Tomcat i7210 /// S5112

Revision 1.00

Table of Contents

Before you begin…

Check the box contents!
The retail motherboard package should contain the following:


1x Tomcat i7210 S5112 motherboard


1x 34-Pin floppy drive cable


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


1x Tomcat i7210 S5112 User's Manual


1x Tomcat i7210 S5112 Quick Reference Guide


1x TYAN driver CD


1x I/O shield


1 x Serial ATA driver diskette


1 x Serial ATA RAID driver diskette


3 x Serial ATA power cable

6 x Serial ATA data cable


1 x USB2.0 cable

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 one of the most powerful server solutions for the Intel Pentium® 4 processor, the Tomcat i7210 S5112 based on the Intel E7210 chipset. The Tomcat i7210 S5112 is an ATX form factor server board and features two onboard Gigabit Ethernet ports, six Serial ATA RAID ports, two 64-bit PCI-X 66MHz slots, and an onboard ATI 8MB PCI RAGE XL controller. This platform also offers convenient remote Intelligent Platform Management Interface (IPMI) monitoring through Tyan's optional Server Management Daughter Card.

Remember to visit Tyan's website at http://www.tyan.com. There, you can find information on all of Tyan's products with up-to-date FAQs, a list of worldwide distributors, Tyan software utilities, the latest drivers, memory compatibility listings, and BIOS setting explanations.

1.2 – Hardware Specifications

Processors

- Single Intel Pentium4 "Northwood" or "Prescott" 800/533MHz FSB Processor
- Single ZIF PGA478 Socket
- Onboard VRM10

Chipset

- Intel's Canterwood ES (E7210) chipsets
  - E7210 (North Bridge)
  - Hance Rapids (6300ESB)
- Winbond W83627HF Super I/O chip

Expansion Slots

- Two PCI-X 66MHz slots
- Three 32bit/33Mhz PCI 2.2 slots

Memory

- Dual/Single memory channel up to four DDR DIMM sockets
- Supports ECC or non-ECC memory
- Registered Memory is NOT supported
- Up to 4GB of Unbuffered PC3200/2700 DDR modules

Integrated PCI Graphics

- ATI Rage XL PCI controller
- 8 MB Frame Buffer

Integrated PCI IDE (Hance Rapids)

- Up to two bus-master IDE channels
- Supports up to 4 ATA-100/66/33 IDE ATAPI compliant drives

Integrated LAN

- Up to two Gigabit onboard Ethernet LAN controllers
  - Intel 82547EI/GI CSA GbE NIC
  - Intel 82541EI/GI PCI GbE NIC

System Management

- Supports Tyan M3289 SMDC via 2x25pin-header
- On board Analog Devices ADM1027 H/W Monitoring chip
- Total seven 3-pin fan headers with tachometer monitoring and five of them with PWM control
- Chassis intrusion header
- Temperature and voltage monitoring
- IPMB connector
- Watchdog timer

Tyan 1U/2U Riser Support

- Supports Tyan M2033, M2037, M2037R and M2053 1U riser cards
- Supports Tyan M2042, M2043, M2043X and M2044 2U riser cards

Integrated SATA RAID (Hance Rapids)

- Two SB integrated SATA ports up to 1.5 Gbit/s
- Supports SATA RAID 0,1

Integrated SATA RAID Controller

- Silicon Image SiI3114 SATA controller
- Four 1.5Gbit/s SATA ports
- Supports SATA RAID 0, 1, 10

Integrated I/O Interface

- One floppy connector for up to two drives
- Two 9-pin UART serial support (one via an optional cable)
- One ECP/EPP/SPP parallel port header (via an optional cable)
- Four USB2.0 ports (2 front USB ports via an optional cable)
- PS/2 mouse & keyboard ports

BIOS

- Award BIOS 8Mbit flash ROM
- Supports ACPI 1.0, PnP, DMI 2.0
- Auto configuration of IDE hard disk types
- User settings of hardware monitoring
- Multiple boot options
- Power Management: ACPI S1, S3, S4 and S5

Form Factor

- ATX 2.03 (12”x9.6”, 305mm x 244mm)
- ATX 12V power connectors
- Optimized for 1U/2U rackmount or pedestal chassis
- Stacked Mouse/Keyboard Ports
- Stacked two USB ports
- One serial and one VGA ports
- Two side-by-side GbE RJ45 connectors

Regulatory

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

Software Specifications

OS (Operating System) Support

Microsoft Windows XP
Microsoft Windows 2000 Advanced Server
Microsoft Windows Server 2003
Microsoft Windows NT4.0
Red Hat 8.0, 9.0
SuSE Server 8.0
Other distributions of Linux pending validation

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

Chapter 2: Board Installation

Installation

You are now ready to install your motherboard. The mounting holes pattern of the Tomcat i7210 S5112 matches the ATX specification. Before continuing with installation, confirm that your chassis supports a standard ATX motherboard.

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

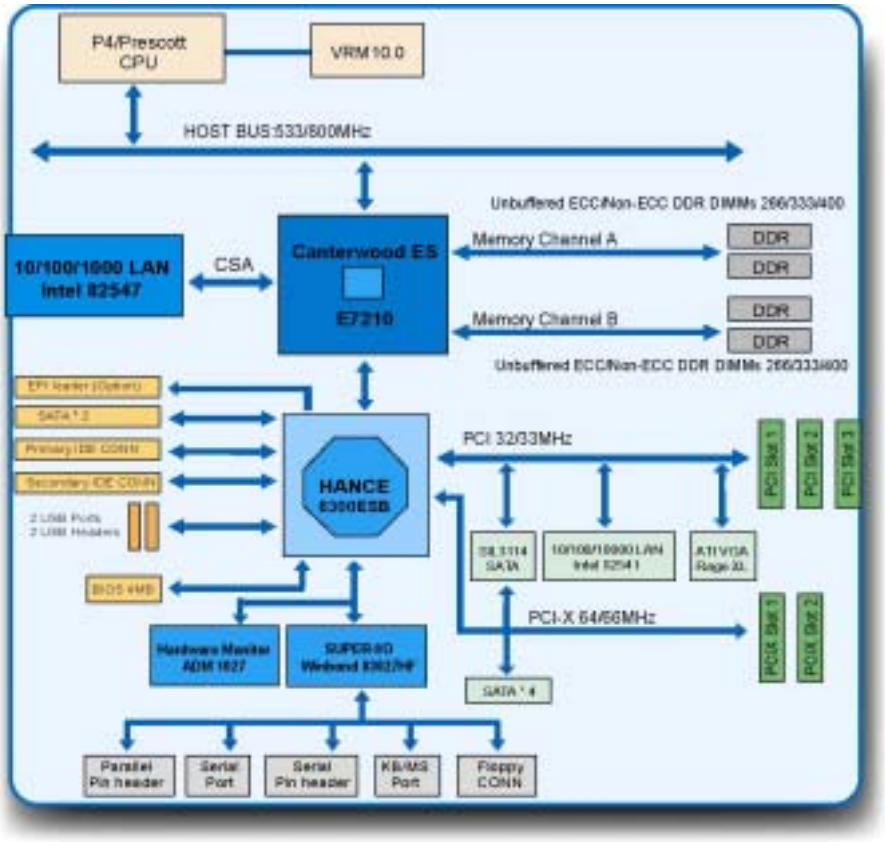
The first thing you should do read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(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

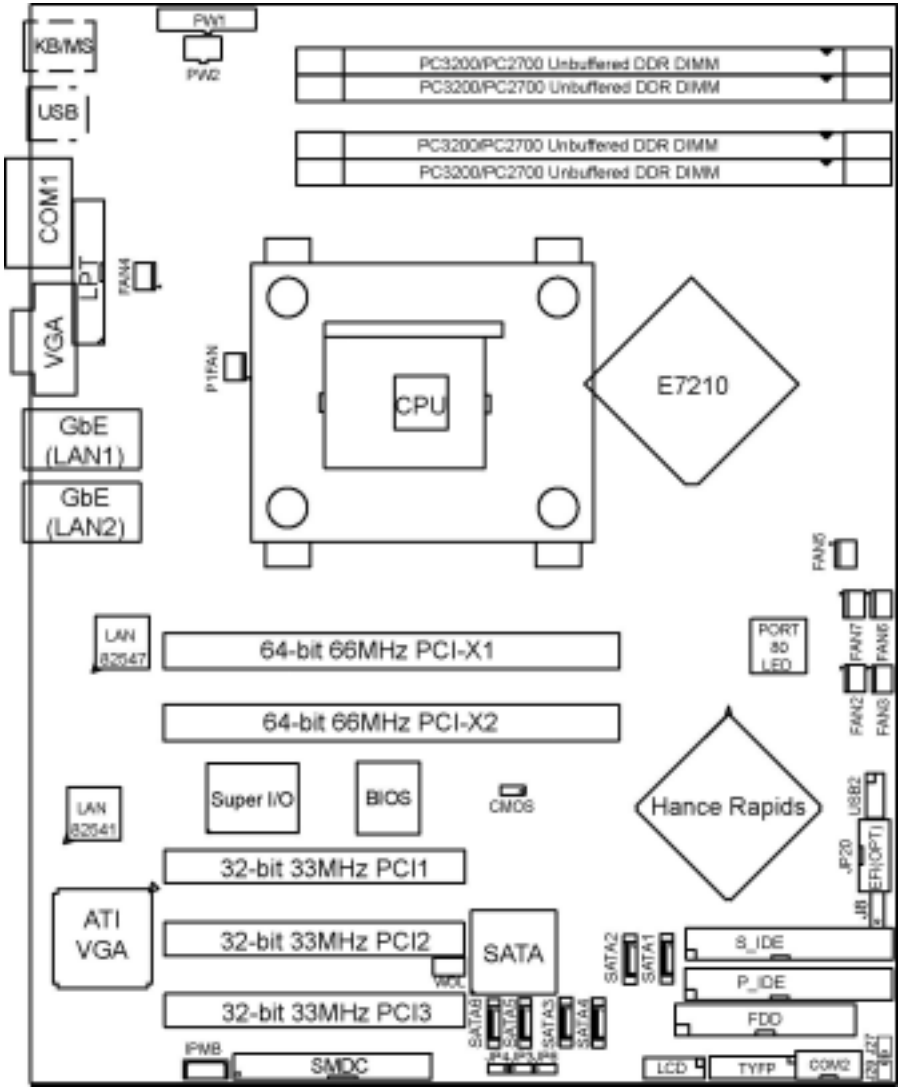
2.1 – Board Diagram



The above picture is purely representative. Due to engineering updates and new board revisions, certain components may change and or be repositioned. The picture above may or may not look exactly like the board you received.

