Tiger i7322DP /// S5353

Version 1.0

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Table of Contents

Check the box contents!

The retail motherboard package should contain the following:


1 x Tiger i7322DP S5353 motherboard


1 x 34-Pin floppy drive cable


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


1 x Tiger i7322DP S5353 User's Manual


1 x Tiger i7322DP S5353 Quick Reference Guide


1 x TYAN driver CD


1 x I/O shield


1 x Cable set (9 pin serial and 24 pin parallel)


2 x CEK Spring


1 x Serial ATA power cable

2 x Serial ATA cable


1 x USB2.0 cable

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

NOTE

Chapter 1: Introduction

1.1 - Congratulations

Congratulations on your purchase of the powerful Dual Intel processor solution, the Tiger i7322DP S5353. Based on Intel E7320 chipset, the S5353 offers exceptional performance. Compatible with EPS12V power supplies, the ATX form factor S5353 features an onboard XGI XG20 16MB PCI VGA, two Gigabit Ethernet ports, one 10/100 Ethernet port and SATA/RAID, which provides a versatile solution for your server needs.

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

1.2 - Hardware Specifications

Processors

- Two mPGA604 sockets
- Supports up to two 64-bit Intel® Xeon processors (including dual-core processors) with 800MHz FSB

Expansion Slots

- One PCI-X 1.0 64-bit/66MHz slot
- One 32-bit/33MHz PCI 2.3 slot
- One TYAN TARO SO-DIMM socket
- One x4 PCIe connector

Chipset

- Intel Lindenhurst-VS (E7320) MCH
- Intel Hance Rapids (6300ESB) South Bridge
- SMSC DME1737 LPC I/O chip

System Management

- SMSC DME1737 and EMC6D102 (or ADM1027) w/ hardware monitoring
- Two 3+1-pin CPU Fan headers w/ tachometer input and programmable temperature-sensing fan speed control

Integrated LAN Controllers

- One 10/100 LAN controller
  —One Intel i82551QM LAN controller
  —Operating at 32bit/33MHz interface
- Two GbE LAN controllers
  —One Broadcom BCM5721 PCI-Express GbE LAN controller
  —One Broadcom BCM5705(W) PCI GbE LAN controller
- Pin Headers for front panel LAN LED

Optional Modules

- M3291, IPMI 2.0 Remote System Management Daughter Card
  -Renesas H8S2167 BMC controller
  -BT, KCS, Logging support
  -IPMI-over-LAN
  -Remote power on/off and reset
- M7901/M7902, single/dual-channel Ultra 320 SCSI controller TARO card
  -Adaptec AIC-7901/7902 controller
  -Adaptec Host RAID 0, 1, 10

- Seven 3-pin system Fan headers, 5 w/ tachometer input and programmable temperature-sensing fan speed control
- Temperature and voltage monitoring
- Chassis intrusion header
- IPMB connector for optional Tyan M3291 SMDC card
- Watchdog timer

Integrated PCI Graphics

- XGI XG20 graphics controller
- 16MB DDR frame buffer of video memory

Memory

- Dual memory channels, 6 x DIMM sockets
- Supports up to six DDR2-400 DIMMs
- Registered ECC memory supported

Integrated PCI IDE (6300ESB)

- Dual channel master mode support four IDE devices
- Support for ATA-100/66/33 IDE drives and ATAPI compliant devices

Integrated Serial ATA (6300ESB)

- Two serial ATA host controllers embedded
- Supports two serial ports running at 1.5Gb/s
- RAID 0 or 1 supported (Windows 32-bit Only)
- SATA activity LED connector

Back Panel I/O Ports

- Stacked PS/2 mouse & keyboard ports
- Stacked two USB2.0 and one RJ45 10/100 ports with activity LED
- One 15-pin VGA port
- One 9-pin COM port
- Two RJ45 10/100/1000 Base-T port w/ activity LED

- M9000 SAS/SATA II TARO card
  -Adaptec AIC-9405/9410 SAS controller
  -Supports up to 4-port (M9000-5) and 8-port (M9000-10) SAS & SATA running at 3.0Gb/s
  -Adaptec HostRAID 0, 1 & 10

Integrated I/O Interfaces

- One floppy connector
- Two USB 2.0 ports (via cable)
- One COM2 port (via cable)
- One LPT port (via cable)
- TYAN 2 x 9 pin header
- 2 x 25 connector for optional IPMI SMDC card

BIOS

- Phoenix BIOS 8Mbit Flash
- Supports APM 1.2 & ACPI 1.0
- PnP, DMI2.0, WfM2.0 power Management

Form Factor

- SSI CEB footprint
- 10.2" x 12.0” (259mm x 305mm)

Power

- On board dual 4-phase VRM
- EPS 12V (24-pin + 8-pin) power connectors

Regulatory

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

Chapter 2: Board Installation

Precautions: The Tiger i7322DP supports SSI, EPS12V type power supplies (24pin + 8pin) and will not operate with any other types. For proper power supply installation procedures see page 37.

DO NOT USE ATX 2.x or ATXGES power supplies as they will damage the board and void your warranty.

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:

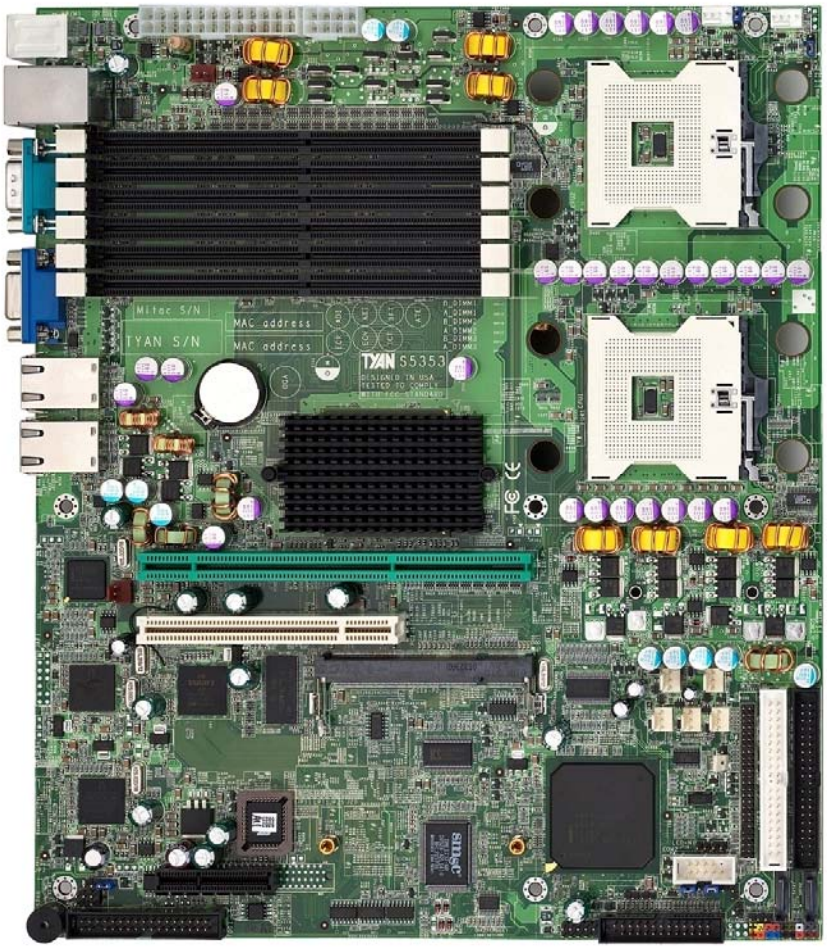
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.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

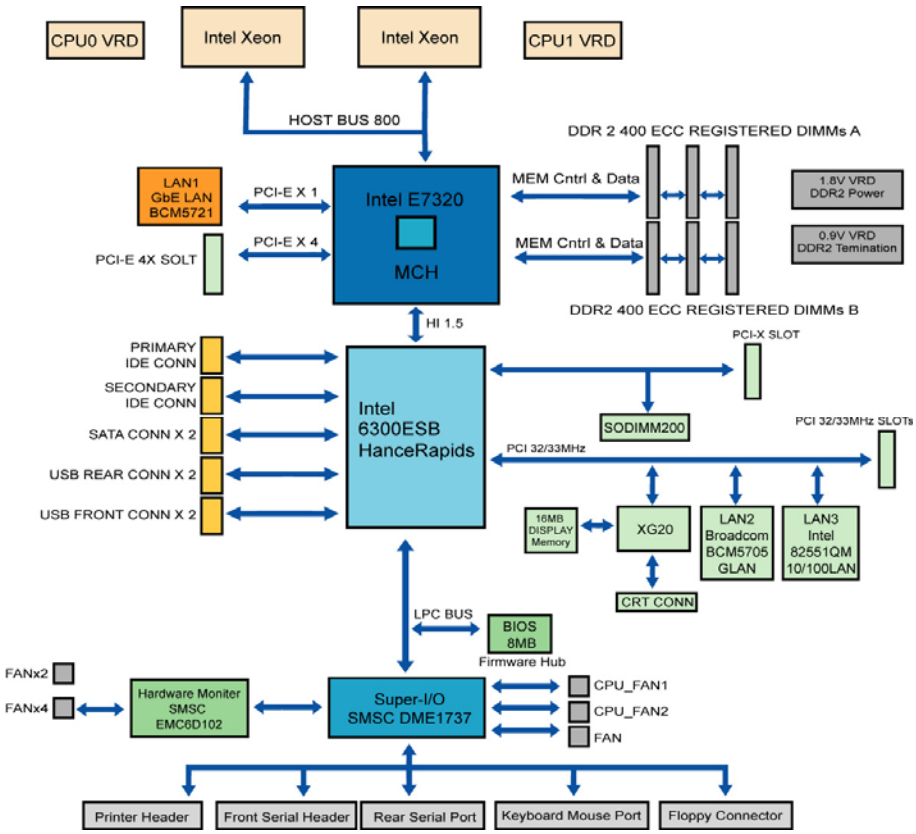
2.1- Board Image

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.



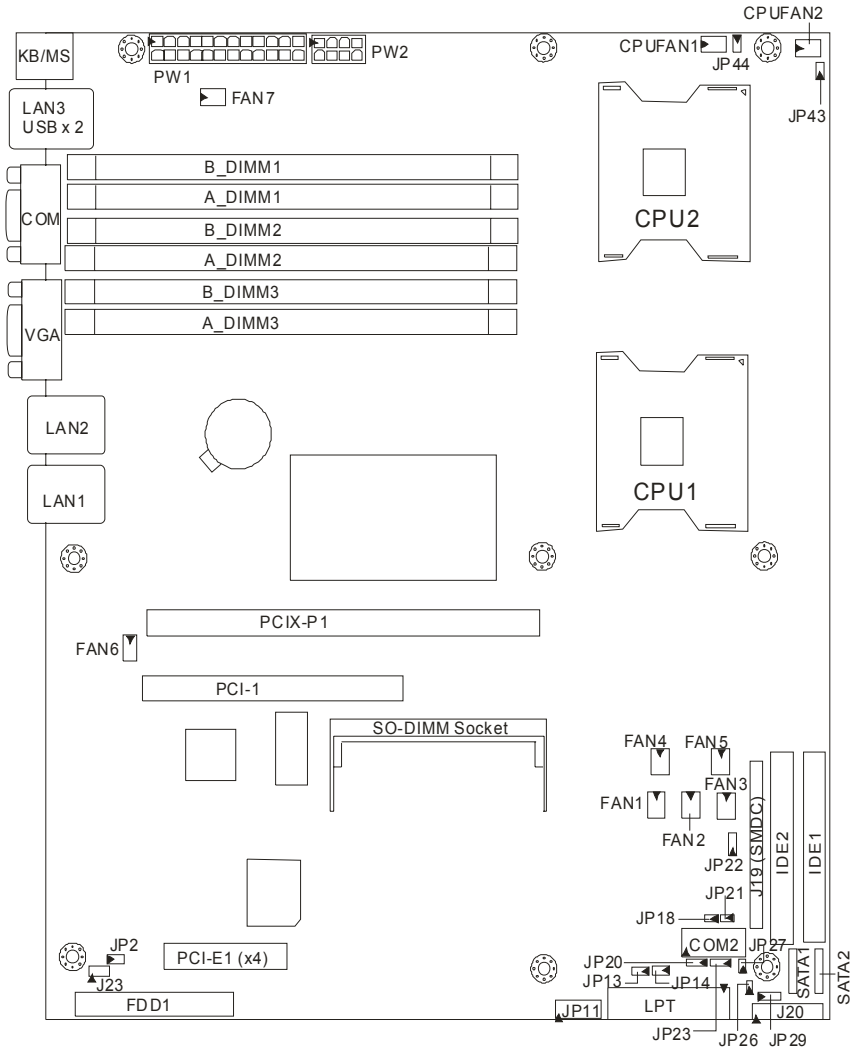
The following page includes details on the vital components of this motherboard.

