Tomcat i845GV /// S2198

Revision 1.00

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Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

1x Tomcat i845GV S2198 motherboard

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

1 x Serial ATA power cable

2 x Serial ATA data cable

1x Tomcat i845GV User's Manual (Soft Copy)

1x TYAN driver CD (Optional)

1x I/O shield (Optional)

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 just bought one of the most advanced platforms suited for digital content creation, productivity and 3D gaming applications. The Tomcat i845GV is based on Intel's 845GV chipset, supporting the Intel Pentium 4 or Celeron Processor with 533/400MHz FSB, DDR memory, Intel Extreme Graphics, and more. These features enable breakthrough performance for today's rapidly developing multimedia applications.

Visit TYAN's Website at http://www.TYAN.com. There you can find information on all of TYAN's products with FAQ's, distributor's list and BIOS setting explanations.

1.2 – Hardware Specifications

Processors
- Single Intel® Pentium® 4 , Celeron® , Celeron®D processor
- One mPGA478 ZIF socket
- Onboard VRM 9.0X
- 533/400 MHz FSB support
- Supports Hyper-Threading feature

Expansion Slots
- One 32-bit/66 MHz PCI-X 3.3V Slot
- One 32-bit/33 MHz PCI 3.3V slot

Chipset
- MCH Intel's 845GV chipset
- 6300ESB (Hance Rapids) South Bridge chip
- ITE IT8712 LPC Super I/O chip

Memory
- Two DDR-333*/266/200 DIMM sockets
- Up to 2 GB of non-ECC DDR memory modules
  * For 533 MHz FSB only

Integrated Graphics
- Intel integrated Extreme Graphics core from 845GV GMCH
- Dynamic Video Memory Technology (DVMT)

Integrated PCI IDE (Parallel ATA)
- Supports "Native Mode" registers and interrupts
- Independent timing of up to 4 drives, with separate primary and secondary IDE cable connections
- Supports UDMA 100/66/33 or PIO IDE/ATAPI devices

Integrated SATA (From 6300ESB)
- Two integrated SATA ports up to 1.5 Gbit/s
- Supports SATA RAID 0, 1

Integrated LAN Controllers
- One 10/100 Fast Ethernet LAN with Intel 82551QM Fast Ethernet NIC (SKU: S2198GNN- one 10/100 and one GbE)
- Shared footprint with optional Intel 82541PI GbE NIC (SKU: S2198G2N- two GbE NICs)
- One 10/100/1000 Gigabit LAN with Intel 82541PI NIC
- Two side-by-side RJ45 with LEDs

Integrated I/O
- Two 9-pin UART serial support (one via an optional cable)
- One IDE connectors for up to two IDE devices
- Four USB 2.0 ports (3 rear ports, 1 front USB port via an optional cable)

BIOS
- Award BIOS 4 Mb flash ROM (8Mb optional)
- Supports APM & ACPI
- Auto detection of memory size
- Auto configuration of IDE hard disk types
- Multiple boot options
- Power Management: S1, S3, S4 and S5

Form Factor
- Flex ATX (9" x 7.5")
- ATX/12V power connectors (One 20-pin and one 4-pin)
- One USB Type B connector for an external USB device
- Stacked four USB ports (3 usable)
- One serial and one VGA ports
- Two RJ45 connectors

System Management
- H/W monitor functions integrated in IT8712 LPC Super I/O
- Total three 3-pin fan headers with tachometer monitoring and PWM control
- Temperature and voltage monitoring

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

Operating System Support
- Windows 2000 and XP
- Windows 98SE and NT4
- Windows ME
- Linux

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

Chapter 2: Board Installation

Installation

You are now ready to install your motherboard. The mounting hole pattern of the Tomcat i845GV matches the FlexATX system board specifications. Your chassis should support a standard FlexATX motherboard form factor.

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

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

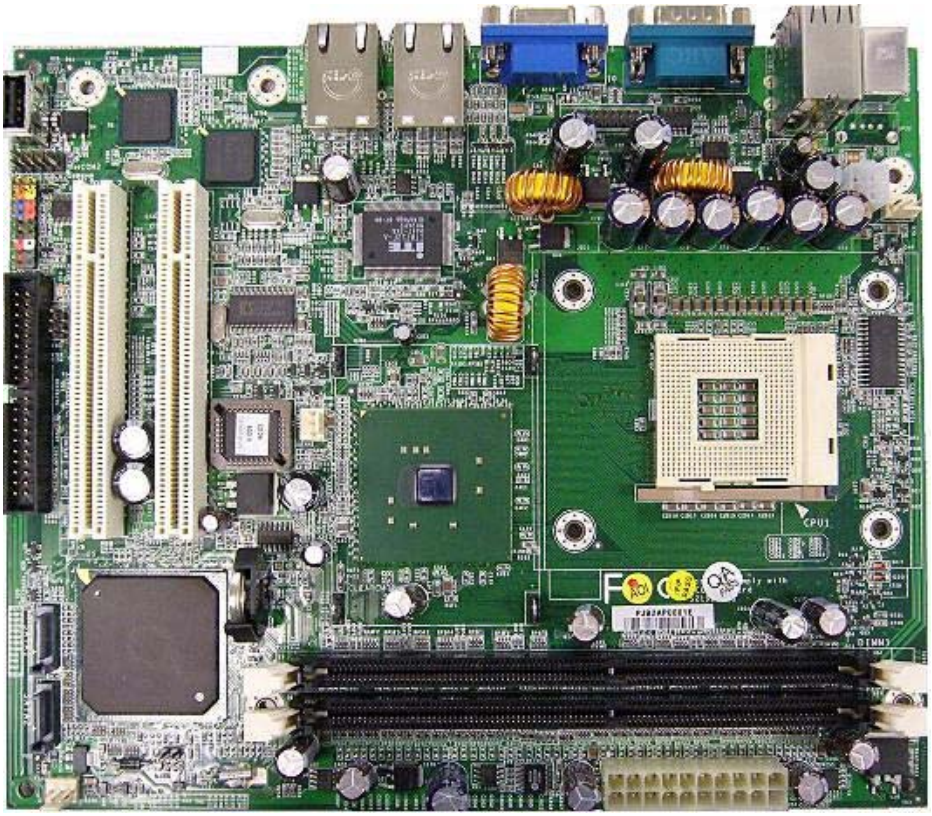
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.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

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

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

2.1 – Board

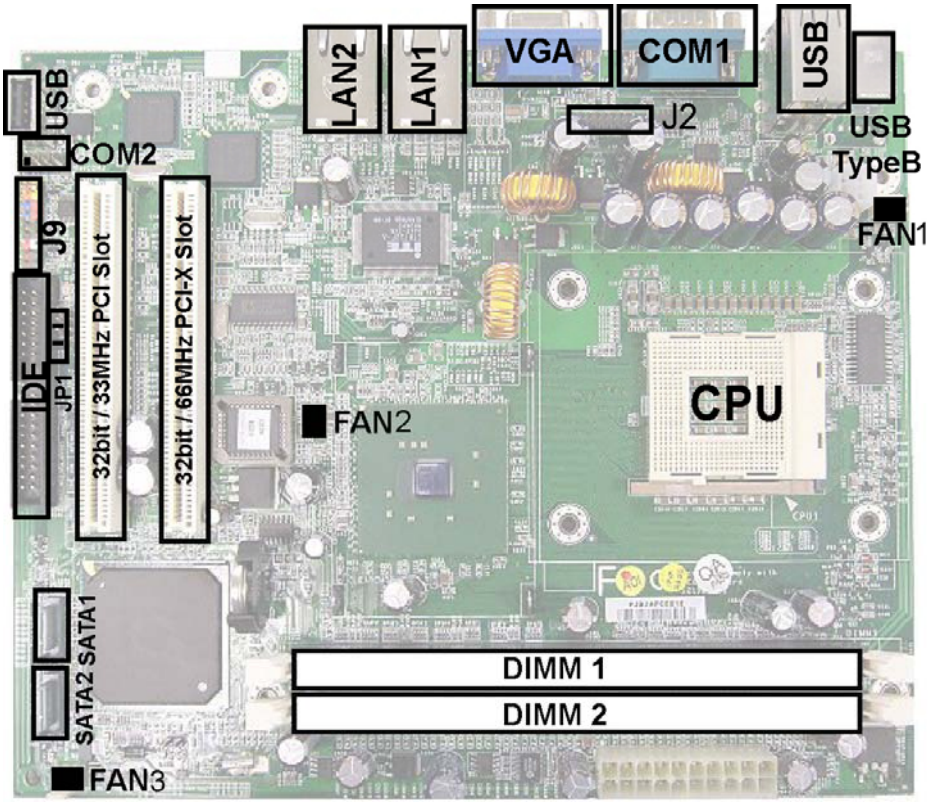
The following is an image of the Tomcat i845GV S2198.



