Tyan S2390
Trinity KT

Motherboard User's Manual
Revision 1.00

PRINTED IN USA

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chapter 1

Introduction

Overview

The Trinity KT is a quality, high performance motherboard designed for Socket A AMD® Duron™ and Athlon™ microprocessors. The Trinity KT utilizes the VIA KT-133 chipset with AwardBIOS™, can support Duron™ CPU speeds of 600 MHz through 750 MHz and Athlon™ CPU speeds of 750 MHz through 1 GHz, and 200 MHz system bus interface speed. For CPU compatibility information and updates, check the Tyan website for more details: **http://www.tyan.com**

The Trinity KT motherboard provides high performance capabilities that are ideal for a wide range of demanding applications such as CAD, CAM, CAE, desktop publishing, 3D modeling, animation, and video production.

This integrated high-performance system board in an ATX form factor offers more features and expandability than other ATX boards in its class. Some of the features included are onboard UltraDMA 33 / 66, and (optionally) onboard digital link sound with Via 686A sound chipset utilizing the AC'97 audio codec.

Flexibility and expandability have also been designed into the Trinity KT. With I/O and drive controller support built onboard (along with the many onboard features previously mentioned), the AGP 1x / 2x / 4x slot, six PCI slots, and ISA slot (shared with a PCI) are free for more add-on expansion cards.

Remember to take a look at Tyan's website located at **http://www.tyan.com**. There you can find information on all of Tyan's products along with FAQs, distributors list, drivers, and BIOS setting explanations.

Icons

In order to help you navigate this manual and set up your system, we have added several icons to our format.

This icon alerts you to particularly important details regarding the setup or maintenance of your system. This icon often appears next to information that may keep you from damaging your board or system. While we will often point out the most vital paragraphs in a chapter, you should always read every word in the text. Failing to do so can lead to exasperation and expense.

Wherever possible, we have included step-by-step instructions for setting up your system, which are indicated by this icon. However, it is in your best interest to read an entire section (and perhaps the entire manual) before you begin to install your motherboard.

While we have alerted you to potential dangers in several places in the manual with this icon, these warnings should not be regarded as the whole of your safety regimen. Never forget that computers are electrical devices, and are capable of delivering a shock. Prevent damage to yourself and to your board: always ensure that your system is turned off and unplugged whenever you are working with it, and that you are equipped with a static safety device. If a static safety device is not available to you, remember to touch any unpainted metal surface in your case before handling your board.

Hardware Specifications/Features

Processor Information
- Single ZIF Socket A
- AMD® Athlon™ 750 MHz to 1 GHz*
- AMD® Duron™ 600 MHz to 750 MHz*
- 200 MHz System Bus Interface Speed
- Auto-detect processor voltage

Expansion Slots
- One 1x / 2x / 4x mode AGP v2.0 slot
- Six 32-bit PCI v2.1 compliant slots
- One 16-bit ISA slot (shared w/ a PCI slot***)
- Total seven usable slots

Chipset Information
- VIA KT-133 chipset
  (VT8363 and VT82C686A)

Hardware Monitoring
- VIA 686A hardware monitoring chip
- 3-pin fan monitoring headers
- Flexible temperature and voltage sensing
- 3-pin Wake on LAN header
- 3-pin Wake on Ring header

Memory
- Three 168-pin 3.3V unbuffered DIMM sockets
- Supports up to 1.5 GB
  (through PC100 registered 512 MB DIMMs)
- ECC memory is NOT supported (except for PC100
  registered 512 MB DIMMs)
- Supports PC100 / 133 SDRAM (unregistered,
  non-ECC) and VCM SDRAM

Integrated PCI IDE
- Dual channel master mode
- Supports up to four Enhanced IDE devices
- Support for PIO Mode 4, UDMA 33 / 66 IDE
  ATAPI compliant devices

Integrated I/O
- One floppy connector for up to two drives
- Two 9-pin UART serial ports
  (one port is via cable; optional)**
- One 25-pin ECP / PPP parallel port
- PS/2 keyboard and mouse ports
- Four USB ports (two ports via cable; optional)**

Integrated Audio	•VIA 686A digital link audio
(Manufacturing Option)	•AC'97 audio codec Rev 2.1
	•One MIDI / Game port
	•Line-in, MIC-in, and Line-out ports
	•4-pin CD-ROM audio (ATAPI) header
	•4-pin Video-in (ATAPI) header
BIOS	•AwardBIOS™ 2 Mbit Flash RAM
	•Supports APM 1.2 and ACPI 1.0
	•Auto detection of memory size
	•Auto configuration of IDE hard disk types
	•User settings for hardware monitoring
	•Mutliple boot options
	•DMI 2.0 compliant
Form Factor	•ATX 2.03 (12" x 8.2")
	•Four-layer board
	•One 20-pin ATX power connector
	•Stacked mouse and keyboard ports
	•Stacked one serial port and one parallel port
	•Stacked two USB ports
	•Stacked audio and MIDI / Game ports (optional)
Regulatory	•FCC Class B (Declaration of Conformity)
	•European Community CE
	(Declaration of Conformity)

*	Check the Tyan website for more CPU compatibility information: **www.tyan.com**
**	Available for purchase at Tyan Online Store: **www.etyan.com**
***	You can only install an ISA card if you did not install a card in the bottom PCI slot

Software Specifications

O S   •Operates with Windows 98, Windows NT 4.0
                                                  and Windows 2000

Technical Support

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

Help resources:
1. See FAQ and beep codes sections of this manual.
2. See Tyan website for FAQ, bulletins, driver updates, etc: **http://www.tyan.com**
3. Contact your dealer or distributor 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.

For Resellers Only:
A receipt or copy of your invoice marked with the date of purchase is required before
any warranty service can be rendered. You can obtain service by calling the manufac-
turer 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 to the manufacturer. Tyan will pay to have the board shipped
back to you.

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chapter 2

Board Installation

Unpacking

The motherboard package should contain the following:

- (1) Trinity KT mainboard
- (1) 34-pin floppy cable pack
- (1) 80-pin ATA-66 IDE cable included
- (1) Trinity KT User's Manual
- (1) Driver CD

Installation

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

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

What's the first thing I should do?
The first thing you should do is read this user's manual. It contains important information which will make configuration and setup much easier.

Here are some precautions you should follow 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 any unpainted metal part on the computer case. (Or wear a grounded static safety wrist strap.)
>
> (2) **Hold the motherboard by its edges and do not touch the bottom of the board.**
>
> (3) **Avoid touching motherboard components, IC chips, connectors, and leads.**
>
> (4) **Avoid touching pins of memory modules and chips.**
>
> (5) **Place motherboard on a grounded antistatic surface or on the antistatic bag.**

INSTALL

Having reviewed the precautions above, the next step is to take the motherboard out of the cardboard box and static bag, hold it by its edges, and place it on a grounded antistatic surface, component side up. Inspect the board for damage.

⚠ important!

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

Press down on any of the socket ICs if it appears that they are not properly seated (the board should still be on an antistatic mat). Do not touch the bottom of the board. Remember, don't take any electronic device out of its protective bag until you are ready to actually install it into the computer case. If you do not ground yourself, you risk zapping the motherboard or adapter card. Subsequent problems may not arise immediately because electrostatic discharge damage, unlike physical damage, causes the device to fail over time.

1.
2.
3.
procedure

Installation Steps

1. Set Jumpers
2. Mount Motherboard in Chassis
3. Install Memory
4. Install CPU & Cooling Fan
5. Connect IDE and Floppy Drives
6. Install Add-on Cards
7. Connect PS/2, USB, Serial and Parallel Devices
8. Connect Power Supply

Quick References for Jumpers

In this manual, the terms "closed" and "on" are used when referring to jumpers (or jumper pins) that are active; "open" and "off" are used when referring to jumpers (or jumper pins) that are inactive. See the **Figure 2-1** for examples of "on" and "off" pins and jumpers. The square pin in the diagram is Pin 1.

Jumpers and pins are connected by slipping the blue plastic jumper connector overtop of two adjacent jumper pins (indicated by **1-2** or **2-3**). The metal rod inside the plastic shell bridges the gap between the two pins, completing the circuit. See **Figure 2-2** for more example of pin connections.
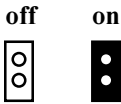
Figure 2-1	**Figure 2-2**
2 pin jumpers	**3 (or more) pin jumpers**
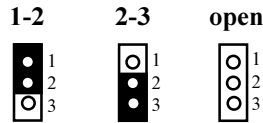
The tables and maps on the following pages will help you set the jumpers for CPU speed, Infrared, and external connector pin assignments, among others. The miniature motherboard maps will help you locate the jumpers on your board. A full-page map of the motherboard can be found on the next two pages.

Map of Motherboard Jumpers

Keyboard
FAN1
JP1
Mouse
Power Supply
2 USB Ports
Internal Buzzer
COM1 Port
FDD
Temperature Monitor
Printer Port
P-IDE
AMD® Athlon™ Socket A 500 MHz to 1 GHz
VIA KT-133
Game Port*
S-IDE
Mic*
Line-in*
Line-out*
COM2
3 DIMM Sockets
JP18
1 AGP 1x / 2x / 4x
Battery
JP21
WOM1
Video-in
J1
WOL1
VIA 686A Southbridge
CD Audio-in
FAN2
J2
JP24
6 32-bit PCI slots
JP22
ISA slot
BIOS