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

2.2 – Board Parts



This jumper diagram 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 diagram. The board parts are not to scale.

2.3 – Jumper Settings & Definitions

Jumper / Connector	Function	Ref. Page
CMOS	CMOS Clear	See Section 2.3.1
P1FAN	CPU fan connector	See Section 2.3.2
FAN2	Chassis Fan Connector	See Section 2.3.2
FAN3	Chassis Fan Connector	See Section 2.3.2
FAN4	Chassis Fan Connector	See Section 2.3.2
FAN5	Chassis Fan Connector	See Section 2.3.2
FAN6	Chassis Fan Connector	See Section 2.3.2
FAN7	Chassis Fan Connector	See Section 2.3.2
COM2	COM2 connector	See Section 2.3.3
SMDC	SMDC Header	See Section 2.3.4
TYFP	TYAN Front Panel Connector	See Section 2.3.5
EFI	EFI Connector	See Section 2.3.6
USB2	USB Header	See Section 2.3.7
JP3	En/Disable Onboard VGA	See Section 2.3.8
JP4	En/Disable Onboard 82541 NIC	See Section 2.3.9
JP6	En/Disable SATA Controller	See Section 2.3.10
J8	External Speaker Header	See Section 2.3.11
J27	LAN1 LED Header	See Section 2.3.12
J29	LAN2 LED Header	See Section 2.3.12
SATA1 – SATA6*	Serial ATA RAID Connector	See Section 2.3.13

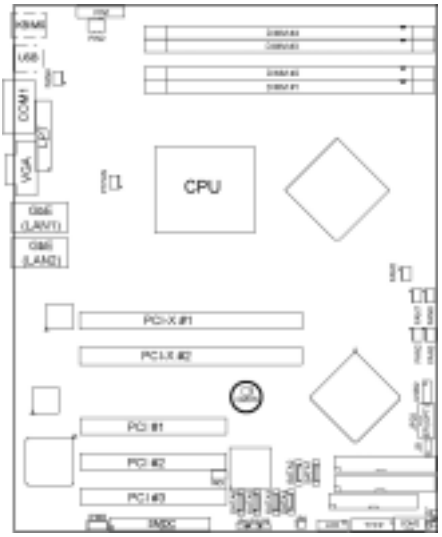
***SATA RAID (SATA3/SATA4/SATA5/SATA6) functions by Silicon Image SiI3114 chip.**

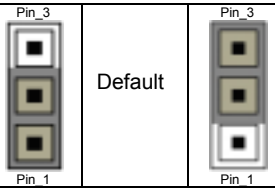
Jumper Example

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

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

2.3.1 - Clear CMOS Jumper



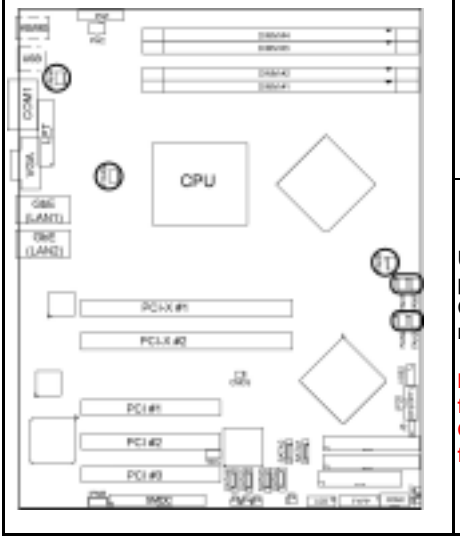


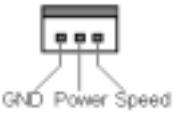
You can reset the CMOS settings by using this jumper if you have forgotten your system/setup password or need to clear system BIOS setting.

- Power off system and **disconnect both power connectors from the motherboard**
- Use jumper cap to close Pin_2 and Pin_3 for several seconds to Clear CMOS
- Put jumper cap back to Pin_1 and Pin_2 (default setting)

Reconnect power & power on system

2.3.2 - Fan Connectors (P1FAN, FAN2, FAN3, FAN4, FAN5, FAN6 and FAN7)

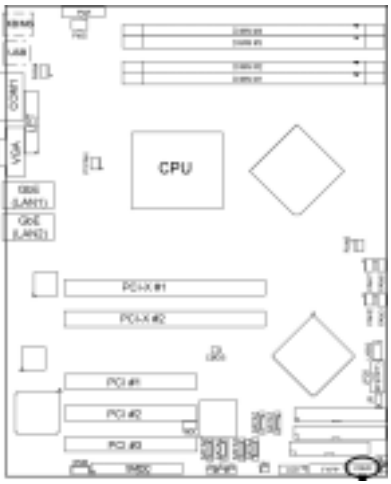




Use these headers to connect chassis and processor cooling fans to your motherboard. Cooling fans can keep the system stable and reliable for its product life.

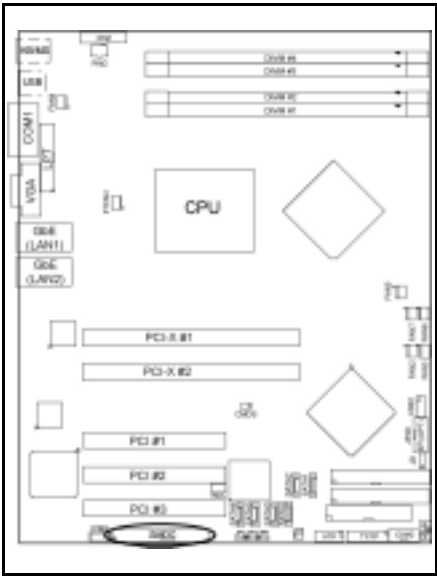
P1FAN connector can support up to 1.5A fans.
Other connectors can support up to 850mA fans.

2.3.3 - COM2 port (COM2, via a cable)



Signal	PIN #	PIN #	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	NC

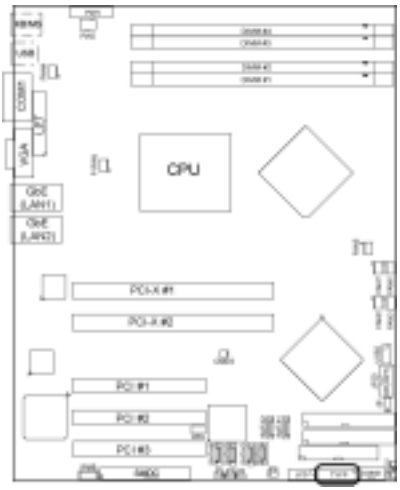
2.3.4 - SMDC Header

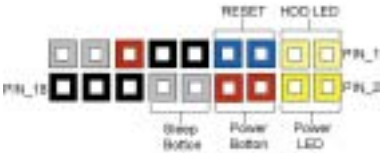


Connect Server Management Daughter Card (SMDC)
Compatible with Tyan M3289 (SMDC)
See Appendix III for details about the Tyan SMDC

2.3.5 – TYAN Front Panel Connector (TYFP)

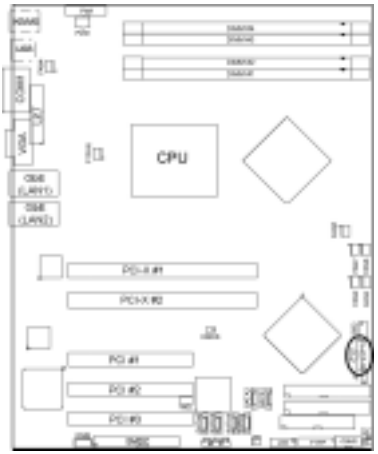
Your chassis will usually come with connectors to install onto the motherboard, such as HDD and Power LEDs. The TYAN Front Panel Connector (TYFP) has been implemented for such purposes.





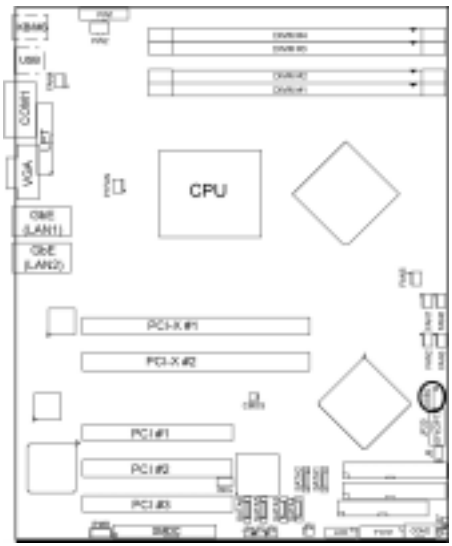
Function	PIN #	PIN #	Function
HDD LED+	1	2	PWR LED+
HDD LED-	3	4	PWR LED-
GND	5	6	SB3V
RESET	7	8	SWT_BTN
SB3V	9	10	NC
NMI	11	12	3.3V
SB5V	13	14	KEY
SMB DATA	15	16	Chassis Intru -
SMB CLK	17	18	Chassis Intru +

2.3.6 - EFI Connector (Reserved)