The above photograph 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.

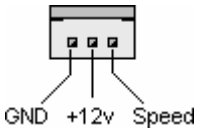
The following page includes details on the vital components of this motherboard.

2.2 – Board Jumpers



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.

2.3 – Fan Connectors (FAN1, FAN2, FAN3)



Use these headers to connect cooling fans, both chassis and processor fans, to your motherboard. Cooling fans help keep the system more stable and operating reliably for its product life.

2.4 – CMOS Reset (JP1)

1 **3** **Default**	1,2: Default 2,3: Clear CMOS Connect pins 1 and 2 together to reset the CMOS settings in case an incorrect setting causes system instability or you have forgotten your system/setup password or have just flashed your BIOS.
1 **3** **Clear CMOS**	Power off the system and disconnect the power supply. - Close pins 2 and 3 on JP1 - Wait about 5 seconds - Close pins 1 and 2 on JP1 - Reconnect the power supply and power on the system

2.5 – Front Panel Connector (J9)

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

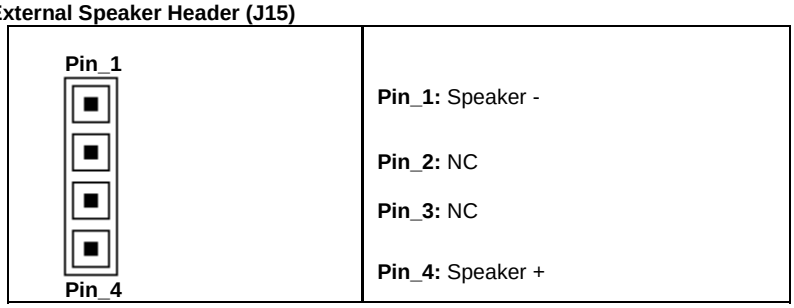
J9 Pinout:
HDD LED: 1, 3
Power LED: 2, 4
Reset Switch: 5, 7
Power Switch: 6, 8

Pin 2 Power LED+	Pin 4 Power LED-	Pin 6 Power BT	Pin 8 GND	Pin 10 Reserved	Pin 12 +5V	Pin 14 Key	Pin 16 Reserved	Pin 18 Reserved
Pin 1 HDD LED+	Pin 3 HDD LED-	Pin 5 GND	Pin 7 Reset Switch	Pin 9 +5V	Pin 11 Reserved	Pin 13 GND	Pin 15 Reserved	Pin 17 Reserved

2.6 – USB TYPE A & B Connectors (JP22, JP21)

USB TYPE A VERTICAL CONNECTOR. CONNECT TO JP21
USB TYPE B CONNECTOR, CONNECT TO JP22

2.7 – External Speaker Header (J15)



Pin_1: Speaker -

Pin_2: NC

Pin_3: NC

Pin_4: Speaker +

2.8 – Port 80 LED Header (J2, Tyan P2198 is needed)

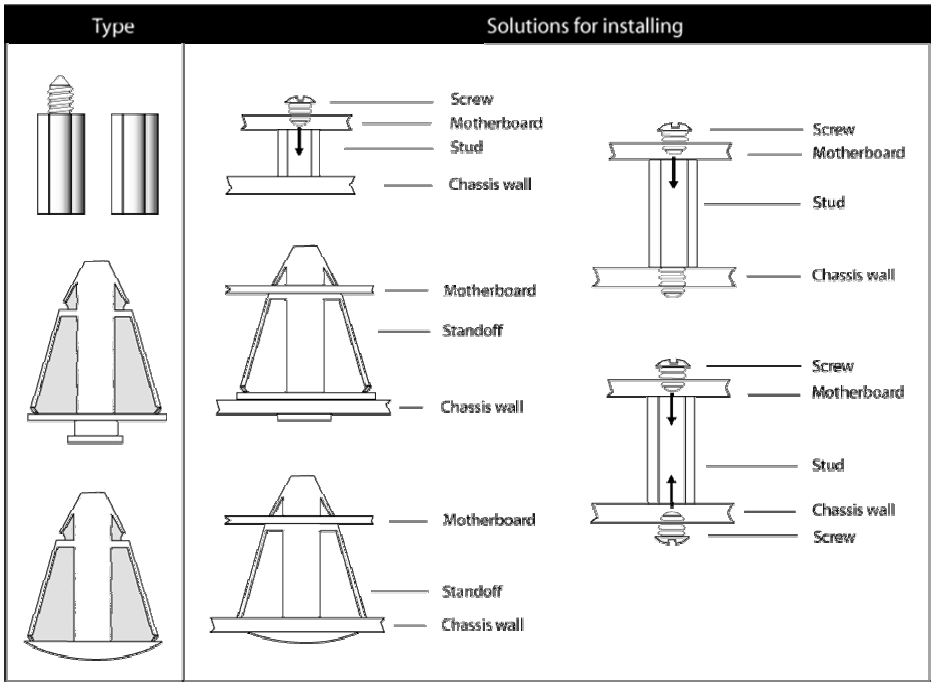
Pin 2	**Pin 4**	**Pin 6**	**Pin 8**	**Pin 10**	**Pin 12**	**Pin 14**	**Pin 16**
3.3V Power	LED-A	GND	LED-B	LED-C	LED-D	LED-E	LED-F
Pin 1	**Pin 3**	**Pin 5**	**Pin 7**	**Pin 9**	**Pin 11**	**Pin 13**	**Pin 15**
SMB CLK	SMB Data	LED-H	GND	LED-L	Super IO GPIO 27	Super IO GPIO 26	LED-G

2.9 – 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.

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



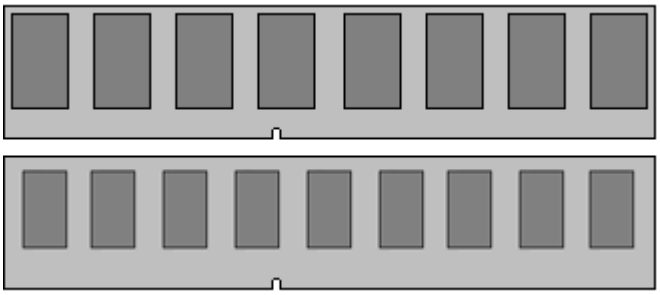
TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.10 – 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.

Use only 184-pin unbuffered non-ECC memory for S2198.



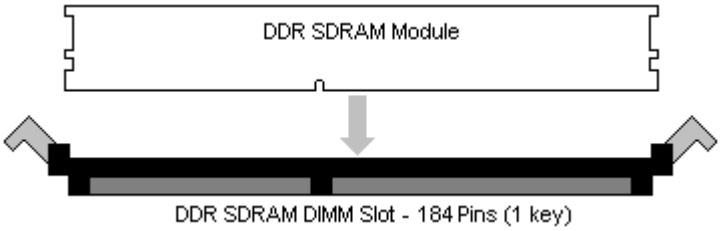
Unbuffered
Non-ECC
= 8 Chips

Unbuffered
ECC
= 9 Chips

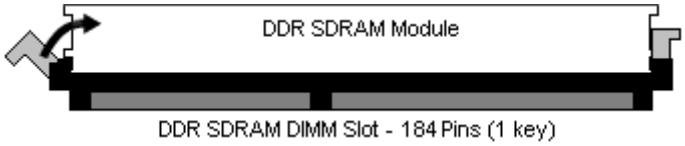
Note: The Tomcat i845GV has two DIMM sockets, which supports a maximum of four banks of DDR memory (only supports 64 Mb, 128 Mb, 256 Mb, and 512 Mb technologies for x8 and x16 devices.)