INSTALL
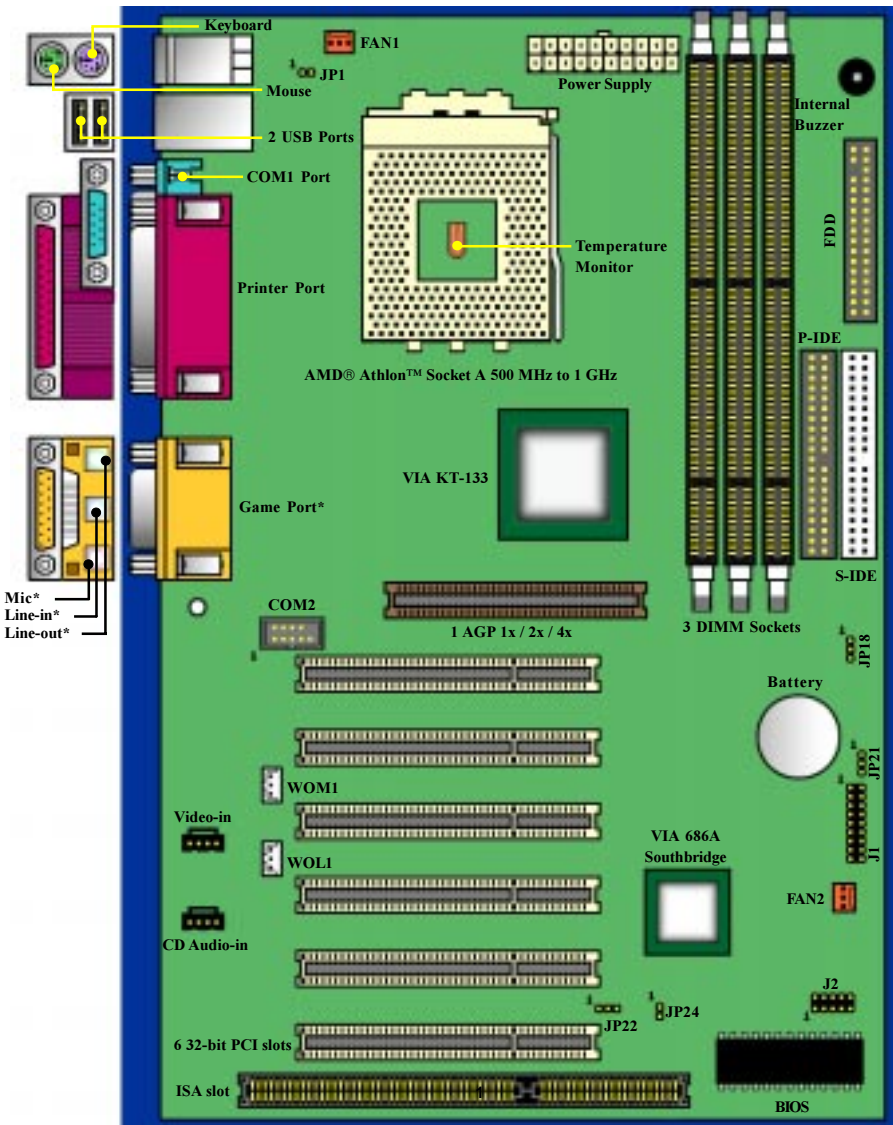
The tiny "1"s next to jumpers of 3 pins or more indicate the position of pin 1 for that jumper.

* Optional feature

Map of Trinity KT Features

PS/2 Mouse & Keyboard ports

Socket A Type for Athlon™ CPU

ATX Power Supply Header

3 DIMM slots

2 USB ports

Internal Buzzer

Floppy connector

Parallel, COM1 ports

Primary IDE

Secondary IDE

Joystick port*, mic*, line-in*, line-out*

Video-In

Battery

CD Audio

Award BIOS

6 PCI slots

ISA slot

AGP 2x / 4x slot

VIA KT-133 chipset
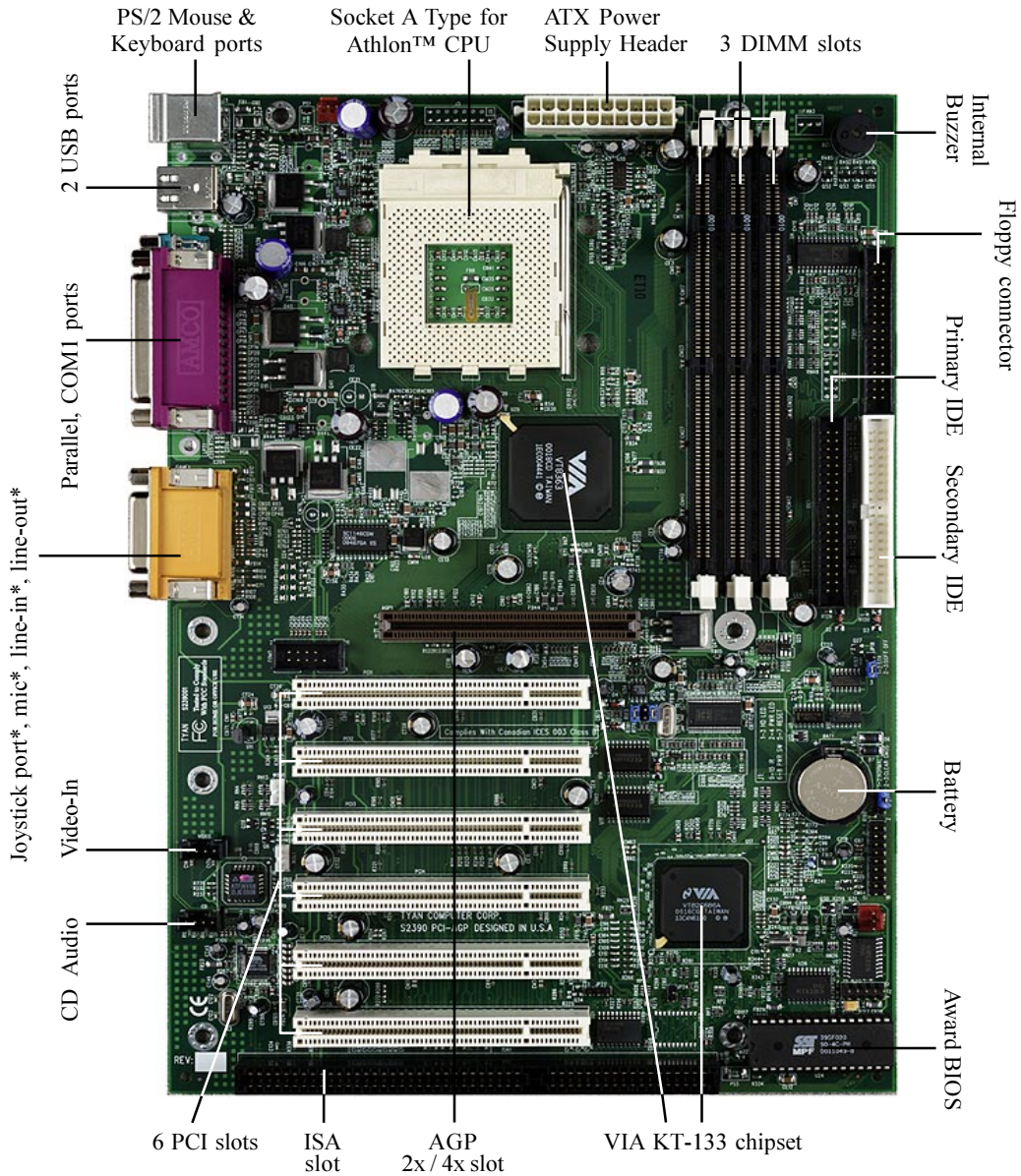
* Optional feature

1. Setting Jumpers

Note: There are no Jumper settings for CPU bus speed or clock multiplier on the Trinity KT board. The Trinity KT is designed to automatically detect the socketed Duron™ / Athlon™ CPU and its proper speed settings.

1-A. J1 External Pin Assignments

HDD LED	VCC	1	2	Power LED+	Pwr/Slp LEDs
	LED	3	4	Sleep LED+	
Reset Switch	Ground	5	6	Switch	Power Switch
	Switch	7	8	Ground	
Infrared	IR +5V	9	10	NO CONNECT	
	NO CONNECT	11	12	VCC	Speaker
	IR RX	13	14	NO CONNECT	
	IR GND	15	16	NO CONNECT	
	IR TX	17	18	External Speaker	

WOM1, WOL1

JP21 (clear CMOS)

JP22

J1

1-B. Power LED (JP22)

Pin	1	2	3
	+5 VSB LED YEL	Ground	VCC LED GRN
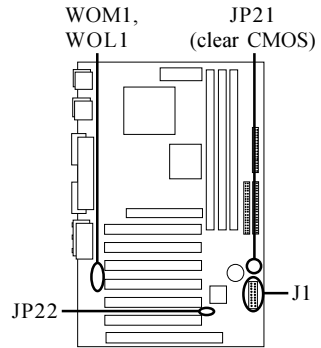
Jumper JP22 is a 3-pin ACPI LED header. If you need a 2-pin Power LED header, use jumper J1 above.

1-C. Clear CMOS and Reset Password (JP21)

	Normal	Clear
JP21	1-2	2-3

important!

If you have been locked out of your system because you forgot your password or set the CMOS incorrectly, follow the instructions below.

     1. Power off the system, and disconnect the power supply.
     2. Set jumper JP21 to pins 2 and 3
     3. Wait for 10 seconds, then return jumper JP21 to pins 1 and 2.
     4. Power on the system again.

By following this procedure, you will erase your password and reset the CMOS to the BIOS defaults.

1-D. Wake-On Modem Connector (optional) (WOM1)

Pin	1	2	3
	+5 VSB	Ground	WOR

1-E. Wake-On LAN Connector (optional) (WOL1)

Pin	1	2	3
	+5 VSB	Ground	WOL

1-F. Fan Connectors (FAN1, FAN2)

Pin	1	2	3
	Ground	+12V	Speed

Fan1 is for the CPU fan. The **Fan2** connector is for the Chassis Fan.

1-G. CD Audio Connector (CD1)

Pin	1	2	3	4
	CD-L	Ground	Ground	CD-R

1-H. Video-In (VIDEO1)
Video-in ATAPI Header for external multimedia devices.

1-I. COM2 port header (COM2)
This is the connector header for the COM2 Port.

1-J. Front Side USB Header (J2)
Certain computer chassis allow for two front-end USB port connections. This board provides a front side USB header should you decide to set up a USB connector at the front side of your computer.

1-K. EXTSMI Server Management Connector (JP1)
The EXTSMI (External System Management Interface) connector JP1 is used by some plug-in cards. Certain applications associated with these plug-in cards use the interface for hardware control and queries.

1-L. Power Management (JP18)
STR is part of the ACPI system, which provides energy saving functions for the computer. If this jumper is set to NOT ENABLED (close pins 2-3) which is the default setting, the system will default to S1 state, even if the BIOS has ACPI functions enabled. If the jumper is ENABLED (close pins 1-2), and ACPI functions are enabled in the BIOS, the system will go to energy saving S3 state (hibernation), saving the system's state into volatile memory.

1-M. Sleep Button (JP24)
The sleep button jumper is connected to the front panel sleep button (if one exists). The purpose of this jumper is to provide for manual activation of the BIOS power-saving state.
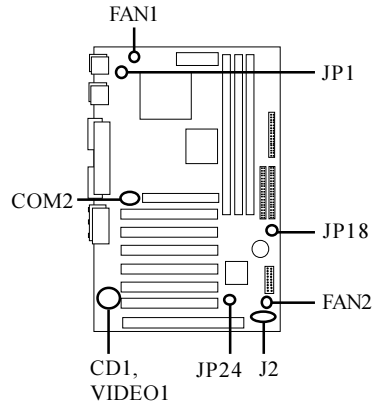
Soft Power Connector
The Soft Power Connector is part of jumper block J1 (pins 6-8). The Trinity KT uses the chipset for power management, including turning on and off the system. If the Power Button Function option in the BIOS Power Management Menu is set to On/Off (which is the default), pressing the power button once after the BIOS has booted up will turn the system on and off. If the Power Button Function option is set to Suspend, pressing the power button once will wake the system or send it to Suspend mode. In this case, you cannot turn the system off unless you shut down through the Windows operating system or you hold the power button down for four seconds.

