

**Tyan S1894**  
**Tigercub 100**

**Motherboard User's Manual**  
**Revision 1.10**

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# chapter 1

## Introduction

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### Overview

The S1894SLA Tigercub 100 Micro ATX is a quality, high performance motherboard designed for Intel Pentium II microprocessors. This motherboard utilizes the Intel 440BX / 440ZX or VIA AGPset and can support CPU speeds of 233MHz through 450MHz, and host bus speeds of 66MHz to 100MHz.

The S1894SLA motherboard, with built-in 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, and video production.

This integrated system board achieves high reliability with numerous features and yet is small enough to be supported in a Micro ATX form factor. Some of the features included are onboard dual channel PCI PIO, BUS Master IDE and UltraDMA/33, onboard Ensoniq 1371 PCI Wavetable sound, onboard floppy controller, and onboard high speed I/O.

Flexibility and expandability have been designed into the Tigercub 100. With I/O and drive controller support built onboard, the one AGP slot, three PCI and one ISA slots (one shared, four usable) are free for 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, 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 fiddle 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 SEC slot (Slot One type)
- 66 to 100MHz bus support
- Pentium II 233-450MHz (Celeron)
- Supports Celeron CPU
- VRM component installed on-board
- On-board CPU/case fan headers

### Chipset Information

- Intel 440BX AGPset, Intel 440ZX AGPset, or Via AGPset
- Intel PIIX4e controller
- National 351 Super I/O chipset

### Voltage and Power Information

- ATX power supply connector
- +12V power source for DC fan onboard
- 3.3V DRAM support
- Utilizes GTL+ bus to reduce power consumption and EMI

### Main Memory

- Up to 256MB onboard (386MB for BX - without registered buffer)
- Three 168-pin DIMM sockets (Two 168-pin DIMM for ZX)
- Supports 100MHz SDRAM w/SPD, and SDRAM+ECC

### System Management

- ADM9240 control chip with on-board alarm for heat, fan and voltage
- System Management software
- Chassis intrusion detection capable

### Expansion Slots

- One 32-bit AGP slot
- Three 32-bit PCI BUS Master slots
- One 16-bit ISA slots
- One shared, four usable slots

**Physical Dimensions**

- Micro-ATX design
- 7.5 inches x 9.0 inches
- Double-row ATX connectors

**BIOS Information**

- Award Plug ‘n’ Play flash BIOS
- Deep Green, Energy Star, PC98, and Year 2000 compliant
- LED for sleep mode

**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/33 (UIDE) built-in (up to 33MB/sec DTR)
- Bus Mastering Mode (up to 22MB /sec DTR)
- Support for two floppy drives (up to 2.88MB)
- Two serial ports (16550 UARTs)
- One ECP/EPP parallel port
- One IR (InfraRed) I/O interface port
- Two USB rev 1.2 ports
- One PS/2 mouse port
- One PS/2 keyboard port
- Wake-on LAN feature header (3-pin) (requires ATX 2.01 power supply)
- Power supply fan control connector

**Ensoniq ES 1371 AudioPCI**

- AC97 Codec
- Uses a single, shared IRQ
- High performance PCI bus master
- Spatial enhanced 3D sound (SWS)
- Wavetable synthesis built in
- Joystick, Audio in, Speaker, Microphone connectors

## Software Specifications

### OS

•Operates with MS-DOS, Windows 3.x, Windows for WorkGroup 3.x, Windows 95, Windows 98, Windows NT, OS/2, Novell Netware, and SCO Unix.

Information presented in this publication has been carefully checked for reliability. However, no responsibility is assumed for inaccuracies. The information contained in this document is subject to change without notice.

## 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 to 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).

If your dealer is unable to assist you,

(1) Try our web page:

(2) User Newsgroup:

(3) Technical support phone line:

(4) Or email address

<http://www.tyan.com>

[alt.comp.periphs.mainboard.tyan](mailto:alt.comp.periphs.mainboard.tyan)

(510)-440-8808

[techsupport@tyan.com](mailto:techsupport@tyan.com)



# Unpacking

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# chapter 2

## Board Installation

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The motherboard package should contain the following:

- (1) S1894SLA motherboard
- (1) 40-pin IDE and 34-pin floppy cable pack
- (1) S1894 User's manual
- (1) CPU retention module
- (1) System Management & Driver CD (Intel LANDesk optional) with Ensoniq AudioPCI manual and installation instructions

### Installation

You are now ready to install your motherboard. The mounting hole pattern of the S1894 matches the Micro ATX system board specifications. The S1894 will fit in a Micro ATX or a standard ATX chassis.

### Quick References for Jumpers



## 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.

The next step is to properly ground yourself. First, unplug the power from your computer case and then touch the metal casing of the power supply or any metal part on the computer case. This will discharge any electricity from your body. Take the motherboard out of the cardboard box and static bag, holding it by its edges, and place it on a grounded anti-static 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 anti-static 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 don't 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.

### Install the motherboard into your case.

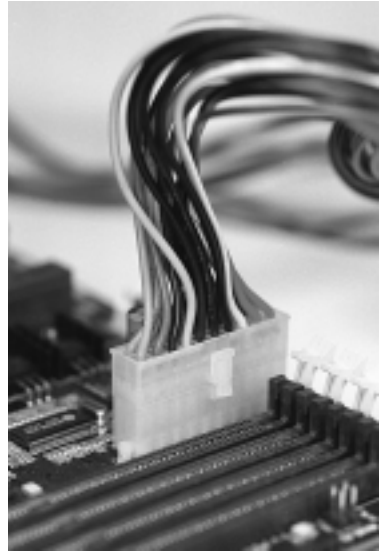
Follow the instructions provided by the case manufacturer for proper installation guidelines. TYAN recommends that you use only one screw to hold down the motherboard. The rest of the mounting holes should be used for the plastic standoffs. If your case does not have a hole for a standoff, simply cut 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.

**Plug in the power connector as shown.**

The photos below show the ATX power connector before (Figure 1) and after (Figure 2) it has been plugged in.



**Figure 1**



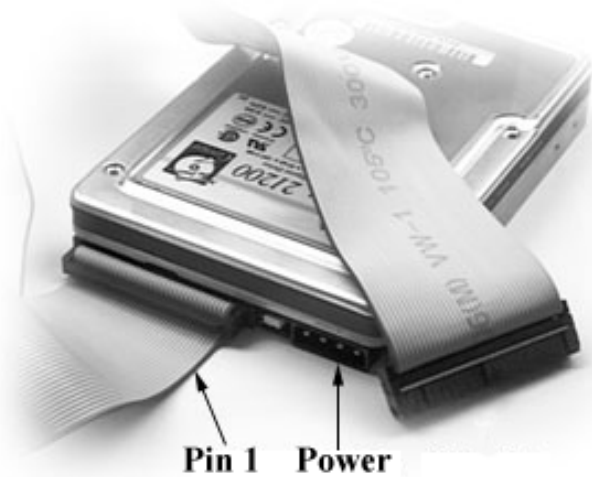
**Figure 2**

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 above. Make absolutely 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. Tyan recommends using an ATX power supply that conforms to industry standard revision 2.01.



**Next, connect your IDE cables (if you're using IDE hard drives).**

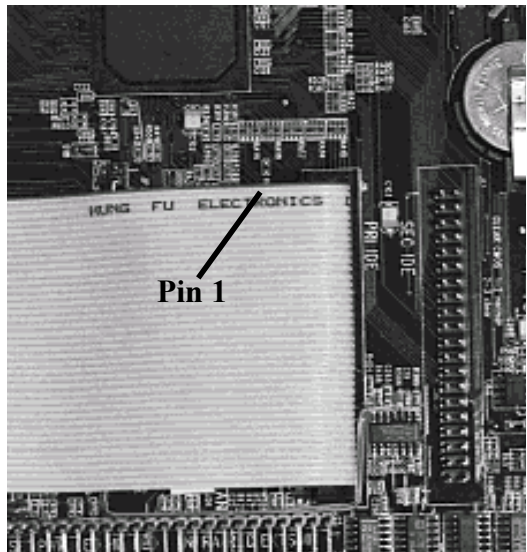
**Figure 3**



The colored stripe on the cable indicating pin 1 should face towards the rear of the case (towards the ATX connectors).

In Figure 3 you can see how the IDE cables should look when they are connected to your hard drive. Notice how Pin 1 (denoted by a red stripe) is connected so that it is next to the power connector of the drive. In most cases, this is the proper way of connecting your IDE cable to the hard drive.

