

Tyan S2380
Trinity K7

Motherboard User's Manual
Revision 1.00

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chapter 1

Introduction

Overview

The S2380 Trinity K7 is a quality, high performance motherboard designed for Slot A AMD Athlon K7 microprocessors. The Trinity K7 utilizes the VIA VT8371 with Award BIOS. S2380 can support Athlon K7 CPU speeds of 500 MHz through 1 GHz, and host bus speeds of up to 200MHz (FSB running at 100 MHz DDR). The S2380 motherboard, with a built-in 4x AGP slot, provides high performance capabilities that are ideal for a wide range of demanding applications such as CAD, CAM, CAE, desktop publishing, 3D animation, 3D Games and video production.

This system board in an ATX form factor offers far more features and expandability than Micro ATX models. Some of the features included are Four USB ports, onboard dual channel PCI PIO, 6 PCI slots, Bus Master IDE and UltraDMA/66, onboard floppy controller, and onboard high speed I/O.

Flexibility and expandability have been designed into the Trinity K7. With I/O and drive controller support built onboard, the one AGP slot, plus six PCI slots gives a total of seven usable slots for numerous add-on expansion cards. Remember to take a look at TYAN Computer's web site located at <http://www.tyan.com>. There you can find information on all of TYAN's products along with FAQs, distributors list, and drivers.

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 with 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.

Hardware Specifications/Features

Processor Information

- One Slot A CPU connector
- Supports AMD Athlon K7 CPU up to 1 GHz
- FSB Support for 200 MHz (100 MHz DDR)
- Auto-Detect Processor Voltage.
- Processor Built in 128KB L1 Cache
- Processor Built in 512KB L2 Cache

Chipset Information

- VIA KX-133:VT8371+VT82C686A

Voltage and Power Information

- ATX power supply connector
- Input Voltage - 90V to 130V at 60Hz
- Output Wattage - 235W
- Output Voltage - 3.3V, +/-5V, +/- 12V
- 3.3V DRAM support
- Backup Battery
 - 3.0V to 3.6V Cr2032 Lithium
 - Magnesium-oxide coin cell

Main Memory

- Up to 1.5 GB
- Three 168-pin DIMM sockets
- Supports PC100/PC133 SDRAM
- Supports VCM SDRAM Memory

Expansion Slots

- One 4x 32-bit AGP slot
- Six 32-bit PCI Bus Master slots
- One 16-bit ISA slot (shared w/ one PCI)
- Total seven usable slots

BIOS Information

- Award BIOS 2Mbit Flash RAM
- Supports APM and ACPI
- Auto Detection of memory size
- Auto Configuration of hard disk types
- User Settings of hardware monitoring
- Multiple boot options
- DMI 2.0 / PC99 compliant

Hardware Monitoring

- VIA hardware monitoring built into VT82C686A

- 3-pin Fan Monitoring headers
- Flexible Temperature Sensor Under CPU heatsink
- Hardware Detects +/- 5V, +/-12V, CPU status
- System Health Status Detect
- 3-pin Wake on LAN header
- 3-pin Wake on Ring header

Disk Drive & System I/O

- Two PCI bus mastering EIDE channels
- Supports EIDE CD-ROMs
- PIO Mode 3 & 4 (up to 17MB/sec DTR)
- UltraDMA/66 bus mastering mode (up to 66MB/sec DTR)
- Support for two floppy drives (up to 1.44MB)
- Two serial ports (16550 UARTs)
- One ECP/EPP parallel port
- Four USB rev 2.0 Ports (two headers via cable optional)
- One PS/2 mouse port
- One PS/2 keyboard port

Integrated Audio

- VIA VT82C686A Southbridge Digital Link Audio
- AC '97 Audio Codec
- Line in, Line out, Game Port, Mic Port
- Four Pin CD-ROM Audio & VIDEO-IN header

Physical Dimensions

- ATX 2.01 design (12" x 8.2")
- Four Layer Board

Software Specifications

OS

- Operates with MS-DOS ver 6.22, Windows 98 & Win98 SE, Windows NT 4.0, Windows 2000

Please refer to web for OS updates

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 attempting to do so yourself (which can have expensive consequences). Please refer to your dealer for specific warranty coverage details.

Help resources:

1. See FAQ and beep codes sections of this manual.
2. See Tyan web site 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 manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid, or hand-carried to the manufacturer. TYAN will pay to have the board shipped back to you.

chapter 2

Board Installation

Unpacking

The motherboard package should contain the following:

- (1) S2380 mainboard
- (1) 34-pin floppy cable pack
- (1) 80-pin ATA-66 IDE cable
- (1) S2380 User's Manual
- (1) Driver CD
- (1) URM Retention Module

Installation

You are now ready to install your motherboard. The mounting hole pattern of the S2380 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 and then touch any metal part on the computer case. (Or wear a grounded 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.**

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.



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.

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. Connect Power Supply
7. Install Add-on Cards
8. Connect PS/2, USB, Serial and Parallel Devices

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.

Jumpers and pins are connected by slipping the 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.

