TYAN

Tomcat i7230W / / / S5162

Version 1.0

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Check the box contents!

	1x S5162 motherboard
	1x 34-Pin floppy drive cable
	1 x Ultra-DMA-133/100/66/33 IDE cable
	2 x Serial ATA power cable
	4 x Serial ATA cable
	1 x USB2.0 cable
	1 x S5162 user's manual
	1 x S5162Quick Reference guide
	1 x TYAN driver CD
	1 x I/O shield
	1 x Serial & Parallel Port cable set

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

NOTE: The box contents do not include any driver diskette. Please use the included driver CD to make a driver diskette. Refer to Appendix II for the information on how to make a driver diskette.

Chapter 1: Introduction

1.1 - Congratulations

You have purchased one of the most powerful server solutions. The Tomcat i7230W (S5162) is a flexible Intel® platform for multiple applications, based on Intel® E7230 (Mukilteo) MCH and ICH7-R chipsets.

Designed to support the family of Intel® Socket 775 processors and 8GB DDR2 667/533/400 memory. The S5162 has integrated Dual Gigabit Ethernet LAN, built-in 16MB XGI XG20™ video and four serial ATA ports. This motherboard represents the best choice for a server platform product.

Remember to visit TYAN's Website at http://www.TYAN.com. There you can find information on all of TYAN's products with FAQs, online manuals and BIOS upgrades.

1.2 - Hardware Specifications

Processor
- Single LGA775 socket
- Support Intel® Pentium® D (dual-core) /Prescott/Cedar Mill processor
- 1066/800/533 MHz FSB

Chipset
- Intel® E7230 (Mukilteo) MCH
- ICH7-R South Bridge
- 6700PXH 64-bit PCI Hub
- SMSC SCH5017 Super I/O chip

Memory
- Four 240-pin DDR2 DIMM sockets
- Supports ECC DIMMs
- Maximum of 8GB unbuffered (Non-Reg) DDR2-667/533/400

Expansion Slots
One (1) PCI-E X16 slot routed to PCI-E X8 bus from MCH
Two (2) PCI 32-bit, 33MHZ slots from ICH7-R
Three (3) PCI-X slots from PXH
One (1) PCI-X 64-bit, 133MHZ slots

Integrated Video Controller
XGI XG20
PCI interface
16MB frame buffer memory

Integrated ATA-100 (ICH7-R)
- One ATA-100 channel for up to two ATA-100 devices

Integrated SATA Controllers (ICH7-R)
- Supports four SATA-II ports running at 3.0Gb/s
- RAID 0/1/5/10 capable (Windows Driver CD support only)

Integrated LAN Controllers
One (1) Intel® i82573E GbE LAN controllers
-operating at PCIe x1 interface
-With Intel AMT support (82573E only)
One (1) Intel® i82573V GbE LAN controller
    -operating at PCIe x1 interface

from PCI-X bus B
Two (2) PCI-X 64-bit, 133/100MHZ slots from PCI-X Bus A

System Management
SMSC SCH5017 and EMC6D103 with hardware monitoring
One (1) 3+1-pin CPU fan headers with tachometer monitoring and smart FAN control (by SCH5017)
Four (4) 3+1-pin system fan headers with tachometer monitoring, three (3) of them support smart FAN control
Temperature and voltage monitoring
Watchdog timer support
Port 80 code display LED

Integrated I/O
One floppy connector
One IDE connector
Four SATA ports
One ECP/EPP/SPP parallel port (via cable)
Two USB 2.0 ports (via cable)
One COM port (via cable)
Tyan 2x9 front-panel pin header
Tyan 2x6 front-panel pin header for LAN LED and ID LED/Switch
2x25 connector for optional Tyan IPMI SMDC

Back Panel I/O Ports
- Stacked PS/2 mouse & keyboard ports
- Stacked 4 USB ports
- One 9-pin COM port
- One 15-pin VGA port
- Two side-by-side RJ-45 10/100/1000 ports

Optional Modules
M3291, IPMI 2.0 Remote System Management card
- Renesas H8S2167 BMC controller
- BT, KCS, logging support
- IPMI-over-LAN
- Remote power on/off and reset

BIOS
Phoenix BIOS on 8Mbit Flash ROM or SPI Flash ROM
Serial Console Redirect
USB boot supported
Supports APM1.2 and ACPI
PnP, DMI2.0, WfM2.0
S0/S1/S3/S4/S5 states supported

Power Supply
- EPS12V
- 24-pin + 8-pin power connectors

Form Factor
ATX footprint
12" x 9.6" (305mm x244mm)

Regulatory
FCC Class B (DoC)
European Community CE (DoC)
BSMI

*8GB not validated at time of print.

1.3 - Software Specifications

OS (Operating System) Support
Microsoft Windows 2000 SP4
Microsoft Windows XP SP2 (32-bit)
Microsoft Windows XP SP1 (64-bit)
Microsoft Windows Server 2003 SP1(32-bit & 64-bit)
SUSE LINUX Enterprise Server 9.0 SP2 (32-bit & 64-bit)
SUSE LINUX Professional 9.3 (32-bit & 64-bit)
RHEL3 Update 5 (32-bit & 64-bit)
RHEL4 Update 1 (32-bit & 64-bit)

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

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting hole pattern of the Tomcat i7230W S5162 matches the ATX specification. Before continuing with installation, confirm that your chassis supports an ATX motherboard.

How to install our products right… the first time

The first thing you should do is reading 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
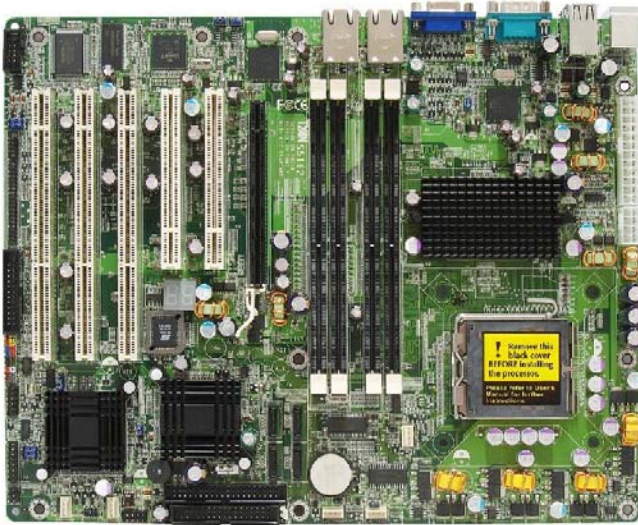
This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

2.2 - Block Diagram
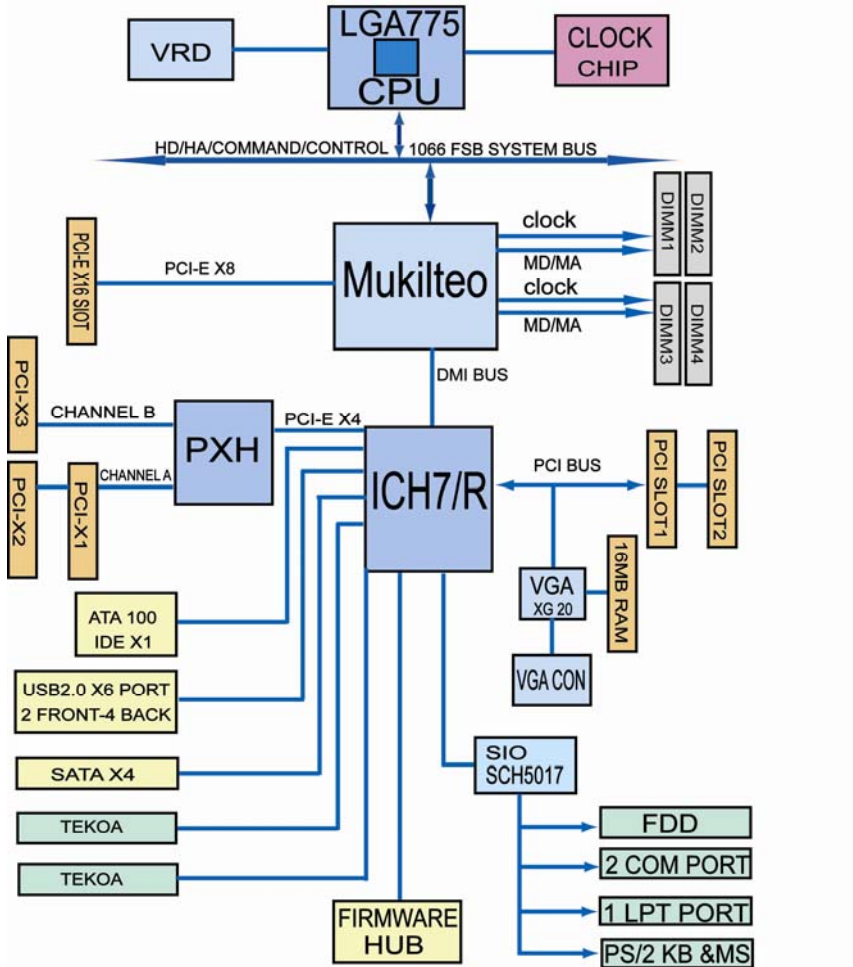
Tomcat i7230W S5162

2.3 - Board Parts, Jumpers and Connectors
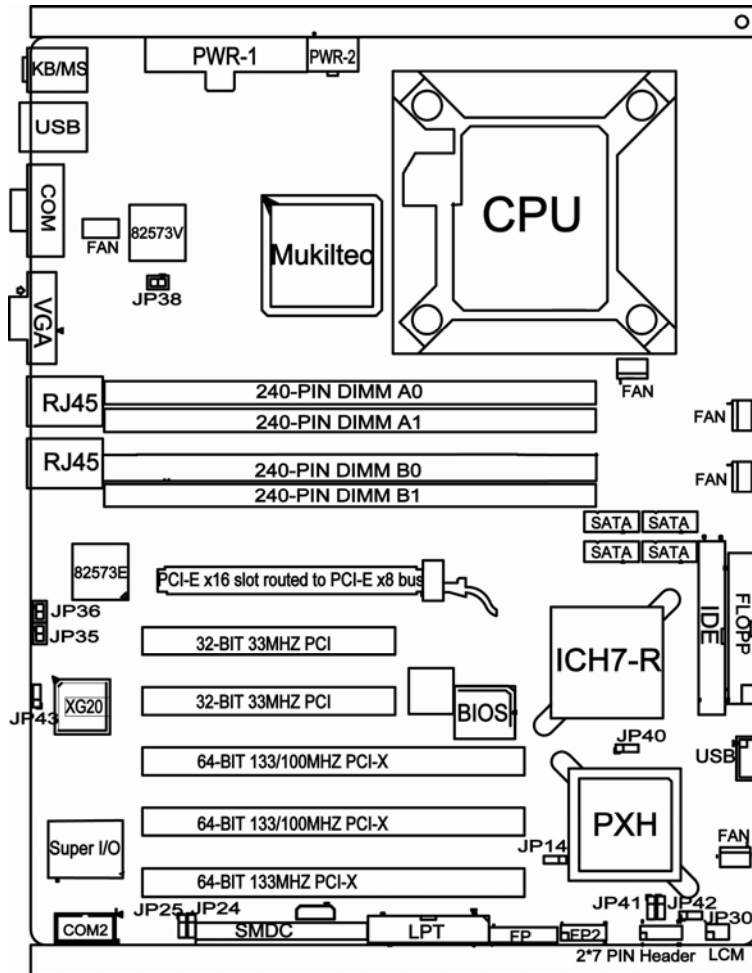
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

Jumper Legend

🔳🔳	**OPEN** - Jumper OFF, without jumper cover
🔳🔳	**CLOSED** – Jumper ON, with jumper cover

Jumper/Connector	Function
JP14	PXH Channel A speed setting
JP16	Front Panel Header
JP24/JP25	SM BUS Select
JP30	CMOS Clear
JP35	82573E SPI Shared Select
JP36	82573E NVM (Non-Volatile Memory) Protection Select
JP38	82573V NVM (Non-Volatile Memory) Protection Select
JP40	PXH Channel B speed setting
JP41	PXH Channel A PCI BUS speed setting
JP42	PXH Channel B PCI BUS speed setting
JP43	Onboard VGA controller Enable/Disable select

