Tomcat i875PR /// S5102-P

Revision 1.00

Table of Contents

Before you begin…

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


1x Tomcat i875PR S5102-P motherboard


1x 34-Pin floppy drive cable


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


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


1x Tomcat i875PR S5102-P User's Manual


1x Tomcat i875PR S5102-P Quick Reference Guide


1x TYAN driver CD


1x I/O shield


1 x Promise FastTrak 378 RAID Driver Diskette


1 x Cable set: 9-pin Serial and 25-pin Parallel


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/dealer for replacement before continuing with the installation process.

Chapter 1: Introduction

1.1 – Congratulations!

You have purchased one of the most powerful solutions for the Intel Pentium® 4 processor, the Tomcat i875PR S5102-P Based on Intel 875P chipset, this platform offers convenient remote Intelligent Platform Management Interface (IPMI) monitoring through a Server Management Daughter Card. The Tomcat i875PR S5102-P are ATX form factor, onboard Gigabit Ethernet port, Fast Ethernet port, Serial ATA, IDE RAID and an onboard ATI 8MB PCI RAGE XL VGA.

Remember to visit TYAN's Website at http://www.tyan.com. There you can find information on all of TYAN's products with FAQs, distributors list, and BIOS setting explanations.

1.2 – Hardware Specifications

Processors
- Socket 478 processor
- Supports single Intel® Pentium® 4 processor "Northwood / Prescott"
- Onboard VRM10
- Front-Side Bus support for 800/533/400MHz

Chipset
- Intel® 875P North Bridge chipset
- Intel® ICH5 South Bridge chipset
- Winbond® W83627HF LPC I/O chip
- Analog devices ADM1027* hardware monitoring chip

Memory
- Four 184-pin DIMM sockets
- Supports DDR 400/333/266
- Up to 4GB of Un-buffered ECC and non-ECC type memory modules
- Registered Memory is NOT supported

Expansion Slots
- Four 32-bit / 33MHz PCI 2.3 slots

Integrated LAN Controller(s) (Optional)
- Two Gigabit LAN controller
  Intel® 82547 Gigabit Ethernet controller
  - Operating at 266MB/s CSA interface
  Intel® 82541 Gigabit Ethernet controller (Optional)
- One 10/100 Mbps LAN controller
  Intel® 82562 10/100 Mbps LAN controller

Intelligent PCI Graphic
- ATI® Rage XL PCI controller
- 8MB Frame Buffer

Integrated PCI IDE (ICH5)
- Dual channel master mode support up to four IDE devices
- Support for ATA-100 / 66/ 33 IDE drives and ATAPI compliant devices

Integrated Serial ATA RAID
- Promise® PDC20378 SATA RAID controller
- Two Serial ATA RAID ports and one Ultra ATA/133 IDE RAID port
- Support up to two SATA and two ATA-133/100 IDE drives
- Supports IDE RAID 0, 1, 0+1(Need to install two SATA Hard drivers and two ATA-133/100 IDE drives simultaneously)

System Management
- Total of three 3-pin headers
- Three fan headers with tachometer monitoring
- Watchdog timer

Integrated I/O Interface
- One floppy connector supports up to two drives
- Eight USB 2.0 ports (two rear connectors and six ports by headers)
- Two 9-pin serial port (one rear connector and one header)
- One 25-pin ECP/EPP/SPP parallel port header
- One IrDA connector (via optional cable)
- Power/IDE LED connectors

Integrated Serial ATA (ICH5)
- Two Serial ATA Host controllers embedded in ICH5
- Support two Serial ports running at 150MB/s

Intelligent Platform Management Interface (Optional)
- QLogic™ Zircon Baseboard Management Controller (BMC) based on powerful ARM7 technology
- Tailored for IPMI highest 1.5 Spec.
- Supports KCS and BT styles
- Supports flexible Windows and Linux based Management Solution
- Supports RMCP and SNMP protocols
- Supports ASF standard and EMP
- I^2C serial multi-master controllers and UARTs
- Built-in IPMB connector
- Supports remote Power on/off and reset support (IPMI-over-LAN)
- Server Management Daughter Card (SMDC) via built-in 2x25 header

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

Rear Panel I/O ports
- Stacked PS/2 Mouse & Keyboard ports
- Stacked two USB2.0 ports and one RJ45 100/10 LAN port on top
- One Serial and One VGA connectors
- One RJ45 (LAN1) connector with LEDs
- One RJ45 (LAN2) connector with LEDs (optional)

Power
- On board VRM, 3-phase PWM
- ATX 12V power connector

Regulatory
- EMI - CE, FCC Class B

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

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

Chapter 2: Board Installation

Installation

You are now ready to install your motherboard. The mounting holes pattern of the Tomcat i875PR S5102-P matches the ATX specification. Before continuing with installation, confirm that your chassis supports a standard ATX motherboard.

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

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

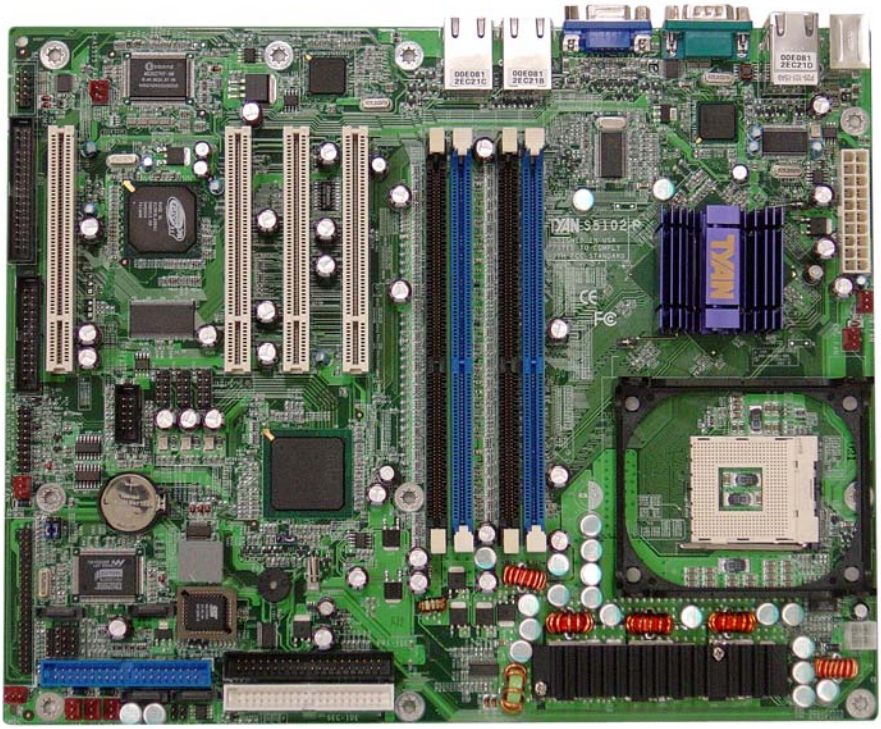
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.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

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

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

2.1 – Board Image

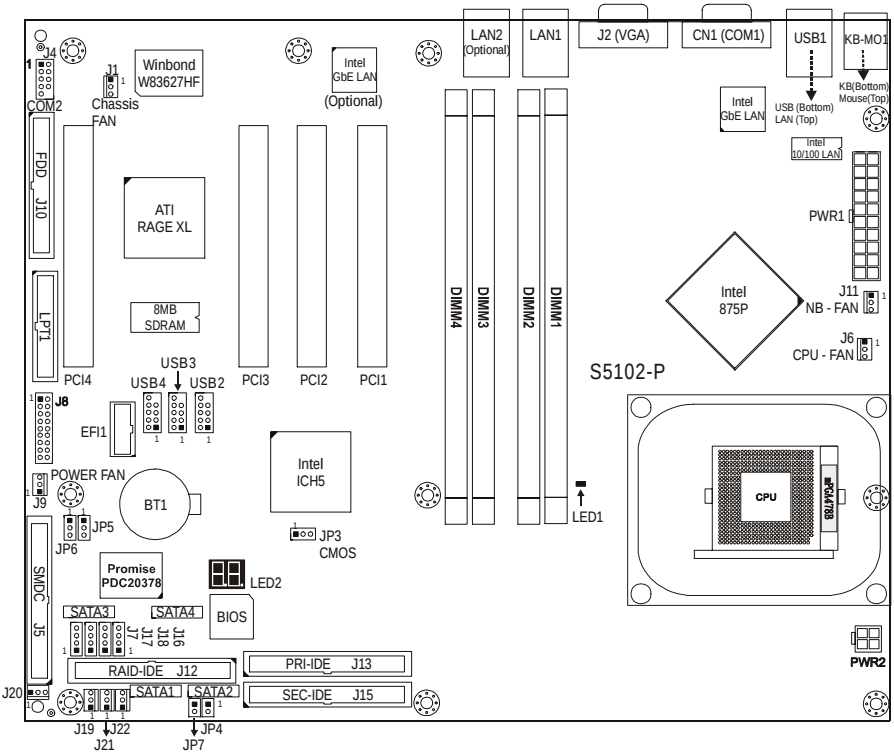
The following is an image of the Tomcat i875PR S5102-P.