Figure 4 shows the IDE cable properly connected to the motherboard. Contact your hard disk drive manufacturer or documentation for more information.

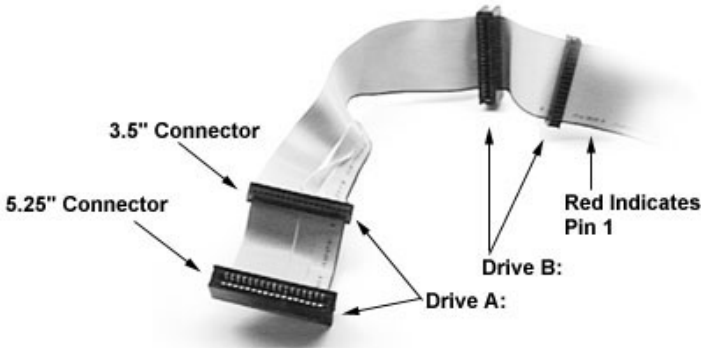


**Figure 4**

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: 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.

**Now that you have installed your IDE drives, your floppies are next.**



**Figure 5**

Pin 1 on the floppy cable is usually denoted by a red or colored stripe down one side of the cable (see Figure 5). 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 5 above for a detailed anatomy of the floppy cable. Remember, you can only have 2 floppy drives connected at any given time.

The colored stripe on the cable indicating pin 1 should face towards the rear of

the case (towards the ATX connectors), as with the IDE cables. Please refer to your documentation for proper installation, or see Figure 4 on page 13.

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 dead give-away that the cable is on backwards. Reverse the cable at the motherboard end and try again.

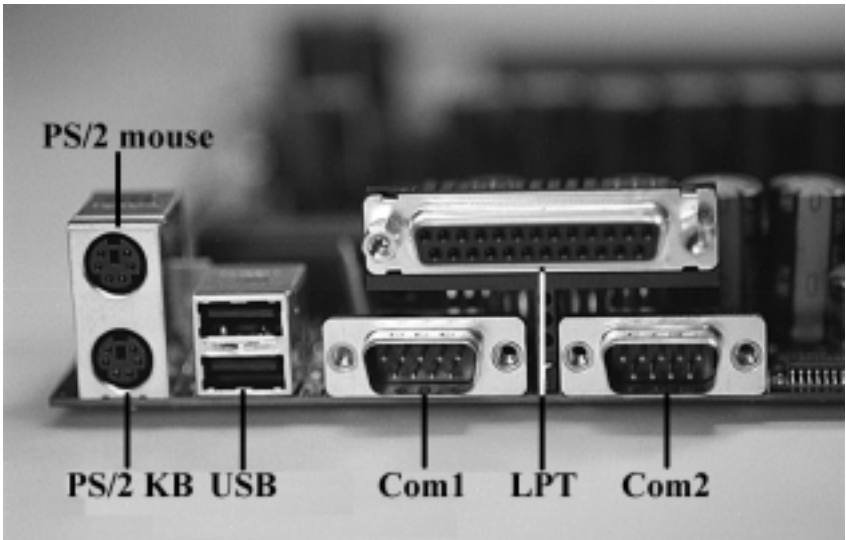
**Next are the Com and Printer ports.**



important!

**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 6 at the top of the next page shows the ATX double row connectors on this board. The Com and Printer ports, as well as the other ports, are labeled.



**Figure 6**

Note: Only TYAN cables will work on this motherboard. If you are using an existing case with old cables, your system will not function properly. Use only TYAN-approved cables.

**Connecting the USB and PS/2 ports.**

This board includes ports for USB, PS/2 mouse, and PS/2 keyboard devices. The location of these ports is shown in Figure 6 above. 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.

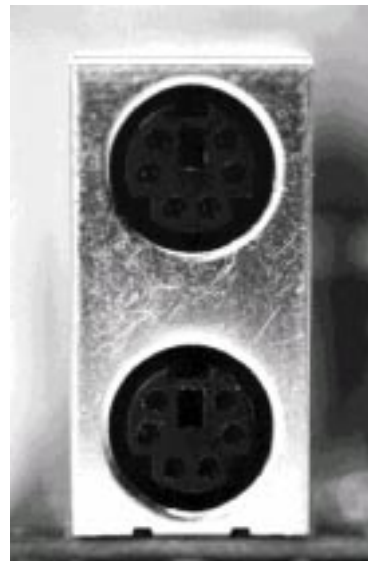
The PS/2 connectors are probably quite familiar to you. The USB connectors, however, may be foreign. The USB (Universal Serial Bus) is a versatile port. This one port type can function as a serial, parallel, mouse, keyboard, or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices. Close-ups of the USB connector, as well as of the USB and PS/2 ports, are on the following page.



Figure 7 shows the USB ports and Figure 8 the PS/2 ports.



**Figure 7**



**Figure 8**

**Installing your add-in cards is relatively simple but...**

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 PCI-Bus interface card on your system, be aware that any one of the two 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.
- 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.



important!

- Before turning on the system, make sure no cards are touching each other or are shorting.

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.

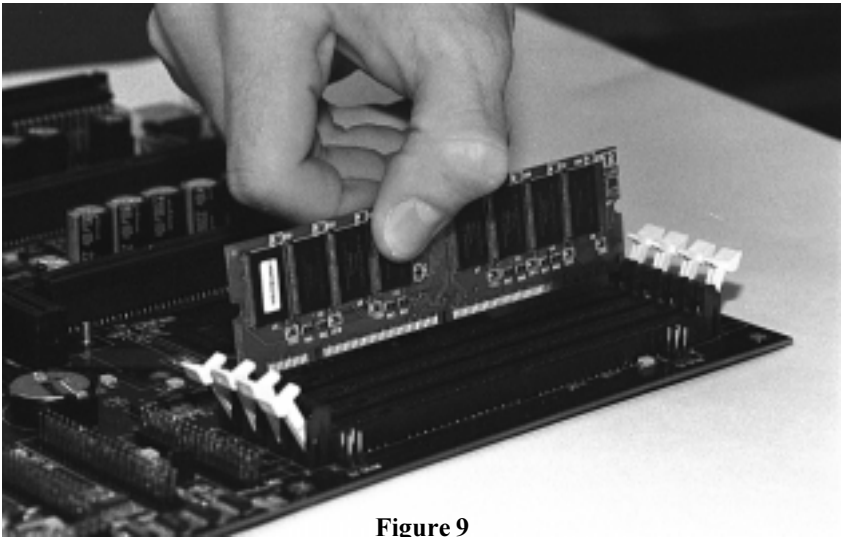
**Next, you need to install your memory.**

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 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.

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 9 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.

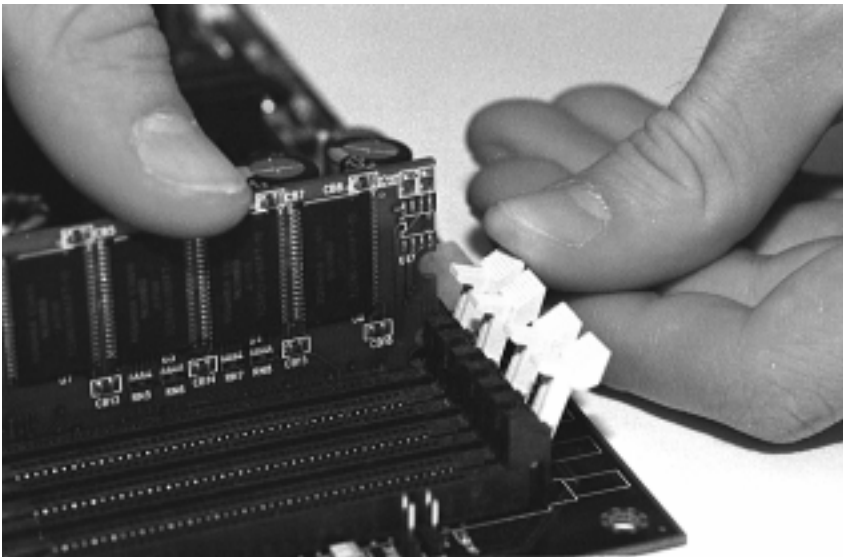


To lock the DIMM into place, push the plastic clips on either end of the slot onto the notches in the ends of the DIMM (see Figure 10 on the following page). To remove your DIMM, simply pull the clips back, and pull up on the module.



**Figure 9**

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



**Figure 10**

**Finally, install your CPU.**

Pentium II processors (233 through 450MHz) can be used on the Tigercub 100. Please refer to pages 29-30 for the correct CPU jumper settings for your board. 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 with minimal, but firm, pressure. Do not press down hard on the CPU.

