Trinity i845E /// S2099

Revision 1.10

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Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

1x Trinity i845E motherboard

1x 34-Pin floppy drive cable

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

1x Ultra-DMA-133/100/66 IDE cable (only for models with Promise RAID)

1x Trinity i845E User's Manual

1 x Trinity i845E Quick Reference

1x TYAN driver CD

1x I/O shield

Software driver disk for Promise RAID (only for models with Promise RAID)

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 Trinity i845E is based on Intel's 845E chipset, supporting the Intel Pentium 4 Processor, DDR memory, AGP Pro, 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

Processor
- Single mPGA478 ZIF socket
- Supports one Intel Pentium 4 processor, including "Northwood" series
- Onboard VRM (VRM 9.1 spec)
- Front-Side Bus support for 400MHz or 533MHz

Chipset
- Intel 845E chipset
- MCH + ICH4 + FWH
- Winbond W83627HF LPC I/O ASIC

Memory
- Four 184-pin 2.5v DDR DIMM sockets
- Supports up to 2GB of Unbuffered PC2100/1600 DDR memory
- Supports ECC memory modules

Expansion Slots
- One AGP Pro slot
- Five 33MHz 32-bit (5-volt) PCI slots
- Total of six usable slots

Integrated PCI IDE
- Dual-channel master mode
- Supports up to four Enhanced IDE devices
- Support for ATA-100/66 IDE and ATAPI compliant devices

Integrated LAN (manufacturing option)
- Gigabit Ethernet and Fast Ethernet
- Two LAN controllers
- one Intel 82540 Gigabit controller
- one Intel 82562 10/100 controller

Integrated IDE RAID (manufacturing option)
- Promise PDC20276 bus-master controller
- Dual-channel ATA-133 IDE RAID
- Supports up to 4 ATA-133/100/66 IDE drives
- Supports RAID Levels 0, 1

Integrated 2D/3D Graphics (manufacturing option)
- ATI RAGE XL graphics controller
- 8MB frame buffer
- Standard 15-pin analog VGA port

Integrated I/O
• One floppy connector supports up to two drives
• One 9-pin 16550-based serial port
• One 25-pin SPP/ECP/EPP parallel port
• Six USB 2.0 ports
• PS/2 keyboard and mouse ports

1.3 Software Specifications

OS (Operating System) Support
- Microsoft Windows NT 4
- Microsoft Windows 2000

Microsoft Windows XP

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

Integrated Audio (manufacturing option)
• AC'97 6-channel audio codec
• Line-In, Line-Out, Mic-In jacks
• CD-In, Aux-In connectors

Hardware Monitoring
• Winbond 83627HF hardware monitoring ASIC
• CPU temperature/voltage monitoring
• 3-pin fan monitoring headers

BIOS
• Phoenix AwardBIOS on 4Mbit Flash ROM
• Jumper-free overclocking and over-voltage
• User settings for hardware monitoring
• Auto-configuration of IDE hard drive types
• Multiple boot options

Form Factor
• ATX footprint (12" x 9.6")
• ATX12V power connector
• Stacked parallel (one), serial (one) and VGA (one) ports
• Stacked USB (four) ports
• Side-by-side LAN (two) ports
• Stacked keyboard and mouse ports

Regulatory

• FCC DoC (Declaration of Conformity)
• European CE (Declaration of Conformity)

Chapter 2: Board Installation

WARNING: The Trinity i845E only supports ATX12V power supplies and will not operate with other types. Refer to section 2.18 for instructions on installing ATX12V power supplies. DO NOT use EPS12V or ATX-GES power supplies as they will damage the board and void your warranty.

Only ATX form factor chassis' are supported. Other form factors may short the board because the installation studs are in different locations than those required by the Trinity i845E.

Installation

You are now ready to install your motherboard. The mounting hole pattern of the Trinity i845E matches the ATX system board specifications. Your chassis should support a standard ATX 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:

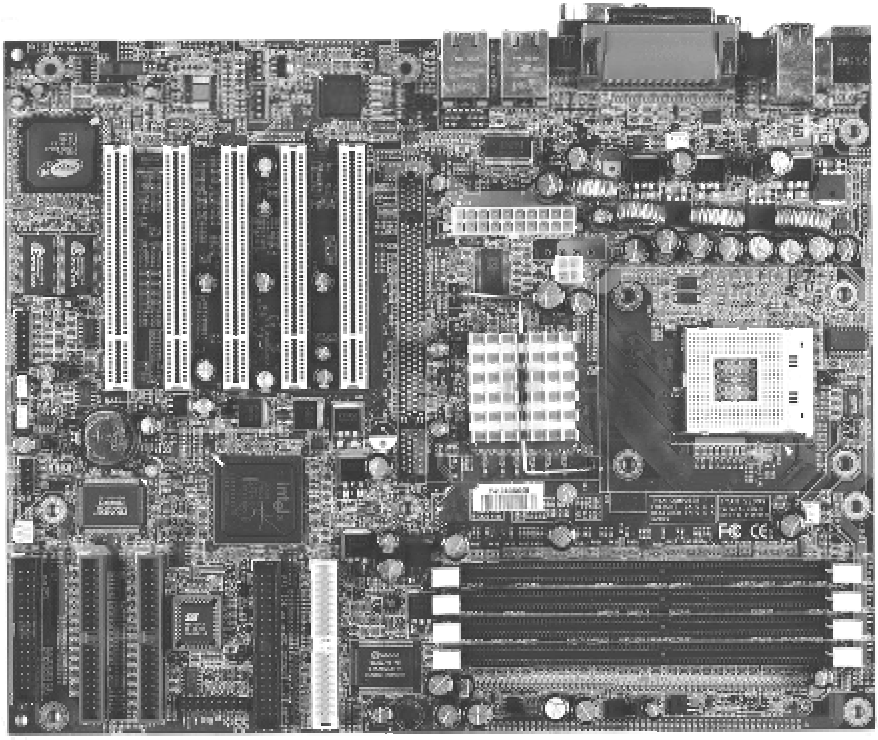
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, Tyan recommends wearing a static safety wrist strap.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

2.0 – Board

The following is an image of the Trinity i845E S2099.