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

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

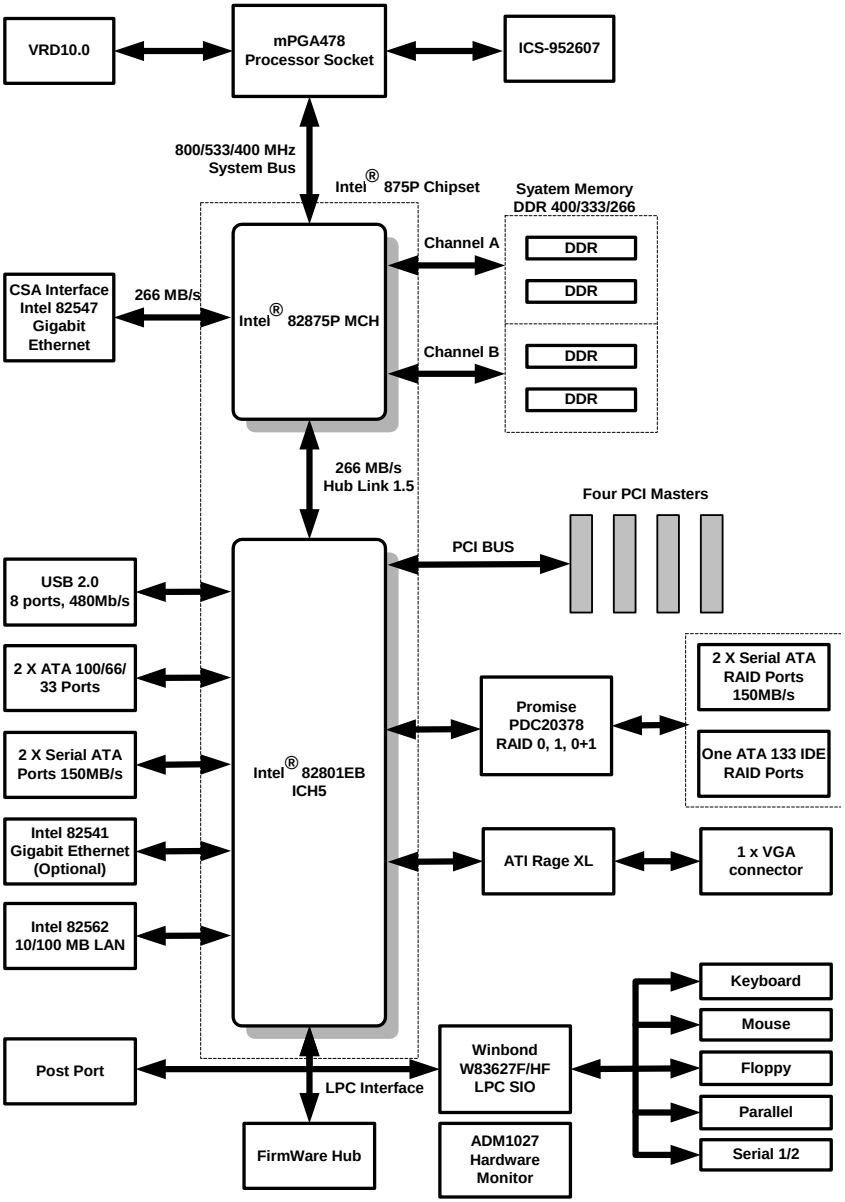
2.2 – Board Parts



This jumper diagram is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above diagram. The board parts are not to scale.

2.3 – Block Diagram

The following is a block diagram of the Tomcat i875PR S5102-P.



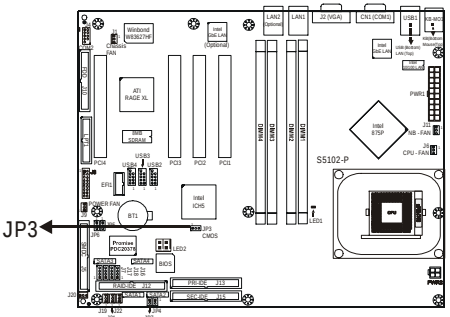
2.4 – Jumper Settings & Definitions

Jumper	Function	Ref. Page
JP3	Clear CMOS	Page 2-5

Jumper Example

	Jumper OFF – open (without jumper cap)
	Jumper ON – closed (with jumper cap)

CMOS Reset (JP3)



	Normal
	Clear CMOS

You can reset the CMOS settings in case an incorrect setting causes system instability or you have forgotten your system / setup password or have just flashed your BIOS by using these jumpers.

- Power off system, disconnect power supply from the motherboard
- Set jumper to Clear CMOS
- Wait about 5 seconds
- Set jumper to Normal (Default)

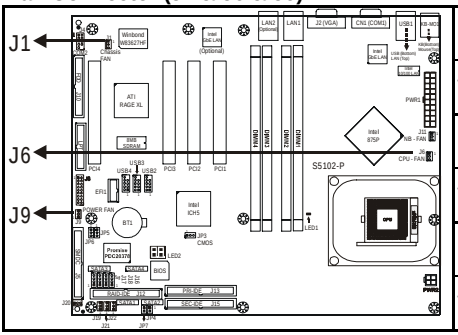
And plug the power supply back into the motherboard.

2.5 – Connector Description

Connector	Function	Ref. Page
J1	Chassis fan connector	Page 2-6
J4	COM2 port	Page 2-7
J5**	SMDC Connector	Page 2-10
J6	CPU fan connector	Page 2-6
J7	SMBus_0 Connector	Page 2-7
J8	Front panel connector	Page 2-7
J9	Power fan connector	Page 2-6
J12*	IDE RAID connector	Page 2-8
EFI1	EFI1 connector	Page 2-8
LED1	Power On LED	Page 2-8
LED2	Post error code for BIOS	Page 2-8
LPT1	Printer Port connector	Page 2-9
SATA1/SATA2	Serial ATA connector	Page 2-9
SATA3/SATA4*	Serial ATA RAID connector	Page 2-9
USB2/USB3/USB4	USB headers	Page 2-9
J11**	North bridge fan connector	Page 2-10
J16 / J17 / J18**	Front panel LAN display headers	Page 2-10
J19 / J20 / J21 / J22**	Auto fan control connectors	Page 2-11
JP4 / JP7**	Full speed fan control headers	Page 2-11
JP5 / JP6**	SMDC I^2C headers	Page 2-11

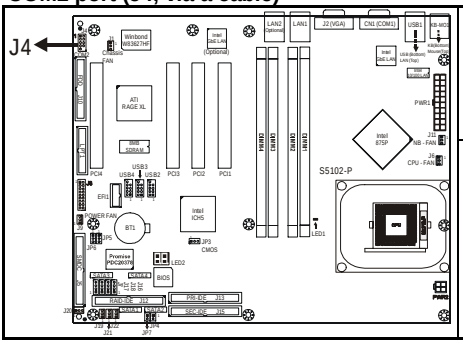
***SATA RAID (SATA3/SATA4) and IDE RAID (J12) functions by Promise PDC20378 chip.**
****(J5, J11, J16, J17, J18, J19, J20, J21, J22, JP4, JP5, JP6 and JP7) These connectors and jumpers are reserved for OEM use only.**

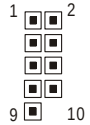
Fan Connector (J1 & J6 & J9)



J1	**Chassis fan**
Tachometer/speed Read and controlled	
J6	**CPU fan**
Tachometer/speed Read and controlled	
J9	**Power fan**
Tachometer/speed Read and controlled	

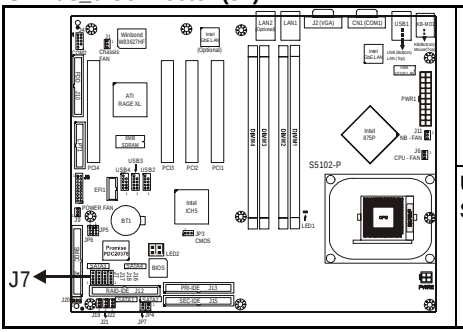
COM2 port (J4, via a cable)





Signal	Pin#	Pin#	Signal
DCD	1	2	DSR
RX	3	4	RTS
TX	5	6	CTS
DTR	7	8	RI
GND	9	10	NC/Key

SMBus_0 Connector (J7)

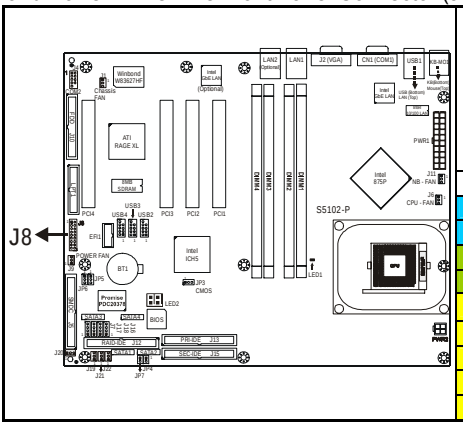


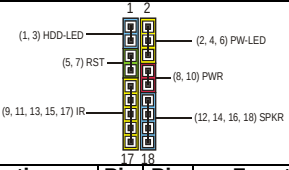
Pin 1: SMBUS_DATA
Pin 2: GND
Pin 3: SMBUS_CLK
Pin 4: NC

Use this connector to connect external SMBUS devices

Front Panel Connector (J8)

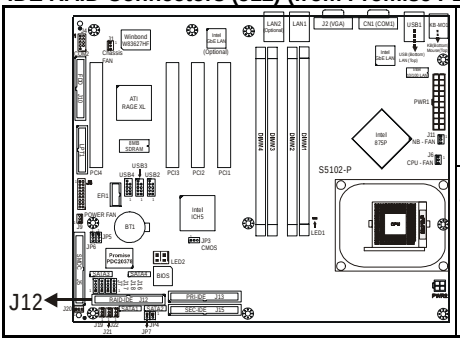
Your chassis will usually come with connectors to install onto the motherboard, such as HD and Power LEDs. The Front Panel Connector (J8) has been implemented for such purposes.

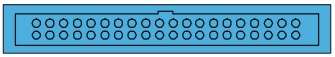




Function	Pin	Pin	Function
HDD_LED+	1	2	Power_LED+
HDD_LED-	3	4	GND
GND	5	6	GND
Reset Button	7	8	Power Button
VCC	9	10	GND
CIRRX	11	12	VCC
IRRX	13	14	GND
GND	15	16	NC
IRTX	17	18	Speaker

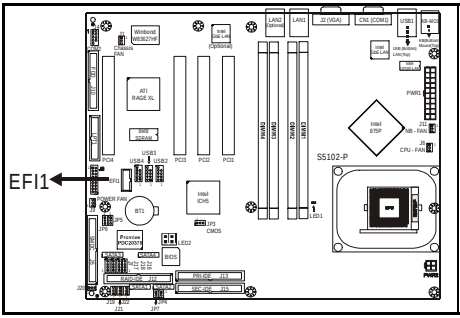
IDE RAID Connectors (J12) (from Promise PDC20378 chip)





Supports IDE RAID 0, 1, 0+1 (Need to install two SATA Hard drives plugged into SATA3 and SATA4 connectors simultaneously)

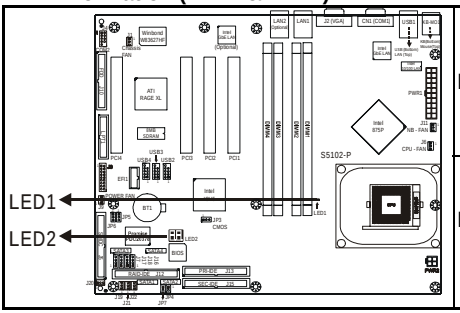
EFI1 Connector



Pin 1: GND
Pin 3: USBP2+
Pin 5: TXD
Pin 7: RXD
Pin 9: NC

Pin 2: VCC
Pin 4: USBP2-
Pin 6: VCC3
Pin 8: GND
Pin 10: +12V

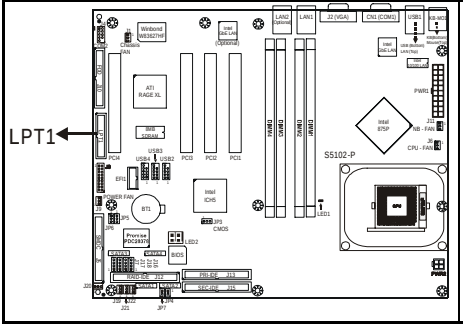
LED Information (LED1 & LED2)