JP43

JP30

JP25

JP24
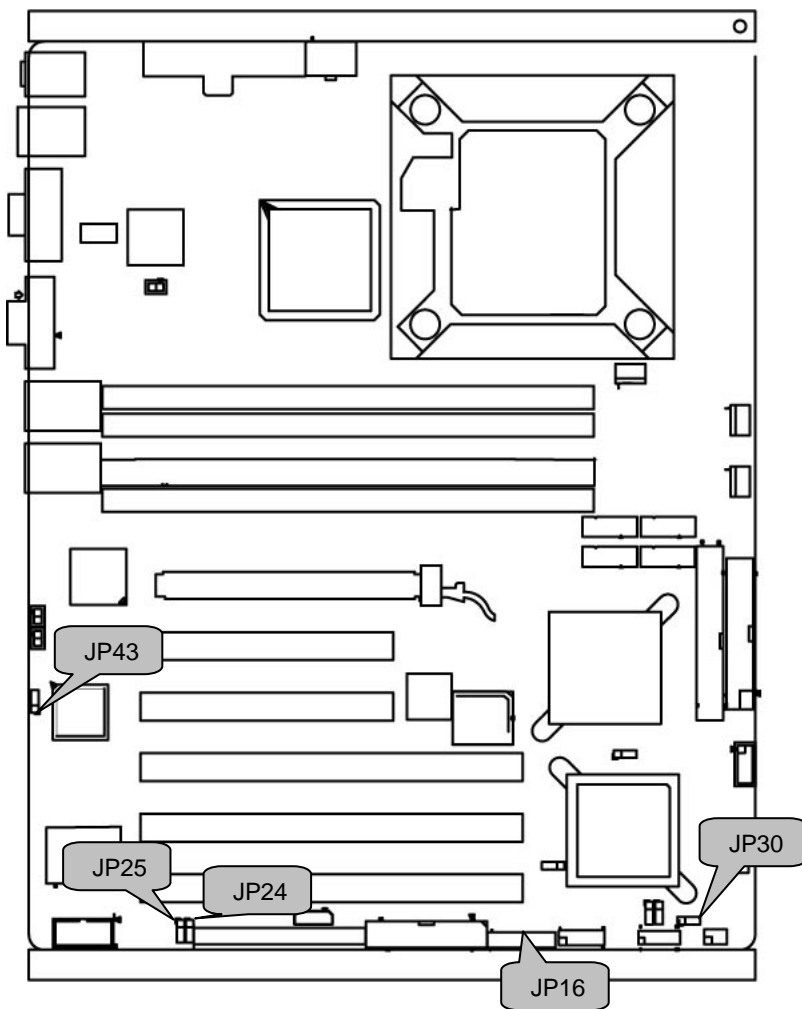
JP16

JP16: Front Panel Header

The Front Panel Header is used to connect some control or signal wires from motherboard to chassis, such as HDD LED, power LED, power button, and reset button.

HLED+	1 ■	■ 2	PLED+
HLED-	3 ■	■ 4	PLED-
GND	5 ■	■ 6	PWR SW+
Reset SW+	7 ■	■ 8	PWR SW-
VCC	9 ■	■ 10	SLP/Warning LED+
NMI	11 ■	■ 12	SLP/Warning LED-
+5V$_{SB}$	13 ■	■ 14	N/A
SDA	15 ■	■ 16	GND
SMBUS Clock	17 ■	■ 18	INTRU#

JP30: Clear CMOS Jumper

1 ■ ■ 3 ■ **Normal (Defaut)**	Use this jumper when you forgot your system/setup password or need to clear system BIOS setting. How to clear the CMOS data - Power off system and **disconnect the power supply from the AC source** - Use jumper cap to close Pin 2 and 3 for several seconds to Clear CMOS - Replace jumper cap to close Pin 1 and 2 Reconnect the power supply to the AC source - Power on system
1 ■ ■ 3 ■ **Clear**	

JP24/JP25: SM BUS Select

■ ■ ■ 1 3	1-2: Connect LAN SM BUS to mother board SM BUS
■ ■ ■ 1 3	2-3: Connect LAN SM BUS to SMDC SM BUS

JP43 Onboard VGA controller Enable/Disable select

■ ■ ■ 1 3	1-2: Enable by HW
■ ■ ■ 1 3	2-3: Enable/Disable by BIOS
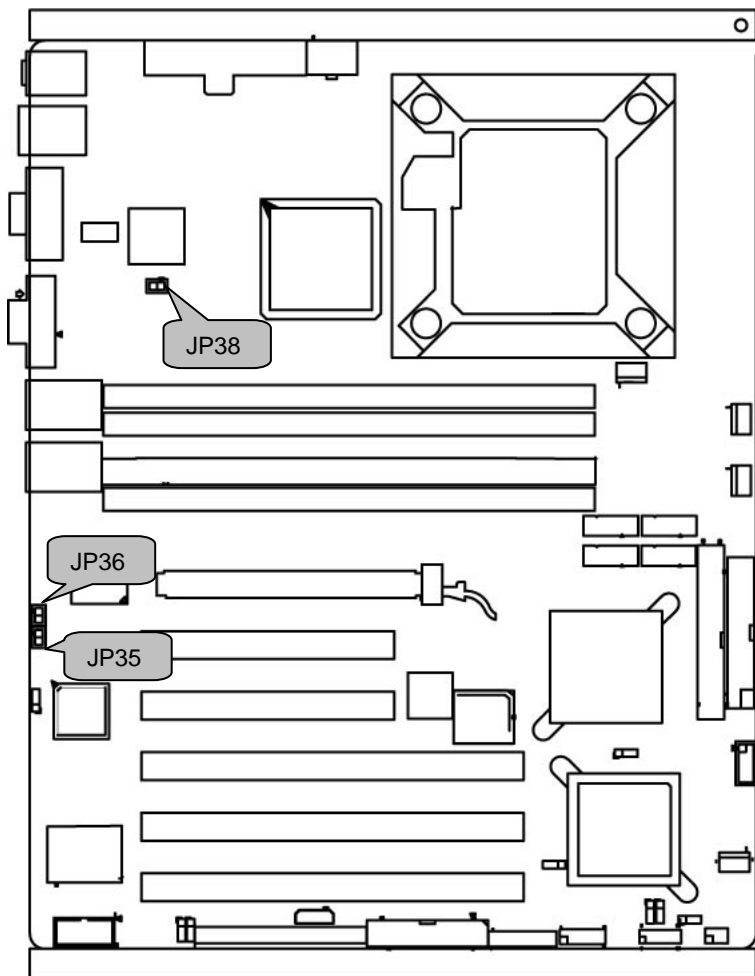
JP35　82573E SPI Shared Select

▣ ▣ **1　2**	1-2 Off: Not shared SPI
	1-2 On: shared SPI

JP36 82573E SPI Shared Select

▣ ▣ **1 2**	1-2 Off: Protection Enable
	1-2 On: Protection Disable

JP38: 82573V NVM(Non-Volatile Memory) Protection Select

▣ ▣ **1 2**	1-2 Off: Protection Enable
	1-2 On: Protection Disable

JP40

JP14

JP42
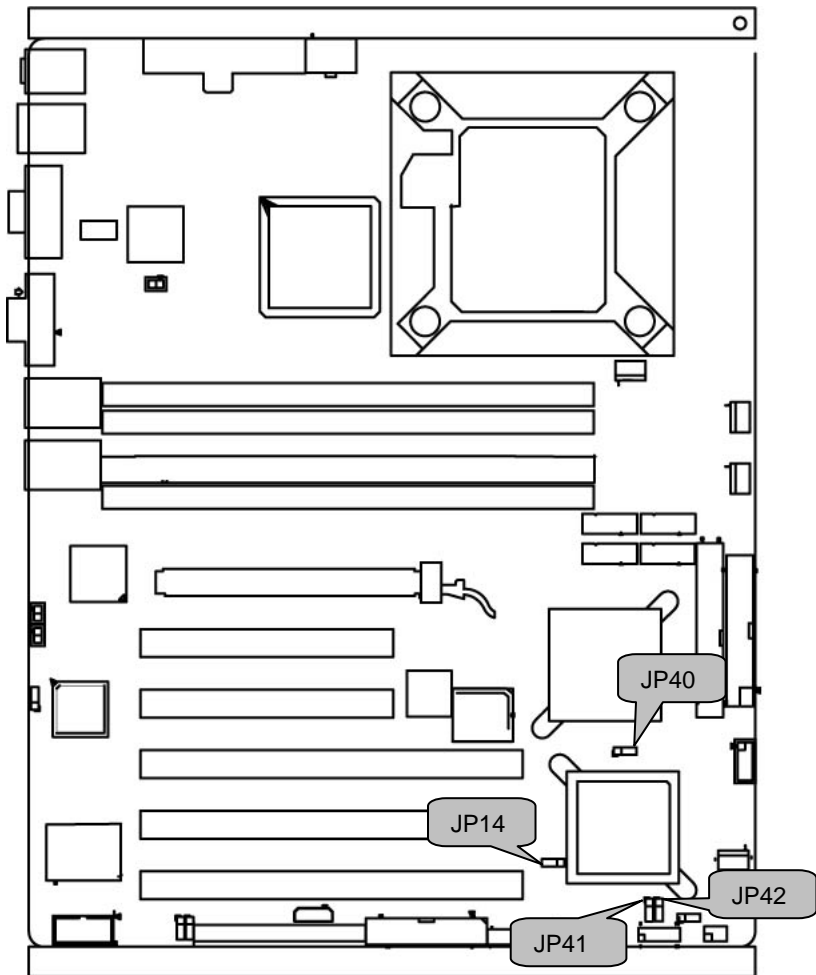
JP41

JP14: PXH Channel A speed setting

▣▣▣ 1 3	1-2: Enable 133MHz
▣▣▣ 1 3	2-3: Disable 133MHz

JP40: PXH Channel B speed setting

▣▣▣ 1 3	1-2: Enable 133MHz
▣▣▣ 1 3	2-3: Disable 133MHz

JP41: PXH Channel A PCI BUS speed setting

▣▣▣ 1 3	1-2: Selected by plug-in card
▣▣▣ 1 3	2-3: set to 33MHz

JP42: PXH Channel B PCI BUS speed setting
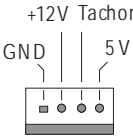
▣▣▣ 1 3	1-2: Selected by plug-in card
▣▣▣ 1 3	2-3: set to 33MHz
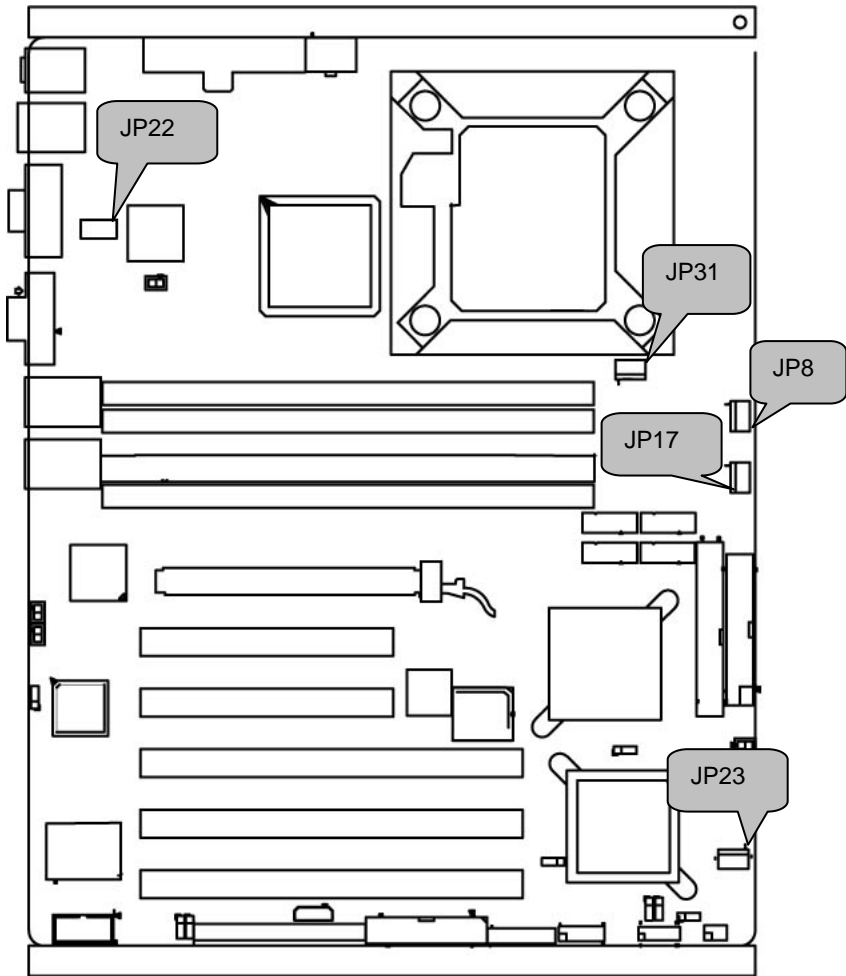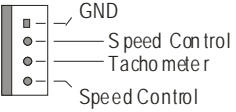
JP22: Front Fan Connector

	Use these headers to connect the chassis cooling fans to your motherboard to keep the system stable and reliable.
GND Speed Control Tachometer Speed Control	These connectors support the tachometer monitoring and auto fan speed control.