2.11 – Memory Installation Procedure

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



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



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

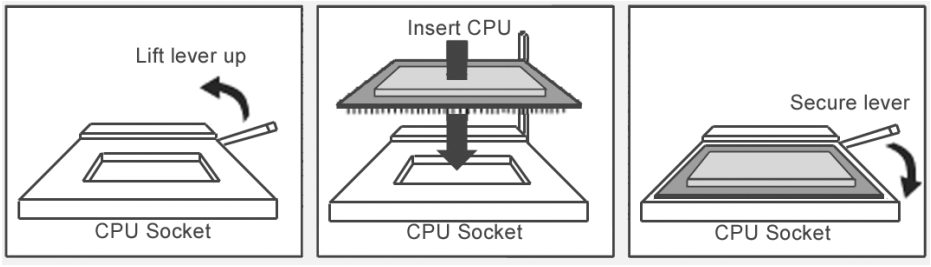
NOTE Due to the PCI v2.2 specifications, you **MUST** unplug the power connector to the motherboard before performing system hardware changes to avoid having your motherboard boot-up automatically.

2.12 – Installing the Processor and Heatsink

Your brand new Tomcat i845GV supports the latest processor technologies from Intel. Check TYAN's website for latest processor support:

http://www.TYAN.com

The following diagrams will detail how to install your processor:



The processor you choose to use may not look exactly like the one pictured above, nor will the socket look exactly the same. For example, your processor may appear to be in a different color and have different markings on it. The diagram is provided as a visual guide to help you install the processor.

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 keys underneath the processor just like on memory modules to ensure that they insert the correct way.
3. Seat the processor firmly into the socket by gently pressing down until the processor sits flush with the socket.
4. Place the socket lever back down until it snaps into place.
5. Your processor is installed.

Take care when installing Pentium 4 processors as they have very fragile connector pins below the processor and can bend and break if inserted improperly.

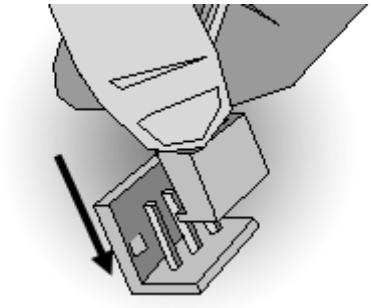
Heatsink Installation

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.

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

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.

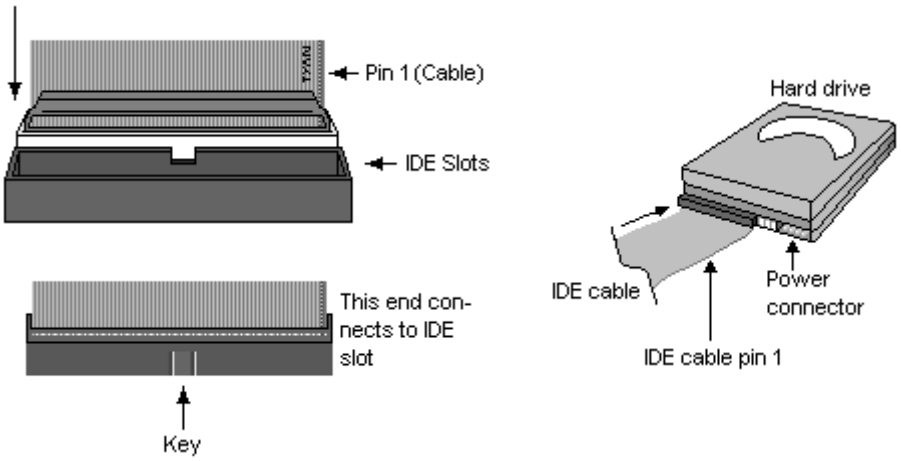


After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.13 – Attaching Drive Cables

Attaching IDE cables to your drives is simple because they only go in one way. TYAN motherboards have two on-board IDE channels for you to use, each supporting two drives. There is a white and a black IDE connector on your motherboard. **The black connector is the Primary IDE channel and the white connector is the Secondary IDE channel.**

Attaching IDE cables to the IDE connectors is illustrated below:

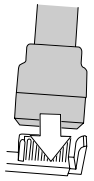


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other ends into the drive(s). Each standard IDE cable has three connectors, two being close to each other. The BLUE connector that is far on its own is the end that plugs into the motherboard whereas the other two connectors are used to connect to drives.

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

Serial ATA

Attaching Serial ATA cables to the Serial ATA connectors are illustrated below: Plug in one end of the Serial ATA cable into the motherboard Serial ATA connector, and the other end into the drive. Each standard Serial ATA cable has two connectors, one at each end. Connectors are the same on both ends.

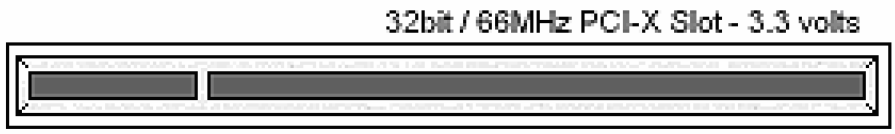


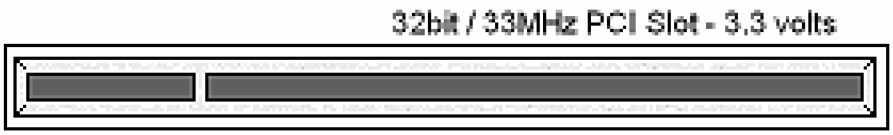
NOTE

Before continuing onto **Connecting External Devices**, make sure everything is properly connected. Things like jumpers and case wiring are the most common causes of troubleshooting frustrations, both for the end-user and for any company doing technical support.

2.14 – Installing Add-In Cards

Before installing add-in cards, it's good to be aware if they're fully compatible with your motherboard. For this reason, we've provided a chart, listing the most common slots that may appear on your motherboard. Not all the slots in this diagram will be on the same board though, but there will be combinations. See below for the way the slots look and what each one means.





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

TIP: It's good practice to spread out cards as far apart from each other as possible if you can. This gives more breathing room and sensitive electronics will cool better and perform more reliably.

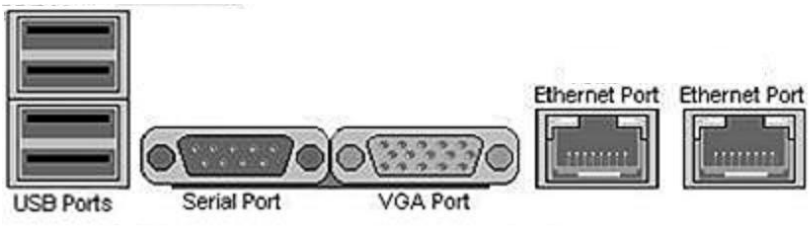
NOTE

YOU MUST unplug the power connector to the motherboard before performing system hardware changes, to avoid having your motherboard boot-up automatically, due to the PCI v2.2 spec.

2.15 – Connecting External Devices

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

S2198 Tomcat i845GV



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.

2.16 – LAN LED Scheme

10/100 LAN

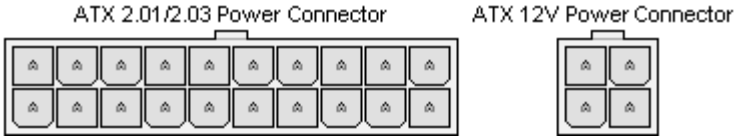
	Link LED	**Activity LED**
Linked at 10Mbps	Off	Blink
Linked at 100Mbps	Yellow	Blink

10/100/1000 LAN

Description	**Left LED (Link)**	**Right LED (Activity)**
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	

2.17 – Installing the Power Supply

There are two power connectors on your Tomcat i845GV. By default, the Tomcat i845GV requires that you have an ATX12V power supply that has a 20-pin and a 4-pin power connector. Do not use any other type of power supply.



1. **Disconnect power supply from electrical outlet**
2. **Connect ATX12V 4-pin power connector(J11)**
3. **Connect ATX12V 20-pin power connector(J18)**
4. **Connect power cable to power supply to power outlet**

Make sure you have connected BOTH the 20-pin and 4-pin connectors before attempting to apply power to the board.

2.18 – 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, even though the instructions herein were followed, 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 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 virus and 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 completed, 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.

NOTE

THE FOLLOWING SECTION DETAILS MOST IF NOT ALL OF THIS BOARD'S BIOS FEATURES.

HOWEVER, YOUR ACTUAL BIOS SETUP MAY NOT BE EXACTLY AS THE ONE DETAILED IN THIS MANUAL.

PLEASE REFER TO THE TYAN WEBSITE FOR UP TO DATE FEATURES CONCERNING BIOS AND OTHER DATA.

