P5T30-B4 MAINBOARD

User's Manual

Rev: 1.05

Date: January - 98

FCC Compliance Statement

This device complies with Part 15 of the FCC rules, operation is subject to the following two 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.

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interface to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Move the equipment away from the receiver.
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for additional suggestions.

The FCC requires the user to be notified that any change or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment. The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations.

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INTRODUCTION

Product Description

The **P5T30-B4** represents the highest level of technology available in PC Mainboards today. Designed as a flexible, high-performance and cost-effective solution for System Integrators and End Users alike, the P5T30-B4 provides the power and expandability to meet the requirements of the most advanced operating systems and software applications.

The P5T30-B4 is designed to provide greater overall system throughput by utilizing the latest in I/O technology. By incorporating such advanced features as Ultra DMA/33 Bus Mastering IDE and Universal Serial Bus (USB) onto the mainboard, optimum system performance is assured and system design and implementation is simplified.

Fully "Plug & Play" compatible via an Award BIOS, the P5T30-B4 facilitates easy system configuration and peripheral setup. Advanced BIOS features include Temperature Monitoring and Alert functions designed to prevent the CPU from overheating. Also, the Award BIOS supports ACPI Readiness and is compatible with the PC'97 specification. With support for up to 512KB Pipelined Burst SRAM L2 cache and 256MB of **EDO** or **SDRAM** System RAM, the P5T30-B4 is the ideal foundation for high-end computer systems.

Item Checklist

Your mainboard package should include the items listed below. Damaged or missing items should be reported to your vendor.

☑ The P5T30-B4 mainboard

☑ Mounting bracket with (1) COM2 serial port & (1) PS/2 connector ribbon cable attached.

☑ Mounting bracket with (1) parallel & (1) serial COM1 port ribbon cables attached.

☑ Floppy disk drive ribbon cable

☑ IDE ribbon cable

☑ Fan adaptive cable

☑ This User's Manual

☑ Diskette containing support software for updating the FLASH BIOS, Hardware Monitoring, Bus Master IDE drivers and TX-Patch

☐ Optional Infrared Module

☐ Optional USB Module

Features

Processor	ZIF socket 7 support INTEL®Pentium®75−200 MHz, P55C Processor (MMX), CYRIX 6x86 ~P200+ / 6x86MX (M2) series, AMD K5/K6 series
Chipset	INTEL ®430TX Chipset
BIOS	Award ®PCI BIOS, support DMI, Green PC, Plug-and-Play, ACPI, LS-120 120MB ATAPI F.D.D. Symbios® SCSI BIOS to support 53C810/860Ultra SCSI
Cache Memory	On board 512 KB Write-back, Pipelined Burst L2 Cache
System Memory	4×SIMM+2×DIMM MAX. 256MB Support EDO, FPM DRAM, SDRAM module
On-board I/O Features	1×FDC Port Connector support up to 2.88MB 3-pin CPU Fan connector Two-way IrDA 6-pin connector to support IrDA 8-pin USB connector to support 2 USB ports AT keyboard connector PS/2 mouse connector 1×Parallel Port connector support ECP/EPP 2×High Speed Serial Port connector (16550)
Advanced Features	Hardware Monitoring (CPU Fan, CPU Temperature, Power Voltage)
PCI Bus Master IDE	2×PCI Bus Master IDE, support LBA mode, PIO mode 3,4 ULTRA 33 synchronous DMA mode
Expansion Slots	4×32-bit PCI Bus Master slots, 3×ISA 16-bit slots
CMOS Battery	Coin-form replaceable battery
Form Factor	¾ Baby AT Form factor (10.6″ by 8.7″)
Options	IrDA interface kit (internal cable/bracket set and external module) USB cable/bracket set
Accessories	5-in-1 cable set: FDD cable, PS/2 Mouse connector kit, Two Serial, One Parallel bracket User's Manual, Driver/ Utility diskettes

BOARD LEVEL FEATURES
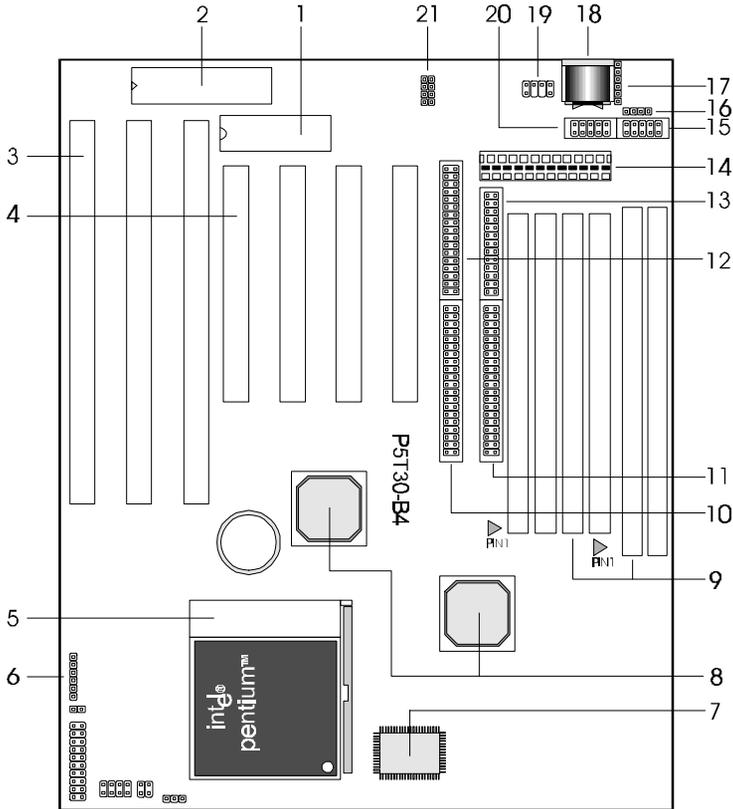
1. **Mainboard BIOS**	12. **Floppy connector**
2. **Keyboard BIOS**	13. **Printer port connector**
3. **ISA slots**	14. **Power connector**
4. **PCI slots**	15. **COM2 connector**
5. **CPU socket (Socket 7)**	16. **Supplementary ATX**
6. **Infrared (IR) connector**	**power connector**
7. **L2 Pipeline-burst cache**	17. **Infrared (IR) connector**
8. **Intel® 82430TX chipset**	18. **AT keyboard connector**
9. **DRAM SIMM/DIMM sockets**	19. **PS/2 mouse connector**
10. **Secondary IDE connector**	20. **COM1 connector**
11. **Primary IDE connector**	21. **USB connector**

BOARD LEVEL FEATURES

1. **MAINBOARD BIOS:** Award BIOS supporting "Plug and Play", DMI, Green PC specification, Enhanced IDE and Multi-I/O. The BIOS is FLASH Upgradeable via the AWDFLASH Utility.
2. **KEYBOARD BIOS:** Firmware chip controlling keyboard operations.
3. **ISA SLOTS:** (3) 16-bit ISA slots
4. **PCI SLOTS:** (4) 32-bit PCI slots are provided.
5. **CPU SOCKET:** ZIF Socket 7 for Pentium CPUs. This mainboard supports CPU speeds of 75-233MHz for Intel, AMD K5/K6 and Cyrix.
6. **BACK INFRARED (IR) CONNECTOR:** UART2 can also be used for the optional Infrared Module, enabling wireless communication capability. A supplied bracket with a single customized cable connects directly to the infrared pin-header on the mainboard. For computer cases that support a front IR device, see number 17.
7. **L2 PIPELINE-BURST CACHE:** Supports Write Back Secondary Cache with 512KB Pipeline Burst SRAM.
8. **CHIPSET:** Intel$^®$ 82430TX.
9. **DRAM SIMM/DIMM SOCKETS:** (4) 72-pin SIMM and (2) 168-pin DIMM sockets are provided to support a maximum RAM memory capacity of 256 MB. SIMM/DIMM types of either Fast Page Mode (FPM) or Extended Data Output (EDO) are supported and automatically detected by the BIOS. SDRAM is supported on DIMM sockets.
10. **SECONDARY IDE CONNECTOR:** Connector for second IDE channel.
11. **PRIMARY IDE CONNECTOR:** Connector for first IDE channel. The on-board PCI Bus Mastering IDE controller features support for DMA Mode 2, PIO Modes ¾, and Ultra DMA/33 (33MB/sec) for faster data transfer rates. (2) Connectors are provided for support of up to (4) IDE devices on two channels. Other ATAPI and Enhanced IDE devices such as Tape Drives and CD-ROMs are also supported.
12. **FLOPPY CONNECTOR:** Built-in floppy controller supports (2) 5.25" or 3.5" (1.44MB or 2.88MB) floppy drives.
13. **PRINTER PORT CONNECTOR:** EPP and ECP compatible parallel port.
14. **POWER CONNECTOR:** 12-Pin Power Connector.
15. **COM2 CONNECTOR:** High-speed UART compatible serial port. COM2 can be directed to the Infrared Module for wireless connection capability.
16. **SUPPLEMENTARY ATX POWER CONNECTOR:** Works with the power connector (Item 12) and the Adaptive Power Cable (optional) to support the ATX power supply.
17. **FRONT INFRARED (IR) CONNECTOR:** This is convenient to system cases that support a front IR connector.
18. **AT KEYBOARD CONNECTOR:** Supports IBM compatible AT style keyboards.
19. **PS/2 MOUSE CONNECTOR**: Supports PS/2 style mice.
20. **COM1 CONNECTOR:** High-speed UART compatible serial port.
21. **USB CONNECTOR**: A header connector for an optional USB (Universal Serial Bus) module is provided. This connector permits the connection of two USB peripheral

devices directly to the port without an external hub. USB is a new technology supporting keyboards, mouse, printers, fax modems and other telephony devices.