2.2 - Block Diagram



Tiger i7322DP (S5353) Block Diagram

2.3 - Board Parts, Jumpers and Connectors

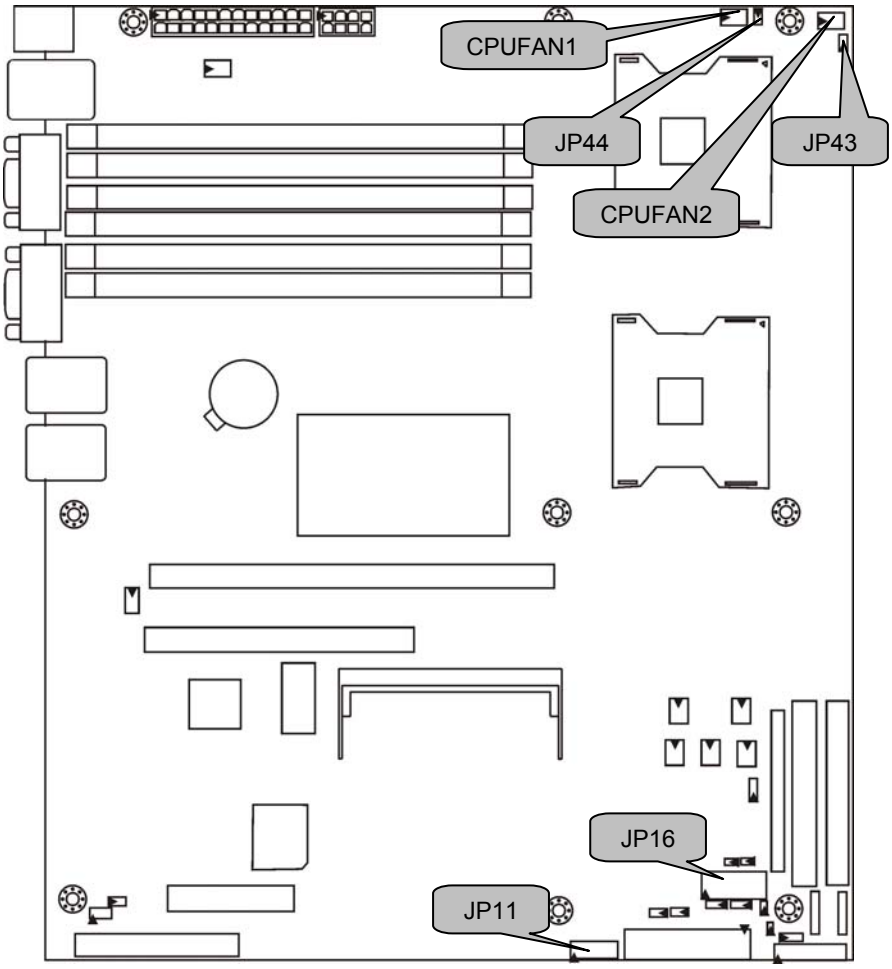


This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

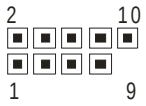
Jumper Legend

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

Jumper/Connector	Function
FAN6/FAN7	3-pin Chassis Fan Connector
CPUFAN1/CPUFAN2	4-pin CPU Fan Connector
JP43/JP44	CPU Fan Support 4-pin or 3-pin Select Jumper (Close 1-2) Default support 3-pin (Close 2-3) support 4-pin
FAN1~FAN5	3-pin System Fan Connector
JP16	COM2 Connector
JP11	USB Front Panel Connector
J20	Front Panel Header
J19	SMDC Connector
JP13	External HDD LED Header
JP14	SATA LED Header
JP2	External Speaker Connector (Close 3-4) Default, Buzzer
JP29	3-pin Power LED Connector
JP18/JP21	BCM5721 External LAN1 Connector
JP26/JP27	BCM5705 External LAN2 Connector
JP20/JP23	SMDC/ASF2.0 Select Jumper (Close 1-2) Default, support ASF 2.0 (Close 2-3) support SMDC card
JP22	Clear CMOS Jumper (Close 1-2) Default (Close 2-3) Clear CMOS
J16	SO-DIMM Socket
J23	Reserved for OEM only


CPUFAN1
JP44
JP43
CPUFAN2
JP16
JP11

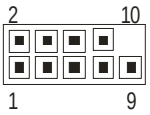
JP11: USB Front Panel Header



Use this header to connect to front panel USB connector.

Signal	Pin	Pin	Signal
USBPWR	1	2	USBPWR
USB_2D-	3	4	USB_3D-
USB_2D+	5	6	USB_3D+
GND	7	8	GND
KEY	9	10	NC

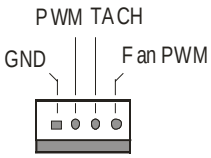
JP16: COM2 Connector



Use these pin definitions to connect a port to COM2.

Signal	Pin	Pin	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	KEY

CPUFAN1/CPUFAN2: CPU Fan Support 4-pin Connector

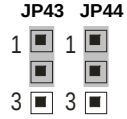


Use these headers to connect the cooling fans to the motherboard to keep the system stable and reliable.

Pin 1	Pin 2	Pin 3	Pin 4
GND	PWM	TACH	Fan PWM

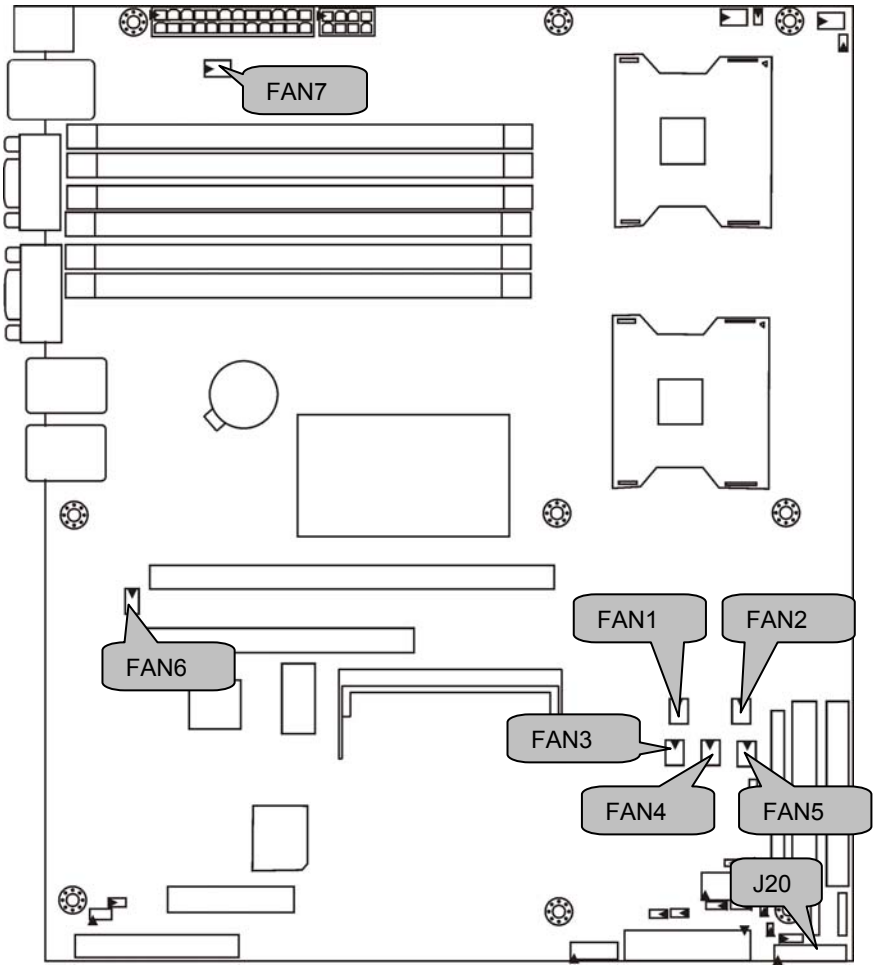
JP12: CPUFAN1 JP31: CPUFAN2

JP43/JP44: CPU Fan Support 4-pin or 3-Pin Select Jumper

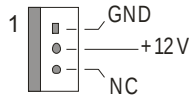


Use the default setting if the CPU fan has a 3-pin fan power connector.

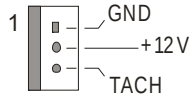
Select this setting if the CPU fan has a 4-pin fan power connector.


FAN7
FAN6
FAN1
FAN2
FAN3
FAN4
FAN5
J20

FAN6/FAN7: 3-pin Fan Connector

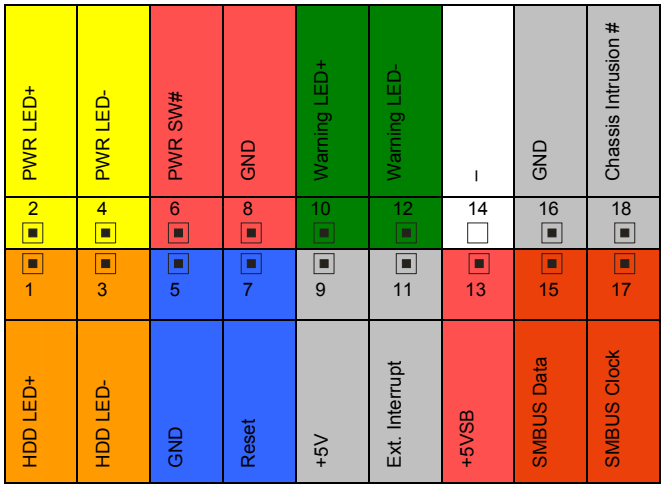
	Use these headers to connect the cooling fans to the motherboard to keep the system stable and reliable. JP3: FAN6 JP7: FAN7

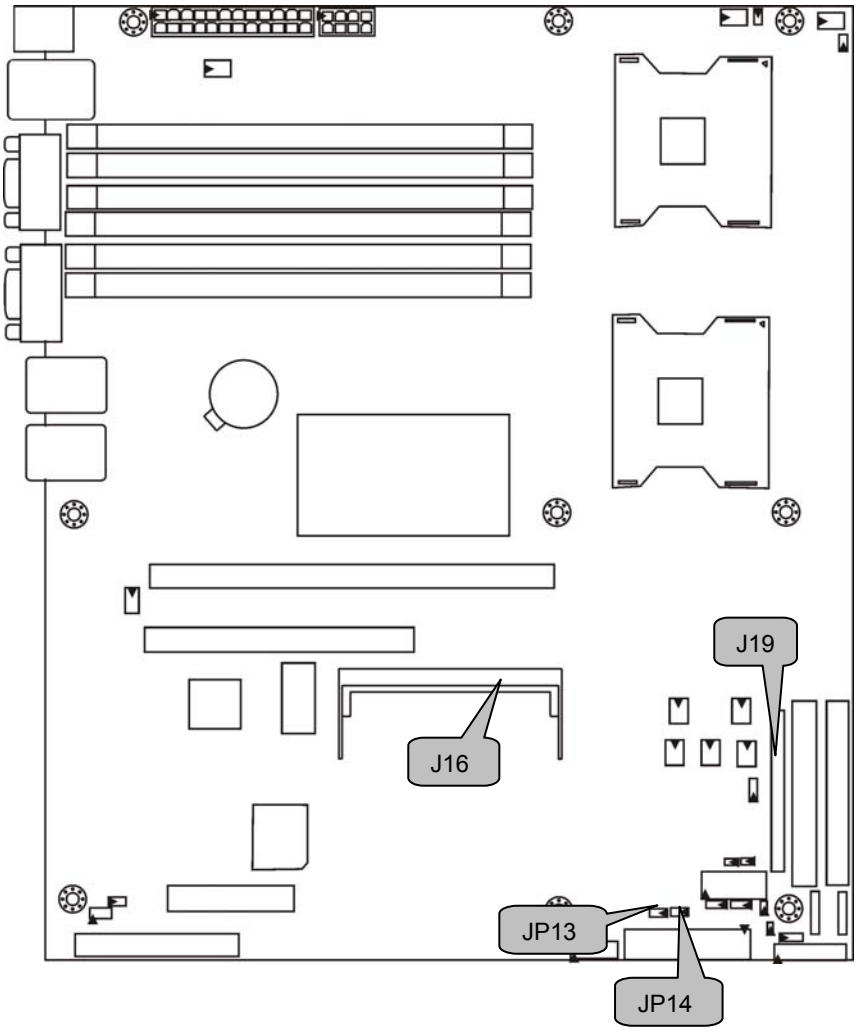
FAN1/FAN2/FAN3/FAN4/FAN5: 3-pin Fan Connector with Speed Control

	Use these headers to connect the cooling fans to the motherboard to monitor their fan speeds to keep the system stable and reliable. JP15: FAN1 JP17: FAN2 JP19: FAN3 JP24: FAN4 JP28: FAN5

J20: Front Panel Header

The motherboard provides one front panel header for electrical connection to the front panel switches and LED's.




J19
J16
JP13
JP14

JP13: External HDD LED Connector

Use this header to connect for external HDD LED's.

Pin 1	Pin 2
GND	EXT_HDLED

JP14: SATA LED Connector

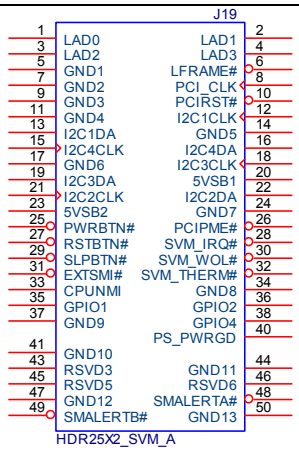
Use this header to connect SATA LED's to indicate the status of the SATA RAID.

Pin 1	Pin 2
3.3V	SATALED-

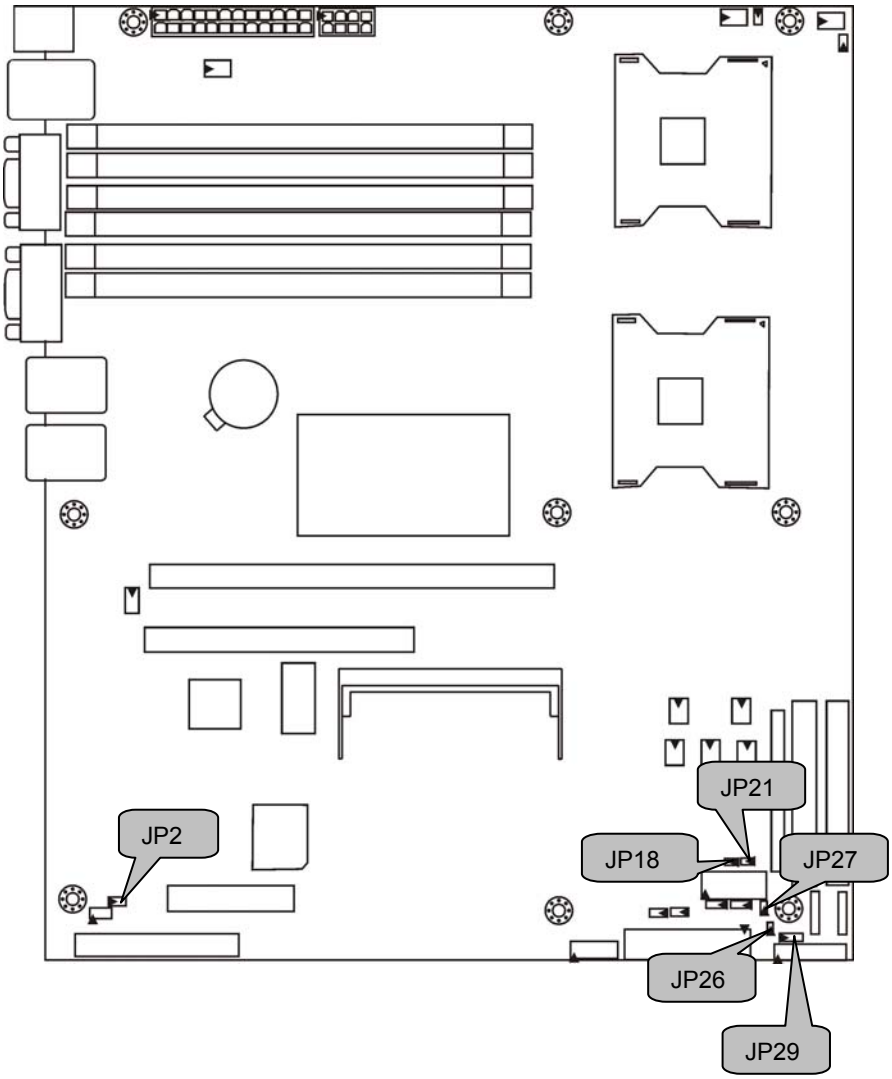
J16: SO-DIMM Socket

Connect SAS/SATA II Daughter Card (compatible with Tyan M9000-10, M7901/7902 Ultra 320 SCSI "TARO" card).