Currently, Intel produces two types of Pentium II processors: the active (or boxed) processor and the passive processor (see Figures 11 and 12 below). These two types of processors are essentially the same in design; the only difference lies in their cooling methods. The active processor is equipped with a cooling fan and heat sink, while the passive processor is equipped with a heat sink alone. Both types of CPUs provide the user with the same performance, and both types can be installed in the Pentium II slot on the Tigercub 100 board.

**Active**



**Figure 11**

**Passive**



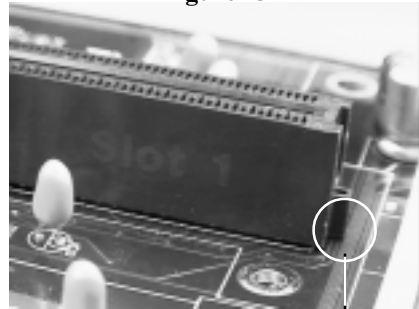
**Figure 12**

**Installing CPU Retention Modules**

Installation of a Pentium II processor requires a CPU retention module, which is first secured onto the motherboard. For the S1894, a universal retention module is used.

To attach the retention module, place the motherboard on a flat surface. Locate the key pin on one end of the Pentium II slot on the board. Then carefully line up the key notch on the retention module with the key pin on the Pentium II slot (the key pin on the Pentium II slot indicates the correct orientation of the CPU).

**Figure 13**



**Pentium II Slot Connector and Key Pin**

**INSTALL**



**Figure 14**

Drop the retention module (Figure 14) down over the Pentium II slot so that the retention module sits flat against the motherboard. Tighten the screws in a clockwise manner to secure the module to the board. **Warning:** Do not overtighten the screws as you may damage the module and/or the motherboard.

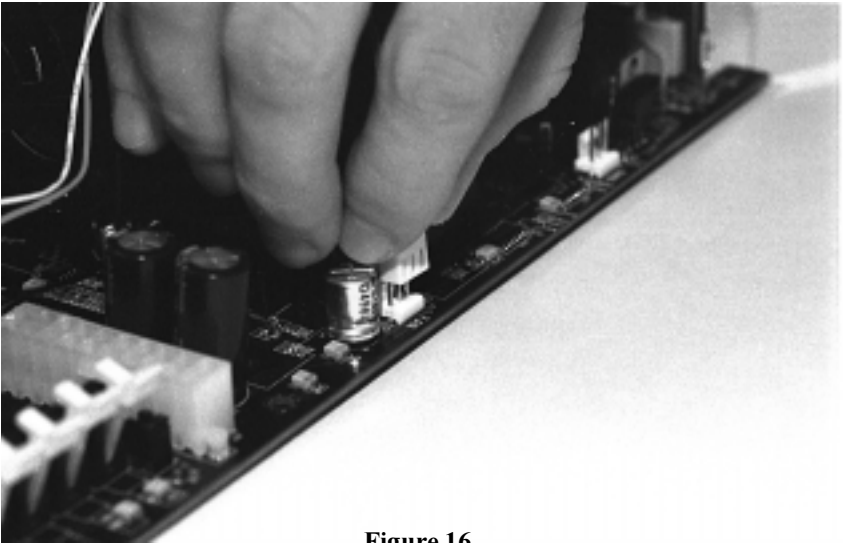
**Installing the Active Processor**

When the retention module is securely installed, you are ready to plug in the CPU. Press down firmly on the CPU until you hear a “click” (see Figure 15). This clicking sound indicates that the CPU is fully locked into the retention module. If you have an active processor, you will also need to connect the CPU’s cooling fan cable to the cooling fan power connector on the board.



**Figure 15**

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 16 on the following page).



**Figure 16**

### **Installing the Passive Processor**

The installation of the passive processor differs only slightly from that of the active processor. Your passive CPU package should contain one CPU retention module, one heat sink retention bracket with mounting locks, two mounting attachments, and one heat sink lock. Install the retention module as explained in the active processor section.



**Figure 17**

The heat sink mount (Figure 17) has two pins on the bottom and four pins on the top. Notice that the bottom two pins are of different sizes. The size of the pins and the holes in the motherboard will determine the correct

orientation. When the bracket is correctly installed, the four pins on top will be right next to the Pentium II CPU slot.

Insert the heat sink mount into the holes on the motherboard. When the bracket is properly inserted into the holes on the motherboard, you will hear a clicking noise.

Align the CPU with the CPU retention module. Make sure the heat sink is lined up with the heat sink mount bracket. If you put the CPU in the wrong way, you may damage the CPU, the motherboard, and/or the CPU socket. Slowly press down on the CPU module until the CPU locks into place. You will hear a clicking noise when the CPU is locked securely into the module.



**Figure 18**

The heat sink lock (Figure 18) has four notches which will correspond to the four pins on the heat sink mounting bracket. Gently slide the lock between the heat sink and the heat sink mounting bracket until

both sides of the lock are firmly secured. A clicking sound will be heard when the lock is securely fastened to the heat sink mounting bracket. To remove the lock from the heat sink mounting bracket, gently press the ends of the locks inward and pull.

Lock the heat sink mount to the board by inserting the two mounting locks (Figure 19) into the pins of the heat sink mounting bracket which are now below the mainboard. There will be a click when the locks are securely fastened.



**Figure 19**

### **Removing the CPU.**

To remove the CPU, move the locks to the center of the CPU. A click will be heard when the CPU has been unlocked. Gently pull up on the CPU, taking care not to bend the motherboard or the CPU retention module.

To remove the lock from the retention module, gently press the ends of the locks inward and pull.

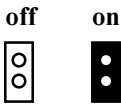
### **You are done.**

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).

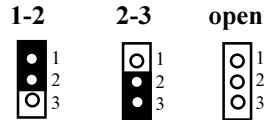
## Setting Jumpers

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. Jumpers and pins are connected by slipping the blue plastic jumper connector overtop of two adjacent jumper pins. The metal rod inside the plastic shell bridges the gap between the two pins, completing the circuit. See the drawings below for examples of “on” and “off” pins and jumpers.

### 2 pin jumpers



### 3 (or more) pin jumpers





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# chapter 3

## Onboard Resource Settings

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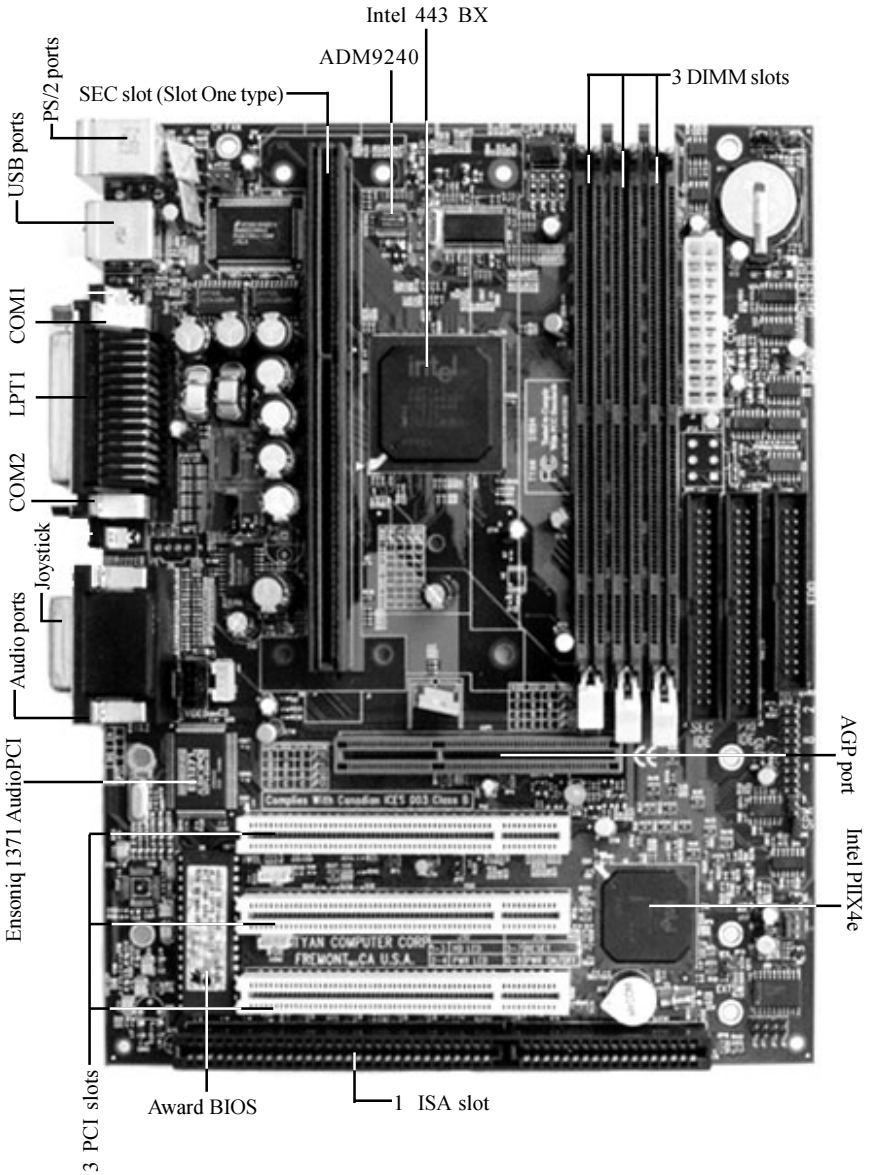
The tables on the following pages will help you set the jumpers for CPU speed, wake on events, and external connector pin assignments, among others. The miniature motherboard maps will help you locate the jumpers on your board. A full-page map of the motherboard can be found on the facing page.