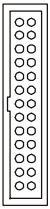


LED1: Power on LED

LED2: Post error code for BIOS
(Ref. Appendix II)

Printer Port Connector (LPT1)



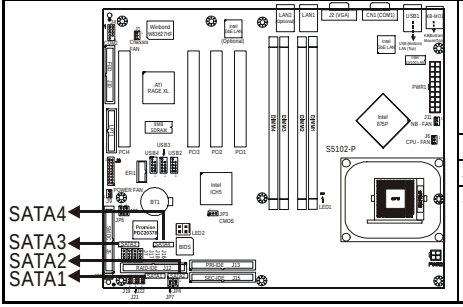


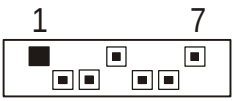
Pin 1: STB-	Pin 2: AFD-
Pin 3: PD0	Pin 4: ERR-
Pin 5: PD1	Pin 6: INIT-
Pin 7: PD2	Pin 8: SLIN-
Pin 9: PD3	Pin 10: GND
Pin 11: PD4	Pin 12: GND
Pin 13: PD5	Pin 14: GND
Pin 15: PD6	Pin 16: GND
Pin 17: PD7	Pin 18: GND
Pin 19: ACK-	Pin 20: GND
Pin 21: BUSY	Pin 22: GND
Pin 23: PE	Pin 24: GND
Pin 25: SLCT	Pin 26: NC

Serial ATA Connectors (SATA1 & SATA2 & SATA3 & SATA4)

SATA1 / SATA2 (from ICH5): RAID function is NOT supported

SATA3 / SATA4 (from Promise PDC20378 chip): RAID function is supported

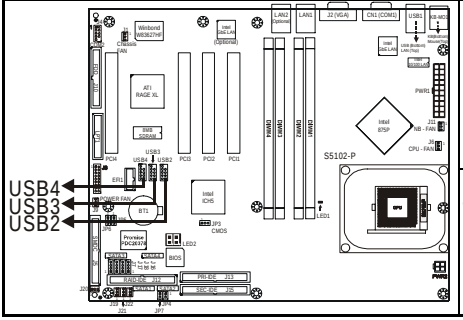


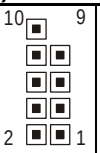


Pin	1	2	3	4	5	6	7
Signal	GND	TXP	TXN	GND	RXN	RXP	GND

Supports serial ATA devices

Front USB Connector (USB2 & USB3 & USB4)



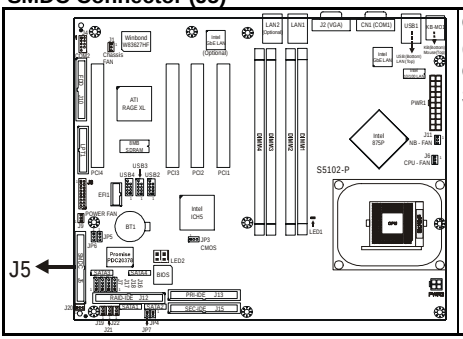


Pin 10: No Connect	Pin 9: Key
Pin 8: GND	Pin 7: GND
Pin 6: +Data	Pin 5: +Data
Pin 4: -Data	Pin 3: -Data
Pin 2: +5VDU	Pin 1: +5VDU

Use the USB2 & USB3 & USB4 header here for front panel USB 2.0 connectors (via the cable)

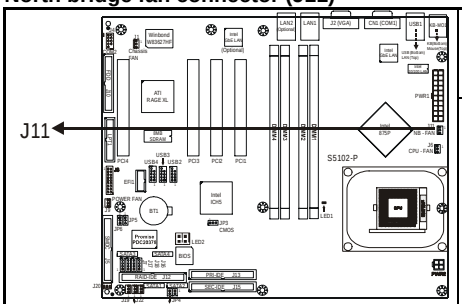
OEM Reserved Connectors and Jumpers as below:

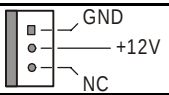
SMDC Connector (J5)**



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

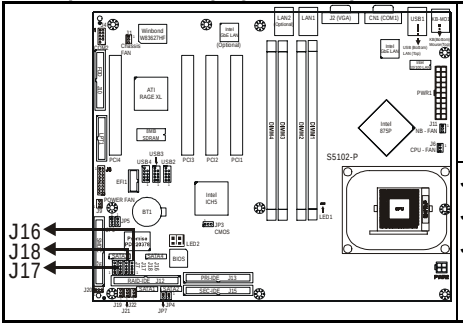
North bridge fan connector (J11)**





Without PWM fan control and fan speed reading

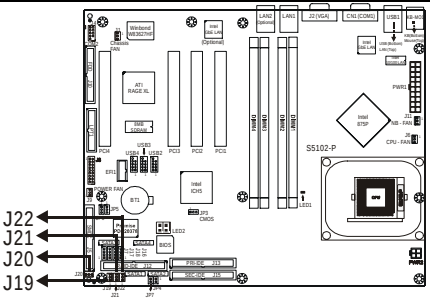
Front panel LAN display headers (J16, J17 and J18)**

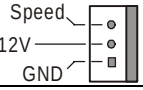


Pin 4: GND
Pin 3: Link LED
Pin 2: GND
Pin 1: Link LED

J16: Intel 82547 LAN Link LED
J17: Intel 82541 LAN Link LED
J18: Intel 82562 LAN Link LED

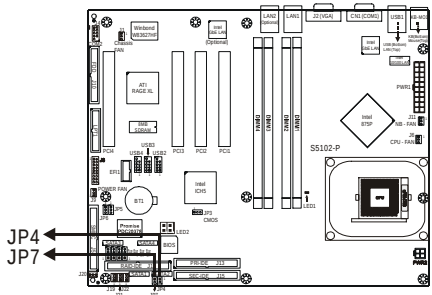
Auto fan control connectors (J19, J20, J21 and J22)**





With PWM fan control
With fan speed reading

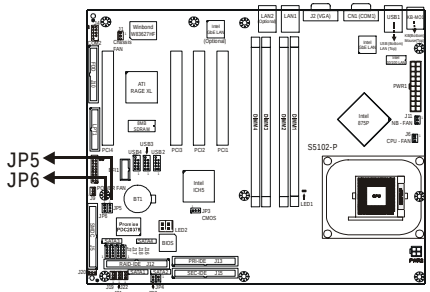
Full speed fan control headers (JP4 and JP7)**



OPEN (Default)
Auto fan control

CLOSED
Full speed fan control
Without PWM fan control

SMDC I^{2}C headers (JP5 and JP6)**



JP5 and JP6 CLOSED: 1 – 2
Without SMDC I^{2}C function

(Default)
JP5 and JP6 CLOSED: 2 – 3
With SMDC I^{2}C function

2.6 – Mounting the Motherboard

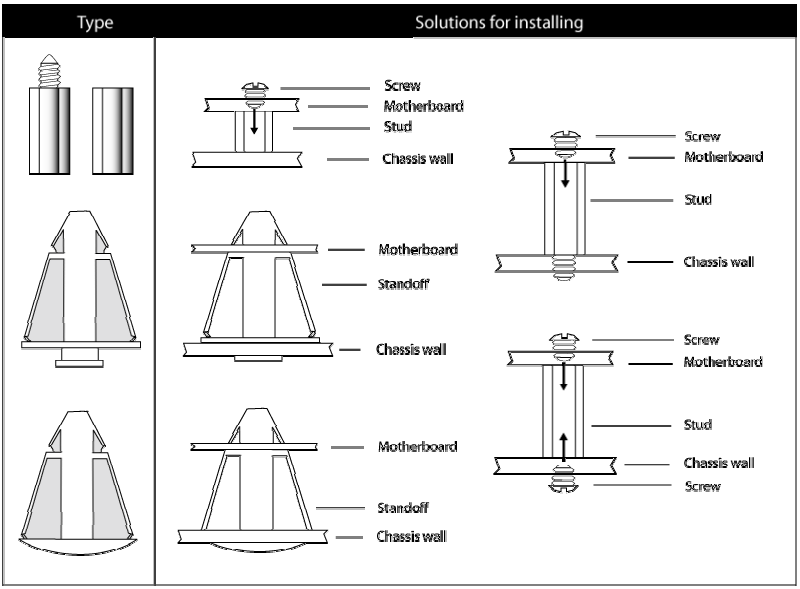
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you're unsure of stud placement, simply lay the motherboard inside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

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

- **Memory Type**: The Tomcat i875PR S5102-P supports unbuffered ECC and non-ECC type memory modules. **Registered Memory is NOT supported**.

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

Mounting the Motherboard

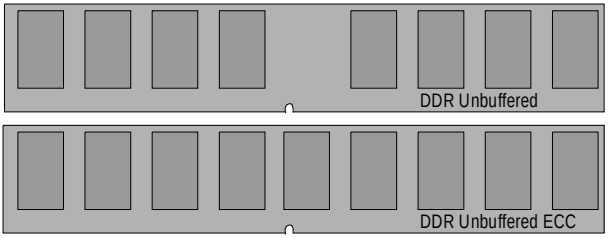


TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.7 – Installing the Memory

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

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



Here are a few key points to note before installing memory into your Tomcat i875PR S5102-P:

- 128MB, 256MB, 512MB and 1GB unbuffered ECC and non-ECC PC2100/PC2700/PC3200 DDR memory modules are supported
- All installed memory will be automatically detected - no need to set any jumpers
- The Tomcat i875PR S5102-P supports up to 4GB of memory
- **Registered Memory is NOT supported**.
- You can install either single- or double-sided modules on this board. Each DIMM can work respectively for single-channel mode and dual-channel mode. Please note that the same type and density memory modules are necessary while using dual-channel DDR, otherwise it may cause system instability.
  Please refer to the following table for detailed dual-channel DDR.

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

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

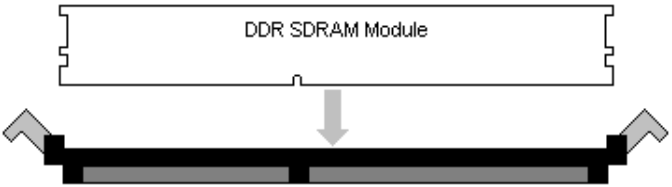
- **Supported System Bus Frequency and Memory Speed Combinations**

CPU FSB	DDR DIMM Type	Memory Frequency
800MHz	PC3200, PC2700*, PC2100	400, 333*, 266 MHz
533MHz	PC2700, PC2100	333, 266 MHz
400MHz	PC2100	266 MHz
***** When using 800MHz CPU FSB, PC2700 DDR DIMMS may run only at 320MHz (not 333MHz) due to chipset limitations.		