JP8/JP17: Chassis Fan Connector

+12V Tachometer GND | | 5 V ▪ ⚬ ⚬ ⚬	Use this header to connect the chassis cooling fan to your motherboard to keep the system at optimum performance levels.

J31: CPU_FAN Connector

GND Speed Control Tachometer Speed Control	Use this header to connect the processor cooling fan to your motherboard to keep the system stable and reliable. This connector supports the tachometer monitoring and auto fan speed control.

J20,J21,J22,J23: Serial ATA RAID Connector

7 ▪	7	GND	Connects to the Serial ATA ready drives via the Serial ATA cable
▪	6	RXP	
▪	5	RXN	J20: SATA1 J21: SATA3
▪	4	GND	J22: SATA2 J23: SATA4
▪	3	TXN	
1 ▪	2	TXP	**You can use any of the four Serial ATA ports for RAID 0, 1, 5, and 10 from the onboard ICH7R chipset**
	1	GND	

2.4 - Tips on Installing Motherboard in Chassis

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 are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

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

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

Mounting the Motherboard
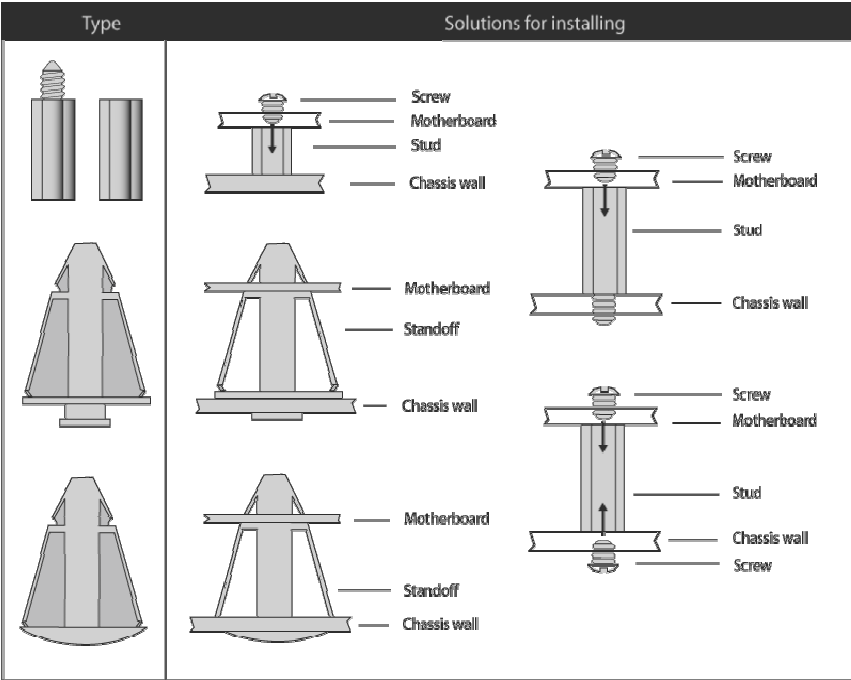
2.5 - Installing the Processor & Cooling Fan

Your Tomcat i7230W S5162 supports the latest processor technologies from Intel. Check the TYAN website for latest processor support:

http://www.tyan.com

Processor Installation

The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.
Follow these instructions to install your processor
1.   Locate the processor socket on the motherboard and lift the protective cover off as shown.
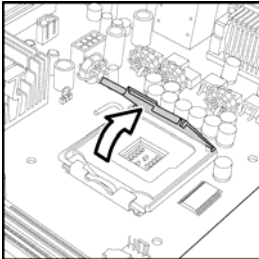
⚠ **WARNING**:

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

2.   Pull the locking lever out of it's locked position and let it spring into the open position.
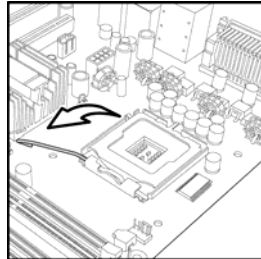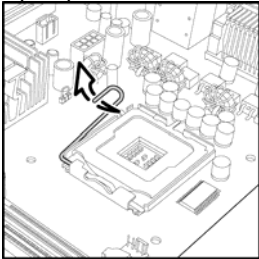
3. Lift the metal cover to expose the socket interior and place the socket in as shown.
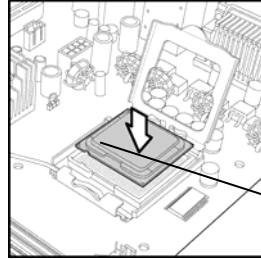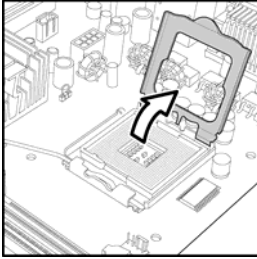
Pin 1

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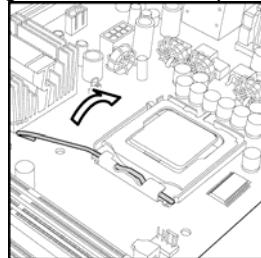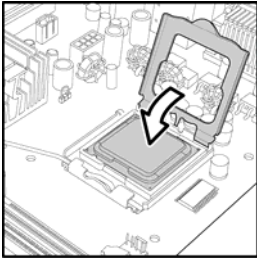
Cooling Fan Installation

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

Follow these instructions to install the heatsink shown.

1. Apply some thermal compound (also called heatsink compound or thermal grease) to the top of the processor. Try and apply a thin, even layer over the top of the processor.
2. Align the heatsink with the four holes around the processor socket.
3. Press the heatsink down until the four screws are securely seated in the holes.
4. Use screw drive to secure the four screws.
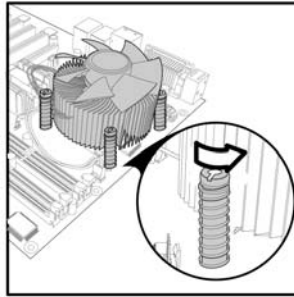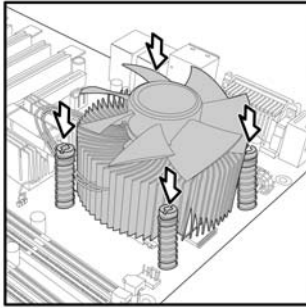
To remove the heatsink you will need to twist each of the black locking pegs until they spring up and unlock the heatsink from the motherboard.
Remember to connect the power supply for the fan to complete the installation.
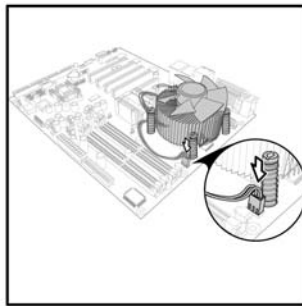
Some heat sinks require a bracket to be installed beneath the motherboard before the heat sink is placed on the top side of the motherboard. To install a heat sink like this:
1   Turn the motherboard upside down and place the rear bracket in position with the mounting posts poking through the corresponding holes in the motherboard.
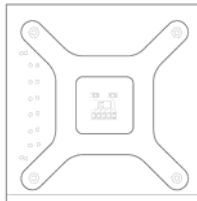
2   Turn the motherboard the right way up, holding the bracket in place.
3   Place the heat sink assembly on top of the processor.
     It should match up with the mounting holes on the rear bracket.

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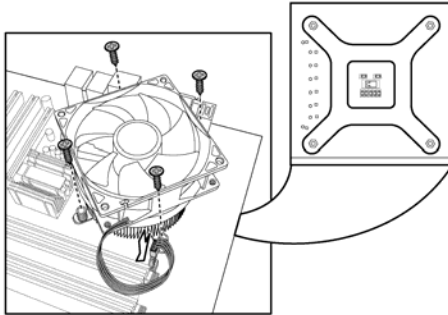
If there is a fan on the heat sink you will need to connect the power lead for the fan to one of the fan power supply pin headers on the motherboard.

2.6 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Only DDR2-667/533/400 DIMM modules are required. Check the TYAN Web site at: **www.tyan.com** for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR2 memory modules.
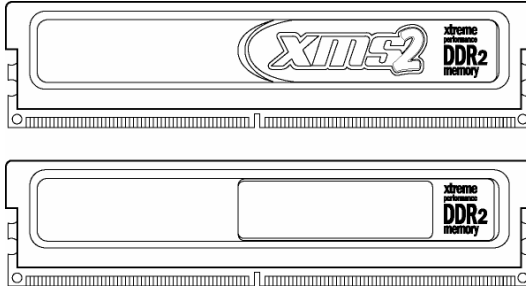
Key points to note before installing memory:
- Only **DDR2 667/533/400** unbuffered(Non-Reg)/ECC memory modules are supported.
- All installed memory will automatically be detected and no jumpers or settings need changing.
- The Tomcat i7230W S5162 supports up to 8GB of memory.

Notes

Standard DDR memory modules are not supported.

Registered Memory Module is NOT supported.

Memory Installation Procedure

Follow these instructions to install memory modules into the Tomcat i7230W S5162.

1.   Press the locking levers in the direction shown in the following illustration.
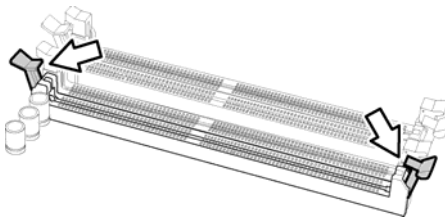
2.   Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.

Key slot
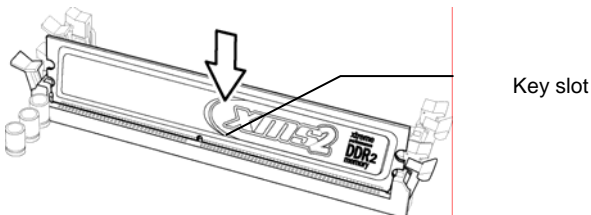
3.   Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.
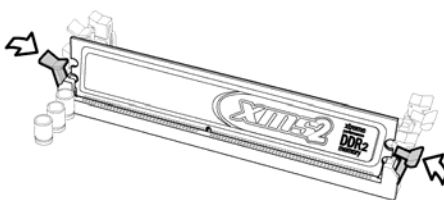
2.7 - Attaching Drive Cables

Attaching IDE Drive Cable

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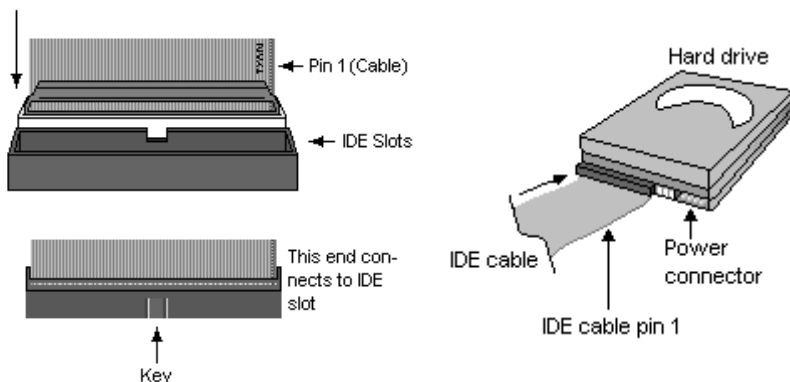
Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard.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

Note: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

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

Attaching Serial ATA Cables
The Tomcat i7230W is also equipped with 4 Serial ATA (SATA) channels. Connections for these drives are also very simple.