### Other Pin Assignments



# TYAN Chapter 3

## Onboard Resource Settings



### CPU Settings for 66MHz Bus

Clock Speed	Mult	JP10	JP11	JP12	JP13
233MHz	x3.5	ON	OFF	OFF	ON
266MHz	x4	OFF	ON	ON	ON
300MHz	x4.5	OFF	ON	OFF	ON
333MHz	x5	OFF	OFF	ON	ON

### CPU Settings for 100MHz Bus

Clock Speed	Mult	JP10	JP11	JP12	JP13
350MHz	x3.5	ON	OFF	OFF	ON
400MHz	x4	OFF	ON	ON	ON
450MHz	x4.5	OFF	ON	OFF	ON

ONBOARD

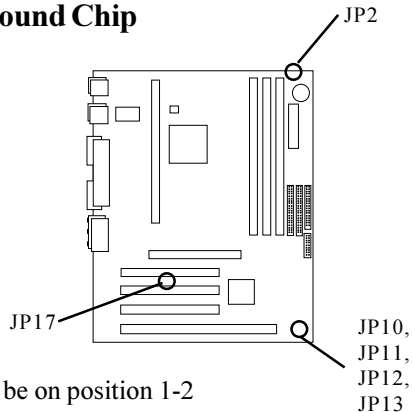
The above clock speed settings control only the clock multiplier. 233MHz corresponds to 3.5x; 266MHz corresponds to 4x, etc. The bus speed is BIOS selectable. Tyan does not recommend operating CPUs, memory or the PCI bus at higher than rated speed. Tyan takes no responsibility for any problems related to overclocking any bus or component on the system board.

### Sound Settings for Onboard Sound Chip

Sound	Enable	Disable
JP17	OFF	ON

### CMOS Settings

	Default	Reset CMOS
JP2	1-2*	2-3



\* For normal operation, JP2 needs to be on position 1-2



## Hardware CMOS & Password Reset

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

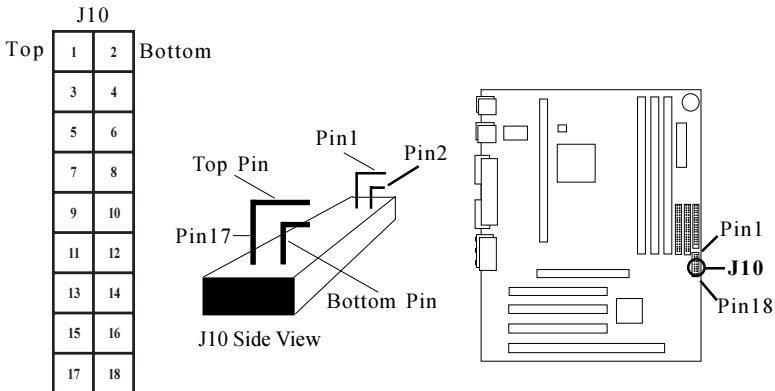
1. Power off the system
2. Set jumper JP2 to pins 2 and 3 (see previous page for location of JP2).
3. Wait for 2 seconds, then return jumper JP2 to pins 1 and 2.
4. Power on the system again.

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

### J10 External Connector Settings

Pins	1-3	2-4	5-7 or 7-8	6-8 or 5-6
Function	HD LED	Power LED	Reset Switch	Power On/Off
Assignment	1=LED+ 3=LED-	**	5=GND 7=Reset 8=GND	5=GND 6=Power 8=GND

\*\* For 2-pin: bi-color/single color - Use pins 2-4  
For 3-pin: bi-color - Use pins 2-4 and GND pin 13



## Other Pin Assignments

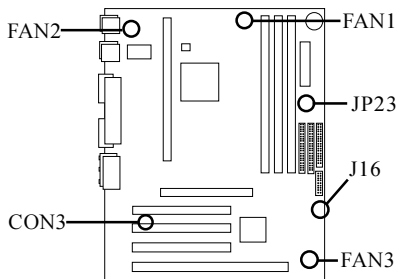
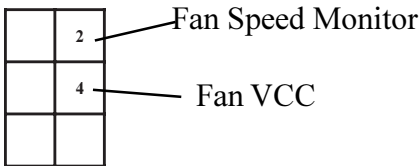
	1	2	3
FAN1-3	GND	VCC	Fan Monitor (speed)
CON3 (Wake-on LAN)	Standby 5V	GND	Wake (Power On, Active High)

## Fan Monitoring/Control Connections

	1	2	3	Notes
Fan Speed Monitor (RPM)	Fan1	Fan2, JP23 or Fan3	~	For proper RPM readings, only two connections are possible: Fan1, and a choice of (Fan2, Fan3, or JP23)
Fan Control (On/Off)	Fan1	Fan2 or JP23	Fan3	For on/off Fan control, three connections are possible: Fan1, Fan2 or JP23, and Fan 3. If both Fan2 and JP23 are used, the fan speed monitor will NOT work properly.

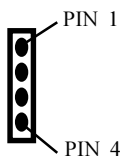
ONBOARD

## JP23 (Power Supply Fan)



## J16 External AT Speaker

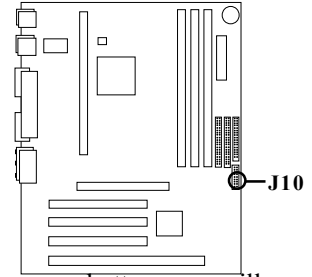
	Enable Spkr
J16	1-4



## Soft Power Connector

The Soft Power Connector is located on pins 6 and 8 (or pins 5 and 6) of jumper block J10.

The Tigercub uses the PIIX4e chip for power management, including turning on and off the system. If the Power Button Function option in the 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 in 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.



## Speaker Connector Installation

The Tigercub provides a 4-pin header to connect the speaker. The speaker is connected to pins 1-4 of jumper block J16 (previous page).

## 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. The Reset switch is a 18-pin connector and should be installed on pins 5 and 7 or pins 7 and 8 of jumper block J10.

## External SMI

The EXTSMI (External System Management Interface) connector, JP16, is used by some plug-in cards. Certain applications associated with these plug-in cards use the interface for hardware control and queries.

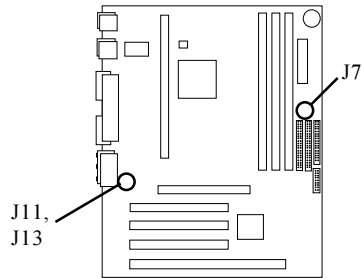


## Chassis Intrusion Alarm Connector

The J7 connector is an intrusion alarm, that can be connected to the system chassis. When active (J7 is closed), this alarm will alert the system administrator anytime someone opens the system's case. **(This function is only used for a system management software.)**

## Ensoniq Audio Connectors

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 Ensoniq 1371 PCI sound chip, and the digital signal is turned into an audio signal which goes out through the speaker. The CD connectors (J11 & J13) is for CD-ROMs.