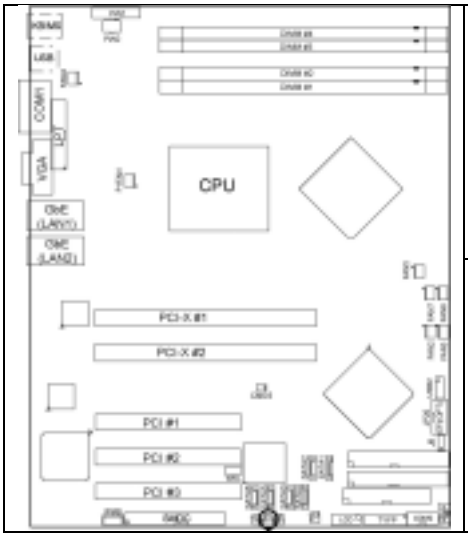
Function	PIN #	PIN #	Function
KEY	1	2	+12V
RXD	3	4	GND
TXD	5	6	+3.3V
USB+	7	8	USB-
GND	9	10	+5V

2.3.7 - Front USB Connector (USB2)



Signal Description	Pin #	Pin #	Signal Description
VCC	1	2	VCC
USB Channel_0 Data -	3	4	USB Channel_1 Data -
USB Channel_0 Data +	5	6	USB Channel_1 Data +
GND	7	8	GND
KEY	9	10	GND

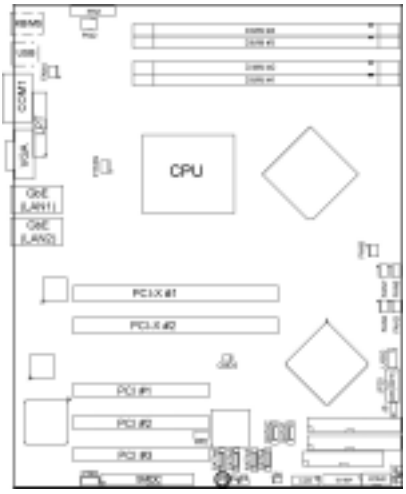
2.3.8 - Enable/Disable onboard ATI Rage XL graphics (JP3)



Enable (Default)

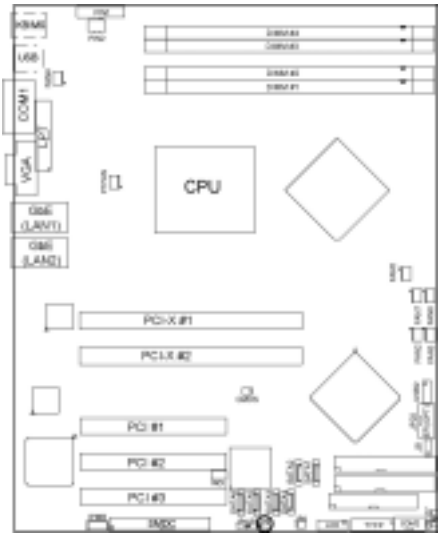
Disable

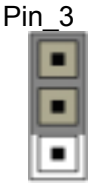
2.3.9 - Enable/Disable onboard 82541GI GbE NIC (JP4)



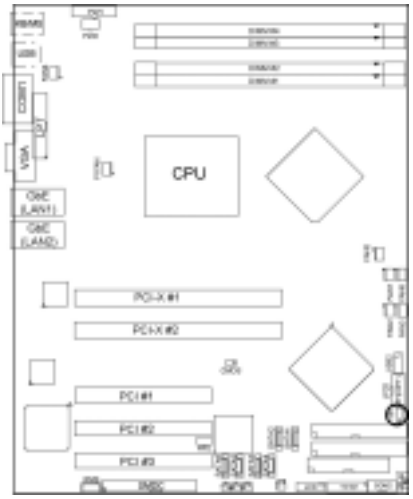
	Enable (Default)
	Disable

2.3.10 - Enable/Disable onboard SI3114 SATA Controller (JP6)



	Enable (Default)
	Disable

2.3.11 – External Speaker Header (J8)



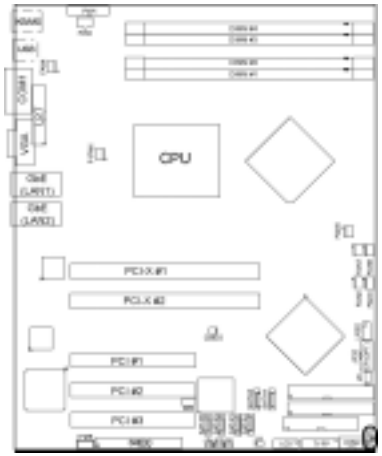
Pin_1: Speaker +

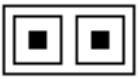
Pin_2: Buzzer -

Pin_3: Speaker -

Pin_4: Speaker -

2. 3.12 – Gigabit LAN1 LED Header (J27) & LAN2 LED Header (J29)

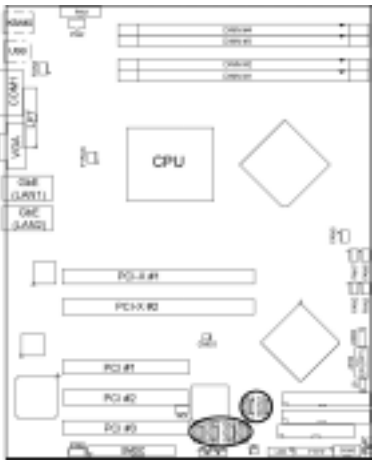


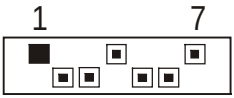


Pin_1 : SB3V
Pin_2 : LINK- /ACT-

Description	**Left LED (ACTIVITY)**	**Right LED (SPEED)**
No Link	OFF	OFF
Linked at 10 Mbps	Green	OFF
Linked at 100 Mbps	Green	Green
Linked at 1000 Mbps	Green	Yellow
Activity at any speed	Blink Green	

2.3.13 - Serial ATA Connectors (SATA1 & SATA2 & SATA3 & SATA4 & SATA5 & SATA6)
SATA1/SATA2 (from Hance Rapids): RAID0, 1 function is supported
SATA3/SATA4/SATA5/SATA6 (from Silicon Image Sil3114 chip): RAID0, 1, 10 function is supported.





Pin	1	2	3	4	5	6	7
Signal	GND	TXP	TXN	GND	RXN	RXP	GND

Supports Serial ATA devices

For information regarding the setup of SATA/RAID, you may search the content of the driver CD that shipped with your motherboard or refer to our website at: HTTP://WWW.TYAN.COM

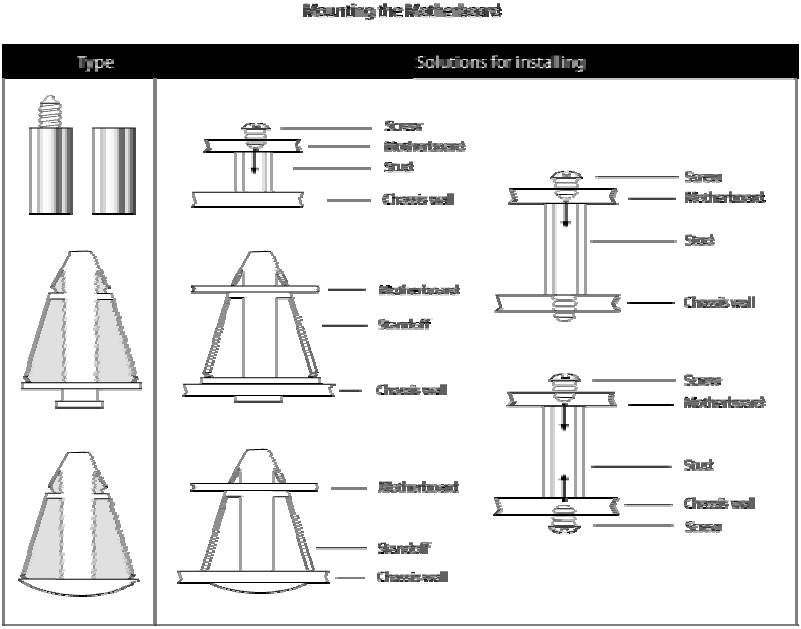
2.4 – Mounting the Motherboard

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

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

- **Memory Type**: The Tomcat i7210 S5112 supports unbuffered ECC and non-ECC type memory modules. **Registered Memory is NOT supported**.

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

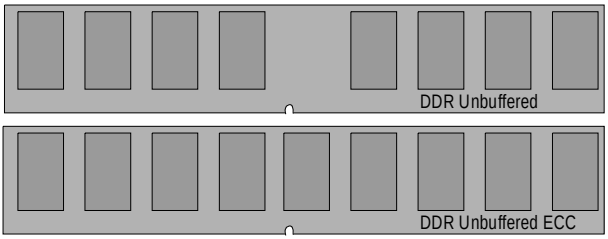


TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.5 – Installing the Memory

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

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



Here are a few key points to note before installing memory into your Tomcat i7210 S5112:

- 128MB, 256MB, 512MB and 1GB unbuffered ECC and non-ECC PC2100/PC2700/PC3200 DDR memory modules are supported
- All installed memory will be automatically detected - no need to set any jumpers
- The Tomcat i7210 S5112 supports up to 4GB of memory
- **Registered Memory is NOT supported**.
- You can install either single- or double-sided modules on this board. Each DIMM can work respectively for single-channel mode and dual-channel mode. Please note that the same type and density memory modules are necessary while using dual-channel DDR, otherwise it may cause system instability.
  Please refer to the following table for detailed dual-channel DDR.

