Tomcat i915 /// S5120

Revision 1.00

Table of Contents

Before you begin…

Check the package contents before you proceed.
The retail motherboard package should contain the following:


1 x Tomcat i915 S5120 motherboard


1 x 34-Pin floppy drive cable


1 x Ultra-DMA-133/100/66/33 IDE cable
(2 for models with Promise SATA RAID)


1 x Tomcat i915 S5120 User's Manual


1 x Tomcat i915 S5120 Quick Reference Guide

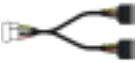

1 x TYAN driver CD


2 x Promise Driver Diskette
(only for models with Promise SATA RAID)


1 x I/O shield


1 x Serial Port cable


1 x IEEE1394a cable


2 x Serial ATA power cable

4 x Serial ATA cable


1 x USB2.0 cable

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

Chapter 1: Introduction

1.1 Congratulations!

Congratulations on your purchase of the TYAN Tomcat i915 S5120, one of the most powerful and versatile motherboard solutions available for Intel Prescott processors. Based on the acclaimed Intel i915G chipset, the S5120 offers exceptional performance and outstanding features. The ATX form factor S5120 features an onboard Gigabit Ethernet port, fast Ethernet port, serial ATA, RAID, and Integrated Intel GMA 900 3D graphics engine.

For more information about this and other TYAN products, visit the TYAN Web site at http://www.tyan.com. Product FAQs, a list of distributors and advanced BIOS information are also available on the Web site.

1.2 Hardware Specifications

Processors
- Single Socket-T (LGA775 socket)
- Intel® "Prescott" processor with EM64T support
- 800/533MHz FSB support

Expansion Slots
- One x16 PCI Express connector for graphics (configurable to x1 PCI Express)
- Two x1 PCI Express connectors
- Four 32/33 PCI 2.3 slots
- Total seven usable expansion slots

Chipset
- Intel i915G (Grantsdale-G) GMCH
- Intel ICH6 South Bridge
- SMSC DME1737

System Management
- SMSC DME1737 w/ hardware monitoring
- One 3+1-pin CPU Fan header w/ tachometer input and temperature-sensing auto fan control
- Four 3-pin system Fan headers (3 w/ tachometer input and 2 w/ temperature-sensing auto fan control)
- Temperature and voltage monitoring
- Watchdog timer
- Port 80 code display LED

Memory
- Dual memory channels
- Supports Up to four DDR-333/400 DIMM
- Up to 4GB of Unbuffered, non-ECC memory

Integrated I/O Interface
- One floppy connector
- Four USB 2.0 ports (via cable)
- One COM port (via cable)
- TYAN 2 x 9 front-panel pin header

Integrated LAN Controllers
- One Gigabit LAN controller
  - — Broadcom BCM5751 PCI Express GbE LAN controller operating at x1 PCIe interface
- One 10/100 LAN controller (optional)
  - — Intel 82551QM 10/100 LAN controller operating at 32bit/33MHz PCI bus

Integrated Audio
- Realtek ALC880 7.1 channel audio CODEC
- Intel High Definition Audio/AC'97 2.3 supported, UAA compliant
- Supports S/PDIF In/Out interface
- 2x5 pin header for front panel audio connector
- CD-in connector

Integrated PCI IEEE1394a Controller
- VIA VT6307 PCI FireWire (1394a) controller
- Two IEEE1394a ports (via cable)

Intelligent PCI IDE (ICH6)
- Single channel master mode supports two IDE devices
- Support for ATA-100/66/33 IDE drives and ATAPI compliant devices

Integrated Serial ATA (ICH6)
- Four Serial ATA Host controllers embedded
- Support four Serial ports running at 1.5Gb/s

Integrated 3D Graphic (i915G)
- Intel® GMA 900 3D engine embedded
- Up to 224MB shared memory support for graphics

Rear Panel I/O ports
- Stacked PS/2 Mouse & Keyboard ports
- S/PDIF In/Out optical jacks
- One 15-pin VGA port
- One 25-pin SPP/ECP/EPP parallel port
- Six audio jacks
- Stacked two USB2.0 ports and one RJ45* 10/100 Base-T port w/ activity LED (*optional)
- Stacked two USB2.0 ports and one RJ45 10/100/1000 Base-T port w/ activity LED

Integrated Serial ATA RAID (optional)
- Promise PDC20579 SATA RAID controller
- 2 x SATA and 1 x Ultra ATA/133 channels
- Support up to two SATA and two ATA-133/100 IDE drives
- Supports RAID 0, 1, 0+1

BIOS
- Award BIOS 8Mbit Flash ROM
- Supports APM 1.2 & ACPI 1.0B
- PnP, DMI 2.0, WfM 2.0 Power Management
- Support BIOS Boot Specification v1.01 (BBS)
- Watchdog timer ready

Power
- ATX12V support, on board 4-phase VRM
- Universal 24-pin + 8-pin power connectors
- 4-pin auxiliary power connector

Form Factor
- ATX footprint
- 12” x 9.6” (305mm x 245mm)

Regulatory
- FCC Class B (Declaration of Conformity)
- CE (Declaration of Conformity)
- BSMI

Note

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

Chapter 2: Board Installation

2.1 Installing the Motherboard

The Tomcat i915 S5120 motherboard conforms fully to the ATX specification. Before continuing with the installation, confirm that your chassis supports a standard ATX motherboard. If you are unsure, contact your dealer for more information.

2.1.1 Installation Notes

This user manual contains important information and you should read it thoroughly before attempting the installation procedure.

Precautions:

- Static electricity can damage components on your motherboard. Before touching the product, discharge any static build up in yourself by touching a well grounded object such as a metal water pipe or a grounded electrical appliance. TYAN recommends putting on a good quality grounded wrist strap before removing your motherboard from the antistatic bag.
- Disconnect your computer from the power supply before any disassembly procedure is attempted.
- Touch the motherboard as little as possible and do not touch the bottom of the board at all. Bending or flexing the motherboard may break delicate components or copper tracks on the board.
- Avoid touching any of the motherboard components.
- Place the motherboard on a grounded antistatic surface or on the antistatic bag in which the board was shipped.
- Inspect the board for damage.

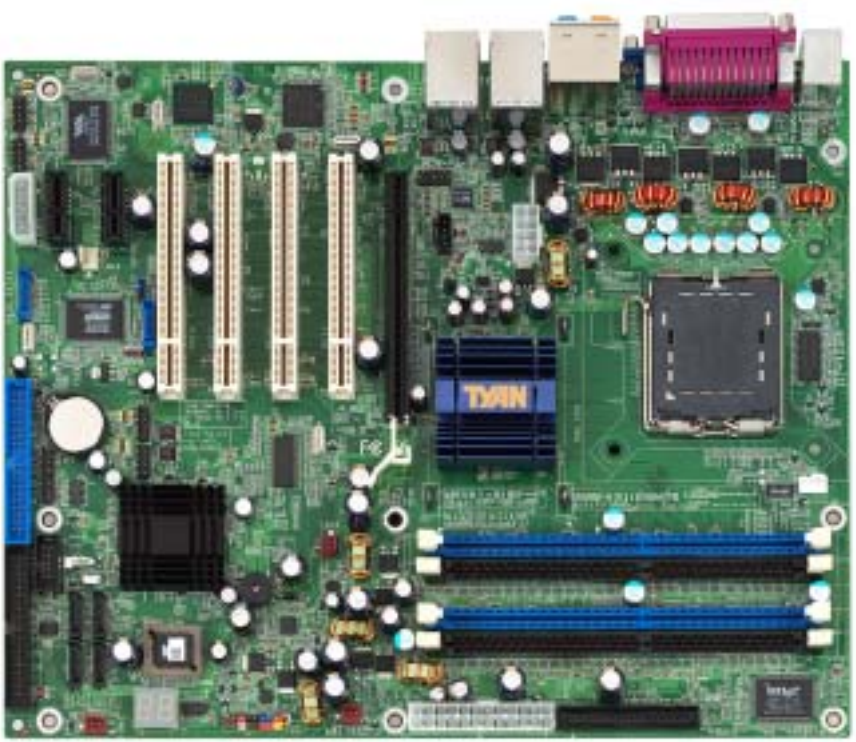
Read the following sections for detailed instructions on how to install your motherboard in a chassis and add a processor, memory, and disk drives.

Warning

Do not apply power to the board if it appears damaged.

2.2 Board Image

The following is an image of the Tomcat i915 S5120.

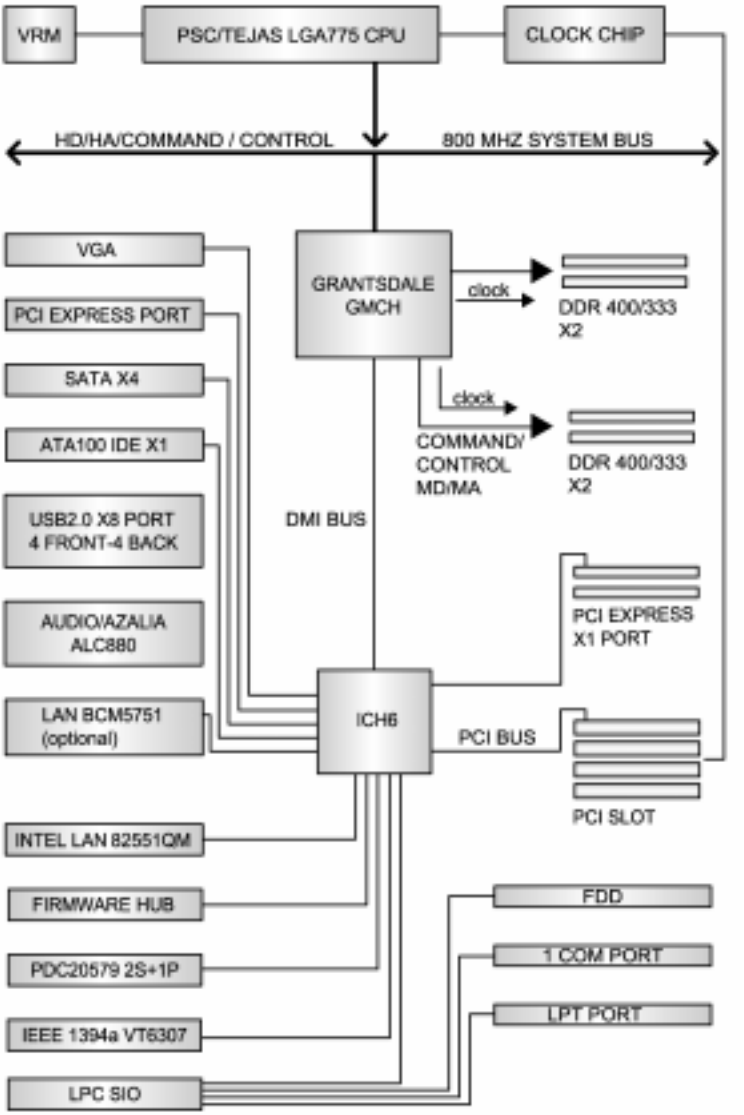


The above photograph is purely representative. Due to engineering updates and new board revisions, certain components may change and or be repositioned. The picture above may or may not look exactly like the board you received.

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

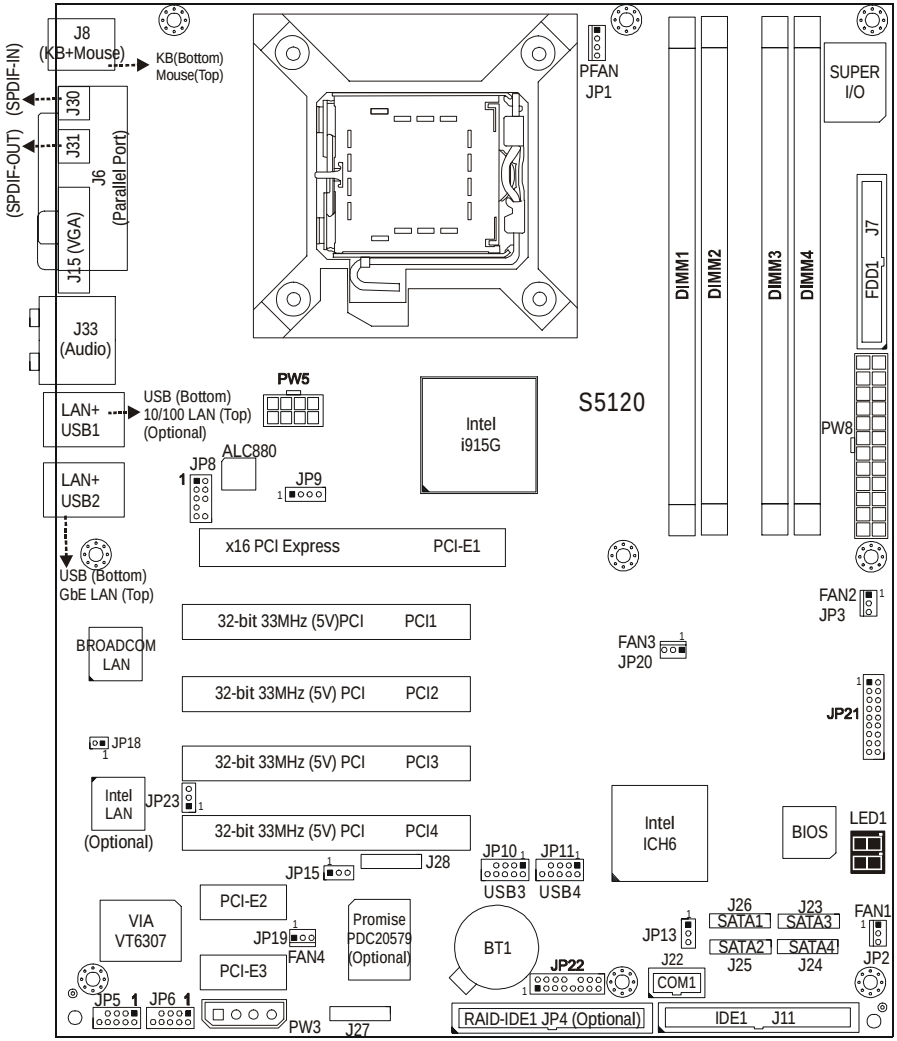
2.3 Block Diagram

The following is a block diagram of the Tomcat i915 S5120.



2.4 Motherboard Components

The diagram below shows the main motherboard components.



This diagram represents the latest version of the motherboard available at the time of publishing. The board you receive may or may not look exactly like the above diagram. Parts are not drawn to scale.

2.5 Jumpers and Connectors

Jumpers and connectors are provided on your motherboard for configuration and connection to peripherals. The following section shows you how to set your jumpers and use your connectors.

Jumper/ Connector	Function	Ref. Page
J22	COM1 Port	Page 2-6
J23/J24/J25/J26	Serial ATA Connectors	Page 2-6
J27/J28*	RAID Serial ATA1/ATA2 Connector (optional)	Page 2-6
J30/J31	S/PDIF-in and S/PDIF-out Connector	
JP1 (PFAN)	CPU Fan Connector with tachometer monitoring and fan speed control	Page 2-7
JP2/JP3 (FAN1/FAN2)	Chassis Fan Connector with tachometer monitoring and fan speed control	Page 2-7
JP4*	RAID IDE Connector (optional)	Page 2-8
JP5/JP6	IEEE1394a Connector	Page 2-8
JP8	Front Panel Audio Connector	Page 2-9
JP9	CD Audio Input Connector	Page 2-9
JP10/JP11 (USB3/USB4)	Front Panel USB Connector	Page 2-10
JP13	Clear CMOS Jumper	Page 2-10
JP15**	Reserved	
JP18	Gigabit LAN (BCM5751) Enable/Disable Jumper	Page 2-11
JP19 (FAN4)	Chassis Fan Connector	Page 2-11
JP20 (FAN3)	Chassis Fan Connector with tachometer monitoring	Page 2-12
JP21	Front Panel System Connector	Page 2-12
JP22**	Reserved	
JP23	10/100 LAN (Intel 82551QM) Enable/Disable Jumper	Page 2-13

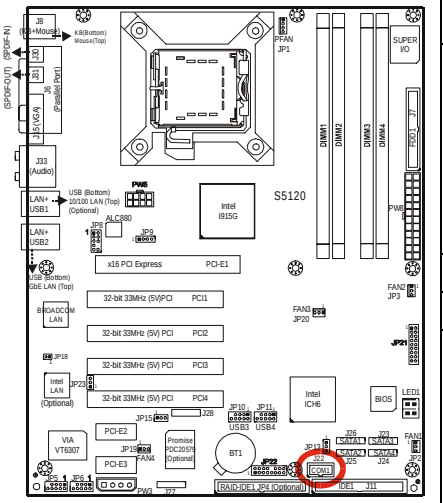
***SATA RAID (J27/J28) and IDE RAID (JP4) are only for models with Promise SATA RAID.
****JP15 and JP22 are reserved for OEM use only.