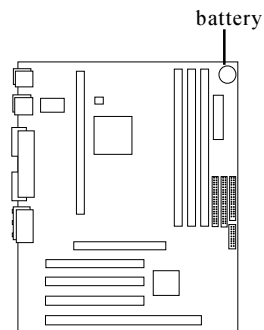
### Windows 95 Users:

You may encounter problems with some of the devices in the Intel 82371EB chipset. Neither the PCI Bridge nor the PCI Universal Serial Bus device IDs for this chipset (also called PIIX4e) are recognized by Windows 95. This is a software problem, not a hardware problem, and can be easily remedied by either upgrading to Windows 98 or downloading the 82371EB patch found at <http://www.tyan.com/html/drivers.html> or at <ftp://download.intel.com/design/pcisets/busmastr/setupex.exe>. Note that USB requires Windows 95 OSR 2.1 or above; please contact Microsoft for the USB update.



## CMOS RTC

The 440BX AGPset includes a Real Time Clock (RTC) circuit, which provides the date and time for the system. 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



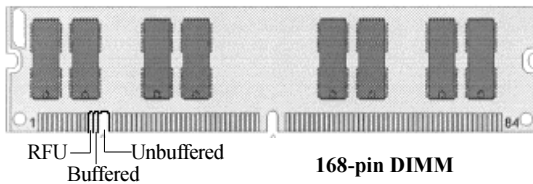
an external battery is 2 years. If yours is running low, you will need to replace it with a new 3V lithium battery (Sony CR2032).

## Flash EEPROM

The Tigercub 100 uses flash memory to store BIOS programs. It can be updated as new versions of the BIOS become available. You can upgrade your BIOS easily using the flash utility (see page 69).

## RAM Installation

The Tigercub 100 uses a 64-bit data path from memory to CPU and can accommodate up to 768MB of SDRAM. The 168-pin DIMMs must be of the 3.3V, **unbuffered** variety. The position of the notch in the DRAM key position will tell you whether or not a DIMM is unbuffered (see the figure below). All installed memory will be automatically detected, so there is no need to set any jumpers.



Some details of memory installation:

- One unbuffered DIMM must be installed for the system to POST.
- The mainboard supports 8MB, 16MB, 32MB, 64MB, and 128MB SDRAM DIMM modules.

**NOTE: The table below shows some of the possible memory configurations for BX boards.**

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	0	0	256MB
256MBx1	256MBx1	0	512MB
256MBx1	256MBx1	256MBx1	768MB

**Warning! The 256MB DIMMs represented above are REGISTERED memory chips. DO NOT use registered and non-registered memory chips simultaneously! (Check with your memory dealer for more information.)**

**ONBOARD**

The table below shows some of the possible memory configurations for **ZX** boards.

DIMM Bank 1	DIMM Bank 2	Total
8MBx1	0	8MB
8MBx1	8MBx1	16MB
16MBx1	8MBx1	24MB
16MBx1	16MBx1	32MB
32MBx1	16MBx1	48MB
32MBx1	32MBx1	64MB
64MBx1	32MBx1	96MB
64MBx1	64MBx1	128MB
128MBx1	64MBx1	192MB
128MBx1	128MBx1	256MB

## Cache Memory

Pentium II processors have the L2 (Level 2) cache built into their architecture, so there is no need for an L2 cache on the motherboard. The Pentium II processor has a physical L2 cache size of 512KB and a cacheable memory area of 512MB.

### Enable the Wake-on LAN Power Jumper (Con3)

In order for the Wake On LAN (WOL) feature to work correctly, the adapter must be connected to a continuous power source. This allows the WOL adapter to “listen to” the network even when the computer is turned off. The WOL power jumper (con3) is enabled when the jumper is connected or closed (ON). Warning: As always, turn off and unplug power to the computer before setting the WOL jumper. The WOL connector on your motherboard is live when the computer is plugged in to a power outlet. Failure to do so could damage the adapter or computer. Also, be sure that your ATX power supply is 2.0 compliant or better. This level of quality is required because the standby voltage for WOL is 800 mAmps.

**Using Wake-on LAN**

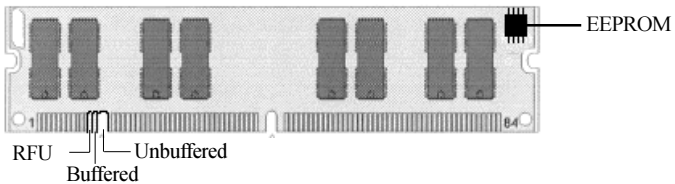
The Wake-on LAN feature operates according to a published specification. In simple terms, the specification allows designers to build network adapters that are capable of “listening to” network activity even when the computer is turned off. WOL adapters have a special low power standby mode that is active when the rest of the computer is without power. The adapter will respond to a special “wake-up” packet sent by another computer or network device. Typically this wake-up packet causes the adapter to signal the computer to power up and run a pre-defined program.

The wake up packet structure and behavior is defined in the WOL specification, available from the website at <http://www.us.pc.ibm.com/infobrf/iblan.html>.

**Frequently Asked Questions**

**Q:** Why don't I get a display after I put in my old DIMM module?

**A:** The 440BX chipset requires the memory manufacturer to program an EEPROM chip with SPD (Serial Presence Detection) on the module in order for the BIOS to program the 440BX's timing registers properly. Your DIMM may not have the EEPROM chip on the module, or the EEPROM may not contain the correct program. Check with your memory vendor for details. The figure on the below shows a DIMM module with an EEPROM chip.



**168-pin DIMM**

**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 conflict in address, IRQ, or DMA. If you are using Windows 95, the Device Manager 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.

## Frequently Asked Questions (cont.)

**Q:** Can I use EDO DIMMs on this motherboard?

**A:** No. The Intel 440BX AGPset does not support EDO memory. The 440BX AGPset supports bus speeds of 100MHz, and EDO memory does not. You must use SDRAM (which does support 100MHz bus speeds) on this board.

**Q:** What is AGP?

**A:** AGP (Accelerated Graphics Port) is a new bus architecture for 3D graphics. The AGP slot eliminates the PCI bandwidth bottleneck by bypassing the PCI interface and accessing the system memory directly. Currently, the AGP supports 1X and 2X modes, which yield bandwidths of 264MB/s (at 33MHz bus speed) and 533MB/s (at 66MHz bus speed), respectively. Compare this with the mere 132MB/s (at 33MHz bus speed) that you get with the PCI bus.

**Q:** Does my operating system support AGP?

**A:** Currently, only Windows 98 and Windows NT 5.0 will have built-in support for AGP. Some AGP cards require Windows 95 OSR2.1 or a special driver from Intel. Please check with your graphics vendor for more details.

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# chapter 4

## BIOS Configuration

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### Introduction to Setup

This manual describes the Award EliteBIOS Setup program. The Setup program lets you modify basic system configuration settings. The settings are then stored in a dedicated battery-backed memory, called CMOS RAM, that retains the information when the power is turned off.

The EliteBIOS 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 EliteBIOS 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 EliteBIOS 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 <Del> immediately after switching the system on, or
2. By pressing the <Del> key or by simultaneously pressing <Ctrl>, <Alt>, and <Esc> keys 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.

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.

## 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.

## In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the EliteBIOS supports an override to the CMOS settings that resets your system to its default configuration.

You can invoke this override by immediately pressing <Insert> when you restart your computer. You can restart by either using the ON/OFF switch, the RESET button or by pressing <Ctrl>, <Alt> and <Delete> at the same time.

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 Menu

When you enter the EliteBIOS 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.

ROM PCI/ISA BIOS (2A69JT50)  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	PC HEALTH MONITOR
CHIPSET FEATURES SETUP	SUPERVISOR PASSWORD
POWER MANAGEMENT SETUP	USER PASSWORD
PNP/PCI CONFIGURATION	IDE HDD AUTO DETECTION
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	
F10 : Save & Exit Setup	
↑ ↓ → ← : Select Item	
(Shift)F2 : Change Color	
Time, Date, Hard Disk Type...	

A brief description of each highlighted selection appears at the bottom of the screen. Following is a brief summary of each Setup category.

### Standard CMOS Setup

Options in the original PC AT-compatible BIOS.

### BIOS Features Setup

Award Software enhanced BIOS options.

### **Chipset Features Setup**

Options specific to your system chipset.

### **Power Management Setup**

Advanced Power Management (APM) options.

### **PnP/PCI Configuration**

Plug and Play standard and PCI Local Bus configuration options.

### **Integrated Peripherals**

I/O subsystems that depend on the integrated peripherals controller in your system.

### **PC Health Monitor**

Displays temperature, fan speed, voltage and chassis door information detected by the LM81 chip.

### **Supervisor/User Password**

Change, set, or disable a password. In BIOS versions that allow separate user and supervisor passwords, only the supervisor password permits access to Setup. The user password generally allows only power-on access.