J19: SMDC Connector



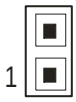
For connection with Tyan Server Management Daughter Card (SMDC). The SMDC connector is compatible with Tyan M3291 SMDC.


JP21
JP2
JP18
JP27
JP26
JP29

JP18/JP21: BCM5721 External LAN1 Connector

JP18 (Link/Activity)		JP21 (10/100/1GM)	
Pin 1	Pin 2	Pin 1	Pin 2
3.3VSB	LAN1_ACT-	1000M+	100M+

JP26/JP27: BCM5705 External LAN2 Connector

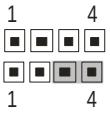


JP27 (Link/Activity)		JP26 (10/100/1GM)	
Pin 1	Pin 2	Pin 1	Pin 2
3.3VSB	LAN2_ACT-	1000M+	100M+

JP29: 3-pin Power LED Header

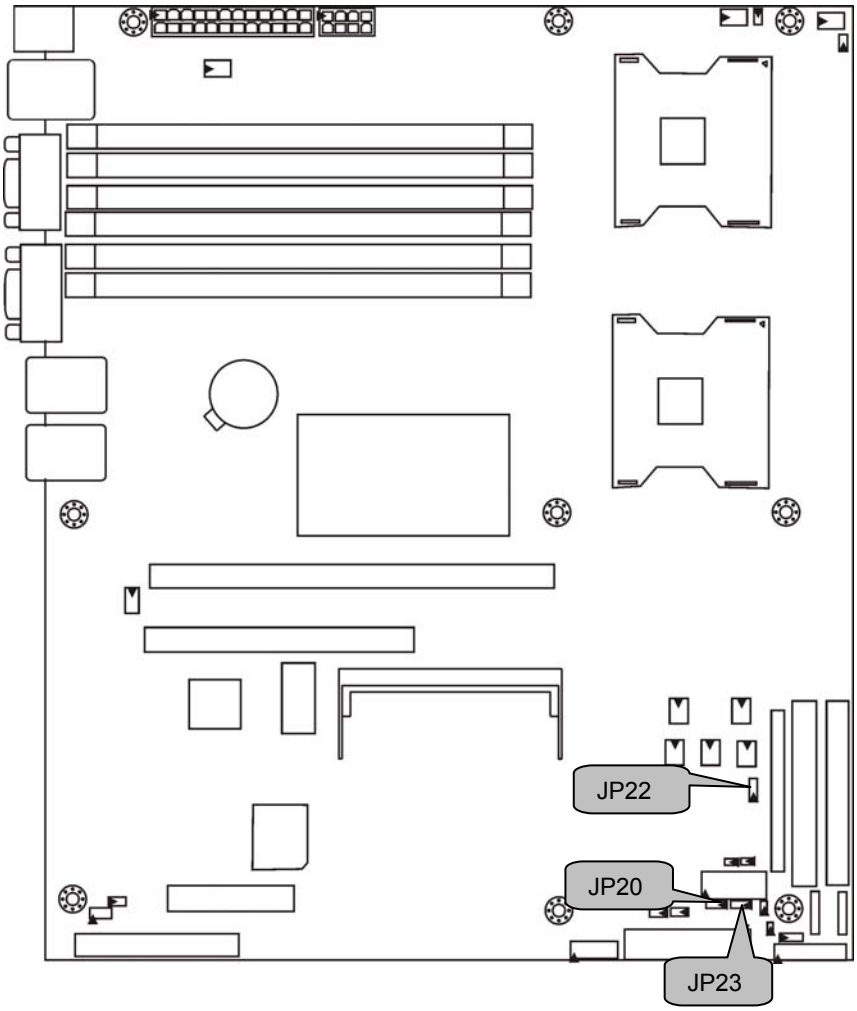
Pin 1	Pin 2	Pin 3
PWRLED+	NC	GND

JP2: External Speaker Header



Pin 1	Pin 2	Pin 3	Pin 4
VCC	NC	INTSP	SPK3

Close Pin 3-4: Buzzer (Default)


JP22
JP20
JP23

JP22: Clear CMOS Jumper

 (Clear)	You can reset CMOS settings by using this jumper if you have lost your system/setup password or need to clear the system BIOS settings. Power off the system and set JP22 to (2-3) position, and then power on the system. The CMOS will be cleared when the POST screen is visible. Finally shut down the power and move JP22 to it's default (1-2) position and power on the system again.
 (Default)	

JP20/JP23: SMDC/ASF2.0 Select Jumper

	Support ASF2.0, only applies to LAN1 (5721)
	Supports M3291 SMDC card which only applies to LAN3 (82551)

2.4 – Mounting the Motherboard

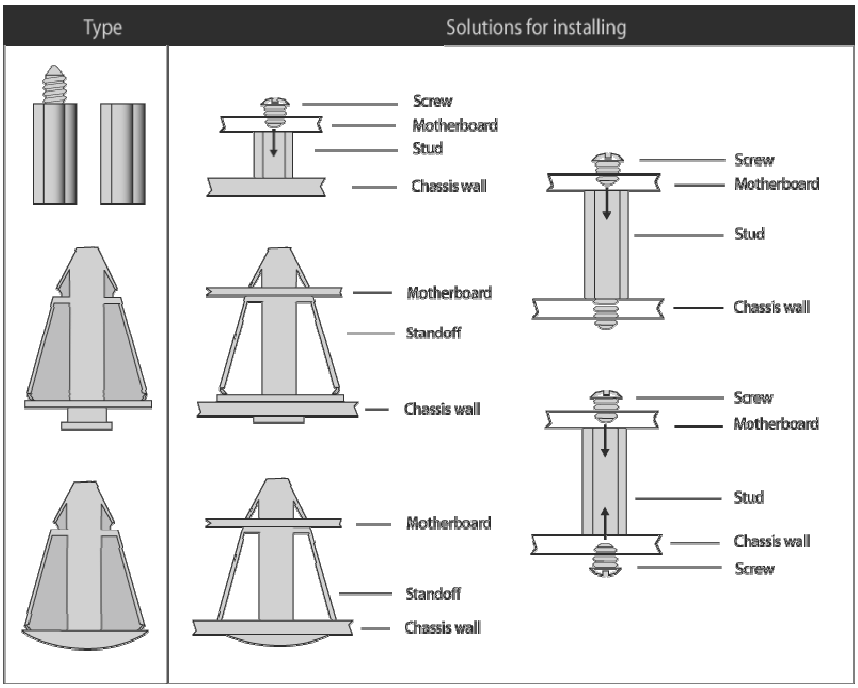
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard 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.

Pay attention when installing board in chassis. Some components are near the mounting holes and can be damaged.

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 Memory

Before attempting to install any memory, make sure that the memory you have is compatible with the motherboard as well as the processor.
The following diagram shows common types of DDR2 memory modules.
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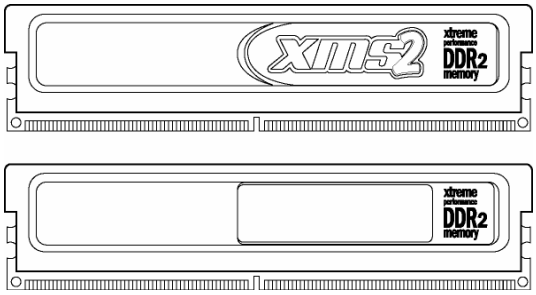


Key points to note before installing memory into Tiger i7322DP:

For optimal dual-channel DDR operation, always install memory in pairs beginning with A_DIMM1 and B_DIMM1. Memory modules of the same type and density are required for dual-channel DDR operation. Mismatched memory may cause system instability.

Refer to the following table for supported DDR2 populations.

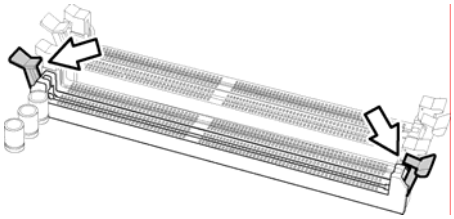
	Option 1	Option 2	Option 3
A_DIMM1	Install	Install	Install
B_DIMM1	Install	Install	Install
A_DIMM2	X	Install	Install
B_DIMM2	X	Install	Install
A_DIMM3	X	X	Install
B_DIMM3	X	X	Install

128MB, 256MB, 512MB, 1GB, 2GB Registered ECC DDR2-400 SDRAM memory modules are supported. All installed memory will be automatically detected. The Tiger i7322DP S5353 supports up to 16GB of memory.

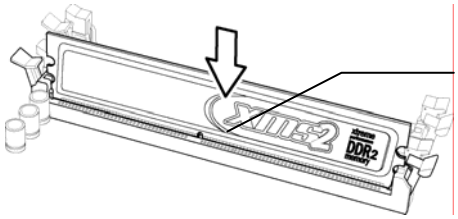
Memory Installation Procedure

Follow these instructions to install memory modules into the Tiger i7322DP S5353.

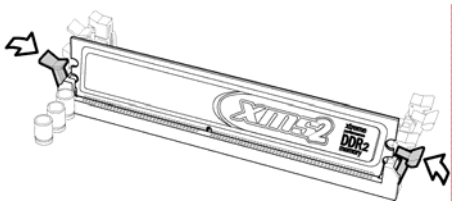
1. Press the locking levers in the direction shown in the following illustration.



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



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



2.6 - Installing the Processor and Cooling Fan

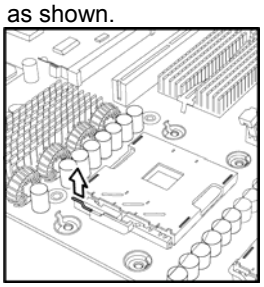
Your Tiger i7322 S5353 supports the latest processor technologies from Intel. Check the TYAN website for latest processor support:

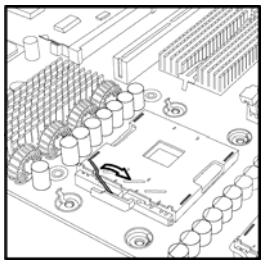
http://www.tyan.com

Processor Installation

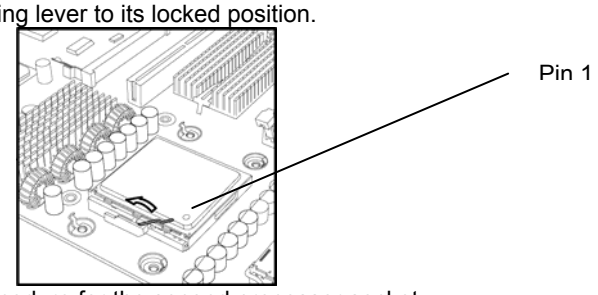
The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.
Follow these instructions to install your processor and heat sink.

1. Locate the processor sockets on the motherboard and lift the locking lever as shown.

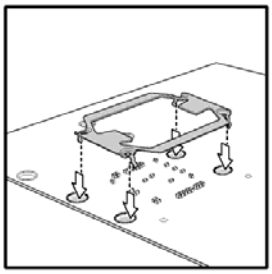




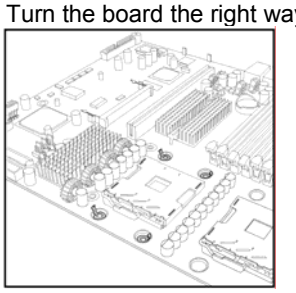
2. Insert the processor into the socket making sure that pin 1 is correctly located.
3. Return the locking lever to its locked position.

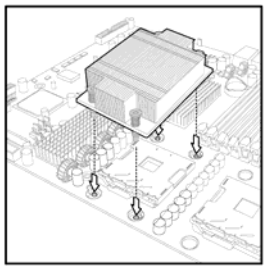


4. Repeat this procedure for the second processor socket.
5. Turn the board upside down and insert the heat sink spring mechanism as shown.



6. Turn the board the right way up again and screw the heat sink into place.





7. Repeat this procedure for the second processor.

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.

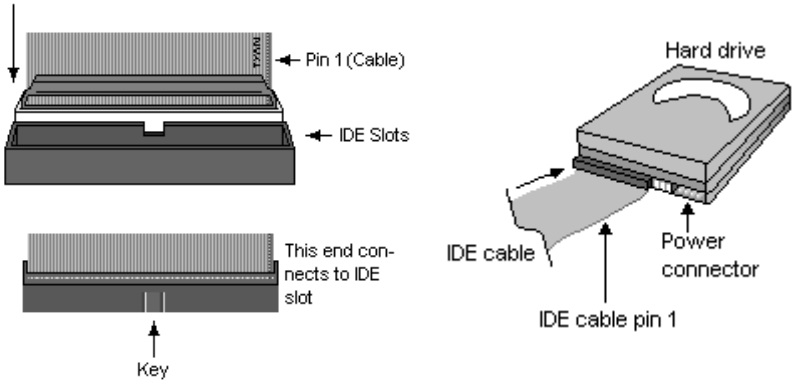
Follow these instructions to install the heatsink shown.