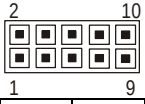
Jumper Legend

Jumper OFF – open (without jumper cap)

Jumper ON – closed (with jumper cap)

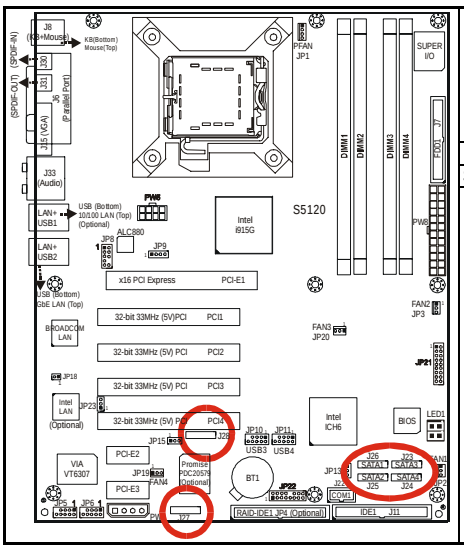
2.5.1 Serial port: COM1 (J22)

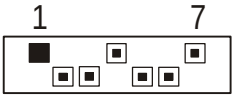




Signal Description	DSR (Data-Set-Ready)	RTS (Request-to-Send)	CTS (Clear-to-Send)	RI (Ring-Indicator)	NC/Key
Pin#	2	4	6	8	10
Pin#	1	3	5	7	9
Signal Description	DCD (Data Carrier Detect)	RX (Receive-Data)	TX (Transfer-Data)	DTR (Data-Terminal-Ready)	GND (Ground)

2.5.2 Serial ATA Connectors: SATA1 & SATA2 & SATA3 & SATA4 (J26/J25/J23/J24), RAID SATA1/SATA2 (J27/J28) *(on SATA RAID model only)*



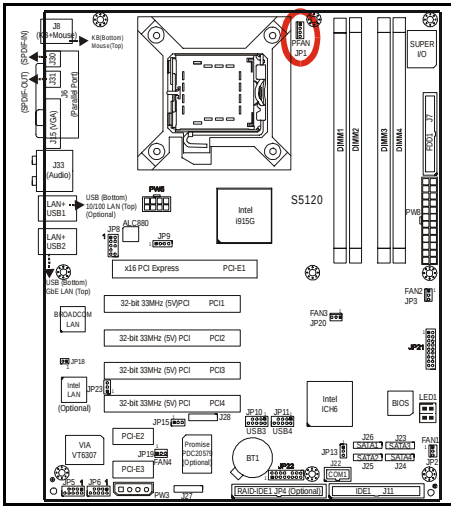


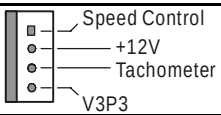
Pin	1	2	3	4	5	6	7
Signal	GND	TXP	TXN	GND	RXN	RXP	GND

Connects to the Serial ATA ready drives via the Serial ATA cable

Along with the RAID IDE connector (JP4, see page 2-8), J27/J28 support RAID 0, 1 and 0+1 through the on board SATA RAID controller chip. You may use the RAID feature to setup a disk array configuration or to support additional drives

2.5.3 CPU Fan Connector: JP1 (PFAN)

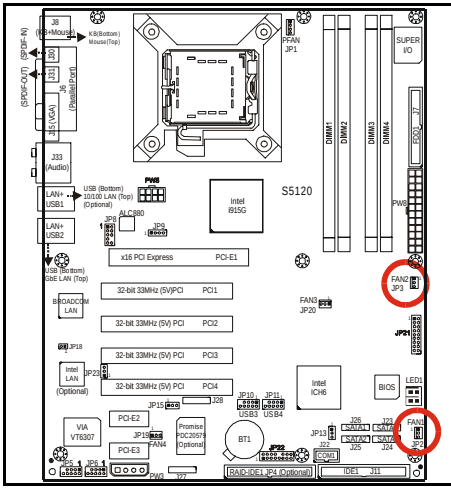


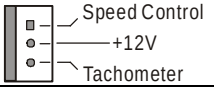


Use this header to connect the processor cooling fan to your motherboard to keep the system stable and reliable.

This connector supports the tachometer monitoring and auto fan speed control.

2.5.4 Chassis Fan Connectors: JP2/JP3 (FAN1 / FAN2)

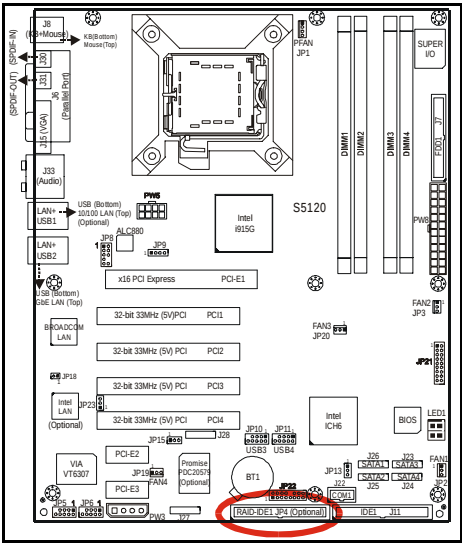


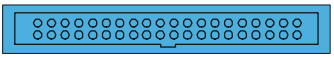


Use these headers to connect the chassis cooling fans to your motherboard to keep the system stable and reliable.

These connectors support the tachometer monitoring and auto fan speed control.

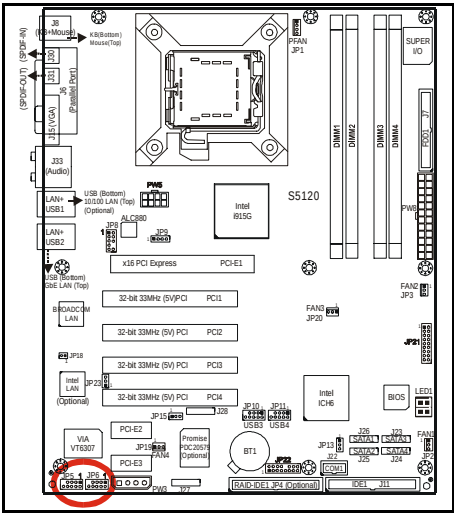
2.5.5 RAID IDE Connector: JP4 (RAID-IDE1) *(on SATA RAID model only)*





Supports RAID 0, 1, 0+1 along with the J27 (RAID SATA1) and J28 (RAID SATA2) through the on board SATA RAID controller chip.

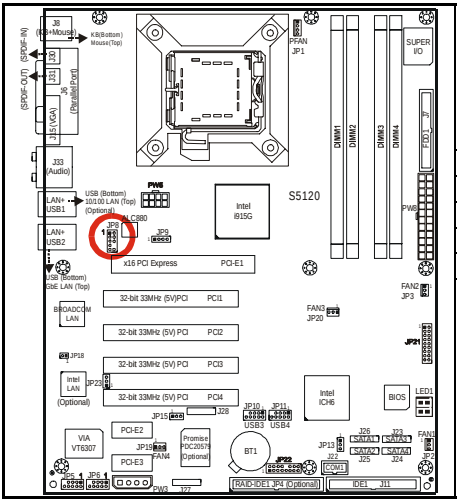
2.5.6 IEEE1394a Connector: JP5 / JP6

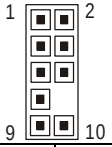


NC	NC	XTPB+	GND	XTPA+
9	**7**	**5**	**3**	**1**
10	**8**	**6**	**4**	**2**
GND	VCC	XTPB-	GND	XTPA-

Use these headers to connect IEEE1394a (FireWire) type device via the enclosed 1394a cable.

2.5.7 Front Panel Audio Connector: JP8

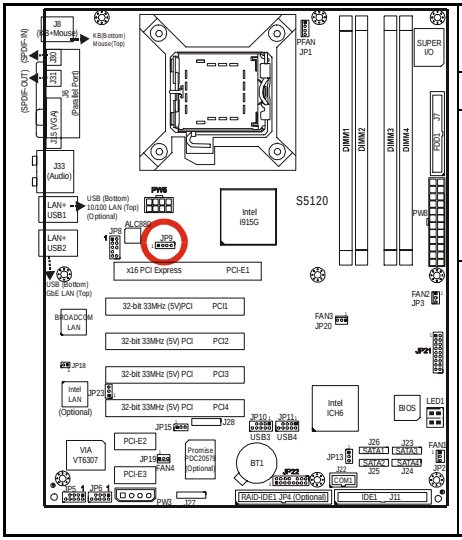




1L	**1**	**2**	GND
1R	**3**	**4**	Presence
2R	**5**	**6**	AUD FP JS
AUD FP JS	**7**	**8**	NC
2L	**9**	**10**	AUD VREF

Use this header to connect with the front panel audio outputs.

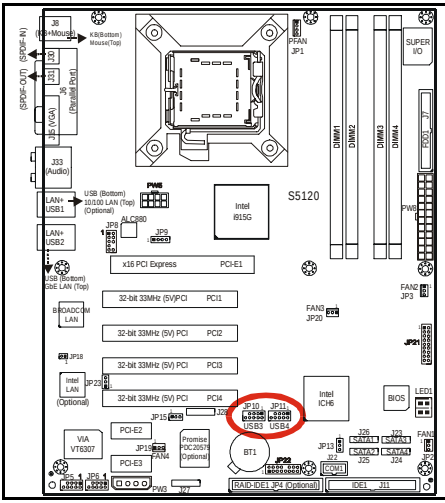
2.5.8 CD Audio Input Connector: JP9

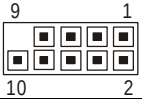


Pin_1	Pin_2	Pin_3	Pin_4
CD_In_Left	GND	GND	CD_In_Right

Use this header to connect to the audio output of a CD-ROM drive via an optional CD audio cable so that you can listen to the audio CDs through the integrated audio chip on the motherboard.

2.5.9 Front Panel USB 2.0 Connectors: USB3/USB4 (JP10/JP11)

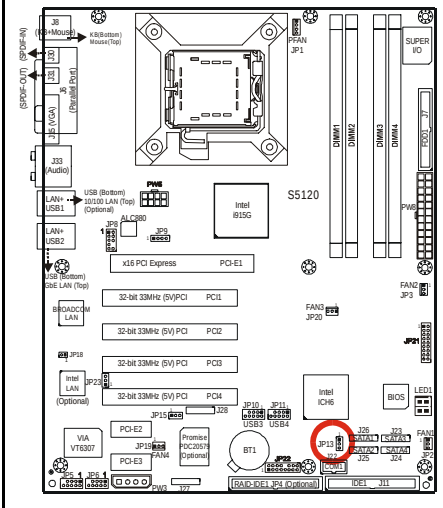




GND	GND	Data 1+	Data 1 -	+5V
9	**7**	**5**	**3**	**1**
10	**8**	**6**	**4**	**2**
GND	GND	Data 2+	Data 2 -	+5V

Use these headers to Connect to the USB devices via the enclosed USB cable.

2.5.10 Clear CMOS Jumper: JP13

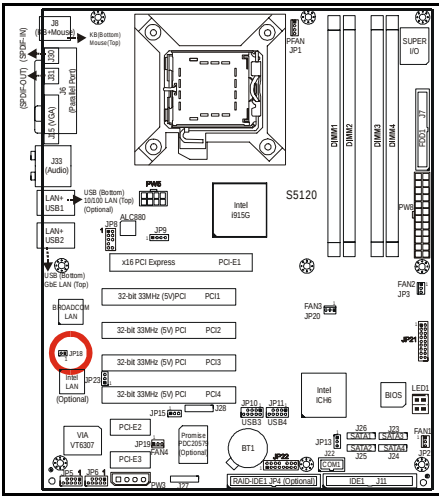


	**Default**
	Clear

Use this jumper when you forgot your system/setup password or need to clear system BIOS setting.

How to clear the CMOS data
- Power off system and **disconnect power supply from AC source**
- Use jumper cap to close Pin_2 and 3 for several seconds to Clear CMOS
- Replace jumper cap to close Pin_1 and 2 (default setting)
- Reconnect power supply to AC source
- Power on system

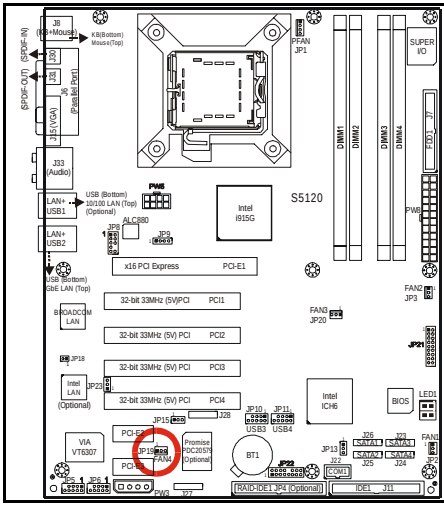
2.5.11 Gigabit LAN (BCM5751) Enable/Disable Jumper: JP18

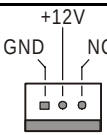


1 	**OPEN**
1 	**CLOSED** (Default)

Disable the on board Gigabit LAN function by removing the jumper cap if needed.

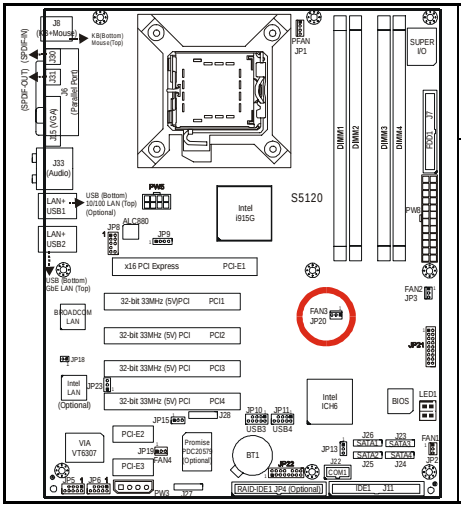
2.5.12 Chassis Fan Connector: JP19 (FAN4)

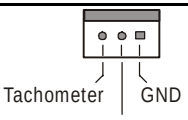




Use this header to connect the chassis cooling fan to your motherboard to keep the system stable and reliable.

2.5.13 Chassis Fan Connector: JP20 (FAN3)



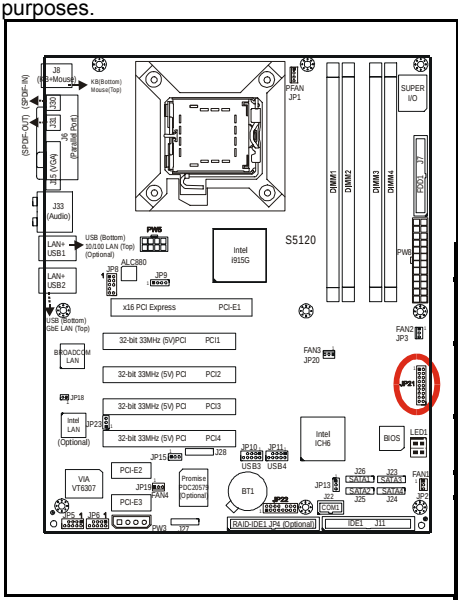


Use this header to connect the chassis cooling fans to your motherboard to keep the system stable and reliable.

This connector supports the tachometer monitoring.

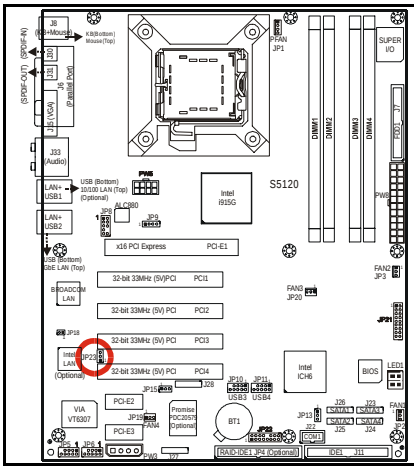
2.5.14 Front Panel System Connector: JP21

Your chassis will usually come with connectors to install onto the motherboard, such as HD and Power LEDs. The Front Panel Connector (JP21) has been implemented for such purposes.



Function	PIN	PIN	Function
HD_LED+	1	2	PWR+
HD_LED-	3	4	PWR-
GND	5	6	Power Button
Reset Button	7	8	GND
+5V	9	10	Sleep Button
NIMI	11	12	GND
+5VSB	13	14	NC
SMBUS Data	15	16	GND
SMBUS Clock	17	18	INTRU#

2.5.15 10/100 LAN (Intel 82551QM) Enable/Disable Jumper: JP23 *(optional)*

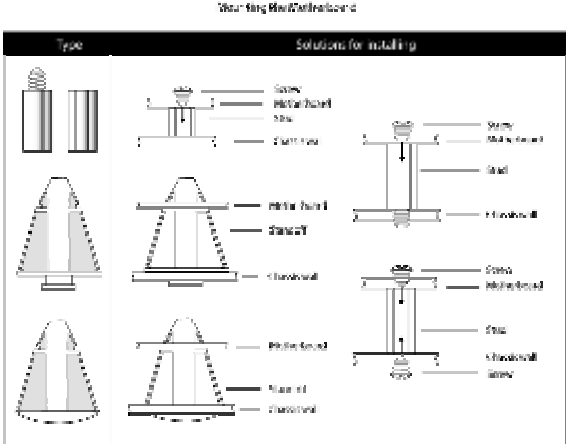


3 ■ ■ 1 ■	**Pin 1 – 2 Closed** (Default)
To enable on-board 10/100 Ethernet	
3 ■ ■ 1 ■	**Pin 2 – 3 Closed**
To disable on-board 10/100 Ethernet	

2.6 Mounting the Motherboard

Before installing your motherboard, ensure that your chassis is fully compatible. The Tomcat i915 S5120 motherboard conforms fully to the ATX specification. Your chassis should include preinstalled mounting posts that match exactly with the mounting holes in the motherboard. Lay the motherboard on top of the mounting holes to ensure that all the necessary mounting posts exist in your chassis and that they match the mounting holes on the motherboard.
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.