### **IDE HDD Auto Detection**

Automatically detect and configure IDE hard disk parameters.

### **Load BIOS Defaults**

BIOS defaults are factory settings for the most stable, minimal-performance system operations.

### **Load Setup Defaults**

Setup defaults are factory settings for optimal-performance system operations.

### **Save & Exit Setup**

Save settings in nonvolatile CMOS RAM and exit Setup.

### **Exit Without Saving**

Abandon all changes and exit Setup.

## Standard CMOS Setup

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.

ROM PCI/ISA BIOS (2A69JT50)  
STANDARD CMOS SETUP  
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Fri, Aug 1 1998																		
Time (hh:mm:ss) : 10 : 7 : 7																		
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE										
Primary Master	: Auto	0	0	0	0	0	0	AUTO										
Primary Slave	: Auto	0	0	0	0	0	0	AUTO										
Secondary Master	: Auto	0	0	0	0	0	0	AUTO										
Secondary Slave	: Auto	0	0	0	0	0	0	AUTO										
Drive A : 1.44M, 3.5 in.					<table border="1"> <tr> <td>Base Memory:</td> <td>640K</td> </tr> <tr> <td>Extended Memory:</td> <td>64512K</td> </tr> <tr> <td>Other Memory:</td> <td>384K</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>Total Memory:</td> <td>65536K</td> </tr> </table>				Base Memory:	640K	Extended Memory:	64512K	Other Memory:	384K	<hr/>		Total Memory:	65536K
Base Memory:	640K																	
Extended Memory:	64512K																	
Other Memory:	384K																	
<hr/>																		
Total Memory:	65536K																	
Drive B : None																		
Floppy 3 Mode Support : Disabled																		
Video : EGA/VGA																		
Halt On : All but Keyboard																		
ESC : Quit                    ↑ ↓ → ← : Select Item            PU/PD/+/- : Modify F1 : Help                    (Shift)F2 : Change Color																		

### 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.

## HARD DISKS

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 Detection function in Setup.

Here 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

**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, Drive B

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

### Floppy 3 Mode Support

When Enabled, the BIOS supports Japanese 3 Mode 1.2MB, 3.5-in diskette drive as well as standard 720-KB and 1.44-MB diskettes.

### 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. The table on the following page shows 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.

**Other Memory:** Between 640 KB and 1 MB; often called High memory. DOS may load terminate-and-stay-resident (TSR) programs, such as device drivers, in this area, 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.

## BIOS Features Setup

This screen 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.

**NOTE: The diagram below may not be an exact representation due to differences in BIOS versions.**

ROM PCI/ISA BIOS (2A69JT50)  
BIOS FEATURES SETUP  
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
CPU LW Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D8000-DBFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	DC000-DEFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: On		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PS/2 Mouse Function Control	: Enabled		
PCI/VGA Palette Snoop	: Disabled		
Assign IRQ For VGA	: Enabled		
OS Select For DRAM > 64MB	: Non-OS2		
Report No FDD For Win95	: No		
		ESC : Quit	↑↓←→ : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

### BIOS Feature Setup - Default Settings Chart

Setting Option	BIOS Default	Setup Default
Virus Warning	Disabled	Disabled
CPU Internal Cache	Enabled	Enabled
External Cache	Enabled	Enabled
CPU LW Cache ECC Checking	Enabled	Enabled
Quick Power On Self Test	Disabled	Enabled
Boot Sequence	A, C, SCSI	A, C, SCSI
Swap Floppy Drive	Disabled	Disabled
Boot Up Floppy Seek	Enabled	Enabled
Boot Up NumLock Status	On	On

## Default Settings Chart (Continued)

Setting Option	BIOS Default	Setup Default
Gate A20 Option	Normal	Fast
Typematic Rate Setting	Disabled	Disabled
Typematic Rate (Chars/Sec)	6	6
Typematic Delay (Msec)	250	250
Security Option	Setup	Setup
PS/2 Mouse Function Control	Enabled	Enabled
PCI / VGA Palette Snoop	Disabled	Disabled
Assign IRQ For VGA	Disabled	Enabled
OS Select For DRAM > 64MB	Non-OS2	Non-OS2
Report No FDD For Win95	No	No
Video BIOS Shadow	Disabled	Disabled
C8000-CBFFF Shadow	Disabled	Disabled
CC000-CFFFF Shadow	Disabled	Disabled
D0000-D3FFF Shadow	Disabled	Disabled
D4000-D7FFF Shadow	Disabled	Disabled
D8000-DBFFF Shadow	Disabled	Disabled
DC000-DFFFF Shadow	Disabled	Disabled

### 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

Intel recommends that all systems using Pentium-II higher than 300 MHz should enable this option.

### **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 field is effective only in systems with two floppy drives. Selecting Enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B.

### **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.

### **PCI/VGA Palette Snoop**

Your BIOS Setup may not contain this field. If the field is present, leave at Disabled.

### **PS/2 Mouse Function Control**

This option should be disabled if you do not wish to install a PS/2 mouse or if you want to use IRQ12 for another device.

### **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.

### **Report No FDD for Win95**

Select "yes" to this option only IF you do not want to install an FDD and if you do not want Win95 to check for an FDD (Floppy Disk Drive).

### **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.

## Chipset Features Setup

This section describes features of the Intel 440EX 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.

**NOTE: The diagram on the following page may not be an exact representation due to differences in BIOS versions.**

ROM PCI/ISA BIOS (2A69JT50)  
 CHIPSET FEATURES SETUP  
 AWARD SOFTWARE, INC.

<pre> Auto Configuration      : Enabled SDRAM RAS-to-CAS Delay : 3 SDRAM RAS Precharge Time : 3 SDRAM CAS Latency Time : 3 SDRAM Precharge Control : Disabled DRAM Data Integrity Mode : Non-ECC System BIOS Cacheable  : Enabled Video BIOS Cacheable   : Enabled Video RAM Cacheable    : Disabled 8 Bit I/O Recovery Time : 1 16 Bit I/O Recovery Time : 1 Memory Hole At 15M-16M : Disabled Passive Release        : Enabled Delayed Transaction     : Disabled AGP Aperture Size (MB) : 64           </pre>	<pre> ESC : Quit      ↑↓←→ : Select Item F1  : Help      PU/PD/+- : Modify F5  : Old Values (Shift) F2 : Color F6  : Load BIOS Defaults F7  : Load Setup Defaults           </pre>
--	--

### Chipset Features Setup - Default Settings Chart

Setting Option	BIOS Default	Setup Default
Auto Configuration	Enabled	Enabled
SDRAM RAS-to-CAS Delay	3	3
SDRAM RAS Precharge Time	3	3
SDRAM CAS Latency Time	3	3
SDRAM Precharge Control	Disabled	Disabled
DRAM Data Integrity Mode	Non-ECC	Non-ECC
System BIOS Cacheable	Disabled	Disabled
Video BIOS Cacheable	Disabled	Disabled
Video RAM Cacheable	Disabled	Disabled
8 Bit I/O Recovery Time	3	1
16 Bit I/O Recovery Time	2	1
Memory Hole At 15M-16M	Disabled	Disabled
Passive Release	Enabled	Enabled
Delayed Transaction	Disabled	Disabled
AGP Aperture Size (MB)	64	64

BIOS

#### Auto Configuration

Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration

is Enabled.

#### **SDRAM RAS to CAS Delay**

This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

#### **SDRAM RAS Precharge Time**

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

#### **SDRAM CAS Latency Time**

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

#### **DRAM ECC/Parity Select**

Select Parity, ECC (error-correcting code), or Disabled, depending on the type of DRAM installed in your system.

#### **CPU-To-PCI IDE Posting**

Select Enabled to post write cycles from the CPU to the PCI IDE interface. IDE accesses are posted in the CPU to PCI buffers, for cycle optimization.

#### **System BIOS Cacheable**

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

#### **Video BIOS Cacheable**

Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result.

#### **Video RAM Cacheable**

Selecting Enabled allows caching of the video memory, resulting in better video performance.



**8/16 Bit I/O Recovery Time**

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

**Memory Hole at 15M-16M**

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

**Passive Release**

When Enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

**Delayed Transaction**

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

**AGP Aperture Size (MB)**

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](http://www.agpforum.org) for APG information.

## Power Management Setup

This chapter describes all fields offered by Award Software in this screen. Your system board designer may omit or modify some fields. **NOTE: The diagram below may not be an exact representation due to differences in BIOS versions.**

ROM PCI/ISA BIOS (2A69JT50)  
POWER MANAGEMENT SETUP  
AWARD SOFTWARE, INC.