There is no need to set Master/Slave jumpers on SATA drives.

Tyan has supplied two SATA cables and one SATA power adapter. If you are in need of other cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive

1.SATA drive cable connection

2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter
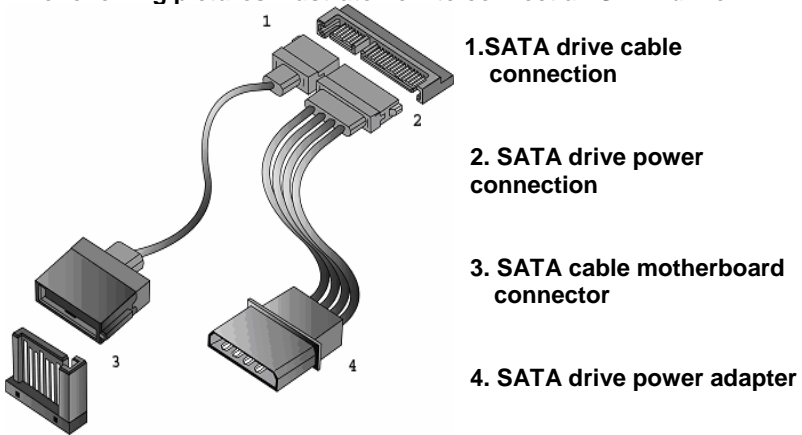
Attaching Floppy Drive Cables

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

Twist at the end of the ribbon cable
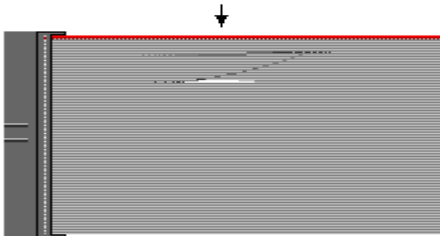
Attach first floppy drive (drive **A:**) to the end of the cable with the twist in it. Drive **B:** is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

2.8 - Connecting External Devices

The following diagrams will detail the rear port stack for this S5162 motherboard:

**PS/2
Mouse/Keyboard**

USB X4

**Gigabit
Ethernet x 2**

Serial Port

VGA Port
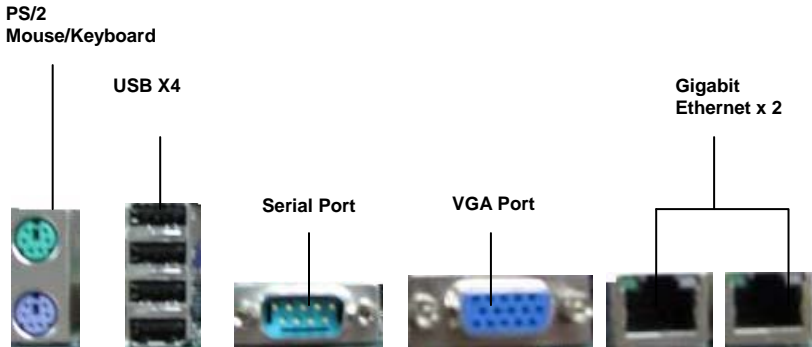
NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

<u>**Onboard LAN LED Color Definition**</u>

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

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

2.9 - Installing the Power Supply

There are two power connectors on your Tomcat i7230W S5162. The Tomcat i7230W S5162 requires that you use an EPS12V power supply that has a 24-pin and an 8-pin power connector. Please be aware that ATX 2.x, ATX12V and ATXGES power supplies are **not** compatible with the motherboard and can damage.

Applying power to the board

1. Connect the EPS 12V 8-pin power connector.
2. Connect the EPS 12V 24-pin power connector.
3. Connect power cable to power supply and power outlet

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

2.10 - 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.**

NOTE

Chapter 3: BIOS Setup

3.1. About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings 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 are subject to change, 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 even when the power is turned off.

To start the BIOS setup utility:
1. Turn on or reboot your system.
2. Press <F2> during POST (F4 on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

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

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

3.1.2 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.

3.1.3 In Case of Problems

If you have trouble booting your 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 what you are doing. The Chipset defaults have been carefully chosen either by TYAN or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

3.2 BIOS Main Menu

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.

```
             PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
   Main    Advanced   Security   Power   Boot   Exit

                                                            Item Specific Help
    System Time:                    [17:38:36]
    System Date:                    [2005-06-07]

    Legacy Diskette A:              [1.44/1.25 MB 3

  ▶ IDE Primary/Master
  ▶ IDE Primary/Slave
  ▶ SATA Port 1
  ▶ SATA Port 2
  ▶ SATA Port 3
  ▶ SATA Port 4

  ▶ Memory Cache
  ▶ Boot Features

    Installed memory
    Available to OS
    Used by devices



   F1   Help     ↑↓  Select Item    -/+     Change Values        F9   Setup Defaults
   Esc  Exit     ↔   Select Menu     Enter   Select ▶ Sub-Menu    F10  Previous Values
```

System Time / Date setup
System Time: Adjusts the system clock.
HHHours (24hr. format)
MMMinutes
SSSeconds

System Date: Adjusts the system date.
MMMonths
DDDays
YYYYYears

Legacy Diskette A
Defines the floppy drive type
NONE / 360K, 5.25 in / 1.2 M, 5.25 in / 720 K, 3.5 in / **1.44 M, 3.5 in /**
2.88 M, 3.5 in

Installed Memory
This displays the amount of system memory present on the system.

3.2.1 IDE Primary/Master, Primary/Slave Setup

Computer detects IDE drive type from drive C to drive F.
Press **Enter** on any of the Primary/Master, Primary/Slave options to view
advanced details of the corresponding drive. The system displays advanced
details like the number of heads/cylinders/sectors on the detected disk and the
maximum storage capacity of the disk.
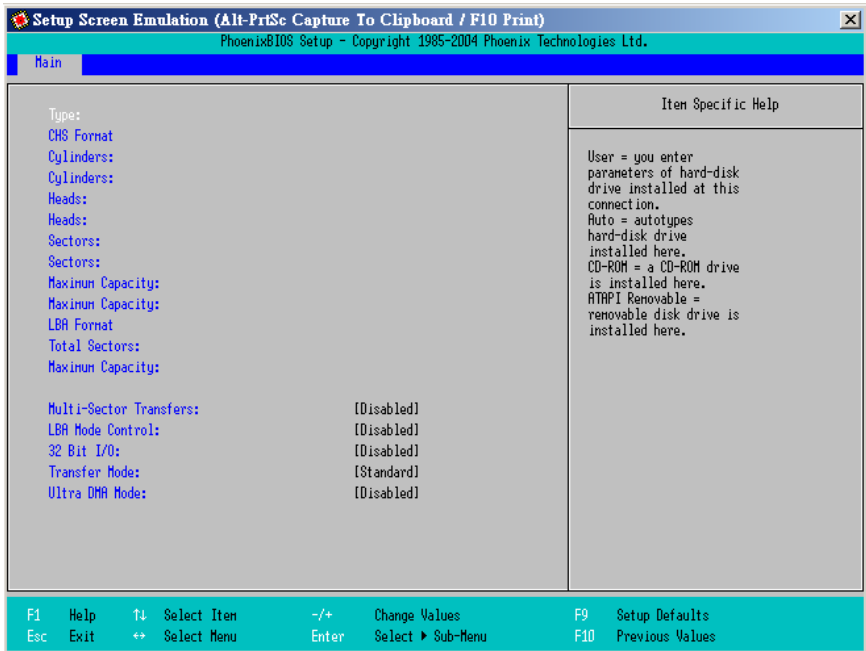
Multi-Sector Transfers
This option allows you to specify the number of sectors per block for multiple sector transfers.
16 Sectors / 2 Sectors / 4 Sectors / 8 Sectors /**Disabled**

LBA Mode Control
Enables or disables LBA Mode.
When LBA is turned on, the BIOS will enable geometry translation. This translation may be done in the same way that it is done in Extended CHS or large mode, or it may be done using a different algorithm called LBA-assist translation. The translated geometry is still what is presented to the operating system for use in Int 13h calls. The difference between LBA and ECHS is that when using ECHS the BIOS translates the parameters used by these calls from the translated geometry to the drive's logical geometry. With LBA, it translates from the translated geometry directly into a logical block (sector) number.
Disabled / Enabled

32 Bit I/O
Enables or disables 32 bit data transfer mode.
Enabling this option causes the PCI hard disk interface controller to bundle together two 16-bit chunks of data from the drive into a 32-bit group, which is then transmitted to the processor or memory. This results in a small performance increase.
Enabled / **Disabled**

Transfer Mode
These modes determine the speed at which data is transferred to and from the drive. The Auto option automatically determines the correct transfer rates.
Auto / **Standard** / Fast PIO 1 / Fast PIO 2 / Fast PIO 3 / Fast PIO 4 / FPIO 3 / DMA 1 / FPIO 4 / DMA 2

Ultra DMA Mode
Enables or disables Ultra DMA Mode.
Ultra DMA (UDMA, or, more accurately, Ultra DMA/33) is a protocol for transferring data between a hard disk drive through the computer's data paths (or bus) to the computer's random access memory (RAM). The Ultra DMA/33 protocol transfers data in burst mode at a rate of 33.3 MBps (megabytes per second), twice as fast as the previous Direct Memory Access (DMA) interface. Ultra DMA support in your computer means that it will boot (start) and open new applications more quickly. It will also help users of graphics-intensive and other applications that require large amounts of access to data on the hard drive. Ultra DMA uses Cyclical Redundancy Checking (CRC), offering a new level of data protection.
Disabled / Mode 0 / Mode 1 / Mode 2 / Mode 3 / Mode 4 / Mode 5

3.2.2 SATA Port 1/2/3/4

Press **Enter** on any of the Primary/Master, Primary/Slave options to view advanced details of the corresponding drive.

```
                    PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
  Main

                                                                  Item Specific Help
    Type:
    LBA Format
    Total Sectors:                                      User = you enter
    Maximum Capacity:                                   parameters of hard-disk
                                                        drive installed at this
    Multi-Sector Transfers:          [Disabled]         connection.
    LBA Mode Control:                [Disabled]         Auto = autotypes
    32 Bit I/O:                      [Disabled]         hard-disk drive
    Transfer Mode:                   [Standard]         installed here.
    Ultra DMA Mode:                  [Disabled]         CD-ROM = a CD-ROM drive
                                                        is installed here.
                                                        ATAPI Removable =
                                                        removable disk drive is
                                                        installed here.


  F1   Help      ↑↓  Select Item    -/+   Change Values       F9   Setup Defaults
  Esc  Exit      ↔   Select Menu    Enter Select ▶ Sub-Menu   F10  Previous Values
```

3.2.3 Memory Cache

This setting allows you to tweak the various cache settings for optimal performance of your system. Press Enter to display the various cache settings.

```
                PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
   Main

                                                                    Item Specific Help
      Cache System BIOS area:          [Write Protect]
      Cache Video BIOS area           [Write Protect]
      Cache Base 0-512k:              [Write Back]         Controls caching of
      Cache Base 512k-640k:           [Write Back]         system BIOS area.
      Cache Extended Memory Area:     [Write Back]
      Cache A000 - AFFF:              [Disabled]
      Cache B000 - BFFF:              [Disabled]
      Cache C800 - CBFF:              [Disabled]
      Cache CC00 - CFFF:              [Disabled]
      Cache D000 - D3FF:              [Disabled]
      Cache D400 - D7FF:              [Disabled]
      Cache D800 - DBFF:              [Disabled]
      Cache DC00 - DFFF:              [Disabled]




      F1    Help     ↑↓  Select Item     -/+    Change Values        F9    Setup Defaults
      Esc   Exit     ↔   Select Menu     Enter  Select ▶ Sub-Menu    F10   Previous Values
```

Cache System BIOS Area
This feature is only available when the system BIOS is shadowed. It enables or disables the caching of the system BIOS ROM at F0000h-FFFFFh via the L2 cache. This greatly speeds up accesses to the system BIOS. However, this does not necessarily make the system perform better because the OS does not need to access the system BIOS often.
As such, it would be a waste of L2 cache bandwidth to cache the system BIOS instead of data that are more critical to the system's performance. In addition, if any program writes into this memory area, it will result in a system crash. So, it is recommended that you write protect this area for optimal system performance.
> NULL / **Write Protect**

Cache Video BIOS Area
This feature is only valid when the video BIOS is shadowed. It enables or disables the caching of the video BIOS ROM at C0000h-C7FFFh via the L2 cache. This greatly speeds up accesses to the video BIOS. However, this does not necessarily make the system perform better because the OS bypasses the BIOS and uses the graphics driver to access the video card's hardware directly.