1. Apply some (a little will work, more doesn't equal better performance) thermal compound 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.

2.10 - Attaching Drive Cables

Attaching IDE Drive Cable
Attaching the IDE drive cable is simple. The cable is “keyed” to only allow it to be connected in the correct manner.

Attaching IDE cable to the IDE connector is illustrated below:



Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector and the other end into the IDE device itself. Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two connectors. The other two connectors are used to connect additional IDE devices.

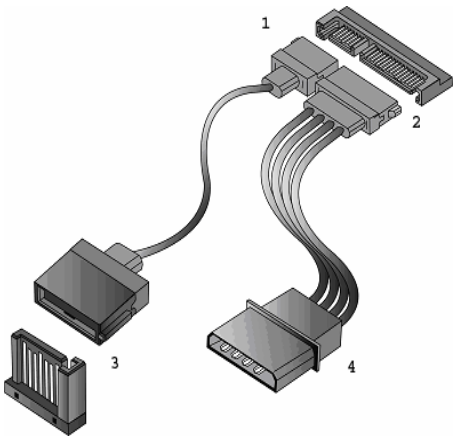
Note: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it properly.

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

Attaching Serial ATA Cables
The Tiger i7322DP 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.

The following pictures illustrate how to connect an SATA drive



1.SATA drive cable connection

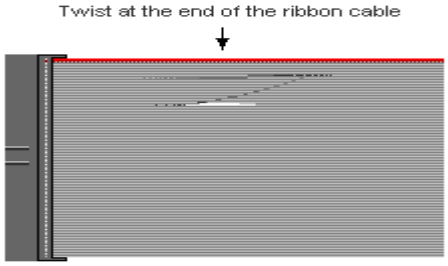
2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

Attaching Floppy Drive Cables

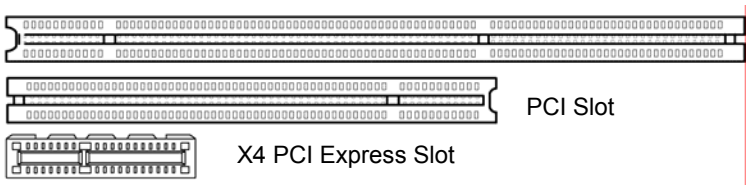
Attaching floppy diskette drives are done in a similar manner to hard drives. See the picture below for an example of a floppy cable. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there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



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:**).

2.11 - Installing Add-In Cards

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



Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

NOTE

YOU MUST ALWAYS unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

PCI, PCI-X and PCI Dives IDESEL and IRQ Assignments

Intel 6300ESB HanceRapids

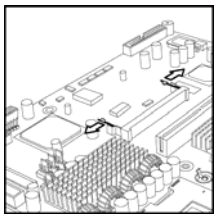
PCI INTERRUPT / IDSEL MAP							
		PCI Bus	**DEVICE**	**IDSEL**	**INT**	**REQ/GNT**	**CLK**
Intel 82551QM	U1	04	02	AD18	PIRQC_N	P_REQN-3 P_GNTN-3	PCICLK3
BCM5705	U2	04	01	AD 17	PIRQB_N	P_REQN-2 P_GNTN-2	PCICLK2
XG20	U61	04	03	AD 19	PIRQA_N	NC	PCICLK4
PCI Slot 1	J16	04	00	AD16	PIRQ-F,G,H,E	P_REQ-1 P_GNT-1	PCICLK1
PCI-X1 Slot 1	J15	03	03	PA_AD19	PA_IRQ-0,1	PA_REQ-0 PA_GNT-0	PA_PCLK0
Tyan Taro Card	J17	03	07	PA_AD23	PA_IRQ-2,3	PA_REQ-1 PA_GNT-1	SODIMM PCLK

PCI INTERRUPT / IDSEL MAP							
BCM5721	U4	01	00				LAN1CLK_100M_P LAN1CLK_100M_N
PCIE1_4X	J14	02	00				SOLT1CLK_100M_P SOLT1CLK_100M_N

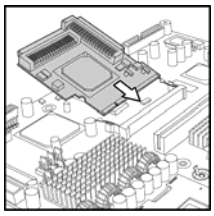
2.12 - Installing Optional SO-DIMM Modules

Your Tiger i7322DP S5353 motherboard is equipped with an optional proprietary SO-DIMM connector. The SO-DIMM connector can be used for expansion cards to provide such features as, additional SAS/SATA II or SCSI support. For details of available expansions cards, visit the TYAN website at http://www.tyan.com. To install a SO-DIMM expansion card:

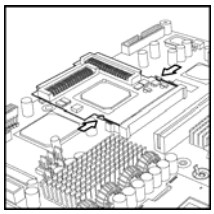
1. Open the spring levers as shown.



2. Insert the SO-DIMM card as shown, making sure that the card is the right way up. The card will fit in only one way and the screw holes in the card should line up exactly with the mounting posts on the motherboard.

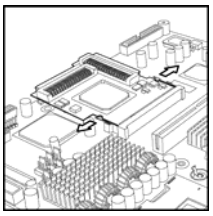


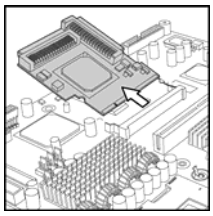
3. Push the SO-DIMM card down into place and make sure the spring levers click into place as shown.



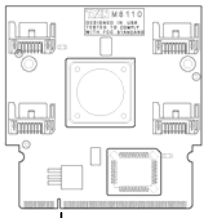
4. Screw the board into place using one or two screws as required.

Removal of a SO-DIMM card is a reversal of the installation procedure. Push out the spring levers as shown and pull the card out of the socket.



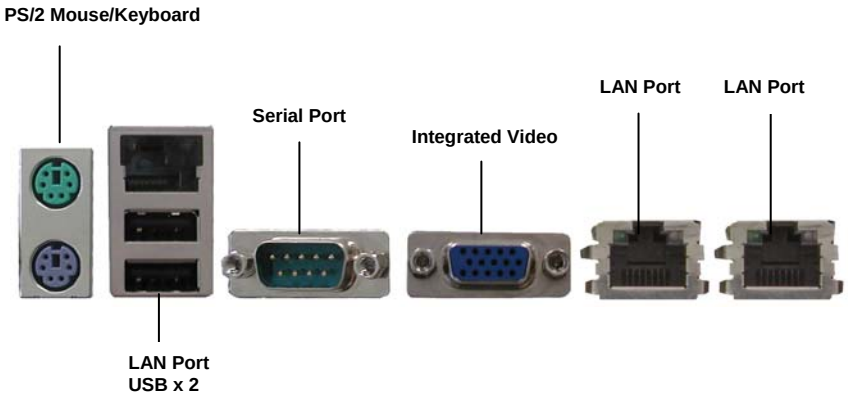


The SO-DIMM expansion cards will fit in the slot only one way. Make sure that you align the slot in the card with the key in the card slot.



2.13 - Connecting External Devices

Your motherboard supports a number of different interfaces for connecting peripherals. Some I/O ports may not be available with the board due to the different configurations.



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

Onboard LAN LED Color Definition
The two onboard Ethernet ports have green and yellow LED's to indicate LAN status. The chart below illustrates the different LED states.

	10/100/1000 Mbps LAN Link/Activity LED Scheme		
	Speed	**Left LED**	**Right LED**
Left Right 	**Link 10Mbps**	Green (Blink)	Off
	Activity 10Mbps		Off

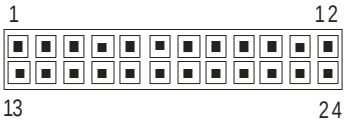
	Link 100Mbps	Green (Blink)	Green
	Activity 100Mbps		Green (Blink)
	Link 1000Mbps	Green (Blink)	Yellow
	Activity 1000Mbps		Yellow (Blink)

2.14- Installing the Power Supply

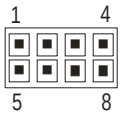
There are two power connectors on your Tiger i7322DP.
The Tiger i7322DP requires an EPS12V (24 pin + 8 pin) power supply to boot.

Please be aware that ATX 2.x and ATXGES power supplies are **not compatible** with the board and can damage the motherboard and/or CPU(s).

EPS12V Main Power 24-Pin
(Chipsets & Components)



12	**+3.3V**	**24**	**GND**
11	**+12V3**	**23**	**+5V**
10	**+12V3**	**22**	**+5V**
9	**+5VSB**	**21**	**+5V**
8	**PWR OK**	**20**	**RESET**
7	**GND**	**19**	**GND**
6	**+5V**	**18**	**GND**
5	**GND**	**17**	**GND**
4	**+5V**	**16**	**PS_ON**
3	**GND**	**15**	**GND**
2	**+3.3V**	**14**	**-12V**
1	**+3.3V**	**13**	**+3.3V**



EPS 12V 8-pin (CPU Power)

4	**GND**	**8**	**+12V2**
3	**GND**	**7**	**+12V2**
2	**GND**	**6**	**+12V1**
1	**GND**	**5**	**+12V1**

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 from the wall outlet before plugging the power cables to motherboard connectors.

2.14 – Finishing Up

Congratulations! 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 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 **calling your vendor's support line**. If they are not available for assistance, please find setup information and documentation online at our website**.**

NOTE

Chapter 3: BIOS

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. This chapter describes different settings for the BIOS that can be used to configure your system.
The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print, and therefore may not match exactly what is displayed on screen.
This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information when the power is turned off.
This motherboard's BIOS is a customized version of the industry-standard BIOS for IBM PC AT-compatible personal computers. The BIOS provides critical, low-level support for the system's central processing unit (CPU), memory, and I/O subsystems.
This BIOS has been customized by adding important features such as virus and password protection, power management, and chipset "tuning" features that control the system. This section will guide you through the process of configuring the BIOS for your system setup.

Starting Setup

The BIOS is immediately activated when you turn on the computer. The BIOS reads system configuration in CMOS RAM and begins the process of checking out the system and configuring it through the Power-On-Self-Test (POST).
When these preliminary tests are complete, the BIOS searches for an operating system on one of the system's data storage devices (hard drive, CD-ROM, etc). If one is found, the BIOS will launch that operating system and hand control over to it.
You can enter the BIOS setup by pressing the **[Delete]** key when the machine boots up and begins to show the memory count.

Setup Basics
The table below shows how to use the setup program with 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.

Getting Help

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

In Case of Problems

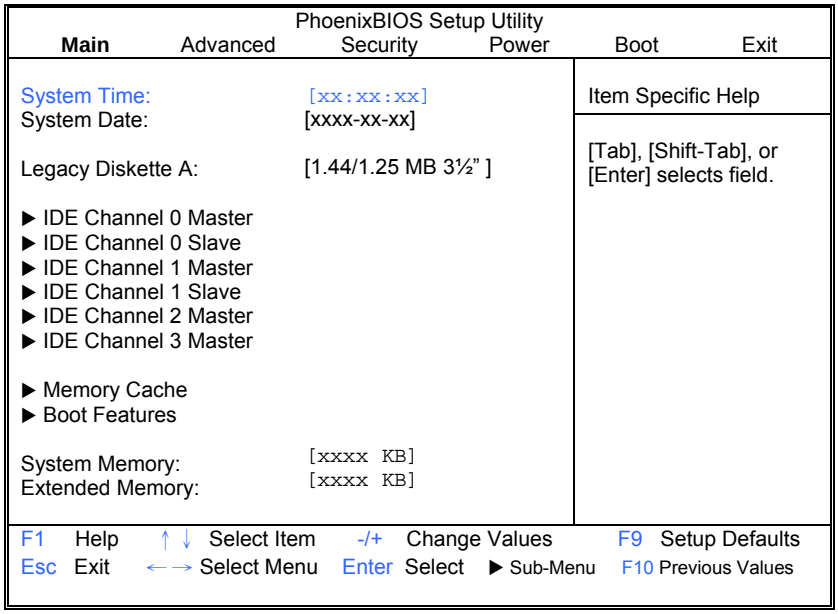
If you discover that you have trouble booting the computer after making and saving the changes with the BIOS setup program, restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best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

Setup Variations

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

3.2 Main BIOS Setup

When you enter PhoenixBIOS CMOS Setup Utility, the following screen will appear as below:



The main menu contains the following menu items:

Main
Use this menu for basic system configuration.

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

Security
Use this menu to configure security settings for your system.

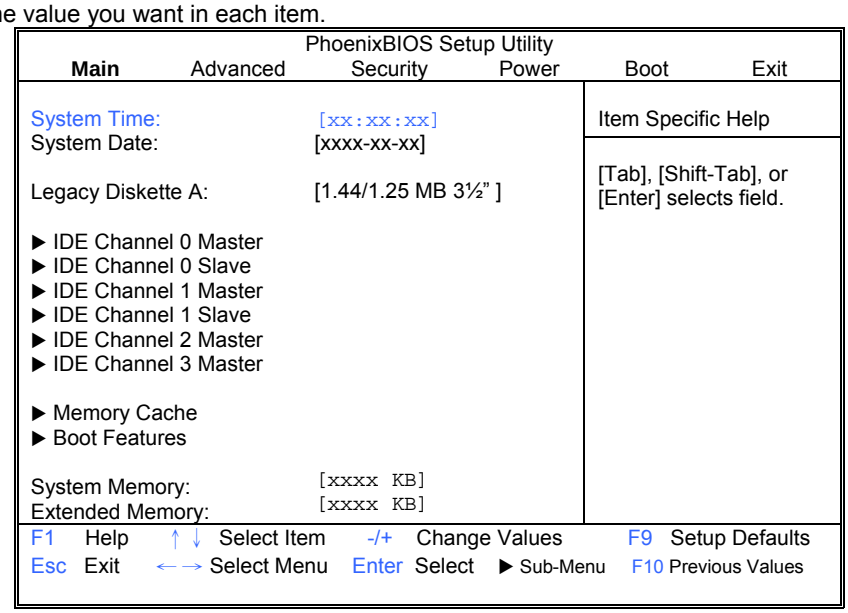
Power
Use this menu to specify your settings for power management.