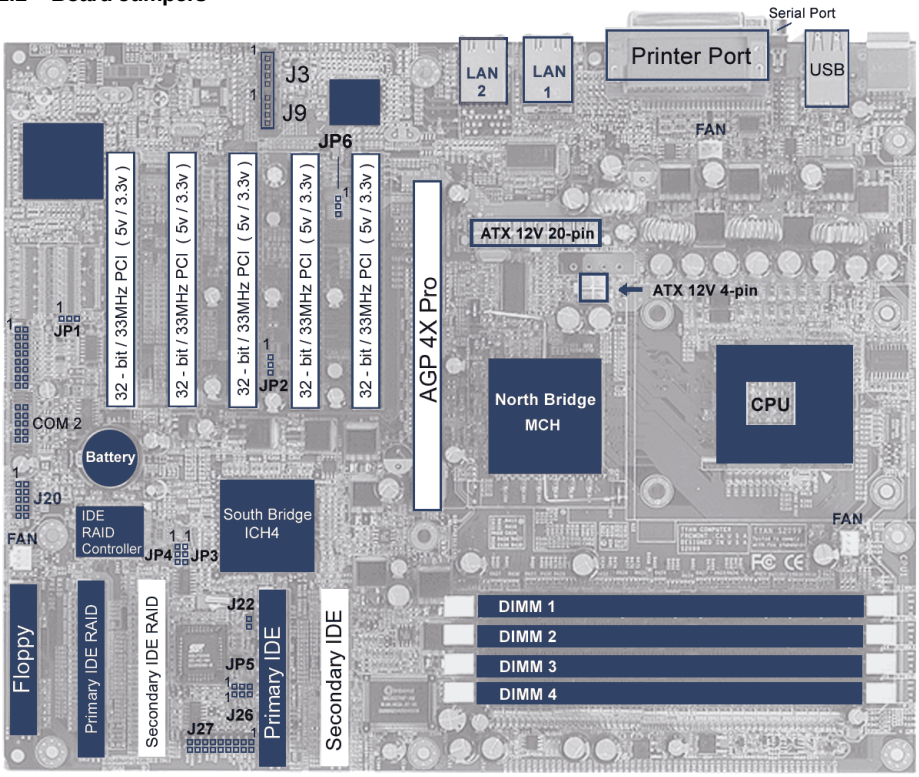


S2099GNNR

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.

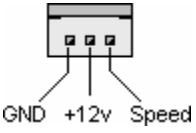
The following page includes details on the vital components of this motherboard.

2.1 – 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.

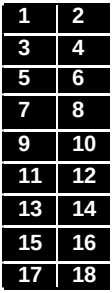
2.2 – Fan Connectors



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.

2.3 – Front Panel Connector (J27)

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.



1,3: Hard drive LED
2,4: Power LED
5,7: Reset Switch
6,8: Power Switch
11,13,15,17: InfraRed
12,14,16,18: Speaker Switch

2.4 – CMOS Reset (JP3)

1,2: Default
2,3: Clear CMOS

Connect pins 2 and 3 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.
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 – Promise Controller (JP4)

1,2: Disabled
2,3: Enabled

2.6 – Onboard ATI RAGE XL (JP1)

1,2: Enabled
2,3: Disabled

2.7 – Intel 82540 Gigabit LAN Controller (JP6) –*S2099GNNR models only*
Note – The Intel 82562 10/100 controller is set through BIOS setup.

1,2: Enabled
2,3: Disabled

2.8 – Pin Header Definitions

J3/J9 = CD-In/Aux-In (optional)
J26 = Power LED (3-pin)
J20 = USB

2.9 Secondary USB connector (J20)

1= Power In (+5V)
2 = Signal Out
3 = Signal In
4 = GND
5 = GND

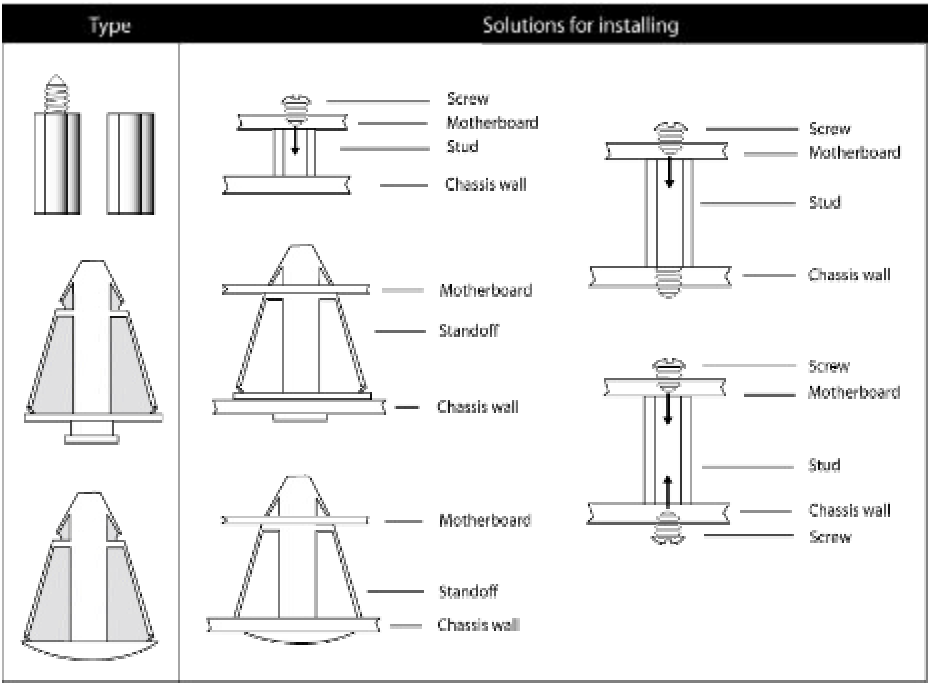
2.10 – Mounting the Motherboard

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. These are also usable, however Tyan recommends using metal studs with screws to make sure the motherboard stays secure during shipment of while moving the system.

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

Mounting the Motherboard



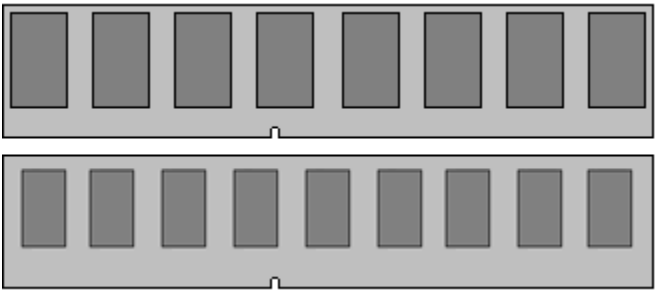
TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.11 – 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.

Use only 184-pin unbuffered ECC or non-ECC memory for S2099.