Comprehensive Mainboard View

Static Precautions

Static electricity can be a serious danger to the electronic components on this mainboard. To avoid damage caused by electrostatic discharge, observe the following precautions:

✓ Don't remove the mainboard from its anti-static packaging until you are ready to install it into a computer case.

✓ Before you handle the mainboard in any way, touch a grounded, anti-static surface, such as an unpainted portion of the system chassis, for a few seconds to discharge any built-up static electricity.

✓ Handle add-in cards and modules by the edges or mounting bracket.

Installing the CPU

✓ WARNING: Use of a CPU Cooling Fan to prevent CPU from overheating is highly recommended. The Fan should be installed first before inserting the CPU into its socket.

1. Locate the ZIF (Zero Insertion Force) Socket 7. This socket supports Pentium (P5) CPUs (75-233Mhz).

2. First open the socket by pulling the lever sideways, then upwards. Notice how the lever locks in place when pressed all the way down.

3. The CPU must be inserted with the correct orientation. One corner of the CPU has a "notch" and looks different that the other three. This corner is also missing a pin unlike the other three and is marked with a white dot on top of the CPU. Align this corner towards the end of the lever as shown in the figure below. Insert the CPU, press it down, and close the lever until it locks into place.
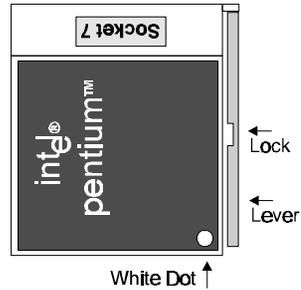
Connecting the CPU Cooling Fan (J12)

This mainboard features a fan monitoring function to alert you when the cooling fan starts to malfunction (Refer to page 27). If you are using a fan with the standard 4-pin Molex-Type Power-Supply connector, you should use the fan adaptive cable provided as shown:
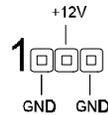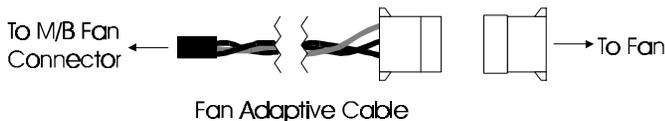
INSTALLING THE CPU AND MEMORY

Plug the Molex-Type connector of the adaptive cable to the fan's power connector and plug the other 3-pin Header Connector to J12, regardless of the polarity. If your Fan provides this 3-pin Header Connector, simply plug it into J12, regardless of the polarity.

Setting the CPU Clock Selection Jumper (JBF0-2 & JFS0-2)

After installing the CPU, you must set the clock selection jumper to match the frequency of the CPU. Find the Jumper Blocks labeled JBF0-2 and JFS0-2 on the mainboard (Refer to the diagram on page 8). Set the jumper according to the table below for your CPU frequency.

Jumper setting for CPU:			
CPU Model	**CPU Clock**	**Bus Clock (JFS0-2)**	**Ratio (JBF0-2)**
Intel Pentium	233MHz	66MHz	x3.5
Intel Pentium	200MHz	66MHz	x3.0
Intel Pentium	166MHz	66MHz	x2.5
Intel Pentium	150MHz	60MHz	x2.5
Intel Pentium	133MHz	66MHz	x2.0
Intel Pentium	120MHz	60MHz	x2.0
Intel Pentium	100MHz	66MHz	x1.5
Intel Pentium	90MHz	60MHz	x1.5
Intel Pentium	75MHz	50MHz	x1.5
AMD-K6-PR300	300MHz	66MHz	x4.5
AMD-K6-PR266	266MHz	66MHz	x4.0
AMD-K6-PR233	233MHz	66MHz	x3.5
AMD-K6-PR200	200MHz	66MHz	x3.0
AMD-K6-PR166	166MHz	66MHz	x2.5
AMD-K5-PR200		66MHz	x3.0
AMD-K5-PR166		66MHz	x2.5
AMD-K5-PR150		60MHz	x2.5
AMD-K5-PR133	100MHz	66MHz	x1.5
AMD-K5-PR120	90MHz	60MHz	x1.5
AMD-K5-PR100	100MHz	66MHz	x1.5
AMD-K5-PR90	90MHz	60MHz	x1.5
AMD-K5-PR75	75MHz	50MHz	x1.5
Cyrix 6x86MX PR233 (M2)	188MHz	75MHz	x2.5
Cyrix 6x86MX PR200 (M2)	150MHz	75MHz	x2.0
Cyrix 6x86MX PR200 (M2)	166MHz	66MHz	x2.5
Cyrix 6x86MX PR166 (M2)	133MHz	66MHz	x2.0
Cyrix 6x86MX PR166 (M2)	150MHz	60MHz	x2.5
Cyrix 6x86 P200+	150MHz	75MHz	x2.0
Cyrix 6x86 P166+	133MHz	66MHz	x2.0
Cyrix 6x86 P150+	120MHz	60MHz	x2.0
Cyrix 6x86 P133+	110MHz	55MHz	x2.0

Cyrix 6x86 P120+	100MHz	50MHz	x2.0

The Internal (Core) frequency corresponds to the number marked on the CPU. The External Frequency when multiplied with the Ratio gives the CPU's internal frequency.

Bus Clock (JFS0-2): MHz	**Ratio (JBF0-2)**

This jumper automatically sets the ISA Clock as well.

* If you are uncertain about the speed or voltage requirements of your particular CPU, you should obtain Technical Documentation from the manufacturer. Such information is available via the Intel, Cyrix and AMD WWW sites.

Setting the CPU Voltage Selection Jumper (JP1 & JP2)

Locate Jumper JP1 and JP2 on the mainboard (Refer to the diagram on page 13). Set this jumper in accordance with your specific CPU type. The Intel MMX CPU is an example of a dual supply chip (2.8V & 3.3V). When single supply CPUs are used, this setting is not relevant and should be left on the default. (Refer to the CPU documentation)
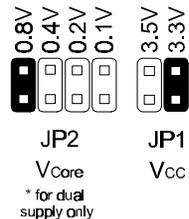
	Intel Pentium		Cyrix		
CPU	P55C	P54C	6x86		6x86MX (M2)
Vcore/Vcc	2.8V/3.3V	"x" / 3.3V	"x" / 3.3V	"x" / 3.5V	2.9V/3.3V
JP1 & JP2					

 (*) : See what voltage is required for your Cyrix CPU, 3.3V or 3.5V.

"x" : Don care.

	AMD			AMD	
CPU	K6 (*)			K5 (*)	
Vcore/Vcc	2.2V/3.3V	2.9V/3.3V	3.2V/3.3V	"x" / 3.3V	"x" / 3.5V
JP1 & JP2					

(*): See what voltage is required for your CPU.   "x": Don care.

Installing the Memory (DRAM SIMM/DIMMs)

- The P5T30-B4 mainboard supports **72-pin SIMMs and 168-pin DIMMs** of two types:
  - **SIMM:** 5 Volt **Fast Page Mode** (Asymmetric or Symmetric) or **EDO** (Extended Data Output)
  - **DIMM:** 3.3 Volt unbuffered **SDRAM** (Synchronous Dynamic Random Access Memory) or 3.3 Volt **EDO**.

- SIMM Sizes supported: **4MB, 8MB, 16MB, 32MB, 64MB,** and **128MB**

- DIMM Sizes supported: **8MB, 16MB, 32MB, 64MB,** and **128MB**

- A total of **(4)** SIMMs or **(2)** DIMMs can be installed for a maximum RAM capacity of **256MB**. To mix both SIMM and DIMM modules on the same mainboard, please refer to the chart below for possible combination:

SOCKET	DIMM 1	DIMM 2	BANK 0 SIMM 1/2	BANK 1 SIMM 3/4
MEMORY	≤ 32MB	≤ 32MB	Yes	No
MODULE	No	≤ 32MB	Yes	Yes

- Minimum RAM capacity is **8MB** (With (2) 4MB SIMMs Installed or (1) 8MB DIMM)

- SIMM/DIMMs speed requirements: 70ns or 60ns

- This mainboard contains (2) SIMM Banks and (2) DIMM Banks. The SIMM banks consists of (4) SIMM Sockets. **For SIMMs, memory must be installed two SIMMs at a time. Both SIMMs in a bank must be identical. DIMM modules, on the other hand, can be installed one at a time.**

The Level-2 Cache (SRAM)

Two cache sizes are available:
- **256K Cache:** (2) 32Kx32 128K SRAM chips
- **512K Cache:** (2) 64Kx32 256K SRAM chips

The Level-2 Cache on this mainboard is *not* upgradeable.