2 pin jumpers

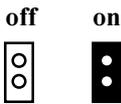


Figure 2-1

3 (or more) pin jumpers

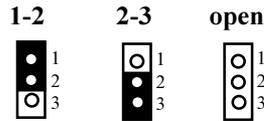
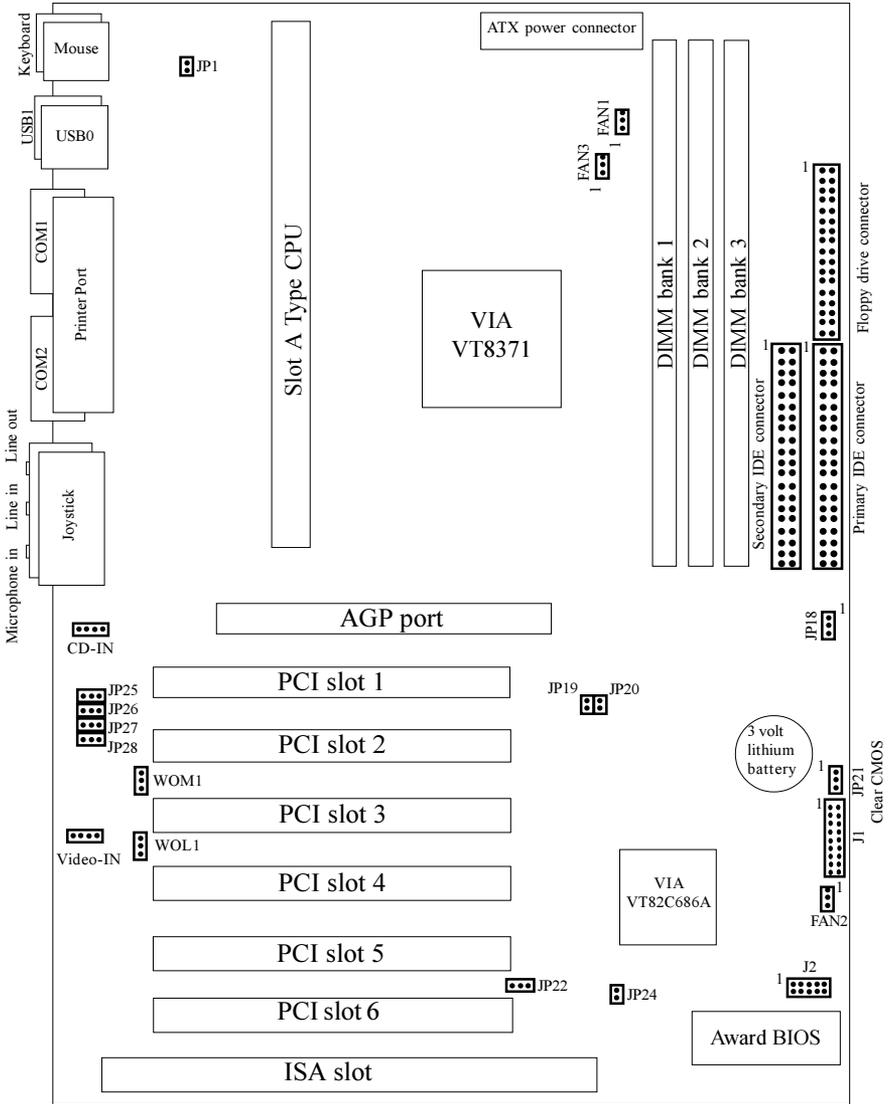


Figure 2-2

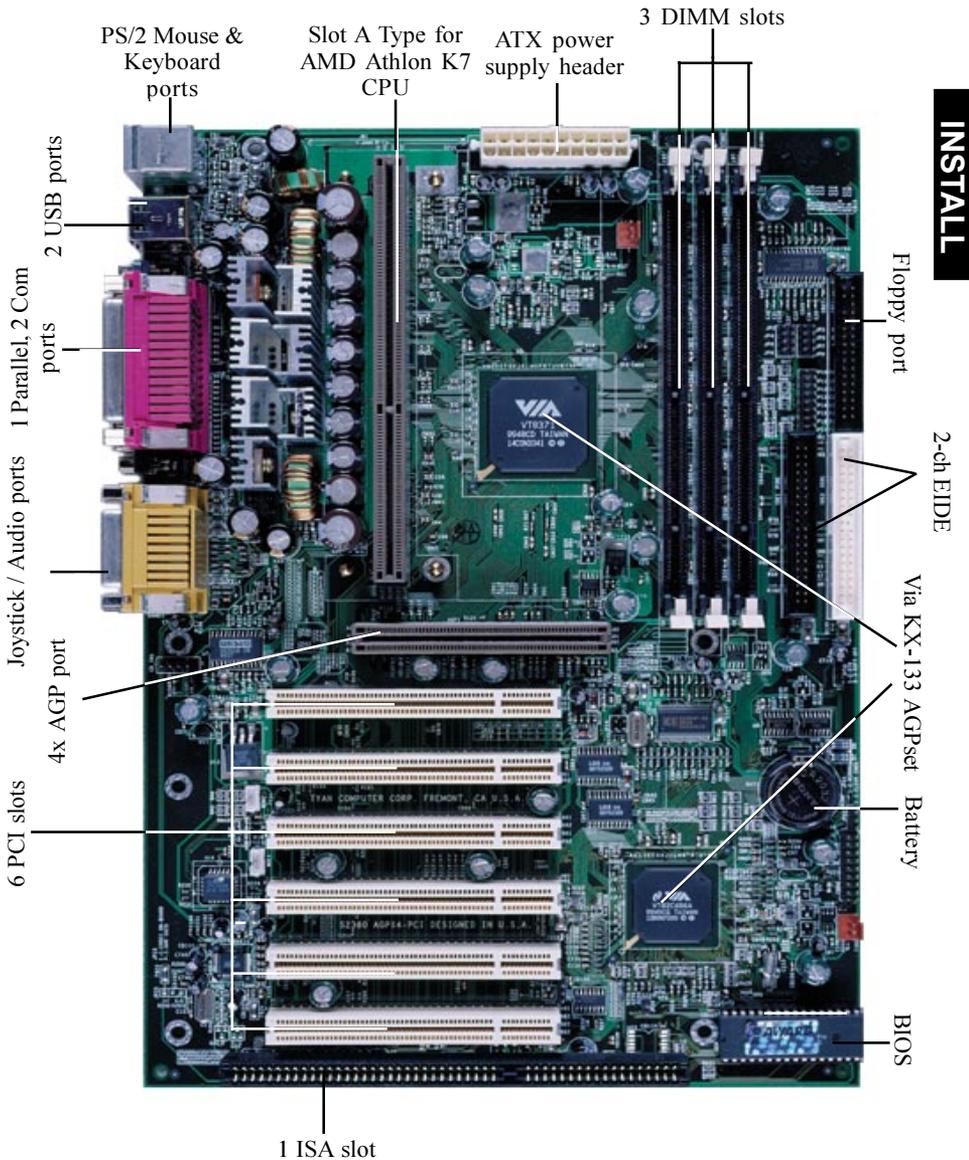
The tables and maps on the following pages will help you set the jumpers for CPU speed, infrared, and external connector pin assignments, among others. The miniature motherboard maps will help you locate the jumpers on your board. A full-page map of the motherboard can be found on the next two pages.