Unbuffered
Non-ECC
= 8 Chips

Unbuffered
ECC
= 9 Chips

2.12 – Important Memory Module Information

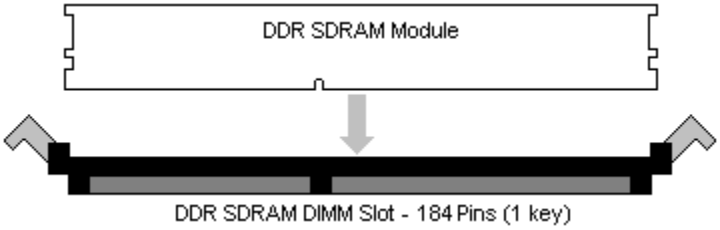
The Trinity i845E has four DIMM sockets, but it only supports a maximum of four banks of DDR memory (only support 64-Mb, 128-Mb, 256-Mb and 512-Mb technologies for x 8 and x16 devices).

S = Single Bank **D** = Double Bank **X** = Empty

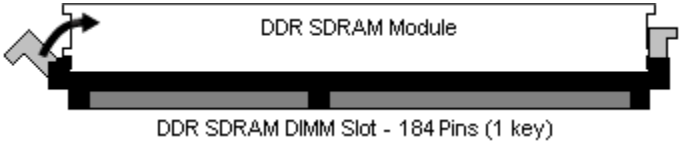
DIMM 1	DIMM 2	DIMM 3	DIMM 4
S	X	X	X
X	**S**	X	X
X	X	**S**	X
X	X	X	**S**
S	**S**	X	X
S	X	**S**	X
S	X	X	**S**
X	**S**	**S**	X
X	**S**	X	**S**
X	X	**S**	**S**
S	**S**	**S**	X
S	**S**	X	**S**
S	X	**S**	**S**
X	**S**	**S**	**S**
S	**S**	**S**	**S**
DIMM 1	**DIMM 2**	**DIMM 3**	**DIMM 4**
D	X	X	X
X	**D**	X	X
X	X	**D**	**X**
X	X	X	**D**
D	X	**D**	X
D	X	X	**D**
X	**D**	**D**	X
X	**D**	X	**D**

2.13 – 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. SDRAM modules (also referred to as PC100 or PC133) and their sockets have two keys and will not insert into DDR DIMM sockets. 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

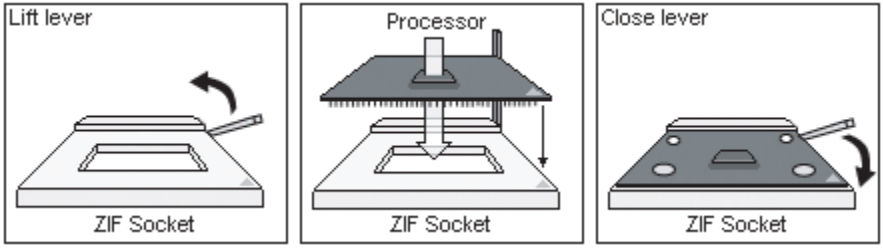
YOU MUST unplug the power connector to the motherboard before performing system hardware changes, to avoid having your motherboard boot-up automatically, due to the PCI v2.2 spec.

2.14 – Installing the Processor and Heatsink

Your brand new Trinity i845E 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.

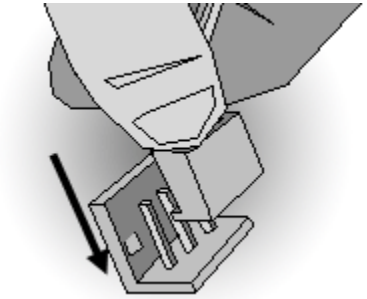
Heatsink Installation

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.

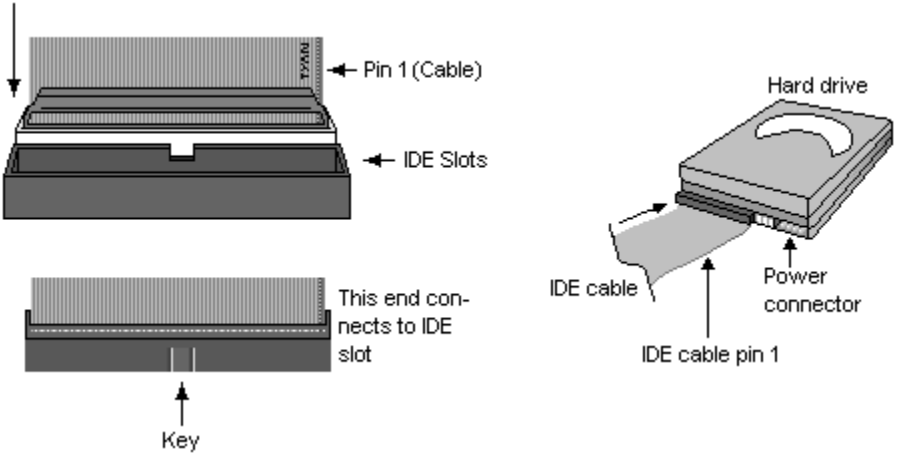


After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.15 – 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:

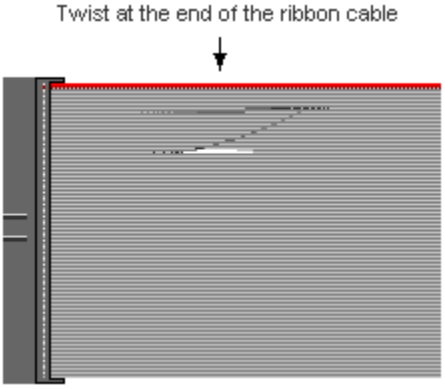


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other ends into the drive(s). Each standard IDE cable has three connectors, two being close to each other. The BLUE connector that is far on its own is the end that plugs into the motherboard whereas the other two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

Floppy Drives

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



The first floppy drive (sometimes 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 disks.

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.

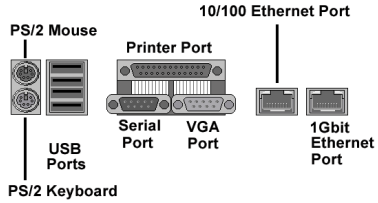
NOTE

Before continuing onto section **2.16 – 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.