Hardware Reset Switch Connector Installation
The Reset switch on your case's display panel provides you with the Hardware Reset function, which is the same as power on/off. The system will do a cold start after the Reset button is pushed.

CMOS RTC
The Real Time Clock (RTC) circuit, which provides the date and time for the system is integrated into the KT-133 chipset. If the external battery for the RTC is low, it will prevent your system from POSTing, and you will not get a display. Normally the life span of an external battery is 2 years. If yours is running low, you will need to replace it with a new 3V lithium battery (Sony CR2032).

Flash EEPROM
The Trinity KT uses flash memory to store BIOS firmware. It can be updated as new versions of the BIOS become available. You can upgrade your BIOS easily using the Flash Utility (see page 55).

INSTALL

2. Mounting the Motherboard in the Chassis

Follow the instructions provided by the case manufacturer for proper installation guidelines. Tyan recommends that you make use of all mounting holes to screw down the motherboard. The adapter cards and the screws holding them down will keep your board flat. The fastening screws should not short / touch any of the traces on the motherboard. Make certain that you do not overtighten the screws, as that will damage the motherboard and possibly break internal traces in the surrounding area. The hole you should use is located at the top-center of the board where the adapter cards are fastened to the case.

3. Installing Memory

Since Tyan boards are manufactured with performance in mind, you should use add-in components that match. Some DIMM modules may seem to be high quality because of name or feel but that does not guarantee real-world usability. Some cheaper or OEM memory may have brand-name components, but they may contain inferior or substandard parts which do not meet the critical tolerances our products require. Because of this, your memory may not work correctly in a Tyan board though it may work well in a competitor's board. This is because many of our competitors do not adhere to the

Figure 2-3

strict tolerances required for high performance. If you buy a Tyan board, you are getting the best system available. To make installation easy and trouble free, get high quality parts. For a list of recommended memory vendors, please visit Tyan's website at **www.tyan.com -** go to the "Memory Support" area in the Support Section. The website memory compatibility lists include DIMMs that have proven to be very stable on our boards and perform extremely well.

To install your DIMMs, line your module up so that the pins fit into the slot.   There is only one way that your DIMM can fit properly. Make sure that the short row of pins is lined up with the short gap in the DIMM slot. **Figure 2-3** (previous page) shows how to sit the DIMM into its slot. To insert the DIMM, push down vertically on the module with even force, as shown in the photo. Do not shove one end in first; doing so will bend the DIMM pins.

To lock the DIMM into place, push the plastic clips on either end of the slot onto the notches in the ends of the DIMM (see **Figure 2-4** below). In some cases, pushing the memory module into the DIMM slot will move the plastic clips inward, automatically locking the module into place. To remove your DIMM, simply pull the clips back, and pull up on the module.

INSTALL

Figure 2-4

Place the DIMMs in an anti-static bag as soon as you remove them to avoid static damage.

The Trinity KT uses a 64-bit data path from memory to CPU and can accommodate up to 1.5GB of SDRAM. The 168-pin DIMMs (Dual In-line Memory Modules) must be of the 3.3V, **unbuffered** variety. The position of the notch in the SDRAM key position will tell you whether or not a DIMM is unbuffered (see the Figure 2-5 below). All installed memory will be automatically detected, so there is no need to set any jumpers.

RFU — Unbuffered
Buffered
168-pin DIMM

EEPROM
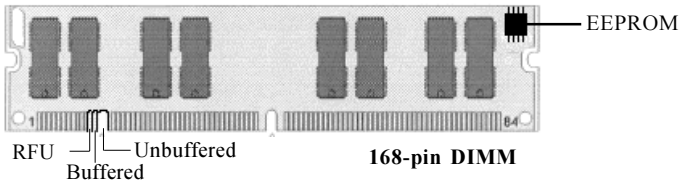
Figure 2-5

Some details of memory installation:

• The mainboard supports 32MB, 64MB, 128MB, and 256MB unbuffered SDRAM.
• ECC memory is only supported with 512 MB PC100 registered DIMMs

The table below shows some of the possible memory configurations. Not all possible configurations are listed.

DIMM Bank 1	DIMM Bank 2	DIMM Bank 3	Total
32MBx1	32MBx1	0	64MB
0	32MBx1	32MBx1	64MB
64MBx1	32MBx1	0	96MB
0	32MBx1	64MBx1	96MB
64MBx1	64MBx1	0	128MB
0	64MBx1	64MBx1	128MB
64MBx1	128MBx1		192MB
0	128MBx1	64MBx1	192MB
128MBx1	128MBx1	0	256MB
0	128MBx1	128MBx1	256MB
128MBx1	256MBx1	0	384MB
0	256MBx1	256MBx1	512MB
512MBx1	512MBx1	0	1024MB
512MBx1	512MBx1	512MBx1	1536MB

warning **Warning! DO NOT use registered DIMMs, with exception to 512 MB PC100 registered memory. (Check with your memory dealer for more information).** See www.tyan.com for the latest memory compatibility information.

4. Installing the CPU and Cooling Fan

Socket A type Duron™ and Athlon™ processors can be used on the Trinity KT. Remember:

- The CPU is a sensitive electronic component and it can easily be damaged by static electricity. Do not touch the CPU pins with your fingers.
- Before the CPU is installed, the mainboard must be placed on a flat surface. You should be able to insert the CPU into the socket with minimal, but firm pressure. Do not press down hard on the CPU.
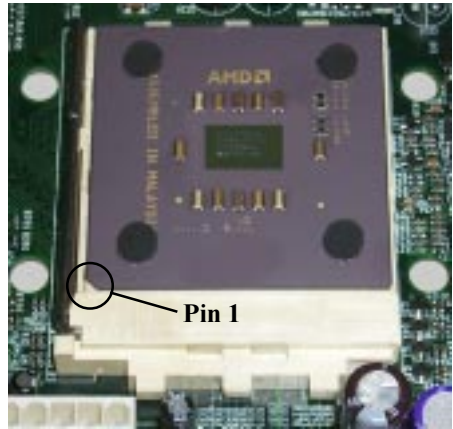
Pin 1

Figure 2-6

Pin 1 on the CPU is denoted by a small dot on one of the corners and Pin 1 on the ZIF socket is denoted by an angled corner (see **Figure 2-6**). Never force a CPU into a socket. Forcing a CPU to seat will bend the pins on the CPU and possibly damage the motherboard.

Push down lightly on the CPU, and lower the arm on the ZIF socket to secure the CPU. A squeaking noise is normal as the arm lowers. After the CPU is securely seated, install the appropriate cooling device. Tyan strongly recomends a heatsink / fan combination. Consult with your case manufacturer for other cooling options.

Locate the cooling fan connector (e.g. FAN1) on the motherboard. Plug the CPU's cooling fan cable into the cooling fan connector on the board. There will be a plastic clip assembly similar to that of the ATX power connector that will force you to connect the fan cable correctly (see **Figure 2-7** below).

5. Connecting IDE and Floppy Drives

The colored stripe on a ribbon cable should face toward the ATX Power Connector on the motherboard. In **Figure 2-8** (next page), you can see how the IDE cables should look when they are connected to your hard drive. Notice how Pin 1 (denoted by a colored stripe) is connected so that

Figure 2-7

it is next to the power connector of the drive. The primary IDE connector is black; the secondary IDE connector is white. In most cases, this is the proper way of connecting your IDE cable to the hard drive. **Figure 2-9** on the next page shows the IDE cable properly connected to the motherboard. Contact your hard disk drive manufacturer or documentation for more information.

ATA-66 IDE hard drives require a special 80 pin IDE cable which has additional grounding wires. The cable is included in the motherboard package, and is required when using ATA-66 drives. This cable will also support all legacy IDE drives. **Note: The BLUE end of the ATA-66 cable must connect to the motherboard. Only Tyan-approved cables will work on this motherboard. If you are using an existing case with old cables, your system may not function properly.**

important!

Figure 2-8

Pin 1   Power

Some symptoms of incorrectly installed HDDs are:

- Hard disk drives are not auto-detected: may be a Master / Slave problem or a bad IDE cable. Contact your vendor.
- Hard Disk Drive Fail message at bootup: may be a bad cable or lack of power going to the drive.
- No video or beeps on bootup: usually means the cable is on backwards.
- Hard drive lights are constantly on: usually means bad IDE cable or defective drives / motherboard. Try another HDD.
- Hard drives do not power up: check power cables and cabling. May also be a bad power supply or IDE drive.
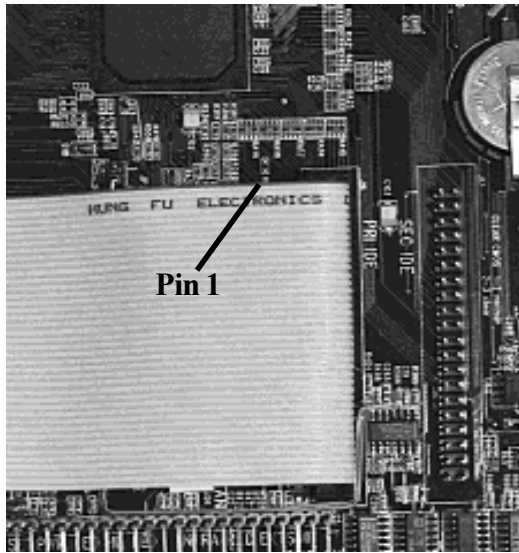
Figure 2-9

*Note: The images above is used to illustrate a concept and may not represent the actual image of your motherboard.

Connecting Floppy Drives

Pin 1 on the floppy cable is usually denoted by a red or colored stripe down one side of the cable (see **Figure 2-10** below). Most of the current floppy drives on the market require that the colored stripe be positioned so that it is right next to the power connector. In most cases, there will be a key pin on the cable which will force you to connect the cable properly.
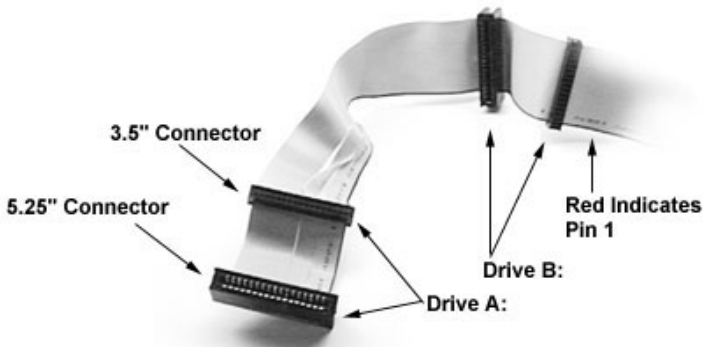
Figure 2-10

Drive A: is usually attached to the end of the cable with the twist in it. Drive B: is usually connected to the middle of the cable. Refer to your installation instructions or call your dealer if you are unsure about attaching floppy drives. Refer to **Figure 2-10** for a detailed anatomy of the floppy cable.