Boot
Use this menu to configure boot options for your system.

Exit
This contains the various BIOS exit options.

3.3 Main

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



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.
Options: NONE / 360K, 5.25 in / 1.2 M, 5.25 in / 720 K, 3.5 in / **1.44 M, 3.5 in /** 2.88M, 3.5 in

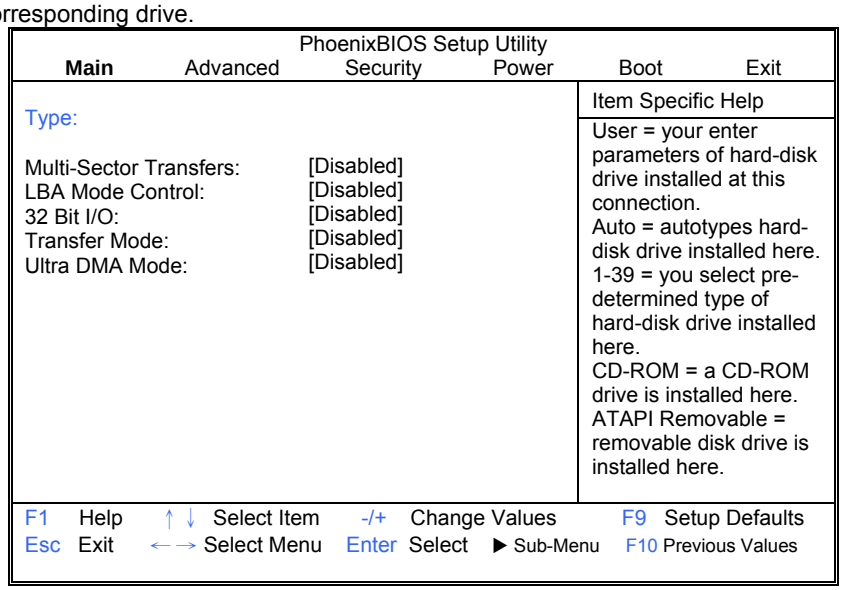
System Memory

This displays/allows you to change the amount of system memory present on the system.

Extended Memory
This displays/allows you to change the amount of extended memory present on the system.

3.3.1 IDE Channel Master / Slave Setup

Computer detects IDE drive type from drive C to drive F.
Press **Enter** on any of the Master/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.
This option lets you set the following hard disk parameters:

Type
Selects the type of device connected to the system.
Options: Auto / CD/DVD / Not Installed / ARMD

Multi-Sector Transfers
This option allows you to specify the number of sectors per block for multiple sector transfers.
Options: Disabled / 2 Sectors / 4 Sectors / 8 Sectors / **16 Sectors**

LBA Mode Control
Enables or disables LBA Mode.
In LBA Mode, instead of referring to a cylinder, head and sector number, each sector is instead assigned a unique "sector number". In essence, the sectors are numbered 0, 1, 2, etc. up to (N-1), where N is the number of sectors on the disk.

In order for LBA to work, it must be supported by the BIOS and operating system, but since it is also a new way of talking to the hard disk, the disk must support it as well. All newer hard disks do in fact support LBA, and when auto detected by a BIOS supporting LBA, will be set up to use that 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.
LBA has in recent years become the dominant form of hard disk addressing. Since the 8.4 GB limit of the Int13h interface was reached, it became impossible to express the geometry of large hard disks using cylinder, head and sector numbers, translated or not, while remaining below the Int13h limits of 1,024 cylinders, 256 heads and 63 sectors. Therefore, modern drives are no longer specified in terms of classical geometry, but rather in terms of their total number of user data sectors and addressed using LBA.
Options: **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.
Options: 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.
Options: 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.
Because the Ultra DMA protocol is designed to work with legacy application PIO and DMA protocols, it can be added to many existing computers by installing an

Ultra DMA/33 Peripheral Component Interconnect adapter card. Ultra DMA uses the same 40-pin Integrated Drive Electronics interface cable as PIO and DMA.
Options: **Disabled /** Mode 0 / Mode 1 / Mode 2

3.3.2 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 Utility					
Main	Advanced	Security	Power	Boot	Exit
Memory Cache				Item Specific Help	
Cache System BIOS area:	[Write Protect]			Controls caching of system BIOS area.	
Cache Video BIOS area:	[Write Protect]				
Cache Base 0-512K:	[Write Back]				
Cache Base 512K-640K:	[Write Back]				
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]				
Cache E000 – E3FF:	[Write Protect]				
Cache E400 – E7FF:	[Write Protect]				
Cache E800 – EBFF:	[Write Protect]				
Cache EC00 – EFFF:	[Write Protect]				
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.
Options: 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.
Options: NULL / **Write Protect**

Cache Base 0-512K
Control caching of 512K base memory.
Options: Write Through / **Write Back**

Cache Base 512-640K
Control caching of 512K-640K base memory.
Options: Write Through / **Write Back**

Cache Extended Memory Area
Control caching of system memory above one megabyte.
Options: Write Through / **Write Back**

Cache A000-AFFF~ Cache EC00-EFFF
Control caching of the memory blocks.
Options: Write Back/ Write Through / **Write Protect**

3.3.3 Boot Features

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

PhoenixBIOS Setup Utility

Main	Advanced	Security	Power	Boot	Exit

Boot Features		Item Specific Help
Floppy check:	[Disabled]	Enabled verifies floppy type on boot; disabled speeds boot.
Keyboard Error Report	[Enabled]	
Summery screen:	[Enabled]	
Quiet Boot	[Disabled]	
QuickBoot Mode:	[Enabled]	
Extended Memory Testing	[Just zero it]	
Halt on POST Errors:	[Enabled]	

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

Floppy Check
Enabled verifies floppy type on boot; disabled speeds boot.
Options: Enabled / **Disabled**

Keyboard Error Report
Enabled BIOS keyboard error report; BIOS will display the keyboard error message & save the event in DMI.
Disabled BIOS keyboard error report; BIOS will not warn & display the error message.
Options: **Enabled** / Disabled

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.
Options: **Enabled** / Disabled

Quiet Boot
Enables or disables the OEM logo screen during boot up.
Options: 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

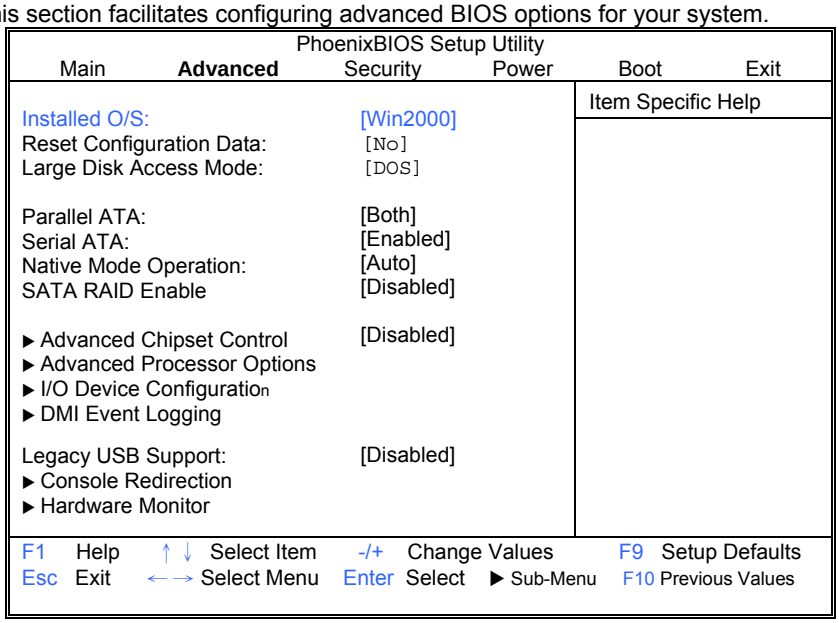
If disabled, the BIOS will run the whole gamut of boot-up tests.
It is recommended that you disable this feature when you boot up a new computer for the first time or whenever you install a new piece of hardware. This allows the BIOS to run full diagnostic tests to detect any problems that may slip past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

Extended Memory Testing
Determine the tests that will be run on extended memory (memory above 1MB) during boot up.
Options: Normal / **Just zero it** / None

Halt on POST Errors
Enabled -> BIOS will halt & display error message if there is any POST error .
Disabled -> BIOS will not halt if there is any POST error.
Options: Enabled / **Disabled**

3.4 Advanced

This section facilitates configuring advanced BIOS options for your system.



Installed OS
Select the operating system installed on the PC.
Note: An incorrect setting can cause the operating system to behave unpredictably.
Options: 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 System Configuration 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.
Options: 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.
Options: **DOS** / Other

Parallel ATA
This option determines the controller to be used for parallel ATA devices.
Options: Primary / Secondary / **Both**

Serial ATA
This enables or disables booting from a serial ATA device.
Options: **Enabled** / Disabled

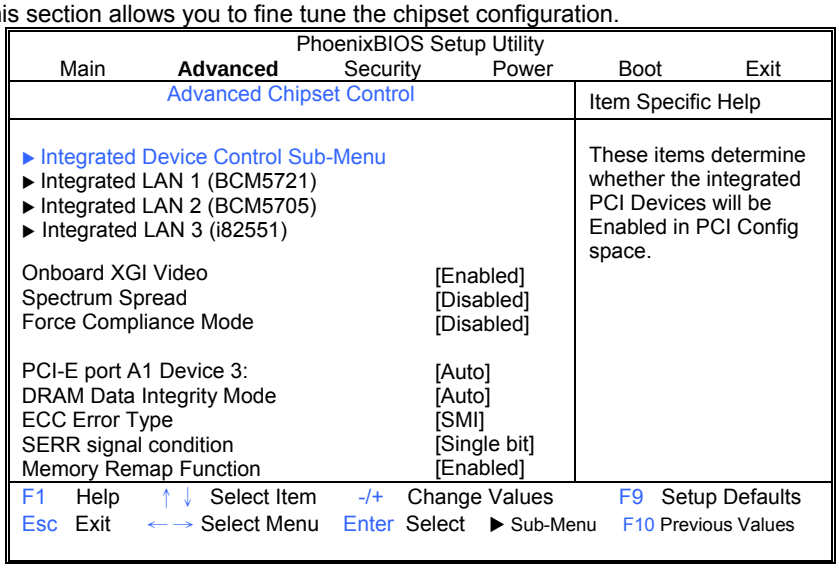
Native Mode Operation
This determines whether SATA devices should work in Native Mode or in Emulated Mode. In Native Mode, the SATA devices are treated as regular SATA devices, while in Emulated Mode, they are treated as though they were IDE devices.
If you are installing Windows 98, ensure that this option is set to Emulated, else the installation will hang.
Options: **Auto /** Parallel ATA / Serial ATA / Both

SATA RAID Enable
When this option is enabled, the Silicon Image RAID BIOS is loaded on system start up, allowing for configuration of hardware RAID arrays. With the SATA RAID ROM option disabled, the drives attached to the controller can only act independently of one another.
Options: Enabled / **Disabled**

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.
Options: **Disabled** / Enabled

3.4.1 Advanced Chipset Control

This section allows you to fine tune the chipset configuration.



Onboard XGI Video
Toggles the onboard XGI video graphics.
Options: **Enabled** / Disabled

Spectrum Spread
When enabled, this option modulates the frequency of the CPU clock rate (and hence all clock driven mainboard components), so that any EMI interference generated is not always at the same constant frequency, but instead is spread over a small band of frequencies, therefore reducing problems with equipment that may be particularly sensitive to certain fixed frequencies.
Options: Enabled / **Disabled**

Force Compliance Mode
Enable or Disable PCI-E Compliance mode by setting item to the desired value.
Options: Enabled / **Disabled**

PCI-E port A1 Device 3
The item control the PCI-E device which is plugged on the PCI-E slot to be disabled or enabled.
Options: Disabled / Enabled / **Auto**

DRAM Data Integrity Mode
If you have ECC memory modules installed, select the correct ECC mode with this setting.
Options: Disabled / 72-bit ECC / 144-bit ECC / **Auto**

ECC Error Type
When an ECC error occurs, it generates an interrupt. Select the type of interrupt to report: NMI (Non-Maskable); SMI (System Management); SCI (System Control).
Options: None / NMI / **SMI** / SCI

SERR signal condition
Select ECC error conditions that SERR# be asserted.
Options: None / **Single bit** / Multiple bit/ Both

Memory Remap Function
Remaps the memory used by the BIOS (A0000 to FFFF - 384 k) above the 1 Mb limit. If enabled, you cannot shadow Video and System BIOS.
Options: **Enabled** / Disabled

3.4.1.1 Integrated Device Control Sub-Menu

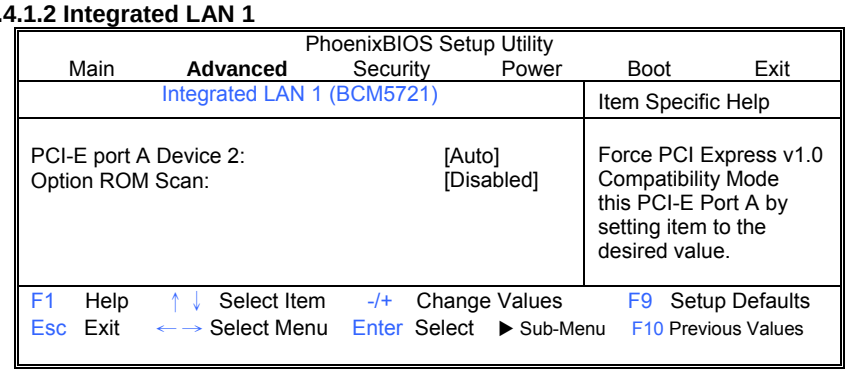
PhoenixBIOS Setup Utility					
Main	**Advanced**	Security	Power	Boot	Exit
Integrated Device Control Sub-Menu				Item Specific Help	
USB Device 29, function 1:			[Enabled]	Enable or disable this USB Device by setting item to the desired value.	
USB Device 29, Function 0 & 1:			[Enabled]		
USB Device 29, Function 7:			[Enabled]		
F1 Help ↑ ↓ Select Item -/+ Change Values F9 Setup Defaults					
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values					