See the diagram below for some examples of typical motherboard fixing studs.

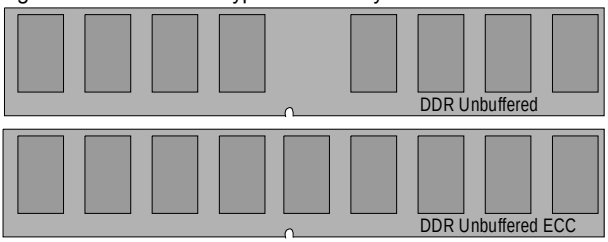


TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.7 Installing Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. PC2700/PC3200 (DDR333/DDR400) modules are required. Check the TYAN Web site at: **www.tyan.com** for details of the type of memory recommended for your motherboard.

The following diagram shows common types of memory modules.



Key points to note before installing memory:

- 128MB, 256MB, 512MB and 1GB unbuffered non-ECC PC2700/PC3200 DDR memory modules are supported
- All installed memory will be automatically detected and no jumpers or settings need changing.
- The Tomcat i915 S5120 supports up to 4GB of memory
- **Registered Memory is NOT supported**.
- You can install either single or double-sided modules on this motherboard. Each DIMM can work in single-channel mode or dual-channel mode. Please note that memory modules of the same type and density are required while using dual-channel DDR. Mismatched memory may cause system instability.

  Refer to the following table for details of dual-channel DDR.

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

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

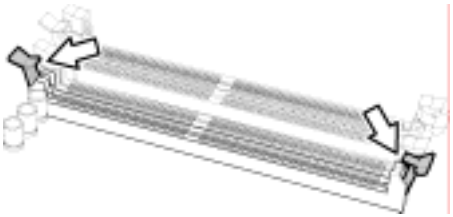
- **Supported System Bus Frequency and Memory Speed Combinations**

CPU FSB	DDR DIMM Type	Memory Frequency
800MHz	PC3200, PC2700	400, 333MHz
533MHz	PC2700	333MHz

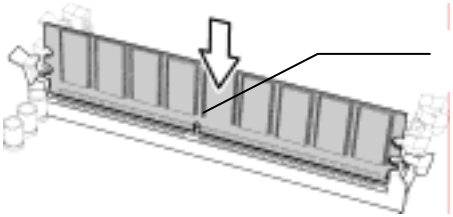
2.7.1 Memory Installation Procedure

Follow these instructions to install memory modules into the Tomcat i915 S5120.

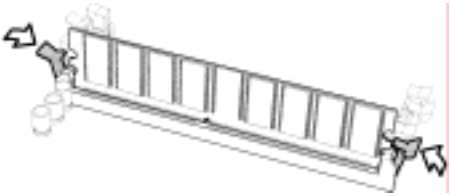
1. Press the locking levers in the direction shown in the following illustration.



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



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.8 Installing the Processor and Cooling Fan

Your Tomcat i915 S5120 supports the latest processor technologies from Intel. Check the TYAN website for latest processor support:

http://www.tyan.com

Processor Installation

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

Follow these instructions to install your processor

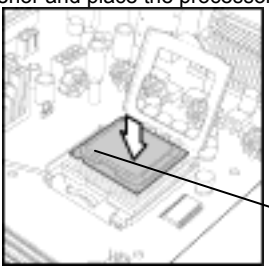
1. Locate the processor socket on the motherboard and lift the protective cover off as shown.

WARNING:

This new processor socket designed by Intel is easy to be damaged. The processor has to be installed very carefully to prevent the contact pins of the socket from breaking. It is strongly recommended the processor installation job to be handled by the experienced technician.

2. Pull the locking lever out of its locked position and let it spring into the open position.

3. Lift the metal cover to expose the socket interior and place the processor in as shown.



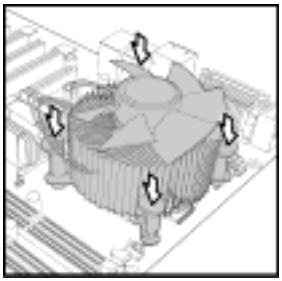
4. Close the cover and return the locking lever to its locked position.

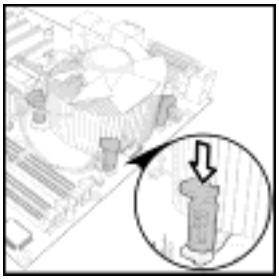
Cooling Fan Installation

After you have installed the processor, the heatsink should be installed to ensure that the processor runs efficiently and does not overheat. Use the heatsink supplied for best results.

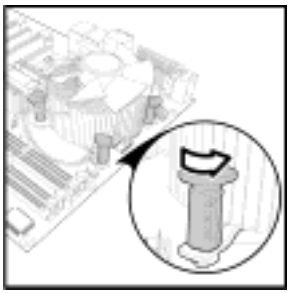
Follow these instructions to install the heatsink shown.

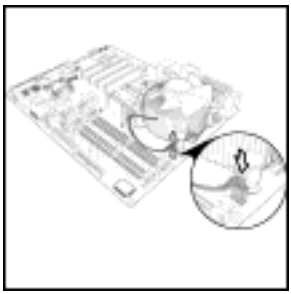
1. Apply some thermal compound (also called heatsink compound or thermal grease) to the top of the processor. Try and apply a thin, even layer over the top of the processor.
2. Align the heatsink with the four holes around the processor socket.
3. Press the heatsink down until the four white, plastic pegs are securely seated in the holes.
4. Press down the black pegs until they click to lock the heatsink in place.





To remove the heatsink you will need to twist each of the black locking pegs until they spring up and unlock the heatsink from the motherboard.
Remember to connect the power supply for the fan to complete the installation.

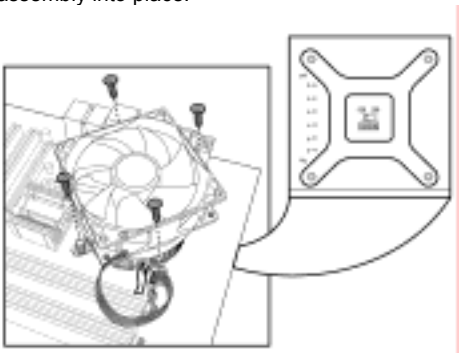




Some heat sinks require a bracket to be installed beneath the motherboard before the heat sink is placed on the top side of the motherboard. To install a heat sink like this:

1 Turn the motherboard upside down and place the rear bracket in position with the mounting posts poking through the corresponding holes in the motherboard.

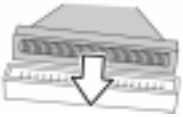
2 Turn the motherboard the right way up, holding the bracket in place.
3 Place the heat sink assembly on top of the processor.
It should match up with the mounting holes on the rear bracket.
4 Screw the heat sink assembly into place.



If there is a fan on the heat sink you will need to connect the power lead for the fan to one of the fan power supply pin headers on the motherboard.

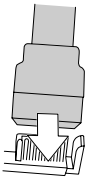
2.9 Installing Drive Cables

IDE and FDD connectors are "keyed" to only allow insertion only one way. TYAN motherboards have two on-board IDE channels, each supporting two drives. **The black connector is a standard IDE channel. Only the blue connector supports RAID.**



Insert the IDE cable as shown in the diagram.
TIP: When connecting to an IDE cable to a drive, Pin 1 on the IDE cable (usually designated by a colored wire) should be closest to the drive power connector.

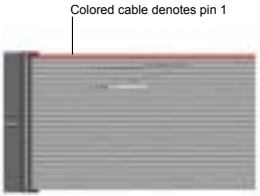
Serial ATA



Attaching Serial ATA cables to the Serial ATA connectors is 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.

Floppy Drives

Floppy disk drive (FDD) cables can be installed in the same way as IDE cables. Usually connectors are keyed to prevent insertion the wrong way. In most cases the cable should be inserted into the drive with pin 1 closest to the power input. FDD cables usually have a single red wire that marks pin 1. See the diagram below.



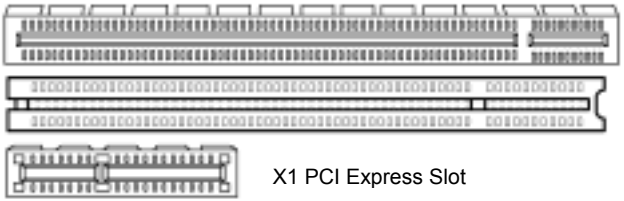
Troubleshooting Floppy Drives

See the chart below for troubleshooting floppy disk drive installations.

Symptoms of incorrectly installed floppy drives	
Drive is not automatically detected	Usually caused by faulty cables, cables put in backwards or a faulty floppy drive. Try another floppy drive or try replacing the cable. Check to see if the onboard floppy controller is enabled in the BIOS setup.
Drive Fail message at boot up	The cable, floppy drive or motherboard may be faulty. Try another drive or cable.
Drive does not power on	Check power cable and cabling. A faulty power supply or drive cable could be the problem.
Drive activity light is constantly on	Usually signifies that the cable on the drive is inserted backwards. Reverse the cable at the floppy drive end and try again.

2.10 Installing Expansion Cards

Before installing add-in cards, you should ensure that they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the expansion slots that appear on your motherboard.



X16 PCI Express Slot

PCI Slot

X1 PCI Express Slot

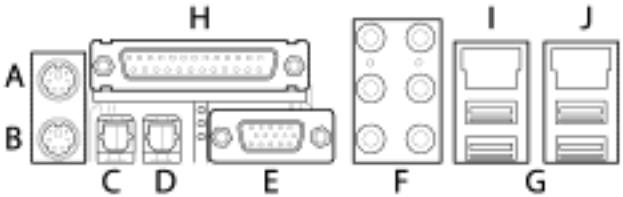
Expansion cards should be pushed firmly into the appropriate slot. Excessive force can damage both the card and the motherboard and care should be taken.

Notes

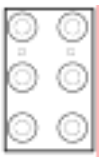
Unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion cards

2.11 Connecting External Devices

Your new motherboard supports a number of different interfaces for connecting peripherals. See the diagram below.



Port definitions:

A	PS2 mouse port (green)			
B	PS2 keyboard port (purple)			
C	SPDIF-IN port (red)			
D	SPDIF-OUT port (light green)			
E	VGA port (blue)			
F	5 + 1 audio out ports	Center / subwoofer speaker (orange)		Line–in (blue)
		Rear speaker (black)		Front speaker (light green)
		Side speaker (grey)		Mic-in (pink)
G	USB 2.0 ports			
H	Parallel printer port (dark red)			
I	10/100 Ethernet port			
J	Gigabit Ethernet port			

Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation

2.11.1 Onboard LAN LED Color Definition

The two onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

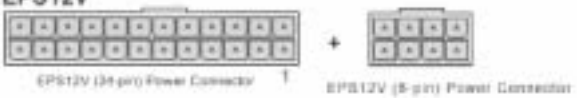
LAN Link/Activity LED Scheme			
		**Left LED**	**Right LED**
10 Mbps	**Link**	**Green**	**Off**
	Active	**Blinking Green**	**Off**
100 Mbps	**Link**	**Green**	**Green**
	Active	**Blinking Green**	**Green**
1000 Mbps	**Link**	**Green**	**Yellow**
	Active	**Blinking Green**	**Yellow**
No Link		**Off**	**Off**

2.12 Installing the Power Supply

There are three power connectors on your Tomcat i915 S5120. By default, the Tomcat i915 S5120 requires that you have an EPS12V power supply that has a 24-pin and an 8-pin power connector. However, the Tomcat i915 S5120 is also ATX12V compatible. All 3 power connectors need to be used if you plan on using the ATX12V power.

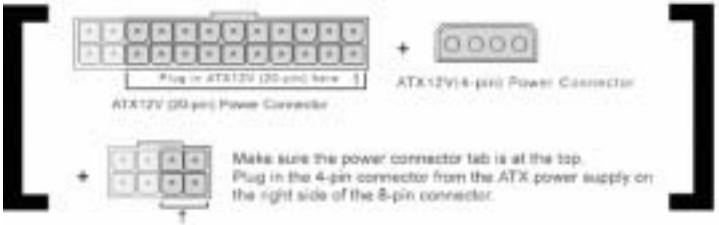
Power Supply	Main power connector	12V power connector	4-pin AUX power connector
EPS12V	Required	Required	Not required
ATX12V	Required	Required	Required

1. EPS12V



2. ATX12V

(All 3 connectors need to be used for ATX12V power)



1. Disconnect power supply from electrical outlet
2. Connect 12V power connector
3. Connect 4-pin AUX power connector (required for ATX12V power)
4. Connect Main power connector
5. Connect power cable to power supply to power outlet

Note

YOU MUST unplug the power supply before plugging the power cables to motherboard connectors.

2.13 Finishing Up

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.

If you experience difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website (**www.tyan.com**) or by calling your vendor's support line.

Chapter 3: BIOS Setup

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. This chapter describes different settings for the BIOS that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information when the power is turned off.

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

This BIOS has been customized by adding important features such as 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.

3.1.1 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.

3.1.2 Setup Basics

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

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

3.1.3 Getting Help

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

3.1.4 In Case of Problems

If you have trouble booting the computer after making and saving changes with the BIOS setup program, restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
Only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are sure of the outcome. TYAN or your system manufacturer has carefully chosen the chipset defaults for best performance and reliability. Even a small change to the Chipset setup options may cause the system to become unstable or unusable.

3.1.5 Setup Variations

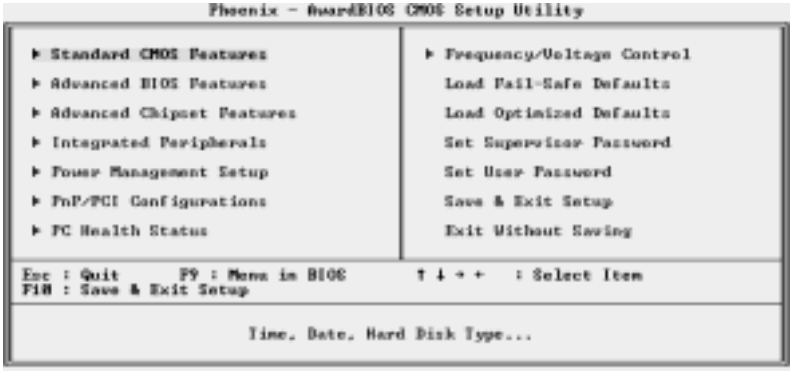
While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the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

Note

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

3.2 Main BIOS Setup

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



Standard CMOS Features
Use this menu for basic system configuration.

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

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

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

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

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

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

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

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

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

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

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

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

3.3 Standard CMOS Features

In this section, you can alter general features such as the date and time, as well as access to the IDE configuration options. Note that the options listed below are for options that can directly be changed within the Main Setup screen. Users use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Date / Time Setup

System Date: Adjusts the system date.

MM	Months
DD	Days
YYYY	Years

System Time: Adjusts the system clock.

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

IDE Master / Slave Setup

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

- None
- **Auto**
- Manual

Drive A / B

Defines the floppy drive type.

- None
- 360K, 5.25in
- 1.2M, 5.25in
- 720K, 3.5in
- **1.44M, 3.5in**
- 2.88M, 3.5in

Video

Defines the video display mode.

- **EGA/VGA**
- CGA 40
- CGA 80
- MONO

Halt On

Determines if the computer should stop when an error is detected during power up.

- No Errors
- **All Errors**
- All, But Keyboard
- All, But Diskette
- All, But Disk/Key

3.4 Advanced BIOS Features

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

3.4.1 CPU Features

Press [Enter] to access advanced features of the CPU.

Delay Prior to Thermal

This BIOS feature is only valid for systems that are powered by 0.13µ Intel Pentium 4 processors with 512KB L2 cache.

These processors come with a Thermal Monitor that consists of an on-die thermal sensor and a Thermal Control Circuit (TCC).

When the Thermal Monitor is in automatic mode and the thermal sensor detects that the processor has reached its maximum safe operating temperature, it will activate the TCC. The TCC will then modulate the clock cycles by inserting null cycles, typically at a rate of 50-70%

of the total number of clock cycles. This results in the processor "resting" for 50-70% of the time.
As the die temperature drops, the TCC will gradually reduce the number of null cycles until no more is required to keep the die temperature below the safe point. Then the thermal sensor turns the TCC off. This mechanism allows the processor to dynamically adjust its duty cycles to ensure its die temperature remains within safe limits.
The Delay Prior To Thermal BIOS feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up.
Generally, the Thermal Monitor should not be activated immediately on booting, as the processor will be under a heavy load during the booting process. This causes a sharp rise in die temperature from its cold state. Because it takes time for the thermal output to radiate from the die to the heat sink, the thermal sensor will register the sudden spike in die temperature and prematurely activate the TCC. This unnecessarily reduces the processor's performance during the booting up process.
Therefore, to ensure optimal booting performance, the activation of the Thermal Monitor must be delayed for a set period of time.
It is recommended that you set this BIOS feature to the lowest value (in minutes) that exceeds the time it takes to fully boot up your computer. For example, if it takes 5 minutes to fully boot up your system, you should select 8 Minutes.
You should not select a delay value that is unnecessarily long. Without the Thermal Monitor, your processor may heat up to a critical temperature (approximately 135°C), at which point the thermal sensor shuts down your processor by removing the core voltage within 0.5 seconds.