Remember, you can only have 2 floppy drives connected at any given time. Some symptoms of incorrectly installed floppy drives are:

- Floppy drives are not detected: usually caused by faulty cables, backward cables, or a bad floppy or motherboard. Try another single floppy drive to verify the problem or try another cable. Also, check to see if the onboard floppy is enabled in the BIOS.
- Floppy Drive Fail message at bootup: the cable, floppy, or motherboard may be faulty. Try another cable or floppy drive to verify.
- Light on the floppy is on constantly: usually signifies that the cable is on backwards. Reverse the cable at the floppy drive end and try again.

6. Installing Add-on Cards

There are a few rules you need to follow when plugging in a card. In order to assure proper operation and a quick installation, adhere to these guidelines:

- If you are going to install a soundcard, the onboard sound must be manually disabled through the BIOS first.
- If you are going to install a PCI-Bus interface card on your system, be aware that any one of the 6 PCI slots can support a Master or Slave device.
- NEVER force a card into a slot. If it doesn't fit, look at the socket on the computer to make sure there are no wires or other obstructions to the slot.
- NEVER plug an ISA card into a PCI slot or a PCI card in an ISA slot. You will void your warranty and damage your system board if you do this.

AGP slot

ISA slot

! important!

- You can only install an ISA card if you have not installed a PCI card in the sixth PCI slot (the PCI slot directly above the ISA slot).
- When plugging the card in, especially when installing long cards, try to push the entire card in at one time. Don't force one end of the card into the socket first and then the other. This will create a rocking motion between the card and the slot and it will damage the pins within the socket.
- Make sure that the cards are seated securely into the slots.
- Before turning on the system, make sure no cards are touching.
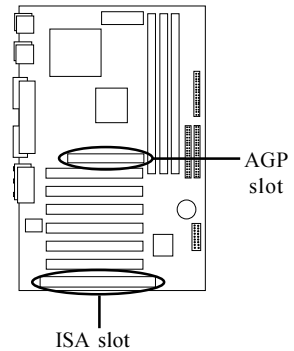
If you follow these basic guidelines, there shouldn't be any problems with installation. However, if you do encounter any problems, have a qualified professional install your cards for you or contact your card manufacturer.

Remember, always read the manuals and installation notes that come with the adapter cards. They contain important information which will help you install the components right, the first time.

INSTALL

7. Connecting PS/2, USB, Serial & Parallel Devices

This board includes ports for USB, PS/2 mouse, and PS/2 keyboard devices. Note that, for this board, the mouse port is the upper PS/2 port, and the keyboard port is the lower PS/2 port.

The PS/2 connectors are probably quite familiar to you, while the Universal Serial Bus (USB) connectors, may not be. The USB port can function as a serial, parallel, mouse, keyboard, or joystick port. It is fast enough to support video transmissions, and is capable of supporting up to 127 daisy-chained peripheral devices. **Figure 2-11** (below) shows the ATX double row connectors on this board. The Serial and Parallel ports, as well as the other ports, are labeled.

PS/2 mouse   LPT   MIDI / Game Port

PS/2 keybrd   USB O/1   COM1   Line-out   Line-in   Mic-in
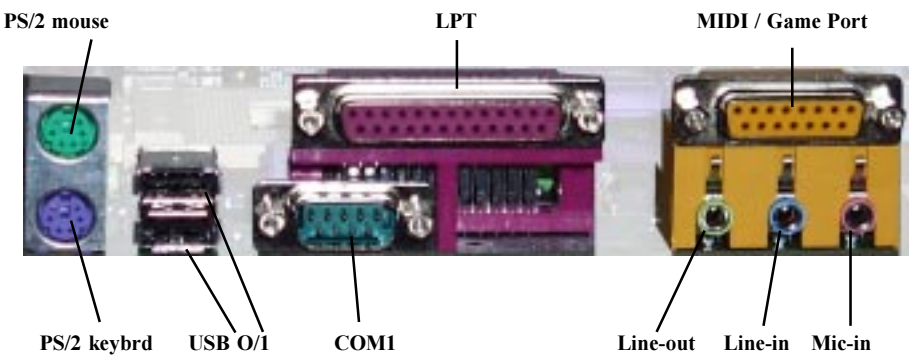
Figure 2-11

Connecting Serial and Printer Ports

warning

Warning: When plugging in your keyboard and mouse, or when plugging anything into a serial or parallel port, make sure that the power is off. Connecting these devices and ports while the power is on is called "hot plugging," and may damage your system.

8. Connecting the Power Supply

The Trinity KT requires an ATX power supply. Tyan recommends using one that conforms to industry standard revision 2.01. The photos below show the ATX power connector before (**Figure 2-12**) and after (**Figure 2-13**) it has been plugged in. The plastic clip on the power connector should lock over the plastic tab on the onboard connector. You shouldn't be able to plug the power connector in any other way but just to be safe, make sure it looks like **Figure 2-13** below.
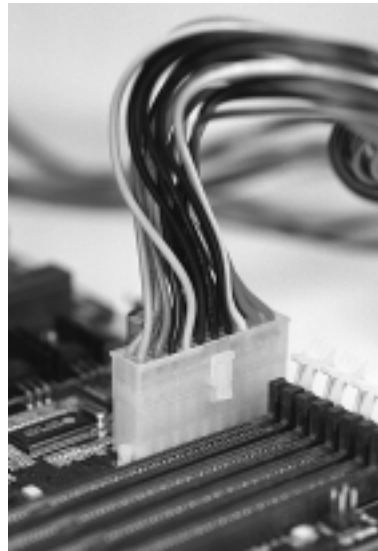
Figure 2-12	**Figure 2-13**

Make certain that you do not miss connecting any pins because if you do, you will void your warranty and cause damage to yourself or your motherboard when you turn the system on. After connecting the power, make sure the connector is seated firmly into its socket so it will not become loose or fall off when the computer is jostled or moved. **NOTE: When installing your power supply, make sure the power supply switch is turned 'OFF'. You may turn the switch back 'ON' once you've finished building your system.**

important!

You are done!

Other than checking the jumper settings and cable connections, and putting the case back on, you are done. Installing a new motherboard may sound difficult, but by following these directions, you should have a fairly uneventful time installing our products. If you do encounter problems, your dealer will be able to help you, or you can consult one of our many technical support resources (see page 8).

Frequently Asked Questions

Q: My system sometimes becomes unstable. How should I check the system?
A: The first thing to do is to check and see if you have any device conflicts in IRQ, or DMA. If you are using Windows 98/2000, the Control Panel is a good place to start. Please consult your operating system manual for details. Second of all, slowing down the memory timing in the BIOS's chipset setup section will help the situation, as well. Many memory modules are not suitable for high performance systems and are probably the main source of your problem.

Q: How do I find out what memory will work with my motherboard?
A: Memory compatibility information can be found on Tyan's web site at:
http://www.tyan.com

Q: Where can I get USB cables for my motherboard?
A: You can get USB cables from **www.etyan.com** or **www.wiretekusa.com**:
Tyan USB Cable Part #S1606-001-01

Q: What is the USB pin out information for Tyan motherboards?
A: Please refer to URL link here: **http://www.tyan.com/techref/html/io_usb.html**

Q: My motherboard is dead, how do I return it?
A: Contact the place of purchase or your distributor for assistance to return the motherboard for service. RMA issues will not be handled via email by Tyan Tech Support. Please refer to URL link here for more details:
http://www.tyan.com/support/html/rma_faq.html

Q: How do I upgrade my BIOS?
A: Check the section on Flash Utility (see page 55) for information on upgrading your BIOS. BIOS update files and instructions on how to install them are also available from the Tyan web site at: **http://www.tyan.com**

Q: Is my motherboard Y2K compliant?
A: Please refer to URL link here: **http://www.tyan.com/support/html/year2000.html**

Q: Why do I get a "CMOS checksum invalid" error message during POST?
A: If you get the above error message or "Invalid configuration, run Setup" message, the it is an indication that the CMOS battery needs to be changed. Contact your dealer for assistance. Once you've replaced your battery, don't forget to check the Clear CMOS section (see page 15), so you can reset your CMOS.

INSTALL

chapter 3

BIOS Configuration

Introduction to Setup

The BIOS is the basic input output system is required by the computer to perform functions such as CPU and hard drive support. This chapter decribes different settings for AMIBIOS that can be use to configure your system.

⚠ important! **The BIOS section of the manual is subject to change without notice and is provided here for reference purposes only. The settings and configurations of the BIOS are current at the time of print, and therefore they may not be exactly the same as that displayed on your screen.**

This manual describes the Award BIOS Setup program. The Setup program lets you modify basic system 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.

The Award BIOS in your computer is a customized version of an industry-standard BIOS for IBM PC AT–compatible personal computers. It supports Intel x86 and compatible processors. The BIOS provides critical low-level support for the system central processing, memory, and I/O subsystems.

The Award BIOS has been customized by adding important, but nonstandard, features such as virus and password protection, power management, and detailed fine-tuning of the chipset controlling the system. The rest of this manual is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The Award BIOS is immediately activated when you first turn on the computer. The BIOS reads system configuration information in CMOS RAM and begins the process of checking out the system and configuring it through the power-on self test (POST).

When these preliminaries are finished, the BIOS seeks an operating system on one of the data storage devices (hard drive, floppy drive, etc.). The BIOS launches the operating system and hands control of system operations to it.

During POST, you can start the Setup program in one of two ways:
1. By pressing <Delete> immediately after switching the system on, or
2. By pressing the <Delete> key when the following message appears briefly at the bottom of the screen during POST:

TO ENTER SETUP BEFORE BOOT PRESS DEL KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the RESET button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message appears and you are again asked to:

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Setup Keys

The table on the following page shows how to navigate in Setup using the keyboard.

Getting Help

Press <F1> to pop up 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. Help window functions are also listed on the next page.

KEY	FUNCTION
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to item on the left side
Right arrow	Move to item on the right side
ESC key	Main Menu: Quit and do not save changes into CMOS RAM Status Page Setup Menu: Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ KEY	Increase the numeric value or make changes
- KEY	Decrease the numeric value or make changes
F1 key	General help; only for Status Page Setup Menu and Option Page Setup Menu
F2 key Shift-F2	Change color from total of 16 colors. F2 to select next color; Shift-F2 to select previous color
F3 key	Calendar; only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS; only for Option Page Setup Menu
F6 key	Load the default CMOS RAM value from BIOS default table; only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes; only for Main Menu

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer is no longer able to boot, restart by either using the ON/OFF switch, the RESET button or by pressing <Ctrl>, <Alt> and <Delete> at the same time, or clear the CMOS (see page 15 for details).

The best advice is to alter only settings that you thoroughly understand. In particular, do not change settings in the Chipset screen without a good reason. The Chipset defaults have been carefully chosen by Award Software or your system manufacturer for the best performance and reliability. Even a seemingly small change to the Chipset setup may causing the system to become unstable.