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

2.8 – Memory Installation Procedure

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



DDR SDRAM DIMM Slot - 184 Pins (1 key)

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

DDR SDRAM DIMM Slot - 184 Pins (1 key)

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

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

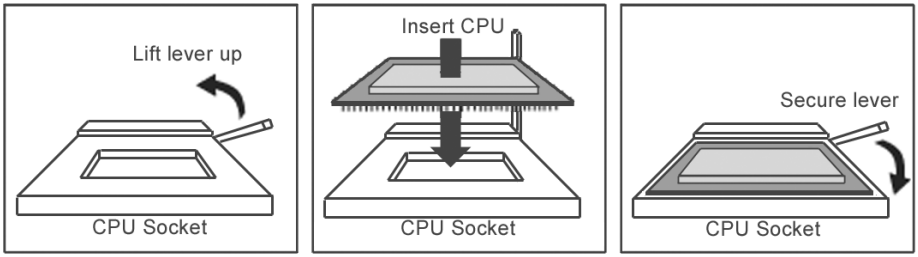
Note: You **MUST** unplug the power connector to the motherboard before performing system hardware changes, to avoid damaging the board or expansion device

2.9 – Installing the Processor and Heatsink

Your Tomcat i875PR S5102-P supports the latest processor technologies from Intel. Check the following page on TYAN's website for latest processor support:

http://www.tyan.com

The following diagrams will detail how to install your processor:



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

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

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

Heatsink Installation

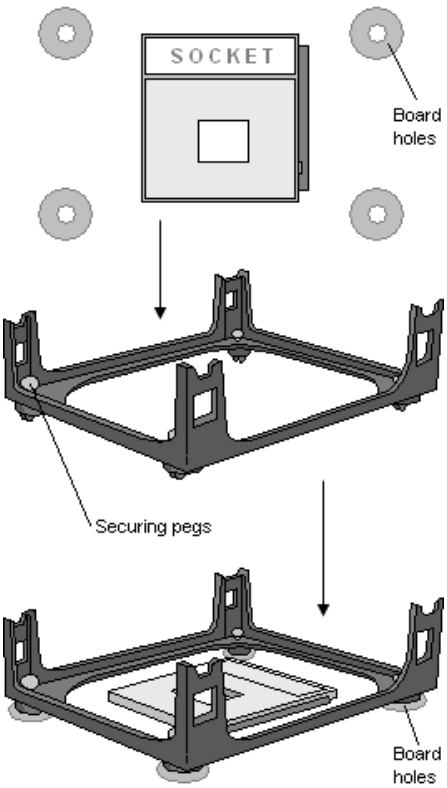
After you are done installing the processor, you should proceed to installing the heatsink. Heatsink will ensure that the processor not overheat and continue to operate at maximum performance for as long as you own them. An overheated processor is dangerous to the health of the motherboard.

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

Heatsink Installation

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

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



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

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

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

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

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

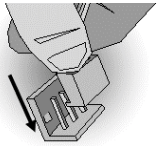
In most cases, either side of the heatsink can be clipped down last, but usually, the side of the socket where it is raised, secures last.

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

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

Finishing Installing the Heatsink

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

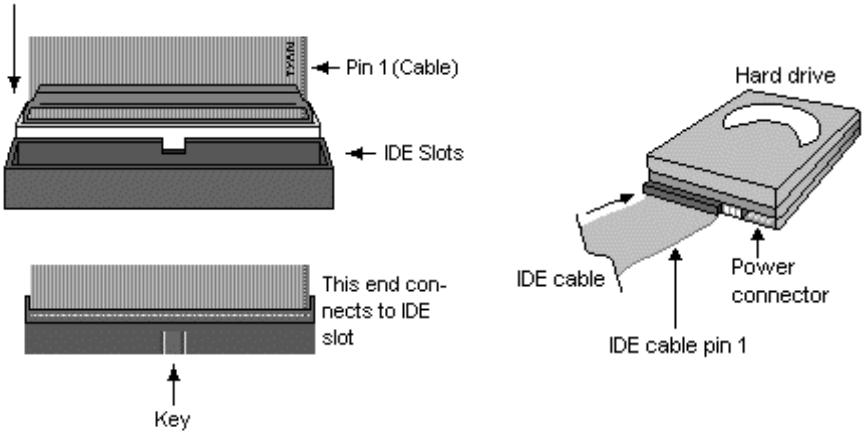


After you're finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.10 – Attaching Drive Cables

Attaching IDE drive cabling is simple. These cables are "keyed" to only allow them to be connected in the correct manner. TYAN motherboards have two on-board IDE channels, each supporting two drives. **The black connector designates the Primary channel, while the white connector designates the Secondary channel.**

Attaching IDE cables to the IDE connectors is illustrated below:

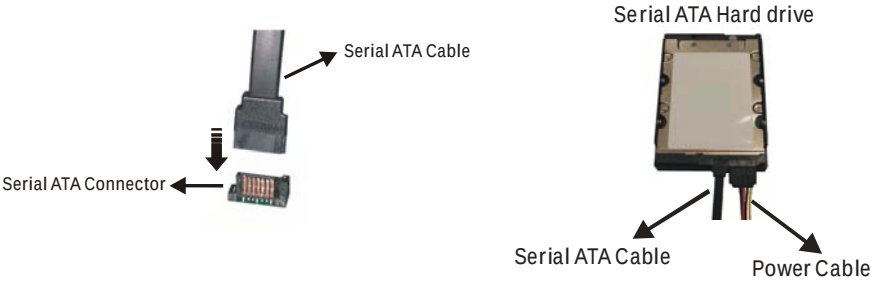


Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard.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

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

Serial ATA

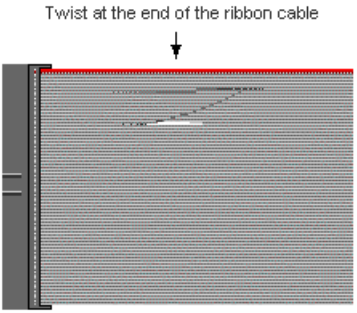
Attaching Serial ATA cables to the Serial ATA connectors is illustrated below:



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

Floppy Drives

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



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

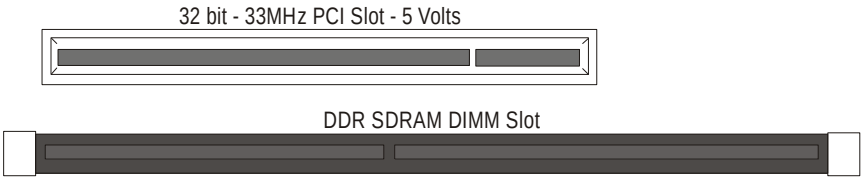
Refer to your floppy drive's installation instructions (if available), or contact your dealer if you are unsure about how to attach the floppy drive(s). Remember, you can only have 2 floppy drives connected at any given time.

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

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

2.11 – Installing Add-In Cards

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



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

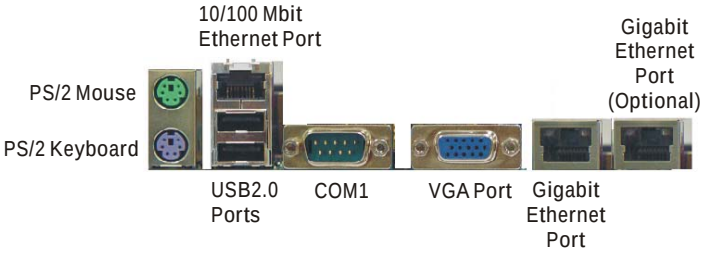
TIP: It's a good practice to install add-in cards in a staggered manner, rather than directly adjacent to each other. This allows air to more easily circulate within the chassis, providing improved cooling for all installed devices.

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

2.12 – Connecting External Devices

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

Tomcat i875PR S5102-P



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

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

Onboard LAN LED Color Definition

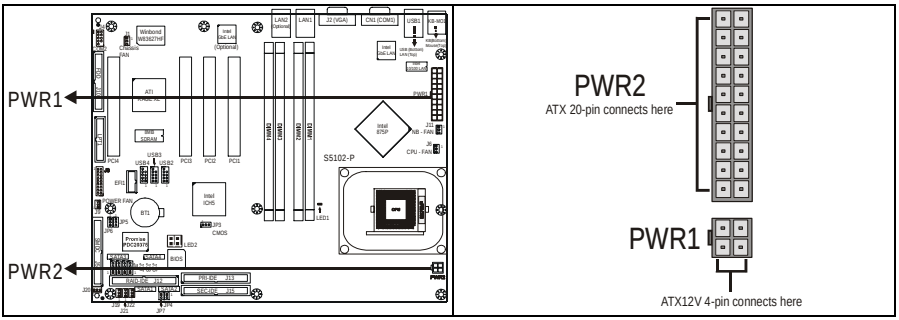
LAN (Intel 82562) Link/Activity LED Scheme		
	**Left LED**	**Right LED**
Link 10 Mbps	Green	Off
Active 10 Mbps	Blink Green	Off
Link 100Mbps	Off	Yellow
Active 100Mbps	Off	Blink Yellow
Standby	Green	Off

LAN1 (Intel 82547) Link/Activity LED Scheme		
Left Right 	**Left LED**	**Right LED**
Link 10 Mbps	Blink Green	Off
Active 10 Mbps	Blink Green	Off
Link 100Mbps	Off	Blink Yellow
Active 100Mbps	Off	Blink Yellow
Link 1000Mbps	Blink Green	Blink Yellow
Active 1000Mbps	Blink Green	Blink Yellow
Standby	Green	Off

LAN2 (Intel 82541) Link/Activity LED Scheme		
Left Right 	**Left LED**	**Right LED**
Link 10 Mbps	Blink Green	Off
Active 10 Mbps	Blink Green	Off
Link 100Mbps	Off	Blink Yellow
Active 100Mbps	Off	Blink Yellow
Link 1000Mbps	Blink Green	Blink Yellow
Active 1000Mbps	Blink Green	Blink Yellow
Standby	Green	Off

2.13 – Installing the Power Supply

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



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

2.14 – Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line.**

Chapter 3: BIOS Setup

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3.1 – Main BIOS Setup

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

Phoenix – AwardBIOS CMOS Setup Utility

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

Standard CMOS Features
Use this menu for basic system configuration.

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

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

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

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

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

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

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

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

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

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

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

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

3.2 – Standard CMOS Features

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

Phoenix – AwardBIOS CMOS Setup Utility

Standard CMOS Features

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

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

Date / Time Setup:
System Date: Adjusts the system date.

MM	Months
DD	Days
YYYY	Years

System Time: Adjusts the system clock.