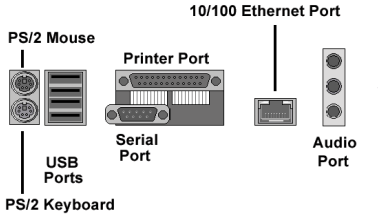
2.16 – Connecting External Devices

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:

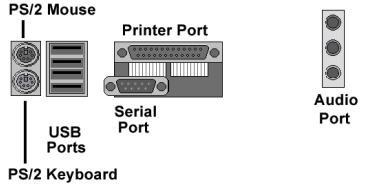
S2099 Trinity i845E



S2099GNNR - (2) Ethernet ports



S2099ANR - (1) audio port and (1) Ethernet port



S2099A - (1) one audio port

Depending on the individual motherboard design, the PS/2 keyboard and mouse ports may sometimes have their positions swapped. The most common designs implemented today place the keyboard connector closest to the motherboard, while the top connector is for the mouse.

Although primarily to connect printers, the parallel printer port is also used for devices such as ZIP drives, external CD-RW drives, scanners, and other external devices. Serial ports, also known as COM ports, are primarily used to connect external modems and other RS-232C devices.

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.

2.17 – Installing the Power Supply

There are two power connectors on your Trinity i845E. By default, the Trinity i845E requires that you have an ATX 12Vpower supply that has a 20-pin and a 4-pin power connector. Please be aware that EPS 12V and dual AMD (20+4-pin) power supplies are **not compatible** with the board.

1. **Disconnect power supply from electrical outlet**
2. **Connect ATX12V 4-pin power connector**
3. **Connect ATX12V 20-pin power connector**
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, jumper cables. 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 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.

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. h 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.

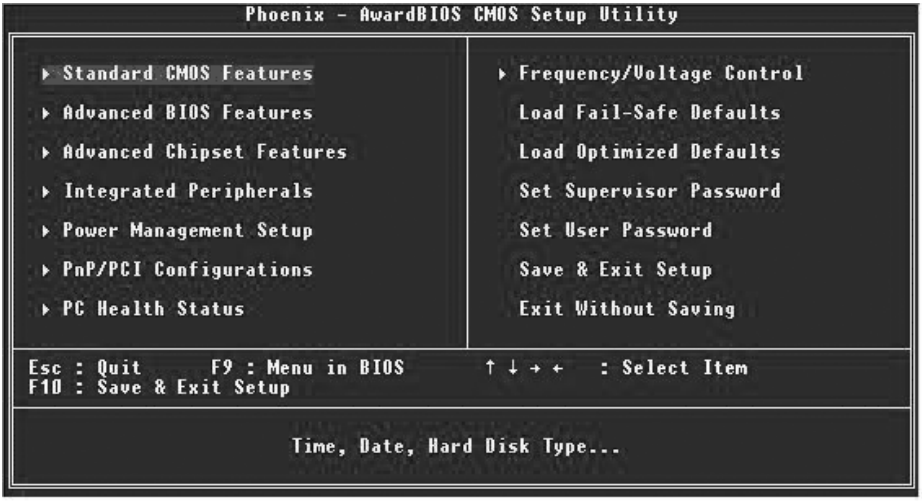
Setup Variations

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.

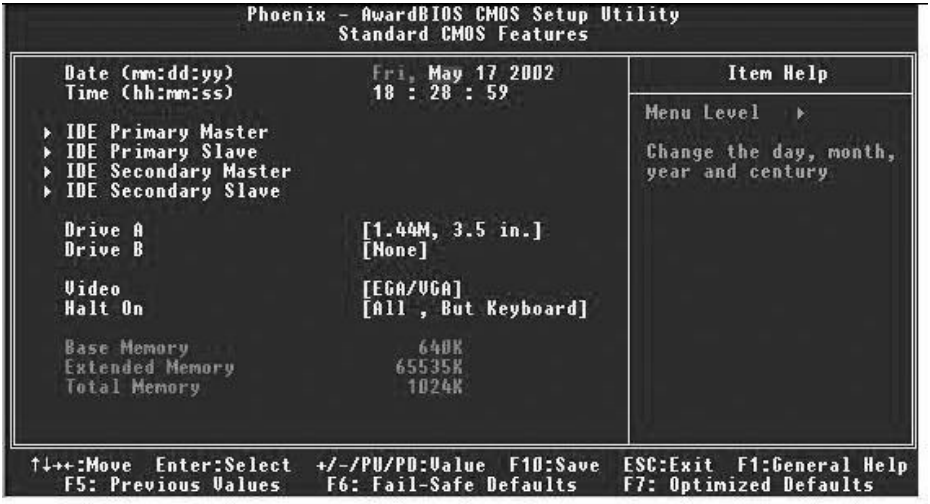
3.1 – Entering Setup

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.



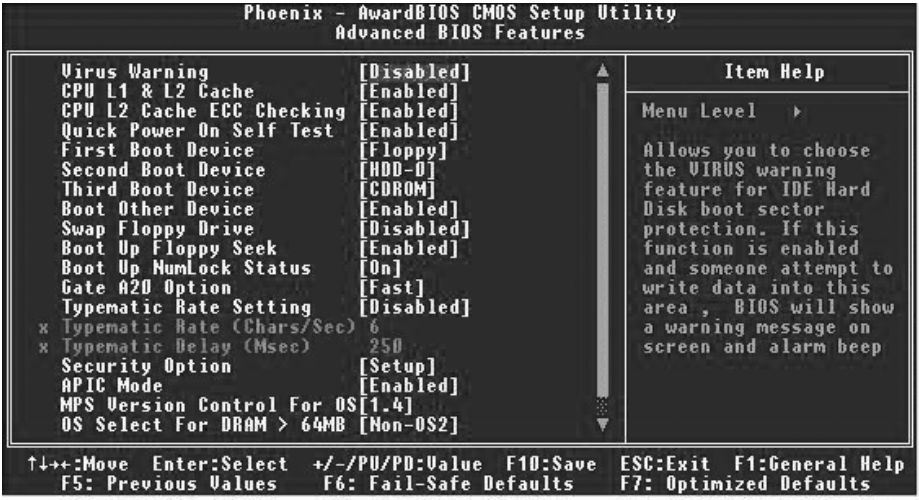
(Standard CMOS Features continued)

System Time	HH: Hours (24 hr. format) MM: Minutes SS: Seconds	Adjusts the system clock.
System Date	MM: Month DD: Day YYYY: Year	Adjusts the system date.