Figure 2-3 : Map of Motherboard Jumpers



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

Figure 2-4 : Map of S2380 Features





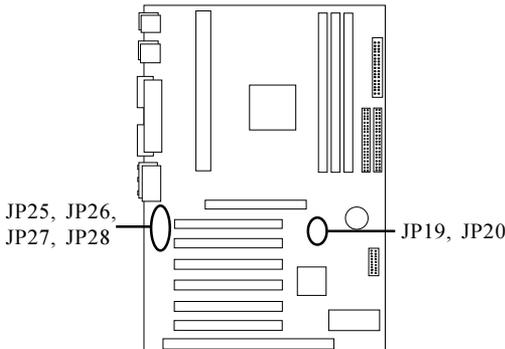
1. Setting Jumpers

1-A. CPU Speed Settings (Auto-Detected)

The CPU speed settings are Auto-Detected by the CPU. The CPU voltage may be changed by using jumpers JP25-JP28. After the system is ready to boot, the **BUS Speed** is auto-detected although you may set the BUS speed manually using jumpers JP19 and JP20 . Presently all Athlon CPUs use a 200MHz bus speed. (200 Mhz is at 100 Mhz DDR Double Data Rate).

Tyan does not recommend operating CPUs, memory, or PCI Bus at higher than rated speed. Tyan takes no responsibility for any problems related to overclocking any bus or component on the system board.

CPU Voltage	JP 25	JP 26	JP 27	JP 28
Auto	1-2	1-2	1-2	1-2
1.30V	Open	Open	Open	Open
1.35V	2-3	Open	Open	Open
1.40V	Open	2-3	Open	Open
1.45V	2-3	2-3	Open	Open
1.50V	Open	Open	2-3	Open
1.55V	2-3	Open	2-3	Open
1.60V	Open	2-3	2-3	Open
1.65V	2-3	2-3	2-3	Open
1.70V	Open	Open	Open	2-3
1.75V	2-3	Open	Open	2-3
1.80V	Open	2-3	Open	2-3
1.85V	2-3	2-3	Open	2-3
1.90V	Open	Open	2-3	2-3
1.95V	2-3	Open	2-3	2-3
2.00V	Open	2-3	2-3	2-3
2.05V	2-3	2-3	2-3	2-3



1-B CPU Clock Speed Settings (Jumper JP19 & JP20)

CPU Clock	JP 19	JP20
180MHz	Close	Close
200MHz	Open	Open
240MHz	Close	Open
266MHz	Open	Close

Default is Open / Open

1-C. Panel Connector Settings (Jumper J1)

HDD LED	LED+	1	2	LED Green	Pwr/Slp LEDs
	LED-	3	4	LED Yellow	
Reset Switch	Ground	5	6	Power On/Off	Power (Sleep) Switch
	Reset	7	8	Ground	
Infrared	VCC	9	10	NC.	
	N.C	11	12	Power+5V	
	IRRX	13	14	N.C	
	Ground	15	16	N.C	
	IRTX	17	18	Speaker	

Power LED:

For 2-pin: bicolor/single color - Use pins 2-4

For 3-pin: Use jumper JP22.

1-F. Clear CMOS and Reset Password (Jumper JP21)

	Default	Reset
JP21	1-2	2-3

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, **UNPLUG POWER CONNECTOR**
2. Set jumper JP21 to pins 2 and 3
3. Wait for 2 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.



important!

1-D. Wake-On LAN (WOL1)

Pin	1	2	3
	5VSB	Ground	WOL1

1-E. Wake-On Modem (WOM1)

Pin	1	2	3
	5VSB	Ground	WOM1

1-H Hardware Reset Switch Connector Installation

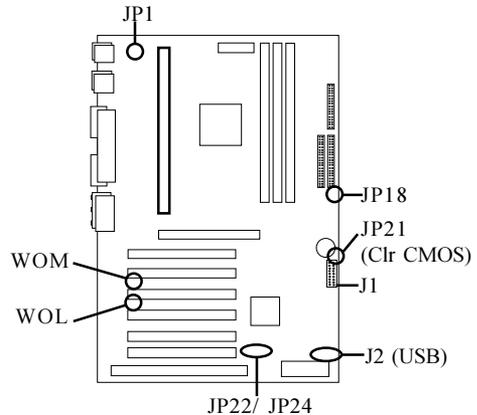
The Reset switch on your case's display panel provides you with the Hardware Reset function, which is the same as power on/off. The system will do a cold start after the Reset button is pushed. (J1 pin 5 & 7)

1-I Onboard Sound audio Connectors (Video-In and CD-IN)

There are two 4-pin connectors onboard which are used for various peripherals' audio signals. The digital signal that comes in through these connectors is directed through the VIA KX-133 onboard sound function, and the digital signal is turned into an audio signal which goes out through the speaker. This consists of the VIDEO-IN connector for DVD drives and the CD-IN connector is for CD-ROMs.

1-M. USB Header (Jumper J2)

The Southbridge of the KX-133 chipset is capable of handling 4 USB ports. Only 2 connectors are provided on the motherboard. If you need to use all four ports, a USB header (J2) is provided should you decide to set up a USB connector externally.



1-K Power LED Connector (Jumper JP22)

Jumper JP22 is a three pin power LED header that can be used if you have a 3 pin Power LED. Otherwise refer to panel connector J16 for 2 pin LEDs. 3 pin LED's can still be used on J1 where pin 13 would be for the Ground pin.

Suspend to RAM ACPI Enable/Disable (Jumper JP18)

This jumper controls the ACPI advanced power management function. Set the jumper JP18 to 1-2 to enable ACPI or set the jumper to 2-3 to turn the ACPI function off. Default is OFF (2-3). ACPI must also be enabled in the BIOS in order for this function to be activated. If ACPI is not enabled, the Sleep Button (Jumper J24) will not function.

External SMI (Jumper JP1)

The External SMI Signal Management Interrupt header is reserved for use with external hardware devices.

Sleep Button (Jumper JP24)

JP24 is used to connect to the sleep button. Depressing the sleep button will send the computer into an S1 standby mode. During this mode the monitor and harddisks are switched off. Hitting the keyboard or sleep button again will wake up the computer.

CMOS RTC

The Real Time Clock (RTC) circuit, which provides the date and time for the system is integrated into the Via KX-133 AGPset. 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 K7 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 61).