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

IDE Master / Slave Setup:
Computer detects IDE drive type from drive C to drive F.
None / Auto / Manual

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

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

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

3.3 – Advanced BIOS Features

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

Phoenix – AwardBIOS CMOS Setup Utility
Advanced BIOS Features

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

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

Virus Warning:
This settings toggles virus protection on or off for boot sector writes.
Disabled / Auto

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

USB Flash Disk Type:
Auto - By USB Device
Floppy - Emulation to Floppy Mode
HDD - Emulation to HDD Mode
Auto / Floppy / HDD

Boot Sequence:
Select 〔Press Enter〕to set Boot Sequence

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

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

Boot Up NumLock Status:
Sets the Num Lock on or off.
On / Off

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

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

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

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

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

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

Console Redirection:
Select 〔Press Enter〕to set Console Redirection

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

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

CPU Feature:

Phoenix – AwardBIOS CMOS Setup Utility
CPU Feature

Delay Prior to Thermal	[16 Min]	Item Help
Thermal Management	Thermal Monitor 1	
CPU L1 & L2 Cache	[Enabled]	Menu Level ►►
Hyper-Threading Technology	[Enabled]	
X APIC Mode	[Enabled]	
MPS Version Control For OS	[1.4]	

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

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

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

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

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

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

Boot Sequence:

Phoenix – AwardBIOS CMOS Setup Utility

Boot Sequence

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

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

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

First / Second / Third / Other Boot Device:
This BIOS attempts to load the operating system from the devices in the sequence selected in these item.

Floppy / LS120 / HDD-0 / SCSI / CDROM / HDD-1, HDD-2 / HDD-3 / ZIP100 / USB-FDD / USB-ZIP / USB-HDD / LAN / Disabled

Console Redirection:

Phoenix – AwardBIOS CMOS Setup Utility

Console Redirection

Console Redirection	[SMDC]	Item Help
Baud Rate	[19200]	
Agent after boot	[Enabled]	Menu Level ►►

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

Console Redirection:
This option allows you to enabled or disabled the Console Redirection.

Enabled / Disabled / SMDC

Baud Rate:
This option allows you to select the Baud Rate.

9600 / 19200 / 38400 / 57600 / 115200

Agent after boot:
Keep Agent running after OS boot.

Enabled / Disabled

3.4 – Advanced Chipsets Features

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

Phoenix – AwardBIOS CMOS Setup Utility

Advanced Chipset Features

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

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

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

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

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

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

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

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

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

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

3.5 – Integrated Peripherals

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

Phoenix – AwardBIOS CMOS Setup Utility

Integrated Peripherals

► OnChip IDE Device	[Press Enter]	Item Help
► Onboard Device	[Press Enter]	
► SuperIO Device	[Press Enter]	Menu Level ►

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

OnChip IDE Device:

Phoenix – AwardBIOS CMOS Setup Utility

OnChip IDE Device

IDE HDD Block Mode	[Enabled]	Item Help
On-Chip Primary PCI IDE	[Enabled]	
IDE Primary Master PIO	[Auto]	
IDE Primary Slave PIO	[Auto]	Menu Level ►►
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	
On-Chip Secondary PCI IDE	[Enabled]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Secondary Master UDMA	[Auto]	
IDE Secondary Slave UDMA	[Auto]	
On-Chip Serial ATA Setting		
On-Chip Serial ATA	[Disabled]	
Serial ATA Port Mode 1	[SATA 0 Master]	
Serial ATA Port Mode 2	SATA 1 Master	

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

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

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

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

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

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

Serial ATA Port Mode 1/2:
This item allows you to set SATA mode.
Primary Master / Primary Slave / Secondary Master / Secondary Slave

Onboard Device:

Phoenix – AwardBIOS CMOS Setup Utility
Onboard Device

		Item Help
USB Controller	[Enabled]	
USB 2.0 Controller	[Enabled]	Menu Level ►►
USB Keyboard Support	[Disabled]	
USB Mouse Support	[Disabled]	
Onborad i541 LAN Ctrl	[Enabled]	
Onborad Promise Raid Ctrl	[Enabled]	
Onboard i547 LAN Ctrl	[Enabled]	
Onborad LAN Boot ROM	[Disabled]	

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

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

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

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

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

Onborad i541 LAN Ctrl
This item allows you to "Enable" or "Disable" onboard Intel 82541 LAN Ctrl function.
Enabled / Disabled

Onboard Promise RAID Ctrl:
This item allows you to "Enable" or "Disable" onboard Promise Raid Ctrl function.
Enabled / Disabled

Onboard i547 LAN Ctrl
This item allows you to "Enable" or "Disable" onboard Intel 82547 LAN Ctrl function.
Enabled / Disabled

Onborad LAN Boot ROM
This item allows you to "Enable" or "Disable" onboard LAN Boot ROM function.
Disabled / i562 / i547 / i541

Super IO Controller:

Phoenix – AwardBIOS CMOS Setup Utility
Super IO Device

Onboard FDC Controller	[Enabled]	Item Help
Onboard Serial Port 1	[3F8 / IRQ4]	
Onboard Serial Port 2	[2F8 / IRQ3]	
UART Mode Select	[Normal]	Menu Level ►►
RxD, TxD Active	[Hi, Lo]	
IR Transmission Delay	[Enabled]	
UR2 Duplex Mode	[Half]	
Use IR Pins	[IR-Rx2 Tx2]	
Onboard Parallel Port	[378 / IRQ7]	
Parallel Port Mode	[SPP]	
EPP Mode Select	[EPP1.7]	
ECP Mode Use DMA	[3]	

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

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

Onboard Serial Port 1 / 2:
Select an address and corresponding interrupt for the first and second serial ports.
3F8/IRQ4 / 2E8/IRQ3 / 3E8/IRQ4 / 2F8/IRQ3 / Disabled / Auto

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

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

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

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

Use IR Pins:
This item allows you to select IR "IR-Rx2 Tx2" or "RxD2" or "TxD2" function.
IR-Rx2 Tx2 / RxD2 / TxD2

Onboard Parallel Port:
This field allows the user to configure the LPT port.
378/IRQ7 / 278/IRQ5 / 3BC/IRQ7 / Disabled

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

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

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

3.6 – Power Management Setup

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

Phoenix – AwardBIOS CMOS Setup Utility
Power Management Setup

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

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

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

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

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

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

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

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

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

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

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

Power On Setup:

Phoenix – AwardBIOS CMOS Setup Utility
Power On Setup

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

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

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

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

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

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

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

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

POWER ON Function:
Defines the action of the power button when pressed.
Password / Hot Key / Mouse left / Mouse Right / Any Key / Button only/ Keyboard 98

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

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

Reload Global Timer Events:

Phoenix – AwardBIOS CMOS Setup Utility
Reload Global Timer Events

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

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

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

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

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

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

3.7 – PnP/PCI Configurations

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

Phoenix – AwardBIOS CMOS Setup Utility

PnP / PCI Configurations

Reset Configuration Data	[Disabled]	Item Help
Resources Controlled By	[Auto (ESCD)]	
X IRQ Resources	Press Enter	Menu Level ►
PCI / VGA Palette Snoop	[Disabled]	Default is Disabled. Select Enabled to Reset Extended System Configuration Data ESCD> when you exit Setup if you have Installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
PCI Device list	[Enabled]	
PCI1 INT Assignment	[Auto]	
PCI2 INT Assignment	[Auto]	
PCI3 INT Assignment	[Auto]	
PCI4 INT Assignment	[Auto]	
CNR LAN INT	[Auto]	
Promise SATA INT Assignment	[Auto]	
Intel i541 INT Assignment	[Auto]	

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

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

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

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

PCI 1 INT Assignment:
Default item to distribute IRQ to set Device.
Auto / 3 / 4 / 5 / 7 / 8 /11 / 12 /14 /15

CNR LAN INT Assignment:
Leave as default.
Auto / 3 / 4 / 5 / 7 / 8 /11 / 12 /14 /15

PromiseSATA INT Assignment:
Leave as default.
Auto / 3 / 4 / 5 / 7 / 8 /11 / 12 /14 /15

Intel i541 INT Assignment:
Leave as default.
Auto / 3 / 4 / 5 / 7 / 8 /11 / 12 /14 /15

3.8 – PC Health Status

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

Phoenix – AwardBIOS CMOS Setup Utility

PC Health Status

Auto FAN1~4 Power Control	[Disable]	Item Help
Current CPU Temperature	xx℃/xxx℉	
Current System Temperature	xx℃/xxx℉	Menu Level ►
FAN1 Speed	xxxxRPM	
FAN2 Speed	xxxxRPM	
FAN3 Speed	xxxxRPM	
FAN4 Speed	xxxxRPM	
Current Power Fan Speed	xxxxRPM	
Current Chassis Fan Speed	xxxxRPM	
Current CPU Fan Speed	xxxxRPM	
Vagp (V)	x.xxV	
Vcore(V)	x.xxV	
3.3 V	x.xxV	
+ 5 V	x.xxV	
+12 V	xx.xxV	
-12 V	-xx.xxV	
VBAT (V)	x.xxV	
5VSB (V)	x.xxV	

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

Auto FAN1~4 Power Control
Leave as default.
Disabled / Enabled

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

3.9 – Frequency/Voltage Control

Options related to control CPU clock and frequency ratio.

Phoenix – AwardBIOS CMOS Setup Utility

Frequency / Voltage Control

CPU Clock Ratio	[12 X]	Item Help
Auto Detect PCI Clk	[Enabled]	
Spread Spectrum	[Disabled]	Menu Level ►
CPU Clock	[133MHz]	
Memory Frequency for	[Auto]	
DDR Frequency at Next Boot =	333MHz	

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

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

16X…22X / Auto / Default

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

Enabled / Disabled

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

Enabled / Disabled

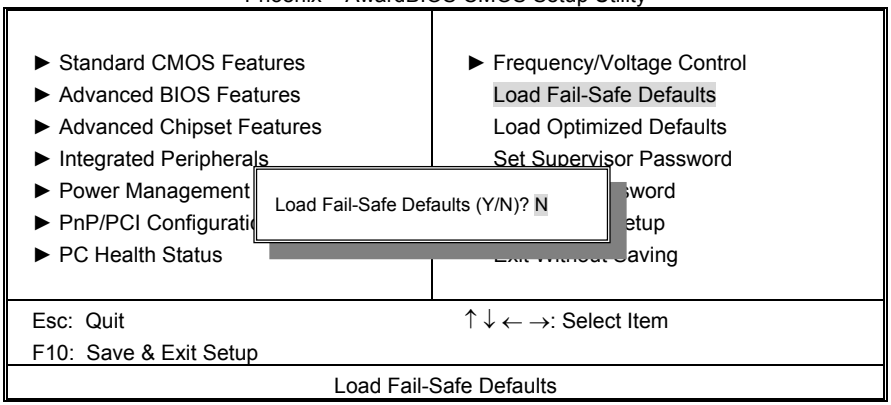
CPU Clock:
Enter a decimal number to set the front side bus speed of the motherboard. For all purposes and to maintain stability, please keep this setting at its default setting.

100MHz,133MHz or 166MHz by CPU setting.