ACPI Function	: Disabled	** Reload Global Timer Events **
Power Management	: User Define	IRQ[3-7,9-15],NMI : Disabled
PM Control by APM	: Yes	Primary IDE 0 : Disabled
Video Off Method	: V/H Sync+Blank	Primary IDE 1 : Disabled
Video Off After	: Standby	Secondary IDE 0 : Disabled
MODEM Use IRQ	: 3	Secondary IDE 1 : Disabled
Doze Mode	: Disabled	Floppy Disk : Disabled
Standby Mode	: Disabled	Serial Port : Enabled
Suspend Mode	: Disabled	Parallel Port : Disabled
HDD Power Down	: Disabled	Power Interruption : Enabled
Throttle Duty Cycle	: 62.5%	PC98 LED : Enabled
VGA Active Monitor	: Disabled	
Power Button Function	: Suspend	
Fan1 Speed in Suspend	: Off	ESC : Quit    ↑↓→← : Select Item
Fan2 Speed in Suspend	: Off	F1 : Help    PU/PD/+/- : Modify
Fan3 Speed in Suspend	: Off	F5 : Old Values (Shift)F2 : Color
Resume by Ring	: Disabled	F6 : Load BIOS Defaults
Resume by Alarm	: Disabled	F7 : Load Setup Defaults
Wake up on LAN	: Disabled	
IRQ 8 Break Suspend	: Disabled	

### Power Management Setup - Default Settings Chart

Setting Option	BIOS Default	Setup Default
ACPI Function	Enabled	Enabled
Power Management	User Define	User Define
PM Control by APM	Yes	Yes
Video Off Method	V/ H Sync+Blank	V/ H Sync+Blank
Video Off After	Standby	Standby
MODEM Use IRQ	3	3
Doze Mode	Disabled	Disabled
Standby Mode	Disabled	Disabled
Suspend Mode	Disabled	Disabled
HDD Power Down	Disabled	Disabled
Throttle Duty Cycle	62.5%	62.5%
VGA Active Monitor	Disabled	Disabled
Power Button Function	Suspend	Suspend

### Default Settings Chart (Continued)

Setting Option	BIOS Default	Setup Default
Fan1 Speed in Suspend	Off	Off
Fan2 Speed in Suspend	Off	Off
Fan3 Speed in Suspend	Off	Off
Resume by Ring	Disabled	Disabled
Resume by Alarm	Disabled	Disabled
Wake up on LAN	Disabled	Disabled
IRQ 8 Break Suspend	Disabled	Disabled
IRQ [3-7,9-15], NMT	Disabled	Disabled
Primary IDE 0	Disabled	Disabled
Primary IDE 1	Disabled	Disabled
Secondary IDE 0	Disabled	Disabled
Secondary IDE 1	Disabled	Disabled
Floppy Disk	Disabled	Disabled
Serial Port	Enabled	Enabled
Parallel Port	Disabled	Disabled
Power Interruption	Disabled	Disabled
PC98 LED	Disabled	Disabled

### 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).

### PM Control by APM

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

**Video Off Method**

Determines the manner in which the monitor is blanked.

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.

**Video Off After**

As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank.

**MODEM Use IRQ**

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

**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. This mode is user-configurable only during User Defined Power Management mode.

**Standby Mode**

After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed. This mode is user-configurable only during User Defined Power Management mode.

**Suspend Mode**

After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. This mode is user-configurable only during User Defined Power Management mode.

**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. This mode is user-

configurable only during User Defined Power Management mode.

**Throttle Duty Cycle**

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

**VGA Active Monitor**

When Enabled, any video activity restarts the global timer for Standby mode.

**CPU FAN Off in Suspend**

Selecting Enabled causes the CPU fan to turn off during Suspend mode.

**Resume by Ring**

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

**IRQ8 Break Suspend**

You can Enable or Disable monitoring of IRQ8 (the Real Time Clock) so it does not awaken the system from Suspend mode.

**Reload Global Timer Events**

When Enabled, an event occurring on each device listed below restarts the global timer for Standby mode.

- IRQ3-7, 9-15, NMI
- Primary IDE 0
- Primary IDE 1
- Secondary IDE 0
- Secondary IDE 1
- Floppy Disk
- Serial Port
- Parallel Port
- Power Interruption

## PnP/PCI Configuration

This chapter describes all fields offered by Award Software in this screen. Your system board designer may omit or modify some fields. **NOTE: The diagram below may not be an exact representation due to differences in BIOS versions.**

ROM PCI/ISA BIOS (2A69JT50)  
PNP/PCI CONFIGURATION  
AWARD SOFTWARE, INC.

PNP OS Installed	: No	Used MEM base addr	: N/A
Resources Controlled By	: Manual	Assign IRQ for USB	: Enabled
Reset Configuration Data	: Disabled		
IRQ-3 assigned to	: PCI/ISA PnP		
IRQ-4 assigned to	: PCI/ISA PnP		
IRQ-5 assigned to	: PCI/ISA PnP		
IRQ-7 assigned to	: PCI/ISA PnP		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP		
DMA-3 assigned to	: PCI/ISA PnP		
DMA-5 assigned to	: PCI/ISA PnP		
DMA-6 assigned to	: PCI/ISA PnP		
DMA-7 assigned to	: PCI/ISA PnP		
		ESC : Quit	↑↓→← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift)F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

### PnP / PCI Configuration - Default Settings Chart

Setting Option	BIOS Default	Setup Default
PNP OS Installed	No	No
Resources Controlled By	Auto	Manual
Reset Configuration Data	Disabled	Disabled
Used MEM base Addr	N/A	N/A
Assign IRQ for USB	Enabled	Enabled

### PNP OS Installed

Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

### 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.

### 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.

### 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 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 IDE IRQ Map to

This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts. If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface(s) installed in your system (PCI or ISA). Standard ISA interrupts for IDE channels are IRQ14 for primary and IRQ15 for secondary.

**Primary/Secondary IDE INT#**

Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A. Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. Because the PCI IDE interface in the chipset has two channels, it requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.

**Used Mem base addr**

Select a base address for the memory area used by any peripheral that requires high memory.

**Used Mem Length**

Select a length for the memory area specified in the previous field. This field does not appear if no base address is specified.



# 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. **NOTE: The diagram below may not be an exact representation due to differences in BIOS versions.**

ROM PCI/ISA BIOS (2A69JT50)  
 INTEGRATED PERIPHERALS  
 AWARD SOFTWARE, INC.

IDE HDD Block Mode : Enabled	Parallel Port Mode : SPP
IDE Primary Master PIO : Auto	Onboard Sound Chip
IDE Primary Slave PIO : Auto	
IDE Secondary Master PIO : Auto	
IDE Secondary Slave PIO : Auto	
IDE Primary Master UDMA : Auto	
IDE Primary Slave UDMA : Auto	
IDE Secondary Master UDMA : Auto	
IDE Secondary Slave UDMA : Auto	
On-Chip Primary PCI IDE : Enabled	
On-Chip Secondary PCI IDE : Enabled	
USB Keyboard Support : Disabled	
KBC Input Clock : 8 MHz	
Onboard FDC Controller : Enabled	
Onboard Serial Port 1 : Auto	ESC : Quit ↑↓→← : Select Item
Onboard Serial Port 2 : Auto	F1 : Help PU/PD/+/- : Modify
UR2 Mode : Standard	F5 : Old Values (Shift) F2 : Color
IRRX Mode Select : IRMODE	F6 : Load BIOS Defaults
Onboard Parallel Port : 3BC/IRQ7	F7 : Load Setup Defaults

BIOS

## Integrated Peripherals - Default Settings Chart

Setting Option	BIOS Default	Setup Default
IDE HDD Block Mode	Enabled	Enabled
IDE Primary Master PIO	Auto	Auto
IDE Primary Slave PIO	Auto	Auto
IDE Secondary Master PIO	Auto	Auto
IDE Secondary Slave PIO	Auto	Auto
IDE Primary Master UDMA	Disabled	Auto
IDE Primary Slave UDMA	Disabled	Auto
IDE Secondary Master UDMA	Disabled	Auto
IDE Secondary Slave UDMA	Disabled	Auto
On-Chip Primary PCI IDE	Enabled	Enabled
On-Chip Secondary PCI IDE	Enabled	Enabled
USB Keyboard Support	Disabled	Disabled

**Default Settings Chart (Continued)**

Setting Option	BIOS Default	Setup Default
KBC Input Clock	8 MHz	8 MHz
Onboard FDC Controller	Enabled	Enabled
Onboard Serial Port 1	2F8 / IRQ3	2F8 / IRQ3
Onboard Serial Port 2	Auto	Auto
UR2 Mode	Standard	Standard
IRRX Mode Select	IRMODE	IRMODE
Onboard Parallel Port	378 / IRQ7	378 / IRQ7
Parallel Port Mode	SPP	SPP

**IDE HDD Block Mode**

Select Enabled only if your hard drives support block mode.