Jumpers are used on this mainboard to select various settings and features. A 2-pin jumper has two settings: Open and Short (or Closed). The jumper is closed by placing the Jumper Cap across the two pins, thereby connecting them. 3-pin jumpers can be set to pins 1-2 or 2-3 connected. Pin-1 is labeled on the circuit board for these jumpers as shown:

3-pin Jumper

Pin 1-2

Pin 2-3

2-pin Jumper

Open

Short
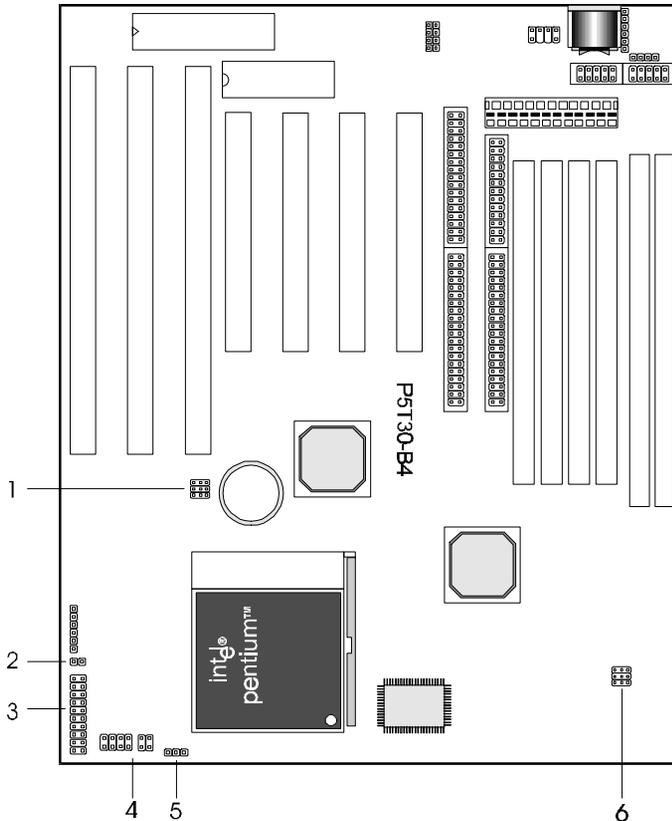
1. **JBF0-2**
2. **J14**
3. **J15**
4. **JP1 & JP2**
5. **J12**
6. **JFS0-2**

P5T30-B4

intel® pentium™

SETTING THE JUMPERS

JBF0-2: CPU Clock Ratio Selection - This jumper is explained in detail on page 10.

J14: IDE Activity LED - Hook the IDE LED lead to this jumper, with the RED lead corresponding to Pin-1.

J15: System Functions Jumper Block

> **Pins [3 & 5] Turbo LED switch** - The Turbo function is not supported by this mainboard. Therefore, the Turbo LED will always remain lit as long as the system power is on.

> **Pins [7 & 9] SMI suspend switch lead** - If your system case has a suspend switch, hook the lead from the switch to pins 7 & 9. A suspend switch is used to save electricity by putting the system into a suspend mode when the computer is not being used. This switch could also be used by the Turbo switch on the front of the system, since this mainboard does not support that function. For this switch to be functional, it must first be enabled in the Power Management Setup in the BIOS Setup utility.
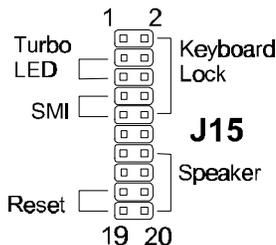
> **Pins [17 & 19] Reset switch lead** - Connects to the Reset Switch lead from the system case. The reset switch is used to "cold-boot" the system without actually turning off the power, reducing wear and tear on the power supply.

> **Pins [2, 6, 8, 10] Keyboard lock switch lead** - Pins 2 & 6 connect to the Power LED from the system case. Pins 8 & 10 connect to the case-mounted keylock switch.

> **Pins [14 & 20] Speaker connector** - Connects to the Speaker lead from the system case.

JP1 & JP2: CPU Voltage Selection Jumper - This jumper is explained in detail on page 10.

J12: CPU cooling fan connector - This jumper is explained in detail on page 9.

JFS0-2: CPU Clock Selection - This jumper is explained in detail on page 10.

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Power Supply Connector

The two cables from the standard 5-volt power supply connect to the power connector on the mainboard (refer to page 6). You must align the connectors on the power cable at a slight angle to correctly fit them onto the mainboards power connector. Then, press down on the connectors to lock them in place. The (2) connectors should be installed so that the BLACK wires meet in the middle of the connector.

This mainboard also features a supplementary ATX Power Connector. Please refer to Appendix A for details.
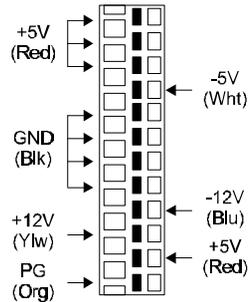
Serial and Parallel Ports

The cables from the supplied serial port connector bracket hook to the COM1 and COM2 connectors on the mainboard. Generally, the upper serial port on the bracket would be configured as COM1 and the lower port as COM2. Make sure to orient Pin-1 marked on the mainboard to the RED stripe on the ribbon cables.

IrDA-compliant infrared module connector

The IrDA connector bracket hooks directly to this connector on the mainboard. This connector provides support for the optional wireless transmitting and receiving infrared module. You must first configure through "UART2 Mode" in *INTEGRATED PERIPHERALS SETUP* where UART2 is directed, COM2 or IrDA. (* Pin-6 is reserved for consumer IR input - remote control *)
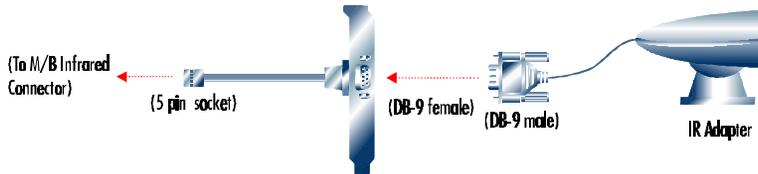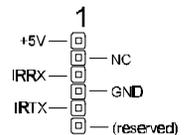
USB Connector

This 8-pin connector permits connection of two USB peripheral devices directly to the system without an external hub.
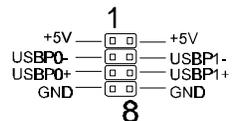
CONNECTIONS

Keyboard Connector

This connection is for a standard IBM-compatible keyboard. May also be known as a 101 enhanced keyboard.

```
3   1        1: KB Clock
  ⎓          2: KB Data
5     4      3: (none)
  2          4: GND
             5: +5V DC
```
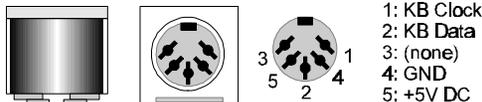
PS/2 Mouse Connector

If you are using a PS/2 mouse, you must purchase the optional connector bracket. This bracket mounts in one of the slots in the back of the case, and features a circular external connector for the PS/2 mouse, plus a 6-pin ribbon cable that connects to the PS/2 mouse connector on the mainboard.

```
3: GND    3 1 2 4    5: CLK
1: Data
2: NC
4: VCC     5     6   6: NC
```
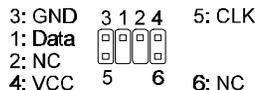
Floppy drives

The on-board floppy controller supports (2) floppy disk drives with the floppy ribbon cable provided. Make sure the RED stripe on the ribbon cable is oriented towards Pin-1. Notice the "twist" between the sets of connectors on the floppy cable. The floppy drive "A" position is at the END of the cable, whereas floppy drive "B" is hooked to one of the connectors on the other side of the twist. The cable provides both "Edge" and "Pin" connectors for both the A and B positions to match the connector on your floppy drives.

IDE Hard Drives and CD-ROMs

The on-board Enhanced IDE controller can support up to (4) IDE hard drives or other ATAPI devices, such as CD-ROMs. This controller, as with all Enhanced IDE controllers, consists of both **Primary** and **Secondary** ports. Each port has an associated connector and cable which can support up to (2) ATAPI devices each.