Setup Keys

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).

The best advice is to alter only settings that you thoroughly understand. In particular do not change settings in the Chipset section unless you are absolutely sure you need to. 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.

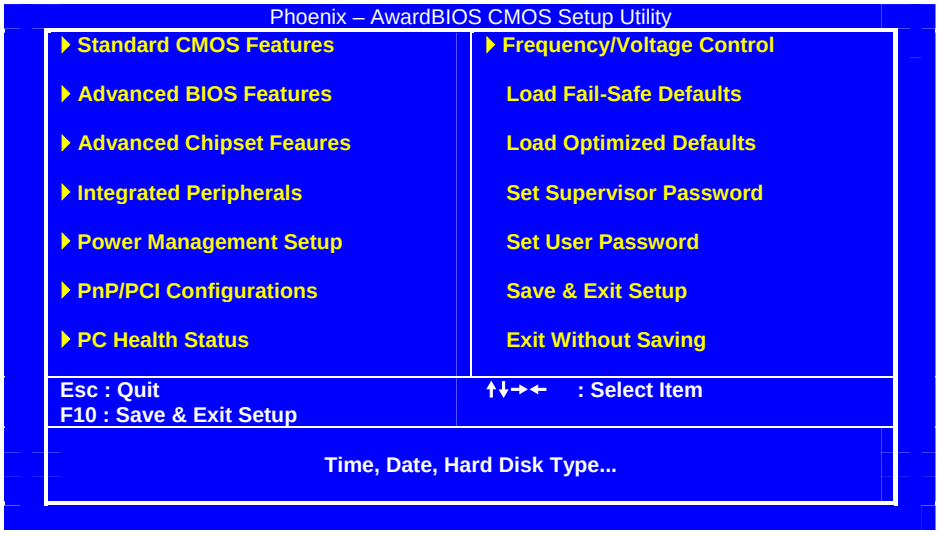
Setup Variations

Not all systems 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 screen shown here. Each system design and chipset combination requires custom configurations. In addition, the final appearance of the Setup program depends on your system designer. Your system designer can decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

On the following pages, options written in **bold type** represent the BIOS Setup default.

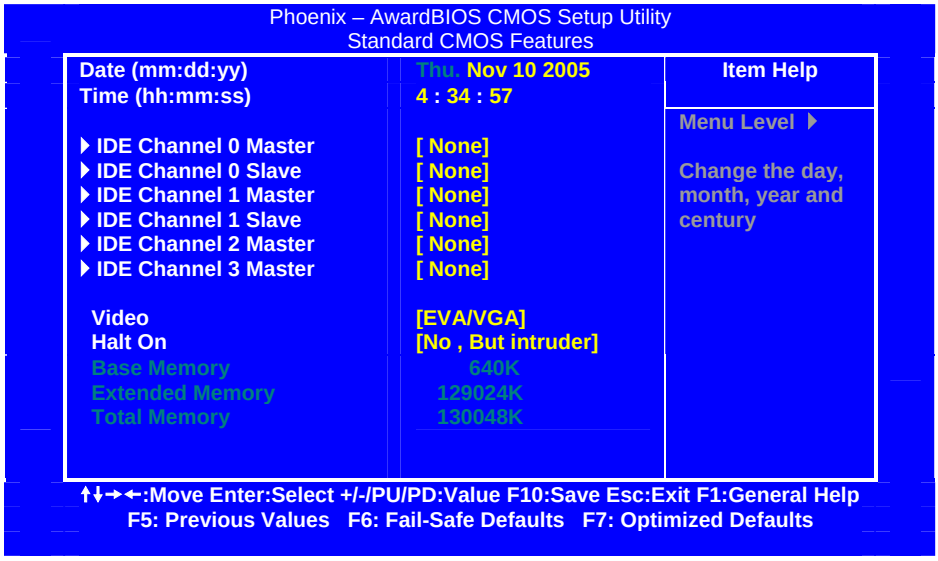
3.1 – Entering Setup

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



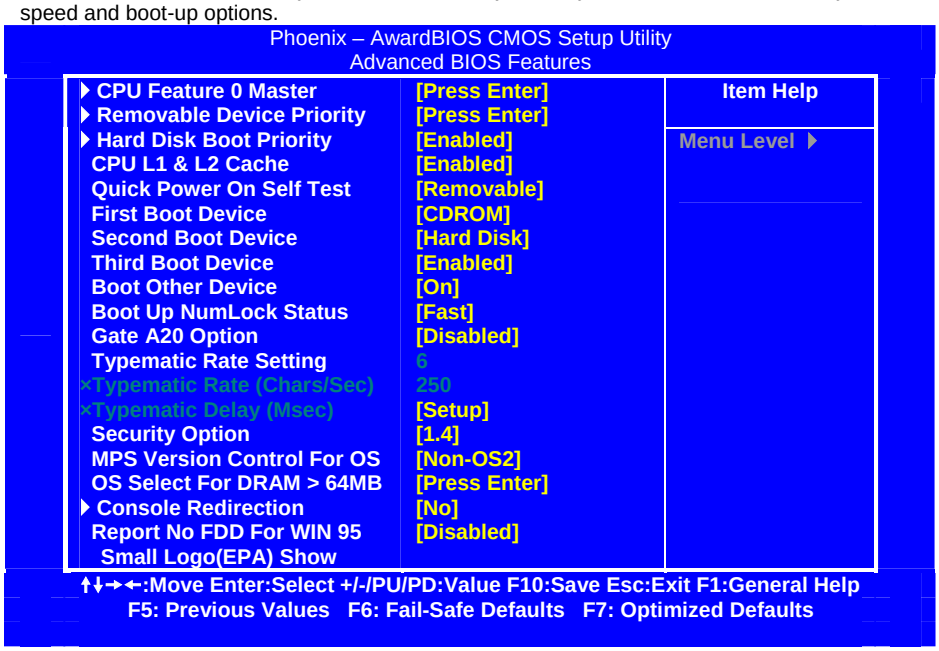
3.2 – Standard CMOS Features

In this section, you can alter general features such as the data 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.