Dual-Channel Mode	Channel A		Channel B		System Density
	DIMM1 (Blue)	DIMM2 (Black)	DIMM3 (Blue)	DIMM4 (Black)	
Two DIMM Symmetrical Population	✓		✓		256MB~2GB
Two DIMM Symmetrical Population		✓		✓	256MB~2GB
Four DIMM Symmetrical Population	✓	✓	✓	✓	512MB~4GB

Note
1. ✓: Installing128MB~1GB Memory modules
2. Symmetrical DIMMs must be identical
   - Same DRAM Technology, eg 128M-bit, 256-bit, etc.
   - Same DRAM bus width, eg x8 or x16
   - Matched Sided DIMMs (Single Sided or Double Sided)

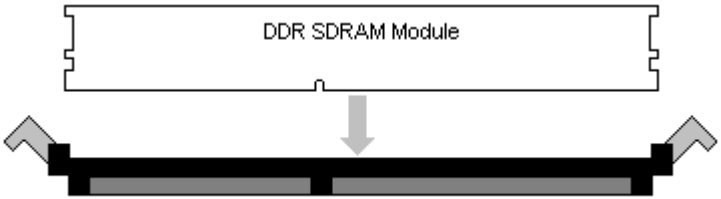
- **Supported System Bus Frequency and Memory Speed Combinations**

To use this type of DIMM…	The processor's system bus frequency must be…
DDR400	800MHz
DDR333	*800MHz or 533MHz
*When using an 800MHz system bus frequency processor, DDR333 memory is clocked at 320MHz. This minimizes system latencies to optimize system throughput.	

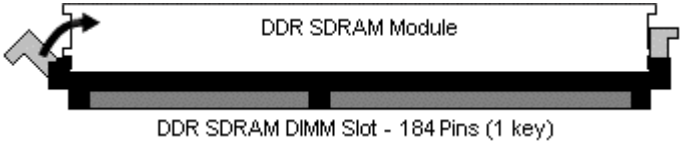
NOTE:
While using ECC type memory, it will take longer time to post. Due to the manner in which it counts the memory and has to write zero's to every bit of the DDR module before progressing through the POST.

2.6 – Memory Installation Procedure

When installing memory modules, make sure the modules align properly with the memory socket. There should be keys (small indents) on your memory modules that fit according to the keys in the memory socket. DDR modules and sockets have only one key, which is slightly near the center of the module/socket. The method of installing memory modules is detailed in the following diagrams.



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



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

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

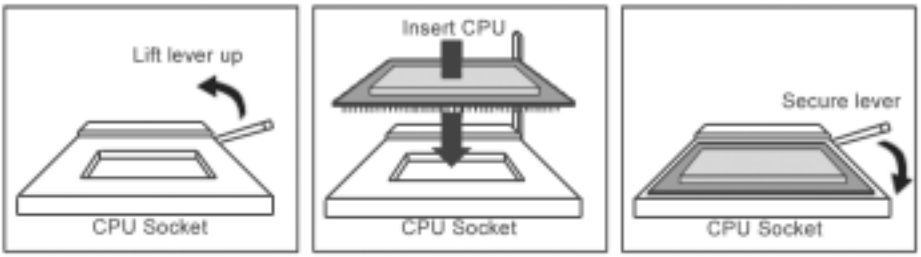
Note: You **MUST** unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion device

2.7 – Installing the Processor and Heatsink

Your Tomcat i7210 S5112 supports the latest processor technologies from Intel. Check the following page on TYAN's website for latest processor support:

http://www.tyan.com

The following diagrams will detail how to install your processor:



The 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.

1. **Lift the lever on the socket until it is approximately 90° or as far back as possible to the socket.**
2. Align the processor with the socket. There are keyed pins underneath the processor to ensure that the processor's installed correctly.
3. Seat the processor firmly into the socket by gently pressing down until the processor sits flush with the socket.
4. Place the socket lever back down until it locks into place.
5. Your processor is installed.

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

Heatsink Installation

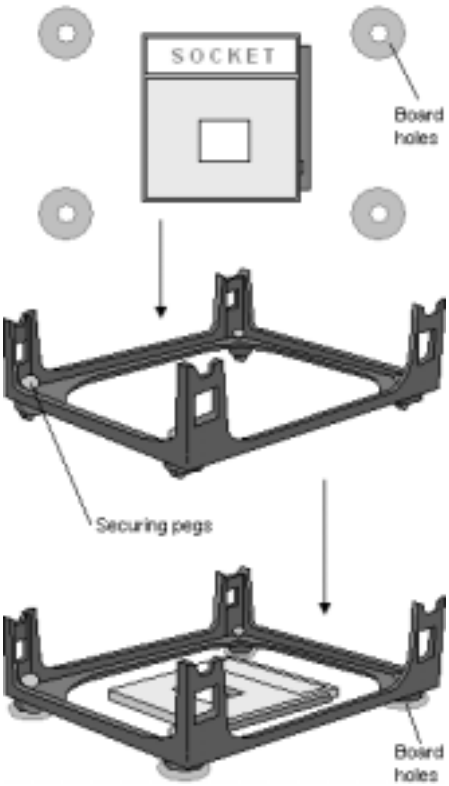
After you are done installing the processor, you should proceed to installing the heatsink. Heatsink will ensure that the processor not overheat and continue to operate at maximum performance for as long as you own them. An overheated processor is dangerous to the health of the motherboard.

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

Heatsink Installation

After you are done installing the processor, you should proceed to installing the heatsink. The heatsink will ensure that the processor does not overheat, and will continue to operate at maximum performance. An overheated processor is also dangerous to the long-term reliability of the motherboard.

The following diagram will illustrate how to install the most common heatsinks:



Install the mounting bracket onto the motherboard by aligning the bracket with the four holes around the processor socket. Once the bracket is aligned, press down on the four white pegs on the bracket until they insert securely, locking the bracket onto the motherboard. Then proceed to installing the heatsink. Instructions on how to install heatsinks should be provided with the heatsink itself.

First, use thermal compound (also called heatsink compound or thermal grease) and apply a small amount on to the processor's core – the small shiny square in the center of the processor.

You may then use a small soft plastic tool, like a credit card to gently smear a thin layer of heatsink compound as evenly as you can across the core. In most cases, you don't need to do this but it may help.

Then, at an angle, clip one side of the heatsink onto the socket and then lay the heatsink flat onto the processor. Then clip the other end of the heatsink down either with your finger or by using a flathead screwdriver.

Some heatsinks have a small clip on the inside of one of the clips which you can insert a small flathead screw driver into to secure the heatsink.

In most cases, either side of the heatsink can be clipped down last, but usually, the side of the socket where it is raised, secures last.

Because one side of the socket is raised (and usually has "SOCKET" imprinted into it) heatsinks have an indent on one side to secure flush with the raised side of the socket.

Be sure to carefully observe which side your heatsink is seated before securing it down to avoid damaging the processor, the heatsink or both.

Finishing Installing the Heatsink

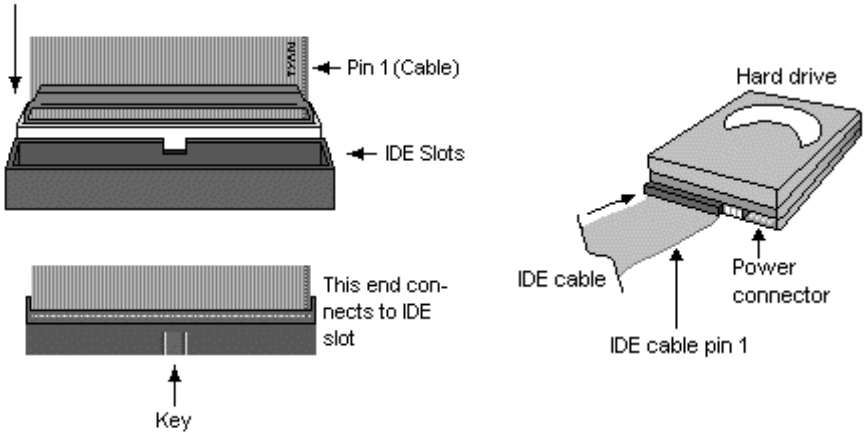
After you finish installing the heatsink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heatsink) to the motherboard. The following diagram illustrates how to connect fans onto the motherboard.

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

2.8 – Attaching Drive Cables

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

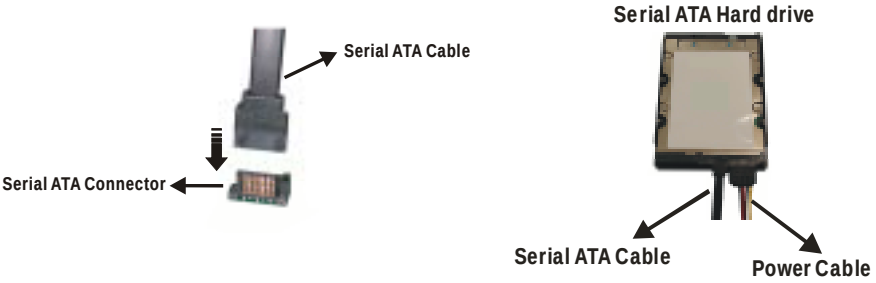


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard.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

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

Serial ATA

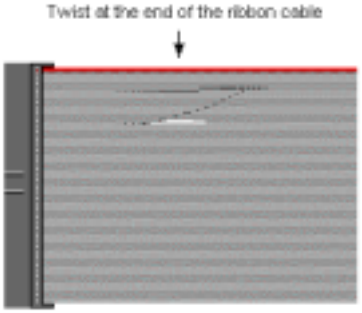
Attaching Serial ATA cables to the Serial ATA connectors is illustrated below:



Simply plug in the BLACK END of the Serial ATA cable into the motherboard Serial ATA connector, and the other end(s) into the drive(s). Each standard Serial ATA cable has two connectors. Both BLACK ENDS of the Serial ATA cable are the same that are used to connect to drives or motherboard.

Floppy Drives

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



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

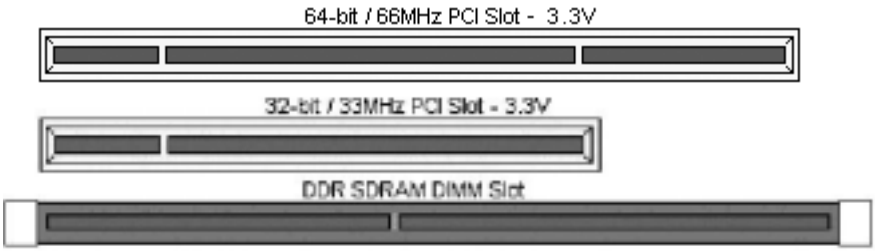
Refer to your floppy drive's installation instructions (if available), or contact your dealer if you are unsure about how to attach the floppy drive(s). Remember, you can only have 2 floppy drives connected at any given time.