2. Mounting the Motherboard in the Chassis

Follow the instructions provided by the case manufacturer for proper installation guidelines. TYAN recommends that you screw down the motherboard with all the mounting holes provided. If your case does not have a hole for a standoff, simply cut off the bottom of the plastic standoff so that the flat portion rests on the metal. The adapter cards and the screws holding them down will keep your board flat. The fastening screw should not short any of the traces on the motherboard. Make certain that you do not overtighten the screw, as it 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.



important!

3. Installing Memory

Since TYAN boards are manufactured with performance in mind, you should use add-in components that match. It is highly recommended that the memory DIMMs are installed prior to connecting the power supply. 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 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. Some brands we recommend are Advantage Memory, Corsair Microsystems, Millenium, Kingston Memory, QesTec Incorporated, Unigen, Micron Technology, and Crucial Technology. These DIMMs have proven to be very stable on our boards and perform extremely well.



This motherboard operates on a 3.3 volt standby for the DIMM banks. Because of this, you need to UNPLUG the AC power cord before installing your DIMM memory modules. Otherwise, the motherboard may automatically power up when the memory is inserted into the slot.

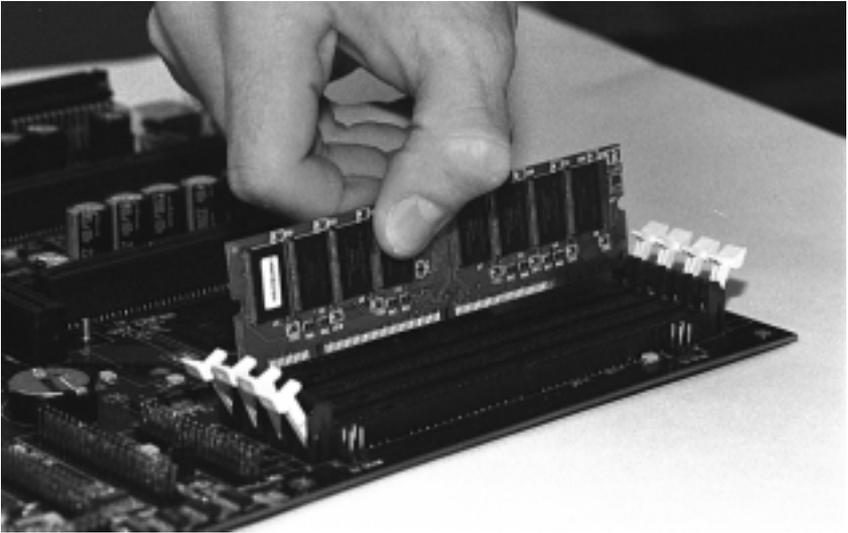


Figure 2-5*

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

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 2-5 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 2-6 on the next page). To remove your DIMM, simply pull the clips back, and pull up on the module.

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

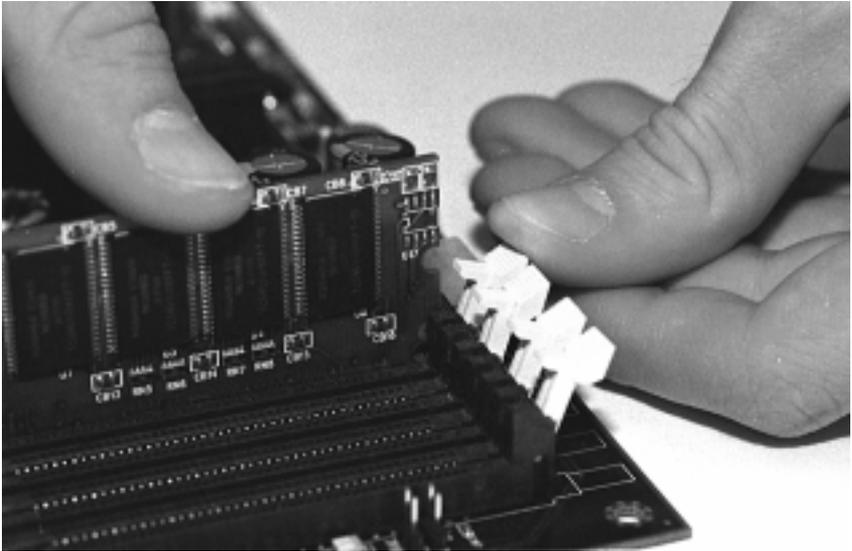


Figure 2-6*

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

The Trinity K7 uses a 64-bit data path from memory to CPU and can accommodate up to 1 GB 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 2-7 below). All installed memory will be automatically detected, so there is no need to set any jumpers.

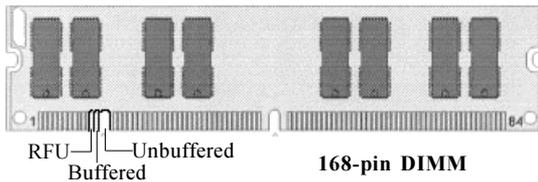


Figure 2-7

Some details of memory installation:

- At least one unbuffered DIMM must be installed for the system to POST.
- The mainboard supports 32MB, 64MB, 128MB, 256MB and 512MB SDRAM.
- Memory supports for PC100, PC133 and VCM Memory.
- **Registered DIMMs are not supported on this motherboard**

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
8MBx1	0	0	8MB
8MBx1	8MBx1	0	16MB
8MBx1	8MBx1	8MBx1	24MB
16MBx1	8MBx1	8MBx1	32MB
16MBx1	16MBx1	8MBx1	40MB
16MBx1	16MBx1	16MBx1	48MB
32MBx1	16MBx1	16MBx1	64MB
32MBx1	32MBx1	16MBx1	80MB
32MBx1	32MBx1	32MBx1	96MB
64MBx1	32MBx1	32MBx1	128MB
64MBx1	64MBx1	32MBx1	160MB
64MBx1	64MBx1	64MBx1	192MB
128MBx1	64MBx1	64MBx1	256MB
128MBx1	128MBx1	64MBx1	320MB
128MBx1	128MBx1	128MBx1	384MB
256MBx1	256MBx1	0	512MB
256MBx1	256MBx1	256MBx1	768MB
512MBx1	512MBx1	512MBx1	1.5GB*

INSTALL

*1.5GB memory onboard not verified at time of print please see website for details.