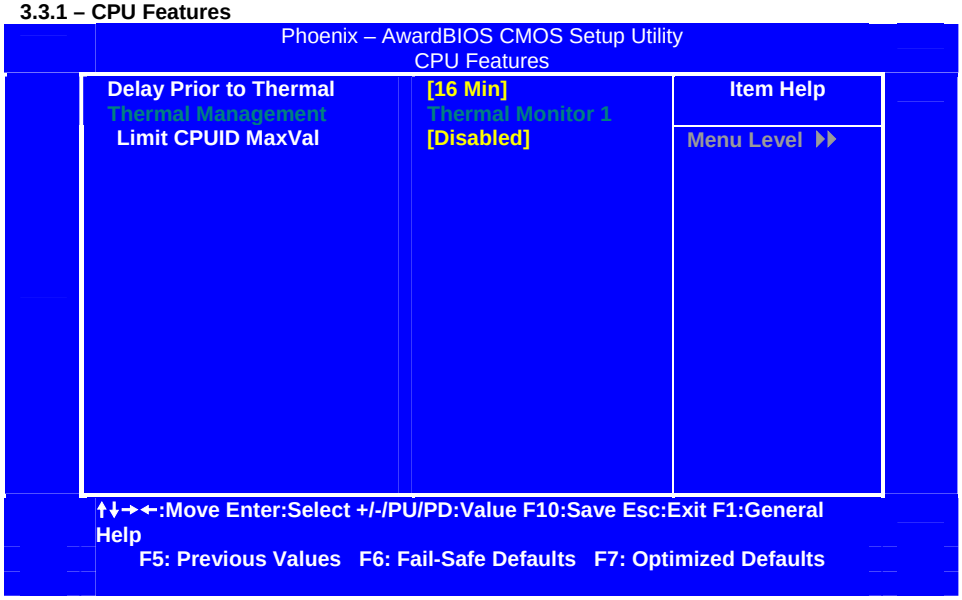
3.3 – Advanced BIOS Features

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

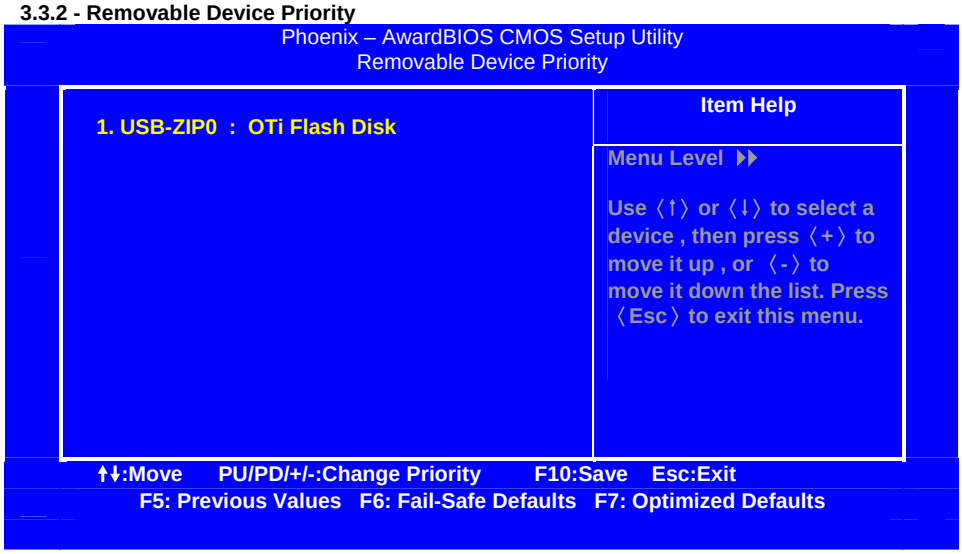


(Advanced BIOS Features continued)