- 4 Min
- 8 Min
- **16 Min**
- 32 Min

Thermal Management
Thermal Management throttles the processor back as it reaches its maximum operating temperature. Throttling reduces the number of processing cycles, thereby diminishing the heat dissipation of the CPU. This cools the unit. Once the CPU has reached a safe operating temperature, thermal throttling is automatically disabled, and normal full speed processing begins again.
The BIOS supports two types of thermal management.

- **Thermal Monitor 1:** Thermal Monitor 1 uses a highly accurate on-die temperature sensing circuit in the CPU that has the ability to act quickly upon any thermal issues (~50ns). This circuitry keeps an eye on the most taxed areas of the CPU-die at all times and will quickly act upon temperatures going over the safety limits. The thermal monitor's control circuit, when active, lowers the CPU temperature by throttling the internal CPU clock speed. This is done with a 50% duty-cycle, which means that a 2GHz CPU will then effectively run at a 1GHz clock speed. Due to the fast response time of the thermal monitor circuit (~50ns) the CPU will only be 'throttled' for a very brief period. Once the CPU-die temperature is within safe operating limits again it'll set back to the 2GHz clock speed it originally operated at.
- **Thermal Monitor 2:** Thermal Monitor 2 decreases or increases the CPU clock and core voltage according to the CPU load. This information is read from the five VID pins of the CPU. Accordingly, the CPU temperature is also automatically decreased, when the core voltage is decreased. This improves the CPU lifespan. The states switch is so fast that the performance decrease is insignificant.

CPU L1 & L2 Cache

This option toggles the use of CPU L1 and L2 cache. The L1 cache is also called the primary cache or internal cache and is built into the processor. The L2 cache also called as the external cache is placed between the CPU and the DRAM (dynamic RAM). A memory cache, sometimes called a cache store or RAM cache, is a portion of memory made of high speed static RAM (SRAM) instead of the slower and cheaper dynamic RAM (DRAM) used for main memory. These caches store frequently accessed instructions and data. Memory caching is effective because most programs access the same data or instructions over and over. By keeping as much of this information as possible in SRAM, the computer avoids accessing the slower DRAM.

- **Enabled**
- Disabled

Hyper-Threading Technology

This option allows you to enable or disable Hyper-Threading Technology. Hyper-Threading Technology is a form of simultaneous multi-threading technology (SMT) where multiple threads of software applications can be run simultaneously on one processor. This is achieved by duplicating the architectural state on each processor, while sharing one set of processor execution resources. Hyper-Threading Technology also delivers faster response times for multi-tasking workload environments. By allowing the processor to use on-die resources that would otherwise have been idle, Hyper- Threading Technology provides a performance boost on multi-threading and multi-tasking operations.

- **Enabled**
- Disabled

APIC Mode

This option allows you to enable or disable Advanced Programmable
Interrupt Controller (APIC) Mode. APIC mode provides multi-processor interrupt management and incorporates both static and dynamic symmetric interrupt distribution across all processors. In systems with multiple I/O subsystems, each subsystem can have its own set of interrupts. Each interrupt pin is individually programmable as either edge or level triggered. The interrupt vector and interrupt steering information can be specified per interrupt. An indirect register accessing scheme optimizes the memory space needed to access the I/O APIC's internal registers. To increase system flexibility when assigning memory space usage, the I/O APIC's two-register memory space is re-locatable.

- **Enabled**
- Disabled

Note

Once the operating system is installed, such as Windows XP, this setting cannot be changed without reinstalling the operating system, regardless of whether the initial setting is Disabled or Enabled.

MPS Version Control For OS

This feature is only applicable to multiprocessor motherboards as it specifies the version of the Multi-Processor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.
MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future. In addition, MPS 1.4 introduces support for a secondary PCI bus without requiring a PCI bridge.

Select the MPS version depending on the operating system installed: select 1.1 for Win NT 3.52, and 1.4 for Win NT4.0, Win2000, and WinXP.

- 1.1
- **1.4**

Note

This option cannot be changed if APIC Mode is set to Disabled.

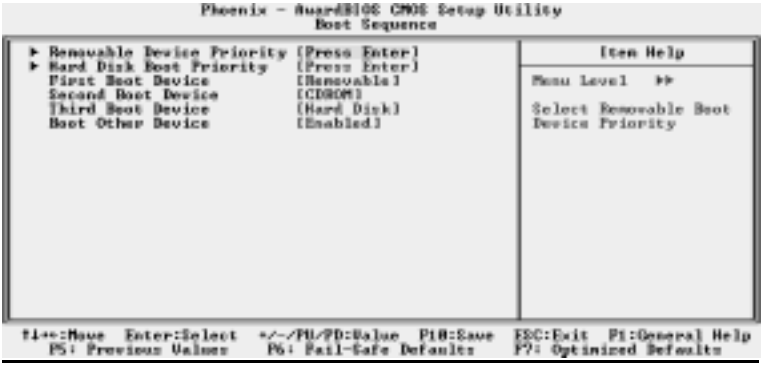
Quick Power On Self Test

This option allows the system to skip self-tests for faster startup.

- **Enabled**
- Disabled

3.4.2 Boot Sequence

This setting controls the order that the BIOS uses to look for a boot device from which to load the operating system during the boot process. The boot sequence options are as follows.



Removable Device Priority

This setting controls the order that the BIOS uses to look for a removable boot device from which to load the operating system during the boot process. The removable boot sequence options are as follows.

The removable boot device priority is as follows.

- Internal Floppy Disks
- LS120 Disk
- Internal Zip Disk
- 1st USB Floppy Disk
- 2nd USB Floppy Disk
- 1st USB ZIP Disk
- 2nd USB ZIP Disk

Hard Disk Boot Priority

This setting controls the order that the BIOS uses to look for a hard disk from which to load the operating system during the boot process. The hard disk boot sequence options are as follows.

The hard disk boot device priority is as follows.

1. Primary Master
2. Primary Slave
3. Secondary Master
4. Secondary Slave
5. 1st USB Hard Disk
6. 2nd USB Hard Disk
7. 3rd USB Hard Disk
8. Other Bootable Add-in Cards

First, Second, and Third Boot Devices

These indicate the boot priority. For example if the First Boot Device is set as Removable, the Second Boot Device as CDROM, and the Third Boot Device as Hard Disk, then the system will try to boot from a removable drive, failing which it will try to boot from a CDROM, and if this also fails, it will try to boot from the Hard Disk.

Boot Other Device

This option allows the system to boot from any other bootable device.

- **Enabled**
- Disabled

Swap Floppy Drive

This will swap your physical drive letters A & B if you are using two floppy disks.

- Enabled
- **Disabled**

Boot Up Floppy Seek
During Power-On Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks.

- **Enabled**
- Disabled

Boot Up NumLock Status
This option, when enabled, automatically turns on your NumLock key when the system is booted. This is a matter of personal taste.

- **On**
- Off

Gate A20 Option
This feature determines how Gate A20 is used to address memory above 1MB. When this option is set to Fast, the motherboard chipset controls the operation of Gate A20. But when set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves memory access speed and thus, overall system speed, especially with OS/2 and Windows.
This is because OS/2 and Windows enter and leave protected mode via the BIOS, so Gate A20 needs to switch often from enabled to disabled and back again. Setting this feature to Fast improves memory access performance above 1MB because the chipset is much faster at switching Gate A20 than the keyboard controller. It is recommended that you set it to Fast for faster memory accesses.

- Normal
- **Fast**

Typematic Rate Setting
This feature enables you to control the keystroke repeat rate when you depress a key continuously. When enabled, you can manually adjust the settings using the two typematic controls (Typematic Rate and Typematic Delay). If disabled, the BIOS will use the default setting.

- Enabled
- **Disabled**

Typematic Rate (Chars/Sec)
Defines how many characters are repeated per second when holding down a key on the keyboard:

- **6**
- 8
- 10
- 12
- 15
- 20
- 24
- 30

Typematic Delay (Msec)
Defines the delay (in milli-seconds) that occurs at keystroke before that key will start to repeat.

- **250**
- 500
- 750
- 1000

Security Option
Setting this option to System will set the BIOS to ask for the password each time the system boots up.
If you choose Setup, then the password is only required for access into the BIOS setup menus.

- **Setup**
- System

OS Select For DRAM > 64MB
This BIOS feature determines how systems with more than 64MB of memory are managed. A wrong setting can cause problems like erroneous memory detection.
If you are using an older version of the IBM OS/2 operating system, you should select OS/2.
If you are using the IBM OS/2 Warp v3.0 or higher operating system, you should select Non-OS/2.
If you are using an older version of the IBM OS/2 operating system but have already installed all the relevant IBM Fix-Paks, you should select Non-OS/2.
Users of non-OS/2 operating systems (like Microsoft Windows XP) should select the Non-OS2 option.

- **Non-OS2**
- OS2

Console Redirection

This option will redirect the BIOS and POST screens to the serial port to allow remote management using a terminal server.

- Enabled
- **Disabled**

Report No FDD For WIN 95
Set this option to Yes if you are using Windows 95/98 without a floppy to release IRQ6 (this is required to pass Windows 95/98's SCT test and get the logo).

- **No**
- Yes

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

- Enabled
- **Disabled**

3.5 Advanced Chipsets Features

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

DRAM Timing Selectable
This option permits you to either manually select memory timings, or allow the SPD (Serial Presence Detect) to determine the said timings automatically.

- Manual
- **By SPD**

Note

On all memory timing settings, lower number is more aggressive.

CAS Latency Time
This setting controls the time delay (in clock cycles - CLKs) that passes before the DRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. In other words, the lower the latency, the faster the transaction.

- **Auto**
- 2
- 2.5
- 3

DRAM RAS# to CAS# Delay
This setting is the number of cycles from when a bank activate command is issued until a read or write command is accepted, that is, before the CAS becomes active.

- **Auto**
- 5
- 4
- 3
- 2

DRAM RAS# Precharge
This setting is the number of cycles needed to return data to its original location to close the bank or number of cycles to page memory before the next bank activate command can be issued.

- **Auto**
- 5
- 4
- 3
- 2

Precharge Delay <tRAS>
This timing controls the length of the delay between the activation and precharge commands -- basically how long after activation can the access cycle be started again. This influences row activation time that is taken into account when memory has hit the last column in a specific row, or when an entirely different memory location is requested.

- **Auto**
- 4 ~ 10

System Memory Frequency
Changing this option allows the memory to be run asynchronously from the FSB but it is best if it is left at AUTO.

- **Auto**
- DDR333
- DDR400

System BIOS Cacheable
Enabling this option will cause the BIOS code from ROM to be copied on to the much faster RAM at location F0000h-FFFFFh, thus increasing system performance. However, if any program writes to this memory area, a system error may result.

- Disabled
- **Enabled**

Video BIOS Cacheable
Enabling this option will cause the VIDEO BIOS code from the video adapter's ROM to be copied on to the much faster RAM, thus increasing system performance. However, if any program writes to this memory area, a system error may result.

- **Disabled**
- Enabled

Memory Hole at 15M-16M
Certain ISA cards require exclusive access to the 1MB block of memory, from the 15th to the 16th megabyte, to work properly. This BIOS feature allows you to reserve that 1MB block of memory for such cards to use.
If you **enable** this feature, 1MB of memory (*the 15th MB*) will be reserved exclusively for the ISA card's use. This effectively reduces the total amount of memory available to the operating system by 1MB.
If you **disable** this feature, the 15th MB of RAM will not be reserved for the ISA card's use. The full range of memory is therefore available for the operating system to use. However, if your ISA card requires the use of that memory area, it may then fail to work.
Since ISA cards are a thing of the past, it is highly recommended that you **disable** this feature. Even if you have an ISA card that you absolutely have to use, you may not actually need to enable this feature.
Most ISA cards do not need exclusive access to this memory area. Make sure that your ISA card requires this memory area before enabling this feature. You should use this BIOS feature only as a last-ditch attempt to get an ISA card to work.

- **Disabled**
- Enabled

3.5.1 PCI Express Root Port Func

This option enables the BIOS to detect the PCI devices attached to the four PCI Express ports. PCI Express is the third generation high performance I/O bus used to interconnect peripheral devices in applications such as computing and communication platforms. The first generation buses include the ISA, EISA, VESA, and Micro Channel buses, while the second generation buses include PCI, AGP, and PCI-X. PCI Express is an all encompassing I/O device interconnect bus that has applications in the mobile, desktop, workstation, server, embedded computing and communication platforms.
To improve bus performance, reduce overall system cost and take advantage of new developments in computer design, the PCI Express architecture had to be significantly re-designed from its predecessor buses. PCI and PCI-X buses are multi-drop parallel interconnect buses in which many devices share one bus.

PCI Express on the other hand implements a serial, point-to-point type interconnect for communication between two devices. Multiple PCI Express devices are interconnected via the use of switches, which means one can practically connect a large number of devices together in a system. A point-to-point interconnect implies limited electrical load on the link allowing transmission and reception frequencies to scale to much higher numbers. Currently PCI Express transmission and reception data rate is 2.5 Gbits/sec. A serial interconnect between two devices results in fewer pins per device package, which reduces PCI Express chip and board design cost and reduces board design complexity. PCI Express performance is also highly scalable. This is achieved by implementing scalable numbers for pins and signal lanes per interconnect based on communication performance requirements for that interconnect.
However, PCI Express is software backwards compatible with existing PCI systems. In fact, a PCI Express system will boot an existing OS with no changes to current drivers and application programs. Even PCI/ACPI power management software will still run.

PCI Express Ports 1-4
When enabled, the BIOS checks these ports to detect and activate the PCI devices connected to them.
When set to Auto, the BIOS auto determines whether to enable or disable them, depending on whether PCI devices have been connected.

- **Auto**
- Enabled
- Disabled

PCI-E Compliance Mode
This BIOS option determines compatibility between PCI-Express specification v1.0 and PCI-Express specification v1.0a.

- **V1.0a**
- V1.0

PEG/Onchip VGA Control
This option lets the BIOS choose the VGA controller. PEG or Portable Embedded GUI is a hardware independent set of GUI classes to construct visual displays for embedded systems.
If you do have PEG installed, then the BIOS can use PEG instead of the Onchip VGA controller.
The default mode is Auto in which the BIOS determines the correct VGA controller to use.

- **Auto**
- Onchip VGA
- PEG Port

On-Chip Frame Buffer Size
This determines the amount of system memory to allocate to video memory. This corresponds to the amount of memory on the onboard graphics card.

- 1MB
- 4MB
- **8MB**
- 16MB
- 32MB

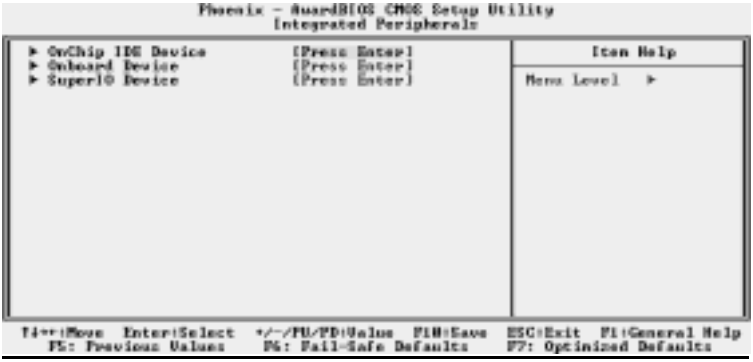
FIXED Memory Size
Fixed memory is the small amount of system memory made available at boot time by the system BIOS for video. Fixed memory is also known as locked memory. This is because it is "locked" for video use only and as such, is invisible and unable to be used by the operating system. This option sets the amount of Fixed memory to be used.

- 0MB
- 32MB
- **64MB**
- 128MB

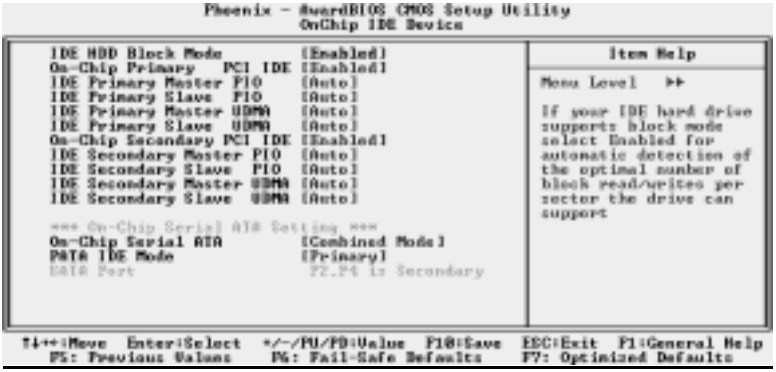
DVMT Memory Size
This sets the maximum amount of memory that can be dynamically allocated by DVMT.

