option	Description
Legacy Diskette A/B	Disabled	
	360kb 5 ¹ / ₄ "	
	1.2MB 5 ¹ / ₄ "	Select floppy type
	720kb 3 ¹ / ₂ "	
	1.44/1.25 MB	
	3 ¹ / ₂ "	
	2.88MB 3 ¹ / ₂ "	

3.4.6 - I/O Device Configuration Sub-Menu

You can use this screen to select options for the I/O Device 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			
I/O Device Configuration Sub-Menu			
Serial port A: [Auto] Item Specific Help			

Serial port B: Mode: Parallel port: Mode: Floppy disk controller: Base I/O address	[Auto] [Normal] [Auto] [ECP] [Disabled] [Primary]	
F1: Help ↑↓: Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description	
Sorial port A	Auto	Configure serial port A using	
Senar port A	Disabled	options.	
Sorial part B	Auto	Configure serial port B using	
Senal port B	Disabled	options.	
	Normal	Sat the mode for Sorial part P	
Mode	IR	Set the mode for Senai port B	
	ASK-IR	using options.	
Parallal part	Auto	Configure parallel port using	
Farallel port	Disabled	options.	
	Output Only		
Mada	Bi-directional	Set the mode for parallel port	
Mode	EPP	using options.	
	ECP		
Floppy disk controller	Enabled	Configuro Eloppy dick	
	Disabled	controller using options	
	Auto	controller dsing options.	
Base I/O address	Primary	Set the base I/O address for	
	Secondary	parallel port.	

3.4.7- Hardware Monitor Sub-Menu

You can use this screen to hardware monitor infomation. 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		
Hardware Monitor Sub-Menu		
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CPUx Temperature Sysx VRM temperature	xxC xxC xxxxRPM	Item Specific Help
System Fanx Speed CPUx VDD Voltage +12V +12V CPU Board +5v +5v CPU Board +3.3V AMD8131 Vcore 1.8V CK804 Vcore 1.5V	xxxxRPM x.x V x.xV x.xV x.xV x.xV x.xV x.xV x.x	
F1: Help ↑↓: Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

3.4.8 – Console Redirection Sub-Menu

You can use this screen to select options for the Console Redirection 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		
Console Redirection Sub-Me	nu	
Com Port Address	[Disabled]	Item Specific Help
Baud Rate Console Type Flow Control Console connection Continue C.R. after POST	[19.2] [PC-ANSI] [CTS/RTS] [Direct] [off]	

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F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values

Feature	Option	Description	
	Disabled		
	On-board		
Com Port Address	COMA	Select the Com Port address.	
	On-board		
	COMB		
	300	-	
	1200	-	
	2400		
Baud Rate	9600	Enable the specified baud	
	19.2K	rate.	
	38.4K	-	
	57.6K	-	
	115.2K		
	VI100	-	
	VI100,8bit		
Console Type	PCI-ANSI,7bit	Enable the specified console	
	PCI-ANSI	type.	
	VI-UIF8		
	CTS/RTS		
Flow Control	XON/XOFF	Enable flow control.	
	None		
Console connection	Direct	Indicate whether the console is connected directly to the	
	Via modem	system or a modem is used to connect.	
Continuo C. P. offer POST	Off	Enable Console Redirection	
Commue C.K. after POST	On	after OS has loaded.	
	-		

3.4.9 – Watchdog Timer Option Sub-Menu

You can use this screen to select options for the Watchdog 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	
Watchdog Timer Option Sub-Menu	

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Watchdog Timer Time Out Minutes	[Disabled] [1]	Item Specific Help
	L 'J	
F1: Help $\uparrow \downarrow$: Select Item -/+: Ch Esc: Exit $\leftarrow \rightarrow$: Select Screen Ente F10: Previous Values	ange Values F er: Select ► Sub	9: Setup Defaults 9-Menu

Feature	Option	Description
Watabdag Timor	disabled	Enable/disable Watchdog
watchdog rimer	enabled	Timer
Time_Out Minutes	1~255	Watchdog Time_Out configuration in Minutes(1- 255)