All IDE devices have jumpers which allow the user to configure the device as either "Master" or "Slave". A Master device is one that is ALONE on the IDE cable, whereas a Slave device is installed as a SECOND device on the same cable. Keep in mind that the Master device will appear *before* the Slave device in the CMOS Setup, as well as the Operating System software. *Refer to the device documentation for jumper settings.*

The Secondary IDE port can be used for up to (2) additional ATAPI devices. Normally it's recommended that you connect your first hard drive to the Primary port, and the first CD-ROM to the Secondary.

Make sure to align the RED stripe on the ribbon cable with Pin-1 on the mainboard IDE connector. On most hard drives and CD-ROMs, the RED stripe should be oriented towards the power connector of the device.

About the BIOS

The **Mainboard BIOS** (Basic Input/Output System) acts as the bridge between your *Hardware* (CPU, Disk Drives, Video, etc.) and Operating System *Software* (Windows 95, OS/2 and so on…) The BIOS Setup (also called CMOS Setup) is where many hardware configuration options are set and stored. This configuration information will remain in the BIOS until it is changed, or cleared by removing the battery for a while and then putting it back.

CMOS (Complementary Metal Oxide Semiconductor) refers to the chip in which the BIOS information is stored.

The P5T30-B4 mainboard features **Award BIOS**, which provides an easy to use Setup program to aid in hardware configuration. In this section we will look at the various menus and options contained in the Award BIOS Setup Program. This mainboard also features a "Flash" BIOS. A Flash BIOS can be upgraded via software, thereby eliminating the need to actually replace the "BIOS Chip" on the mainboard. Procedures for updating the BIOS follow this section.

The Award BIOS installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means that it supports Intel/Cyrix/AMD processors in a standard IBM-AT compatible input/output system.

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit.

Getting Help

Pressing F1 will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

A Final Note About Setup

Not all systems have the same Setup. While the basic look and function of the Setup program remains the same for all systems, individual motherboard and chipset combinations require custom configurations. For example, you may find that your Setup main menu has a different number of entries from the main menu displayed in this manual. These are simply features not supported (or not user configurable) on your system.

The final appearance of the Setup program also depends on the Original Equipment Manufacturer (OEM) who built your system. If your OEM has decided that certain items should only be available to their technicians, those items may very well be removed from the Setup program.

MAINBOARD BIOS SETUP

- Shortly after the system is powered on, provided a CPU and sufficient RAM are installed, you will see the message: *Press **DEL** to enter SETUP.*

- Press the DEL key to enter the Award BIOS Setup program.

MAIN MENU

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP / PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	

Esc : Quit $\uparrow \downarrow \rightarrow \leftarrow$: Select Item
F10 : Save & Exit Setup   (Shift) F2 : Change Color

Time, Date, Hard Disk Type...

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear 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.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

STANDARD CMOS SETUP

This first menu is where the most basic hardware options are set. Information regarding the system clock, IDE hard disks and floppy drives is stored and configured in this section. To enter the Standard CMOS Setup, press the [ENTER] key with this menu highlighted.

```
Date (mm:dd:yy) : Fri, Apr 7 1996
Time(hh:mm:ss)  : 00:00:00

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 , 3.5in.

Drive B : None
Floppy 3 Mode Support: Disabled              Base Memory     :   640K
                                           Extended Memory   : 15360K
Video   : EGA / VGA                          Other Memory    :   384K
Halt On : All Errors                         Total Memory    : 16384K

  ESC : Quit          ↑↓→← : Select Item        PU / PD / + / - : Modify
  F1  : Help          (Shift) F2 : Change Color
```

Upon entering the Standard CMOS Setup screen, you will see a screen like that above.

First, let's set the system **Date**. Use the arrow keys to move to and highlight the "Date" option. Select the Month by using the PgDn and PgUp keys. This is how most settings will be configured. Then, move to the day, year and time via the arrow keys to finish setting the system date and time. Keep in mind that the system time is set in 24-hour time. With this method, 1PM is represented as 13:00, 2PM as 14:00 and so on, with 00:00 corresponding to Midnight.

Pri Master, Pri Slave, Sec Master, Sec Slave - These four options relate to the (4) IDE hard drives, CD-ROMs or other ATAPI devices that can be controlled via the on-board IDE controller (review *IDE Hard Drives and CD-ROMs* on page 16). The "Pri Master" setting specifies the first device on the primary IDE channel, "Pri Slave" - the second. Sec Master and Sec Slave specify the devices on the secondary channel.

The first option available is the most important: **Type**. This is where you will specify the type of device and how it is represented in the BIOS Setup. If the device is a hard disk or CD-ROM, generally the *Auto* option is the best choice for fast and easy setup of the hard disk parameters. Here's an explanation of the *Auto*, *User* and *Types (1-45)* options:

MAINBOARD BIOS SETUP

- **Auto -** This option instructs the BIOS to automatically configure the hard disk by reading the parameters (cylinders, sectors, etc.) directly from the hard disk firmware. Use this option if you are configuring a new hard drive, or one that has already been formatted using the *Auto* option. Keep in mind that a hard drive is configured using a certain set of parameters, those same parameters must be used for the life of the drive, unless the drive is re-FDISKed using a different parameter set. (This procedure deletes the old partition(s) on the drive and creates a new one, using the new parameters).

- **User -** This option allows you to manually enter in the parameters of the hard drive. Generally, this option would be used only if the hard drive has already been formatted with a certain set of parameters, and assured consistency between the old and new parameters is desired.

TYPE	drive type
CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precom
LANDZONE	landing zone
SECTORS	number of sectors
MODE	mode type

- **Types 1-45 -** Similar to the *User* option, these types should only be used if the exact parameters for the hard drive are already entered as a specific type stored in the Setup Program. Again, this would only be needed to assure that the parameters the drive was formatted with and those it is using now, are identical. For new hard drives, the *Auto* option is the preferred choice.

Mode - One of Enhanced IDE's most important features is LBA (Logical Block Addressing) Mode. This feature allows the use of larger hard drives by providing a way to bypass the cylinder limitations imposed by many Operating Systems. LBA Mode is used to extend a hard drive's useable capacity by "remapping" the cylinders in a way that is acceptable to these operating systems. For instance, a hard drive with the parameters of 2100 Cylinders, 16 Heads and 63 Sectors would be represented by LBA Mode as 525 Cylinders, 64 Heads and 63 Sectors. (Notice that the Cylinders have been divided, and the Heads have been multiplied, by a factor of 4)

On hard drives smaller in capacity than 528MB, LBA support is not needed. The option on these devices is ignored, even if enabled. For hard drives greater than 528MB, LBA mode should be enabled. The following rules apply:

- Operating Systems that do not use the FAT file system do not need LBA Mode, and can use the Normal or Large Modes. Examples would be Netware and Unix.

- When configuring a new hard drive greater than 528MB in capacity, always make sure LBA mode is enabled.

- If you are using a hard drive that is over 528MB in capacity, but was already formatted without using LBA mode, LBA support will be ignored even if it is enabled. This assures correct access to the drive data.

- *SCSI Hard Drives* are <u>NOT</u> entered into the Mainboard BIOS Setup in any way. The hard drive settings in the Standard CMOS Setup are only for drives connected to the IDE Controller. So, if only SCSI drives were installed, all these settings would be set to **Type:** *None*. SCSI Devices are configured via the SCSI controller's BIOS.

Floppy Drives A: and B: - Select the Type for the A: and/or B: floppy drives. Remember, floppy drive A: is the first drive, hooked to the END of the floppy ribbon cable. Floppy drive B: is hooked up after the twist. Available settings are listed below:

None	No floppy 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: - Enable this option ONLY for floppy drive(s) that support the Japanese standard (1.2MB on 3.5" Diskette). Options: Disabled (Default), Both, Drive A / B.

Video - This category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select their type 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 - Determines if the system will prompt you if an error is detected during POST.

No errors	The system boot will not be stopped for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

Memory - This category is display-only. All memory detected by the POST (Power On Self Test) of the BIOS is shown as the following types:

Base Memory is the amount of conventional memory installed in the system. This value is typically 640K for systems with 640K or more memory installed on the motherboard. The **Extended Memory** is the amount of memory located above 1MB in the CPU's memory address map. **Other Memory** refers to the memory located in the region between 640K and 1MB. This region can be used for *shadowing* as well as *expanded memory* in DOS.