Setup Variations

Not all systems have the same Setup. While the basic look and function of the Setup program remains the same for all systems, the appearance of your Setup screens may differ from the screens shown here. Each system design and chipset combination require custom configurations. In addition, the final appearance of the Setup program depends on your system designer. Your system designer can decide that certain items should not be available for user configuration and remove them from the Setup program.

Main Setup

When you enter the AwardBIOS CMOS Setup Utility, a Main Menu, similar to the one shown below, appears on the screen. The Main Menu allows you to select from several Setup functions and two exit choices. Use the arrow keys to select among the items and press enter to accept and enter the sub-menu. A brief description of each highlighted selection appears at the bottom of the screen. Following is a brief summary of each Setup category.

BIOS

```
        CMOS Setup Utility - Copyright (C) 1984-2000 Award Software

   ▶ Standard CMOS Features          Frequency/Voltage

   ▶ Advanced BIOS Features          Load Fail-Safe Defaults

   ▶ Advanced Chipset Features       Load Optimized Defaults

   ▶ Integrated Peripherals          Set Supervisor Password

   ▶ Power Management Setup           Set User Password

   ▶ PnP/PCI Configurations          Save & Exit Setup

   ▶ PC Health Status                Exit Without Saving


Esc : Quit                         ↑ ↓ → ←   : Select Item
F10 : Save & Exit Setup            (Shift)F2 : Change Color
```

Menu Option	Function
Standard CMOS Features	Options in the original PC AT-compatible BIOS.
Advanced BIOS Features	Award Software enhanced BIOS options.
Advanced Chipset Features	Options specific to your system chipset.
Integrated Perpherals	I / O subsystems that depend on the integrated peripherals controller in your system.
Power Management Setup	Advanced Power Management (APM) options.
PnP / PCI Configurations	Plug and Play standard and PCI Local Bus configuration options.
PC Health Status	Displays CPU / System temperature and fan speeds.
Load Fail-Safe Defaults	BIOS defaults are factory settings for the move stable, minimal-performance system operations.
Load Optimized Defaults	Setup defaults are factory settings for optimal-performance system operations.
Set Supervisor Password	Change, set, or disable a password. Only thr supervisor password permits access to setup.
Set User Password	Change, set, or disable a password. The user password generally allows only power-on access.
Save & Exit Setup	Save settings in a non-volatile CMOS RAM and exit Setup.
Exit Without Saving	Abandon all changes and exit Setup.

Standard CMOS Features

In the Standard CMOS Features menu you can set the system clock and calendar, record disk drive parameters and the video subsystem type, and select the type of errors that stop the BIOS POST.

Date
The BIOS determines the day of the week from the other date information. This field is for information only. Press the arrow keys to move to the desired field (date, month, year). Press the <PgUp> or <PgDn> key to increment the setting, or type the desired value into the field.

Time
The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the arrow keys to move to the desired field. Press the <PgUp> or <PgDn> key to increment the setting, or type the desired value into the field.

```
      CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Standard CMOS Features

    ┌─────────────────────────────────────────────────┬──────────────────────┐
    │   Date (mm:dd:yy)          Sat, Jan 1 2000       │     Item Help        │
    │   Time (hh:mm:ss)           0 : 10: 30           ├──────────────────────┤
    │                                                  │  Menu Level   ▶      │
    │ ▶ IDE  Primary Master     Press Enter  None      │                      │
    │ ▶ IDE  Primary Slave      Press  Enter  None     │  To enter next page for│
    │ ▶ IDE  Secondary Master   Press  Enter  None     │  detail hard drive   │
    │ ▶ IDE  Secondary Slave    Press  Enter  None     │  settings            │
    │                                                  │                      │
    │   Drive A                 1.44M, 3.5 in.         │                      │
    │   Drive B                 None                   │                      │
    │                                                  │                      │
    │   Video                   EGA/VGA                │                      │
    │   Halt On                 All,But Keyboard       │                      │
    │                                                  │                      │
    │   Base Memory                  640K              │                      │
    │   Extended Memory            31744K              │                      │
    │   Total Memory               32768K              │                      │
    │                                                  │                      │
    └─────────────────────────────────────────────────┴──────────────────────┘

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

BIOS

IDE Primary / Secondary, Master / Slave

The BIOS supports up to four IDE drives. This section does not show information about other IDE devices, such as a CD-ROM drive, or about other hard drive types, such as SCSI drives. Note: We recommend that you select type **auto** for all drives.

The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select type auto for a hard drive, the BIOS detects its specifications during POST, every time the system boots. If you do not want to select drive type auto, other methods of selecting the drive type are available:

1. Match the specifications of your installed IDE hard drive(s) with the preprogrammed values for drive types 1 through 45.
2. Select User and enter values into each drive parameter field.
3. Use the IDE HDD Auto Dectection function in Setup.

The following is a brief explanation of drive specifications:

Type: The BIOS contains a table of pre-defined drive types. Each defined drive type has a specified number of cylinders, number of heads, write precompensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type user.

Size: Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

Cyls: Number of cylinders

Head: Number of heads

Precomp: Write precompensation cylinder

Landz: Landing zone

Sector: Number of sectors

Access Mode: Auto, Normal, large, or LBA

Auto	The BIOS automatically determines the optimal mode.
Normal	Maximum number of cylinders, heads, and sectors supported are 1024, 16, and 63.
Large	For drives that do not support LBA and have more than 1024 cylinders.
LBA (Logical Block Addressing)	During drive accesses, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater than 1024 cylinders.

Drive A
Select the correct specifications for the diskette drive(s) installed in the computer.

None	No diskette drive installed.
360K, 5.25"	5.25" PC-type standard drive; 360 kilobyte capacity.
1.2M, 5.25"	5.25" AT-type high-density drive; 1.2 megabyte capacity.
720K, 3.5"	3.5" double-sided drive; 720 kilobyte capacity.
1.44M, 3.5"	3.5" double-sided high-density drive; 1.44 megabyte capacity.
2.88M, 3.5"	3.5" double-sided extended capacity; 2.88 megabyte capacity.

Video

Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

EGA / VGA	Enhanced Graphics Adapter / Video Graphics Array. For EGA, VGA, SEGA, SVGA, or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode.
CGA 80	Color Graphics Adapter, power up in 80 column mode.
MONO	Monochrome adapter, includes high resolution monochrome adapters.

Halt On

During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

No errors	POST does not stop for any errors.
All errors	If the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.
All, but keyboard	POST does not stop for a keyboard error, but stops for all other errors.
All, but diskette	POST does not stop for diskette drive errors, but stops for all other errors.
All, but disk / key	POST does not stop for a keyboard or disk error, but stops for all other errors.

Memory

You cannot change any values in the Memory fields; they are only for your information. The fields show the total installed random access memory (RAM) and amounts allocated to base memory, extended memory, and other (high) memory. RAM is the computer's working memory, where the computer stores programs and data currently being used, so they are accessible to the CPU. RAM is counted in kilobytes (KB: approximately one thousand bytes) and megabytes (MB: approximately one million bytes). Modern personal computers may contain up to 64 MB, 128 MB, or more.

Base Memory	Typically 640 KB. Also called conventional memory. The DOS operating system and conventional applications use this area.
Extended Memory	Above the 1 MB boundary. Early IBM personal computers could not use memory above 1 MB, but current PCs and their software can use extended memory.
Other Memory	Between 640 KB and 1 MB; often called high memory. DOS may load terminate-and-stay (TSR) programs in this area, such as device drivers, to free as much conventional memory as possible for applications. Lines in your config.sys file that start with loadhigh, load programs into high memory.

Advanced BIOS Features

The screen (shown below) contains industry-standard options additional to the core
PC AT BIOS. This section describes all fields offered by Award Software in this
screen. The example screen below may vary from the one in your Setup program. Your
system board designer may omit or modify some fields.

Advanced BIOS Features - Fail-Safe Defaults

```
CMOS Setup Utility – Copyright (C) 1984-2000 Award Software
                  Standard CMOS Features
```

```
   Virus Warning              Enabled      ▲        Item Help
   CPU Internal Cache         Enabled
   External Cache             Enabled            Menu Level  ▶
   CPU L2 Cache ECC Checking  Enabled
   Quick Power On Self Test   Disabled          Allows you to choose
   First Boot Device          Floppy            the VIRUS warning
   Second Boot Device         HDD-0             feature for IDE Hard
   Third Boot Device          LS120             Disk boot sector
   Boot Other Device          Enabled           protection. If this
   Swap Floppy Drive          Disabled          function is enabled
   Boot UpFloppy Seek         Enabled           and someone attempts
   Boot Up NumLock Status     On                to write data into this
   Gate A20 Option            Normal            area, BIOS will show a
   Typematic Rate Setting     Disabled          warning message on
 X Typematic Rate (Chars/Sec) 6                 screen and alarm beep
 X Typematic Delay (Msec)     250
   Security Option            Setup
   MPS Version Control For OS 1.1
   OS Select For DRAM > 64MB  Non-OS2
   Video BIOS Shadow          Enabled
   C8000-CBFFF Shadow         Disabled
   CC000-CFFFF Shadow         Disabled
   D0000-D3FFF Shadow         Disabled
   D4000-D7FFF Shadow         Disabled
   D8000-DBFFF Shadow         Disabled     ▼
   DC000-CFFFF Shadow         Disabled
```

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

Advanced BIOS Features - Optimized Defaults

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                    Standard CMOS Features
```

Virus Warning	Disabled	Item Help
CPU Internal Cache	Enabled	
External Cache	Enabled	Menu Level ▶
CPU L2 Cache ECC Checking	Enabled	
Quick Power On Self Test	Disabled	Allows you to choose
First Boot Device	Floppy	the VIRUS warning
Second Boot Device	HDD-0	feature for IDE Hard
Third Boot Device	LS120	Disk boot sector
Boot Other Device	Enabled	protection. If this
Swap Floppy Drive	Disabled	function is enabled
Boot UpFloppy Seek	Enabled	and someone attempts
Boot Up NumLock Status	On	to write data into this
Gate A20 Option	Fast	area, BIOS will show a
Typematic Rate Setting	Disabled	warning message on
X Typematic Rate (Chars/Sec)	6	screen and alarm beep
X Typematic Delay (Msec)	250	
Security Option	Setup	
MPS Version Control For OS	1.1	
OS Select For DRAM > 64MB	Non-OS2	
Video BIOS Shadow	Enabled	
C8000-CBFFF Shadow	Disabled	
CC000-CFFFF Shadow	Disabled	
D0000-D3FFF Shadow	Disabled	
D4000-D7FFF Shadow	Disabled	
D8000-DBFFF Shadow	Disabled	
DC000-CFFFF Shadow	Disabled	

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

BIOS

Virus Warning
When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive. Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

CPU Internal Cache/External Cache
Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU

requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The External Cache field may not appear if your system does not have external cache memory.

CPU L2 Cache ECC Checking
Enables Error Checking and correction (ECC) on the L2 cache onboard the CPU.