IDE Primary Master/Slave	None **Auto** Manual	Detects IDE drives.
IDE Secondary Master/Slave	None **Auto** Manual	Detects IDE drives.
Drive A	None 360K, 5.25 in. 1.2M, 5.25 in. 720K, 3.5 in. **1.44M, 3.5 in.** 2.88M, 3.5 in.	Defines floppy drive type.
Drive B	Same options as Drive A **None**	Defines floppy drive type.
Video	**EGA/VGA** CGA 40 CGA80 MONO	Defines video display mode.
Halt On	No Errors All Errors **All, but keyboard** All, but diskette All, but disk/key	Determines if the computer should stop when an error is detected during power up.

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.



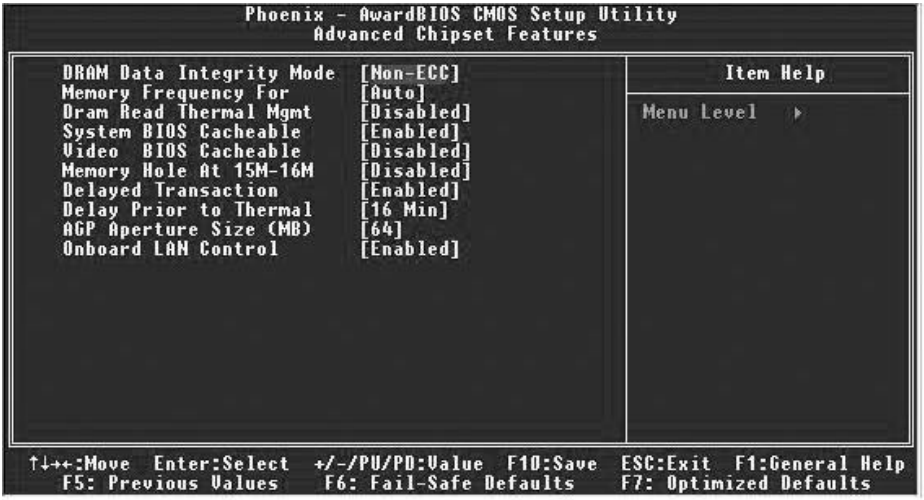
Virus Warning	**Disabled** Auto	This settings toggles virus protection on or off for boot sector writes.
CPU L1 & L2 Cache	**Enabled** Disabled	Toggles the use of CPU L1 and L2 cache.
CPU L2 Cache ECC Checking	**Enabled** Disabled	Checks for ECC.
Quick Power On Self Test	**Enabled** Disabled	This option allows the system to skip self tests for faster startup.
First, Second, Third, Other Boot Device	Options Dependant on system.	Selects the startup device sequence.
Swap Floppy Drive	Enabled **Disabled**	This option switches A: to B: drive.
Boot Up Floppy Seek	**Enabled** Disabled	This option causes the floppy drives to be detected at startup.
Boot Up NumLock Status	**On** Off	Sets the Num Lock on or off.
Gate A20 Option	Normal **Fast**	(Leave as default)
Typematic Rate Setting	Enabled **Disabled**	Toggles control of keyboard key repeat rate.
Typematic Rate (chars/Sec)	**6** , 8, 10, 12, 15, 20, 24, 30	Defines how many characters are repeated per second when holding down a key on the keyboard.
Typematic Delay (MSec)	**250** , 500, 750, 1000	Defines the delay that occurs at key stroke before that key will start to repeat.

(Advanced BIOS Features continued)

Security Option	**Setup** System	Sets the password on either just the BIOS setup or the entire system (BIOS setup included).
MPS Version Control For OS	**1.4** 1.1	Selects Multi Processor specification v1.4 or v1.2
OS Select for DRAM > 64MB	**Non-OS2** OS2	Select OS2 only if you are running OS/2 operating system with more than 64MB of RAM.
Report No FDD for WIN95	**No** Yes	Tells Win9x not to display the floppy drive if there are none installed.
Small Logo (EPA) Show	Enabled **Disabled**	Toggles the display of the EPA Energy Star logo at POST.

3.4 – Advanced Chipset Features

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

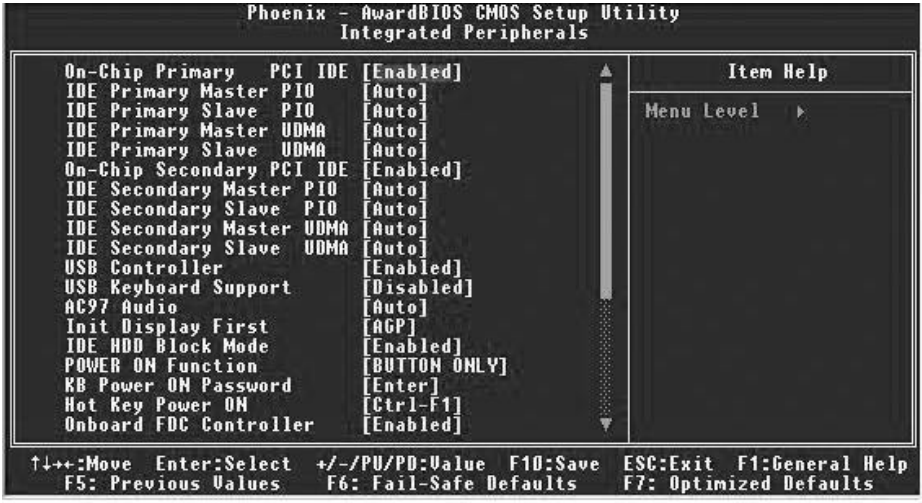


(Advanced Chipset Features continued)

DRAM Data Integrity Mode	**ECC** Non - ECC	Sets DRAM Data Integrity Mode for ECC or Non-ECC
Memory Frequency For	PC100 PC133 **Auto**	Selects memory frequency. (Leave as Default)
DRAM Read Thermal Mgmt	Enabled **Disabled**	(Leave as Default)
System BIOS Cacheable	**Enabled** Disabled	Toggles BIOS caching on and off. For performance, use **Enabled**.
Video BIOS Cacheable	Enabled **Disabled**	Toggles video card BIOS caching. Leave as **Default**.
Memory Hole At 15M-16M	Enabled **Disabled**	Creates a memory reserve at 15 to 16MB address in RAM for ISA devices that require it. Leave as **Default**.
Delayed Transaction	**Enabled** Disabled	(Leave as Default)
Delay Prior to Thermal (minutes)	4, 8, **16**, 32, 64	Set CPU Thermal function after booting xx minutes. (Leave as Default)
AGP Aperture Size (MB)	4, 8, 16, 32, **64**, 128, 256	Sets a RAM amount used for AGP functions.
Onboard LAN Control	**Enabled** Disabled	Enables or Disables onboard LAN function. (Leave as Default)