MAINBOARD BIOS SETUP

BIOS FEATURES SETUP

This menu provides access to more advanced BIOS configuration settings that deal with overall performance of the system and peripheral setup. This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Virus Warning	: Disabled	Report No FDD For WIN 95	: No
CPU Internal Cache	: Enabled		
External Cache	: Enabled	Video BIOS Shadow	: Enabled
Quick Power On Self Test	: Enabled	C8000-CBFFF Shadow	: Disabled
Hard Disk Boot From	: Pri-IDE-M	CC000-CFFFF Shadow	: Disabled
Boot Sequence	: C, A	D0000-D3FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	D8000-DBFFF Shadow	: Disabled
Floppy Disk Access Control	: R/W	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250	ESC : Quit	↑↓→←: Select Item
Security Option	: System	F1 : Help	PU/PD/+/- : Modify
PCI / VGA Palette Snoop	: Disabled	F5 : Old Values	(Shift) F2 : Color
Assign IRQ For VGA	: Disabled	F6 : Load BIOS Defaults	
OS Select For DRAM > 64MB	: Non-OS2	F7 : Load Setup Defaults	

Virus Warning - When enabled, the BIOS will warn the user when any program attempts to write to or format the boot sector. If an attempt is made, the BIOS will halt the system and the following error message will appear:

> ! WARNING !
> Disk boot sector is to be modified
> Type "Y" to accept write or "N" to abort write
> Award Software, Inc.

You can accept or abort this operation.

Note: This feature is designed to guard against viruses that modify the boot sector on hard disks. However, many disk diagnostic programs which attempt to access the boot sector table, as well as partition and format programs, will also trigger this warning. If you will be running such a program, you can disable Virus Protection first, or choose "Y" to accept the boot sector modification when this message shows up.

CPU Internal Cache - Enables or Disables the Level-1 Internal Cache memory. Generally, this would only be *Disabled* for troubleshooting purposes.

External Cache - Enables or Disables the Level-2 External Cache memory. Generally, this would only be *Disabled* for troubleshooting purposes.

Quick Power on Self Test - Speeds up Power On Self Test (POST) after the computer is powered on. When set to Enable, the BIOS will shorten or skip some checks during POST.

Hard Disk Boot From - This option lets you choose to boot from Primary IDE Master (Pri-IDE-M), Primary IDE Slave (Pri-IDE-S), Secondary IDE Master (Sec-IDE-M), Secondary IDE Slave (Sec-IDE-S) or SCSI hard disk. Same as IDE options, the **Boot Sequence** in the next field is set to *C, A* when the *SCSI* is chosen.

Boot Sequence - When your system is powered on, the BIOS performs a variety of operations, then attempts to boot an Operating System from either a hard drive, floppy drive, or CD-ROM. This setting determines the sequence that the BIOS will follow when searching devices for a bootable disk. Most users find the *C, A* setting to be most beneficial, since it takes the least amount of time to boot the system. If however, you want the ability to boot from a Floppy or CD-ROM drive, you would need to choose either the *A, C* or *CDROM, C, A* setting. For instance, if your boot sequence was set to *C, A* and for some reason you wanted to boot to your Floppy A: Drive, it would not be possible, since the BIOS would always boot from the C: drive first. In this case, this setting would need to be changed to *A, C* so that the system would first check the floppy drive for a bootable disk. This would slow bootup speed, however, since the floppy would be checked on every boot.

C, A	System will first search hard disk drive then floppy disk drive for boot sector.
A,C	System will first search for boot sector on floppy disk, then hard disk.
C only	System will first search for boot sector on hard disk only.
CDROM, C, A	System will first search the CDROM drive, then hard disk drive and then floppy disk drive for boot sector.
C, CDROM, A	System will first search for boot sector on hard disk drive , then CDROM drive, and then floppy disk drive.

Swap Floppy Drive - The hardware connections determine which floppy is configured as drive A: and drive B: "Swapping" the floppy drives can be useful if your system has two floppy drives, and you want the ability to boot from both. For example: Since a PC cannot boot from the B: Floppy, you would need to "Swap" floppy drives A: and B: in order to set the second floppy drive to drive A:, thereby making it bootable.

Boot Up Floppy Seek - When enabled, BIOS will attempt to move the head of the floppy disk drive forth and back once during POST to see if the drive is working properly.

Floppy Disk Access Control - When *R/W*, the floppy disk can be read and written. The other option is *Read Only*.

Boot Up NumLock Status - When *On*, the NumLock key will be automatically enabled when the system boots.

Boot Up System Speed - Sets the system speed to High or Low. Generally, low speed would only be used for troubleshooting purposes.

MAINBOARD BIOS SETUP

Gate A20 Option - This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard (*Normal*). Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset (*Fast;* default) to provide support for gate A20.

Typematic Rate Setting - Determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. This feature is used to accelerate cursor movements with the arrow keys.

Typematic Rate (Chars/Sec) - When the typematic rate is enabled, this selection allows you to select the rate at which the keys are accelerated:

Typematic Delay (Msec) - When the typematic rate is enabled, this selection allows you to select the delay (in msec) between when the key was first depressed and when the acceleration begins.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

Security Option - This option enables password checking every time the computer is powered on *or* every time BIOS Setup is executed. If *System* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears only when the BIOS Setup program is executed. Refer to the section *Supervisor Password* for more information.

PCI / VGA Palette Snoop - This option must be set to *Enabled* if any ISA MPEG card installed requires VGA palette snooping. The settings are *Disabled* or *Enabled*.

Assign IRQ For VGA - The *Enabled* option allows you to auto-route an IRQ for use by a VGA card.

OS Select For DRAM > 64MB - This should be set to **OS2** if you are running IBM OS/2 with more than 64MB of RAM in the system. Otherwise, the setting should be **Non-OS2**.

Report No FDD For WIN 95 - While the FDD in "STANDARD CMOS SETUP" is set to NONE, set this option to *No* to release IRQ6 for passing Win95 logo. This option is irrelevant under normal operation.

Video BIOS Shadow - This option controls the location of the contents of the 32KB of Video ROM beginning at the C0000h memory location. The settings are:

Enabled	The contents of C0000h-C7FFFh are written to the same address in system memory (RAM) for faster execution.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

C8000-DFFFF Shadow - These options control the location of the contents of the 16KB expansion card ROMs beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. Shadowing a ROM reduces the memory available between 640KB and 1024KB by the amount used for this purpose. The settings are *Enabled* or *Disabled*.

CHIPSET FEATURES SETUP

This setup menu contains advanced configuration options relating to the mainboard chipset. These options are rarely changed by the user.

Auto Configuration	: Enabled	** System Hardware Monitor **	
		CPU Overheat Alarm (> 65 °C)	: Enabled
DRAM Timing	: 70ns	CPU Fan Malfunction Alarm	: Enabled
DRAM Leadoff Timing	: 10/6/4	System 5V Alarm (< 4.7V)	: Enabled
DRAM Read Burst (EDO/FP)	: x333/x444		
DRAM Write Burst Timing	: x333		
Fast EDO Lead Off	: Enabled		
Refresh RAS# Assertion	: 5 Clks		
SDRAM (CAS Lat/RAS-to-CAS)	: 3/3		
SDRAM Speculative Read	: Disabled		
System BIOS Cacheable	: Disabled		
Video BIOS Cacheable	: Enabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1	ESC : Quit	↑↓→←: Select Item
Memory Hole At 15M-16M	: Disabled	F1 : Help PU/PD/+/- : Modify	
PCI 2.1 Compliance	: Disabled	F5 : Old Values (Shift) F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Auto Configuration - When *Enabled*, pre-defined values for 60ns DRAM, Cache, Timings, etc. are set according to the CPU type & system clock. *Enabled* is the recommended setting. These settings are only editable when Auto Configuration is *Disabled*.

Note: The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might occur if your system had mixed speed DRAM chips installed. Here, greater delays may be required to preserve the integrity of the data held in the slower memory chips.

DRAM Timing - DRAM timing is controlled by the DRAM timing registers. The timings programmed into this register are dependent on the system design. 60ns is the fastest rate. The 70ns timing is slower and may be required in certain system designs to support loose layouts or slower memory.

MAINBOARD BIOS SETUP

DRAM Leadoff Timing - This Read_Leadoff/Write_Leadoff/RAS#_Precharge timing of CPU clocks allowed before reads and writes to DRAM are performed. Slower leadoffs may be required to support slower memories.

DRAM Read Burst (EDO/FP) - Sets the burst mode read timing for two different DRAM types - (EDO/FP). Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place, while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory. *x333/x444 timings* is the default.

x222/x333	Read DRAM (EDO/FPM) timings are 2-2-2/3-3-3
x333/x444	Read DRAM (EDO/FPM) timings are 3-3-3/4-4-4
x444/x444	Read DRAM (EDO/FPM) timings are 4-4-4/4-4-4

DRAM Write Burst Timing - Sets the timing for burst mode writes from DRAM. Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place, while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory. *x333 timings* is the default.

x222	Write DRAM timings are 2-2-2-2
x333	Write DRAM timings are 3-3-3-3
x444	Write DRAM timings are 4-4-4-4

Fast EDO Lead off - The item allows you to select the Fast EDO Lead Off or not to enhance the performance.

Refresh RAS# Assertion - This item allows you to select the type of DRAM refresh clock delay: 4 or 5 Clocks.

SDRAM (CAS Lat/RAS-to-CAS) - This item allows you to select the CAS# latency for all SDRAM cycles and RAS# to CAS# delay: 2/2 or 3/3.