- 0MB
- 32MB
- **64MB**
- 128MB
- 224MB

Integrated Peripherals
Options related to onboard peripheral features could be altered through the following:



3.5.2 OnChip IDE Device



IDE HDD Block Mode

The IDE HDD Block Mode feature speeds up hard disk access by transferring data from multiple sectors at once instead of using the old single sector transfer mode. When you enable it, the BIOS will automatically detect if your hard disk supports block transfers and configure the proper block transfer settings for it. Up to 64KB of data can be transferred per interrupt with IDE HDD Block Mode enabled.

If you disable IDE HDD Block Mode, only 512 bytes of data can transferred per interrupt. This degrades performance quite a bit. For optimal performance, enable this option.

- **Enabled**
- Disabled

Note

Microsoft recommends that WinNT 4.0 users without Service Pack 2 disable IDE HDD Block Mode as it causes data corruption.

On-Chip Primary PCI IDE

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers-- a primary and a secondary-- so, up to four separate hard disks can be installed.

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. This is simpler and more efficient (and faster).

Your system includes two built-in IDE controllers, both of which operate on the PCI bus. This setup item allows you either to enable or disable the primary controller. You might choose to disable the controller if you were to add a higher performance or specialized controller.

- **Enabled**
- Disabled

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

- **Auto**
- Mode 0 ~ Mode 4

Primary / Secondary Master / Slave UDMA
This option allows you to select the mode of operation for the Ultra DMA/33 implementation. This is possible only if your IDE hard drive supports UDMA and the operating environment includes a DMA driver (Windows 95 OSR2 or a third party IDE bus master driver). UDMA (Ultra DMA) is advanced technology that provides for even faster throughput, up to 33.3 MB/s in UDMA mode 2 and 66.7 MB/s in UDMA mode 4, twice to four times that of EIDE, for much lower prices than SCSI. Many new computers come with large UDMA drives and UDMA interfaces, and it's possible to add a UDMA interface card (such as the Promise Ultra33 or Ultra66) to an existing system to boost speed, even on older non-UDMA drives. If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

- **Auto**
- Disabled

On-Chip Secondary PCI IDE
Your system includes two built-in IDE controllers, both of which operate on the PCI bus. This setup item allows you either to enable or disable the secondary controller. You might choose to disable the controller if you were to add a higher performance or specialized controller.

- **Enabled**
- Disabled

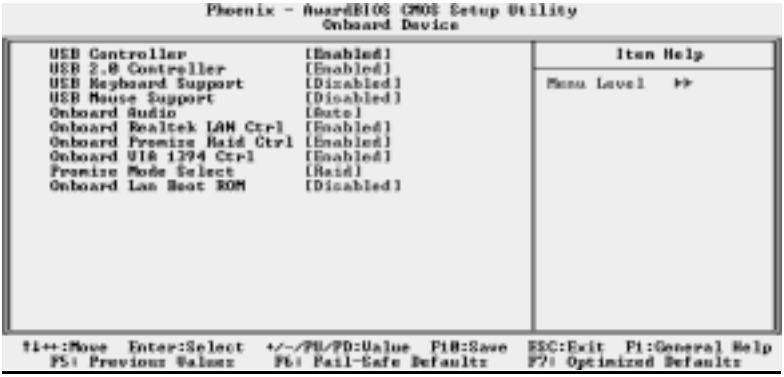
On-Chip Serial ATA
This selects the mode for the On-Chip Serial ATA controller. The following are the modes.

- Disabled: This disables the SATA controller.
- Auto: This auto selects the correct mode for the SATA controller.
- **Combined Mode**: This combines both PATA (Parallel ATA) and SATA. This allows a maximum of 2 IDE drives in each channel.
- Enhanced Mode: This enables both SATA as well as PATA and allows a maximum of 6 IDE drives in each channel.
- SATA Only: This operates SATA in legacy mode.

PATA IDE Mode
This enables the selected IDE controller in PATA mode (Parallel ATA mode).

- **Primary**
- Secondary

3.5.3 Onboard Device



USB Controller
This option enables or disables IRQ allocation for the USB (Universal Serial Bus) controller. Enable this if you are using a USB device. If you disable this while using a USB device, you may have problems running that device. However, if you don't use any USB devices, set the option to Disabled. It will free up an IRQ for other devices to use.

- **Enabled**
- Disabled

Note

This option is for the older USB 1.1 specification

USB 2.0 Controller
This option enables or disables IRQ allocation for the USB 2 (Universal Serial Bus - Specification 2.0) controller. Enable this if you are using a USB 2 device. If you disable this while using a USB 2 device, you may have problems running that device. However, if you don't use any USB 2 devices, set the option to Disabled. It will free up an IRQ for other devices to use.

- **Enabled**
- Disabled

Note

USB 2.0 has a throughput of 480 Mbps (40 times faster than USB 1.1) and is fully backward compatible with USB 1.1.

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

- Enabled
- **Disabled**

USB Mouse Support
Set this option to enabled if your system has a USB controller (including USB 2.0) and a USB mouse.

- **Disabled**
- Enabled

Onboard Audio
This enables/disables the on board Azalia sound chip. The default is Auto, which automatically determines whether to enable or disable this chip.

- **Auto**
- Disabled

Onboard Intel LAN Ctrl
This enables/disables the onboard Intel LAN Controller. Disabling this will stop all network activity if you are using this controller to connect to the network.

- **Enabled**
- Disabled

Onboard Promise RAID Ctrl
This enables/disables the onboard Promise Raid Controller. Disabling this will disable access to any connected RAID devices.

- **Enabled**
- Disabled

Onboard VIA 1394 Ctrl
This enables/disables the onboard VIA 1394 (FireWire) controller. Disabling this will disable access to any connected FireWire devices.

- **Enabled**
- Disabled

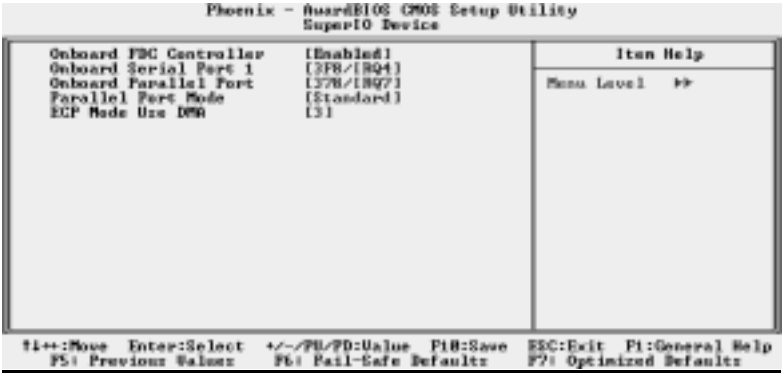
Promise Mode Select
This controls the configuration of the promise IDE port. Options are:

- **Raid**
- Ultra ATA

Onboard Broadcom LAN PXE Boot ROM
This controls if the onboard Lan will is run on boot up. Lan Boot ROMs are used to download operating system code from a network server. Options are:

- **Disabled**
- Enabled

3.5.4 Super IO Device



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

- **Enabled**
- Disabled

Onboard Serial Port 1
Select an address and corresponding interrupt for the first serial port.

- **3F8/IRQ4**
- **2F8/IRQ3**
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

Onboard Parallel Port
To use the parallel port on the system, select an address and corresponding interrupt for the parallel port.

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

Parallel Port Mode
This field allows the user to select the parallel port mode. The default value is Standard that automatically selects the correct mode to use. The other modes are explained as follows:
SPP works with all parallel port devices. However, it is the slowest transfer mode and should only be used when faster transfer modes cannot be used.
There are two faster bidirectional modes available - the ECP (Extended Capabilities Port) and EPP (Enhanced Parallel Port) modes.

ECP uses the DMA protocol to achieve data transfer rates of up to 2.5Mbytes/s and provides symmetric bidirectional communication. On the other hand, EPP uses existing parallel port signals to provide asymmetric bidirectional communication.

Generally, because of its FIFOs and the DMA channel it uses, ECP is good for large data transfers (useful for scanners and printers). On the other hand, EPP is better with links that switch directions frequently (like parallel port drives).

There are two versions of the EPP transfer protocol - EPP1.7 and EPP1.9. Generally, EPP1.9 is the preferred setting because it supports the newer EPP1.9 devices and most EPP1.7 devices; and offers advantages like support for longer cables. However, because certain EPP1.7 devices cannot work properly with an EPP1.9 port, this BIOS feature was implemented to allow you to set the EPP mode to EPP1.7 when such an issue occurs.

Therefore, it is recommended that you set this BIOS feature to EPP1.9. But if you have trouble connecting to your parallel port device, switch to EPP1.7.

However, the manufacturer of your parallel port peripheral may have designated a preferred parallel port mode for the device in question. In that case, it's best to follow their recommendation.

For those who don't know what mode to select but at least know that their parallel port device supports bidirectional transfers, the BIOS offers the ECP+EPP mode. If you select this mode, then the parallel port device will be able to use either one of those modes. However, this should be considered as a last resort as you may be needlessly tying up an IRQ for nothing if your device does not use ECP at all. Or, the BIOS may not select the best parallel port mode for the device. If possible, set the parallel port to the transfer mode that best suits your parallel port device.

However, the manufacturer of your parallel port peripheral may have designated a preferred parallel port mode for the device in question. In that case, it's best to follow their recommendation.

- **Standard**
- SPP
- EPP1.7
- EPP1.9
- ECP
- ECP + EPP

ECP Mode Use DMA

This BIOS feature determines which DMA channel the parallel port should use when it is in ECP mode.

The ECP mode uses the DMA protocol to achieve data transfer rates of up to 2.5 Mbits/s and provides symmetric bidirectional communications. For all this, it requires the use of a DMA channel.

By default, the parallel port uses DMA Channel 3 when it is in ECP mode. This works fine in most situations.

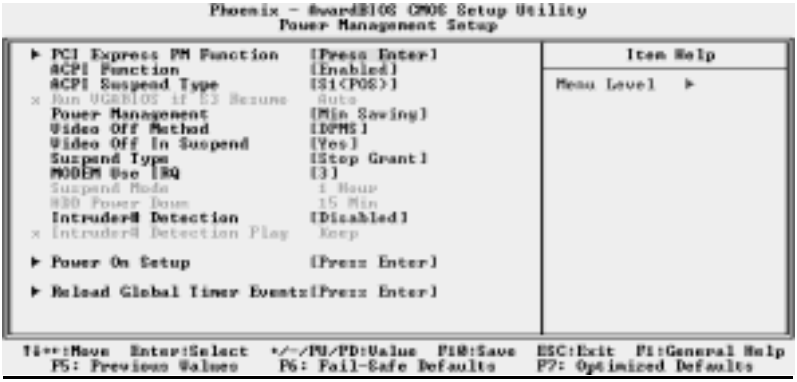
This feature is provided just in case one of your add-on cards requires the use of DMA Channel 3. In such a case, you can use this BIOS feature to force the parallel port to use the alternate DMA Channel 1.

Please note that there is no performance advantage in choosing DMA Channel 3 over DMA Channel 1 or vice versa. As long as either Channel 3 or Channel 1 is available for your parallel port to use, the parallel port will be able to function properly in ECP mode.

- **3**
- 1

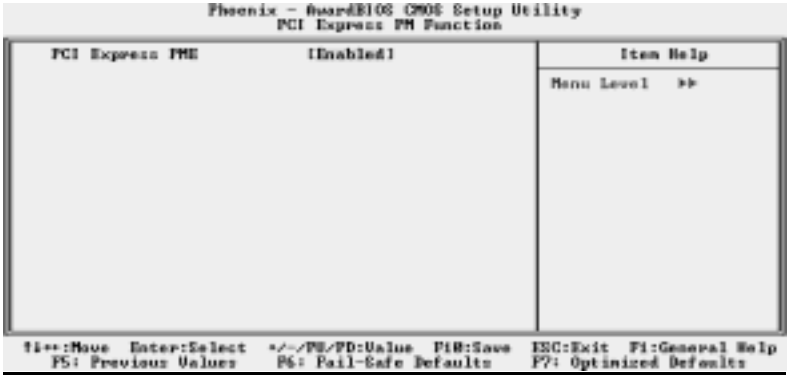
Power Management Setup

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



3.5.5 PCI Express PM Function

PCI Express components are permitted to wakeup the system using a wakeup mechanism followed by a power management event (PME) Message. PCI Express systems may provide the optional auxiliary power supply (Vaux) needed for wakeup operation from states where the main power supplies are off. PCI Express-PM extends beyond the PME mechanism defined in conventional PCI-PM as PCI Express PME Messages include the Requestor ID of the requesting agent. These PME Messages are in-band TLPs routed from the requesting device towards the Root Complex.



PCI Express PME

This option performs the same function as Wake-Up by PCI card, but is for PCI-Express cards.

- **Enabled**
- Disabled

ACPI Function

If your system supports ACPI, then enable this ACPI function. ACPI (Advanced Configuration and Power Interface) establishes industry-standard interfaces for OS-directed configuration and power management on laptops, desktops, and servers.

ACPI allows the Operating System (instead of the BIOS) to control Power Management (OSPM). The ACPI Standard defines hardware registers (which are implemented in chipset silicon), BIOS interfaces, which include configuration tables, control methods, and motherboard device enumeration and configuration; system and device power states, and the APCI thermal model.
All devices in the system can communicate with each other about resource use. The operating system has the most knowledge on a running system's state, and so is in the best position to perform power management.

- **Enabled**
- Disabled

ACPI Suspend Type
This option specifies the method to be used hibernation. The options are as follows.

- **S1 (POS) (Power On Suspend):** In this method, the processor does not execute instructions but remains connected to the bus; the processor preserves the state and content of its internal registers, along with the dynamic context of the memory. Only information about devices qualified as suitable to be woken up from hibernation is kept by the processor. When a waking up event occurs, the devices that can wake up the system force all the peripherals to be relinked.
- S3 (STR) (Suspend To RAM): In this method, the processor does not execute instructions. The state and content of the processor's internal registers is stored in RAM along with the dynamic context of the memory. Information about devices qualified as suitable to be woken up from hibernation is also stored in RAM. When a waking up event occurs, the devices that can wake up the system restore the contents of the registers of the processor from RAM and force all the peripherals to be relinked.
- S1 & S3 - In this method, the BIOS depends on the OS to select either S1 or S3.

Run VGABIOS if S3 Resume
Selects whether to run the VGA BIOS if resumed from S3 state. This is only necessary for older VGA drivers. Select Auto, if in doubt.

- **Auto**
- Yes
- No

Note

This option is enabled only if S3 or S1 & S3 is selected from the ACPI Suspend Type option.

Power Management
This function allows you to set the default parameters of power-saving modes. Set this to User Define to choose your own parameters. The following table shows the parameters for Maximum Saving and Minimum Saving options for the various modes:

Mode	Doze	Standby	Suspend	HDD Power Down
Min Saving	1 hour	1 hour	1 hour	15 min
Max Saving	1 min	1 min	1 min	1 min

- **Min Saving**
- Max Saving
- User Define

Video Off Method
This option defines the method used to power off video. The various methods are as follows.

- Blank Screen: The system BIOS will only send a blank screen when disabling video.
- H SYNC + Blank: In addition to Blank screen, the BIOS will also turn off the V-SYNC & H-SYNC signals from VGA cards to monitor.
- **DPMS:** Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association VESA). Use the software supplied for your video subsystem to select video power management values.

Note

Green monitors detect the V/H SYNC signals to turn off their electron guns. It is important to realize that the CRT consumes the most power (several hundred watts) of any system. To really save energy, you must shut it down when not in use.

Green monitors (also known as Energy Star monitors) reduce power usage by 90% without actually turning off the CRT. To make a green monitor function properly you MUST use Video Off Method = V/H Sync, because this tells the Green Monitor to shut down. If you incorrectly use the "Blank Screen" setting then you will just get a blank screen that still consumes 100% power. If you have a screensaver running, then you will not have CPU inactivity, and the standard BIOS options will not shut the CRT down ever. So, turn OFF your screensaver in the WINDOWS control panel, not in the BIOS.

Video Off in Suspend
This option defines the time frame in which the video will be disabled under current power management settings. The settings are:

- No: System BIOS will never turn off the screen.
- **Yes:** System BIOS turns of the screen when system is in SUSPEND mode.

Suspend Type
This option defines the system suspend type. The two suspend types are:

- **Power on Suspend:** If this is selected, the CPU will enter into Doze mode.
- **Stop Grant:** When selected, the CPU clock will enter Sleep mode.

In both of these modes, the system activities are detected by monitoring the IRQ signals or I/O.

Modem Use IRQ
This setting allows you to select the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

- NA
- **3**
- 4
- 5
- 7
- 9
- 10
- 11

Suspend Mode
This setting defines the method used to power down the system.

HDD Power Down
This setting defines the delay before the hard drive is powered down.