3.50 - BIOS Memory Menu

This menu has options for memory speed & latency. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

PhoenixBIOS Setup Utility		
Cache Ram System Memory: Extended Memory: Memory Cache: Cache System BIOS area: Cache Video BIOS area: Cache Base 0-512k: Cache Base 0-512k: Cache Base 512k-640k: Cache Extended Memory Area: Cache A000 – AFFF: Cache Extended Memory Area: Cache B000 – BFFF Cache C800 – CBFF: Cache C800 – CBFF: Cache C000 – CFFF: Cache D000 – D3FF: Cache D400 – D7FF: Cache D400 – D7FF: Cache D800 – DBFF: Cache D800 – DBFF: Cache E000 – E3FF: Cache E400 – E3FF: Cache E800 – E8FF: Cache E800 – E8FF:	[XXXX KB] [XXXX KB] [XXXX KB] [uncached] [uncached] [uncached] [uncached] [uncached] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled]	Item Specific Help
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description
Mamany Casha	Disabled	Set the state of memory
Memory Cache	Enabled	cache.
Cache A000-AFFF	Disabled	Control caching of the memory

Cache B000-BFFF	USHC	blocks.
	Write Through	
	Write Protect	
	Write Back	
Cache C800-CBEE	Disabled	
~	Write Through	Control caching of the memory
Cache EC00-EFFF	Write Protect	blocks.
	Write Back	

3.60 - Security Menu

This menu has options for the Security options. 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		
Supervisor Password Is: User Password Is:		Item Specific Help
Set Supervisor Password Set User Password		
Fixed disk boot sector: Diskette access:	[Normal] [User]	
Virus check reminder: System backup reminder:	[Disabled] [Disabled]	
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description
Decoward on boot	Disabled	Enable password entry on
Password on boot	Enabled	boot.
Fixed disk boot sector	Normal	Write protects boot sector on
	Write Protect	viruses.
Diskette access	User	Control access to diskette

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	Supervisor	drives.
Virus check reminder	Disabled	Display reminder message at
	Daily	1 st of every month).
System back reminder	Disabled	Display reminder message at
	Daily	1 st of every month).

3.70 - BIOS Boot Menu

This menu has options for the Boot Device Priority. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

Phoenix	PhoenixBIOS Setup Utility		
QuickBoot Mode: Boot-time Diagnostic Screen Summary screen POST Errors: • Boot Device Priority	[Disabled] [Disabled] [Disabled] [Enabled]	Item Specific Help	
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values			

Feature	Option	Description
Owiek De et Me de	Disabled	Allow the system to skip
	Enabled	certain tests while booting.
Boot-time Diagnostic Screen	Disabled	Display the diagnostic screen
	Enabled	during boot.
Summary screen	Disabled	Display system configuration
	Enabled	on boot.
DOST Erroro	Enabled	Display system configuration
FUST EIIUIS	disabled	on boot.

Boot Device Priority	Menu Item	Select the search order for the types of boot devices.
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3.7.1 - Boot Device Priority

You can use this screen to select options for the Boot Device Priority settings. Follow the "Item Specific Help" on the right side to select, move or enable the item.

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.

3.80 - Power Menu

This menu has options for the Power management. 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		
Enable ACPI Resume On Time Resume Time : Resume Date : Resume On Modem Ring Power Button Off Spread Spectrum After Power Failure AMD Power Now	[Yes] [Off] [00:00:00] [00/00/0000] [Off] [Enabled] [Disabled] [Last State] [Disabled]	Item Specific Help
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values		

Feature	Option	Description
Rosumo On Timo	Off	Enable wakes the system up
Resulte Off Time	On	at a specific time.
Resume Time	00:00:00	Specify the time when the system is to wake up
Resume Date	00/00/0000	Specify the date when the system is to wake up
	Off	Enable wakes the system up
Resume On Modem Ring	On	when an incoming call is detected on your modem
Power Button Off	Enabled	Enable will let power button possible to shutdown the system in legacy OS without holding for 4 seconds
	Disabled	Disable will force 4 second power button to shutdown the system.
Spread Spectrum	Enabled	Enable or disable Spread spectrum.
	Disabled	

After Power Failure	Last State	Sets the mode of operation if an AC/Power Loss occurs. The two modes are:
	Stay Off	Disabled keep the power off
	Power On	The Disabled choice turns off Resume on Modem Ring.
	Enabled	Enable or disable AMD Power
	Disabled	Now.