SDRAM Speculative Read - This item is capable of allowing a DRAM read request to be generated slightly before the address has been fully decoded. This can reduce all read latencies. More simply, the CPU will issue a read request and included with this request is the place (address) in memory where the desired data is to be found. This request is received by the DRAM controller. When it is enabled, the controller will issue the read command slightly before it has finished determining the address.

System BIOS Cacheable - When *Enabled*, the Video BIOS cacheable will cause access to the System BIOS addressed at F0000H to FFFFFH to be cached. *Disabled* is the default.

Video BIOS Cacheable - When *Enabled*, the Video BIOS cacheable will cause access to the video BIOS addressed at C0000H to C7FFFH to be cached. *Enabled* is the default.

8 Bit I/O Recovery Time - The recovery time is the length of time, measured in CPU clocks, that the system will delay after the completion of an input/output request. This delay takes place because the CPU is operating faster than the input/output bus. Therefore the CPU must be delayed to allow for the completion of I/O transfers. This item allows you to determine the recovery time allowed for 8 bit I/O. Choices are from NA, 1 to 8 CPU clocks. *1* is the default.

16 Bit I/O Recovery Time - This item allows you to determine the recovery time allowed for 16 bit I/O. Choices are from NA, 1 to 4 CPU clocks. *1* is the default.

Memory Hole At 15M-16M - In order to improve compatibility, certain space in memory can be reserved for old style ISA cards that map memory between 15M-16M. Do not enable this feature unless you use the old style ISA card, otherwise the memory size may be reduced to 15 MB for some operating system. *Disabled* is the default.

PCI 2.1 Compliance - It is used by targets that cannot complete the initial data phase within the requirements of the PCI 2.1 specification. *Disabled* is the default.

CPU Overheat Alarm (>65°C) - When *Enabled*, once the CPU temperature exceeds 65 °C, a warning will be issued via the speaker and the operating CPU speed will be slowed down to ease the situation.

CPU Fan Malfunction Alarm - When *Enabled*, the system will issue a warning via the speaker when the CPU fan starts to malfunction.

System 5V Alarm (<4.7V) - When *Enabled*, you will be warned via the speaker if the system board operating voltage is below 4.7V.

MAINBOARD BIOS SETUP

POWER MANAGEMENT SETUP

This menu contains configuration options that reduce power consumption when the system is not in use. Other "Green-PC" compliant peripherals are also supported. Power Management allows you to configure you system to use energy most efficiently, and yet still in a manner consistent with your own style of computer use.

```
Power Management         : User Defined   ** Reload Global Timer Events **
PM Control by APM        : Yes            IRQ[3-7, 9-15], NMI      : Enabled
Video Off Method         : DPMS           Primary IDE 0            : Disabled
Video Off After          : Doze           Primary IDE 1            : Disabled
                                          Secondary IDE 0          : Disabled
Doze Mode                : Disabled       Secondary IDE 1          : Disabled
Standby Mode             : Disabled       Floppy Disk              : Disabled
Suspend Mode             : Disabled       Serial Port              : Enabled
HDD Power Down           : Disabled       Parallel Port            : Disabled

Throttle Duty Cycle      : 50.0%
VGA Active Monitor       : Enabled
Resume By Ring           : Disabled

** Break Event From Suspend **            ESC : Quit        ↑↓ → ←: Select Item
IRQ 8 Clock Event        : Disabled       F1  : Help        PU/PD/+/- :  Modify
                                          F5  : Old Values  (Shift) F2 :  Color
                                          F6  : Load BIOS Defaults
                                          F7  : Load Setup Defaults
```

Power Management - This category allows you to select the type (or degree) of power saving and is directly related to the following modes: Doze Mode, Standby Mode, Suspend Mode and HDD Power Down. There are four selections for Power Management, three of which have fixed mode settings:

Disabled	No power management. Disables all four modes
Min Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPUs**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (default)	Set each mode individually. When Enabled, each range is from 1 min. to 1 hr., except for HDD Power Down which ranges from 1 min. to 15 min.

PM Control by APM - When set to *Yes*, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If the Max. Power Saving is not enabled, this will be preset to *No*.

Video Off Method - This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports, writing blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off After - This is to determine when to activate the video off function. Options are: "Standby", "Doze" (default), "Suspend" and "N/A".

PM Timers - The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected. See above for available selections.

Doze Mode	When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.
Standby Mode	When enabled and after the set time of system inactivity, the fixed disk drive and the video will be shut off while all other devices still operate at full speed.
Suspend Mode	When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.
HDD Power Down	When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Throttle Duty Cycle - This item determines the duty cycle for the clock control thermal throttling mode. The duty cycle indicates the percentage of time the STPCLK# signal is asserted..

VGA Active Monitor - When enabled, the video detect logic will generate a timer reload event for device monitor 11.

Resume by Ring - This item enables the modem to bring the system out of Power Saving mode.

** Break Event From Suspend ** - When *IRQ 8 Clock Event* is enabled, the unmasked IRQ8 will generate a Fast Burst Timer reload or stop break event.

** Reload Global Timer Events **

IRQ[3-7, 9-15], NMI: Enable an unmasked IRQ [3-7, 9-15], NMI, when asserted, reload the Global Standby Timer.

Primary/Secondary IDE 0/1, Floppy Disk, Serial Port, Parallel Port: Enable reload events from the respective device monitor to reload the Global Standby Timer.

MAINBOARD BIOS SETUP

PNP/PCI CONFIGURATION SETUP

The PCI **P**ersonal **C**omponent **I**nterconnect Bus was developed by Intel and other industry leader partners primarily to address two important issues faced by PC hardware designers today: a) How to allow peripheral devices to take the fullest advantage of the power of Pentium and Pentium Pro chip technology, and b) Provide a simpler installation process for peripheral devices, such as Network cards, EIDE or SCSI controllers.

PCI accomplishes these goals with its 32-bit Data path Local Bus design, and support for Plug & Play. Unlike older expansion bus architectures, PCI provides peripherals with a direct connection to the CPU and memory. The PCI bus runs at 33Mhz and has a maximum transfer capability of 132MBps. With Plug & Play, the system BIOS automatically determines hardware resources for new peripherals, simplifying installation of multiple interface cards.

This Setup Menu provides configuration options for the PCI Bus and its assigned resources.

```
┌─────────────────────────────────────────────┬─────────────────────────────────────────────┐
│ PNP OS Installed           : No             │ PCI IDE IRQ Map To         : PCI-AUTO         │
│ Resources Controlled by    : Manual         │   Primary    IDE    INT#   : A                │
│ Reset Configuration Data   : Disabled       │   Secondary  IDE    INT#   : B                │
│                                             │ SYMBIOS SCSI BIOS          : Auto             │
│ IRQ-3     assigned  to     : Legacy ISA     │ PCI Latency Timer          : 80 PCI Clocks    │
│ IRQ-4     assigned  to     : Legacy ISA     │                                               │
│ IRQ-5     assigned  to     : PCI/ISA PnP    │ Used MEM base addr         : N/A              │
│ 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     : Legacy ISA     │                                               │
│ IRQ-15    assigned  to     : Legacy ISA     │                                               │
│ DMA-0     assigned  to     : PCI/ISA PnP    │                                               │
│ DMA-1     assigned  to     : PCI/ISA PnP    ├─────────────────────────────────────────────┤
│ DMA-3     assigned  to     : PCI/ISA PnP    │ ESC : Quit       ↑↓→←: Select Item            │
│ DMA-5     assigned  to     : PCI/ISA PnP    │ F1  : Help      PU/PD/+/- :  Modify           │
│ DMA-6     assigned  to     : PCI/ISA PnP    │ F5  : Old Values  (Shift) F2 : Color          │
│ DMA-7     assigned  to     : PCI/ISA PnP    │ F6  : Load BIOS Defaults                      │
│                                             │ F7  : Load Setup Defaults                     │
└─────────────────────────────────────────────┴─────────────────────────────────────────────┘
```

PNP OS Installed - Set to Yes if your operating system supports Plug & Play, such as Windows® 95.

Resources Controlled By - The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. This capability is specifically designed for a Plug and Play operating system such as Windows® 95. Choices are *Auto* and Manual (default).

Reset Configuration Data - Reset Configuration Data: When set to Enabled, ESCD (Extended System Configuration Data) is cleared. This setting will automatically be set back to Disabled when the system reboots. *Enabled* and *Disabled* (default).

IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to - By default, all resources are assigned to the PCI Bus except IRQs 3, 4, 14 and 15. If an ISA card requires a particular IRQ or DMA channel, those resources should be set to Legacy ISA so that the PCI Bus will not try to use them. Choices are *Legacy ISA* and *PCI/ISA PnP*.