Installing the SlotA CPU and Cooling Fan

Using a cooling mechanism for Athlon K7 processors is extremely important. The active cooler shown in Figure 2-8 below is equipped with a cooling fan and heat sink, allowing better air flow and heat dissipation for the CPU. The size of the cooling mechanism will not interfere with CPU installation. The CPU will fit with ease into the CPU slot of the Trinity K7 board.



Figure 2-8

Figure 2-9 below shows an overhead view of the retention braces positioned at both ends of the CPU slot. Be sure to tighten the retention brace screws to secure them onto the motherboard.

Figure 2-9





Figure 2-10

Carefully line up the pins of the CPU with the pins of the Slot while placing the CPU between the two retention braces (the CPU cooling fan should face the memory DIMM sockets). Lower the CPU onto the motherboard (see Figure 2-10 above). Your CPU will be firmly secured onto the motherboard once the retention braces “snap” into the sides of the CPU. The installed CPU should look like Figure 2-11 below.



Figure 2-11

You will also need to connect the CPU’s cooling fan cable to the cooling fan power connector on the board. 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 2-12 below.

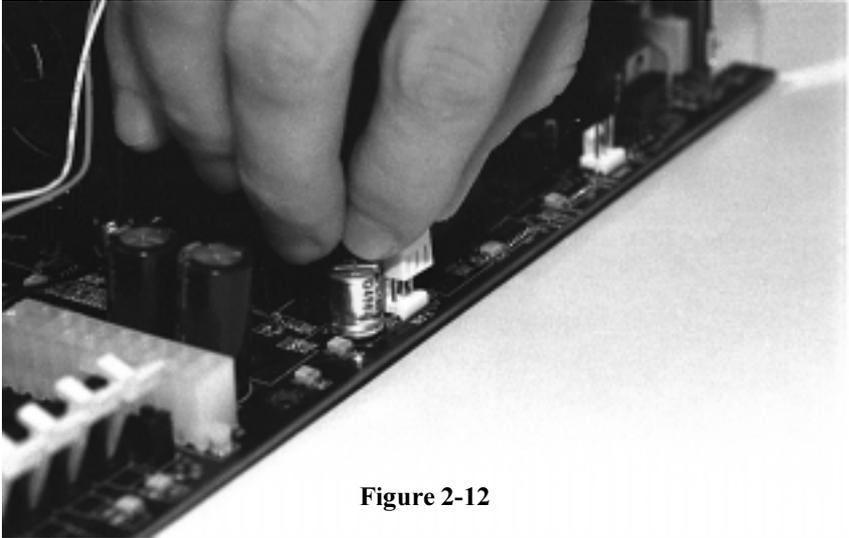


Figure 2-12

Removing CPU

To remove the CPU, gently bend the sides of the retention brace away from the CPU and slowly pull the CPU upwards. This may require careful firm tugs to pull the CPU out of its slot.

5. Connecting IDE and Floppy Drives

The colored stripe on a ribbon cable should be plugged into Pin 1. 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 2-13 on the following page shows the IDE cable properly connected to the motherboard. Contact your hard disk drive manufacturer or documentation for more information.

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.

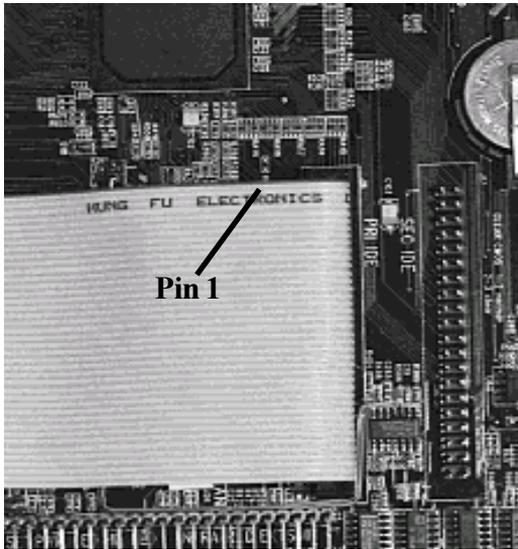


Figure 2-13*

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

- No video or beeps onbootup: usually means the cable is on backwards.
- Hard drive lights are constantly on: 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.

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 2-14 on the following page). 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.

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 2-14 on the following page for a detailed anatomy of the floppy cable. Remember, you can only have 2 floppy drives connected at any given time.

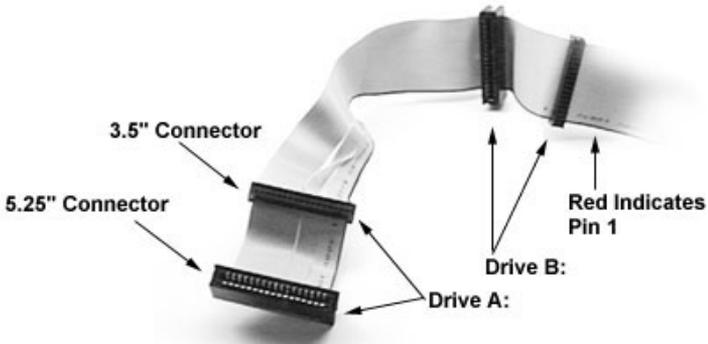


Figure 2-14

The color stripe on the cable should face toward the top of your chassis, or toward the battery on the motherboard. Please refer to your documentation for proper installation.

Some symptoms of incorrectly installed floppies 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: a definite giveaway that the cable is on backwards. Reverse the cable at the motherboard 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:



- 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.



- 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
- **NOTE: This motherboard operates on a 3.3 volt standby for PCI v2.2. Because of this, you need to UNPLUG the AC power cord before installing your card. Otherwise, the motherboard may automatically power up when the card is inserted into the slot.**

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.

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 PS/2 mouse port is the upper PS/2 port, and the PS/2 keyboard port is the lower PS/2 port. The PS/2 connectors are probably quite familiar to you. The USB connectors, however, may be foreign. The USB (Universal Serial Bus) 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. Figures 2-15 and 2-16 on the following page shows the USB ports on the left and PS/2 ports on the right (respectively).