3.90 - BIOS Exit Menu

This menu has options for the Exit Priority. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

Phoenix	BIOS Setup Utility		
Exit Saving Charges		Item Specific Help	
Load Setup Defaults Discard Changes Save Changes		Exit System Setup and save your changes to CMOS.	
F1: Help ↑ ↓ : Select Item -/+: Change Values F9: Setup Defaults Esc: Exit ← →: Select Screen Enter: Select ▶ Sub-Menu F10: Previous Values			

Exit Saving Changes

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

Exit Discarding Changes

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

Load Setup Defaults

Use this option to load default setup values.

Discard Changes

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

Save Changes

Use this option to restore all new setup values that you have made and saved in CMOS.

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

CPU, Memory, Video

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

4.10 Beep Codes

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

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

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

4.20 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: <u>http://www.tyan.com</u>

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

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

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

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

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

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

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

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

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

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

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead

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of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

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

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

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

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

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

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

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

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

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN's BIOS updates can be found at http://www.tyan.com

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

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



Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Appendix II: BIOS POST Code

Code	Beeps / Description	Code	Beeps / Description
02h	Verify Real Mode	3Ah	Autosize cache
03h	Disable Non-Maskable Interrupt (NMI)	3Ch	Advanced configuration of chipset registers
04h	Get CPU type	3Dh	Load alternate registers with CMOS values
06h	Initialize system hardware	42h	Initialize interrupt vectors
08h	Initialize chipset with initial POST	45h	POST device initialization
	values		
09h	Set IN POST flag	46h	2-1-2-3. Check ROM copyright notice
0Ah	Initialize CPU registers	48h	Check video configuration against CMOS
0Bh	Enable CPU cache	49h	Initialize PCI bus and devices
0Ch	Initialize caches to initial POST values	4Ah	Initialize all video adapters in system
0Eh	Initialize I/O component	4Bh	QuietBoot start (optional)
0Fh	Initialize the local bus IDE	4Ch	Shadow video BIOS ROM
10h	Initialize Power Management	4Eh	Display BIOS copyright notice
11h	Load alternate registers with initial POST values	50h	Display CPU type and speed
12h	Restore CPU control word during	51h	Initialize EISA board
4.01	warm boot	501	T
13h	Initialize PCI Bus Mastering devices	52h	
14n 4.0h	Initialize keyboard controller	54n	Set key click if enabled
16h	1-2-2-3. BIOS ROM checksum	58h	2-2-3-1. Test for unexpected interrupts
17h	autosize	59n	Initialize POST display service
18h	8254 timer initialization	5Ah	Display prompt "Press F2 to enter SETUP"
1Ah	8237 DMA controller initialization	5Bh	Disable CPU cache
1Ch	Reset Programmable Interrupt Controller	5Ch	Test RAM between 512 and 640 KB
20h	1-3-1-1. Test DRAM refresh	60h	Test extended memory
22h	1-3-1-3. Test 8742 KBD Controller	62h	Test extended memory address lines
24h	Set ES segment register to 4 GB	64h	Jump to UserPatch1
26h	Enable A20 line	66h	Configure advanced cache registers
28h	Autosize DRAM	67h	Initialize Multi Processor APIC
29h	Initialize POST Memory Manager	68h	Enable external and CPU caches
2Ah	Clear 512 KB base RAM	69h	Setup System Management Mode (SMM) area
2Ch	1-3-4-1. RAM failure on address	6Ah	Display external L2 cache size
2Eh	1-3-4-3. RAM failure on data bits of	6Bh	Load custom defaults (optional)
	low byte of memory bus		
2Fh	Enable cache before system BIOS shadow	6Ch	Display shadow-area message
30h	1-4-1-1. RAM failure on data bits of	6Eh	Display possible high address for UMB
	high byte of memory bus		recovery
32h	Test CPU bus-clock frequency	70h	Display error messages
33h	Initialize Phoenix Dispatch Manager	72h	Check for configuration errors
36h	Warm start shut down	76h	Check for keyboard errors
38h	Shadow system BIOS ROM	7Ch	Set up hardware interrupt vectors