As such, it would be a waste of L2 cache bandwidth to cache the video BIOS instead of data that are more critical to the system's performance. In addition, if any program writes into this memory area, it will result in a system crash. So, it is recommended that you write protect this area for optimal system performance.

NULL / **Write Protect**

Cache Base 0-512K
This feature allows you to control caching of 512K base memory.

Uncached / **Write Back** / Write Through / Write Protect

Cache Base 512K-640K
This feature allows you to control caching of 512K 640K base memory.

Uncached / **Write Back** / Write Through / Write Protect

Cache Extended Memory Area
This feature allows you to control caching of system memory above one megabyte.

Uncached / **Write Back** / Write Through / Write Protect

Cache A000-AFFF/B000-BFFF
These features allow you to control caching of A000-AFFF/B000-BFFF memory.

USMC Caching / **Disabled** / Write Through / Write Protect / Write Back

Cahe C8000-CBFF/Cache CC00-CFFF/Cahe D000-D3FF/Cahe D400-D7FF/Cache D800-D8FF/Cahe DC00-DFFF
These feature allows you to control caching of C8000-CBFF/CC00-CFFF/D000-D3FF/D400-D7FF/D800-D8FF/DC00-DFFF memory.

Disabled / Write Through / Write Protect / Write Back

3.2.4 Boot Features

This option allows setting boot parameters. Press Enter to view the Boot Features screen.

```
┌──────────────────────────────────────────────────────────────────────────────┐
│ ● Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)      ✕  │
│             PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.  │
│ ┌──────┐                                                                       │
│ │ Main │                                                                       │
│ └──────┴─────────────────────────────────────────────────────────────────────│
│                                                          Item Specific Help    │
│   Floppy check:                    [Disabled]                                  │
│   Summary screen:                  [Enabled]                                   │
│   Boot-time Diagnostic Screen:     [Enabled]           Enabled verifies        │
│   QuickBoot Mode:                  [Enabled]           floppy type on boot;     │
│   Extended Memory Testing          [Just zero it]      disabled speeds boot.   │
│                                                                                │
│   Error Halt in POST               [Enabled]                                   │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│                                                                                │
│ F1   Help    ↑↓  Select Item    -/+    Change Values     F9   Setup Defaults   │
│ Esc  Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu F10  Previous Values  │
└──────────────────────────────────────────────────────────────────────────────┘
```

Floppy Check
This feature is used to verify floppy type on boot. Selecting "Disabled" will speed the boot process.
> **Disabled** / Enabled

Summary Screen
Enables or disables the display of the summary screen during boot up.
When Summary Screen is Enabled (the default), a Phoenix BIOS Setup Utility summary screen appears during system boot after the power-on self-test (POST). The summary screen lists many of the system setup settings. When this option is set to Disabled, the summary screen does not appear.
> **Enabled** / Disabled

Boot-time Diagnostic Screen
This feature is used to display the diagnostic screen during the boot process.
> **Enabled** / Disabled

Quick Boot Mode
This BIOS feature allows you to decrease the time it takes to boot up the computer by shortening or skipping certain standard booting procedures.
If enabled, the BIOS will shorten the booting process by skipping some tests and shortening others. In addition, it will also perform the following to further speed up the booting process:

Spin up the hard disks as soon as power is supplied (or as soon as possible)

Initialize only critical parts of the chipset

Read memory size from the SPD (Serial Presence Detect) chip on the memory modules

Eliminate logo delays

If disabled, the BIOS will run the whole gamut of boot-up tests.
It is recommended that you disable this feature when you boot up a new computer for the first time or whenever you install a new piece of hardware. This allows the BIOS to run full diagnostic tests to detect any problems that may slip past Quick Boot's abbreviated testing scheme.
After a few error-free test runs, you should enable this feature for much faster booting.

Enabled / Disabled

Error Halt in POST
Select Disabled if user don't want stop POST with any error.

Enabled / Disabled

3.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.

```
Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)          [x]
                 PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
   Main    Advanced    Security    Power    Boot    Exit

                                                            Item Specific Help
       Setup Warning
       Setting items on this menu to incorrect
       values may cause your system to malfunction.

   ▶ Advanced Chipset Control
   ▶ Advanced Processor Options
   ▶ I/O Device Configuration
   ▶ Hardware Monitor
   ▶ DMI Event Logging

     Installed O/S:                     [Other]
     Reset Configuration Data:          [No]
     Large Disk Access Mode:            [Other]

     Route Port 80h cycles to           [LPC]
     Legacy USB Support:                [Disabled]
   ▶ Console Redirection



   F1   Help    ↑↓  Select Item    -/+   Change Values      F9   Setup Defaults
   Esc  Exit    ↔   Select Menu    Enter Select ▶ Sub-Menu  F10  Previous Values
```

Installed OS
Select the operating system installed on the PC.
Note: An incorrect setting can cause the operating system to behave
unpredictably.
     Other / Win95 / Win98 / WinMe / Win2000

Reset Configuration Data
If you install a new piece of hardware or modify your computer's hardware
configuration, the BIOS will automatically detect the changes and reconfigure
the ESCD (Extended SystemConfiguration Data). Therefore, there is usually no
need to manually force the BIOS to reconfigure the ESCD.
However, sometimes, the BIOS may not be able to detect the hardware
changes. A serious resource conflict may occur and the operating system may
not even boot as a result. This is where the Reset Configuration Data BIOS
feature comes in.
This BIOS feature allows you to manually force the BIOS to clear the previously
saved ESCD data and reconfigure the settings. All you need to do is enable this

BIOS feature and then reboot your computer. The new ESCD should resolve the conflict and allow the operating system to load normally.

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

Yes / **No**

Large Disk Access Mode
This option determines whether a hard drive with more than 1024 cylinders, more than 16 heads and or more than 64 tracks per sector is present on the system. Set this option to **DOS** if such a hard drive is present. Else, set this option to **Other**. Virtually, all modern hard disks have these characters so leave this option at **DOS**, unless you know otherwise.

DOS / **Other**

Route Port 80h cycles to
This feature allows you to route Port 80h I/O cycles to LPC or PCI bus.

LPC / PCI

Legacy USB Support
When enabled, the BIOS takes control of the USB ports. Enable this only if you run an OS that does not support USB (e.g. DOS) or when you have USB hardware like USB mice that you want to use even before the operating system loads.

Enabled / **Disabled**

3.3.1 Advanced Chipset Control

This section allows you to fine tune the chipset configuration.

```
Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)     X
                    PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
         Advanced

                                                              Item Specific Help
   ▶ Integrated Device Control Sub-Menu
   ▶ PCI Express Sub-Menu
                                                       These items determine
     Default Primary Video Adapter:     [Onboard]      whether the integrated
     PXH Bus Frequency Control          [133MHz]       PCI Devices will be
     Spread Spectrum                    [Disabled]     Enabled in PCI Config
                                                       Space.
     ECC Condition                      [Multiple bit]
     ECC Error Handler                  [SMI]
     Parallel ATA:                      [Channel 0]
     Serial ATA:                        [Enabled]
     Native Mode Operation:             [Onboard]
     SATA Controller Mode Option:       [Compatible]
     SATA RAID Enable                   [Disabled]
     SATA AHCI Enable                   [Disabled]




   F1   Help    ↑↓  Select Item    -/+    Change Values       F9   Setup Defaults
   Esc  Exit    ←→  Select Menu    Enter  Select ▶ Sub-Menu   F10  Previous Values
```

Default Primary Video Adapter
This feature is used to select the priority of initialing VGA card (PCI VGA or PCI-E VGA).
   Onboard / PCI

PXH Bus Frequency Control
133Mhz for one PCI-X card plugged.
100Mhz for two PCI-X card plugged.
66Mhz for over two PCI-X card plugged.
   133MHz / 100MHz/66MHz

Spread Spectrum
This feature is used to configure the function of clock spread spectrum.
   Enabled / **Disabled**

ECC Condition
This feature is used to select ECC Error condition to be detected.
   Multiple bit / **None** / Single bit / Both

ECC Error Handler

When an ECC error occurs, it generates an interrupt. This feature is used to select the type of interrupt to report.

SMI / NMI / SCI / **None**

Parallel ATA

This feature is used to enable the PATA function.

Enabled / **Disabled**

Serial ATA

This feature is used to enable the SATA function.

Enabled / **Disabled**

Native Mode Operation

This feature is used to choose Native Mode for ATA. However, certain OS is not supported under Native Mode.

Auto / Serial ATA

SATA Controller Mode Option

This feature is used to select SATA controller mode. In "compatible mode", SATA and PATA drives are auto-detected and placed in Legacy mode. In "Enhanced (non-AHCI) mode", SATA and PATA drives are auto-detected and placed in Native IDE mode.

Compatible / Enhanced (non-AHCI)

SATA RAID Enable

This feature is used to enable SATA RAID functionality.

Disabled / Enabled

SATA AHCI Enable

This feature is used to enable SATA AHCI functionality.

Disabled / Enabled

3.3.1.1 Integrated Device Control Sub-Menu

These items are for determining whether the integrated PCI devices will be enabled in PCI configuration space.

```
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
      Advanced

   USB Device 29, Function 3:          [Enabled]            Item Specific Help
   USB Device 29, Function 2 & 3:      [Enabled]
   USB Device 29, Function 1 & 2 & 3:  [Enabled]      Enable or Disable this
   USB Device 29, Function 0&1&2&3:    [Enabled]      USB Device by setting
   USB Device 29, Function 7:          [Enabled]      item to the desired
                                                      value.



  F1  Help    ↑↓  Select Item    -/+    Change Values        F9   Setup Defaults
  Esc Exit    ↔   Select Menu     Enter  Select ▶ Sub-Menu    F10  Previous Values
```

USB Device 29, Function 3:
Enable or Disable this USB Device by setting item to the desired value.
> **Enabled** / Disabled

USB Device 29, Function 2 & 3:
Enable or Disable these 2 USB Functions by setting item to the desired value.
> **Enabled** / Disabled

USB Device 29, Function 1 & 2 & 3:
Enable or Disable these 3 USB Functions by setting item to the desired value.
> **Enabled** / Disabled

USB Device 29, Function 0 & 1 & 2 & 3:
Enable or Disable these 4 USB Functions by setting item to the desired value.
> **Enabled** / Disabled

USB Device 29, Function 7:
Control USB 2.0 functionality through this Setup Item.
Enabled / Disabled

3.3.1.2 PCI Express Sub-Menu

These items are for debugging the PCI Express Ports.
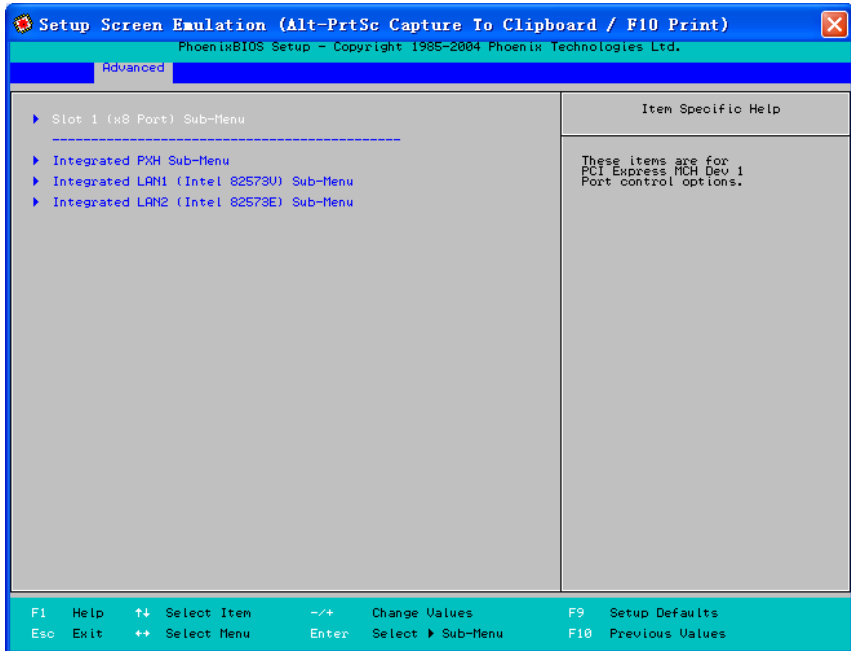
3.3.1.2.1 Slot 1 (x8 Port) Sub-Menu