3.5 – Integrated Peripherals

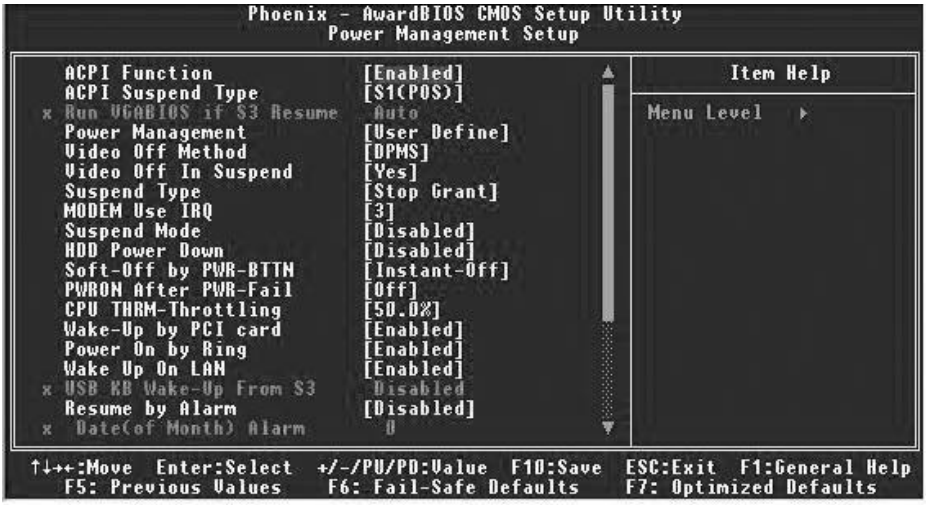
Options related to onboard peripheral features can be altered through the following:



OnChip Primary PCI IDE	**Enabled** Disabled	Enables or Disables onboard IDE controller.
OnChip Secondary PCI IDE	**Enabled** Disabled	Enables or Disables onboard IDE controller 2.
AC97 Audio	**Auto** Disabled	Choose to detect onboard AC97 Audio by BIOS.
Init Display First	**PCI** AGP	Defines which graphics device to start first.
Primary/Secondary Master/Slave PIO	**Auto** PIO 1,2,3,4	Changes PIO (Programmed I/O) interface mode for HDD.
Primary/Secondary Master/Slave UDMA	**Auto** UDMA 1, 2, 3, 4 ,5	Changes UDMA (Ultra Direct Memory Access) interface mode for HDD.
Super IO Device	Press Enter	
USB Controller	**All Enabled** None	Toggles the use of onboard USB ports.
USB Keyboard Support	Enabled **Disabled**	Toggles the use of a USB keyboard under DOS.
IDE HDD Block Mode	**Enabled** Disabled	Leave this setting as is.

3.6 – Power Management Setup

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

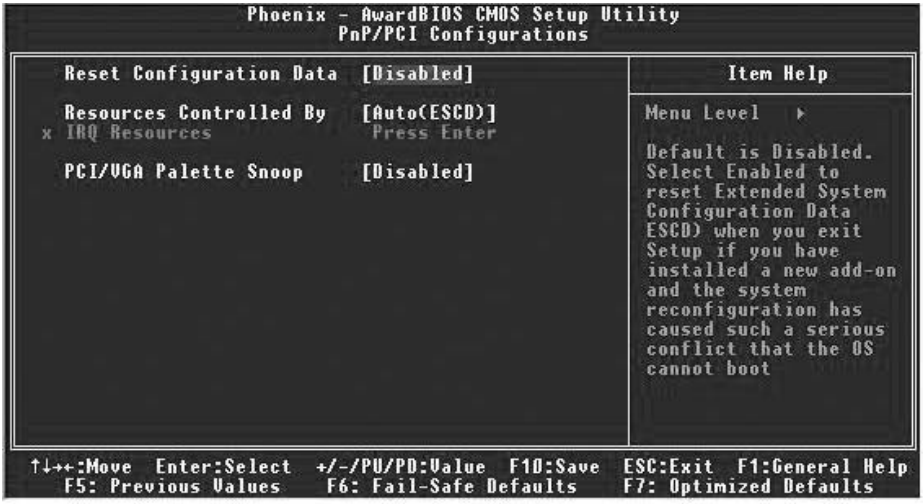


ACPI function	**Enabled** Disabled	Toggles advanced power and configuration done by OS.
ACPI Suspend Type	**S1 (POS)**	Defines ACPI system suspend mode.
Power Management Option	User Define Maximum Saving Minimum Saving	Defines the type of power saving features the system should follow.
Video Off Method	V/H SYNC+Blank Blank **DPMS**	Defines the method used to power off graphics.
HDD Power Down	**Disabled** 1,5,10,20,30,45,60 minutes	Defines hard drive power down delay.
Suspend Mode	**Disabled** Standby Sleep	Defines the method used to power off the system.
Video Off In Suspend Suspend Type	Yes/Stop Grant No/Power On Suspend	Defines the suspend type for Stop Grant or power on suspend.
Soft-Off by PWRBTN	**Instant-Off** 4-seconds	Defines the action of the power button when pressed.
PWRON After PWR-Fail	**Off** On	Defines whether the system will remain off if power fails or turn on when power is restored.

(Power Management Setup continued)

Wake Up by PCI Card	**Disabled** Enabled	Defines whether the system can be powered on by a PCI Card.
Power On by Ring or Wake Up on LAN	**Disabled** Enabled	Defines whether the system will wake up if the modem is dialed into. Set for default.
RTC Alarm Resume	**Disabled** Enabled	Defines the time/date when the system will wake up.
Primary/Secondary IDE 0 & 1	**Disabled** Enabled	Enables or Disables monitoring Primary IDE 0/1 for power saving.
FDD, COM, LPT port	**Disabled** Enabled	Enables or Disable of monitoring FDD, COM, LPT for power saving.
FDD, PIRQ [A-D] #	**Disabled** Enabled	Enables or Disables monitoring PCI PIRQ [A-D] # IRQ Active.