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

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

2.9 – Installing Add-In Cards

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



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

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

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

2.10 – 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, mouse, and printer cables. The following diagram will detail the ATX port stack for the following board:

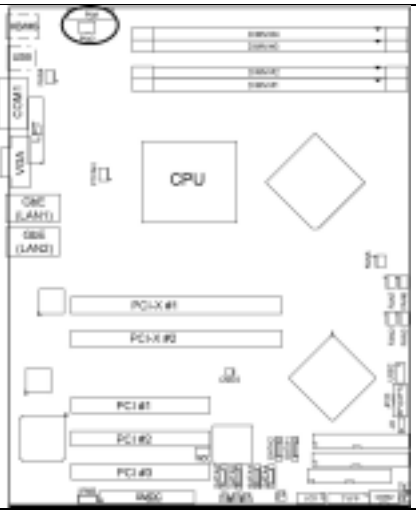
Tomcat i7210 S5112

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

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

2.11 – Installing the Power Supply

There are two power connectors on this motherboard. By default, this motherboard requires that you have an ATX12V power supply that has the standard ATX-style 20-pin connector, as well as an additional 4-pin square connector. The CPU power is provided by the onboard switching voltage regulator, which is sourced by +12V power. This +12V CPU power source is from the onboard 4-pin square connector. The +12V power on the 20-pin ATX power connector is for system board and separated from CPU +12V regulator power source. Therefore, the CPU will not be powered if you do not connect the 4-pin square ATX 12V power connector.



PW1: 20-pin main power connector

PW2: 4-pin +12V power connector

NOTE

YOU MUST unplug the power supply before plugging in the 20-pin and 4-pin power cables to motherboard connectors.

2.12 – 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

Installation

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. This chapter describes different settings for the BIOS 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 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 when the power is turned off.

This motherboard's BIOS is a customized version of the industry-standard BIOS for IBM PC AT-compatible personal computers. The BIOS provides critical, low-level support for the system's central processing unit (CPU), memory, and I/O subsystems.

This BIOS has been customized by adding important features such as password protection, power management, and chipset "tuning" features that control the system. This section will guide you through the process of configuring the BIOS for your system setup.

Starting Setup

The BIOS is immediately activated when you turn on the computer. The BIOS reads system configuration in CMOS RAM and begins the process of checking out the system and configuring it through the Power-On-Self-Test (POST).

When these preliminary tests are complete, the BIOS searches for an operating system on one of the system's data storage devices (hard drive, CD-ROM, etc). If one is found, the BIOS will launch that operating system and hand control over to it. You can enter the BIOS setup by pressing the [**Delete**] key when the machine boots up and begins to show the memory count.

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	Change from one menu to the next
Up/Down Arrow Keys	More between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Change settings.

Getting Help

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

In Case of Problems

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

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

Setup Variations

Not all systems will 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: On the following pages, options written in **bold type** represent the BIOS Setup default.

3.1 – Main BIOS Setup

When you enter Phoenix - AwardBIOS CMOS Setup Utility, the following screen will appear as below:

Phoenix – AwardBIOS CMOS Setup Utility

► Standard CMOS Features	► Frequency/Voltage Control
► Advanced BIOS Features	Load Fail-Safe Defaults
► Advanced Chipset Features	Load Optimized Defaults
► Integrated Peripherals	Set Supervisor Password
► Power Management Setup	Set User Password
► PnP/PCI Configurations	Save & Exit Setup
► PC Health Status	Exit Without Saving
Esc: Quit	↑↓←→: Select Item
F10: Save & Exit Setup	
Time, Date, Hard Disk Type…	

Standard CMOS Features
Use this menu for basic system configuration.

Advanced BIOS Features
Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PnP / PCI Configuration
This entry appears if your system supports PnP / PCI.

PC Health Status
Use this menu to show your system temperature, speed and voltage status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Supervisor / User Password
Use this menu to set User and Supervisor Passwords.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.

Exit Without Save
Abandon all CMOS value changes and exit setup.

3.2 – Standard CMOS Features

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. User can Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Phoenix – AwardBIOS CMOS Setup Utility

Standard CMOS Features

Date (mm: dd: yy)	Thu, Apr 3 2003	Item Help
Time (hh: mm: ss)	13: 31: 30	
►IDE Channel 0 Master	[None]	Menu Level ►
►IDE Channel 0 Slave	[None]	
►IDE Channel 1 Master	[None]	Change the day, month, year and century
►IDE Channel 1 Slave	[None]	
►IDE Channel 2 Master	[None]	
►IDE Channel 3 Master	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Video	[EGA/VGA]	
Halt On	[All Errors]	
Based Memory	640K	
Extended Memory	64512K	
Total Memory	65536K	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Date / Time Setup:

System Date: Adjusts the system date.

MM	Months
DD	Days
YYYY	Years

System Time: Adjusts the system clock.

HH	Hours (24hr. format)
MM	Minutes
SS	Seconds

IDE Master / Slave Setup:

Computer detects IDE drive type from drive C to drive F.

None / Auto / Manual

Drive A / B:
Defines the floppy drive type.
None / 360K, 5.25in / 1.2M, 5.25in / 720K, 3.5in / 1.44M, 3.5in / 2.88M, 3.5in

Video:
Defines video display mode.
EGA/VGA / CGA 40 / CGA 80 / MONO

Halt On:
Determines if the computer should stop when an error is detected during power up.
No Errors / All Errors / All, But Keyboard / All, But Diskette / All, But Disk/Key

3.3 – Advanced BIOS Features

In Advanced BIOS features, you will be able to adjust many of the feature that effect system speed and boot-up options.

Phoenix – AwardBIOS CMOS Setup Utility
Advanced BIOS Features

CPU L1 & L2 Cache	[Enabled]	Item Help
Hyper-Threading Technology	[Enabled]	
Quick Power On Self Test	[Enabled]	
►Boot Sequence	[Press Enter]	Menu Level ►
Swap Floppy Drive	[Disabled]	
Boot Up Floppy Seek	[Enabled]	Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Boot Up NumLock Status	[On]	
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
X Typematic Rate (Chars/Sec)	6	
X Typematic Delay (Msec)	250	
Security Option	[Setup]	
APIC Mode	[Enabled]	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
►Console Redirection	[Press Enter]	
HDD S.M.A.R.T Capability	[Disabled]	
Report No FDD For WIN 95	[No]	
Small Logo (EPA) Show	[Disabled]	
►DMI Event Log	[Press Enter]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU L1 & L2 Cache:
Toggles the use of CPU L1 and L2 cache.
Enabled / Disabled

Hyper-Threading Technology:
This option allows you to enabled or disabled the Hyper-Threading Technology.
Enabled / Disabled

Quick Power On Self Test:
This option allows the system to skip self tests for faster startup.
Enabled / Disabled

Swap Floppy Drive:
This option allows the system to swap floppy drive.
Disabled / Enabled

Boot Up Floppy Seek:
This option allows the system to seek floppy drive when boots up.
Enabled / Disabled

Gate A20 Option:
Select if chipset or keyboard controller should control GateA20. When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.
Normal / Fast

Typematic Rate Setting:
Toggles control of keyboard key repeat rate.
Enabled/Disable

Typematic Rate (Chars/Sec):
Defines how many characters are repeated per second when holding down a key on the keyboard.
6 / 8 / 10 / 12 / 15 / 20 / 24 / 30

Typematic Delay (Msec):
Defines the delay that occurs at keystroke before that key will start to repeat.
250 / 500 / 750/ 1000

Security Option:
Sets the password on either just the BIOS setup or the entire system (BIOS setup included).
Setup / System

APIC Mode:
This option allows you to enabled or disabled Advanced Programmable Interrupt Controller (APIC) Mode.
Enabled / Disabled

MPS Version Control For OS:
Selects APIC mode depending on operating system: select 1.1 for Win NT 3.52, and 1.4 for Win NT4.0, Win2000 and WinXP
1.4 / 1.1

OS Select For DRAM > 64MB:
Select OS2 only if you are running OS/2 operating system with more than 64MB of RAM.
Non-OS2 / OS2

HDD S.M.A.R.T. Capability:
Select Monitoring and Reporting technology.
Enabled / Disabled

Report No FDD For WIN 95:
Select enable to detect if there is FDD for WIN95 exist.
No / Yes

Small Logo (EPA) Show:
Toggles the display of the EPA Energy Star logo at POST.
Enabled / Disabled

Boot Sequence:

Phoenix – AwardBIOS CMOS Setup Utility
Boot Sequence

►Hard Disk Boot Priority	[Press Enter]	Item Help
First Boot Device	[Floppy]	
Second Boot Device	[CDROM]	Menu Level ►►
Third Boot Device	[Hard Disk]	
Boot Other Device	[Enabled]	Select Your Boot Device Priority

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Hard Disk Boot Priority:
Select 〔Press Enter〕 to set Hard Disk Boot Priority

First / Second / Third Boot Device:
This BIOS attempts to load the operating system from the devices in the sequence selected in these item.
Floppy / LS120 / Hard Disk / SCSI / CDROM / ZIP100 / USB-FDD / USB-ZIP / USB-HDD / LAN / Disabled

Boot Other Device:
System can load the operating system from the other devices except above devices
Enabled / Disabled

Console Redirection:

Phoenix – AwardBIOS CMOS Setup Utility
Console Redirection

Console Redirection	[Disabled]	Item Help
Baud Rate	[9600]	
Agent after boot	[Disabled]	Menu Level ►►
		[Enabled] Attempt to redirect console via COM port [Disabled] Attempt to redirect console when keyboard absent

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Console Redirection:
Run Console Redirection function

Enabled / Disabled

Baud Rate:
Specify Baud Rate of console redirection
9600/19200/38400/57600/115200

Agent after boot:
Keep Agent running after OS boot
Enabled / Disabled

DMI Event Log:

Phoenix – AwardBIOS CMOS Setup Utility
DMI Event Log

DMI Event Log	[Enabled]	Item Help
Clear All DMI Event Log	[No]	
View DMI Event Log	[Enter]	Menu Level ►►
Mark DMI Events as Read	[Enter]	
Event Log Capacity		[Enabled] Store POST error messages to the DMI Event log. [Disabled] Don't store POST error messages to the DMI Event log.
Event Log Validity		

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

DMI Event Log:
Store POST error messages to the DMI Event log
Enabled / Disabled

Clear All DMI Event Log:
When this item is selected to [Yes], the DMI event log will be cleared at next POST stage, and then set this item to [No] automatic.
Yes/No

View DMI Event Log:
Press [Enter] to show all DMI event logs.
Enter

Mark DMI Events as Read:
Clear all DMI event logs immediately. Press [Enter] will pop up a confirm screen. Hit [Y] and [enter], then clear all DMI event logs right now
Enter

Event Log Capacity:
Read only to show event log Capacity

Event Log Validity:

Read only to show event log Validity

3.4 – Advanced Chipsets Features

In Advanced Chipset Features, you will be abled to adjust many of the chipset special features.