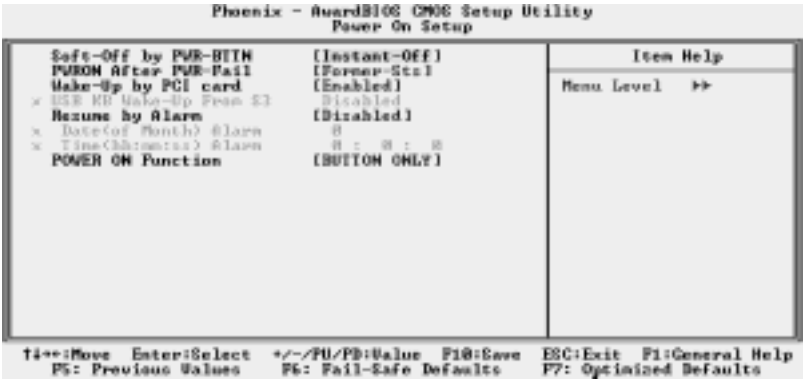
Intruder# Detection
When enabled, this option prevents chassis intrusion. Once you open the system casing, the system marks the chassis as open. Even if you close the casing again, the system still records the chassis as open. Only the system manufacturer can reset this.

- Enabled
- **Disabled**

Intruder# Detection Flag
When set to Clear, this option will clear the intruder detection flag number and will auto set the option to Keep when the system is rebooted.

- Clear
- **Keep**

3.5.6 Power On Setup



Soft-Off by PWR-BTTN
This determines how long the power button needs to be pressed to switch off the PC. Options are:

- **Instant-Off**
- Delay 4 Sec.

PWRON After PWR-Fail
This option defines the state of the system when power fails and returns again. If On is selected, the system automatically switches on when power is resumed. If Former-Sts is selected, the system automatically switches on and restores itself to the state it was last in when power failed.

- **Former-Sts**
- On
- Off

Wake-Up by PCI Card
If enabled, this option awakens the system from a soft off state with an input signal from PME on the PCI card.

- **Enabled**
- Disabled

USB KB Wake-Up From S3
If you have a USB keyboard, then you must enable this function to wake-up the system with a key press.

- Enabled
- **Disabled**

Note

This option is enabled only if S3 or S1 & S3 is selected from the ACPI Suspend Type option.

Resume by Alarm
This option allows your system to turn on at a pre-selected time.

- Enabled
- **Disabled**

Date <of Month> Alarm
Set the date on which the system should turn on every month. Enter 0 to disable this function.

Time <hh:mm:ss> Alarm
Set the time on which the system should turn on depending on the date setting.

Note

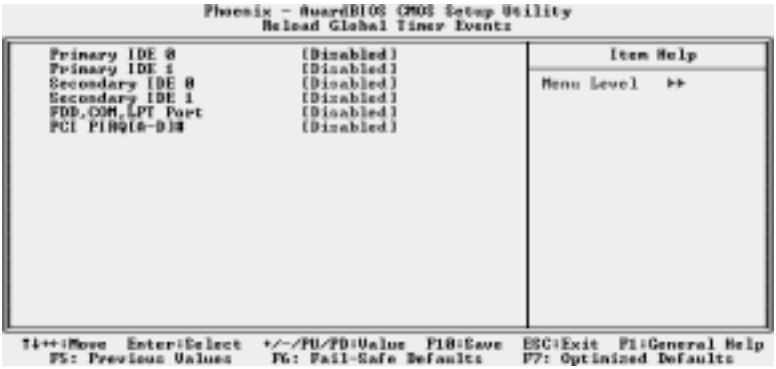
The Date and Time functions are enabled only when the Resume by Alarm function is enabled.

POWER ON Function

This option defines how the system can be woken from sleep mode.

- **Button only**
- Any key

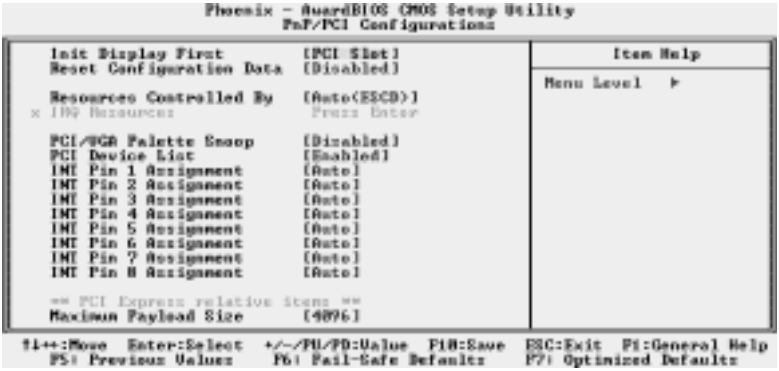
Reload Global Timer Events



Each of these options can be set to disabled or enabled. If enabled, then activity from the corresponding device will reload the global timer.

3.6 PnP/PCI Configurations

This section allows configuring PnP / PCI resources.



Init Display First

This BIOS feature allows you to select whether to boot the system using the PCI Express graphics card or the PCI graphics card. This is particularly important if you have PCI Express and PCI graphics cards but only one monitor.

If you are only using a single graphics card, then the BIOS will detect it as such and boot it up, irrespective of what you set the feature to. However, there may be a slight reduction in the time taken to detect and initialize the card if you select the proper setting for this BIOS feature. For example, if you only use a PCI Express graphics card, then setting Init Display First to PCIEx may speed up your system's boot-up process.

Therefore, if you are only using a single graphics card, it is recommended that you set the Init Display First feature to the proper setting for your system (PCIEx for a PCI Express card and PCI Slot for a PCI card).

However, if you are using multiple graphics cards, it is up to you to choose which card you want to use as your primary display card. It is recommended that you select the fastest graphics card as the primary display card.

- **PCI Slot**
- PCIEx

Reset Configuration Data

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

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

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

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

- Enabled
- **Disabled**

Resources Controlled By
When this option is set to AUTO, the BIOS by using ESCD, controls the IRQ and DMA assignments of all of the boot and PNP devices in the system. If you set this option to Manual, you will be able to manually assign all IRQ and DMA information.

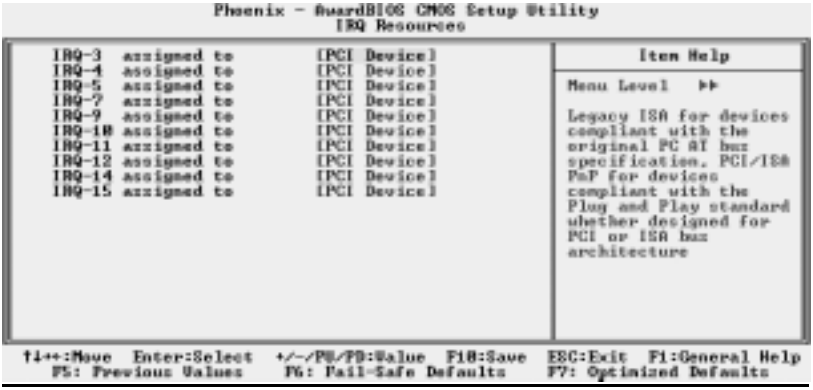
- **Auto (ESCD)**
- Manual

3.6.1 IRQ Resources

This option is used to manually assign IRQ resources.

Note

This option is enabled only if the Resources Controlled By is set to Manual.



IRQ -(3,4,5,7,9,10,11,12,14,15) assigned to
This specifies whether these IRQs are assigned to any PCI Devices or are Reserved (Not Used).

- **PCI Device**
- Reserved

PCI / VGA Palette Snoop
This option is only useful if you use an MPEG card or an add-on card that makes use of the graphics card's Feature Connector.
When enabled, it corrects incorrect color reproduction by "snooping" into the graphics card's frame buffer memory and modifying (synchronizing) the information delivered from the graphics card's Feature Connector to the MPEG or add-on card. It also solves the problem of display inversion to a black screen after using the MPEG card.

- **Disabled**
- Enabled

PCI Device List
Select disabled see BIOS configuration table easier.

- Disabled
- **Enabled**

INT Pin (1,2,3,4,5,6,7,8) Assignment

This setting defines the IRQ for the PCI devices.

- **Auto**
- 3
- 4
- 5
- 7
- 9
- 10
- 11

Maximum Payload Size

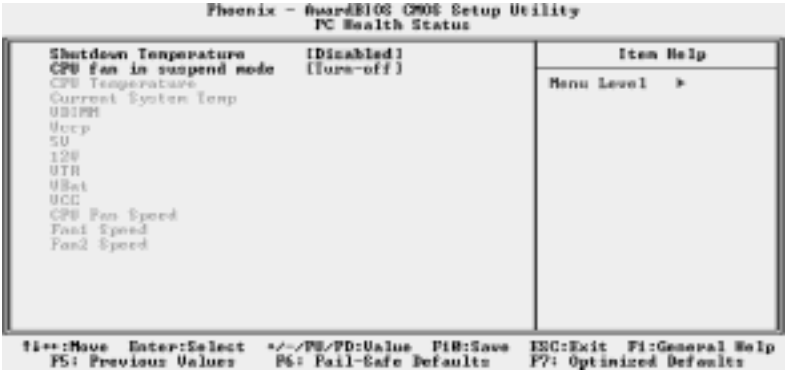
This setting defines the maximum payload size.

- 128
- 256
- 512
- 1024
- 2048
- 4096

This controls the maximum amount of data that can be transferred in a packet. Larger payload sizes increase data throughput, but increase the time that an application must wait for data to begin being transferred.

3.7 PC Health Status

This section monitors critical parameters of your PC and can automatically shutdown the PC if the temperature of the processor exceeds the specified threshold value. This is only available if there is a Hardware Monitor onboard.



Note

The onboard SMSC® DEM1737 hardware monitoring ASIC automatically detects the system, motherboard and CPU temperature. It detects the CPU and chassis fan speeds in RPM. The hardware monitor ASIC also detects the voltage output through the voltage regulators.

Shutdown Temperature
The CPU Shutdown Temperature option allows for a user defined system shutdown temperature. If the CPU temperature exceeds the predefined shutdown threshold, the BIOS forces a system shutdown.

- 60°C/140°F
- 65°C/149°F
- 70°C/158°F
- **Disabled**

CPU fan in suspend mode
This setting determines whether to keep the CPU fan running when in suspend mode.

- Turn-off
- **Stay-on**

3.8 Frequency/Voltage Control

This section facilitates controlling the CPU clock and frequency ratio.

CPU Clock Ratio
The CPU clock ratio setting defines how fast the CPU clock runs relative to the bus speed. TYAN **does not recommend** changing this setting from the default setting. Enter any integer value between 8 and 50. The default is **8x**.

Auto Detect DIMM / PCI Clk
This BIOS feature determines whether the BIOS should actively reduce EMI (Electromagnetic Interference) and reduce power consumption by turning off unoccupied or inactive expansion slots.
When enabled, the BIOS will monitor AGP, PCI and memory slots and turn off clock signals to all unoccupied and inactive slots.
When disabled, the BIOS will not monitor AGP, PCI and memory slots. All clock signals will remain active even to unoccupied or inactive slots.
It is recommended that you enable this feature to save power and reduce EMI.

- **Enabled**
- Disabled

Spread Spectrum
This BIOS feature allows you to reduce the EMI of your motherboard by modulating the signals it generates so that the spikes are reduced to flatter curves. It achieves this by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment.

The BIOS offers various levels of modulation. The greater the modulation, the greater the reduction of EMI.
In most conditions, frequency modulation via this feature should not cause any problems.

However, system stability may be slightly compromised in certain situations. For example, this BIOS feature may cause improper functioning of timing-critical devices like clock-sensitive SCSI devices.

Spread Spectrum can also cause problems with over clocked systems, especially those that have been taken to extremes. Even a slight modulation of frequency may cause the processor or any other over clocked components of the system to fail, leading to very predictable consequences.

Therefore, it is recommended that you disable this feature if you are over clocking your system.

The risk of crashing your system is not worth the reduction in EMI. Of course, if EMI reduction is important to you, enable this feature by all means. But you should reduce the clock speed a little to provide a margin of safety.

- **Disabled**
- -0.5%
- -0.75%
- -1.00%
- +/-0.125%
- +/-0.250%
- +/-0.375%
- +/-0.500%

CPU Clock
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.
The default setting is defined by the type of processor installed.

CPU Voltage Regulator
This option controls how much voltage is supplied to your processor, with a maximum allowable voltage adding of 37.5mV. Select Default if you are not sure.

- **Default**
- -12.5mV
- -25.0mV
- -37.5mV
- -50.0mV
- +12.5mV
- +25.0mV
- +37.5mV

DRAM Voltage Regulator
This option controls how much voltage is supplied to your DRAM, with a maximum allowable voltage adding of 200mV. Select Default if you are not sure.

- **Default**
- +50mV
- +100mV
- +150mV
- +200mV

1.5v Voltage Regulator

This option allows you to define the chipset core voltage. Always leave this option set to default settings.

VTT Voltage Regulator
This option controls how much voltage is supplied as the VTT (+1.5) GTL Termination Voltage to the on-board regulator, with a maximum allowable voltage adding of 150mV. Select Default if you are not sure.

- **Default**
- +50mV
- +100mV
- +150mV

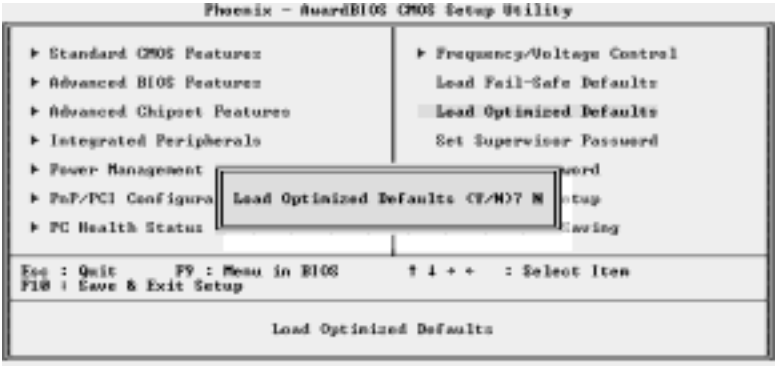
3.9 Load Fail-Safe Defaults

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.

3.10 Load Optimized Defaults

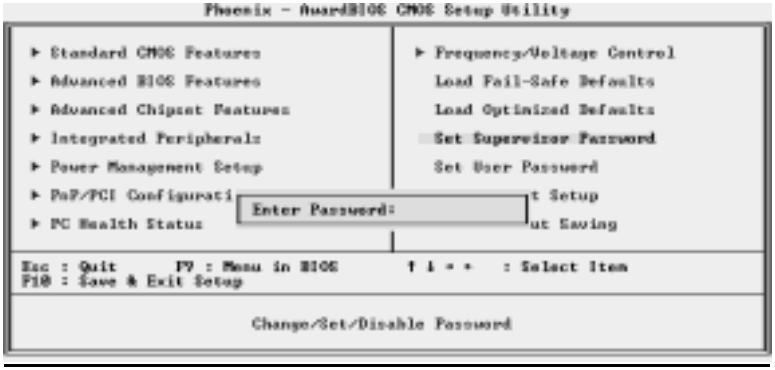


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

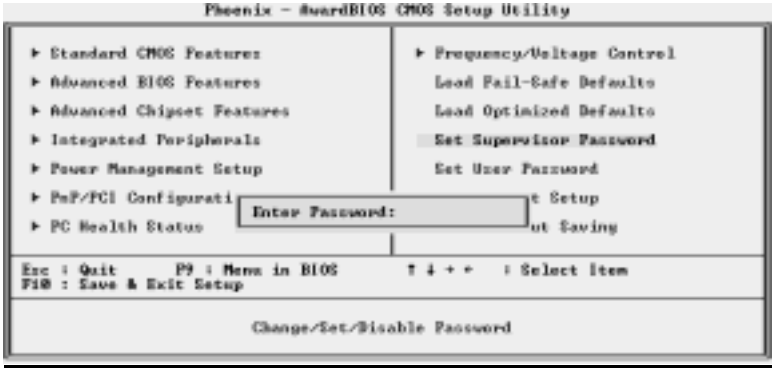
Pressing 'Y' loads the default values that are factory settings for optimal system performance operations.

3.11 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.

3.12 Enter Password



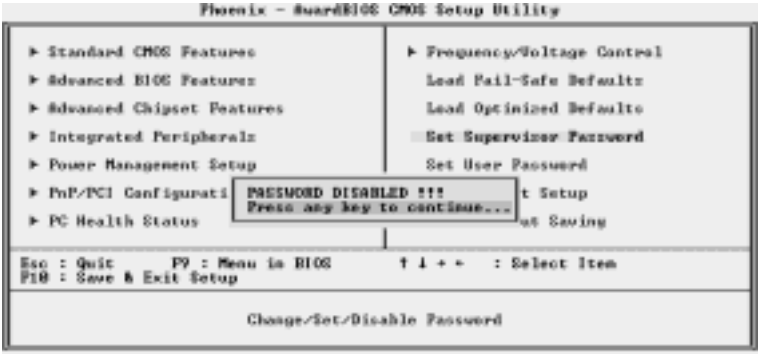
Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter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

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

PASSWORD DISABLED.