These items are for PCI Express MCH Dev1 port control options.

```
                 PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
        Advanced

      PCI Express MCH Dev 1              [Enabled]              Item Specific Help
      --------------------------------------------
      Port Enabled           =
      Width                  =
      Slot Card Detect       =

  F1   Help    ↑↓  Select Item     -/+    Change Values         F9   Setup Defaults
  Esc  Exit    ↔   Select Menu     Enter  Select ▶ Sub-Menu     F10  Previous Values
```
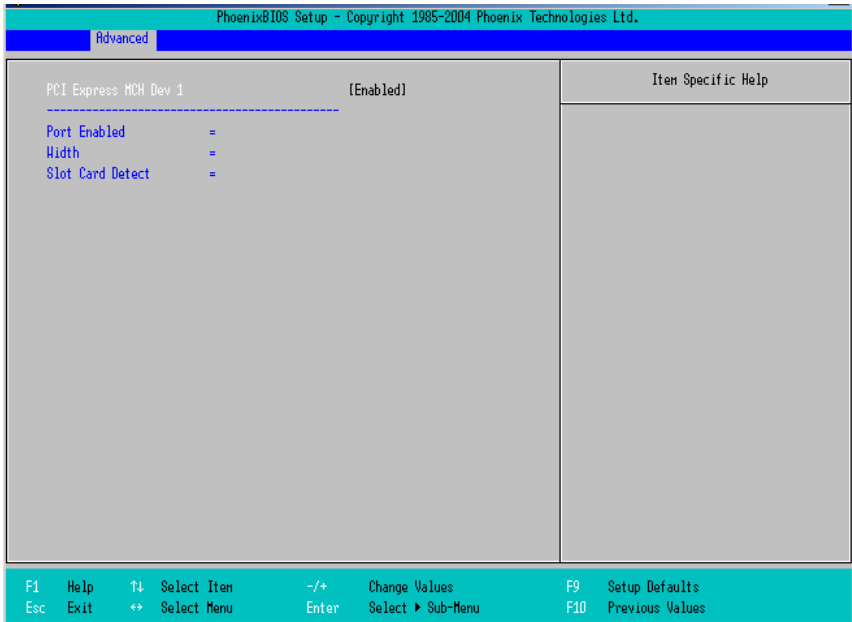
PCI Express MCH Dev 1
This feature is used to enable PCI Express MCH Dev1 port control.
      Enabled / Disabled

3.3.1.2.2 Integrated PXH Sub-Menu

These items are for PCI Express Root Port #1 control options.
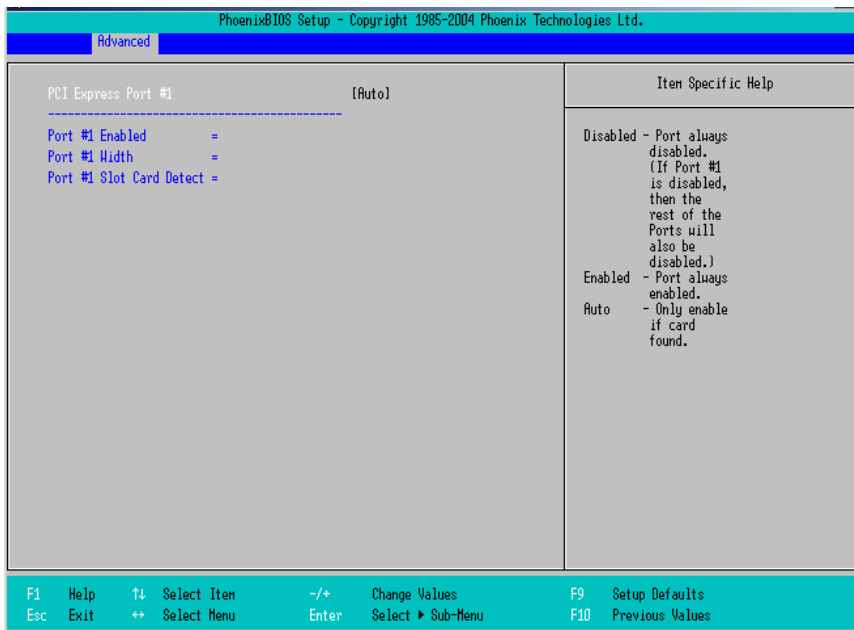
PCI Express Port #1
This feature is used to enable PCI Express Port #1 control.
  Auto / Enabled / Disabled

3.3.1.2.3 Integrated LAN1(82573V)/LAN2 (82573E) Sub-Menu

These items are for Integrated LAN1/LAN2 control option.

```
                    PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
        Advanced

                                                                      Item Specific Help
      Integrated LAN Control          [Auto]
      Option ROM Scan:                [Disabled]
      ----------------------------------------------       Disabled - Port always
      Port #5 Enabled        =                                         disabled.
      Port #5 Slot Card Detect =                                       (If Port #1
                                                                       is disabled,
                                                                       then the
                                                                       rest of the
                                                                       Ports will
                                                                       also be
                                                                       disabled.)
                                                             Enabled  - Port always
                                                                        enabled.
                                                             Auto     - Only enable
                                                                        if card
                                                                        found.




      F1    Help    ↑↓  Select Item    -/+   Change Values       F9   Setup Defaults
      Esc   Exit    ↔   Select Menu     Enter Select ▶ Sub-Menu   F10  Previous Values
```

Integrated LAN Control
This feature is used to enable Integrated LAN control.
    Auto / Enabled / Disabled

Option ROM Scan
This feature is used to enable the functionality of option ROM scanl.
    Disabled / Enabled

3.3.2 Advanced Processor Options

This section allows you to fine-tune the processor options.
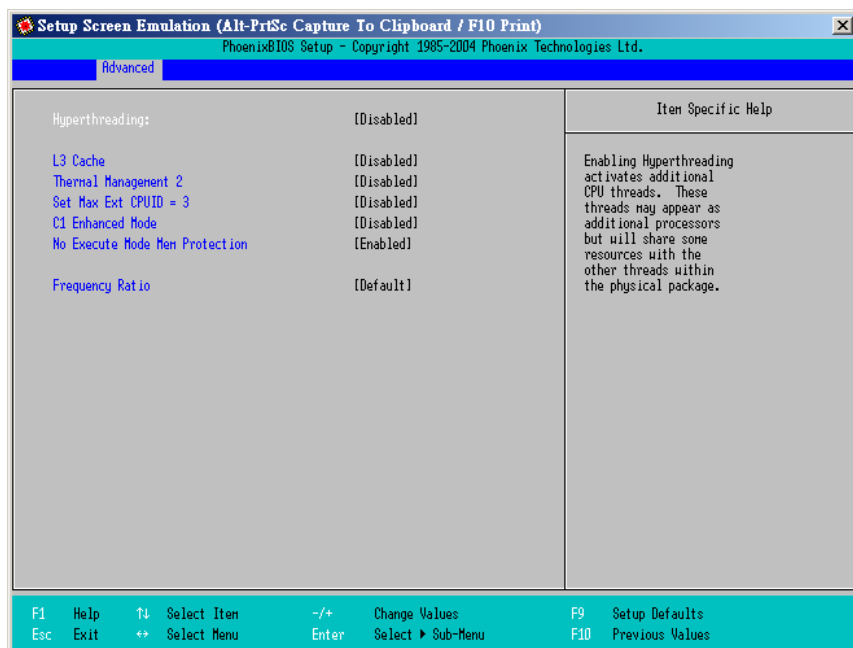
Hyperthreading
Enable this only if you have an Intel Hyper Threading processor.
Hyper-Threading Technology enables multi-threaded software applications to execute threads in parallel. Hyper-Threading Technology provides thread-level-parallelism (TLP) on each processor resulting in increased utilization of processor execution resources. As a result, resource utilization yields higher processing throughput. Hyper-Threading Technology is a form of simultaneous multi-threading technology (SMT) where multiple threads of software applications can be run simultaneously on one processor. This is achieved by duplicating the architectural state on each processor, while sharing one set of processor execution resources. Hyper-Threading Technology also delivers faster response times for multi-tasking workload environments. By allowing the processor to use on-die resources that would otherwise have been idle, Hyper-Threading Technology provides a performance boost on multi-threading and multi-tasking operations for the Intel NetBurst® microarchitecture.
    Enabled / **Disabled**

L3 Cache
This feature is used to enable the L3 cache funtionality.
Enabled / **Disabled**

Thermal Management 2
Thermal Management throttles the processor back as it reaches its maximum operating temperature. Throttling reduces the number of processing cycles, thereby diminishing the heat dissipation of the CPU. This cools the unit. Once the CPU has reached a safe operating temperature, thermal throttling is automatically disabled, and normal full speed processing begins again.
Disabled / Enabled

Set Max Ext CPUID=3
Sets Max CPUID extended function value to 3.
Disabled / Enabled

C1 Enhanced Mode
This feature is used to enable the C1 Enhanced mode.
Disabled / Enabled

No Execute Mode Mem Protection
This feature is used to enable the function of No Execute Mode Mem Protection.
Enabled / Disabled

Frequency Ratio
This feature is used to set the Frequency Ratio
Default / X 8 / 19 /14 /15 / 16 / 17 / 18

3.3.3 I/O Device Configuration

This setting allows you to configure I/O devices.
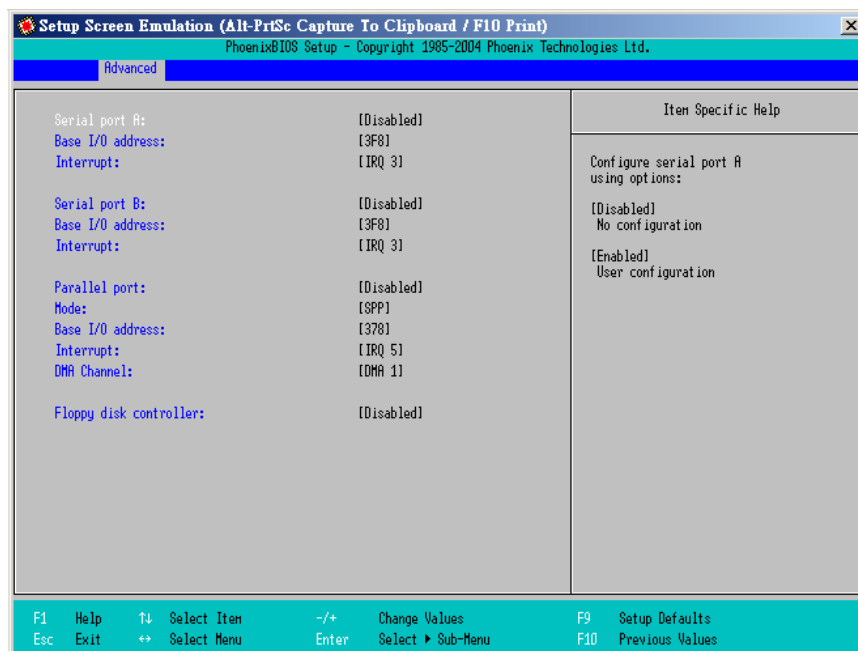
Serial Port A/B:
This defines how the first serial port is detected and configured.
Disabled / Enabled

Base I/O Address:
Set the base I/O address for serial port A/B.
3F8 / 2F8 / 3E8 / 2E8

Interrupt:
Set the interrupt for serial port A/B.
IRQ3 / IRQ4

Parallel Port
This defines how the parallel port is detected and configured.
Disabled / Enabled

Mode
This field allows the user to select the parallel port mode. The default value is Standard that automatically selects the correct mode to use. The other modes are explained as follows:

SPP works with all parallel port devices. However, it is the slowest transfer mode and should only be used when faster transfer modes cannot be used.

There are two faster bidirectional modes available - the ECP (Extended Capabilities Port) and EPP (Enhanced Parallel Port) modes.

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

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

SPP / EPP / ECP

Base I/O Address / Interrupt
This determines the base address and interrupt of the parallel port.

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

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

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

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

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

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

DMA 1 / DMA 3

Floppy Disk Controller
This defines how the floppy disk controller is detected and configured.