Figure 2-15

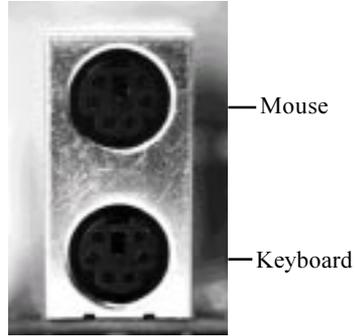


Figure 2-16

Connecting Com and Printer Ports

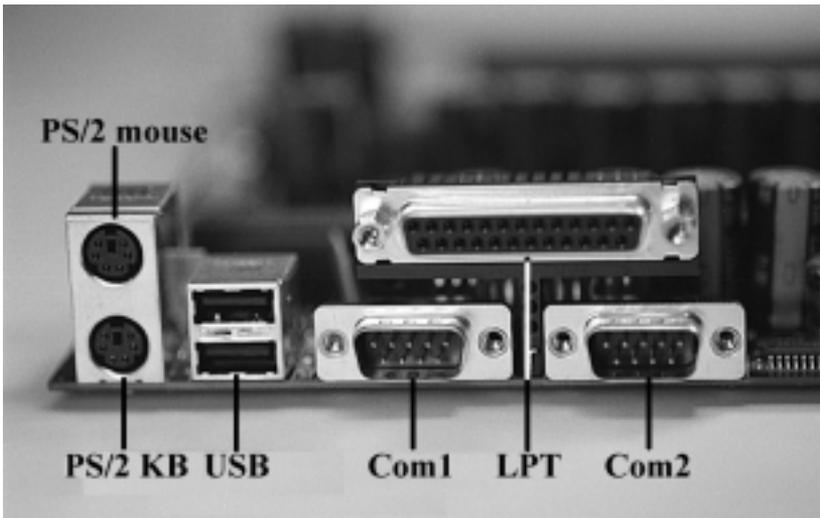


Figure 2-17



Warning: When plugging in your keyboard and mouse, or when plugging anything into a serial or Com 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. Figure 2-17 above shows the ATX double row connectors on this board. The Com and Printer ports, as well as the other ports, are labeled.

8. Connecting the Power Supply

Tyan recommends using an ATX power supply that conforms to industry standard revision 2.01. The Trinity K7 motherboard comes equipped with one onboard power connector. Figure 2-18 shows an ATX power connector. When plugging in the power connector, make sure that the plastic clip on the power connector is aligned with the plastic tab on the onboard connector (See Figure 2-19 below) . Make certain that you do not miss 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.

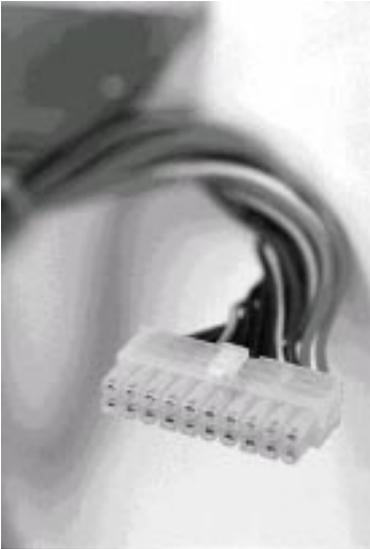


Figure 2-18

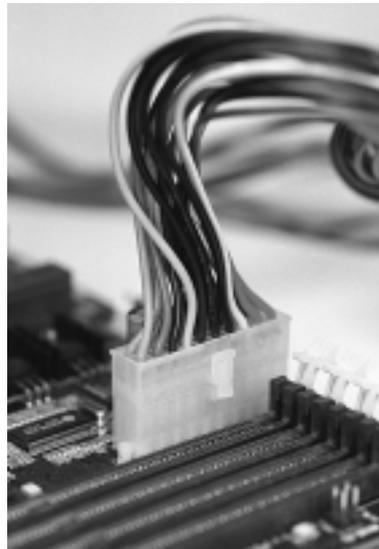


Figure 2-19

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).

chapter 3

BIOS Configuration



Introduction to Setup

The BIOS section of the manual is subjected 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, although 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 AMD Athlon K7 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 immediately after switching the system on, or
2. By pressing the 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.

Key	Function
Up arrow	Move to previous item.
Down arrow	Move to next item.
Left arrow	Move to item on the left hand.
Right arrow	Move to item on the right hand.
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 16 colors. F2 to select color forward, Shift-F2 to select color backwards.
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.

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 Peripherals

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 most 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 the 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 nonvolatile CMOS RAM and exit Setup.

Exit Without Saving

Abandon all changes and exit Setup.

Standard CMOS Features

In the Standard CMOS 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.

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	
▶ IDE Primary Master	Press Enter None	Menu Level ▶
▶ IDE Primary Slave	Press Enter None	To enter next page for detail hard drive settings
▶ IDE Secondary Master	Press Enter None	
▶ IDE Secondary Slave	Press Enter None	
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

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.

IDE Primary/Secondary, Master/Slave

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	Menu Level ▶▶
Access Mode	Auto	To auto-detect the HDD's size, head... on this channel
Capacity	0 MB	
Cylinder	0	
Head	0	
Precamp	0	
Landing Zone	0	
Sector	0	

↑↓→← :Move Enter:Select +/-/F0/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

The BIOS supports up to four IDE drives (IDE Primary/Secondary Master/Slave). 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 “auto” for the hard drive option (IDE Primary/Secondary Master/Slave), the BIOS detects its specifications during POST, every time the system boots. If you do not want to select “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 “Manual” and enter values into each drive parameter field.
3. Use the IDE HDD Auto Detection 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 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 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 counted in kilobytes (KB: approximately one thousand bytes) and megabytes (MB: approximately one million bytes).

RAM is the computer's working memory, where the computer stores programs and data currently being used, so they are accessible to the CPU. 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.

Total Memory: Displays the total memory in the system.