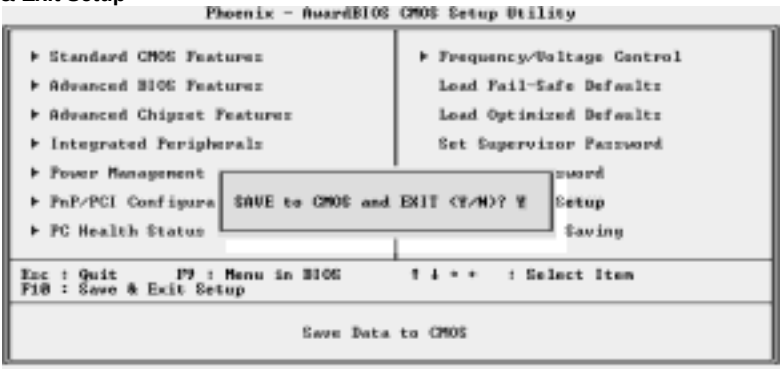
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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



3.13 Exit Selecting

Save & Exit Setup

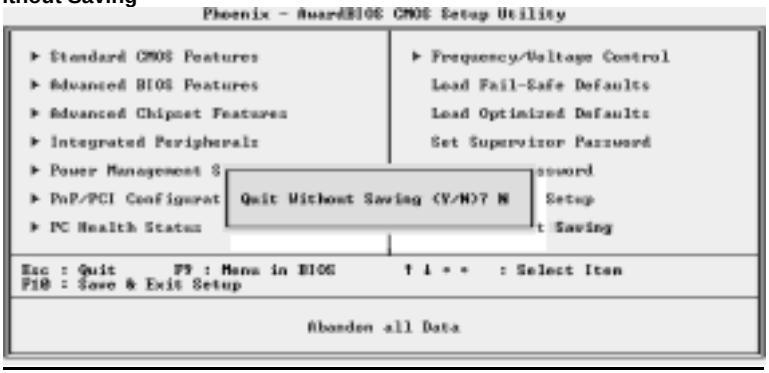


Pressing <Enter> on this item asks for confirmation:

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

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

Exit Without Saving



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

Chapter 4: SATA/RAID Setup (for SATA RAID model)

The motherboard includes the Promise® PDC20579 SATA RAID controller with two Serial ATA interfaces and one Parallel ATA133 interface to support RAID 0, 1, 0+1 or Ultra ATA configuration

Note: The interfaces that PDC20579 support only connect HDDs. It does **NOT** support ATAPI devices such as CD-ROMs, DVD-ROMs, etc. Please move your ATAPI device to the onboard IDE channel.

Warning

Before installing the driver into an existing system, backup any important or useful data. Failure to follow this accepted PC practice could result in data loss.

4.1 Getting Started

Important

If you wish to include your current bootable Serial or Parallel ATA drive using the Windows NT 4.x, Windows 2000, or Windows XP operating system as part of a bootable Mirrored (RAID 1) array on your SATA RAID Controller, do NOT connect the hard drive to the SATA RAID 378 controller yet.

You MUST install the Windows NT4, 2000, or XP driver software first onto this drive while it is still attached to your existing hard drive controller.

The FastTrak 579 Serial ATA RAID controller supports two Serial ATA drives. For optimal performance, install Serial ATA drives of the same model and capacity.

The drives' matched performance allows the array to function better as a single drive.

If you are striping (RAID 0) for performance, use one or two new drives. If mirroring (RAID 1) 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).

1. Install the disk drives into the drive bays of your system.
2. Attach the power cables to the disk drives.
3. Attach one Serial ATA data cable to each Serial ATA disk drive. Then attach the other ends of the cables to the connectors on the motherboard.
4. Attach the Y-cable power splitters to your Serial ATA disk drives. .

Note

The FastTrak 579 RAID controller is a PCI Plug-n-Play (PnP) device. No changes are necessary in the Motherboard CMOS Setup for resources or drive types in most applications.

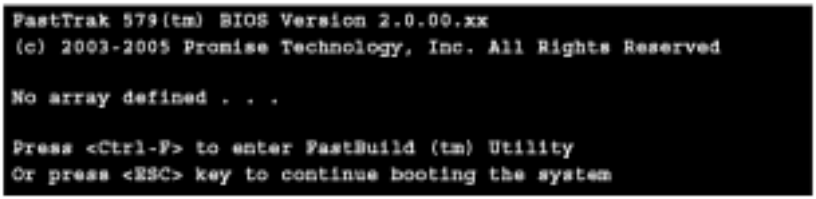
4.2 Create Your Disk Array

You will now use the onboard FastBuild™ BIOS utility to create your array using the attached drives. See page 23 for a full discussion of the FastBuild utility.

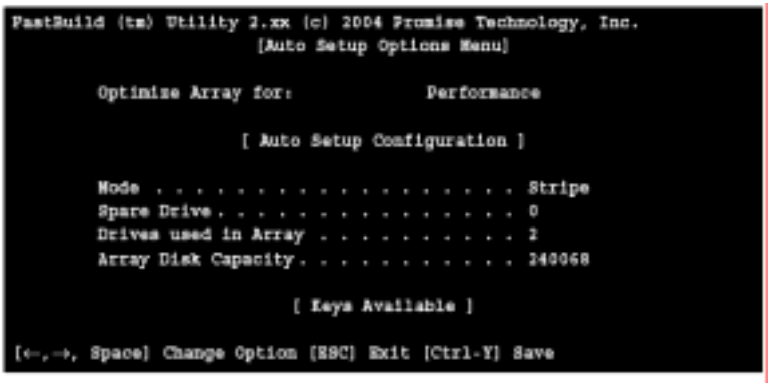
There are four four different ways to create this array. You can create an array for:
• Performance
• Security, using new disk drives (recommended)
• Security, using an existing disk drive and a new one
• Security, using Quick Initialization

The first three steps are the same for all four choices. After that, follow the steps for the array you want to create.

1. Boot your system. If this is the first time you have booted with the FastTrak 579 RAID controller and drives installed, the Promise onboard BIOS will display the following screen.



2. Press the Ctrl-F keys to display the FastBuild Utility Main Menu.
3. Press 1 to display the Auto Setup Menu below. This is the fastest and easiest method to creating your first array.



4.2.1 Creating a Performance Array

Use this setting to create a Striped (RAID 0) array. These arrays have no fault tolerance but a two-drive array has better read/write performance.
To create an array for best performance, follow these steps:

1. Press the Spacebar to choose Performance under the Optimize Array for section.
2. Press Ctrl-Y to Save and create the array.
   When the array is created, the screen will return to the Main Menu.

3. Exit the FastBuild Utility.
4. Once the array has been created, you must partition and format the array, using your operating system, as if it were a new single disk drive.
5. Once the arrayed drives have been formatted, proceed to *Step 4: Install Software Drivers* to install your operating system and/or FastTrak driver.

4.2.2 Creating a Security Array with New Drives

Use this setting to create a Mirrored (RAID 1) array with two new disk drives. If one of the drives has data on it, follow the Creating a Security Array with an Existing Data Drive procedure on the next page.
Under the Security setting in Auto Setup, FastBuild assigns two drives for a single Mirrored array.

Note

When creating a Security array with new drives, a feature called Gigabyte Rounding will automatically be set to ON.

To create an array for data protection using new disk drives, follow these steps:
1. Press the Spacebar to choose *Security* under the Optimize Array section.
2. Press Ctrl-Y to Save your selection. The window below will appear.
3. Press N for the Create Only option.
   When the array is created, the screen will return to the Main Menu.
4. Press Esc to exit the FastBuild Utility.
5. Partition and format the array, using your operating system, as if it were a new single disk drive.
6. Proceed to *Step 4: Install Software Drivers* to install your operating system and/or FastTrak driver.

4.2.3 Security Array with an Existing Data Drive

Use this setting to create a Mirrored (RAID 1) array with a new disk drive and an existing drive with data and/or the bootable drive in your system. Use a new drive of identical or larger storage capacity as the existing drive.

Under the Security setting in Auto Setup, FastTrak assigns two drives for a single Mirrored array.

Choose this method if you wish to use a drive that already contains data and/or is the bootable drive from your system. Obtain a second disk drive of equal or larger storage capacity.

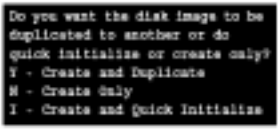
Warning

If you plan to create a Security array using an existing disk drive, backup any important data. Failure to do so could result in data loss.

Important

If you wish to include your current bootable drive using the Windows NT 4.0, 2000, XP or Server 2003 operating system as part of a bootable Mirrored (RAID 1) array, do NOT connect the disk drive to the FastTrak yet.
You MUST install the FastTrak driver to this disk drive while it is still attached to your existing disk drive controller.

Follow these steps:
1. Press the Spacebar to choose *Security* in the Optimize Array field.
2. Press Ctrl-Y to Save your selection. The window below will appear.



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.

4. Press the arrow keys to highlight the drive with the existing data to be copied. This is the Source drive.

Warning

All data on the Target drive data will be erased. Make sure you choose the correct Source drive.

5. Press Ctrl-Y to Save selection and start duplication. The following confirmation screen will appear.

6. Select Y to continue. If you choose N, you will return to the Main Menu.
   Once you select Y, the following progress screen will appear. The process will take a few minutes.

   When the array is created, the screen will return to the Main Menu.
7. Press Esc to exit the FastBuild Utility.
8. Partition and format the array, using your operating system, as if it were a new single disk drive.
9. Proceed to *Step 4: Install Software Drivers* to install your operating system and/or FastTrak driver.

4.2.4 Security Array with Quick Initialization

Use this setting to create a Mirrored (RAID 1) array with one or two existing disk drives containing data that you do *not* want to keep. This method creates a mirrored array and erases the first data block from your existing drives.

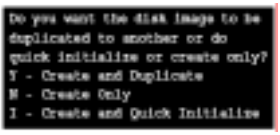
Under the Security setting in Auto Setup, FastTrak assigns two drives for a single Mirrored array.

Choose this method if you wish to create a mirrored array with existing disk drives but you do not want to keep the data currently on those drives.

Warning

Using the Quick Initialization option on existing drives will result in the loss of all data on those drives.

Follow these steps:
1. Press the Spacebar to choose *Security* under the Optimize Array section.
2. Press Ctrl-Y to Save your selection.
3. The window below will appear.



4. Press I for the Create and Quick Initialize.
   When the array is created, the screen will return to the Main Menu.
5. Press Esc to exit the FastBuild Utility.
6. Partition and format the array, using your operating system, as if it were a new single disk drive.
7. Proceed to *Step 4: Install Software Drivers* on page 11 to install your operating system and/or FastTrak driver.

4.3 Install Software Drivers

Following are driver installation procedures for the Windows operating systems that support the FastTrak 579 Serial ATA RAID controller.

Important

If you wish to include your current bootable drive using the Windows 2000, XP or Server 2003 operating system as part of a bootable Mirrored (RAID 1) array, you MUST install the FastTrak driver to this drive while it is still attached to your existing disk drive controller.

4.3.1 Windows Server 2003

New Installation

The following details the installation of the FastTrak Serial ATA RAID Controller drivers while installing Windows Server 2003.

1. Start the installation:
   - Floppy Install: Boot the computer with the Windows Server 2003 installation diskettes.
   - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows Server 2003 Setup window is generated, press S to specify an Additional Device(s).
3. Insert the FastTrak driver diskette into drive A: and press Enter.
4. Choose *Win Server 2003 Promise FastTrak 579 (tm) Controller* from the list that appears on screen, and then press the Enter.
5. Press S to use the driver on the floppy disk and then press Enter to continue with installation.
6. The Windows Server 2003 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win Server 2003 Promise FastTrak 579 (tm) Controller".
   NOTE: If there are any additional devices to be installed, specify them now.
   When all devices are specified, continue to the next step.
7. From the Windows Server 2003 Setup screen, press the Enter. Setup will now load all device files and then continue the Windows Server 2003 installation.

Existing Installation

After installing the FastTrak Serial ATA RAID controller and rebooting your system, Windows Server 2003 setup will show a "Found New Hardware" dialog box. Under Windows 2003, "Mass Storage Controller" will be displayed.

1. Insert the FastTrak driver diskette into the A:\ drive.
2. Choose *Install the software automatically* and press the Enter key.
3. Choose *Win Server 2003 Promise FastTrak 579 (tm) Controller* from the list that appears on screen, and then press the Enter key.
4. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click Continue anyway.
5. When the New Hardware Wizard has finished installing the FastTrak driver, click Finish.

Confirm Installation

1. Right-click on the My Computer icon and select Manage from the popup menu.
2. From the left panel, select Device Manager.
3. Click the "+" in front of SCSI and RAID controllers. "Win Server 2003 Promise FastTrak 579 (tm) Controller" should appear.

4.3.2 Windows XP

New Installation

The following details the installation the FastTrak Serial ATA RAID Controller drivers while installing Windows XP.

1. Start the installation:
   - Floppy Install: Boot the computer with the Windows XP installation diskettes.
   - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows XP Setup window is generated, press S to specify an Additional Device(s).
3. Insert the FastTrak driver diskette into drive A: and press Enter.
4. Choose *WinXP Promise FastTrak 579 (tm) Controller* from the list that appears on screen, and then press the Enter.
5. Press S to use the driver on the floppy disk and then press Enter to continue with installation.
6. The Windows XP Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "WinXP Promise FastTrak 579 (tm) Controller".
   NOTE: If there are any additional devices to be installed, specify them now.
   When all devices are specified, continue to the next step.
7. From the Windows XP Setup screen, press the Enter. Setup will now load all device files and then continue the Windows XP installation.

Existing Installation

After installing the FastTrak Serial ATA RAID controller and rebooting your system, Windows XP setup will show a "Found New Hardware" dialog box.

1. Insert the FastTrak driver diskette into the A:\ drive.
2. Choose Install the software automatically and press the Enter key.
3. Choose *WinXP Promise FastTrak 579 (tm) Controller* from the list that appears on screen, and then press the Enter key.
4. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click Continue anyway.
5. When the New Hardware Wizard has finished installing the FastTrak driver, click Finish.

Confirm Installation

1. Right-click on the My Computer icon and select Manage from the popup menu.
2. From the left panel, select Device Manager.
3. Click the "+" in front of SCSI and RAID controllers. "WinXP Promise FastTrak 579 (tm) Controller" should appear.

4.3.3 Windows 2000

New Installation

The following details the installation of the FastTrak Serial ATA RAID Controller drivers while installing Windows 2000.

1. Start the installation:
   - Floppy Install: Boot the computer with the Windows 2000 installation diskettes.
   - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows 2000 Setup window is generated, press S to specify an Additional Device(s).
3. Insert the FastTrak S150 driver diskette into drive A: and press Enter.
4. Choose *Win2000 Promise FastTrak 579 (tm) Controller* from the list that appears on screen then press Enter.
5. The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win2000 Promise 579 (tm) Controller". NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.
6. From the Windows 2000 Setup screen, press Enter. Setup will now load all device files and then continue the Windows 2000 installation.

Existing Installation

After installing the FastTrak Serial ATA RAID controller and rebooting your system, Windows 2000 setup will show a "New Hardware Found" dialog box.
Under Windows 2000, "PCI Mass Storage Controller" will be displayed.

1. Choose Add New Hardware Wizard from the list, and then press Enter.
2. Choose Add/Troubleshoot a device and click Next. The new hardware wizard will show device list
3. Choose Mass Storage controller and click Next. At the following screen click Finish.
4. Choose Display a list the known drivers for this device so that I can choose a specific driver then click Next.
5. When the Windows 2000 supported SCSI adapter drivers list appears, click Have disk.
6. Insert the FastTrak driver diskette in drive A:\.
7. Type A:\Win2000 in the text box. Click OK.
8. Choose *Win2000 Promise FastTrak 579 (tm) Controller* from the list that appears on screen, then click Next.
9. Click Yes to confirm continue the installation and copy the driver to system.
10. Remove the diskette and click Finish to restart the system. Windows 2000 will then restart for the driver installation to take effect.

Confirm Installation

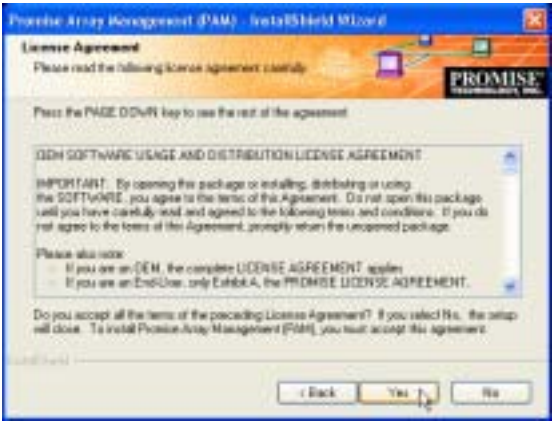
1. Right-click on the My Computer icon and select Manage from the popup menu.
2. From the left panel, select Device Manager.
3. Click the "+" in front of SCSI controllers. "Win2000 Promise FastTrak 579 (tm) Controller" should appear.

4.4 Install PAM Software

Follow these steps to install PAM on each computer:

1. Boot the computer and launch Windows.
2. If the computer is already running, exit all programs.
3. Insert FastTrak CD into your CD-ROM drive.
4. Open the CD and locate the PAM folder.
5. Inside the PAM folder, look for the PAM Setup Installer icon (right).
6. Double-click the icon to run the installer. The opening screen appears.

7. Click Next or press Enter to continue.



8. When the License Agreement appears, click the Yes button to agree to the terms and continue the installation.
   If you click No, PAM Setup will exit.