USB Device 29, Function 1:
Enable or Disable this USB Device by setting item to the desired value.
Options: **Enabled** / Disabled

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

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

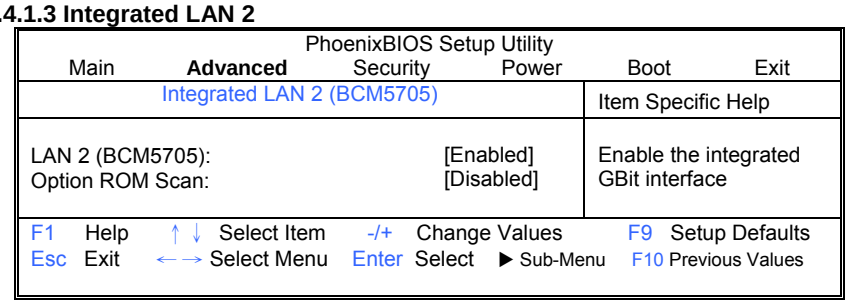
3.4.1.2 Integrated LAN 1



PCI-E port A Device 2:
Force PCI Express v1.0 Compatibility Mode this PCI-E Port A by setting item to the desired value.
Options: **Auto** / Disabled / Enabled / Force PCI Express v1.0 Compatibility Mode

Option ROM Scan
Initialize device expansion ROM
Options: Enabled / **Disabled**

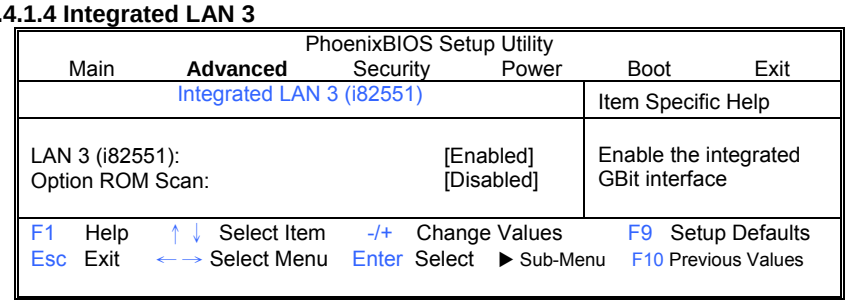
3.4.1.3 Integrated LAN 2



LAN (BCM5705):
Enable the integrated GBit interface
Options: Disabled / **Enabled**

Option ROM Scan
Initialize device expansion ROM
Options: Enabled / **Disabled**

3.4.1.4 Integrated LAN 3

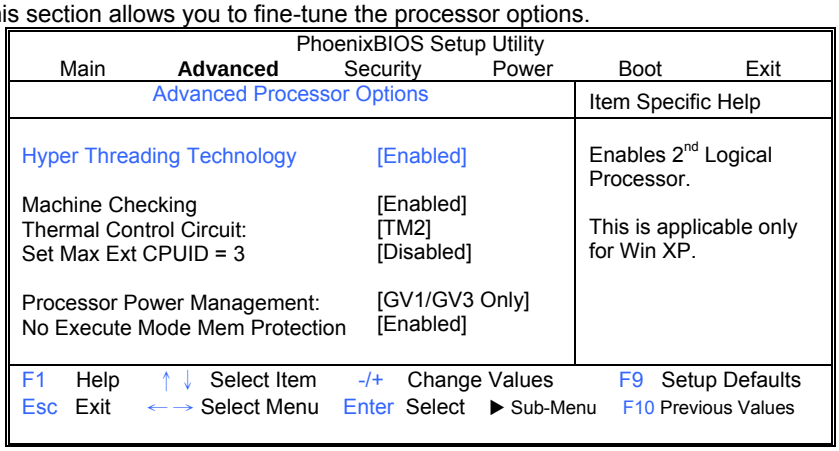


LAN3 (i82551):
Enable the integrated GBit interface
Options: Disabled / **Enabled**

Option ROM Scan
Initialize device expansion ROM
Options: Enabled / **Disabled**

3.4.2 Advanced Processor Options

This section allows you to fine-tune the processor options.



Hyper Threading Technology
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.
Options: **Enabled** / Disabled

Machine Checking
Microsoft windows & new linux kernel support the Machine check architectures. This enables Machine check exception reporting for all implementation-defined errors.
Options: **Enabled** / Disabled

Thermal Control Circuit
Intel CPU supports the thermal monitoring TM1 or TM2 which can control the power consumption.

- **TM1:** Thermal Monitor 1 uses a highly accurate on-die temperature sensing circuit in the CPU that has the ability to act quickly upon any thermal issues (~50ns). This circuitry keeps an eye on the most taxed areas of the CPU-die at all times and will quickly act upon temperatures going over the safety limits. The thermal monitor's control circuit, when active, lowers the CPU temperature by throttling the internal CPU clock speed. This is done with a 50% duty-cycle, which means that a 2GHz CPU will then effectively run at a 1GHz clock speed. Due to the fast response time of the thermal monitor circuit (~50ns) the CPU will only be 'throttled' for a very brief period. Once the CPU-die temperature is within safe operating limits again it'll set back to the 2GHz clock speed it originally operated at.
- **TM2:** Thermal Monitor 2 decreases or increases the CPU clock and core voltage according to the CPU load. This information is read from the five VID pins of the CPU. Accordingly, the CPU temperature is also automatically decreased, when the core voltage is decreased. This improves the CPU lifespan. The states switch is so fast that the performance decrease is insignificant.

Options: **TM2** / TM1

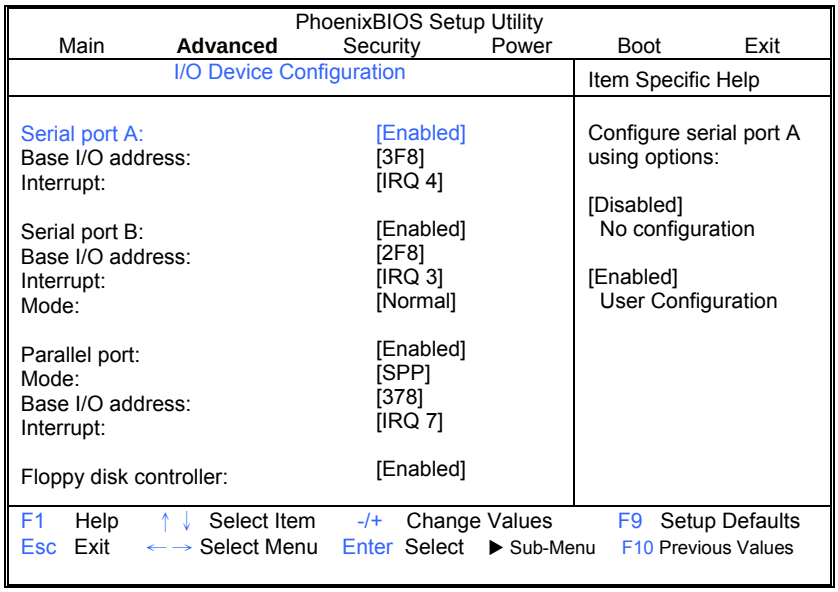
Set Max Ext CPUID=3
Sets Max CPUID extended function value to 3.
Options: **Disabled** / Enabled

Processor Power Management
Support new Intel CPU power management technology, such as EIST & C1E.
Options: EIST & C1E / **GV1/GV3 only**

No Execute Mode Mem Protection
Execution protection prevents code execution from data pages such as the default heap, various stacks, and memory pools. Protection can be applied in both user and kernel-mode. Windows XP SP2 supports this technology.
Options: Enabled / **Disabled**

3.4.3 I/O Device Configuration

This setting allows you to configure I/O devices.



Serial Port A:
This defines how the first serial port is detected and configured.
Options: Disabled / **Enabled**

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

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

Serial Port B:
This defines how the second serial port is detected and configured.
Options: Disabled / **Enabled**

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

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

Mode
Set the mode for serial port B.
Options: **Normal** / IrDA / ASK-IR

Parallel Port
This defines how the parallel port is detected and configured.
Options: 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).
There are two versions of the EPP transfer protocol - EPP1.7 and EPP1.9. Generally, EPP1.9 is the preferred setting because it supports the newer EPP1.9 devices and most EPP1.7 devices and offers advantages like support for longer cables. However, because certain EPP1.7 devices cannot work properly with an EPP1.9 port, this BIOS feature was implemented to allow you to set the EPP mode to EPP1.7 when such an issue occurs.
Therefore, it is recommended that you set this BIOS feature to EPP1.9. But if you have trouble connecting to your parallel port device, switch to EPP1.7.
However, the manufacturer of your parallel port peripheral may have designated a preferred parallel port mode for the device in question. In that case, it's best to follow their recommendation.
For those who don't know what mode to select but at least know that their parallel port device supports bidirectional transfers, the BIOS offers the ECP+EPP mode. If you select this mode, then the parallel port device will be able to use either one of those modes. However, this should be considered as a last resort as you may be needlessly tying up an IRQ if your device does not use ECP at all. Or the BIOS may not select the best parallel port mode for the device. If possible, set the parallel port to the transfer mode that best suits your parallel port device.
However, the manufacturer of your parallel port peripheral may have designated a preferred parallel port mode for the device in question. In that case, it's best to follow their recommendation.
Options: **SPP** / EPP / ECP

Base I/O Address:
Set the base I/O address for parallel port.
Options: **378 /** 278 / 3BC / Disabled

Interrupt:
Set the interrupt for parallel port.
Options: **IRQ7** / IRQ5

Floppy Disk Controller
This defines how the floppy disk controller is detected and configured.
Options: Disabled / **Enabled**

3.4.4 DMA Event Logging

PhoenixBIOS Setup Utility					
Main	**Advanced**	Security	Power	Boot	Exit

DMI Event Logging		Item Specific Help
Event log validity	Valid	
Event log capacity	Full	View the contents of the DMI event log.
View DMI event log	[Disabled]	
Event Logging	[Enabled]	
ECC Event Logging	[Enabled]	
Mark DMI events as read	[Enter]	
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

View DMI event log
View the contents of the DMI event log.
Options: Disabled / **Enabled**

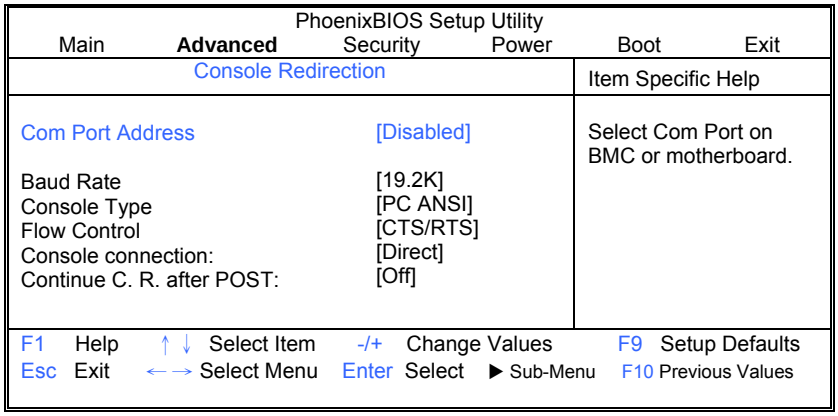
Event Logging
Select Enabled to allow logging of DMI events
Options: Disabled / **Enabled**

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

Mark DMI events as read
Press <Enter> to mark DMI events as read.

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

3.4.5 Console Redirection



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

Baud Rate
Enables the specified baud rate.
Options: 300 / 1200 / 2400 / 9600 / **19.2K /** 38.4K / 57.6K / 115.2K

Console Type
Enable the specified console type.
Options: VT100/VT100, 8bit / PC-ANSI, 7bit / **PC ANSI** / VT100+ / VT-UTF8 / NULL

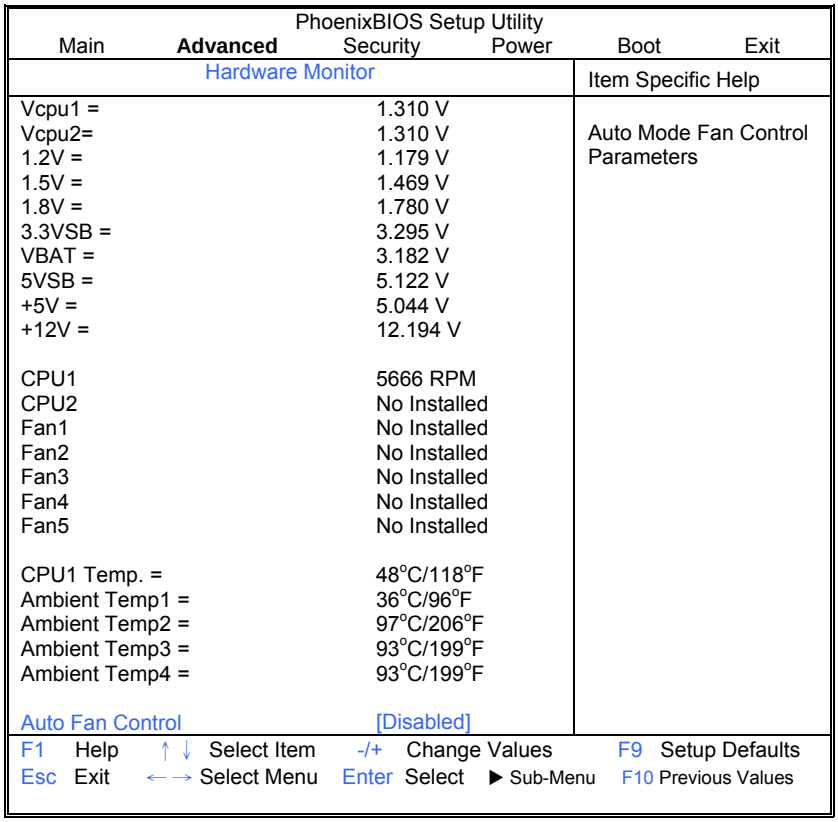
Flow Control
Enable Flow Control.
Options: NULL / XON/XOFF / **CTS/RTS**

Console Connection
Indicate whether the console is connected directly to the system or a modem is used to connect.
Options: **Direct** / Via modem

Continue C.R. after POST
Enable Console Redirection after OS has loaded.
Options: **Off** / On

3.4.6 Hardware Monitor

This displays critical system parameters like CPU speed, fan speeds, voltage levels and CPU temperature.