Advanced BIOS Features

The screen (shown on the following page) 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		Menu Level ▶
External Cache	Enabled		Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and alarm beep
CPU L2 Cache ECC Checking	Enabled		
Quick Power On Self Test	Enabled		
First Boot Device	Floppy		
Second Boot Device	HDD-0		
Third Boot Device	LS120		
Boot Other Device	Enabled		
Swap Floppy Drive	Disabled		
Boot Up Floppy Seek	Enabled		
Boot Up NumLock Status	On		
Gate A20 Option	Normal		
Typematic Rate Setting	Disabled		
X Typematic Rate (Chars/Sec)	6		
X Typematic Delay (Msec)	250		
Security Option	Setup		
OS Select For DRAM > 64MB	Non-OS2		
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		Menu Level ▶
External Cache	Enabled		
CPU L2 Cache ECC Checking	Enabled		
Quick Power On Self Test	Enabled		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 Up Floppy Seek	Enabled		and someone attempts
Boot Up NumLock Status	On		to write data into this
Gate A20 Option	Fast		area, BIOS will show a
Typeomatic Rate Setting	Disabled		warning message on
X Typeomatic Rate (Chars/Sec)	6		screen and alarm beep
X Typeomatic Delay (Msec)	250		
Security Option	Setup		
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		

BIOS

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

Virus Warning

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 (First / Second / Third Boot Device)

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 OS2 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 adaptor.

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.

Advanced Chipset Features

This section describes features of the VIA KX-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.

Chipset Features Setup - Fail-Safe Default Settings

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

BIOS

Bank 0/1 DRAM Timing	SDRAM 10ns	▲	Item Help
Bank 2/3 DRAM Timing	SDRAM 10ns		Menu Level ▶
Bank 4/5 DRAM Timing	SDRAM 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		
K7 CLK_CTL Select	Default		
OnChip USB	Enabled		
USB Keyboard Support	Disabled		
OnChip Sound	Auto		
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 +/-/EU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Chipset Features Setup - Optimized Default Settings

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

Bank 0/1 DRAM Timing	SDRAM 10ns	▲	Item Help
Bank 2/3 DRAM Timing	SDRAM 10ns		Menu Level ▶
Bank 4/5 DRAM Timing	SDRAM 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		
K7 CLK_CTL Select	Optimal		
OnChip USB	Enabled		
USB Keyboard Support	Disabled		
OnChip Sound	Auto		
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	Disabled		
AGP Master 1 WS Write	Disabled		
AGP Master 1 WS Read	Disabled		
Memory Parity/ECC Check	Disabled	▼	

↑↓→← :Move Enter:Select +/-/F0/FD: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 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 either 66MHz or equal to the CPU clock speed, depending on your memory speed.

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 which 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 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.

Due to Tyan's commitment to advanced technologies and first to market, not all high performance 4X AGP graphics cards are compatible w/ our S2380 at the time of print, please go to our web site for the latest update.

AGP Driving Control/Value

This sets the Driving Control value of the 4x AGP video card. Default settings are set to Auto/ DA.

AGP Fast Write

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

K7 CLK-CTL Select

This function sets the K7 clock controller. This setting should remain as Optimal and should not be adjusted.

OnChip USB

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

USB Keyboard Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

OnChip Sound

Integrated Audio is built into the KX-133 southbridge. Use this setting to enable/disable the onboard sound feature.

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.

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		
Onboard FDD Controller	Enabled		
Onboard Serial Port 1	3F8/IRQ4		
Onboard Serial Port 2	2F8/IRQ3		
UART 2 Mode	Standard		
X IR Function Duplex	Half		
X TX,RX inverting enable	No, Yes		
Onboard Parallel Port	378/IRQ7		
Onboard Parallel Mode	Normal		
X ECP Mode Use DMA	3		
X Parallel Port EPP Type	EPP1.9		
Sound Blaster	Disabled		
SB I/O Base Address	220H		
SB IRQ Select	IRQ 5		
SB DMA Select	DMA 1		
MPU-401	Disabled		
MPU-401 I/O Address	330-333H		
Game Port (200-207H)	Enabled	▼	

BIOS

↑↓→← :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		
Onboard FDD Controller	Enabled		
Onboard Serial Port 1	3F8/IRQ4		
Onboard Serial Port 2	2F8/IRQ3		
UART 2 Mode	Standard		
X IR Function Duplex	Half		
X TX,RX inverting enable	No, Yes		
Onboard Parallel Port	378/IRQ7		
Onboard Parallel Mode	Normal		
X ECP Mode Use DMA	3		
X Parallel Port EPP Type	EPP1.9		
MPU-401	Disabled		
MPU-401 I/O Address	330-333H		
Game Port (200-207H)	Enabled		

↑↓→← :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.

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.

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.

UART2 Mode

Select an operating mode for the second serial port:

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

Onboard Parallel Port

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

Onboard Parallel Mode

Select a mode for the onboard parallel port.

MPU-401

Select Enabled to configure the MPU-401 interface.

MPU-401 I/O Address

Select a base I/O address for the MPU-401 interface

Game Port (200-207H)

In order for the Game port to function, this setting must remain enabled.

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	Menu Level ▶
ACPI Suspend Type	S1 (POS)	
Video Off Option	Suspend -> Off	
Video Off Method	V/H SYNC+Blank	
MODEM Use IRQ	3	
Soft-Off by PWRBTN	Instant-Off	
State After Power Failure	Auto	
▶ Wake Up Events	Press Enter	

BIOS

↑↓→← :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	Menu Level ▶
Suspend Mode	Disable	

↑↓→← :Move Enter:Select +/-/F0/FD: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.

Suspend Mode

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

ACPI Suspend Type

Select the type of Power management used when the system goes into standby. The choices are S1 POS or S3 STR. Default is S1.

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.

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

State After Power Failure

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.

Wake Up Events

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

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

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

VGA	<input checked="" type="checkbox"/> OFF	Item Help
LPT & COM	LPT/COM	
HDD & FDD	ON	Menu Level ▶
PCI Master	OFF	
Wake Up On LAN/Ring	Disabled	
RTC Alarm Resume	Disabled	
X Date (of Month)	0	
X Resume Time (hh:mm:ss)	0 0 0	
▶ IRQs Activity Monitoring	Press Enter	

↑↓→← :Move Enter:Select +/-/F0/FD: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.

PCI Master

When On, any PCI card 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.

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.

IRQs Activity Monitoring

Please refer to the screen shot below for the options in IRQ Activity Monitoring.