Enabled / **Disabled**

3.3.4 Hardware Monitor

```
╔══════════════════════════════════════════════════════════════════════╗
║ 🔴 Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print) ☒ ║
╠══════════════════════════════════════════════════════════════════════╣
║          PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd. ║
║  ┌──────────┐                                                          ║
║  │ Advanced │                                                          ║
║ ┌┴──────────┴──────────────────────────────┬───────────────────────┐ ║
║ │                                           │   Item Specific Help  │ ║
║ │ ▶ Voltage Monitoring                      │                       │ ║
║ │ ▶ FAN Control Selections                  │                       │ ║
║ │   CPUFan1(j31)                            │                       │ ║
║ │   CPUFan2(j8)                             │                       │ ║
║ │   CPUFan3(j17)                            │                       │ ║
║ │   SysFan1(j23)                            │                       │ ║
║ │   SysFan2(j22)                            │                       │ ║
║ │                                           │                       │ ║
║ │   CPU Temp. =                             │                       │ ║
║ │   SYS Temp1.(NB) =                        │                       │ ║
║ │   SYS Temp2.(PXH) =                       │                       │ ║
║ │   SYS Temp3.(VR) =                        │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ │                                           │                       │ ║
║ └───────────────────────────────────────────┴───────────────────────┘ ║
║ F1   Help    ↑↓  Select Item   -/+   Change Values    F9   Setup Defaults  ║
║ Esc  Exit    ↔   Select Menu   Enter Select ▶ Sub-Menu F10  Previous Values ║
╚══════════════════════════════════════════════════════════════════════╝
```

3.3.4.1 Voltage Monitoring

```
Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Advanced

                                                            Item Specific Help
   V+12 =
   VBAT =
   V+5 =
   Vcpu =
   VCC =


 F1   Help    ↑↓  Select Item    -/+    Change Values      F9   Setup Defaults
 Esc  Exit    ↔   Select Menu     Enter  Select ▶ Sub-Menu  F10  Previous Values
```

3.3.4.2 Fan Control Selections

```
Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)
            PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
     Advanced

                                                              Item Specific Help
  Auto Fan Control                 [Disabled]
  SysFan1(j23) pins select         [4 PIN]
  CPUFan1(j31) pins select         [4 PIN]        Auto Mode Fan Control
  SysFan2(j22) pins select         [4 PIN]        Parameters
  CPUFan2&3(j8&j17) pins select    [4 PIN]




  F1   Help    ↑↓  Select Item    -/+    Change Values      F9   Setup Defaults
  Esc  Exit    ←→  Select Menu    Enter  Select ▶ Sub-Menu  F10  Previous Values
```

Auto Fan Control
This feature is used to set function of Auto Mode Fan Control.
  Disabled / Enabled

J22/J31/J23/J8&J17 Number of Pins Select
These features are used to select 3 or 4 pin fan connector. After the setting, then you can use the function of "Auto Fan Control".
  4 Pin / 3 Pin

3.3.5 DMI Event Logging

These items are used to view and modify DMI event logs.

```
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
      Advanced

                                                          Item Specific Help
    Event log validity
    Event log capacity
                                                     Report the validity of
    View DMI event log                               the DMI event log

    Event Logging                 [Enabled]
    ECC Event Logging             [Enabled]

    Mark DMI events as read
    Clear all DMI event logs      [No]














 F1   Help    ↑↓  Select Item    -/+    Change Values       F9   Setup Defaults
 Esc  Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu   F10  Previous Values
```
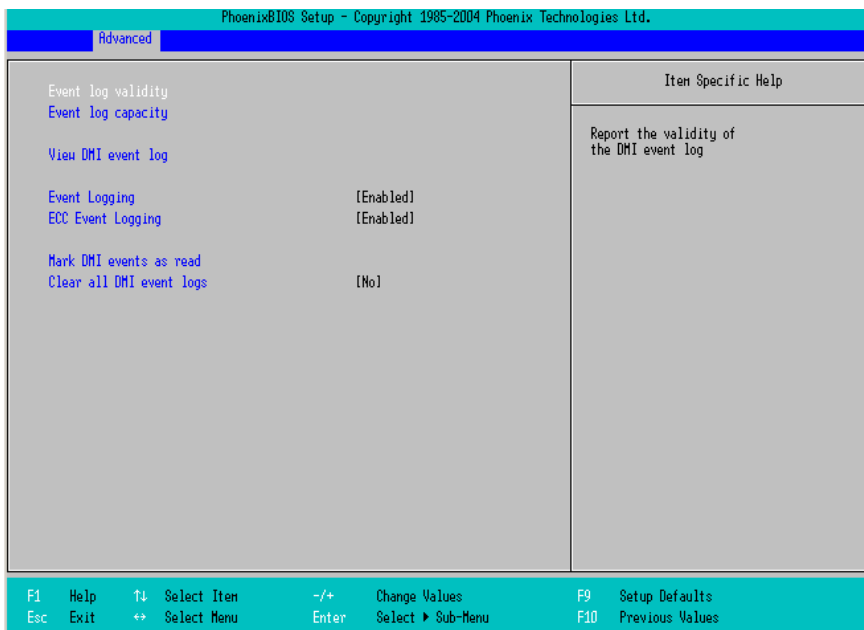
Event Logging
Select Enabled to allow logging of DMI events
        Disabled / **Enabled**

ECC Event Logging
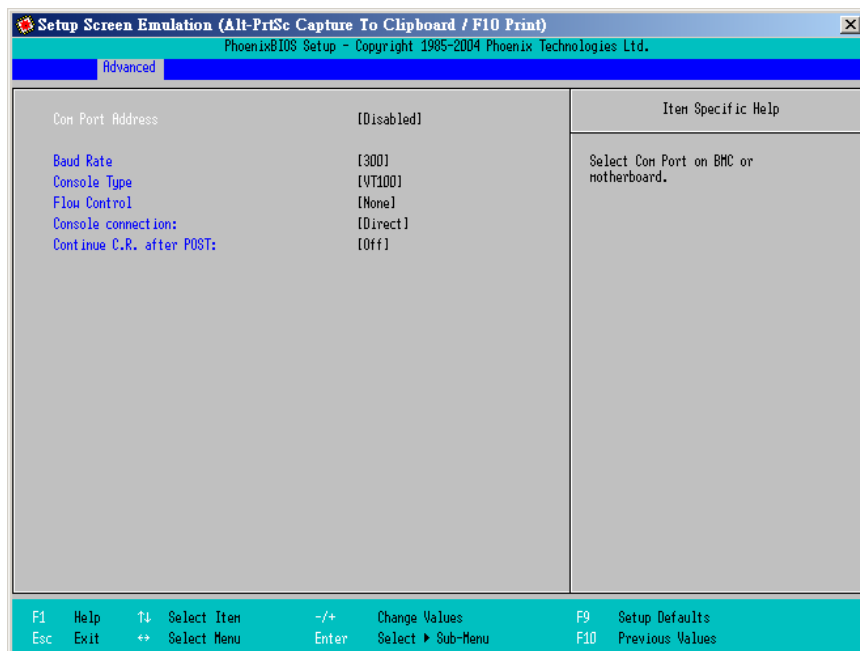Select Enabled to allow logging of ECC events
        Disabled / **Enabled**

Clear all DMI event logs
Setting this to 'Yes' will clear the DMI event log after rebooting.
        No / Yes

3.3.6 Console Redirection

Com Port Address
If enabled it will use a port on the motherboard.
    Disabled / On-board COM A / On-board COM B / NULL

Baud Rate
This feature is used to enable the specified baud rate.
    300 / 19.2K / 1200 / 2400 / 9600 / 38.4K / 57.6K / 115.2K

Console Type
This feature is used to enable the specified console type.
    VT100 / VT100.8bit / PC-ANSI, 7bit / PC ANSI / VT100+ / VT-UTF8 /
    NULL

Flow Control
This feature is used to enable the flow control.
    None / XON/XOFF / CTS/RTS

Console Connection
This feature is used to indicate whether the console is connected directly to the
system or a modem is used to connect.
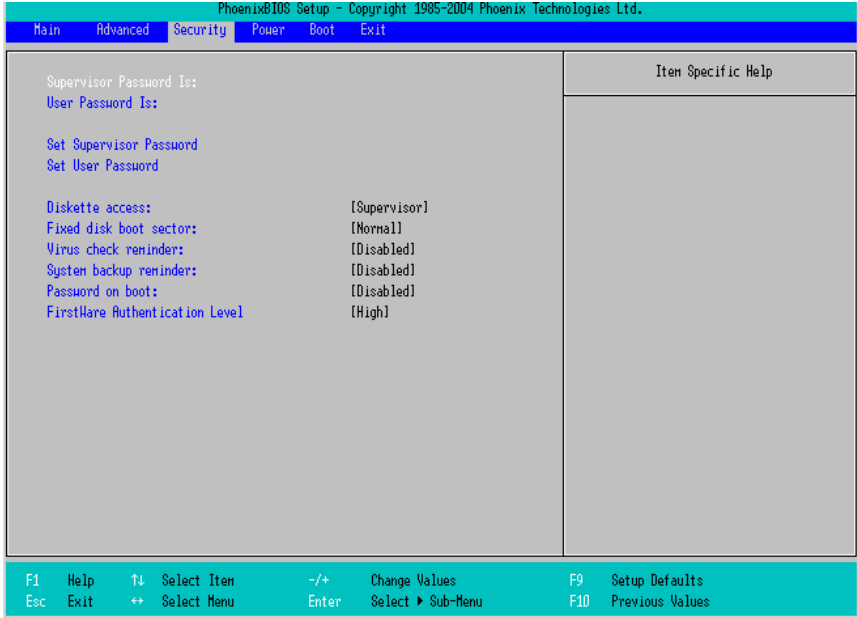   **Direct** / Via modem

Continue C.R. after POST
This feature is used to enable console redirection after OS has loaded.
> **Off** / On

3.4 Security Menu

These settings allow you to configure the security options for your system.

```
               PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
     Main    Advanced   Security   Power   Boot   Exit

                                                              Item Specific Help
        Supervisor Password Is:
        User Password Is:

        Set Supervisor Password
        Set User Password

        Diskette access:              [Supervisor]
        Fixed disk boot sector:       [Normal]
        Virus check reminder:         [Disabled]
        System backup reminder:       [Disabled]
        Password on boot:             [Disabled]
        FirstWare Authentication Level  [High]




     F1    Help    ↑↓  Select Item    -/+   Change Values      F9   Setup Defaults
     Esc   Exit    ↔   Select Menu    Enter Select ▶ Sub-Menu   F10  Previous Values
```

The system displays the current supervisor and user passwords.

Set Supervisor Password
This option allows the supervisor to set the supervisor password to restrict access to the BIOS settings.

Set User Password
This option allows the user to set the user password.