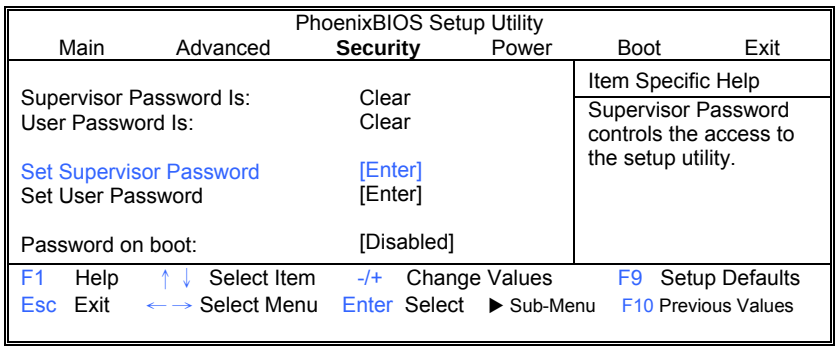
Auto Fan Control

Leave as default.

Options: Enabled / **Disabled**

3.5 Security

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



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.

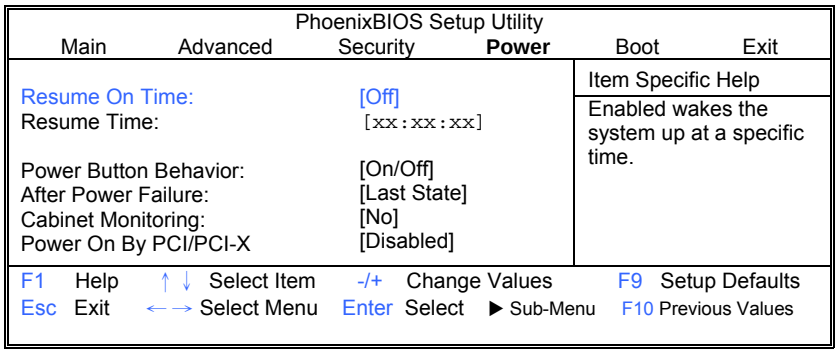
Password on boot

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.

Options: **Disabled** / Enabled

3.6 Power

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



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

Power Button Behavior
This specifies the behavior of the system after the power button is pressed.
Options: **On/Off,** Wake/Sleep.
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.
Options: **Enabled,** Disabled.
Enabled: This restores the system to the last state it was in before the power loss occurred.
Disabled: This keeps the power switched off till the power button is pressed.

Chassis Intrusion Detect
Enable/Disable: when chassis open event is detected, BIOS will record the event.
Options: Enabled / **Disabled**

Power On by PCI/PCI-X card
An input signal from PME on the PCI card awakens the system from a soft off state.
Options: Enabled / **Disabled**

3.7 Boot

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

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Power	**Boot**	Exit

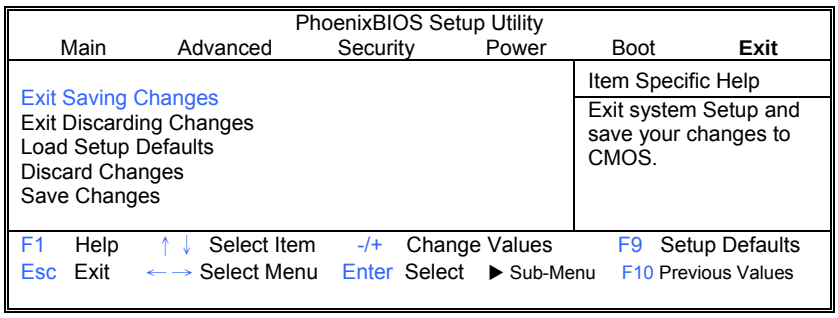
+ Removable Devices + Hard Drives CD-ROM Drive Network Boot	Item Specific Help Keys used to view or configure devices: <Enter> expands or collapses devices with a + or – <Ctrl + Enter> expands all <Shift + 1> enables or disables a device. <+> and <-> moves the device up or down. <n> May move removable device between Hard Disk or Removable Disk. <d> Remove a device that is not installed.

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

The boot menu will list all bootable devices. Use <Enter> to expand or collapses devices with a '+' or '-'. Use <+> or <-> to arrange the priorities of all bootable devices.

3.8 Exit

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
Load the factory default values.

Discard Changes
Discard all changes made without exiting BIOS setup.

Save Changes
Save all changes made without exiting BIOS setup.

NOTE

Chapter 4: SATA/RAID Setup

The motherboard supports RAID 0 or 1 for Serial ATA drives through the Intel® 6300ESB chipset. The Serial ATA as RAID option must be enabled in the BIOS before the system can load the Adaptec® RAID option ROM code for Intel® RAID. The Adaptec® RAID option ROM is a standard PnP (Plug and Play) option ROM that provides a pre-operating system user interface for the Intel® RAID implementation. It also allows the boot order to be selected from within the BIOS setup utility.

For this information, please check Tyan's web site at: **www.tyan.com**

Warning

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

The Intel RAID feature is available in Win2000 and WinXP.

4.1 BIOS Configuration

- Enter the BIOS setup program by pressing the <F2> key after the Power-On Self Test (POST) memory test begins.
- Select the **Advanced** menu.
- Switch the **SATA RAID Enabled** option from **Disabled** to **Enabled**
- Press <F10> to save the BIOS setting and exit the BIOS setup program.

4.2 Installing Serial ATA (SATA) hard disks

Installing Serial ATA (SATA) hard disks requires the use of a new SATA data cable (4-conductor) which supports the Serial ATA protocol and a SATA power cable. Either end of the SATA data cable can be connected to the SATA hard disk or the SATA connector on the motherboard.

Note

- Both the data and power SATA cables are new cables. You cannot use older 40-pin 80-conductor IDE or regular IDE power cables with SATA hard drives.
- Carefully follow any technical instructions that come from the hard disk manufacturer.

Follow the given steps for correct cable installation:

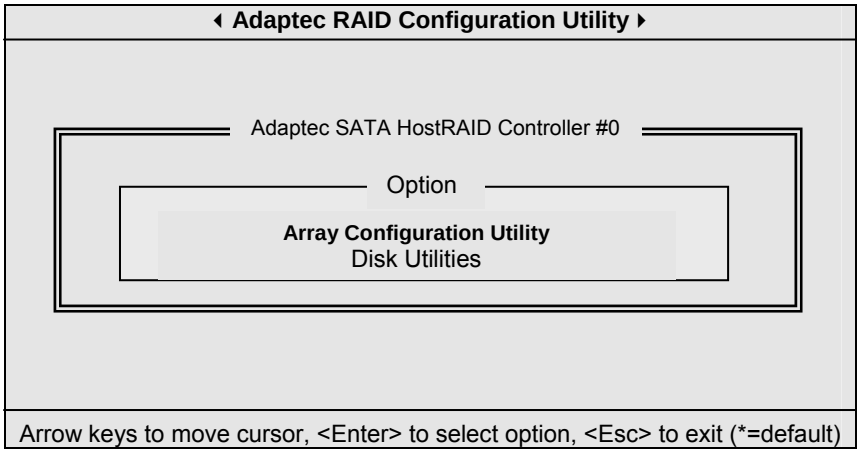
1. Attach either cable end to the SATA connector on the motherboard.
2. Attach the other cable end to the SATA hard disk.

4.3 Adaptec RAID Configuration Utility

The Serial ATA RAID sets must be configured in the RAID Configuration utility for two HDD. This configuration can be done by the Adaptec® RAID Option ROM. During the Power-On Self Test (POST), the following message will appear for a few seconds: Press **<Ctrl-A>** to enter RAID Configuration Utility. After this message appears, press the **<Ctrl>** and **<A>** keys simultaneously, the following screen menu appears.

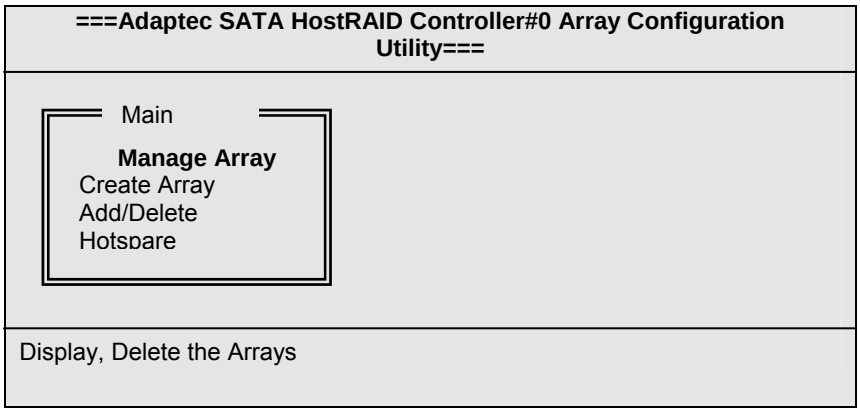
Note

The 'Drive Model', 'Serial #', and 'Size' listed in your system can differ from the following example.



4.4 Manage Array

Use the Manage Arrays option to view array properties and members, and delete arrays. The following sections describe these operations in greater detail.



Display array properties and members

1. From the **Adaptec SATA HostRAID Controller#0 Array Configuration Utility** menu, select **Manage Array.**
2. From the **List of Arrays** dialog box, select the array you want to view and press **Enter**.
   The **Array Properties** dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.
3. Press **Esc** to return to the previous menu.

Warning

Take caution in using this option; All data on the RAID drives will be lost! Deleted arrays cannot be restored.

Deleting Arrays

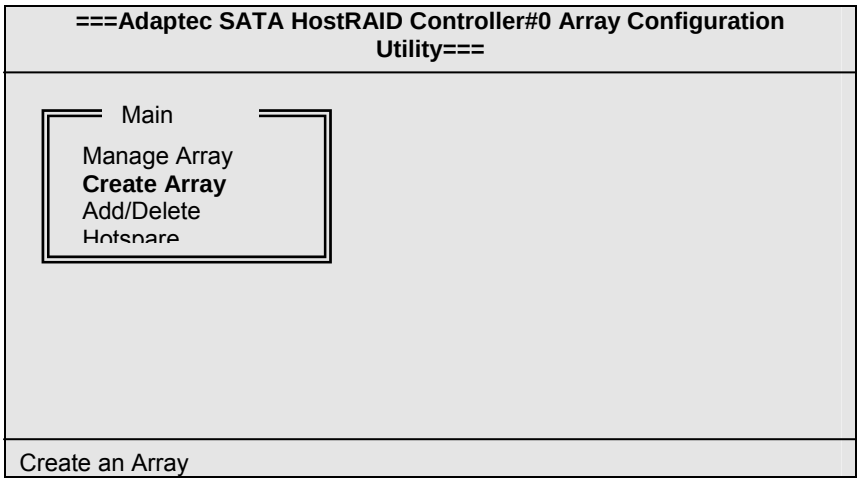
From the Adaptec SATA HostRAID Controller#0 Array Configuration Utility menu, select Manage Array.
Select the array you wish to delete and press Delete.
In the Array Properties dialog box, select Delete and press Enter. The following prompt is displayed:

WARNING: Deleting the array will result in data loss!
Do you want to delete the array? (Yes/No):

Press Yes to delete the array or No to return to the previous menu.
Press Esc to return to the previous menu.

4.5 Create Array

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are uninitialized are shown in gray and cannot be used.



Follow the given steps to create a RAID 0 or RAID 1 Volume

1. From the **Adaptec SATA HostRAID Controller#0 Array Configuration Utility** menu, select option **Create Array** and press the <Enter> key.
2. Select the disks for the new array and press <Ins> key. To deselect any disk, highlight the disk and press **Delete**.
3. Press Enter when both disks for the new array are selected. The **Array Properties** menu displays.

To assign properties to the new array:

1. In the Array Properties menu, select an array type and press Enter. Note that only the available array types, RAID 0 and RAID 1, are displayed. Each of these types requires two drives.
2. Type in an optional label for the array and press Enter.
3. For RAID 0, select the desired stripe size. Available stripe sizes are 16KB, 32KB and 64KB (default)

4. Create RAID via allows you to select between the different creation methods for RAID 0 and RAID 1. The following table gives examples of when each is appropriate.

RAID level	Create RAID via	When appropriate
RAID 0	No Init	Creating a RAID 0 on new drives.
RAID 0	Migrate*	Creating a RAID 0 from one new drive and one drive with data you wish to preserve.
RAID 1	Build*	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve.
RAID 1	Clear	Creating a RAID 1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1	Quick Init	Fastest way to create a RAID 1. Appropriate when using new drives.

***** If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.

Note

Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

A RAID 1 created using the Quick Init option may return some data miscompares if you later run a consistency check. This is normal and is not a cause for concern.

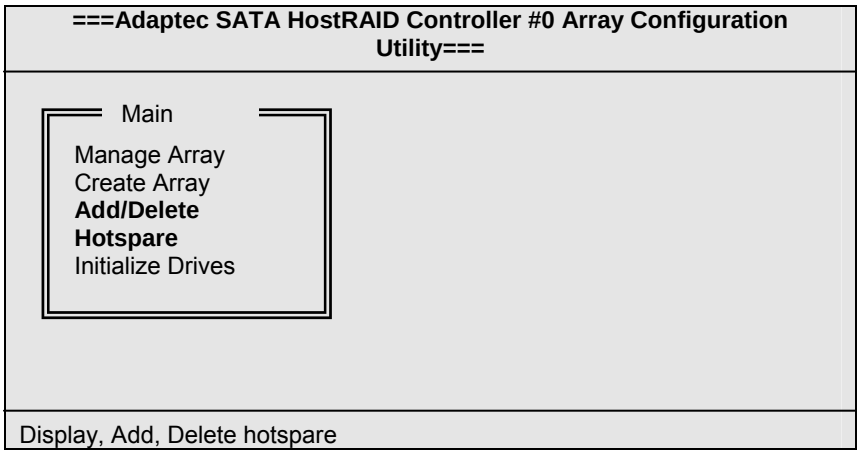
The Adaptec RAID Configuration Utility allows you to use drives of different sizes in a RAID 1. If you choose the smaller drive as the second drive, you will be warned about the risk of data loss.