PCI IDE IRQ Map To - Configures what type of IDE disk controller is in use. By default, Setup assumes that you are using the on-board PCI IDE Controller and this option is set to **PCI-AUTO**. If you have equipped your system with an add-on PCI controller, changing this setting allows you to specify which slot has the controller and which PCI interrupt (A, B, C or D) is associated with the Primary and/or Secondary port. Most add-on IDE controllers are configured to use INT# A for the primary and INT# B for the secondary.

SYMBIOS SCSI BIOS - When set to *Auto* (Default), the system will automatically sense the presence of any SCSI adapter that uses a Symbios SYM53C8XX SCSI chip:

If the SCSI adapter installed **has** its own BIOS on board:	The on-board SCSI BIOS will not be loaded. The adapter own SCSI BIOS will be used.
If the SCSI adapter installed **doesn't have** its own BIOS and the card uses or is compatible with the SYM53C8XX chip:	The on-board SCSI BIOS will load and control the SCSI adapter.

*Disabling, the onboard SCSI BIOS prevents it from being active in any way.

PCI Latency Timer - This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. Available settings are 0 ~ 248. The default is 80.

Used MEM base address - This item allows you to determine which basic addresses are not to be occupied by PCI Card and leave these addresses for some special ISA Card used only.

Choices are C800, CC00, D000, D400, D800, DC00.

MAINBOARD BIOS SETUP

LOAD BIOS DEFAULTS

Loads "Fail Safe" settings into the BIOS Setup program. These options are designed to slow the system down for troubleshooting purposes. To load the default values, highlight this option and press [ENTER]. Enter "Y" in the confirmation screen and press [ENTER] again. User-defined options in the **Standard CMOS Setup** are not affected.

LOAD SETUP DEFAULTS

Loads the default values for best system performance into the BIOS Setup program. To load the default values, highlight this option and press [ENTER]. Enter "Y" in the confirmation screen and press [ENTER] again. User-defined options in the **Standard CMOS Setup** are not affected.

INTEGRATED PERIPHERALS SETUP

This menu is used to configure the integrated IDE subsystem and other peripherals.

IDE HDD Block Mode	: Enabled	
On-Chip Primary PCI IDE	: Enabled	
IDE Primary Master PIO	: Auto	
IDE Primary Slave PIO	: Auto	
IDE Primary Master UDMA	: Auto	
IDE Primary Slave UDMA	: Auto	
On-Chip Secondary PCI IDE	: Enabled	
IDE Secondary Master PIO	: Auto	
IDE Secondary Slave PIO	: Auto	
IDE Secondary Master UDMA	: Auto	
IDE Secondary Slave UDMA	: Auto	
Onboard FDD Controller	: Enabled	
Onboard Serial Port 1	: Auto	
Onboard Serial Port 2	: Auto	
InfraRed/COM2 Selected	: UART COM2	ESC: Quit ↑↓ → ←: Select Item
Onboard Parallel Port	: 378/IRQ7	F1 : Help PU/PD/+/- : Modify
Onboard Parallel Mode	: ECP/EPP	F5 : Old Values (Shift) F2: Color
ECP Mode Use DMA	: 3	F6 : Load BIOS Defaults
Parallel Port EPP Type	: EPP 1.9	F7 : Load Setup Defaults

IDE HDD Block Mode - This allows your hard disk controller to use fast block mode to transfer data to and from your hard disk drive (HDD). **Enabled** or **Disabled**. *Enabled* is the default.

On-Chip Primary PCI IDE - Enables or Disables the primary controller. Situations where this controller would be disabled are: *a) You are not using any IDE Drives* or *b) You are using an add-on IDE controller in a PCI Slot*.

On-Chip Secondary PCI IDE - Enables or Disables the secondary controller. Situations where this controller would be disabled are: *a) You are not using any IDE Drives or b) You are using IDE Drives ONLY on the primary controller or c) You are using an add-on IDE controller in a PCI Slot*.

- **IDE PIO Mode -** IDE Programmed I/O Mode - This setting relates to the speed at which the hard drive is able to transfer data, up to 16.6MB/second for Mode 4 drives. Available settings are *Auto*, *0*, *1*, *2*, *3*, or *4*. As with the **Type** setting, *Auto* is the preferred choice, in that the supported PIO Mode is read directly from the hard drive. Be sure not to use a PIO Mode higher than what the drive actually supports. This could result in loss of data.

PIO Mode	Timing
0	600 ns
1	383 ns
2	240 ns
3	180 ns
4	120 ns

- **IDE UDMA (Ultra DMA) Mode -** The Intel 430TX PCIset used for this mainboard improves the IDE performance by implementing UltraDMA/33 Bus Mastering IDE which can handle data transfer up to 33 Mbyte/sec. This UDMA technology is downward compatible with existing ATA-2 IDE. So there is no upgrade required for current hard drives and cabling. **Auto is* default.

Onboard FDD Controller - Enables or Disables the on-board Floppy Disk Controller.

Onboard Serial Port 1 - With this option, the on-board Serial Port 1 can be Disabled, or set to 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4 or 2E8/IRQ3. (* *Auto* is Default)

Onboard Serial Port 2 - With this option, the on-board Serial Port 2 can be Disabled, or set to 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4 or 2E8/IRQ3. (* *Auto* is Default)

InfraRed/COM2 Selected - By default, this field is set to UART COM2, which directs the second serial port UART to support the COM2 serial port. Choosing **SHARP IR** (**ASKIR**) or **IrDA SIR** (**HPSIR**) will activate the on-board infrared feature and redirect the second serial port UART to support the infrared module connector on the mainboard.

Onboard Parallel Port - With this option, the on-board Parallel Port can be Disabled, or set to 378/IRQ7 (*Default), 3BC/IRQ7 or 278/IRQ5.

Onboard Parallel Port Mode - Sets the operating mode of the parallel port. Options are: *Normal, EPP (Enhanced Parallel Port) / Normal, ECP (Extended Capability Port)* and *ECP/EPP (default)*.

ECP Mode Use DMA - Options are 1 and 3. This field is available only when one of the two following options in **Parallel Port Mode** is selected: ECP or ECP/EPP.

Parallel Port EPP Type - Options are 1.7 and 1.9 (default ; IEEE 1284 compliant).

Supervisor Password and User Password Setting

Passwords can be set to provide protection for the BIOS configuration options, or to restrict access to the computer itself.

When enabled, *User Password* will require all users to enter a password in order to use the system, and/or enter the BIOS setup (but can change its contents). A *Supervisor Password* is used to protect the stored CMOS options from being changed by unauthorized users.

Keep in mind that when set, a password is required only when *booting* the system. It will not provide protection to a system that is already booted.

The password check option is set in **BIOS FEATURES SETUP** by choosing either *System* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when the user enters the BIOS Setup). The password is stored in CMOS RAM.

To set a password:

1. You must first set the *Supervisor* password by choosing *Supervisor Password* and pressing [ENTER]. Setup prompts for a password.

2. Enter a 1-8 character password using letters, numbers, or a combination of both. The specific characters are not shown as you enter them. Press [ENTER].

3. A confirmation box appears asking you to re-enter the password. Enter the password again. Press [ENTER]. Follow the same procedure to set the *User Password*.

Changing a Password:

1. Select the appropriate password option (Supervisor or User) from the main menu and press [ENTER]. Enter the current password and press [Enter]. The screen does not display the characters entered. Enter in the new password, then the confirmation. You cannot change the current password unless you know it.

Erasing a Password:

1. If you know the current password, but want to disable password checking, follow the procedure for changing the password. When Setup prompts for the new password, simply press [ENTER]. You will see a message indicating that the password is disabled.

2. If you do not know the current password, the CMOS must be cleared by removing the battery for a while and then re-installing it back. *This will clear all user-defined BIOS Setup options.

IDE HDD AUTO DETECTION

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk parameters. See also "Standard CMOS Setup".

SAVE & EXIT SETUP / EXIT WITHOUT SAVING

Select *Save & Exit Setup* to save into the CMOS memory all modifications specified during the current session. To save the configuration changes, highlight this option in the main menu and press [ENTER]. The system displays a confirmation message on the screen. Press the "Y" key and then [Enter]. Press the "N" key and then the [Enter] key to abort. The *Exit Without Saving* option allows the user to exit the BIOS Setup without updating any changes made during the current session.

PCI Device Listing

This list of installed PCI devices appears after the **System Configuration** screen:

Bus No.	Device No.	Func No.	Vender ID	Device ID	Device Class	IRQ
0	7	1	8086	7010	IDE Controller	14/15
0	7	2	8086	8829	Serial bus controller	11
0	9	0	1013	7333	Display controller	NA

PCI device listing .....

Bus No.   Encoded value indicating 1 of 256 possible buses in a system.

Device No.   Encoded value indicating 1 of 32 possible devices on a given bus.

Func No.   Encoded value indicating 1 of 8 possible functions on a multifunction device.

Vender ID   Identifies the manufacturer of the device. Valid vendor identifiers are allocated by the PCI SIG (Special Interest Group) to ensure uniqueness.