Phoenix – AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Timing Selectable	[By SPD]	Item Help
CAS Latency Time	[2]	
Active to Precharge Delay	[8]	
Tras Max	[120us]	Menu Level ►
DRAM RAS# to CAS# Delay	[4]	
DRAM RAS# Precharge	[4]	
System BIOS Cacheable	[Enabled]	
Video BIOS Cacheable	[Disabled]	
Delay Prior to Thermal	[16 Min]	
DRAM Data Integrity Mode	[ECC]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

DRAM Timing Selectable:
Select SPD setting SDRAM timing by SPD.
Manual / By SPD

CAS Latency Time:
This setting defines the number of cycles after a read command until output starts.
2 / 2.5 / 3

Active to Precharge Delay:
This item controls the number of DRAM clocks used for DRAM parameters.
8 / 7 / 6 / 5

Tras Max:
This item controls the MAX number of DRAM clocks used for DRAM parameters.
120US/ 70US

DRAM RAS# to CAS# Delay:
This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed.
4 / 3 / 2

DRAM RAS# Precharge:
This item controls the idle clocks after issuing a precharge command to the DRAM.
4 / 3 / 2

System BIOS Cacheable:
Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
Disabled / Enabled

VIDEO BIOS Cacheable:
Selecting Enabled allows caching of the video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
Disabled / Enabled

Delay Prior to Thermal:
This item allow you to select the time from Wait to CPU Thermal control.
4 min/ 8 min / 16 min / 32 min

DRAM Data Integrity Mode:
This item allows you to set Parity mode. It will be hidden when DRAM is Non-ECC type.
ECC / Non-ECC

3.5 – Integrated Peripherals

Options related to onboard peripheral features can be altered through the following:

Phoenix – AwardBIOS CMOS Setup Utility
Integrated Peripherals

► OnChip IDE Device	[Press Enter]	Item Help
► Onboard Device	[Press Enter]	
► SuperIO Device	[Press Enter]	Menu Level ►
Watch Dog Timer Select	[Disabled]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

OnChip IDE Device:

Phoenix – AwardBIOS CMOS Setup Utility
OnChip IDE Device

IDE HDD Block Mode	[Enabled]	Item Help
On-Chip Primary PCI IDE	[Enabled]	
IDE Primary Master PIO	[Auto]	Menu Level ►►
IDE Primary Slave PIO	[Auto]	
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
On-Chip Serial ATA Setting		
SATA Mode	[IDE]	
On-Chip Serial ATA	[Auto]	
Serial ATA Port0 Mode	[SATA 0 Master]	
Serial ATA Port1 Mode	SATA 1 Master	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

IDE HDD Block Mode:
Leave this setting as is.
Enabled / Disabled

On-Chip Primary PCI IDE:
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select "Enabled" to activate each channel separately.
Enabled / Disabled

Primary / Secondary Master/ Slave PIO:
The four IDE PIO (Programmed Input / Output) field let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
Auto / Mode 0 / Mode 1 / Mode 2 / Mode 3 / Mode 4

Primary / Secondary Master/ Slave UDMA:
This allows you to select the mode of operation for the Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable bios SUPPORT.
Auto / Disabled

SATA Mode
Set SATA to normal IDE mode or RAID mode
IDE/RAID

On-Chip Serial ATA:
The integrated peripheral controller contains a SATA interface with support for two SATA channels. Select "Auto" to activate each channel separately.
Disabled /Auto/ Combined Mode/ Enhanced Mode/ SATA Only

Serial ATA Port 0/1 Mode:
This item allows you to set SATA mode.
Primary Master / Primary Slave / Secondary Master / Secondary Slave

Onboard Device:

Phoenix – AwardBIOS CMOS Setup Utility
Onboard Device

		Item Help
USB Controller	[Enabled]	
USB 2.0 Controller	[Enabled]	
USB Keyboard Support	[Disabled]	Menu Level ►►
USB Mouse Support	[Disabled]	
Onboard VGA Ctrl	[Enabled]	
Onboard Lan Ctrl	[Enabled]	
Onboard 3114 Ctrl	[Enabled]	
CSA LAN (Giga-LAN)	[Enabled]	
Onboard Giga Lan Boot ROM	[Disabled]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

USB Controller:
This item allows you to “Enable” or “Disable” onboard USB function.
Enabled / Disabled / 1&2 USB Port / 2&3 USB Port / 1&3 USB Port / 1 Port / 2 Port / 3 Port

USB 2.0 Controller:
This item allows you to decide to “Enable” or “Disable” the USB 2.0 device.
Enabled / Disabled

USB Keyboard Support:
Select “Enabled” if your system contains a USB controller and you have a USB keyboard.
Enabled / Disabled

USB Mouse Support:
Select “Enabled” if your system contains a USB controller and you have a USB mouse.
Enabled / Disabled

Onboard VGA Ctrl:
This item allows you to “Enable” or “Disable” onboard VGA Ctrl function.
Enabled / Disabled

Onboard Lan Ctrl:
This item allows you to “Enable” or “Disable” onboard 82541 Lan Ctrl function.
Enabled / Disabled

Onboard Sil3114 Ctrl:
This item allows you to “Enable” or “Disable” onboard 3114 Ctrl function.
Enabled / Disabled

CSA LAN (GbE LAN):
This item allows you to “Enable” or “Disable” CSA LAN GbE-LAN function.
Enabled / Disabled

On board GbE Lan Boot ROM:
This item allows you to “Enable” or “Disable” On board GbE Lan Boot ROM function.

Enabled / Disabled

Super IO Controller:

Phoenix – AwardBIOS CMOS Setup Utility
Super IO Device

Onboard FDC Controller	[Enabled]	Item Help
Onboard Serial Port 1	[3F8 / IRQ4]	
Onboard Serial Port 2	[2F8 / IRQ3]	Menu Level ►►
UART Mode Select	[Normal]	
RxD, TxD Active	[Hi, Lo]	
IR Transmission Delay	[Enabled]	
UR2 Duplex Mode	[Half]	
Onboard Parallel Port	[378 / IRQ7]	
Parallel Port Mode	[SPP]	
EPP Mode Select	[EPP1.7]	
ECP Mode Use DMA	[3]	
ICH Serial Port 1	[3E8]	
ICH Serial Port 1 Use IRQ	[IRQ10]	
ICH Serial Port 2	[2E8]	
ICH Serial Port 2 Use IRQ	[IRQ11]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard FDC Controller:
Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select "Disabled" in the field.

Enabled / Disabled

Onboard Serial Port 1 / 2:
Select an address and corresponding interrupt for the first and second serial ports.

3F8/IRQ4 / 2E8/IRQ3 / 3E8/IRQ4 / 2F8/IRQ3 / Disabled / Auto

UART Mode Select:
This field allows the users to configure what IR mode the 2nd serial port should use.

Normal / IrDA and ASKIR

RxD, TxD Active:
This field configures the receive and transmit signals generated from the IR port.

Hi, Hi / Hi, Lo / Lo, Hi / Lo, Lo

IR Transmission Delay:
This item allows you to "Enabled" or Disabled" the IR transmission delay.

Enabled / Disabled

UR2 Duplex Mode:
This item allows you to select IR "Half" or "Full" duplex function.

Half / Full

Onboard Parallel Port:
This field allows the user to configure the LPT port.

378/IRQ7 / 278/IRQ5 / 3BC/IRQ7 / Disabled

Parallel Port Mode:
This field allows the user to select the parallel port mode.
SPP / EPP / ECP / ECP+EPP

EPP Mode Select:
This item allows you to determine the IR transfer mode of onboard I/O chip.
EPP1.9 / EPP1.7

ECP Mode Use DMA:
This field allows the user to select the DMA1 or DMA3 for the ECP mode.
DMA1 / DMA3

ICH Serial Port 1:
Select an address for the ICH first serial ports.
Disabled/3F8/2F8/3E8/2E8

ICH Serial Port 1 Use IRQ:
Select a corresponding interrupt for the ICH first serial ports.
IRQ10/IRQ11/IRQ3/IRQ4/IRQ5/IRQ7

ICH Serial Port 2:
Select an address for the ICH second serial ports.
Disabled/3F8/2F8/3E8/2E8

ICH Serial Port 2 Use IRQ:
Select a corresponding interrupt for the ICH second serial ports.
IRQ10/IRQ11/IRQ3/IRQ4/IRQ5/IRQ7

Watch Dog Timer Select:
This item allows the user to select after how long time the system will reboot.
Disabled / 1 Min / 2 Min / 4 Min / 8 Min / 15 Min / 30 Min / 1 Hour

3.6 – Power Management Setup

Options related to power management can be altered through the following:

Phoenix – AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI Function	[Enabled]	Item Help
ACPI Suspend Type	[S1 (POS)]	
Power Management	[User Define]	Menu Level ►
Video Off Method	[DPMS]	
Video Off In Suspend	[Yes]	
Suspend Type	[Stop Grant]	
MODEN Use IRQ	[3]	
Suspend Mode	[Disabled]	
HDD Power Down	[Disabled]	
Intruder# Detection	[Disabled]	
CPU THRM-Throttling	[50.0%]	
►Power On Setup	[Press Enter]	
►Reload Global Timer Events	[Press Enter]	
Intruder# Detection	[Disabled]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function:
Toggles advanced power and configuration done by OS.
Enabled / Disabled

ACPI Suspend Type:
Defines ACPI system suspend mode.
S1 (POS)/ S3 (STR)/ S1&S3

Power Management Option:
Defines the type of power saving features the system should follow.
User Define / Maximum Saving / Minimum Saving

Video Off Method:
Defines the method used to power off graphics.
V/H SYNC+Blank / Blank / DPMS

Video Off In Supend:
Tell you what time frame that the video will be disabled under current power management settings.
Always On / Suspend -> Off

Suspend Type:
Defines the suspend type from Stop Grant or Power On Suspend.
Stop Grant/ Power On Suspend

MODEM Use IRQ:
Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.
N/A / 3 / 4 / 5 / 7 / 9 / 10 / 11

Suspend Mode:
Defines the method used to power off the system.
Disabled / Standby / Sleep

HDD Power Down:
Defines hard drive power down delay.
Disabled / 1 minutes / 5 minutes / 10 minutes / 30 minutes / 45 minutes / 60 minutes

Intruder# Detection:
Defines system intruder detection function.
Disabled /Enabled

CPU THRM-Throttling:
Defines the duty cycle of THRM-Throttling.
87.5% / 75.0% / 62.5 50.0 25.3 / 2.5

Intruder# Detection:
Defines system intruder detection function.
Disabled /Enabled

Power On Setup:

Phoenix – AwardBIOS CMOS Setup Utility
Power On Setup

PWRON After PWR-Fail	[off]	Item Help
Soft-off by PWR-BTTN	[Instant-off]	
Wake-Up by PCI card	[Enabled]	
Power On by Ring	[Disabled]	Menu Level ►►
Power On by Giga Lan	[Disabled]	
USB KB WakeUp From <S4>	[Disabled]	
Resume by Alarm	[Disabled]	
X Date (of Month) Alarm	0	
X Resume Time (hh: mm: ss)	0: 0: 0	
Power ON Function	[BUTTON ONLY]	
KB Power ON Password	[Enter]	
Hot key Power ON	[Ctrl-F1]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

PWRON After PWR- Fail:
Defines the state when the system power failure and returns again.
On / Off / Former- Sts(Former Status)

Soft-off by PWR-BTTN :
Defines the system power- on method when push Power Button .
Instant off / Delay 4 sec.

Wake Up by PCI Card:
An input signal from PME on the PCI card awakens the system from a soft off state.
Enabled / Disabled

Power on by Ring:
Defines whether the system will wake up if the modem is dialed into.
Enabled / Disabled

Power on by Giga Lan:
This item allows you to turn on the system by on board Giga Lan function.
Enabled / Disabled

USB KB WakeUp From <S4>:
Defines whether the system will wake up if the modem is dialed into.
Enabled / Disabled

Resume by Alarm:
Defines the time/date when the system will wake up.
Enabled / Disabled

POWER ON Function:
Defines the action of the power button when pressed.
Password / Hot Key / Mouse left / Mouse Right / Any Key / Button only

KB Power ON Password:
Defines the time/date when the system will wake up.
Enter

Hot Key Power ON:
Defines the wake up hot key.
Ctrl – F1 / Ctrl-F2…..F12

Reload Global Timer Events:

Phoenix – AwardBIOS CMOS Setup Utility
Reload Global Timer Events

Primary IDE 0	[Disabled]	Item Help
Primary IDE 1	[Disabled]	
Secondary IDE 0	[Disabled]	Menu Level ►►►
Secondary IDE 1	[Disabled]	
FDD,COM,LPT Port	[Disabled]	
PCI PIRQ[A-D]#	[Disabled]	

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Primary IDE 0/1:
When set to "On", any event that occurs will awaken a system which has been powered down.
Disabled / Enabled

Secondary IDE 0/1:
When set to "On", any event that occurs will awaken a system which has been powered down.
Disabled / Enabled

FDD, COM, LPT Port:
When set to "On", any event that occurs will awaken a system which has been powered down.
Disabled / Enabled

PCI PIRQ[A-D]#:
When set to "On", any event that occurs will awaken a system which has been powered down.
Disabled / Enabled

3.7 – PnP/PCI Configurations

Options related to all the configurations of PnP / PCI resources.

Phoenix – AwardBIOS CMOS Setup Utility

PnP / PCI Configurations

Reset Configuration Data	[Disabled]	Item Help
Resources Controlled By	[Auto (ESCD)]	
X IRQ Resources	Press Enter	Menu Level ►
PCI / VGA Palette Snoop	[Disabled]	Default is Disabled. Select Enabled to Reset Extended System Configuration Data ESCD> when you exit Setup if you have Installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Reset Configuration Data:
This setting allow you to clear ESCD data.
Enabled / Disabled

Resources Controlled By:
Default whether system resources are controller by BIOS or by user.
Manual / Auto (ESCD)

PCI / VGA Palette Snoop:
Leave as default.
Enabled / Disabled

3.8 – PC Health Status

This menu is related to detecting system temperature, voltage, fan and speed.

Phoenix – AwardBIOS CMOS Setup Utility
PC Health Status

CPU FAN Speed Control	[100% Speed]	Item Help
Current CPU Temp.		
Current VRM Temp.		Menu Level ►
Current System Temp.		
Current CPU Fan Speed		
Current Chassis Fan Speed		
Current Chassis Fan Speed		
Current Chassis Fan Speed		
Current Chassis Fan Speed		
Current Chassis Fan Speed		
Current Chassis Fan Speed		
VCORE		
3VSB		
5 VSB		
+5V		
3.3V		
+12V		
DDRVTT		
2.6VDDR		

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU FAN Speed Control:
To set the CPU Fan speed.
100% Speed/90% Speed/80% Speed/70% Speed/AUTO.

Note: The onboard Winbond® 83627HF and ADM1027 hardware monitoring ASIC automatically detects the system, motherboard and CPU temperature. It detects the CPU and chassis fan speeds in RPM. The hardware monitor ASIC also detects the voltage output through the voltage regulators.

3.9 – Frequency/Voltage Control

Options related to control CPU clock and frequency ratio.

Phoenix – AwardBIOS CMOS Setup Utility
Frequency / Voltage Control

CPU Clock Ratio	[12 X]	Item Help
Auto Detect PCI Clk	[Enabled]	
Spread Spectrum	[Disabled]	Menu Level ►

↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

CPU Clock Ratio:
Sets the CPU multiplier. TYAN does not recommend changing this setting from the default setting.

16X…22X / Auto / Default

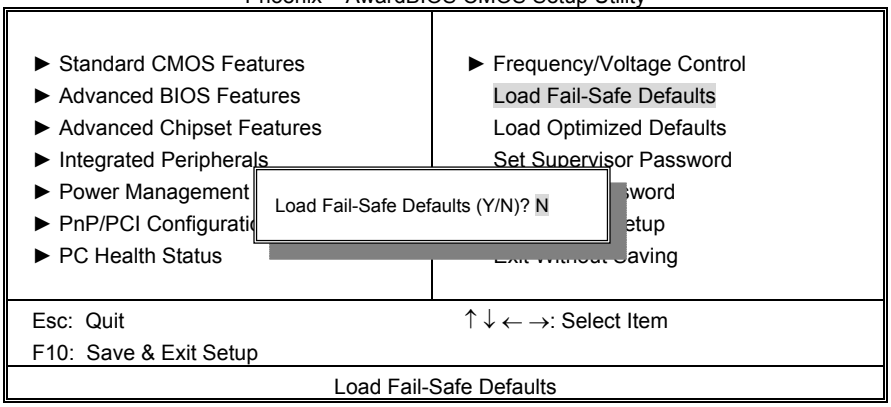
Auto Detect DIMM / PCI Clk:
Sets the BIOS to automatically adjust PCI and memory bus speeds accordingly.

Enabled / Disabled

Spread Spectrum:
Reduces interference on the motherboard. Leave as default if your system works correctly.

Enabled / Disabled

3.10 – Load Fail-Safe Defaults

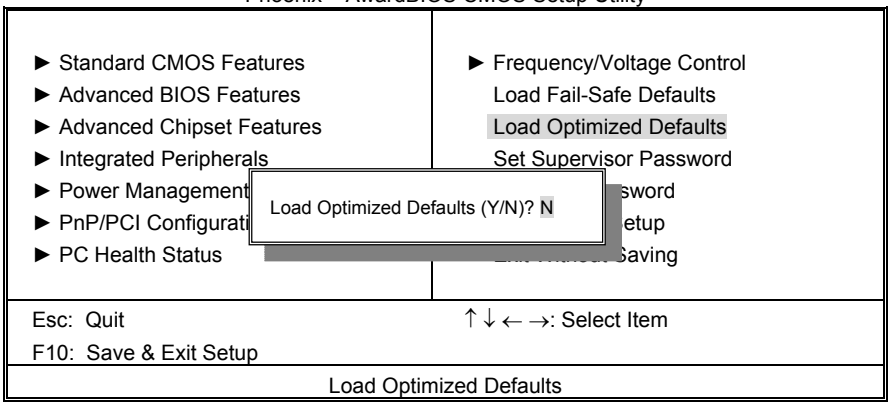


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N)? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