Code	Beeps / Description	Code	Beeps / Description
7Eh	Initialize coprocessor if present	BAh	Initialize DMI parameters
80h	Disable onboard Super I/O ports and IRQs	BBh	Initialize PnP Option ROMs
81h	Late POST device initialization	BCh	Clear parity checkers
82h	Detect and install external RS232 ports	BDh	Display MultiBoot menu
83h	Configure non-MCD IDE controllers	BEh	Clear screen (optional)
84h	Detect and install external parallel ports	BFh	Check virus and backup reminders
85h	Initialize PC-compatible PnP ISA devices	C0h	Try to boot with INT 19
86h.	Re-initialize onboard I/O ports.	C1h	Initialize POST Error Manager (PEM)
87h	Configure Motherboard Devices	C2h	Initialize error logging
88h	Initialize BIOS Data Area	C3h	Initialize error display function
89h	Enable Non-Maskable Interrupts (NMIs)	C4h	Initialize system error handler
8Ah	Initialize Extended BIOS Data Area	C5h	PnPnd dual CMOS (optional)
8Bh	Test and initialize PS/2 mouse	C6h	Initialize notebook docking (optional)
8Ch	Initialize floppy controller	C7h	Initialize notebook docking late
8Fh	Determine number of ATA drives (optional)	C8h	Force check (optional)
90h	Initialize hard-disk controllers	C9h	Extended checksum (optional)
91h	Initialize local-bus hard-disk controllers	D2h	Unknown interrupt
92h	Jump to UserPatch2	E0h	Initialize the chipset
93h	Build MPTABLE for multi-processor boards	E1h	Initialize the bridge
95h	Install CD ROM for boot	E2h	Initialize the CPU
96h	Clear huge ES segment register	E3h	Initialize system timer
97h	Fixup Multi Processor table	E4h	Initialize system I/O
98h	1-2. Search for option ROMs.	E5h	Check force recovery boot
99h	Check for SMART Drive (optional)	E6h	Checksum BIOS ROM
9Ah	Shadow option ROMs	E7h	Go to BIOS
9Ch	Set up Power Management	E8h	Set Huge Segment
9Dh	Initialize security engine (optional)	E9h	Initialize Multi Processor
9Eh	Enable hardware interrupts	EAh	Initialize OEM special code
9Fh	Determine number of ATA and SCSI drives	EBh	Initialize PIC and DMA
A0h	Set time of day	ECh	Initialize Memory type
A2h	Check key lock	EDh	Initialize Memory size
A4h	Initialize Typematic rate	EEh	Shadow Boot Block
A8h	Erase F2 prompt	EFh	System memory test
AAh	Scan for F2 key stroke	F0h	Initialize interrupt vectors
ACh	Enter SETUP	F1h	Initialize Run Time Clock
AEh	Clear Boot flag	F2h	Initialize video
B0h	Check for errors	F3h	Initialize System Management Mode
B2h	POST done - prepare to boot operating system	F4h	Output one beep before boot

Code	Beeps / Description	Code	Beeps / Description
B4h	One short beep before boot	F5h	Boot to Mini DOS
B5h	Terminate QuietBoot (optional)	F6h	Clear Huge Segment
B6h	Check password (optional)	F7h	Boot to Full DOS
B9h	Prepare Boot		

Technical Support

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

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

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

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

Help Resources:

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

Returning Merchandise for Service

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

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



Notice for the USA

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

Operation is subject to the following conditions:

This device may not cause harmful interference, and

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

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver. Plug the equipment into an outlet on a circuit different from that of the receiver. Consult the dealer on an experienced radio/television technician for help.

Notice for Canada

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

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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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