Memory Frequency for:
This option allows you to select DRAM Speed

Auto by SPD / DDR333 / DDR400 / Auto

3.10 – Load Fail-Safe Defaults

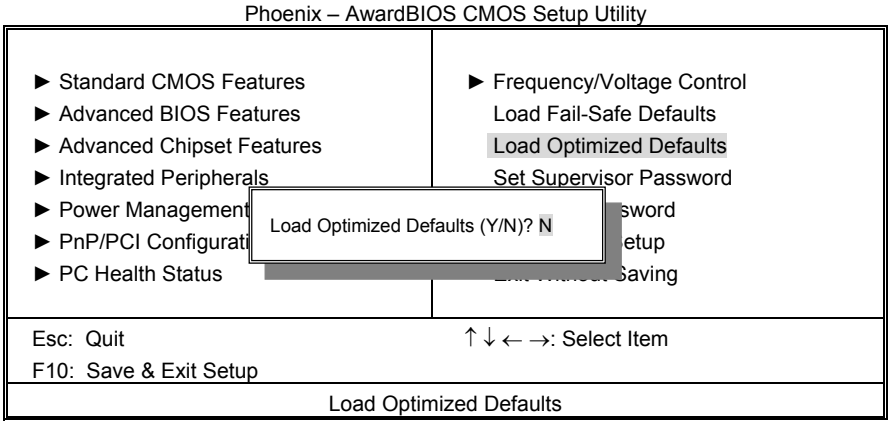


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

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

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

3.11 – Load Optimized Defaults

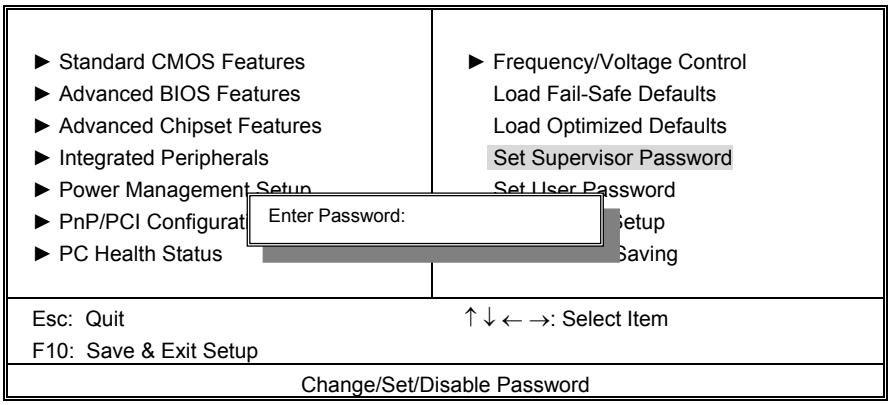


When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

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

3.12 – Supervisor/User Password Setting

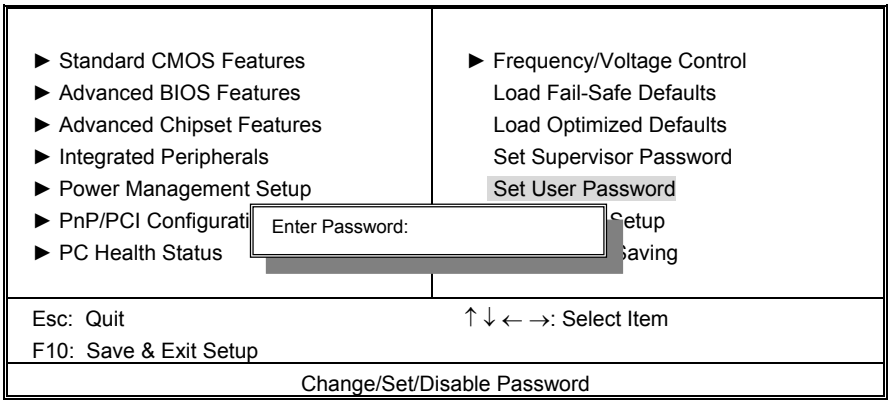


You can set either a supervisor or a user password, or both of them. The differences are:

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

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

ENTER PASSWORD:



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

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

PASSWORD DISABLED.

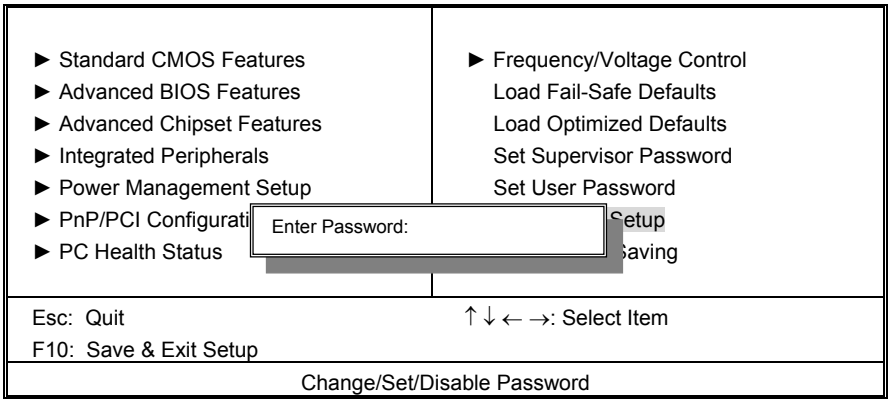
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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

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

3.13 – Exit Selecting

Phoenix – AwardBIOS CMOS Setup Utility



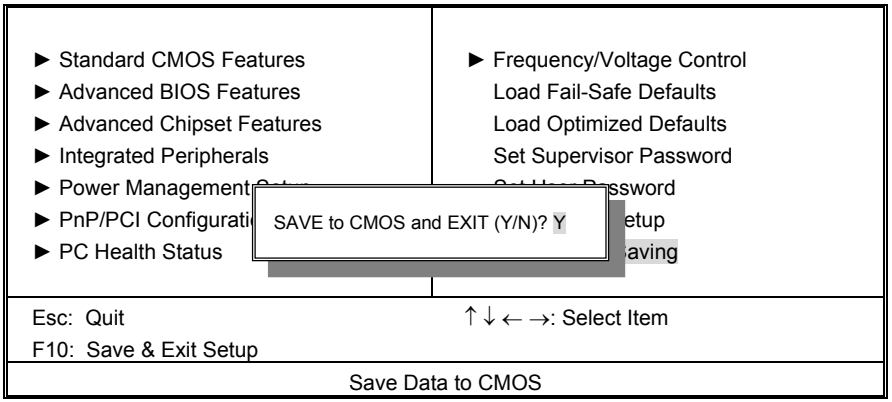
Save & Exit Setup
Pressing <Enter> on this item asks for confirmation:

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

Phoenix – AwardBIOS CMOS Setup Utility



Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

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

Chapter 4: SATA/RAID Setup *(for SATA RAID mode*l)

The motherboard includes the Promise® PDC20378 SATA RAID controller with two Serial ATA interfaces and one Parallel ATA133 interface to support RAID 0, 1 or 0+1 configuration

Note: The PDC20378 only supports HDD devices. 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 PDC20378 controller supports up to two Serial ATA hard drives and two Parallel ATA hard drives

1. Configure the jumpers of the *Parallel* ATA hard drive you're preparing to connect to the SATA RAID controller using the proper Master, Slave, or Cable-Select settings. For more information, refer to the manual that came with your hard drive.
2. Install all of the hard drives into the hard drive bays of your system, including the power cables.
3. Attach the *Parallel* ATA cable to the hard drive(s) and to the Parallel ATA Port connector on the SATA RAID controller. Attach *Serial* ATA data cable to each hard drive. Then attach the other ends of the cables to one of the Serial ATA ports on the SATA RAID controller. All of the connectors are keyed so they will only attach one way.

Note

PDC20378 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 – Creating Your Disk Array

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

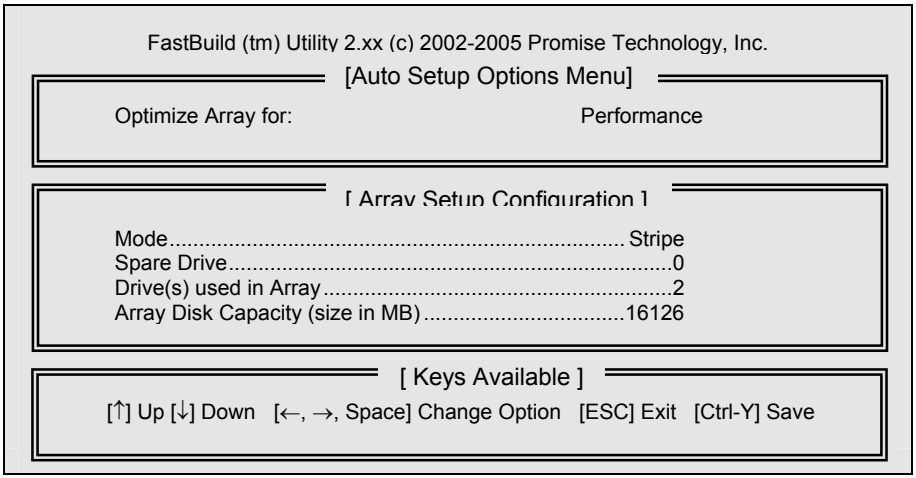
1. Boot your system. If you set the embedded Promise controller as RAID configuration and this is the first time you boot with the PDC20378 and drives installed, the Promise onboard BIOS will display the following screen.

```
FastTrak 378 (tm) BIOS Version 1.00.0.XX
(c) 2002-2005 Promise Technology, Inc. All Rights Reserved.

   No Array is defined . . .

Press <Ctrl-F> to enter FastBuild (tm) Utility or
Press <ESC> to continue booting …
```

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

```
FastBuild (tm) Utility 2.xx (c) 2002-2005 Promise Technology, Inc.

                    [ Main Menu ]

          Auto Setup ..... [ 1 ]
          View Drive Assignments ..... [ 2 ]
          Define Array ..... [ 3 ]
          Delete Array ..... [ 4 ]
          Rebuild Array ..... [ 5 ]

                    [ Keys Available ]

          Press 1...5 to Select Option                [ESC] Exit
```

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



Creating an Array for Performance

NOTE: *The PDC20378 enables you to create striped arrays with 1, 2, 3 or 4 drives.*

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

1. Using the Spacebar, choose “Performance” under the Optimize Array for section.
2. Press <Ctrl-Y> keys to Save and create the array.
3. Reboot your system.
4. Once the array has been created, you will need to FDISK and format the array as if it were a new single hard drive.

Creating a Security Array with New Drives

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

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

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

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

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

6. Proceed with normal FDISK and format procedures as if you had just installed a new hard drive.
7. Once the arrayed drives have been formatted, proceed to Step 4. Installing Software Driver to install your operating system and/or PDC20378 driver.