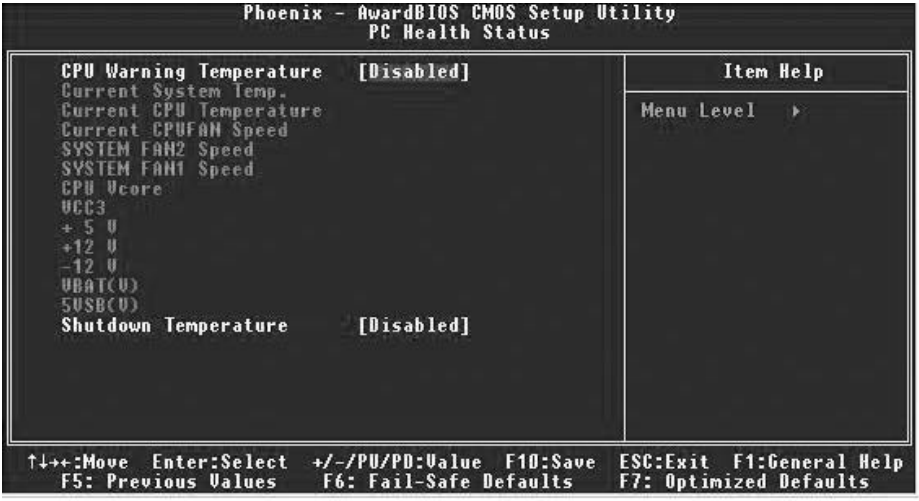
3.7 – PnP/PCI Configuration
Options related to all the configurations of Pnp/PCI resources.



Rest Configuration data	Enabled **Disabled**	Leave as Default.
Resources Controller	**Auto (ESCD)** Manual	Defines whether system resources are controlled by BIOS or by user.
PCI/VGA Palette Snoop	Enabled **Disabled**	Leave as Default.

3.8 – PC Health Status

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

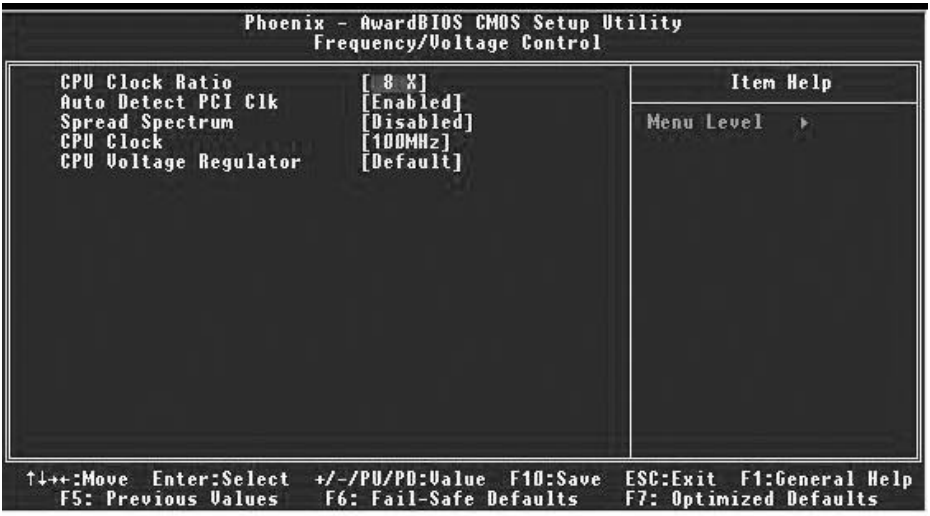


CPU Warning Temperature	**Disabled** 70° C / 158° F 80° C / 176° F 90° C / 194° F	To set the CPU warning temperature.
Shutdown Temperature	**Disabled**	To shut down the system when temperature exceeds. [C/P]

The onboard Winbond 83627HF 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.



Warning: The following options are to be changed only by a certified technician or at Tyan's discretion. Damage to your processor, motherboard, memory, or any other device in your system can be caused by mishandling the following settings.

CPU Clock Ratio	**Auto** 16X… 22x	Sets the CPU multiplier. TYAN does not recommend changing this setting from the default setting.
Auto Detect PCI/DIMM Clk	**Enabled** Disabled	Sets the BIOS to automatically adjust CPI and memory bus speeds accordingly.
Spread Spectrum	Enabled **Disabled**	Reduces interference on the motherboard. Leave as default if your system works correctly.
CPU Clock	100 – 132MHz	Enter a decimal number to set the front side bus speed of the motherboard. For all purposes and to maintain stability, please keep this setting at its default setting.
CPU Voltage Regulator	This option allows you to change the default core voltage of the processor. Please always leave at default settings.	

Chapter 4: IDE RAID Setup *

*Chapter 4 is an excerpt from Promise Technology's IDE RAID manual, *The MBFastTrak133 Lite*.

4.1 - Getting Started

***WARNING**: Before installing the driver into an existing system, backup any necessary data. Failure to follow this accepted PC practice could result in data loss.*

Hard drives must be compatible with the ATA-133/100/66/33 standard in order to operate with the PDC20276 RAID controller. For optimal performance, install all ***identical*** drives of the same model and capacity. The drives' ***matched performance*** allows the array to function better as a single drive.

1. Promise recommends using identical drives as part of a PDC20276 RAID array. If striping for performance, use two new drives. If mirroring for protection, you can use two new drives OR use an existing drive and a new drive (the new drive must be the same size or larger than the existing drive).
2. Configure the jumpers of the hard drive you're preparing to connect to the PDC20276 using the correct "Master / Slave" or "Cable-Select" settings in the positions described in the table below.

   ***NOTE**: Sometimes the Master drive with no slave attached is called "Single." The master slave setting differentiates two drives chained on the same connector.*

Jumper Settings		
# of Drives	IDE Channel 1	IDE Channel 2
1	M	----
2	M	M

3. Install the hard drives into the hard drive bays of your system, including the power cables.

4.2 - Creating Your Disk Array

You will now use the FastBuild BIOS utility to create your array using the attached drives. There are three different scenarios in creating this array. You can create an array for performance, you can create a Security array using new hard drives (recommended), or you can create a Security array using an existing hard drive and a new hard drive.

***WARNING**: If creating a Security array using an existing hard drive, backup any necessary data. Failure to follow this accepted PC practice could result in data loss.*

1. Boot your system. If this is the first time you have booted with the PDC20276 and drives installed, the Promise onboard BIOS will display the following screen.

```
MBFastTrak133 Lite (tm) BIOS Version 2.00.0.XX
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

  No array defined . . .

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.
```

2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu

   Press "1" to display the Auto Setup Menu below. This is the fastest and easiest method to creating your first array .

```
        FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                        [Auto Setup Options Menu]

        Optimize Array for:                 Performance
        Typical Application usage:  A/V Editing

                              [ Auto Setup Configuration ]

        Mode ..................................... Stripe
        Drives used in Array .....................2
        Array Disk Capacity.....................16126

                                    [ Keys Available ]

      [↑] Up [↓] Down   [←, →, Space] Change Option   [ESC] Exit   [Ctrl-Y] Save
```

Creating an Array for Performance

NOTE: *The PDC20276 allows users to create striped arrays with 1, 2 drives.*

To create an array for best performance, follow these steps:

1. Using the Spacebar, choose "Performance" under the **Optimize Array for** section.
2. Select how you will use your PC most under the **Typical Application usage** section The choices are A/V Editing, Server, and Desktop (the default).
3. Press <Ctrl-Y> keys to Save and create the array.
4. Reboot your system.