Warning

Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, there is no way to restart and no way to recover the data that was on the source drive.

When you are finished, press **Done**.

4.6 Add/Delete Hotspare



Create a drive spare:

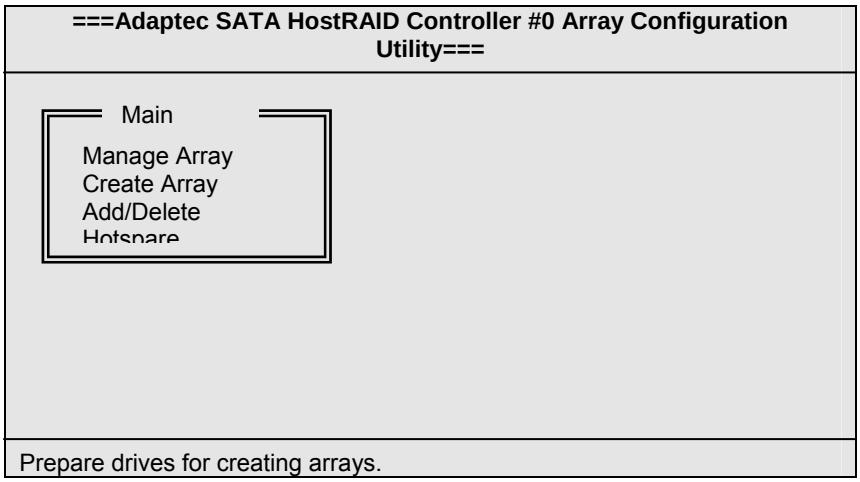
1. Select option Add / Delete Hotspare and press the <Enter> key to create the drive spare.
   The following prompt is displayed:
   Do you want to create a spare? (Yes/No):
2. Press **Y** to create the drive spare.
3. Press **Esc** to return to the previous menu.

Delete a drive spare:

1. Select option Add / Delete Hotspare and press the <Enter> key to delete the drive spare.
   The following prompt is displayed:
   Do you want to delete the spare? (Yes/No):
2. Press **Y** to delete the drive spare.
3. Press **Esc** to return to the previous menu.

4.7 Initialize Drives

If an installed disk does not appear in the disk selection list for creating a new array or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.



Warning

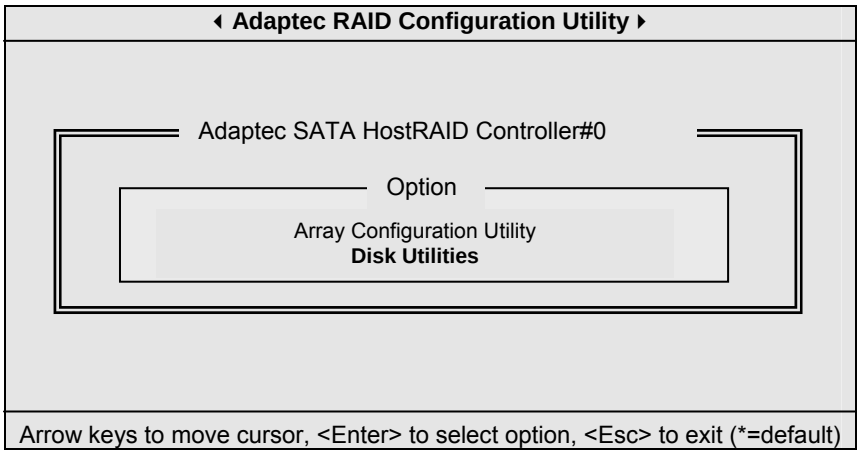
Take caution in using this option; Initialization will erase all Array information from the selected drives. Any away using any of these drives as members will be affected.

1. Select **Initialize Drives**.
2. Use the <↑> and <↓> keys to highlight the disk you wish to Initialize and press **Insert**.
3. Repeat step 2 so that both drives to be initialized are selected.
4. Press <Enter>
5. Read the warning message and ensure that you have selected the correct disk drives to initialize. Type **Y** to continue.

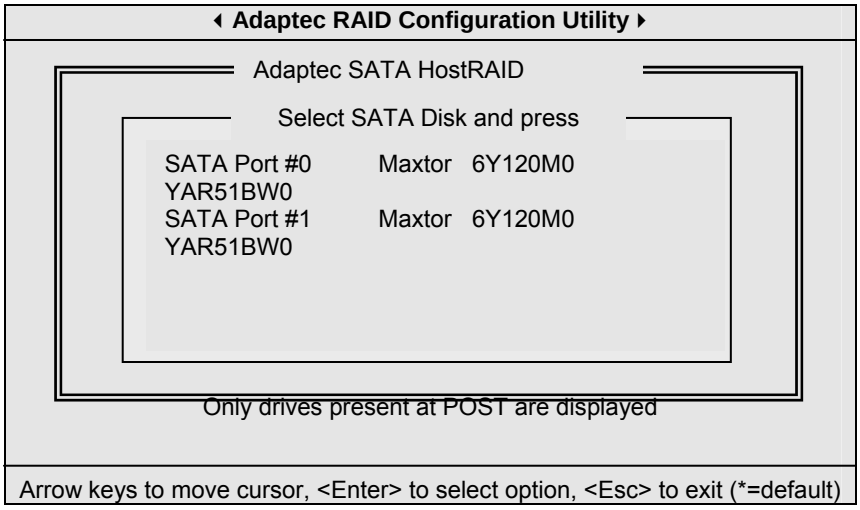
4.8 Disk Utilities

The Disk Utilities enable you to low-level format or verify the media of your Serial ATA hard disks.

From the **Adaptec RAID Configuration Utility** menu, select **Disk Utilities**.



1. Press the <Enter> key to select SATA Disk.



Warning

Take caution in using this option;

Format Disk-This drive is about to be formatted. All data on the disk will be erased.

Verify Disk Media- This drive will be scanned for media defects. All recoverable defects will be remapped.

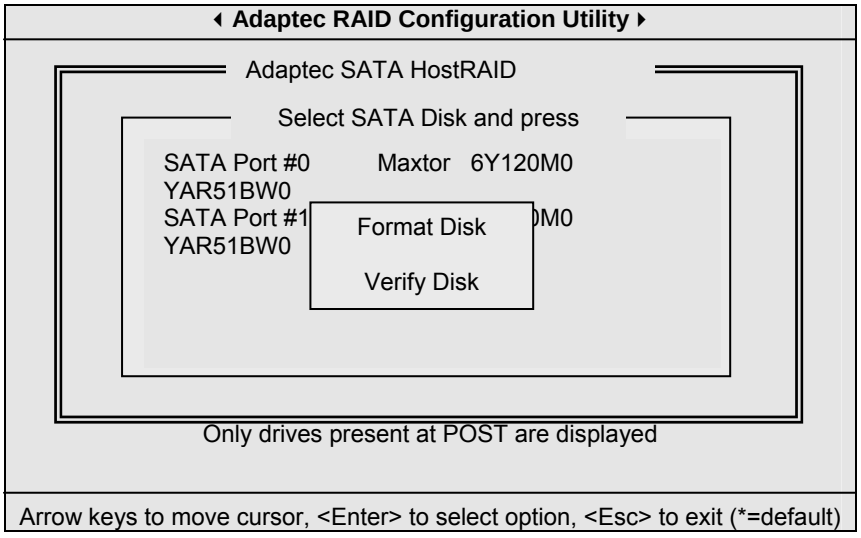
2. Select options **Format Disk** or **Verify Disk Media** and press the <Enter> key.

   You are offered the following options:

   Format Disk— Simulates a format of the hard drive by writing zeros to the entire disk.

   Verify Disk Media— Scans the media of a disk drive for defects. Any errors found are corrected.

3. Press **Esc** to return to the previous menu.



NOTE

Chapter 5: Diagnostics

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

Memory, Video, CPU

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

5.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through 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.

5.2 Flash Utility

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

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

5.3 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

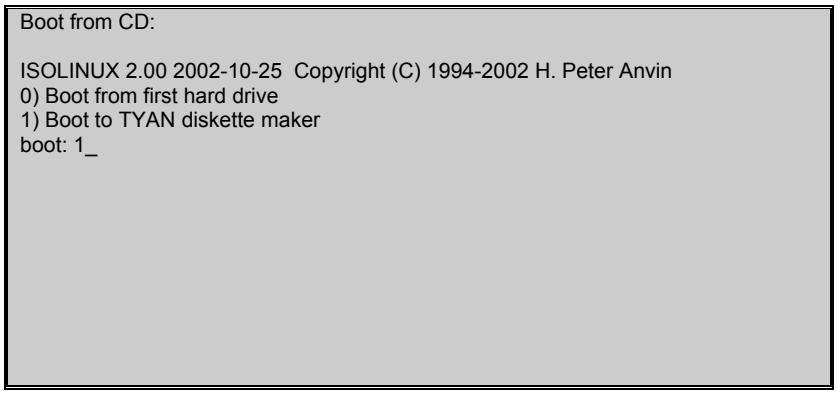
The brief descriptions below will help explain how these items function.

	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.

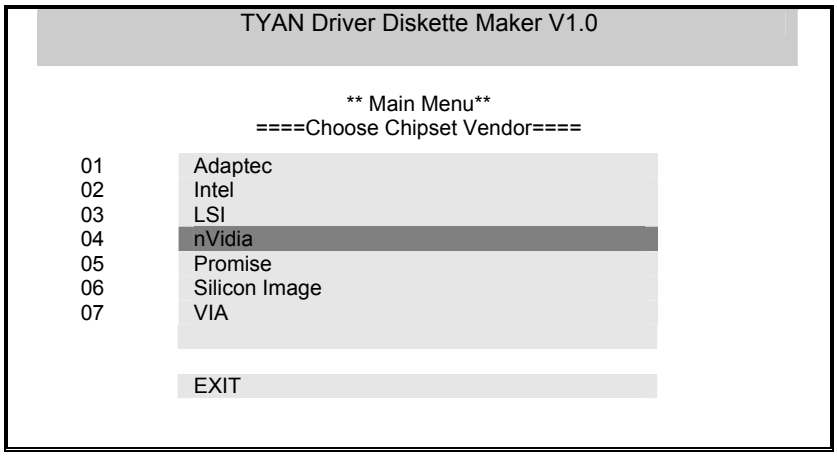
Appendix II: How to Make a Driver Diskette

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

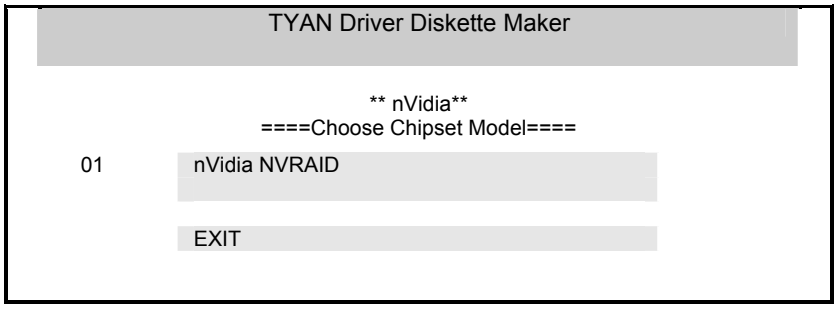
1. Start the system and insert the TYAN CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to TYAN diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from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



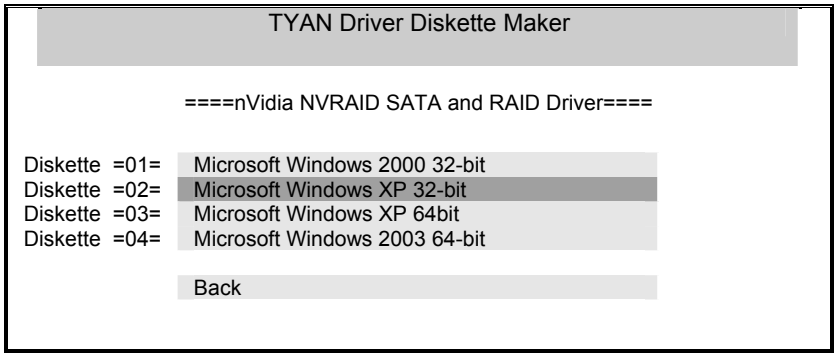
2. Choose the chipset vender which you need from the main menu.



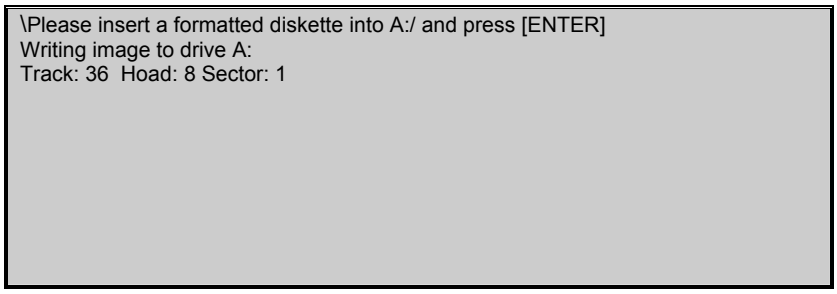
3. The following picture pops up after selecting the chipset model.



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



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



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 only at 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 results in greater speed.

BBS (BIOS Boot Specification): 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. 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, which 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 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 the possibility of

losing your data should the system crash. Information 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 information is stored in SRAM instead of slower 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.

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): 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 socket 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.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses 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, it 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

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.

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.

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

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

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

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

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.)

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.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

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

Parallel port: transmits the bits of a byte on eight different wires 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 fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. 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 with 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 and 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: RAID I/O Steering (Intel)

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

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

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

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

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)

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

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

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

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

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

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

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

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 shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

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

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

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

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

Help Resources:

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

Returning Merchandise for Service

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

NOTE: A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain

service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

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

Operation is subject to the following conditions:

This device may not cause harmful interference, and
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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