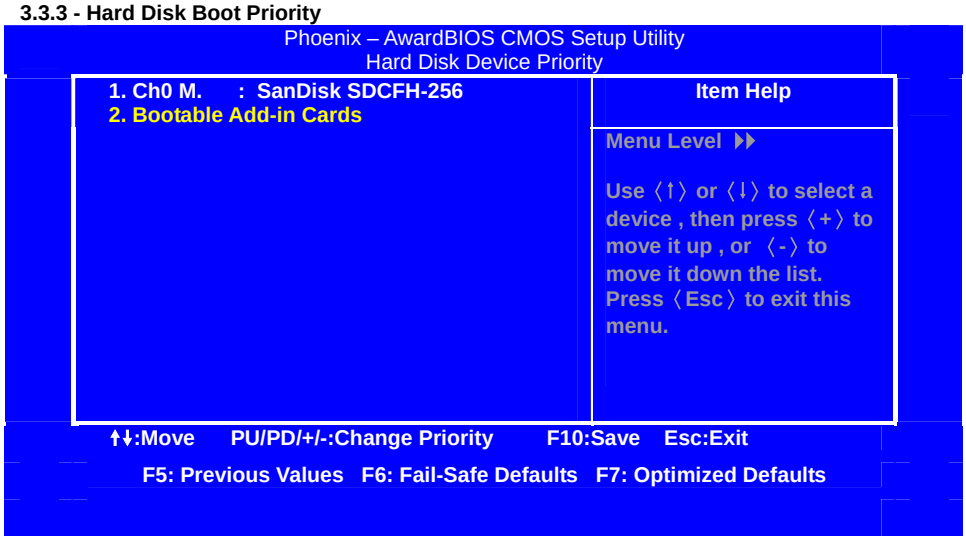
3.3.1 – CPU Features



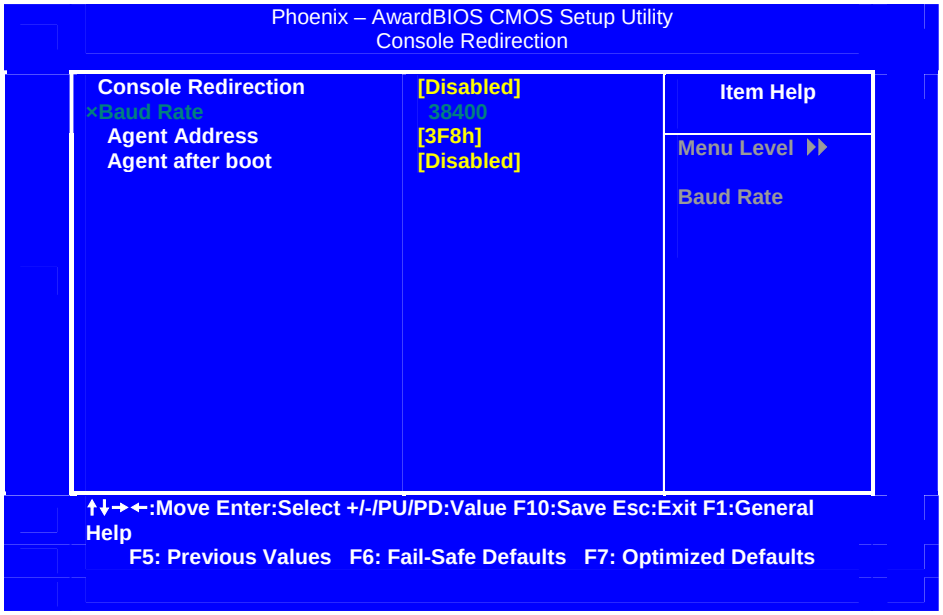
3.3.2 - Removable Device Priority



3.3.3 - Hard Disk Boot Priority

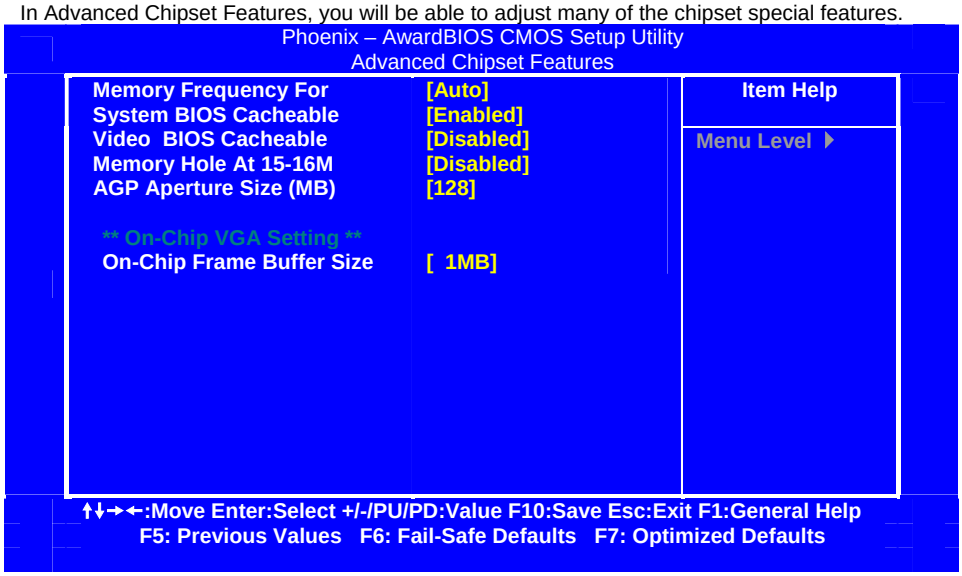


3.3.4 - Console Redirection



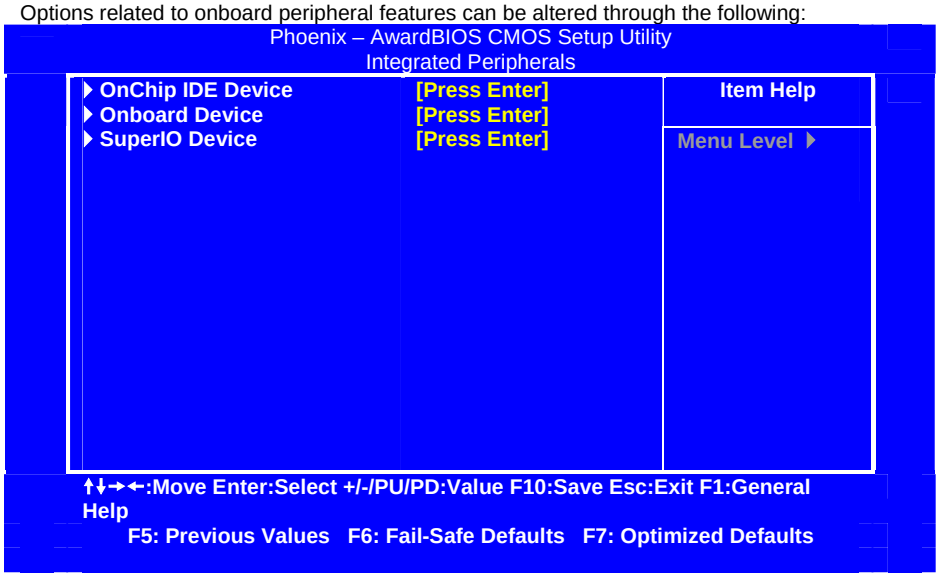
3.4 – Advanced Chipset Features

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



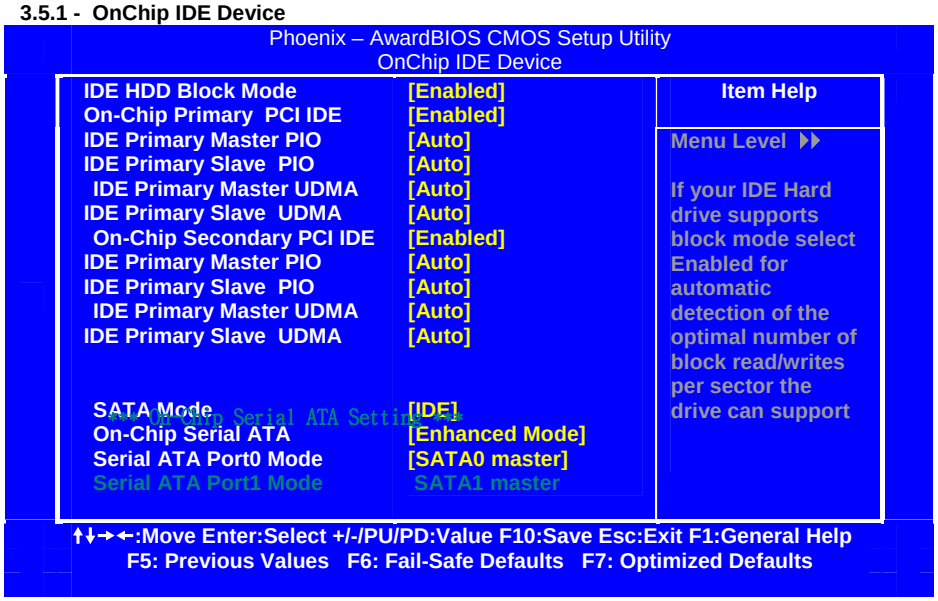
3.5 – Integrated Peripherals

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

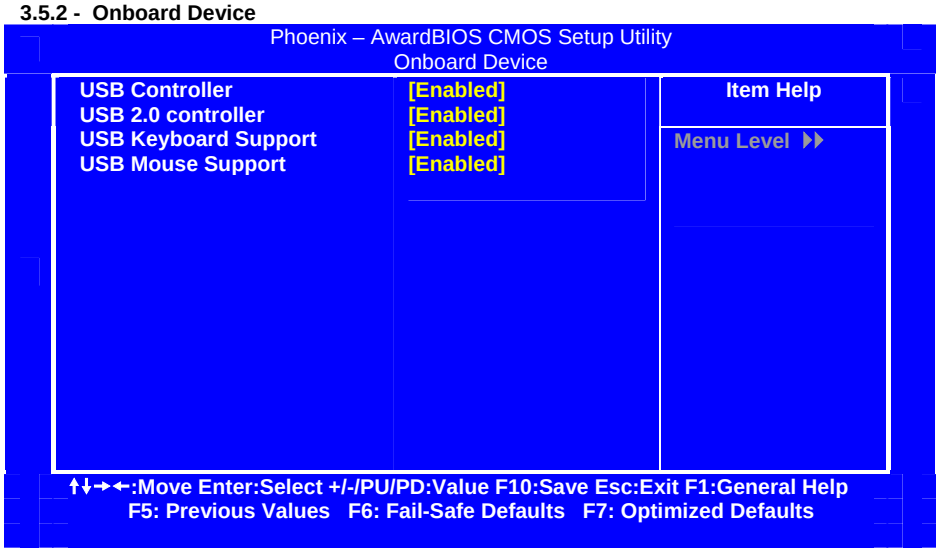


(Integrated Peripherals Continued)