3.11 – Load Optimized Defaults

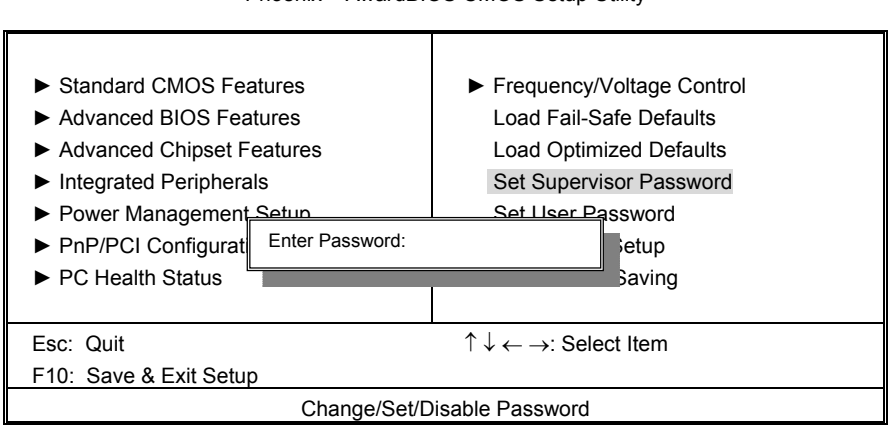


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

3.12 – Supervisor/User Password Setting

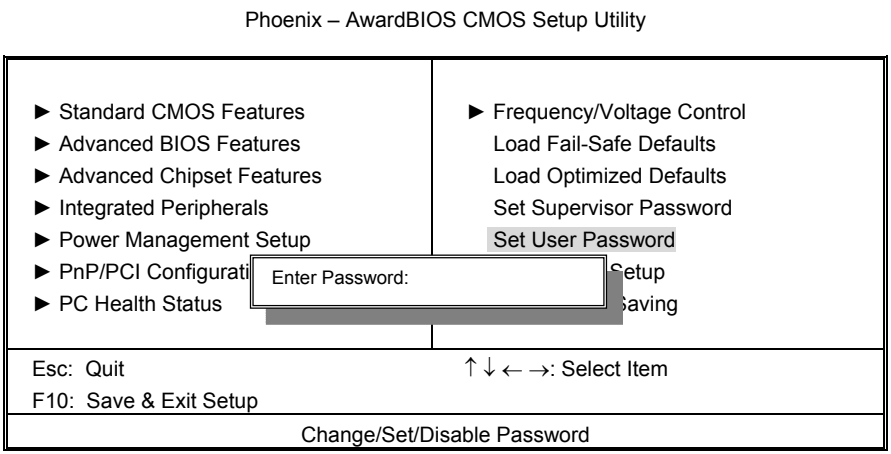


You can set either a supervisor or a user password, or both of them. The differences are:

Set Supervisor Password: can enter and change the options of the setup menus.

Set User Password: Can enter but does not have permission to change any options.
When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:



Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

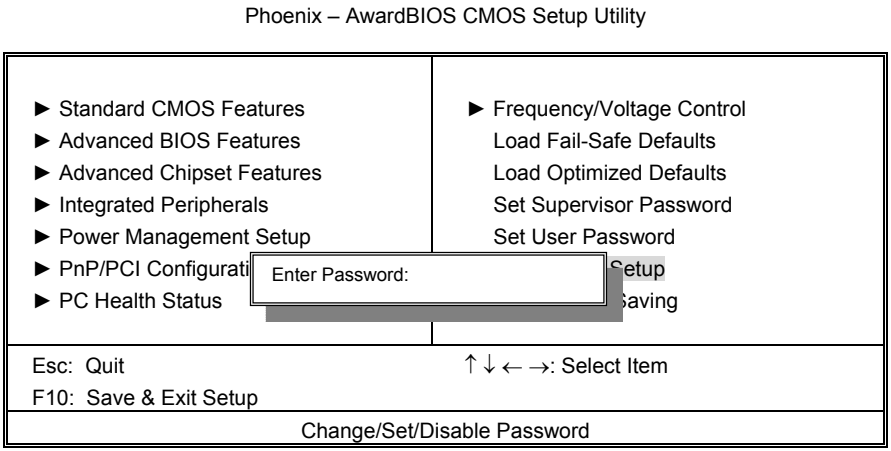
PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

3.13 – Exit Selecting

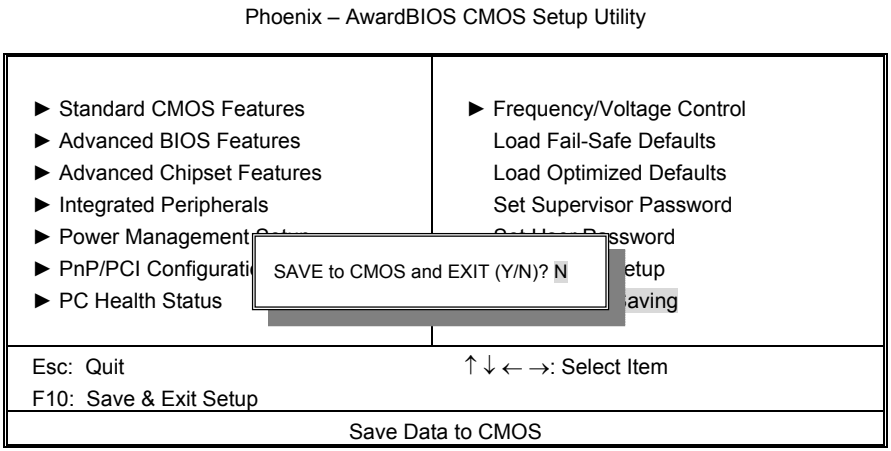


Save & Exit Setup
Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving



Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

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 a series of audible beeps. For example, if the BIOS POST can initialize the video but an error occurs, an error message will be displayed. If it cannot display the message, it will report the error as a series of beeps.

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 or third party vendor for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

Appendix I: Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

IPL: see Initial Program Load.

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

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

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

Mirroring: see RAID.

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

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

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

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

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.
PCI-to-PCI bridge: allows you to connect multiple PCI devices onto one PCI slot.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Striping: see RAID

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

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

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

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

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

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

Appendix II: Post Error Code for BIOS

POST (hex)	Description
CFh:	Test CMOS R/W functionality.
C0h:	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h:	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h:	Expand compressed BIOS code to DRAM
C5h:	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
01h:	Expand the Xgroup codes locating in physical address 1000:0
03h:	Initial Superio_Early_Init switch.
05h:	1. Blank out screen 2. Clear CMOS error flag
07h:	1. Clear 8042 interface 2. Initialize 8042 self-test
08h:	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
0Ah:	1. Disable PS/2 mouse interface (optional). 2. Autodetect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Eh:	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
10h:	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
12h:	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
14h:	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
16h:	Initial onboard clock generator if Early_Init_Onboard_Generator is defined. See also POST 26h.

POST (hex)	Description
18h:	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
1Bh:	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Dh:	Initial EARLY_PM_INIT switch.
1Fh:	Load keyboard matrix (notebook platform)
21h:	HPM initialization (notebook platform)
23h:	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.
24h:	Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information.
25h:	Early PCI Initialization: -Enumerate PCI bus number. -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0
26h:	1. If Early_Init_Onboard_Generator is not defined Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 2. Init onboard PWM 3. Init onboard H/W monitor devices
27h:	Initialize INT 09 buffer
29h:	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed.
2Bh:	Invoke Video BIOS
2Dh:	1. Initialize double-byte language font (Optional) 2. Put information on screen display, including Award title, CPU type, CPU speed, full screen logo.
33h:	Reset keyboard if Early_Reset_KB is defined e.g. Winbond 977 series Super I/O chips. See also POST 63h.
35h:	Test DMA Channel 0

POST (hex)	Description
37h:	Test DMA Channel 1.
39h:	Test DMA page registers.
3Ch:	Test 8254
3Eh:	Test 8259 interrupt mask bits for channel 1.
40h:	Test 8259 interrupt mask bits for channel 2.
43h:	Test 8259 functionality.
47h:	Initialize EISA slot
49h:	1. Calculate total memory by testing the last double word of each 64K page. 2. Program write allocation for AMD K5 CPU.
4Eh:	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
50h:	Initialize USB Keyboard & Mouse.
52h:	Test all memory (clear all extended memory to 0)
53h:	Clear password according to H/W jumper (Optional)
55h:	Display number of processors (multi-processor platform)
57h:	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
59h:	Initialize the combined Trend Anti-Virus code.
5Bh:	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Dh:	1. Initialize Init_Onboard_Super_IO 2. Initialize Init_Onbaord_AUDIO.
60h:	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
63h:	Reset keyboard if Early_Reset_KB is not defined.
65h:	Initialize PS/2 Mouse

POST (hex)	Description
67h:	Prepare memory size information for function call: INT 15h ax=E820h
69h:	Turn on L2 cache
6Bh:	Program chipset registers according to items described in Setup & Auto-configuration table.
6Dh:	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Fh:	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
75h:	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h:	(Optional Feature) Enter AWDFLASH.EXE if: -AWDFLASH.EXE is found in floppy drive. -ALT+F2 is pressed.
77h:	Detect serial ports & parallel ports.
7Ah:	Detect & install co-processor
7Ch:	Init HDD write protect.
7Fh:	Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.

E8POST.ASM starts	**Description**
82h:	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h:	Save all data in stack back to CMOS
84h:	Initialize ISA PnP boot devices
85h:	1. USB final Initialization 2. Switch screen back to text mode
87h:	NET PC: Build SYSID Structure.
89h:	1. Assign IRQs to PCI devices 2. Set up ACPI table at top of the memory.
8Bh:	1. Invoke all ISA adapter ROMs 2. Invoke all PCI ROMs (except VGA)
8Dh:	1. Enable/Disable Parity Check according to CMOS setup 2. APM Initialization
8Fh:	Clear noise of IRQs
93h:	Read HDD boot sector information for Trend Anti-Virus code
94h:	1. Enable L2 cache 2. Program Daylight Saving 3. Program boot up speed 4. Chipset final initialization. 5. Power management final initialization 6. Clear screen & display summary table 7. Program K6 write allocation 8. Program P6 class write combining
95h:	Update keyboard LED & typematic rate
96h:	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh:	Boot attempt (INT 19h)

Appendix III: SMDC Information

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

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

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

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

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. Hence, they should be of the most assistance. Furthermore, if you purchased your system from a dealer near you, you can actually 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:

1) This device may not cause harmful interference, and
2) This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

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

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

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

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

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