9. In the Setup Type dialog box, make your choice between Complete (Recommended) and Custom installation.
   Use the Custom installation to change install locations or to deselect individual components. For example, use Custom to install only the Message Server onto your network fileserver.
   Click Next or press Enter to continue.
10. In the Ready to Install dialog box, click Install or press Enter to continue.
11. When the Add User Account dialog box appears, you may accept the default name or enter a new one in the Name field.
    Enter your password in the Password and Confirm Password fields. A password is not required.
    When you are done, click Next or press Enter to continue.

Note

If you are only installing the Message Server, this dialog box does not appear.

12. When the Install Complete dialog box appears, you have the option to:

• Create PAM shortcuts on your Desktop
• Register PAM online

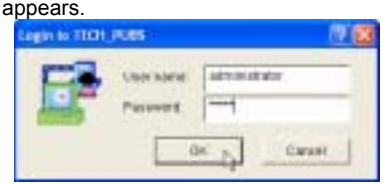
Both of these options are recommended.
Click Finish or press Enter when you are done with installation.

4.4.1 Launch PAM and Log-in

To start PAM:

1. Click on a Desktop icon or go to Start > Programs > Promise Array Management and select Local PAM.
   When the PAM user interface appears:

2. Right-click on the RAID Machine icon in Tree View. Select Login from the popup menu. The Login dialog box appears.



3. In the Login dialog box, enter your Username and Password, and click OK.
   Initially, administrator is the only user. Use the administrator's password selected during installation.
   Access the Online Help for information how to use PAM.
   The PAM software performs the same functions as the FastBuild utility but with a graphic user interface. PAM also performs these additional functions:

• Popup and email event notification
• User accounts with assigned rights and passwords
• Array expansion (add drives to an existing array)
• Array conversion (change RAID level of an existing array)

4.5 FastBuild™ Configuration Utility

- View the FastTrak BIOS Screen
- Navigate the FastBuild Menus
- Create Arrays Automatically
- View Drive Assignments
- Create Arrays Manually
- Delete an Array
- Rebuild a Mirrored Array

The FastBuild Configuration Utility offers several menu choices to create and manage an array on the FastTrak 579 RAID controller. For purposes of this manual, it is assumed you have already created an array in the previous chapter and now wish to make a change to the array or view other options.

4.5.1 View the FastTrak BIOS Screen

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

If an array exists already, the BIOS will display the following above screen showing the controller's BIOS version and status of the array.
The array status consists of five possible conditions: *Functional*, *Synchronizing*, *Rebuilding*, *Critical*, and *Offline*.

Functional – The array is operational.

Synchronizing – The process of verifying data integrity by recalculating redundant data and matching the data on the disk drives.

Rebuilding – The process of reconstructing an array in Critical mode by placing redundant data on a replacement disk drive.

Critical – Degraded array condition due to a failed or removed disk drive. Applies to mirrored (RAID 1) arrays only. Fault tolerance is lost but the data is still accessible. Triggers automatic rebuilding.

Offline – Striped arrays (RAID 0): Degraded array condition due to one failed or removed disk drive. The data is not accessible.

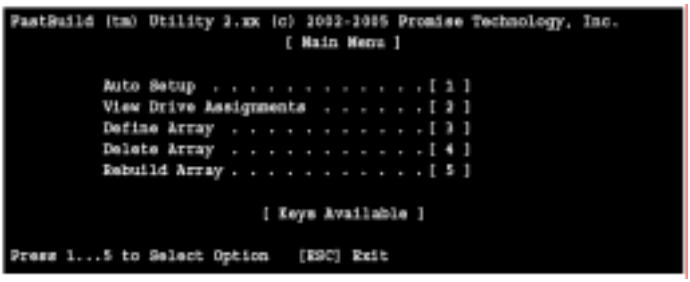
Mirrored (RAID 1) arrays: Degraded array condition due to two failed or removed disk drives. Fault tolerance is lost. The data is not accessible.

If your array goes Offline, contact Promise Technical Support for assistance.

4.5.2 Navigate the FastBuild Menus

When using the menus, these are some of the basic navigation tips: Arrow keys highlights through choices; the Space bar allows to cycle through options; Enter selects an option; Esc aborts or exits the current menu.

Main Menu
This is the first option screen when entering the FastBuild Setup.



To create a new array automatically, press 1 and see *Create Arrays Automatically*. Promise recommends this option for most users.
To manually create an array, press 3 and see *Create Arrays Manually*. If you wish to specify block size, you must create the array manually.
To view the disk drives assigned to arrays, press 2 and see *View Drive* To delete an array, press 4 and see *Delete an Array*.
To rebuild a mirrored (RAID 1) array, press 5 and see *Rebuild a Mirrored Array*.

4.5.3 Create 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, press Ctrl-Y to Save the selections.
FastBuild will automatically build the array.

Optimize Array for
Select whether you want Performance (RAID 0 / Stripe), Security (RAID 1 / Mirror) under the *Optimize Array for* setting.

Performance

RAID 0 (Stripe) supports higher read/write performance. The storage capacity equals the number of drives times the capacity of the smallest drive in the disk array. Under the Performance setting, FastTrak assigns two drives to a single Striped array. If you want a one-drive array, or you want to specify block size, see *Create Arrays Manually*.

Security

RAID 1 (Mirror) creates a fault tolerant array for data security. The storage capacity equals one-half the number of drives times the capacity of the smallest drive in the disk array.

Under the Security setting, FastTrak assigns two drives to a single Mirrored array.

Hot Spare Drive

If a third drive is attached and is not assigned to a mirrored two-drive Mirrored (RAID 1) disk array, it will be recognized as a spare drive. Such a drive is automatically used as a standby replacement. When FastTrak detects that one of the drives in the array has failed, it assigns the hot spare drive to take its place.

To restore fault tolerance as quickly as possible, FastTrak begins an automatic data rebuild on the hot spare drive in the background. There is no need to restart the system.

At any time, you can replace the failed drive with a new one of the same model and size. FastTrak will automatically recognize the new drive as a hot spare.

Important

The hot spare drive must have a capacity that is equal to or larger than the smallest array member.

4.5.4 View Drive Assignments

The View Drive Assignments (2) option in the Main Menu displays whether drives are assigned to a disk array or are unassigned.

Under the Assignment column, drives are labeled with their assigned disk array or shown as Free if unassigned.

Free drives can be used for a future array or as a spare drive when a drive fails in a mirrored array, provided the free drive's capacity is equal to or larger than the smallest array member.

Unassigned drives are not accessible by the OS.

The menu also displays the data transfer mode that relates to speed used by each drive (U refers to Serial ATA).

4.5.5 Create Arrays Manually

The Define Array (3) option from the Main Menu allows users to begin the process of manually defining the drive elements and RAID levels for one or multiple disk arrays attached to FastTrak controller.
Users will commonly create one- or two-drive arrays with the FastTrak controller.
You can use a single drive in a RAID 0 (Stripe) array with FastTrak. In this rare scenario, the controller will create an individual array ID but there will be no performance improvement.
At a later time, you can add a second drive to the single-drive array and create RAID 1 (Mirror) array. See *Add Fault Tolerance to an Existing Drive.*

Note

For most installations, Promise recommends the (1) Auto Setup for easy disk array creation.

Important Features

Halt on Error

When enabled, if the RAID controller detects an error, such as a Critical array, the boot process will stop when the FastTrak BIOS appears and wait for your input. At that point, you can press Ctrl-F to enter the FastBuild utility or press Esc to continue booting.
When disabled, the FastTrak BIOS will appear and show the Critical array, but the computer will continue booting if you take no action.

Stripe Block Size

For striped (RAID 0) arrays you can manually select the stripe block size. Press the Spacebar to scroll through choices progressing as follows (32, 64, 128 MB).
Stripe Block size selected affects how FastTrak sends data blocks to and receives them from the drives. You must perform your own testing to determine how the data block size affects your particular use of the array. In general, a larger block size is better when handling large data transfers (such as in A/V editing or graphics) while a smaller block size is better when handling e-mail and other common server data. The default is 64 KB.

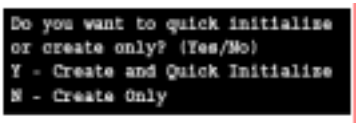
Gigabyte Rounding

The Gigabyte Rounding feature is designed for Mirrored (RAID 1) arrays in which a drive has failed and the user cannot replace the drive with the same capacity or larger. Instead, the Gigabyte Boundary feature permits the installation of a replacement drive that is slightly smaller (within 1 gigabyte) than the remaining working drive (for example, an 80.5 GB drive would be rounded down to 80 GB).
This feature is automatically enabled for Mirrored (RAID 1) arrays, except when when creating the array from an existing drive (versus using two brand new drives). This protects the existing drive's partition table in order to maintain data integrity.

Create a Striped Array

As described in the Drive Assignments Option section above, if you selected a performance (RAID 0) array, follow the directions here.

1. Under the Definition section of this menu, highlight the Array # for your array.
2. Press the Spacebar to select *Stripe* (RAID 0 or Performance).
3. Set the Stripe Block size. 64 KB is the default.
4. Under the Drive Assignments section, press the ↑ and ↓ keys to highlight a drive.
5. Press the Spacebar or Y to change the Assignment option to Y. This action adds the drive to the disk array.
   Assign from one or two drives. If you assign only one drive, there will be no performance benefit.
6. Press Ctrl-Y to save the information. The window below will appear.



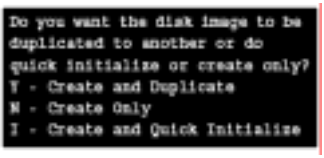
7. Press Y to create and quick initialize the array or press N to create it only.
   When the array is created, the screen will return to the Define Array menu.
8. Press Esc twice to exit the FastBuild Utility.
9. Partition and format the array, using your operating system, as if it were a new single disk drive.

Create a Mirrored Array Using New Drives

As described in the Drive Assignments Option section above, if you selected a mirroring (RAID 1) array and you will use two new disk drives, follow the directions here.

1. Under the Definition section of this menu, highlight the Array # for which your array.
2. Press the Spacebar to select *Mirror* (RAID 1 or Security).
3. Under the Drive Assignments section, press the ↑ and ↓ keys to highlight a drive.
4. Press the Spacebar or Y to change the Assignment option to Y. This action adds the drive to the disk array.

5. Press Ctrl-Y to save the information. The window below will appear.



6. Press N for the Create Only option.
   When the array is created, the screen will return to the Define Array menu.
7. Press Esc twice to exit the FastBuild Utility.
8. Partition and format the array, using your operating system, as if it were a new single disk drive.

Adding Fault Tolerance to an Existing Drive

FastTrak 579 RAID controller will create a mirrored array using an existing system drive with data. You must assign the existing drive and another drive of same or larger capacity to the Mirroring (RAID 1) array. FastBuild will copy the existing data to the new blank drive.

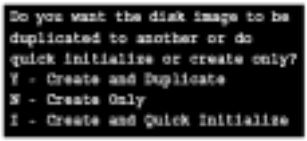
Warning

Backup any important data before proceeding. Failure to follow this accepted PC practice could result in data loss.

Important

If you wish to include your current bootable drive using the Windows NT 4.0, 2000 or, XP or Server 2003 operating system as part of a bootable Mirrored (RAID 1) array on your FastTrak, you MUST install the FastTrak driver onto the bootable drive while it is still attached to your existing hard drive controller.

1. Under the Definition section of this menu, highlight the Array # for which your array.
2. Press the Spacebar to select *Mirror* (RAID 1 or Security).
3. Under the Drive Assignments section, press the ↑ and ↓ keys to highlight a drive.
4. Press the Spacebar or Y to change the Assignment option to Y. This action adds the drive to the disk array.
5. Press Ctrl-Y to Save your selection. The window below will appear.



6. Press Y for the Create and Duplicate option.

Gigabyte Rounding is automatically disabled when creating a Mirrored (RAID 1) array from an existing drive. This action protects the existing drive's partition table in order to maintain data integrity.
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.

7. Press the arrow keys to highlight the drive with the existing data to be copied. This is the Source drive.

Warning

All Target drive data will be erased. Make sure you choose the correct Source drive.

8. Press Ctrl-Y to Save the selection and start duplication. The following confirmation screen will appear.

9. Press Y to continue. If you press N, you will return to the Main Menu.
10. Once you select Y, the following progress screen will appear. The process will take a few minutes.

When the array is created, the screen will return to the Define Array menu.

11. Press Esc twice to exit the FastBuild Utility.
12. Partition and format the array, using your operating system, as if it were a new single disk drive.

Additional Array Information

Hot Spare Drive for Mirrored Arrays

For automatic rebuilds of a Mirrored (RAID 1) array, attach a spare drive to the FastTrak controller. If a disk drive is not assigned to an array and it is the same size or larger than the drives in the array, FastTrak will use the unassigned drive as a hot spare. The hot spare replaces a failed disk drive and the array is rebuilt to the hot spare automatically. This action is performed in the background under all supported operating systems, except DOS. At a later time, you can power down the system and replace failed drive. The new drive then becomes the hot spare.

How FastTrak Orders Arrays

During startup, the disk arrays on the FastTrak 579 Serial ATA controller are recognized in this order:

1. The array set to bootable in the FastBuild Setup.
2. The Array number (i.e. Array 0, Array 1…). This would be involved in determining which drive letters will be assigned to each disk array.

How FastTrak Saves Array Information

All disk array data is saved into the reserved sector on each array member.
Promise suggests that users record their disk array information for future reference.

Another feature of the FastTrak 579 Serial ATA RAID Controller disk array system is to recognize drive members even if drives are moved between different FastTrak controller connectors. Since each drive's array data identifies itself to the array, it is possible to move or swap drives without modifying the array setup.
This is valuable when adding drives, or during a rebuild.

4.5.6 Delete an Array

The Delete Array (4) Menu option allows for deletion of disk array assignments.
This is not the same as deleting data from the drives themselves.

Warning

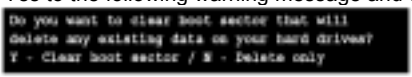
Deleting an existing disk array could result in loss of data. Record all array information including the array type, the disk members, and stripe block size in case you wish to undo a deletion.

Important

If you delete an array by accident, immediately create a new array identical to one you deleted. This action normally recovers the data from the deleted array.

1. To delete an array, highlight the Array you wish to delete and press the Delete key.
2. The Array Definition menu will appear (see below) showing which drives are assigned to this array.

3. Press Ctrl-Y to confirm Yes to the following warning message and continue array deletion:



4. At the next prompt, press Y to clear the boot sector or press N to delete the array only.

The boot sector maps the data partition on the disk drive. To delete an array without deleting the data, press N. This action is sometimes part of a data recovery operation, under the direction of Technical Support.
After deleting the array, create a new array using Auto Setup (1) or the Define Array (3) from the Main Menu.

4.5.7 Rebuild a Mirrored Array

Use the Rebuild Array (5) Menu option to recover from an error in a mirrored (RAID 1) disk array.

Note the Critical Status of the array shown above. If you observe this condition when booting your system from the FastTrak BIOS, your array needs attention.

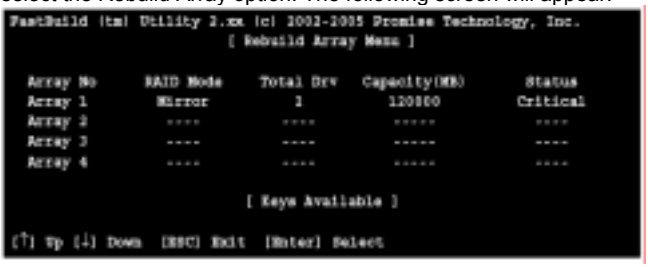
Important

Drives MUST be replaced if they contain any physical errors, before rebuilding the array.

Follow these steps before using the Rebuild Array menu option:
1. Press Ctrl-F to enter FastBuild Main Menu.
2. Press 3 to select Define Array.
3. Press the arrow keys to highlight the failed array and press Enter to select it.

4. In the Array Definition menu, in the Drive Assignments field, identify the failed drive. In the example above, the drive in Channel 2 has failed.
5. Press Esc twice to Exit the FastBuild Utility.

6. Power off your system.
7. Remove the failed drive and replace it with a new drive of the same or larger size.
8. Power on your system and enter the FastBuild Utility.
9. Press 5 to select the Rebuild Array option. The following screen will appear.



10. Highlight the array whose Status is Critical and press Enter. The following screen appears.

11. Under Select Drive for Rebuild, press the arrow keys to highlight the replacement drive.
12. Press Enter and confirm that the data will be copied onto the selected drive.
    Data from the original mirror drive will overwrite any existing data on the replacement drive. A progress bar will appear as below.

    When the *Array was recovered...* message appears, the array is ready for use.
13. Press Esc twice to exit FastBuild and allow your system to finish booting.

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 a memory error.

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

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, please check the TYAN web site: http://www.tyan.com/

Note

Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

Appendix I: Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

IPL: see Initial Program Load.

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

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

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

Mirroring: see RAID.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Striping: see RAID

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

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

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

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

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

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

Appendix II: Post Error Code for BIOS

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

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

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

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

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

Technical Support

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

Help Resources:

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

Returning Merchandise for Service

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

Note

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

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

Operation is subject to the following conditions:

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

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

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

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

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

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