**IDE PIO Modes (Primary/Secondary Master/Slave)**

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 UDMA Modes (Primary/Secondary Master/Slave)**

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 33 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.

**On-Chip PCI IDE (Primary/Secondary)**

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.

**Onboard PCI SCSI Chip**

Select Enabled if your system contains a built-in PCI SCSI controller.

**USB Keyboard Support**

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

### **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 Ports (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.

#### **UR2 Mode**

Select an operating mode for the second serial port:

- Standard RS-232C serial port
- IrDA 1.0 IrDA specification 1.0-compliant serial infrared port
- IrDA 1.1 IrDA specification 1.1-compliant serial infrared port
- ASK-IR Amplitude shift keyed infrared port

#### **Duplex Select**

Select the value required if an IR device is connected to the IR port. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time.

#### **TxD, RxD Active**

Consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals.

### **Onboard Parallel Port**

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

#### **Parallel Port Mode**

Select an operating mode for the onboard parallel (printer) port. Select Normal or SPP unless you are certain both your hardware and software support one of the other available modes.

## PC Health Monitor

The following features are only available with the optional LM81 chip.

### CPU Warning Temperature

Select the combination of lower an upper limits for the CPU temperature. If the temperature extends beyond either limit, any warning mechanism programmed into your system will be activated.

### Current CPU Temperature

This field displays the current CPU temperature, if your computer contains a monitoring system.

### Current System Temperature

This field displays the current system temperature, if your computer contains a monitoring system.

### Current CPU FAN 1/2/3 Speed

These fields display the current speed of up to seven voltage input lines, if your computer contains a monitoring system.

### IV0-IN6 (V)

These fields display the current voltage of up to seven voltage input lines, if your computer contains a monitoring system.

## Supervisor Password

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 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 (see Hardware CMOS & Password Reset, page 30).

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 “awdfash” 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 30).

**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 5

## System Resources

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### POST Messages

During the power-on self test (POST), the BIOS either sounds a beep code or displays a message when it detects a correctable error. Following is a list of POST messages for the ISA BIOS kernel. Specific chipset ports and BIOS extensions may include additional messages. An error message may be followed by a prompt to press F1 to continue or press DEL to enter Setup.

#### **Beep**

Currently the only beep code indicates 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.

#### **BIOS ROM checksum error - System halted**

The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt. Contact your system dealer to replace the BIOS.

#### **CMOS battery failed**

CMOS battery is no longer functional. Contact your system dealer for a replacement battery.



**CMOS checksum error - Defaults loaded**

Checksum of CMOS is incorrect, so the system loads the default equipment configuration. A checksum error may indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

**CPU at nnnn**

Displays the running speed of the CPU.

**Display switch is set incorrectly.**

The display switch on the motherboard can be set to either monochrome or color. This message indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

**Press ESC to skip memory test**

The user may press Esc to skip the full memory test.

**Floppy disk(s) fail**

Cannot find or initialize the floppy drive controller or the drive. Make sure the controller is installed correctly. If no floppy drives are installed, be sure the Diskette Drive selection in Setup is set to NONE or AUTO.

**HARD DISK initializing**

**Please wait a moment...**

Some hard drives require extra time to initialize.

**HARD DISK INSTALL FAILURE**

Cannot find or initialize the hard drive controller or the drive. Make sure the controller is installed correctly. If no hard drives are installed, be sure the Hard Drive selection in Setup is set to NONE.

**Hard disk(s) diagnosis fail**

The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when the diagnostics run.

**Keyboard error or no keyboard present**

The keyboard cannot initialize. Make sure the keyboard is attached correctly and no keys were pressed during POST. To purposely configure the system

without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.

**Keyboard is locked out - Unlock the key**

This message usually indicates that one or more keys have been pressed during the keyboard tests. Be sure no objects are resting on the keyboard.

**Memory Test :**

This message displays during a full memory test, counting down the memory areas being tested.

**Memory test fail**

If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.

**Override enabled - Defaults loaded**

If the system cannot boot using the current CMOS configuration, the BIOS can override the current configuration is a set of BIOS defaults designed for the most stable, minimal-performance system operations.

**Press TAB to show POST screen**

System OEMs may replace the EliteBIOS POST display with their own proprietary display. Including this message in the OEM display permits the operator to switch between the OEM display and the default POST display.

**Primary master hard disk fail**

POST detects an error in the primary master IDE hard drive.

**Primary slave hard disk fail**

POST detects an error in the secondary master IDE hard drive.

**Resuming from disk, Press TAB to show POST screen**

The BIOS offers a save-to-disk feature for notebook computers. This message may appear when the operator re-starts the system after a save-to-disk shut-down. See the Press TAB ... message above for a description of this feature.

**Secondary master hard disk fail**

POST detects an error in the primary slave IDE hard drive.

**Secondary slave hard disk fail**

POST detects an error in the secondary slave IDE hard drive.

**This page has been intentionally left blank.**

# Appendix 1

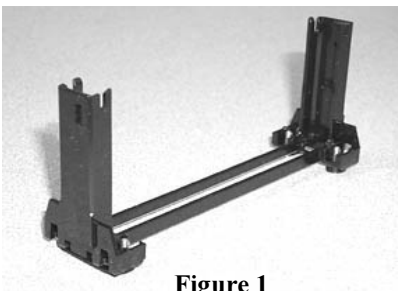
## CPU Retention Module Options

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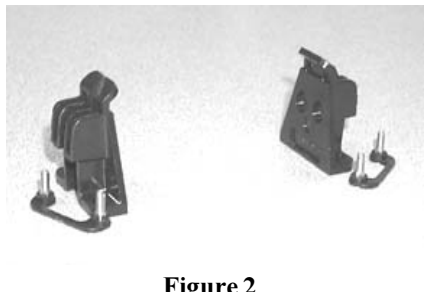
Tyan offers two different options for securing Intel's Pentium II CPUs onto the motherboard. Each option provides retention for both older Pentium II's as well as newer Pentium II's (including Celeron).

### OPTION 1:

Two different types of retention modules are included in the motherboard package. For older versions of Pentium II, use the retention module shown in Figure 1. For newer versions of Pentium II CPUs (including Celeron), use the retention module shown in Figure 2. (Screws for the retention modules are provided.)



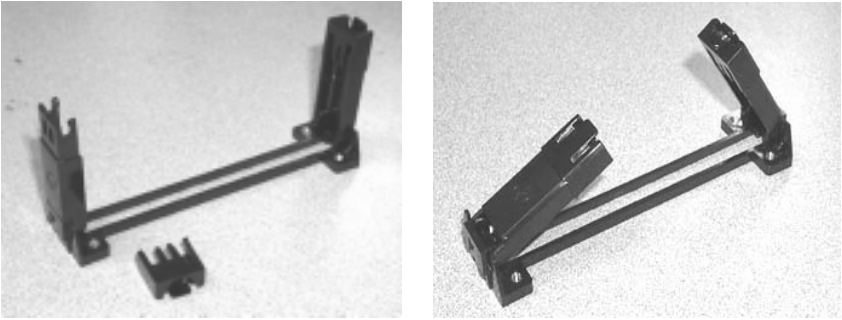
**Figure 1**



**Figure 2**

**OPTION 2:**

One universal retention module is included in the motherboard package. This type of retention module adapts to both old and new Pentium II CPUs - see Figure 3. (Screws for the retention modules are provided)



**Figure 3**

# Appendix 1

## Glossary

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**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** boards are generally smaller and cheaper.

**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** boards are generally larger and more expensive because they have the keyboard, mouse, serial, USB, and parallel ports 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 (Bulletin Board System)** 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 (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).

**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 slower 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/33** 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.

**WOL (Wake-on LAN)** is a feature which operates according to specifications, allowing designers to build network adapters capable of “listening to” network activity even when the computer is off. Special “wake-up” packets sent by another computer causes the adapter to signal the computer to power up and run a pre-defined program.

**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.

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