Quick Power On Self Test
Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work.

Boot Sequence
The original IBM PCs loaded the operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, modern computers usually load the operating system from the hard drive, and may even load it from a CD-ROM drive. The BIOS now offers a large number of boot devices and boot sequence options.

Swap Floppy Drive
This option allows you to swap the floppy drives if more than one is installed. It allows you to switch the A: and B: to make B: become A: .

Boot Up Floppy Seek
When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to Disabled to save time.

Boot Up NumLock Status
Toggle between On or Off to control the state of the <NumLock> key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

Gate A20 Option
Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS / 2 and Windows.

Typematic Rate Setting
When Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When Enabled, you can select a typematic rate and typematic delay.

Typematic Rate (chars / sec)
When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10,12, 15, 20, 24 or 30 characters per second.

Typematic Delay (msec)
When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.

Security Option
If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup.

OS Select for DRAM > 64MB
Select OS / 2 only if you are running OS / 2 operating system with greater than 64 MB of RAM on your system.

Video BIOS Shadow
Software that resides in a read-only memory (ROM) chip on a device is called firmware. The EliteBIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals, such as, for example, a SCSI adapter.

Shadowing copies firmware from ROM into system RAM, where the CPU can read it through the 16-bit or 32-bit DRAM bus. Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves the performance of the system BIOS and similar ROM firmware for expansion peripherals, but it also reduces the amount of high memory (640 KB to 1 MB) available for loading device drivers, etc. Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option.

Video BIOS shadows into memory area C0000-C7FFF. The remaining areas shown on the BIOS Features Setup screen may be occupied by other expansion card firmware. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

BIOS

Advanced Chipset Features

This section describes features of the VIA KT-133 chipset.

Advanced Options

The parameters in this screen are for system designers, service personnel, and technically competent users only. Do not reset these values unless you understand the consequences of your changes. Note: This chapter describes all fields offered by Award Software in this screen. Your system board designer may omit or modify some fields.

Advanced Chipset Features Setup - Fail-Safe Default Settings

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                  Advanced Chipset Features
```

Bank 0/1 DRAM Timing	SDRAM 5/10ns	▲	Item Help
Bank 2/3 DRAM Timing	SDRAM 5/10ns		
Bank 4/5 DRAM Timing	SDRAM 5/10ns		Menu Level ▶
Bank 6/7 DRAM Timing	SDRAM 5/10ns		
SDRAM Cycle Length	3		
DRAM Clock	Host CLK		
Memory Hole	Disabled		
P2C/C2P Concurrency	Enabled		
Fast R-W Turn Around	Disabled		
System BIOS Cacheable	Disabled		
Video RAM Cacheable	Disabled		
AGP Aperature Size	64M		
AGP-4X Mode	Enabled		
AGP Driving Control	Auto		
X AGP Driving Value	DA		
AGP Fast Write	Disabled		
OnChip USB	Disabled		
USB Keyboard Support	Disabled		
CPU to PCI Write Buffer	Enabled		
PCI Dynamic Bursting	Disabled		
PCI Master 0 WS Write	Enabled		
PCI Delay Transaction	Disabled		
PCI#2 Access #1 Retry	Disabled		
AGP Master 1 WS Write	Disabled		
AGP Master 1 WS Read	Disabled		
Memory Parity/ECC Check	Disabled	▼	

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

Advanced Chipset Features Setup - Optimized Default Settings

```
        CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                        Advanced Chipset Features
```

```
┌─────────────────────────────────────────────┬─────────────────────┐
│    Bank 0/1 DRAM Timing      SDRAM 5/10ns  ▲ │     Item Help       │
│    Bank 2/3 DRAM Timing      SDRAM 5/10ns    │                     │
│    Bank 4/5 DRAM Timing      SDRAM 5/10ns    │   Menu Level  ▶     │
│    Bank 6/7 DRAM Timing      SDRAM 5/10ns    │                     │
│    SDRAM Cycle Length        3               │                     │
│    DRAM Clock                Host CLK        │                     │
│    Memory Hole               Disabled        │                     │
│    P2C/C2P Concurrency       Enabled         │                     │
│    Fast R-W Turn Around      Disabled        │                     │
│    System BIOS Cacheable     Disabled        │                     │
│    Video RAM Cacheable       Disabled        │                     │
│    AGP Aperature Size        64M             │                     │
│    AGP-4X Mode               Enabled         │                     │
│    AGP Driving Control       Auto            │                     │
│  X AGP Driving Value         DA              │                     │
│    AGP Fast Write            Disabled        │                     │
│    OnChip USB                Disabled        │                     │
│    USB Keyboard Support      Disabled        │                     │
│    CPU to PCI Write Buffer   Enabled         │                     │
│    PCI Dynamic Bursting      Enabled         │                     │
│    PCI Master 0 WS Write     Enabled         │                     │
│    PCI Delay Transaction     Enabled         │                     │
│    PCI#2 Access #1 Retry     Enabled         │                     │
│    AGP Master 1 WS Write     Disabled        │                     │
│    AGP Master 1 WS Read      Disabled        │                     │
│    Memory Parity/ECC Check   Disabled      ▼ │                     │
└─────────────────────────────────────────────┴─────────────────────┘
```

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

Bank 0/1, 2/3, 4/5, 6/7 DRAM Timing
The system board designer must select the proper value for these fields, according to the specifications of the installed DRAM chips. Turbo mode reduces CAS access time by 1 clock tick.

SDRAM Cycle Length
This field sets the CAS latency timing.

DRAM Clock
Allows you to set the memory clock speed to match Host Clock or to one of the preset clock speeds.

BIOS

Memory Hole
This option specifies the location of an area of memory that cannot be addressed on the ISA bus. The settings are Disabled, 512KB-64KB, or 15MB-16MB.

P2C / C2P Concurrency
By enabling this function the PCI / AGP Master to CPU Cycle can be concurrent if the Host CPU is performing R/W access to the PCI or slave devices.

Fast Read Write turn-around
If Enabled, it reduces the turn around time for a memory read is followed by a memory write consecutively.

System BIOS Cacheable
If Enabled, results in better system performance by permitting caching of the system BIOS ROM at F0000h-FFFFFh. Any program which tries to write to this memory area, however, may cause a system error.

Video RAM Cacheable
Increases video performance by caching video memory.

AGP Aperture Size
Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See **http://www.agpforum.org** for AGP information.

AGP-4x Mode
Enables the 4X AGP mode for higher AGP throughput. A 4X AGP graphics card is required to enable this function.

AGP Driving Control
Due to the compatibility of some AGP cards with the chipset this setting is used to fine tune these issues. Default is set to Auto.

AGP Driving Value
This is the value set for the AGP Driving control. The manufacturers recommended setting is set to CC and it is suggested not to change this value.

AGP Fast Write
This function allows the AGP port to function at a increased rate. Enable this function to allow faster graphics performance.

OnChip USB
The chipset contains an integrated USB controller. Select Enabled if you have USB peripherals.

USB Keyboard Support
This function can enable or disable the use of a USB Keyboard. Default is disabled.

CPU to PCI Write Buffer
When this field is Enabled, writes from the CPU to the PCI bus are buffered to compensate for the speed differences between the CPU and the PCI bus. When Disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another write cycle.

PCI Dynamic Bursting
When Enabled, every write transaction goes to the write buffer. Burstable transactions then burst on the PCI bus; nonburstable transactions do not.

PCI Master 0 WS Write
When this field is Enabled, writes to the PCI bus are executed with zero wait states.

PCI Delay Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transaction cycles. Select Enabled to support compliance with PCI specification version 2.1.

PCI#2 Access #1 Retry
Select Enabled to rotate priority of PCI masters.

AGP Master 1 WS Write / Read
Select Enabled to add one clock tick to AGP write operations.

Memory Parity / ECC Check
Select Enabled, Disabled, or Auto. In Auto mode, the BIOS enables memory checking automatically when it detects the presence of ECC or parity DRAM.

BIOS

Integrated Peripherals

Note: This chapter describes all fields offered by Award Software in this screen. Your system board designer may omit or modify some fields.

Integrated Peripherals - Fail-Safe Default Settings

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                  Integrated Peripherals
```

```
┌──────────────────────────────────────────────┬──────────────────┐
│    OnChip IDE Channel0      Enabled     ▲      │    Item Help     │
│    OnChip IDE Channel1      Enabled            ├──────────────────┤
│    IDE Prefetch Mode        Disabled           │ Menu Level  ▶    │
│    Primary Master   PIO     Auto               │                  │
│    Primary Slave    PIO     Auto               │                  │
│    Secondary Master PIO     Auto               │                  │
│    Secondary Slave  PIO     Auto               │                  │
│    Primary Master   UDMA    Disable            │                  │
│    Primary Slave    UDMA    Disable            │                  │
│    Secondary Master UDMA    Disable            │                  │
│    Secondary Slave  UDMA    Disable            │                  │
│    Init Display First       PCI Slot           │                  │
│    IDE HDD Block Mode       Disabled           │                  │
│    KBC input clock          8 MHz              │                  │
│    Onboard FDD Controller   Enabled            │                  │
│    Onboard Serial Port 1    3F8/IRQ4           │                  │
│    Onboard Serial Port 2    2F8/IRQ3           │                  │
│    UART Mode Select         Normal             │                  │
│  X UART2 Duplex Mode        Half               │                  │
│  X RxD , TxD Active         Hi,Lo              │                  │
│  X IR Transmission delay    Enabled            │                  │
│    Onboard Parallel Port    378/IRQ7           │                  │
│    Onboard Parallel Mode    Normal             │                  │
│  X ECP Mode Use DMA         3                  │                  │
│  X Parallel Port EPP Type   EPP1.9             │                  │
│    PWRON After PWR-Fail     Off         ▼      │                  │
└──────────────────────────────────────────────┴──────────────────┘
```

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

Integrated Peripherals - Optimized Default Settings

```
CMOS Setup Utility – Copyright (C) 1984–2000 Award Software
                     Integrated Peripherals
```

```
┌─────────────────────────────────────────────────┬───────────────────┐
│   OnChip IDE Channel0        Enabled      ▲      │     Item Help     │
│   OnChip IDE Channel1        Enabled             ├───────────────────┤
│   IDE Prefetch Mode          Enabled             │  Menu Level  ▶    │
│   Primary Master   PIO       Auto                │                   │
│   Primary Slave    PIO       Auto                │                   │
│   Secondary Master PIO       Auto                │                   │
│   Secondary Slave  PIO       Auto                │                   │
│   Primary Master   UDMA      Auto                │                   │
│   Primary Slave    UDMA      Auto                │                   │
│   Secondary Master UDMA      Auto                │                   │
│   Secondary Slave  UDMA      Auto                │                   │
│   Init Display First         PCI Slot            │                   │
│   IDE HDD Block Mode         Enabled             │                   │
│   KBC input clock            8 MHz               │                   │
│   Onboard FDD Controller     Enabled             │                   │
│   Onboard Serial Port 1      3F8/IRQ4            │                   │
│   Onboard Serial Port 2      2F8/IRQ3            │                   │
│   UART Mode Select           Normal             │                   │
│ X UART2 Duplex Mode          Half                │                   │
│ X RxD , TxD Active           Hi,Lo               │                   │
│ X IR Transmission delay      Enabled             │                   │
│   Onboard Parallel Port      378/IRQ7            │                   │
│   Onboard Parallel Mode      SPP                 │                   │
│ X ECP Mode Use DMA           3                   │                   │
│ X Parallel Port EPP Type     EPP1.7              │                   │
│   PWRON After PWR-Fail       Off          ▼      │                   │
└─────────────────────────────────────────────────┴───────────────────┘
```

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

On-Chip IDE Channel 0 / 1
This chipset contains a PCI IDE interface with support for two IDE channels. Select
Enabled to activate the primary and/or secondary onboard IDE interface. Select
Disabled to deactivate this interface, if you install a primary and/or secondary add-in
IDE interface.