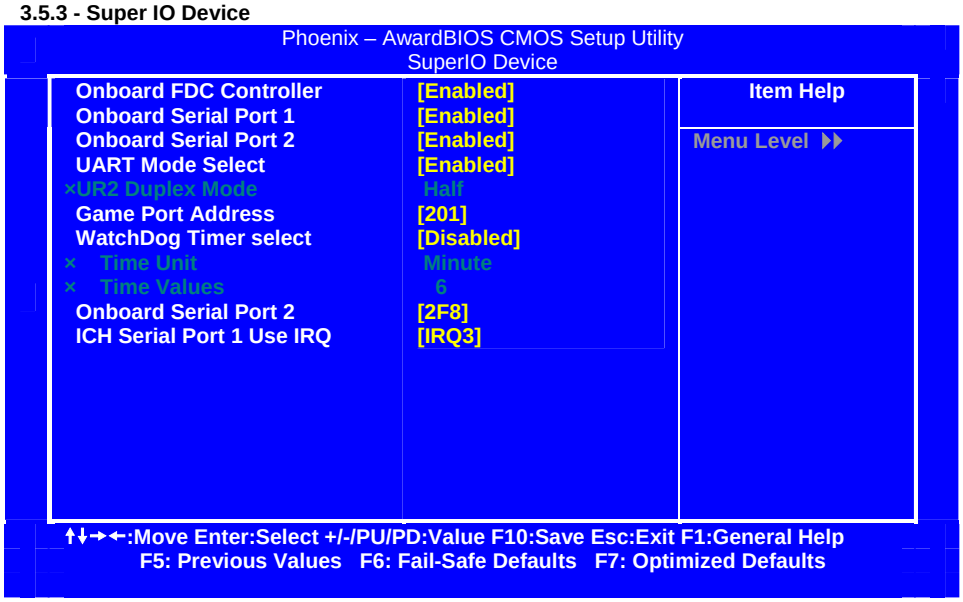
3.5.1 - OnChip IDE Device



3.5.2 - Onboard Device

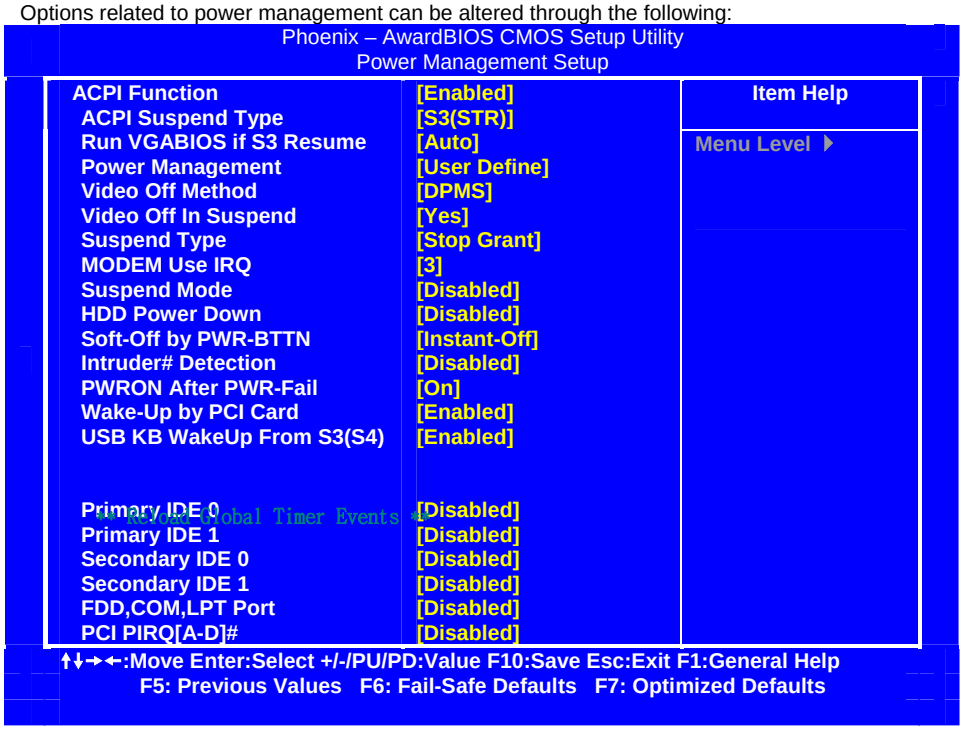


3.5.3 - Super IO Device



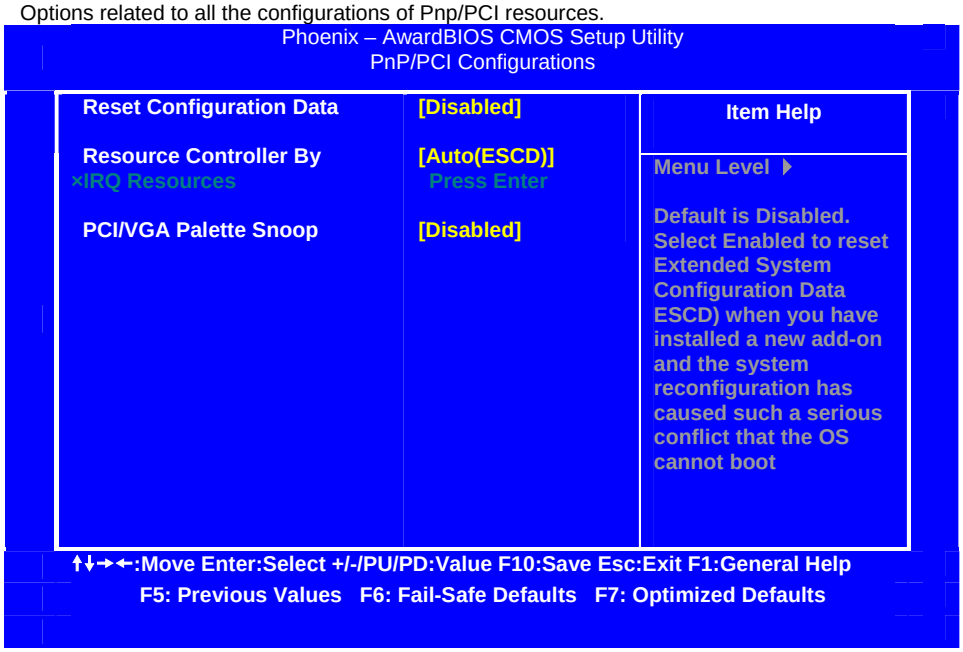
3.6 – Power Management Setup

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



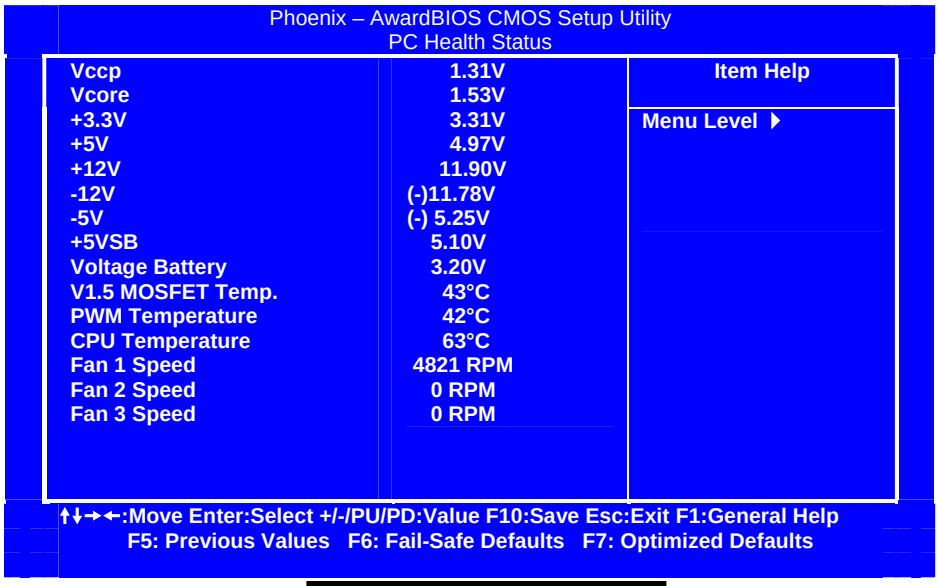
3.7 – PnP/PCI Configuration

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



3.8 – PC Health Status

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

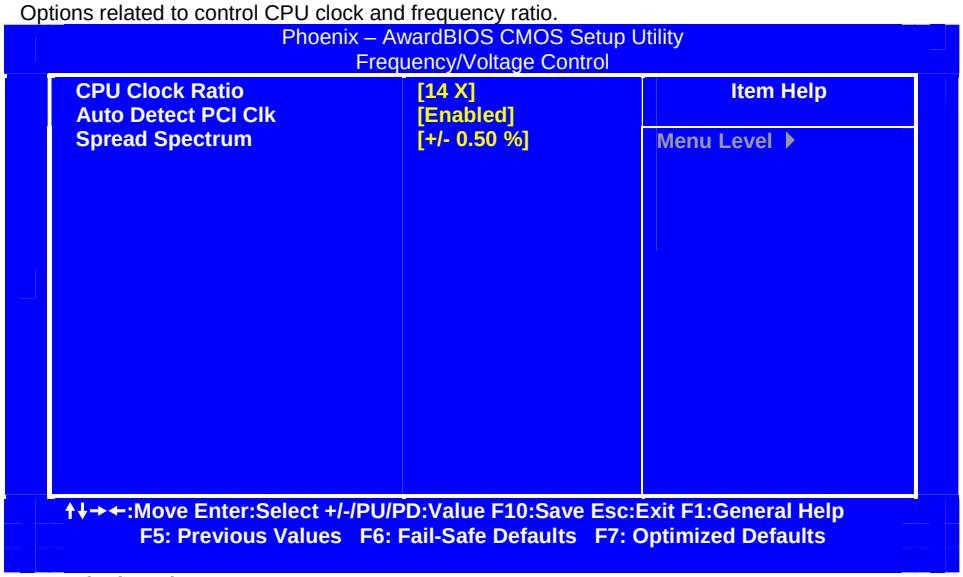


Shutdown Temperature	60° C / 140° F 65° C / 149° F 70° C / 158° F **75° C / 167° F**	To shut down the system when the temperature reaches a certain degree.

The onboard hardware monitoring ASIC automatically detects the system, motherboard, and CPU temperatures. 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 and Voltage Control

Options related to control CPU clock and frequency ratio.

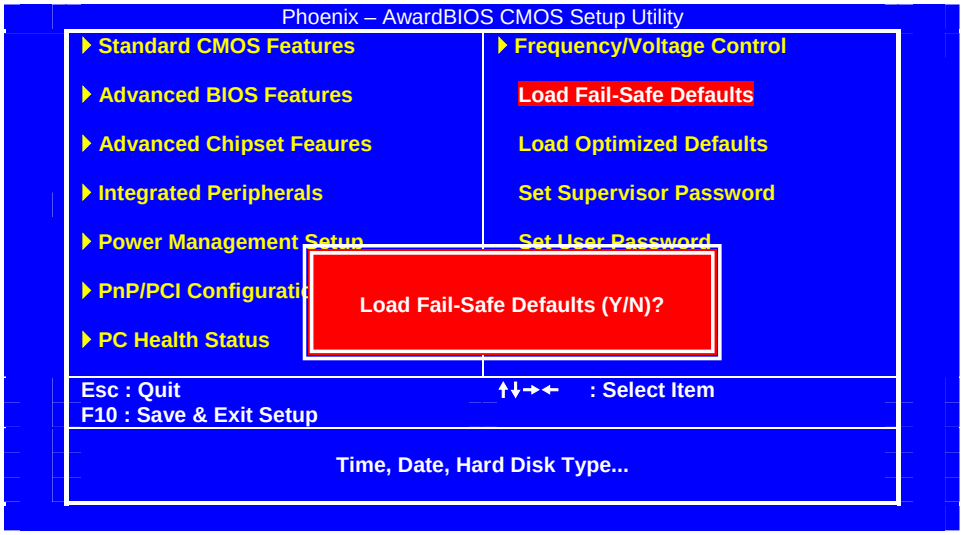


CPU Clock Ratio:
Sets the CPU multiplier. TYAN does not recommend changing this setting from the default setting.
16X…22X / Auto / Default