Device ID   Identifies the particular device. This identifier is allocated by the vendor.

Device Class   Specifies one of the following device classes: Mass storage controller, Network controller, Display controller, Multimedia device, Bridge device, Simple communication controller, Base system peripherals, Input device, Docking station, Processor and Serial bus controller.

The PCI device listing is useful for troubleshooting purposes. More detailed information for each field may be obtained through the PCI specification documentation.

DESKTOP MANAGEMENT INTERFACE

Desktop Management Interface (DMI)

This mainboard supports the **Desktop Management Interface (DMI)**, which is a new method of providing enterprise management for personal computers. The main component of DMI is the Management Information Format Database (MIF), which contains information about the computer system and its components, such as BIOS version/vendor, CPU speed/type, memory size/type, L1/L2 cache, port connectors (IDE, floppy, 2S/1P, USB, keyboard, mouse,), slots … etc. Using DMI, remote PC management software is able to obtain various information about the system, including hardware profiles, capabilities, operational status, installation dates, and other information about the system and its components.

This DMI utility, DMICFG.EXE, allows you to add additional information, such as serial numbers, vendor information, and enclosure/chassis configurations, into the MIF.

```
 [Edit DMI]  [Add DMI]  [Load DMI FILE]  [Save DMI FILE]

        BIOS                 ===    Display Component    ===
       System
     Base Board       Type : BIOS Information
  Enclosure/Chassis   Handle : 0000
      Processor           Vendor Name : Award Software International, Inc.
 Memory Controller       BIOS Version : 4.51 PG
  Memory module          BIOS starting Address Segment : E000
  Memory module          BIOS Build Date : 10/07/96
  Memory module          BIOS Characteristics : Press [ENTER] for detail
  Memory module          Size of BIOS ROM : 0128K
       Cache
       Cache
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   Port Connector
    System slots
↑↓←→Move cursor  Enter-Accept  DEL-Delete  ESC-Abort&Exit
```

Note: The DMI utility must be run in real mode without the EMM386 memory manager loaded.

FLASH BIOS PROGRAMMING UTILITY

Updating the Award BIOS Code is made easy with the AWDFLASH Utility. Since this mainboard features FLASH BIOS, it is not necessary to change the actual BIOS chip in order to upgrade the System BIOS. The user can simply re-program the old BIOS using the AWDFLASH Utility as follows:

1. First, boot the system with DOS or to "Safe Mode" under Windows 95. If you are booting DOS from a hard drive or floppy disk, press [F5] when the message "Starting MS-DOS…" appears on the screen. If you are booting Windows 95, press the [F8] key, and select the "Safe mode command prompt" option. This will assure that the system is running in "*real mode*" with **no device drivers loaded**. *This is the only correct way to run the AWDFLASH Utility program.*

2. There are (2) important files needed to re-program the BIOS. The first is "AWDFLASH.EXE" which is the FLASH BIOS Programming Utility. The second file needed is the updated "BIN" file which contains the actual BIOS code. This file will have the extension [.bin], such as "P598GH.BIN". Make sure these files are on the diskette or hard drive in the same directory.

3. Start the AWDFLASH Utility by changing to the directory where the two required files exist and typing: AWDFLASH and pressing [ENTER].

4. The AWDFLASH Utility Screen appears. You will be asked for the file name to program. Type in the name of the new BIOS (.bin) file and hit [ENTER].

```
         FLASH  MEMORY  WRITER v5.2C
     Copyright (C) 1993, Award Software, Inc.,

     For SIS-85C471-I486SU2G       DATE: 04/26/94
         Flash Type -
     File Name to Program : [                    ]




     Error Message:
```
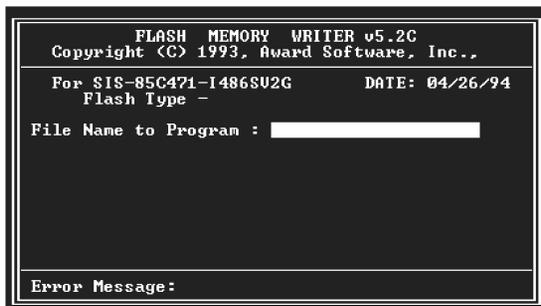
5. The program will then ask if you want to backup the old BIOS. This is recommended in case there are any problems with the new ".bin" file. Enter the name of the new backup file (such as "backup.bin") and press [ENTER].

6. At this time the system will prompt you for final confirmation before beginning programming. The Utility can be aborted at this time by hitting "n". To begin programming, hit "y"…

7. When the Flash programming starts, a bar indicator will show the progress of the programming operation. After successful completion, hit the reset button or power off the computer.

HARDWARE MONITORING UTILITY

Your P5T30-B4 mainboard has an advanced built-in hardware monitoring feature to keep track of CPU temperature, system board voltage and CPU fan speed. When an abnormal condition occurs, the system speaker will BEEP to warn the user to trouble shoot the failed part of the system.

Note:
When an application is using the speaker, the user may LOSE the WARNING BEEP!

The Hardware Monitor utility included with your P5T30-B4 mainboard is designed for Windows 95. With this utility installed, an error message will pop up under Windows 95 in addition to the warning beep to alert the user when problem occurs.

The utility includes the following files:
- T_CHECK.EXE   Hardware monitor utility
- INSTALL.EXE   Hardware monitor utility installation program
- UNINST.EXE   Hardware monitor utility uninstallation program
- Readme file

Installation/Un-installation procedure:

- Run INSTALL.EXE under Windows 95 to install T_CHECK.EXE to your fixed disk. T_CHECK.EXE will then be executed automatically every time with Windows 95 bootup.
- Run UNINSTALL.EXE under Windows 95 to remove T_CHECK.EXE from the system.

DC-310U PCI ULTRA-SCSI ADAPTER

 The **DC-310U** is an Ultra-SCSI Host Adapter based on the Symbios Logic SYM53C860 Ultra-SCSI Chip. Designed to provide a low cost, easy to implement SCSI solution, this adapter utilizes the built-in Symbios Logic SCSI BIOS on supported mainboards.

- Fully Plug & Play and PCI 2.1 compliant, enhanced SCSI features include *Disconnect/Reconnect*, *Scatter/Gather*, and *Tag Queuing* to greatly improve overall system performance, particularly under multitasking environments.
- *Jumper-less hardware design*, *Active SCSI Bus Termination,* and *32-bit PCI DMA Bus Mastering* are a few more of the advanced features built-in to the DC-310U, providing the best performance and ease of use possible.

SCSI Performance

-Symbios SYM53C860 SCSI Chip
-Max: 7 SCSI Devices
-Async: 7MB/sec & Sync: 20MB/sec Maximum SCSI Bus Transfers
-132MB/sec (at 33MHz) Bus Master Data Transfers
-80-byte DMA FIFO for 2/4/8/16 dwords burst across PCI bus

Reliability

SYMTolerANT technology with:
-Active negation of SCSI Data, Parity, Request, and Acknowledge signals for improved fast SCSI transfer rates.
-Input signal filtering on SCSI receivers improves data integrity, even in noisy cabling environments.

PCI Integration

-Full 32-bit PCI DMA bus master
-Jumper-less design
-Active SCSI bus termination

Mainboard BIOS Support

Adapter Setup

```
 1. SYM53C860
 Adapter Setup

          S - SCAM Support  ..........    On
          P - Parity  ........................    Enabled
          I  -  Host Adapter ID  ........   7
          O - Scan Order  ...............    Low to High (0..Max)
          F1  .. Help.
          F2  .. Restore Default Setup.
          ESC  .. Exit this menu.
```

Device Setup

```
 1. SYM53C860
 Dev0 N/A Setup

          R  - Sync Rate (Mega Bytes/sec) ..... 20 Mb/sec
          W - Width (bits) .................................   8
          D  - Disconnect ...............................  On
          T  - Read Write I/O Timeout (secs) ...  10
          S  - Scan for Device at Boot Time ...   Yes
          L  - Scan for SCSI LUNs  .................   Yes
          Q  - Queue Tags  ............................  Enabled
          F1  .. Help.
          F2  .. Restore Default Setup.
          ESC  .. Exit this menu.
```

APPENDIX A

Using ATX Power Supply

This mainboard features a supplementary ATX power connector (Please refer to page 6 for location). It works with the 12-pin power connector and the Adaptive Power Cable (optional) to support the ATX Power Supply.

- Connect the two 6-pin connectors of the Adaptive Power Cable to the 12-pin power connector on the mainboard. The two connectors should be oriented so that the BLACK wires meet in the middle of the 12-pin power connector.

- Connect the 4-pin connector of the Adaptive Power Cable to the supplementary power connector on the mainboard. Align the RED wire to Pin 1 of the supplementary power connector.

- Connect the ATX power connector of the Adaptive Power Cable to the ATX Power Supply. This connector is keyed to prevent connection in the wrong direction. Line up the locking mechanism on the connector of the Power Supply with the tab on this connector.