IDE Prefetch Mode
The onboard IDE drive interface supports IDE prefetching for faster drive accesses. If
you install a primary and / or secondary add-in IDE interface, set this field to Disabled
if the interface does not support prefetching.

BIOS

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

IDE Primary / Secondary Master / Slave UDMA
UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 66 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

Init Display First
Select the type of display adapter used in your system.

IDE HDD Block Mode
Block mode is also called block transfer, multiple commands, or multiple sector read / write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

KBC Input Clock
Allows you to adjust the keyboard clock signal.

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

Onboard Serial Port 1 / 2
Select a logical COM port address and corresponding interrupt for the first and second serial ports. The second serial port offers infrared options in the next field.

UART Mode Select
Select an operating mode for the second serial port:

Standard	RS-232C serial port
IrDA	Serial infrared port
ASKIR	Amplitude shift keyed infrared port

UART2 Duplex Mode
This setting allows the COM port to receive and transmit data simultaneously. Default is at half duplex.

RxD, TxD Active
This setting is reserved and should be left as default. Default setting is Hi, Lo

IR Transmission delay
Adjust this setting to set the delay before a signal is sent through the IR port.

Onboard Parallel Port
Select a logical LPT port address and corresponding interrupt for the physical parallel port.

Onboard Parallel Mode
This option allows the user to select a mode for the onboard parallel port.

ECP Mode Use DMA
Allows the parallel ports to enable DMA, this a faster transfer rate.

EPP Mode Select
This setting selects the printer port's data transfer mode.

PWRON After PWR-Fail
This function enables the computer to power up or down after a sudden power interruption. If the setting is set to OFF, the computer will stay off even if the power is resumed. If it is set to On, the computer will power on when power is restored. If the setting is set to Former-Sts, the computer will return to the previous state before the power was interrupted.

Power Management Setup

Power Management Setup - Fail-Safe and Optimized Default Settings

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                  Power Management Setup
```

```
    ACPI  Function              Enabled              Item Help
  ▶ Power  Management           Press  Enter
    Video  Off  Option          Suspend -> Off     Menu  Level  ▶
    Video  Off  Method          V/H  SYNC+Blank
    MODEM Use  IRQ              3
    Soft-Off  by  PWRBTN        Instant-Off
  ▶ Wake  Up  Events            Press  Enter
```

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

ACPI Function
Enable or disable Advanced Configuration Power Interface.

Power Management
This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. See the section PM Timers for a brief description of each mode. This table describes each power management mode:

Max Saving	Maximum power savings; only available for SL CPUs. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out periods in the PM Timers section, following.
Min Saving	Minimum power savings; inactivity period is 1 hour in each mode (except the hard drive).

(*Power Management option - Fail-safe and Optimized Default Settings*)

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                    Power Management
```

```
┌─────────────────────────────────────────────┬──────────────────┐
│   Power  Management        User Define        │    Item Help     │
│   HDD Power Down           Disable            ├──────────────────┤
│   Doze Mode                Disable            │  Menu Level  ▶   │
│   Suspend Mode             Disable            │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
│                                               │                  │
└─────────────────────────────────────────────┴──────────────────┘
```

BIOS

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

HDD Power Down
After the selected period of drive inactivity (1 to 15 minutes), the hard disk drive
powers down while all other devices remain active.

Doze Mode
After the selected period of system inactivity (1 minute to 1 hour), the CPU clock runs
at slower speed while all other devices still operate at full speed.

Suspend Mode
After the selected period of system inactivity (1 minute to 1 hour), all devices except
the CPU shut off.

ACPI Suspend Type
This setting controls the type of suspend function that is enabled once the computer
has gone into suspend mode.

Video Off Option
Selects the power-saving modes during which the monitor goes blank.

Always On	Monitor remains on during power-saving modes.
Suspend --> Off	Monitor blanked when system enters suspend mode.
All Modes --> Off	Monitor blanked when system enters any power-saving mode.

Video Off Method
Determines the manner in which the monitor is blanked. The Blank Screen option will let the system BIOS blank the screen when disabling video. V/H sync+Blank will allow the system BIOS to turn off the V-SYNC and H-SYNC signals running from the VGA card to the monitor.

V / H SYNC+Blank	System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
Blank Screen	System only writes blanks to the video buffer.

Modem Use IRQ
If Modem Ring Resume is Enabled, it is possible to wake the system by dialing in to it. This field determines which IRQ will be monitored for the incoming call.

Soft-Off by PWRBTN
When you select Instant Off or Delay 4 Sec., turning the system off with the on/off button places the system in a very low power usage state, either immediately or after 4 seconds, with only enough circuitry receiving power to detect wake-up event activity.

Wake Up Events
A power management (PM) event awakens the system from, or resets activity timers for, Suspend mode.

TYAN

Wake Up Events option - Fail-safe and Optimized Default Settings

```
        CMOS Setup Utility – Copyright (C) 1984-2000 Award Software
                             Wake Up Events
```

```
┌─────────────────────────────────────────────┬──────────────────────┐
│    VGA                        OFF            │      Item Help       │
│    LPT & COM                  LPT/COM        ├──────────────────────┤
│    HDD & FDD                  ON             │  Menu  Level  ▶      │
│    DMA/ Master                OFF            │                      │
│    Wake Up On LAN             Disabled       │                      │
│    Modem Ring Resume          Disabled       │                      │
│    RTC Alarm Resume           Disabled       │                      │
│  X Date (of Month)             0             │                      │
│  X Resume Time (hh:mm:ss)      0    0    0   │                      │
│    Primary INTR               ON             │                      │
│  ▶ IRQs Activity Monitoring    Press  Enter  │                      │
│                                              │                      │
│                                              │                      │
└─────────────────────────────────────────────┴──────────────────────┘
```

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

VGA
When On, any video activity is a PM event.

LPT & COM
Select none, or one or more, ports whose activity is a PM event.

HDD & FDD
When On, any hard drive or floppy drive activity is a PM event.

DMA / master
When On, any DMA or bus master activity is a PM event.

Wake Up on LAN
This feature allows remote power up through a LAN connection when used in conjunction with a Wake on LAN compliant network adapter and appropriate software.

BIOS

Modem Ring Resume
When Enabled, an input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from Suspend mode.

RTC Alarm Resume
When Enabled, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

Wake Up on LAN
This feature allows remote power up through a LAN connection when used in conjunction with a Wake on LAN compliant network adapter and appropriate software.

Primary INTR
A system peripheral signals that it wants to gain the attention of the operating system by sending an interrupt request. When the system is in Suspend mode, IRQ activity can cause a Primary or Secondary wake-up. When Primary INTR is On, the IRQs in the above fields can be configured as Primary, Secondary, or Disabled.

Primary	The system wakes up fully when it detects IRQ activity.
Secondary	The system does not wake up, but the interrupt request is processed. Secondary interrupts are typically housekeeping devices needed to maintain the system while not requiring the use of the rest of the system resources. For example, IRQ8, the RTC alarm, is configured as Secondary by default. Another example might be a network adapter continually polled by the network.

IRQ*n*
The following is a list of IRQs (Interrupt Request Lines) assigned to common system peripherals.

IRQ0 (System Timer)
IRQ1 (Keyboard)
IRQ2 (Cascade- Reserved)
IRQ3 (COM2)
IRQ4 (COM1)
IRQ5 (FREE)
IRQ6 (Floppy Disk)

IRQ7 (LPT1)
IRQ8 (RTC Alarm)
IRQ9 (FREE)
IRQ10 (FREE)
IRQ11 (FREE)
IRQ12 (PS/2 Mouse)
IRQ13 (Coprocessor)
IRQ14 (Primary IDE)
IRQ15 (Seconday IDE)

PnP / PCI Configuration

Note: This chapter describes all fields offered by Award Software in this screen. Your system board designer may omit or modify some fields.

PnP / PCI Configurations - Fail-Safe and Optimized Default Settings

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                 PnP/PCI Configurations
```