Diskette access
This option allows the user to control access to diskette drives.
> **Supervisor** / Disabled

Fixed disk boot sector
This option allows the user to write protect boot sector on hard disk to protect against viruses.
> **Normal** / Write Protect

Virus check reminder
This feature is used to display reminder message at the boot process.
> **Disabled** / Enabled

System backup reminder
This feature is used to display reminder message at the boot process.
> **Disabled** / Enabled

Password on boot
When enabled, the system will ask for a password at every boot. The system will continue booting only if the correct password is entered. If the wrong password is entered three times, the system will automatically shut down.
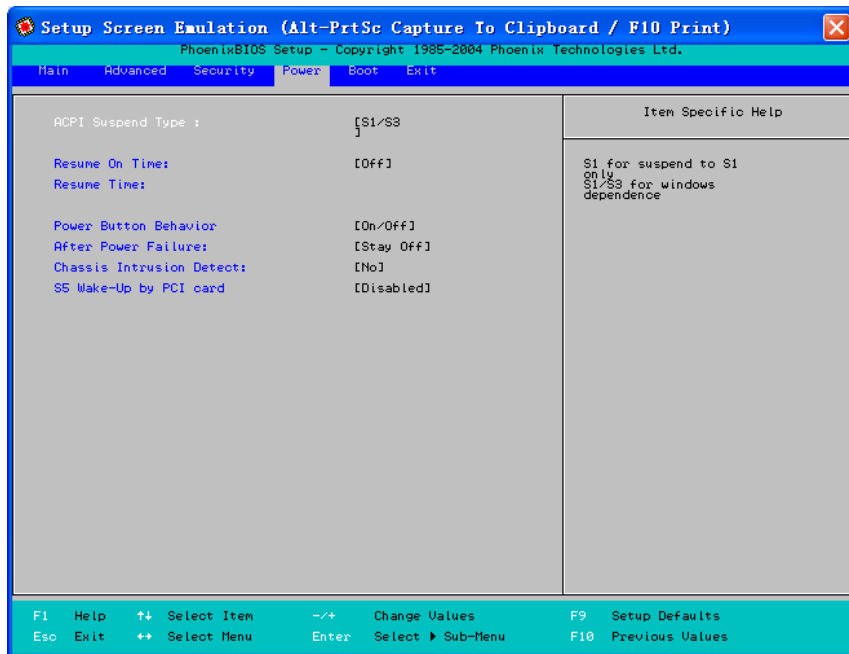> **Disabled** / Enabled

FirstWare Authentication Level
This feature is used to select FirstWare Authentication Level.
> **High** / Medium / Low

3.5 Power Menu

These settings allow you to configure the power options for your system.

```
🔴 Setup Screen Emulation (Alt-PrtSc Capture To Clipboard / F10 Print)      ✕
            PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Main    Advanced    Security    Power    Boot    Exit

                                                            Item Specific Help
    ACPI Suspend Type :              [S1/S3
                                     ]
                                                        S1 for suspend to S1
    Resume On Time:                  [Off]              only
    Resume Time:                                        S1/S3 for windows
                                                        dependence
    Power Button Behavior            [On/Off]
    After Power Failure:             [Stay Off]
    Chassis Intrusion Detect:        [No]
    S5 Wake-Up by PCI card           [Disabled]




    F1    Help    ↑↓  Select Item     -/+    Change Values      F9   Setup Defaults
    Esc   Exit    ↔   Select Menu     Enter  Select ▶ Sub-Menu  F10  Previous Values
```

ACPI Suspend Type
S1 for suspend to S1 only and S1/S3 for windows dependence.
S1/S3 / S1

Resume On Time
When enabled, this allows the system to be worked up at a specified time. This time is specified by the Resume Time parameter.
Off / On

Resume Time
This option allows the user to specify the time when the system is to wake up.

Power Button Behavior
This specifies the behavior of the system after the power button is pressed.
On/Off - This powers on / powers off the system after the power button is pressed.
Wake/Sleep - This wakes the system from/puts the system to sleep.

After Power Failure
Specifies the mode of operation after the system recovers from a power loss.
Enabled: This restores the system to the last state it was in before the power loss occurred.

Chassis Intrusion Detect
This feature is used to enable/disable the function: when chassis open event is detected, BIOS will record the event.
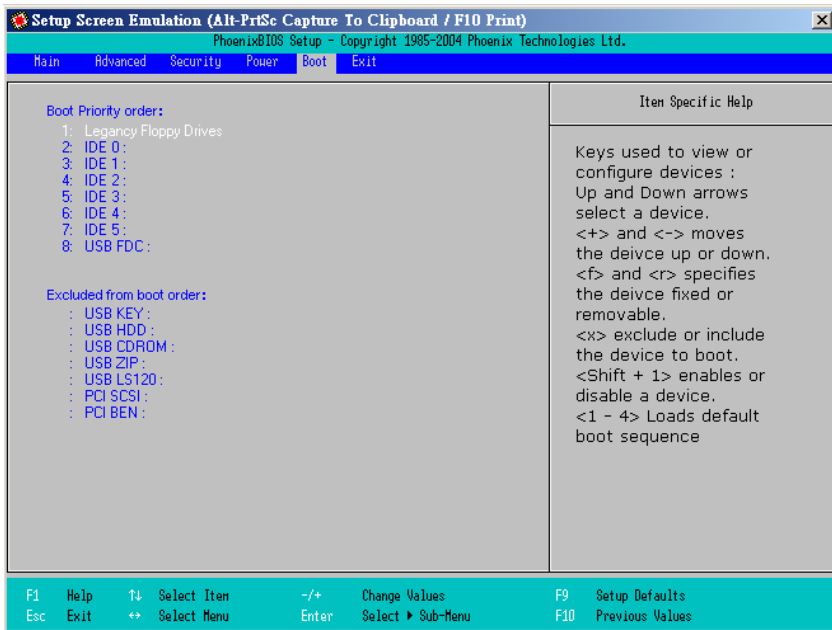**Disabled** / Enabled

S5 Wake-Up by PCI Card
If enabled, this option awakens the system from the S5 (power-off) state with an input signal from PME on the PCI card,
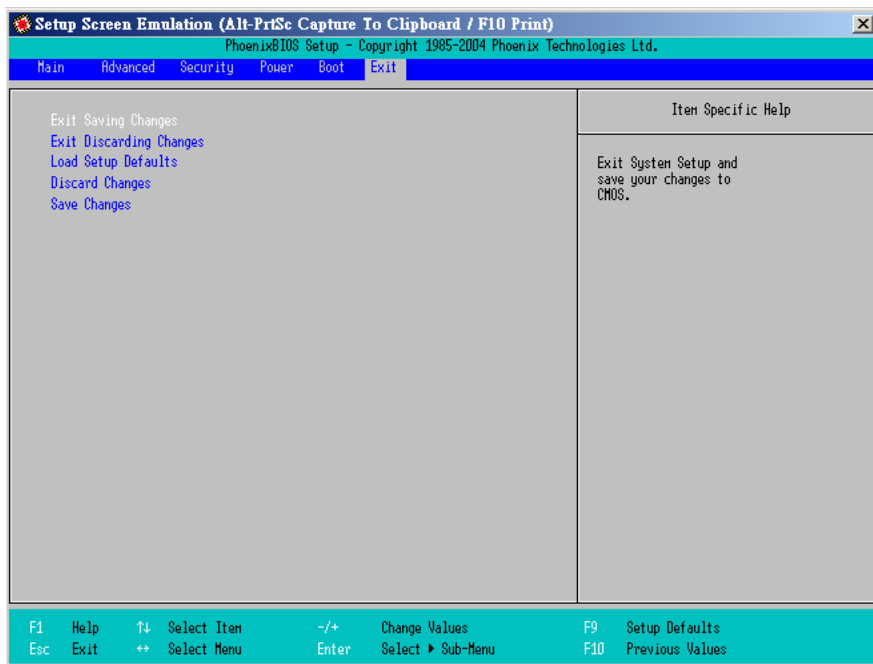**Enabled** / Disabled

3.6 Boot Menu

Use this screen to select options for the Boot Settings Configuration.

3.7 Exit Menu

These settings set the exit options on your system.

Exit Saving Changes
This exits BIOS setup after saving the changes made.

Exit Discarding Changes
This exits BIOS setup after discarding the changes made.

Load Setup Defaults
Loads the factory default values.

Discard Changes
Discards all changes made without exiting BIOS setup.

Save Changes
Saves all changes made without exit BIOS.

Chapter 4: Diagnostics

NOTE: If you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at: http://www.tyan.com.

4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.
•A single long beep followed by two short beeps: It indicates that a video error has occurred and the BIOS can't initialize the video screen to display and additional info.
•A single long beep repeatedly: This indicates that a DRAM error has occurred.
The most common type of error is a memory error.

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

4.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site: http://www.tyan.com/

Note

Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer 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.

4.3 - BIOS Post Code

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.
18h:	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).

POST (hex)	Description
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.
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.

POST (hex)	Description
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
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
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.

POST (hex)	Description
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.
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)

NOTE

Appendix I: SMDC Information

Overview

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 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

Features of Tyan Server Management

Monitor various system components remotely
-such as fans, processor temperature, and more

Remote power on and power off

Console redirect
-the ability to view system remotely

Alert and error actions
-such as audible beep, e-mail, power down and reboot

SMDC runs on stand-by power
-the SMDC will continue to function, even if the system is not powered on

How SMDC and TSO Work

The brief descriptions below will help explain how these items function.

	Agent – a system with SMDC installed The SMDC is installed in the Agent system that uses a compatible/supported Tyan motherboard.
	Manager – manages the Agent The Manger is set up to manage the Agent that has the SMDC. The Manager and Agent should be located in the same place.
	Console – communicates with Manager The Console is used to monitor and control the Agent through the Manager.

Appendix II: How to Make a Driver Diskette

Follow the steps below to make a driver diskette from the TYAN driver CD provided.

1. Start the system and insert the TYAN CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to Tyan diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from hard disk.).

```
Boot from CD:

ISOLINUX 2.00 2002-10-25  Copyright (C) 1994-2002 H. Peter Anvin
0) Boot from first hard drive
1) Boot to TYAN diskette maker
boot: 1_
```

2. Choose the chipset vender which you need from the main menu.

```
                  TYAN Driver Diskette Maker V1.0


                          ** Main Menu**
                    ====Choose Chipset Vendor====
        01        Adaptec
        02        nVidia
        03        LSI
        04        Intel
        05        Promise
        06        Silicon Image
        07        VIA


                  EXIT
```
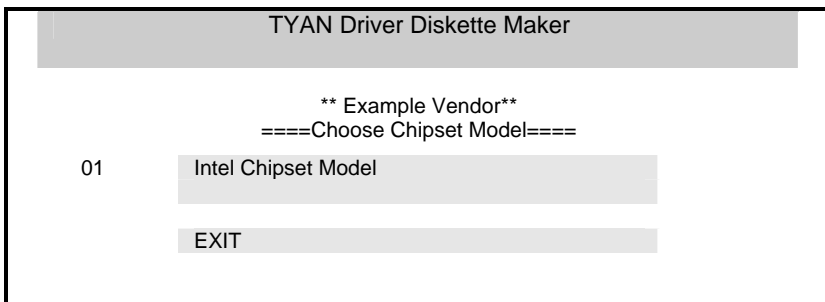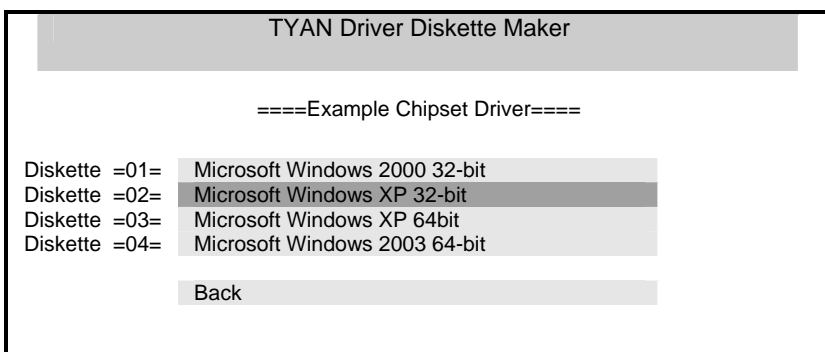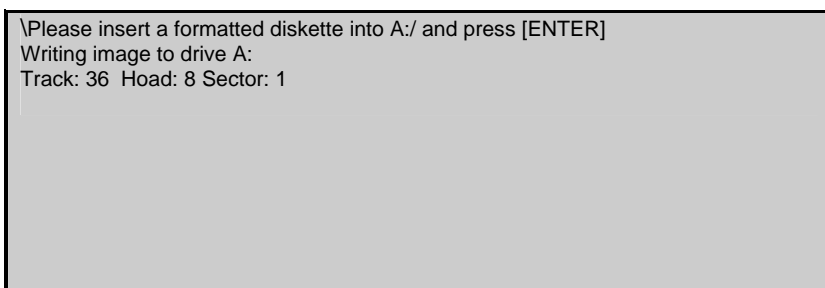
3. The following picture pops up after selecting the chipset model.

TYAN Driver Diskette Maker

** Example Vendor**
====Choose Chipset Model====

01	Intel Chipset Model

EXIT

4. After selecting the chipset model, select the OS to start the diskette making.

TYAN Driver Diskette Maker

====Example Chipset Driver====

Diskette =01=	Microsoft Windows 2000 32-bit
Diskette =02=	Microsoft Windows XP 32-bit
Diskette =03=	Microsoft Windows XP 64bit
Diskette =04=	Microsoft Windows 2003 64-bit

Back

5. Follow the instruction on menu to insert a diskette and press [ENTER].

\Please insert a formatted diskette into A:/ and press [ENTER]
Writing image to drive A:
Track: 36 Hoad: 8 Sector: 1

6. Using "ESC" key to quit the Tyan diskette maker. The system will automatically restart.

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.

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 softare 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.

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