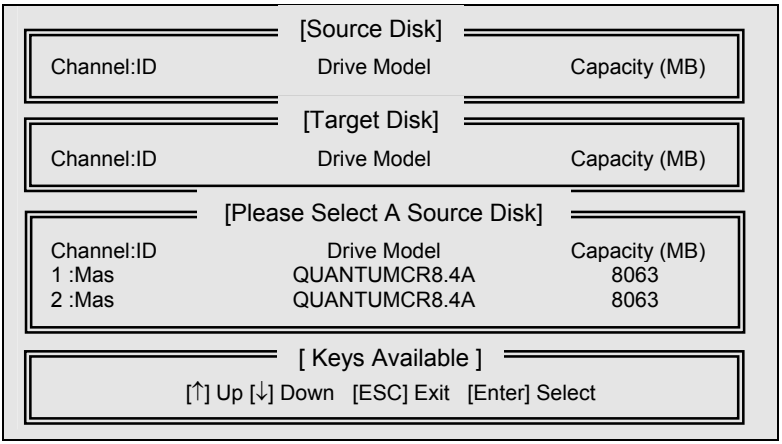
Creating a Security Array with an Existing Data Drive

Follow these steps:

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

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

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



4. Use the arrow keys to choose which drive contains the existing data to be copied.
5. Press Enter key to save selection and start duplication. The following progress screen will appear.

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

6. Select “Y” to continue. If you choose “N”, you will be returned to step 1.
7. Once complete, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system

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

8. Proceed to Step 4. Installing Software Driver to install your operating system and/or PDC20378 driver.

4.3 – Installing Software Drivers

New Windows 2000/XP Installation

The following details the installation of the PDC20378 drivers while installing Windows 2000/XP.

1. Start the installation:
   - Floppy Install: Boot the computer with the Windows 2000/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 2000/XP Setup" window is generated, press "S" to Specify an Additional Device(s)
3. Insert the Promise RAID driver diskette into drive A: and press "Enter".
4. Choose "Win2000/XP Promise FastTrak 378 (or SATA150 TX Series) Controller" from the list that appears on screen, then press "Enter"
5. Press Enter to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, Press Enter to continue with installation.
6. From the Windows 2000/XP Setup screen, press the Enter key. Setup will now load all device files and then continue the Windows 2000/XP installation.

Existing Windows 2000/XP Installation

After configuring the PDC20378 controller and rebooting your system, Windows 2000 setup will show a "Found New Hardware" dialog box. Under Windows 2000/XP, the "Mass Storage Controller" will be displayed.

1. Insert the PDC20378 RAID driver diskette into drive A:
2. Choose *Install the software automatically* and press "Enter"
3. Choose "Win2000/XP Promise FastTrak 378 (or SATA150 TX Series) Controller" from the list that appears on screen, then press "Enter".
4. When the "System Settings Change" dialog box appears, remove the floppy diskette and click on "Yes" to restart the system. Windows 2000/XP will then restart for the driver installation to take effect.

Confirming Windows 2000/XP Installation

1. From Windows 2000/XP, open the Control Panel from "My Computer" followed by the System icon.
2. Choose the "Hardware" tab, then click the "Device Manager" tab.
3. Click the "+" in front of "SCSI & RAID Controllers" hardware type. The "Win2000/XP Promise FastTrak 378 (or SATA150 TX Series) Controller" should appear.

New Windows 98/Me Installation

1. After configuring the PDC20378 controller and the attached hard drive(s), partition and format your hard drive(s), if necessary.
2. Install Windows 98/Me normally.
3. After installation, go the “Start” menu and choose “Settings.”
4. From the “Settings” menu, choose “Control Panel.”
5. In the “Control Panel” window, double-click on the “System” icon.
6. In the “System” window, choose the “Device Manager” tab.
7. In the hierarchical display under “Other Devices” is a listing for “PCI RAID Controller.” Choose it and then press the “Properties” button.
8. Choose the “Driver” tab in the “Properties” window, choose “Update Driver,” and then press “Next.”
9. Choose “Search for a better driver than the one your device is using now (recommended),” then press “Next.”
10. Choose “Specify Location,” and then type “A:\WIN98” in the text box.
11. Insert the “PDC20378 Driver” diskette into the A: drive.
12. Press the “Next” button. A message informing you that Windows 98 has found “Win98-ME Promise FastTrak 378 (or SATA 150 TX Series) Controller” should appear.
13. Press “Next,” then “Finish,” then “Yes” when asked if you want to restart your computer. Be sure to remove the diskette from drive A:

Existing Windows 98/Me Installation

1. After configuring the PDC20378 controller and the attached hard drives, power up the system and boot Windows.
2. The “Add New Hardware Wizard” will appear, informing you that it has found a “PCI RAID Controller.”
3. Check the “Search for the best driver for your device” box and click the Next button.
4. Check the “Specify a Location” box and click Next button.
5. Type “A:\WIN98” in the text box that appears.
6. Insert the “PDC20378 Driver” diskette in drive A:.
7. Click on “Next.” The Add New Hardware wizard will say it has found “Win98-ME Promise FastTrak 378 (or SATA150 TX Series) controller”.
8. Click on “Next,” and then on “Finish.”
9. Choose “Yes” when asked if you want to restart your computer. Remove the diskette from drive A:.

New Windows NT 4.0 Installation

1. Start the system installation by booting from the Windows NT disk:
   a) Floppy install: boot the system with the Windows NT installation diskettes.
   b) Floppyless install: boot from floppy and type "WINNT /B". After files have been copied, the system will reboot. On the reboot, press the "F6" key when the message "Setup is inspecting your computer's hardware configuration…" appears.
   c) CD-ROM disk install: boot from the CD-ROM disk and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration…" appears.
2. When the "Windows NT Setup" window is generated, press "S" to Specify an Additional Device(s).
3. Press "O" to select "Other" and press the "Enter" key.
4. Insert the Promise PDC20378 RAID driver diskette into drive A: and press "Enter"
5. Choose "Win NT Promise FastTrak 378 (or SATA150 TX Series) Controller" from the list that appears on screen, then press "Enter"
6. The Windows NT Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win NT Promise FastTrak 378 (or SATA150 TX Series) controller".
   *a) **NOTE**: If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 7.*
7. From the Windows NT Setup screen, press the Enter key. Setup will now load all device files and then continue the Windows NT installation.
8. After a successful installation, the "SCSI Adapter Setup" box will show that the "Win NT Promise FastTrak 378 (or SATA150 TX Series) Controller" driver has been installed.

Existing Windows NT 4.0 Installation

1. Choose "Settings" from the "Start" menu.
2. Choose "Control Panel" from the "Settings" menu.
3. Double-click on the "SCSI Adapters" icon, which generates the "SCSI Adapters" dialog box.
4. Choose "Drivers," and then press "Add."
5. In the "Install Drivers" dialog box, press "Have Disk…"
6. When the "Install From Disk" appears, insert the "PDC20378 Driver" diskette in drive A:.
7. Type "A:\NT4" in the text box window, then choose "OK."
8. When the "Install Driver" dialog box appears, select "Win NT Promise FastTrak 378 (or SATA150 TX Series) Controller" and then press "OK."
9. When the "Select SCSI Adapter Option" dialog box appears, press "Install."
10. After a successful installation, the "SCSI Adapter Setup" box will show that the "Win NT Promise FastTrak 378 (or SATA150 TX Series) Controller" has been installed.
11. Power off your system.
12. If you plan to move the boot drive to connect the PDC20378, now attach the hard drives otherwise reboot.

4.4 – Using FastBuild™ Configuration Utility

The FastBuild™ Configuration Utility offers several menu choices to create and manage the drive array on the Promise PDC20378. 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.

Viewing PDC20378 BIOS Screen

When you boot your system with the PDC20378 and drives installed, the Promise onboard BIOS will detect the drives attached and show the following screen.

```
FastTrak 378 (tm) BIOS Version 2.00.0.XX
(c) 2002-2005 Promise Technology, Inc. All Rights Reserved.

   Scanning IDE drives . . . . .
```