```
┌─────────────────────────────────────────────┬──────────────────────┐
│    PNP OS  Installed          NO             │     Item Help        │
│    Reset  Configuration  Data  Disabled      ├──────────────────────┤
│                                              │  Menu  Level  ▶      │
│    Resources  Controlled  By   Auto(ESCD)    │                      │
│  X IRQ Resources              Press  Enter   │  Select  Yes if you are│
│  X DMA Resources              Press  Enter   │  using a Plug and Play│
│                                              │  capable  operating  │
│    PCI/VGA  Palette  Snoop     Disabled      │  system. Select No if │
│    Assign  IRQ  For  VGA       Enabled       │  you need the BIOS to │
│    Assign  IRQ  For  USB       Enabled       │  configure non-Boot   │
│                                              │  devices              │
│                                              │                      │
│                                              │                      │
│                                              │                      │
│                                              │                      │
│                                              │                      │
└─────────────────────────────────────────────┴──────────────────────┘
```

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

PNP OS Installed
Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 98).

Reset Configuration Data
Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

Resources Controlled By
The Plug and Play EliteBIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, because the BIOS automatically assigns them.

IRQ Resources (IRQ*n* Assigned to)
When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for Serial Port 1).

PCI / ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

DMA Resources (DMA-*n* Assigned to)
When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.

PCI / ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

PCI / VGA Palette Snoop
Please leave this field at **Disabled**.

Assign IRQ for VGA
Assign an IRQ number to your VGA adapter.

Assign IRQ for USB
Assign an IRQ number to your USB device / controller.

PC Health Status

Note: This chapter describes all fields offered by Award Software in this screen. Your system board designer may omit or modify some fields.

In this screen, the status of the motherboard, CPU, and CPU / Chassis fans are listed. Other critical elements such as voltage are also listed.

Frequency / Voltage

You should leave this at the default setting of **Auto Detect**, and the associated Default values. It is not recommended that you set this to anything else. **Note: Tyan will not be held liable or responsible if the default values have been adjusted.**

important!

User Password (Supervisor / User)

When you select this function, a message appears at the center of the screen:

ENTER PASSWORD:

Type the password, up to eight characters, and press <Enter>. Typing a password clears any previously entered password from CMOS memory. Now the message changes:

CONFIRM PASSWORD:

Again, type the password and press <Enter>. To abort the process at any time, press <Esc>.

In the Security Option item in the Advanced BIOS Features Setup screen, select System or Setup:

Note: To clear the password, simply press <Enter> when asked to enter a password. Then the password function is disabled.

Flash Utility

Note: You will need to visit the Tyan web site at **http://www.tyan.com** in order to get the Flash Utility.

For more information and updates about the Flash Utilities, check the Tyan web site at **http://www.tyan.com**

To flash the BIOS do this:

    i.   Boot system to DOS (make sure you are not under Windows; check your Windows documentation for details on how to boot to DOS only).

    ii.   Type "flash4mb" followed by <ENTER> key.

    iii.   To save or not save the old BIOS is up to you.

    iv.   Type in the BIOS filename, like "BIOSFILE.ROM".

    v.   Flash Utility will auto-complete the flash, including boot block at this point.

    vi.   Shutdown the system. Then restart the system.

! important!

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 of replacing BIOS chips directly with end users. In no event will Tyan be held responsible for damage done to the BIOS by the end user.

chapter 4

System Resources

Beep Codes

Fatal errors, which halt the boot process, are communicated through a series of audible beeps. If AwardBIOS POST can initialize the system video display, it displays the error message. Displayed error messages, in most cases, allow the system to continue to boot. Displayed error messages are described on pages 58-59. See the top of the next page for the beep code chart.

Troubleshooting System Problems

If you hear one long beep followed by two short beeps, then a video problem has probably occured, and the BIOS is having difficulty initializing the video screen. Any other beep sequences that may or may not occur are probably due to memory problems.

Displayed Error Messages

If an error occurs after the system display has been initialized, the error message will be displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to continue
```

and the system will halt. Depending on how the Halt On setting was configured in the Standard CMOS Setup menu, the system may or may not display the error message.

```
RUN SETUP UTILITY
```

may also appear. Press <F1> to run AwardBIOS Setup if this message appears. The following two pages show possible error messages and explainations.

SYSTEM

| Error Message	Explanation
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry.
C: Drive Error	No response from drive C:. Run the AMIDiag Hard Disk Utility. Check the C: hard disk type in Standard Setup.
C: Drive Failure	No response from hard disk drive C:. Replace the drive.
Cache Memory Bad, Do Not Enable Cache!	Cache memory is defective. Run AMIDiag.
CH-2 Timer Error	An AT system has two timers. There is an error in timer 2.
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	CMOS RAM checksum is different than the previous value. Run WINBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM have been destroyed. Run WINBIOS Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected. Run WINBIOS Setup.
CMOS Memory Size Mismatch	The amount of memory found by AMIBIOS is different than the amount in CMOS RAM. Run WINBIOS Setup.
CMOS Time and Date Not Set	Run Standard Setup to set the date and time.
D: Drive Error	No response from drive D:. Run the AMIDiag Hard Disk Utility. Check the hard disk type in Standard Setup.

Error Message	Explanation
D: drive failure	No response from hard disk drive D:. Replace the drive.
Diskette Boot Failure	The boot diskette in drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch Not Proper	Some systems require a video switch be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	Error in the DMA controller.
DMA 1 Error	Error in the first DMA channel.
DMA 2 Error	Error in the second DMA channel.
FDD Controller Failure	AMIBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	AMIBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR1 Error	Interrupt channel 1 failed POST.
INTR2 Error	Interrupt channel 2 failed POST.
Invalid Boot Diskette	AMIBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked...Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue to boot.
Keyboard Error	The keyboard has a timing problem. Make sure a Keyboard Controller AMIBIOS is installed. Set Keyboard in Advanced Setup to Not Installed to skip the keyboard POST routines.
KB/Interface Error	There is an error in the keyboard connector.
No ROM BASIC	Cannot find a proper bootable sector on either drive A: or C:. AMIBIOS cannot find ROM Basic.
Off Board Parity Error	Parity error in memory installed on an adapter card in an expansion slot. The format is: OFF BOARD PARITY ERROR ADDR = (XXXX) XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
On Board Parity Error	Parity error in motherboard memory. The format is: ON BOARD PARITY ERROR ADDR = (XXXX) XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

SYSTEM

Appendix

Glossary

ACPI (**A**dvanced **C**onfiguration and **P**ower **I**nterface) is 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 (**A**ccelerated **G**raphics **P**ort) is a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs at only 66MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133MHz.

AMR (**A**udio **M**odem **R**iser) is a modem that can be used on Intel Reference Motherboard platforms using Intel's core logic chipsets supporting AC-Link 2.1 It supports fax and all data feeback modes. It provides high speed communicstions between your perosn al computer and a remote location, such as an Internet Service Provider (ISP)

AT was the original form factor of IBM's PC.

ATAPI (**AT A**ttachment **P**acket **I**nterface), also known as IDE or ATA, is a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like hard drives.

ATX form factor was designed to replace the AT form factor. It improves on the AT design by rotating the board ninety 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, serial, USB, and parallel ports are built in.

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

A **BBS** (**B**ulletin **B**oard **S**ystem) is a computer system with a number of modems hooked up to it which acts as a center for users to post messages and access information.

The **BIOS** (**B**asic **I**nput/**O**utput **S**ystem) program resides in the ROM chip, and provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

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

A **bus** is 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).

A **cache** is a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times, since the needed information is stored in the SRAM instead of in the slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 1GB of regular memory.

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

GLOSSARY

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 **M**etal-**O**xide **S**emiconductors are chips that hold the basic start-up information for the BIOS.

The **COM port** is another name for the serial port, which is so-called 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 **D**ata **R**ate improves RAM speed to at least 200 MHz. 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 **I**n-line **M**emory **M**odules are a faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

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

DMA Direct **M**emory **A**ccess channels are similar to IRQs. DMA channels allow hardware devices (like sound cards 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 and Play devices will take care of this for you.

In **Doze mode**, only the CPU's speed is slowed.

DRAM Dynamic **RAM** is a widely available, very affordable form of RAM which has the unfortunate tendency to lose data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

EDO RAM (**E**xtended **D**ata-**O**ut **RAM**) speeds access to memory locations by assuming that memory addresses are static: the next time it looks for a bit of data, it will be at the same spot, or one nearby.

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

ESCD (**E**xtended **S**ystem **C**onfiguration **D**ata) is a format for storing information about Plug and Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware is low level software that controls the system hardware.

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

A **Global timer** is an onboard hardware timer, such as the Real Time Clock.

Handshaking is a form of encryption. One system, typically the server, sends an encryption scheme to another agent, typically a client. Thus, the client's data is protected during transmittal to the server.

HDD stands for **H**ard **D**isk **D**rive.

H-SYNC controls the horizontal properties of the monitor.

IC (**I**ntegrated **C**ircuit) is the formal name for the computer chip.

IDE Integrated **D**evice (or Drive) **E**lectronics is a simple, self-contained hard drive interface. It can handle drives up to 8.4GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs).

IDE INT (**IDE Int**errupt) is a hardware interrupt signal that goes to the IDE.

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

IRQ An Interrupt Request is 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. Happily, Plug and Play operating systems take care of these details for you.

ISA stands for **I**ndustry **S**tandard **A**rchitecture. ISA is a slower 8- or 16-bit BUS (data pathway).

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

GLOSSARY

NVRAM ROM and EEPROM are both examples of **N**on-**V**olatile **RAM**, memory that holds its data without power. DRAM, in contrast, is volatile.

OEMs (**O**riginal **E**quipment **M**anufacturers) like Compaq or IBM package other companies' motherboards and hardware inside their case and sell them.

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

PCI stands for **P**eripheral **C**omponent **I**nterconnect. PCI is a 32-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).

The **PCI PIO** (**PCI P**rogrammable **I**nput/**O**utput) modes are the data transfer modes used by IDE drives. These modes use the CPU for data transfer (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 is a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

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

PM timers (**P**ower **M**anagement **timers**) are software timers that count down the number of seconds or minutes until the system times out and enters sleep, suspend, or doze mode.

PnP is an acronym for Plug and Play, a design standard that has become ascendant in the industry. Plug and Play devices require little set-up to use. Novice end users can simply plug them into a computer that is running on a Plug and Play-aware operating system (such as Windows 95), and go to work. Devices and operating systems that are not Plug and Play require you to reconfigure your system each time you add or change any part of your hardware.

The term **RAM** (**R**andom **A**ccess **M**emory), while technically referring to a type of memory where any byte can be accessed without touching the adjacent data, is often used to refer to the system's main memory. This memory is available to any program running on the computer.

ROM (**R**ead-**O**nly **M**emory) is a storage chip which contains the BIOS (Basic Input/ Output System), the basic instructions required to boot the computer and start up the operating system.

SDRAM (**S**ynchronous **D**ynamic **RAM**) is so-called 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.

The **serial port** is so called 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).

SIMM Single **I**n-line **M**emory **M**odules are the most common form of RAM. They must be installed in pairs, and do not have the carrying capacity or the speed of DIMMs.

SIMM bank/socket SIMM sockets are the physical slots into which you stick SIMM modules. A pair of SIMM sockets form a SIMM bank, and act as a unit. If only one socket is filled, the bank will not operate.

In **Sleep/Suspend mode**, all devices except the CPU shut down.

SRAM Static **RAM**, unlike DRAM, does not need to be refreshed in order to prevent data loss. Thus, it is faster, and more expensive.

In **Standby mode**, the video and fixed disk drive shut down; all other devices operate normally.

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

Universal Serial Bus or USB, is 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 (**V**ideo **G**raphics **A**rray) is the PC video display standard.

V-SYNC controls the vertical properties of the monitor.

ZIF socket Zero **I**nsertion **F**orce sockets make it possible to insert CPUs without damaging the sensitive pins. The CPU is lightly placed in an open ZIF socket, and the metal lever pulled down. This shifts the processor over and down, guiding it into place on the board.

GLOSSARY

 S2390 Trinity KT

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TYAN

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

Operation is subject to the following conditions:

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

        ·   Reorient or relocate the receiving antenna.
        ·   Increase the separation between the equipment and receiver.
        ·   Plug the equipment into an outlet on a circuit different from
                 that of the receiver.
        ·   Consult the dealer or 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 normes de Classe B d' interference radio tel que spécifié par
le Ministére Canadien des Communications dans les réglements d'interférence radio.)

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

CAUTION: Lithium Batteries included with this board. Danger of explosion if battery
is incorrectly replaced. Replace only with the same or equivalent type recommended
by manufacturer. Dispose of used batteries according to manufacturer instructions.

Note: The joystick port maximum output rating is 9 amperes at 5 volts.

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