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

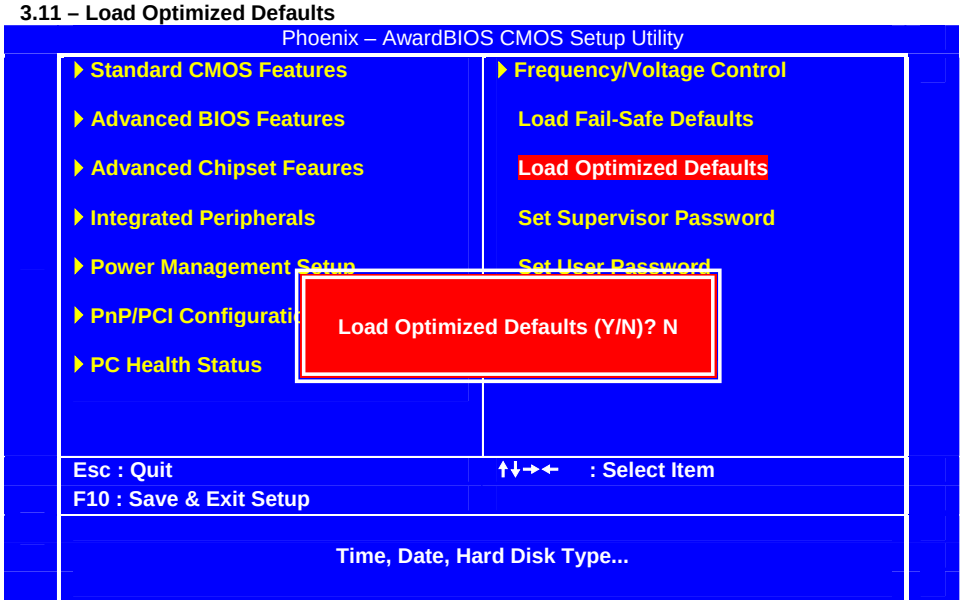


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

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

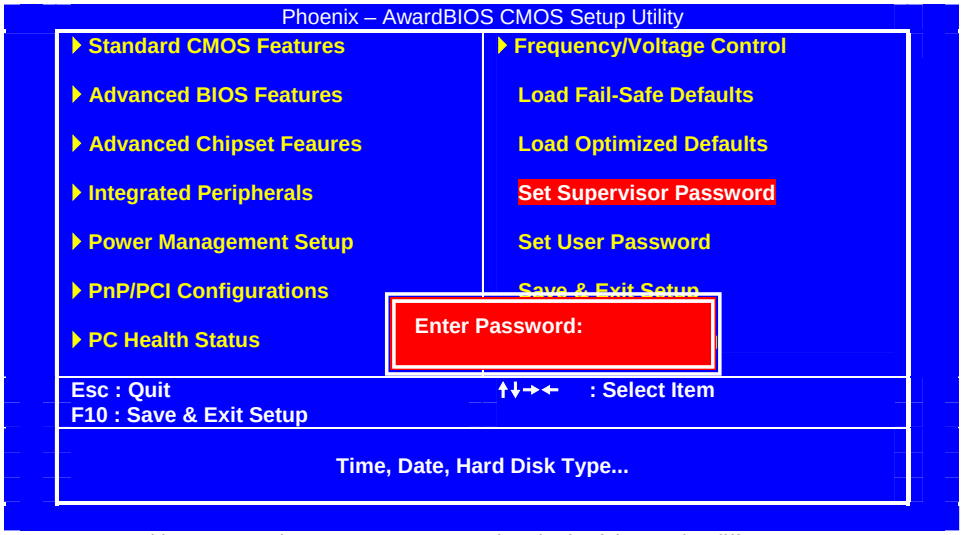


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

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:

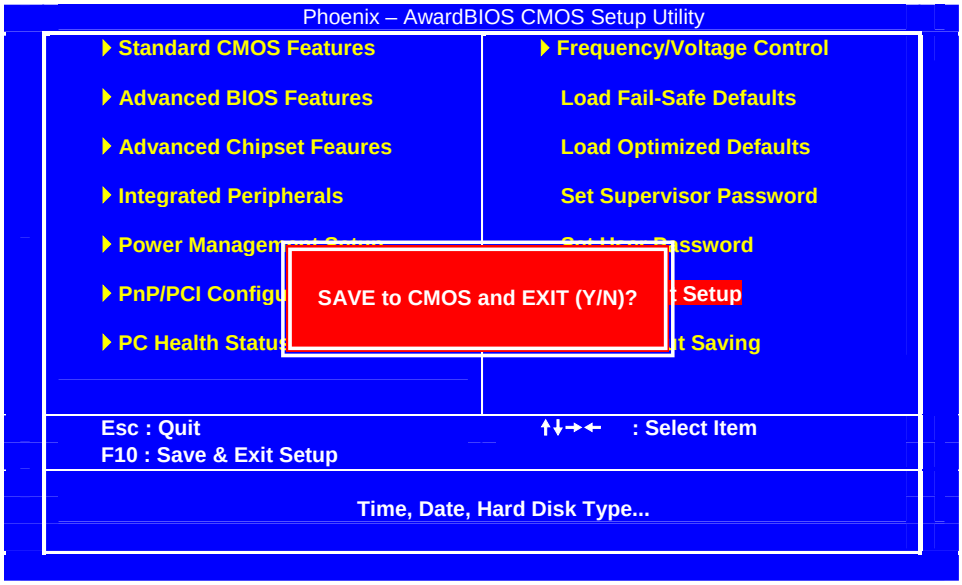
Set Supervisor Password: can enter and change the options of the setup menus.

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.

3.13 – Exit Selecting

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.

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 memory error:

Memory not installed or memory not seated in the socket properly. If this occurs, the board will beep continuously and will not stop until power off. Please ensure that the correct type of memory is installed in the correct location.

If you get this error, please check your memory configuration, order, type, and check for faulty modules. Please check our website for memory compatibility.

Before calling your vendor or calling TYAN Tech Support, be sure that you know how many beeps your board made, and how long the beeps were. Also have other information such as your attached add-in cards, drives and OS to help speed up the support process and come to a possible solution faster.

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, you must check the TYAN website: http://www.TYAN.com/

NOTE	Please be aware that by flashing your BIOS, you agree that in the even of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy of replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damage done to the BIOS 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): an interface specifically designed for the demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the system memory. While the channel runs at just 66MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133MHz.

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 hard drives.

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 O/S, as well as provide the ability to return to the BIOS if the O/S load process fails for some reason. At that point, the next IPL device is called upon to attempt loading of the O/S.

BIOS (Basic Input/Output System): the firmware 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 commonly used to refer to the connection between the processor and system memory, and between the processor and AGP, PCI or ISA buses.

Bus mastering: allows peripheral devices and IDE controllers 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 slower DRAM. Note that the cache is also much smaller than your system memory: a typical cache size is 512KB, while you may have as much as 4GB or more of system memory.

Cache size: refers to the physical size of the cache. 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 system memory is capable of being cached. However, only 512KB of this memory will be in the cache at any given moment.

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 Semiconductor): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called 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 throughput.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs.

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 will 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 replace the BIOS chip. TYAN’s BIOS updates can be found at http://www.TYAN.com.

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

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 most common form factors in use today are; ATX, microATX, FlexATX, Extended ATX, SSI EEB, and SSI MEB.

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

Handshaking: a form of encryption. One system, typically the server, sends an encryption scheme to another agent, typically a client. Thus, the client's data is protected during transmittal to the server.

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 common, formal name for a 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 IDE drives sold today are a form of Enhanced IDE (EIDE), 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 a computer and another device (mouse, keyboard, etc.)

Initial Program Load (IPL): a feature built into BBS-compliant devices, describing those devices as capable of loading and executing an O/S, 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 cause problems. 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). The original IBM PC, PC-XT, and PC-AT utilized these bus architectures.

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 waits for the peripheral to send 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.

OEM (Original Equipment Manufacturer): manufacturers that commonly package other companies' motherboards and hardware inside their chassis 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 bus.

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

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/Me/XP), 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/Inexpensive 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 O/S. 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 features both striping and mirroring, providing fault-tolerance, striping, and faster access, all at the same time.

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.

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).

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.

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

Striping: see RAID

UltraDMA-33/66/100/133 (aka ATA-133/100/66/33): a fast version of the original DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

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

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

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

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

Technical Support

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

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQs, 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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