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

```
FastTrak 378 (tm) BIOS Version 2.00.0.xx
(c) 2002-2005 Promise Technology, Inc. All Rights Reserved.

  ID     MODE          SIZE        TRACK-MAPPING       STATUS

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

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

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

Functional - The array is operational.

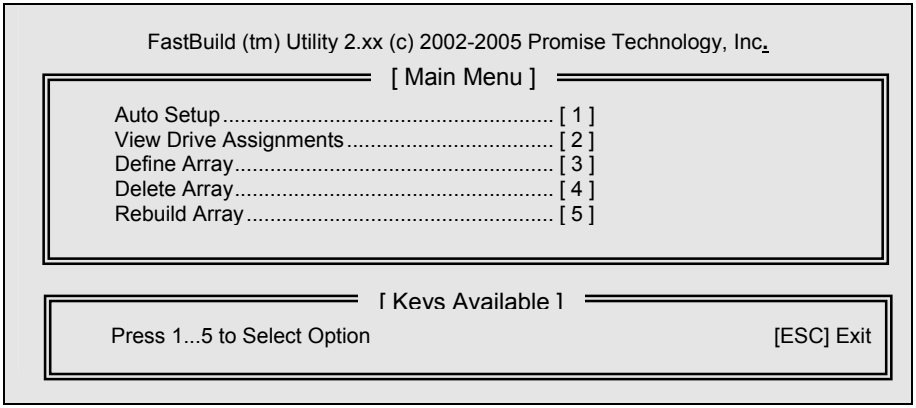
Critical - A mirrored array contains a drive that has failed or disconnected. The remaining drive member in the array is functional. However, the array has temporarily lost its ability to provide fault tolerance. The user should identify the failed drive through the FastBuild™ Setup utility, and then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

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

Navigating the FastBuild™ Setup Menu

When using the menus, these are some of the basic navigation tips: Arrow keys highlights through choices; [Space] bar key allows to cycle through options; [Enter] key selects an option; [ESC] key is used to abort or exit the current menu.

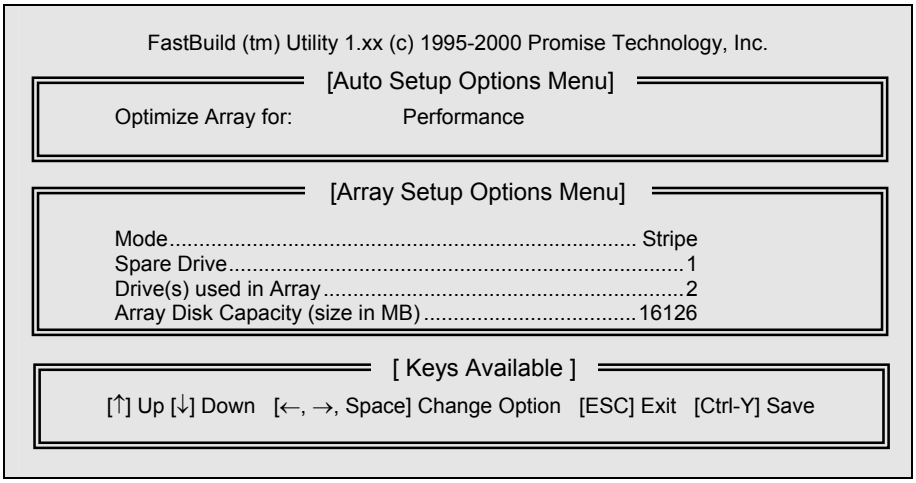
This is the first option screen when entering the FastBuild™ Setup.



***NOTE**: After configuring an array using FastBuild™, you should FDISK and format the arrayed drive(s) if you are using new, blank drives. Depending on the type of array you are using.*

Creating Arrays Automatically

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



Optimize Array For

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

Performance (RAID 0 Striping)

Supports the maximum performance. The storage capacity equals the number of drives times the capacity of the smallest drive in the disk array.

NOTE: *PDC20378 permits striped arrays using 1, 2 drive attached in Auto Setup mode.*

Security (RAID 1 Mirroring)

Creates a mirrored (or fault tolerant) array for data security.

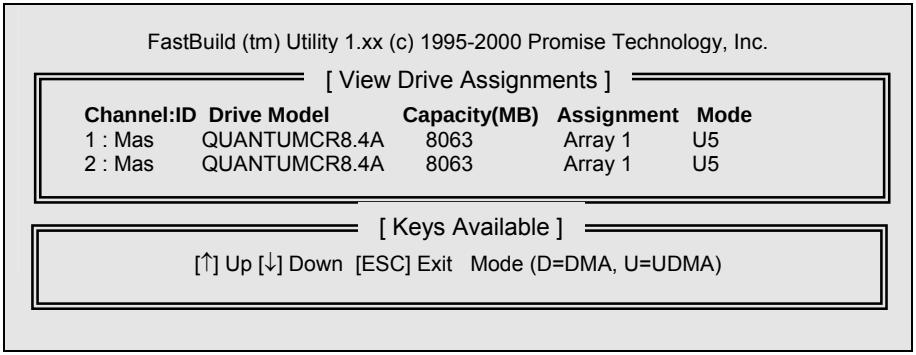
NOTE: *Under the Security setting, PDC20378 permits two drives to be used for a single Mirrored array only.*

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

Viewing Drive Assignments

The View Drive Assignments <2> option in the Main Menu displays whether drives are assigned to a disk arrays or are unassigned.

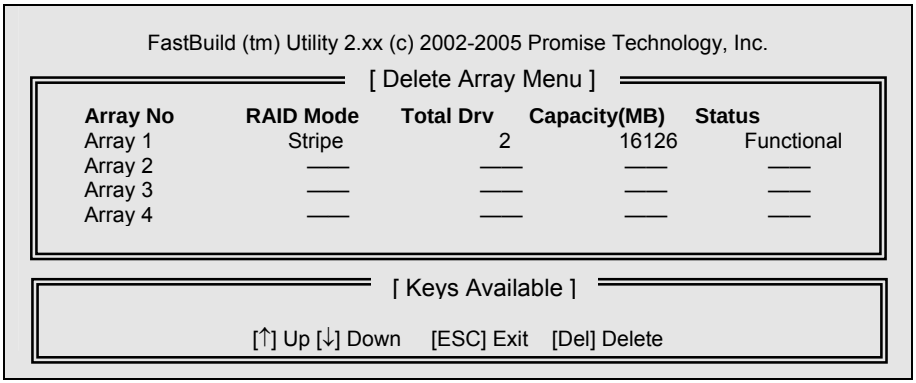
The menu also displays the data transfer mode that relates to speed used by each drive (U6 refers to 133MB/sec transfers, U5 refers to 100MB/sec transfers, U4 refers to 66MB/sec transfers, etc...)



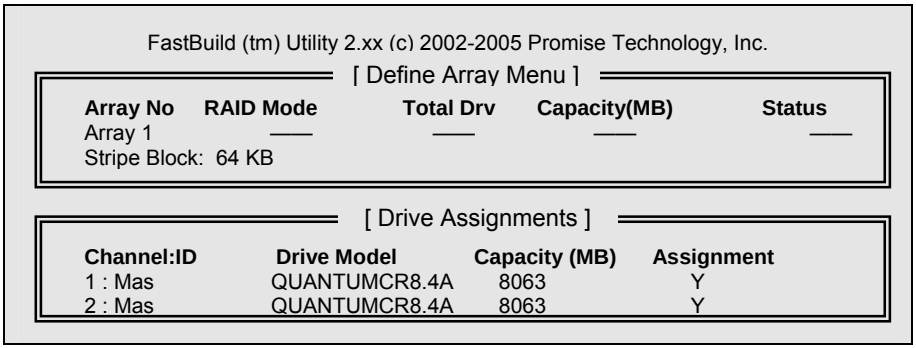
Deleting An Array

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. If you delete an array by accident (and before it has been used again), the array can normally be recovered by defining the array identically as the deleted array.

***WARNING**: Deleting an existing disk array could result in its data loss. Make sure to record all array information including the array type, the disk members, and stripe block size in case you wish to undo a deletion.*



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



3. Confirm yes to the following warning message with the <Ctrl-Y> key to continue array deletion:

   Are you sure you want to delete this array?
   Press Ctrl-Y to Delete, others to Abort

4. After deleting the array, you should create a new array using Auto Setup or the Define Array menu from the FastBuild Main Menu.

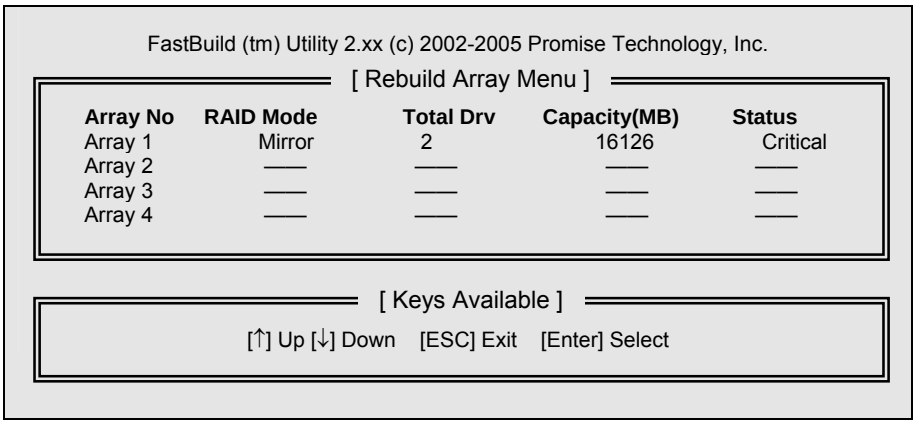
Rebuilding A Mirrored Array

The Rebuild Array <5> Menu option is necessary to recover from an error in a mirrored disk array. You will receive an error message when booting your system.

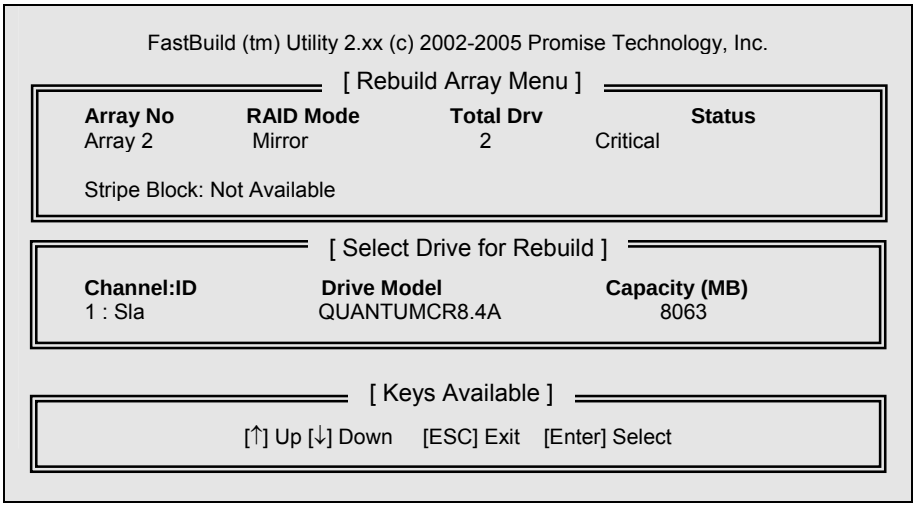
NOTE: *Drives MUST be replaced if they contain any physical errors.*

Follow these steps BEFORE using the Rebuild Array menu option:

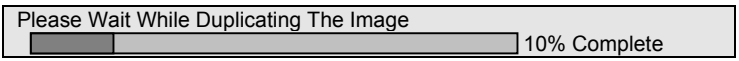
1. On bootup, the Startup BIOS will display an error message identifying which drive has failed.
2. Press <Ctrl-F> keys to enter FastBuild Main Menu.
3. Select submenu Define Array <3>.
4. Select the failed array and identify the Channel and ID of the failed drive.
5. Power off and physically remove the failed drive.
6. Replace the drive with an identical model.
7. Reboot the system and enter the FastBuild Main Menu.
8. Select the <5> Rebuild Array option. The following screen will appear.



9. Highlight the array whose Status is “Critical”.
10. Press [Enter]. The following screen will then appear (see next page).



11. Under [Select Drive for Rebuild], highlight the replacement drive.
12. Press [Enter] and confirm that the data will be copied on to the selected drive. All data on the replacement drive will be written over with mirrored information from the array drive. A progress bar will appear as below.



13. Once the rebuild process is complete, the user will be asked to reboot the system.

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.

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

Appendix III: SMDC Information

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

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

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

Tyan SMDC is not a peripheral card. Unlike regular peripheral card such as AGP card, Network card or SCSI card, SMDC does not require any hardware specific driver. As long as a standby power comes into the system, SMDC will begin looking after the system.

Tyan SMDC provides diversified methods to communicate with the hardware. IT manager has the flexibility to choose among *Keyboard Controller Style* (KCS), *Block Transfer* (BT) style, Intelligent Chassis Management Bus (ICMB), Intelligent Platform Management Bus (IPMB), Emergency Management Port (EMP) and standard IPMI-Over-LAN communication as defined in latest IPMI 1.5 specification.

Tyan SMDC is compatible with all IPMI-compliance software as well as Tyan System Operator™ (TSO) software package.

By adding SMDC, Tyan's server board becomes a highly manageable and IPMI compatible system with all the advanced features suggesting in IPMI Spec.

More detailed information on Tyan's SMDC card can be found on our website:
http://www.tyan.com/products/html/m3289.html

Technical Support

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

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

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

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

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: **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.

Document #: D1662 - 100