(IRQs Activity Monitoring - Fail-safe and Optimized Default Settings)

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
 IRQs Activity Monitoring

BIOS

Primary INTR	<input checked="" type="checkbox"/>	Item Help
IRQ3 (COM 2)	Enabled	Menu Level >>>
IRQ4 (COM 1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Diske)	Enabled	
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Reserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Enabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

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

Primary 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.

IRQn

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

IRQ3 (COM2)	IRQ10 (Reserved)
IRQ4 (COM1)	IRQ11 (Reserved)
IRQ5 (LPT2)	IRQ12 (PS/2 Mouse)
IRQ6 (Floppy Disk)	IRQ13 (Coprocessor)
IRQ7 (LPT1)	IRQ14 (Hard Disk)
IRQ8 (RTC Alarm)	IRQ15 (Reserved)
IRQ9 (IRQ2 Redir)	

PnP/PCI Configurations

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	
Resources Controlled By	Auto (ESCD)	Menu Level ▶
X IRQ Resources	Press Enter	Select Yes if you are using a Plug and Play capable operating system. Select No if you need the BIOS to configure non-Boot devices
X DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
Assign IRQ For VGA	Enabled	
Assign IRQ For USB	Enabled	

BIOS

↑↓→← :Move Enter:Select +/-/F0/FD: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 95).

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.

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:

System	Enter a password each time the system boots and whenever you enter Setup.
Setup	Enter a password whenever you enter Setup.

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

Flash Writer Utility

You can upgrade the BIOS on your motherboard by using the Flash Memory Writer (FMW) utility. This utility can be downloaded from TYAN's BBS and from the TYAN website. The system BIOS is stored on a flash EEPROM chip on the mainboard, which can be erased and reprogrammed by the FMW. The following three files make up the FMW:

- AWDFLASH.EXE The Flash Memory Writer utility for Award to Award upgrade.
- README.TXT A text file of instructions.
- S71AWXX.BIN* The new BIOS file.

(*This file name is subject to change and can have either a .bin or .rom extension.)

The FMW records (or programs) a new BIOS onto the flash memory chip. You

cannot upgrade an Award BIOS to an AMI BIOS or vice-versa.

Note: You should always clear your CMOS after flashing a BIOS. This will clear out any stray settings from your old BIOS which may have been carried over from the flashing process. Most problems encountered after flashing a BIOS will be solved by this simple procedure.

To reprogram the system BIOS, the CPU must be running in real mode. FMW will not run if the CPU is operating in a protected or virtual mode. This means that you cannot run it with Windows running or with any memory manager software. You must disable any memory manager software before you can run FMW. The easiest way to do this is as follows:

1) Boot your system from a bootable floppy disk with no CONFIG.SYS or AUTOEXEC.BAT files, and then run FMW from a backup copy of your support disk. You can make your back-up floppy bootable when you format it, and use one disk for both purposes.

2) If you are using MS-DOS 6.x, you can use the feature that allows you to bypass the CONFIG.SYS and AUTOEXEC.BAT files. You can access this feature by pressing <F5> while the “Starting MS-DOS...” line is on the screen during boot-up.

If you are uncertain whether or not you have a memory manager running, try FMW. If it works, then there is no active memory manager on your system. If you see a warning message about the CPU mode, follow the above directions to get around the memory manager.

Once you have your CPU in real mode, you can run FMW. You can copy the contents of the “Flash” directory to your hard drive, or you can run the utility from a backup of the support floppy disk. Either way, make sure that the new BIOS file is in the same directory as the FMW utility.

To start FMW, change to the “Flash” directory if you are not already in it. Type “awdfmw” at the DOS command line and press the <Enter> key. The FMW utility screen will appear:

FLASH MEMORY WRITER V3.0 Copyright (C) 1993, AWARD SOFTWARE, INC.	
For VX/HX-2A59CT51	Date: 4/13/98
File Name to Program:	
Error Message:	

Type in the whole file name, e.g. A61AW10.BIN, and confirm that you want to program the BIOS. The utility will then “Blank,” “Erase,” and “Program” the flash memory on the mainboard with the new BIOS file. You should choose “Yes” to save the original system BIOS to a floppy diskette **before** you program the new BIOS. This leaves you with a backup of your original BIOS in case you need to re-install it. If you cannot successfully program the new BIOS file for some reason, re-install your original BIOS from the backup file. Remember, always reset the CMOS after flashing to a new BIOS (see page 15).

Warning: If you do not successfully install a complete BIOS file in the flash memory on the mainboard, your system may not be able to boot. If this happens, it will require service by your system vendor. Follow the instructions in this section precisely to avoid such an inconvenience.

chapter 4

System Resources

Beep Codes

Fatal errors, which halt the boot process, are communicated through a series of audible beeps. Currently the only beep code indicated that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. Any other beeps are probably a RAM problem

Appendix

Glossary

ACPI (Advanced Configuration and Power Interface) 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 (Accelerated Graphics Port) 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.

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

ATAPI (AT Attachment Packet Interface), 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.

The **BIOS (Basic Input/Output System)** 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.

Closed and open jumpers Jumpers and jumper pins are active when they are On or Closed, and inactive when they are Off or Open.

CMOS Complementary Metal-Oxide Semiconductors 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 or Double Data Rate is a form of data transfer that is supported on both ends of the clock cycle. DDR allows double the speed of the initial transfer rate.

DIMM Dual In-line Memory Modules 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 Memory Access 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 (Extended Data-Out 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 (Extended System Configuration Data) 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 **Hard Disk Drive**.

H-SYNC controls the horizontal properties of the monitor.

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

IDE Integrated Device (or Drive) Electronics 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 Interrupt) is a hardware interrupt signal that goes to the IDE.

I/O Input/Output 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 **Industry Standard Architecture**. 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).

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

OEMs (**Original Equipment Manufacturers**) 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 **Peripheral Component Interconnect**. 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 Programmable Input/Output**) 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 (**Power Management 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 (Random Access Memory)**, 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 (Read-Only Memory) 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 (Synchronous Dynamic 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 In-line Memory Modules 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/66 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 (Video Graphics Array) is the PC video display standard.

V-SYNC controls the vertical properties of the monitor.

ZIF socket Zero Insertion Force 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.

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'interférence radio tel que spécifié par le Ministère Canadien des Communications dans les règlements 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.