   Once the array has been created, you will need to FDISK and format the array as if it were a new single hard drive.

Creating a Security Array With New Drives

PDC20276 permits only two drives to be used for a single Mirrored array in Auto Setup.

To create an array for data protection using new hard drives, follow these steps:

1. Using the Spacebar, choose "Security" under the **Optimize Array for** section.

   Press <Ctrl-Y> keys to Save your selection.
3. The window below will appear.

```
Do you want the disk image to be duplicated to another? (Yes/No)
Y - Create and Duplicate
N - Create Only
```

4. Press "N" for the Create Only option.
5. A window will appear almost immediately confirming that your Security array has been created. Press any key to reboot the system.
6.

```
Array has been created.
<Press Any Key to Reboot>
```

7. Proceed with normal FDISK and format procedures as if you had just installed a new hard drive.

4.3 - Creating a Security Array With An Existing Data Drive

NOTE: *The PDC20276 permits only two drives to be used for a single Mirrored array in Auto Setup.*

You would use this method if you wish to use a drive that already contains data and/or is the bootable system drive in your system. You will need another drive of identical or larger storage capacity.

WARNING*: Backup any necessary data before proceeding. Failure to follow this accepted PC practice could result in data loss.*

WARNING*: If you wish to include your current bootable drive using the Windows NT 4.x or Windows 2000 operating system as part of a bootable Mirrored (RAID 1) array on your PDC20276, do NOT connect the hard drive to the PDC20276 controller yet. You MUST install the Windows NT4 or 2000 driver software first to this drive while it is still attached to your existing hard drive controller. For all other Operating Systems, proceed here.*

Follow these steps:

1. Using the Spacebar, choose "Security" under the **Optimize Array for** section.
2. Press <Ctrl-Y> keys to Save your selection. The window below will appear.

```
Do you want the disk image to be duplicated to another? (Yes/No)
Y - Create and Duplicate
N - Create Only
```

3. Press "Y" for the Create and Duplicate option. The window below will appear asking you to select the Source drive to use. FastBuild will copy all data from the Source drive to the Target drive.

```
                    Source Disk
Channel:ID          Drive Model          Capacity (MB)

                    Target Disk
Channel:ID          Drive Model          Capacity (MB)

                [Please Select A Source Disk]
 Channel:ID         Drive Model          Capacity (MB)
 1 :Master      QUANTUMCR8.4A            8063
 2 :Master      QUANTUMCR8.4A            8063

          [↑] Up [↓]  [ESC] Exit  [Ctrl-Y] Save
```

4. Use the arrow keys to choose w hich drive contains the existing data to be copied.

5. Press [Ctrl-Y] keys to Save selection and start duplication. The following progress screen will appear.

```
Start to duplicate the image . . .
Do you want to continue? (Yes/No)
Y – Continue  N – Abort
```

4.4 - Using FastBuild™ Configuration Utility

The FastBuild™ Configuration Utility offers several menu choices to create and manage the drive array on the Promise PDC20276. It is assumed you have already created an array in the previous section and now wish to make a change to the array or view other options.

Viewing the PDC20276 BIOS Screen
When you boot your system with the PDC20276 and drives installed, the Promise onboard BIOS will detect the drives attached and show the following screen.

```
MBFastTrak133 Lite (tm) BIOS Version 1.xx (Build xx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

  Scanning IDE drives . . . . .
```

If an array exists already, the BIOS will display the following screen showing the BIOS version and status of the array.

```
MBFastTrak133 Lite (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

  ID      MODE  SIZE    TRACK-MAPPING          STATUS

  1 *   2+0 Stripe      16126M    611/128/32     Functional


  Press <Ctrl-F> to enter FastBuild (tm) Utility....
```

The array status consists of three possible conditions: *Functional, Critical, Offline*.

Functional - The array is operational.

Critical - A mirrored array contains a drive that has failed or disconnected. The remaining drive member in the array is func tional. However, the array has temporarily lost its ability to provide fault tolerance. The user should identify the failed drive through the FastBuild™ Setup utility, and then replace the problem drive.

Offline - A striped array has 1 drive that has failed or been disconnected. When the array condition is “offline,” the user must replace the failed drive(s), then restore data from a backup source.

Creating Arrays Automatically

The Auto Setup <1> selection from the Main Menu can intuitively help create your disk array. It will assign all available drives appropriate for the disk array you are creating. After making all selections, use Ctrl-Y to Save selections. FastBuild™ will automatically build the array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[Auto Setup Options Menu]

        Optimize Array for:          Performance
        Typical Application usage:   A/V Editing

[ Auto Setup Configuration ]

        Mode ..... Stripe
        Spare Drive Count.....1
        Drives used in Array .....2
        Array Disk Capacity.....16126

[ Keys  Available ]

 [↑] Up [↓] Down   [←, →, Space] Change Option   [ESC] Exit   [Ctrl-Y] Save
```

Optimize Array For
Select whether you want Performance (RAID 0), Security (RAID 1) under the "Optimize Array for" setting.

Performance (RAID 0 Striping)
Supports the maximum performance. The storage capacity equals the number of drives times the capacity of the smallest drive in the disk array.

NOTE: *The PDC20276 permits striped arrays using 1, 2 drive attached in Auto Setup mode.*

Security (RAID 1 Mirroring)
Creates a mirrored (or fault tolerant) array for data security.

NOTE: *Under the Security setting, the PDC20276 permits two drives to be used for a single Mirrored array only.*

Defining Typical Application Usage

Allows the user to choose the type of PC usage that will be performed in order to optimize how the PDC20276 handles data blocks to enhance performance. Your choice will determine the block size used. You may choose from: A/V Editing (for audio/video applications, or any similar application that requires large file transfers), Server (for numerous small file transfers), or Desktop (a combination of large and small file sizes).

NOTE If you wish to customize the settings of individual disk arrays (such as block size), you must manually create disk arrays with the Define Array <3> option from the Main Menu.

Chapter 5: 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.

5.1 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.

5.2 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: 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.

Appendix II: 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 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. 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 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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