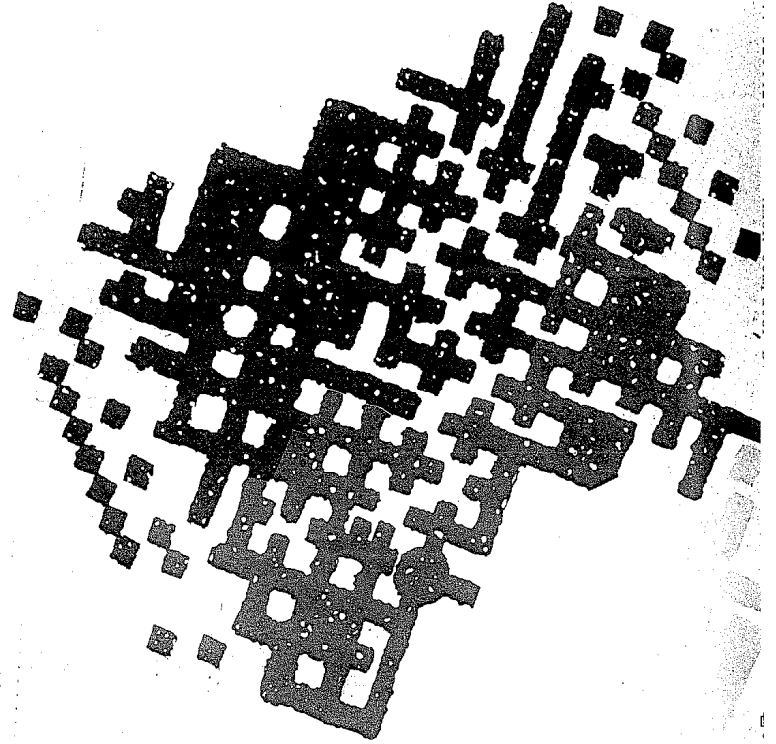


# USER'S MANUAL

PI4/PI4T PCI MAINBOARD



Recycled Papers



Part Number: MN-064-B12-81



# PCI Local Bus introduc- tional

## Introduction

Graphics-oriented operating systems such as Windows and OS/2 have created a data bottleneck between the processor and its display peripherals in standard PC I/O architectures. Moving peripheral functions with high bandwidth requirements closer to the system's processor bus can eliminate this bottleneck. Substantial performance gains are seen with Graphical User Interfaces (GUIs) and other high bandwidth functions (i.e., full motion video, SCSI, LANs, etc.) when a "local bus" design is used.

The advantages offered by local bus designs have motivated several versions of local bus implementations. The benefits of establishing an open standard for system I/O buses have been clearly demonstrated in the PC industry. It is important that a new standard for local buses be established to simplify designs, reduce costs, and increase the selection of local bus components and add-on cards.

The PCI Local Bus, a high performance, 32-bit or 64-bit bus with multiplexed address and data lines, has been defined with the primary goal of establishing an industry standard, high performance local bus architecture that offers low cost and allows differentiation. It is intended for use as an interconnect mechanism between highly integrated peripheral controller components, peripheral add-on board, and processor/memory systems.



**Features**

- 32-bit data path (132 MB/s peak)
- Concurrency with processor/memory
- Synchronous bus operating at up to 33 MHz
- Auto configuration support of PCI Local Bus add-on boards
- Processor independence
- Multi-master capability
- Parity on both data and address lines

PROBLEM REPORT FORM

DATE: / /

COMPANY NAME : TEL:  
CONTACT PERSON: FAX:

MODEL NO : \_\_\_\_\_  
CPU : \_\_\_\_\_  
COPROCESSOR : \_\_\_\_\_  
MEMORY : \_\_\_\_\_  
BIOS : \_\_\_\_\_  
HDC : \_\_\_\_\_  
HDD : \_\_\_\_\_  
VGA CARD : \_\_\_\_\_  
SOFTWARE : \_\_\_\_\_  
OTHERS : \_\_\_\_\_

**PROBLEM DESCRIPTION:**

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### 3.10 Standard type of hard disk

Type	Size	Cylinders	Heads	W- Pcomp	L- Zone	Sect
1	10MB	306	4	128	305	17
2	20MB	615	4	300	615	17
3	30MB	615	6	300	615	17
4	62MB	940	8	512	940	17
5	81MB	977	10	65535	977	17
6	122MB	919	16	65535	919	17
7	163MB	1011	15	65535	1011	22
8	258MB	944	14	65535	944	40
9	201MB	723	15	65535	723	38
10	20MB	820	3	65535	820	17
11	35MB	855	5	65535	855	17
12	49MB	855	7	65535	855	17
13	20MB	306	8	128	319	17
14	42MB	733	7	65535	733	17
16	20MB	612	4	0000	663	17
17	40MB	977	5	300	977	17
18	56MB	977	7	65535	977	17
19	59MB	1024	7	512	1023	17
20	30MB	733	5	300	732	17
21	42MB	733	7	300	732	17
22	30MB	733	5	300	733	17
23	10MB	306	4	0000	336	17
24	53MB	925	7	0000	925	17
25	69MB	925	9	65535	925	17
26	43MB	754	7	754	754	17
27	68MB	754	11	65535	754	17
28	40MB	699	7	256	699	17
29	68MB	823	10	65535	823	17
30	53MB	918	7	918	918	17
31	93MB	1024	11	65535	1024	17
32	127MB	1024	15	65535	1024	17
33	42MB	1024	5	1024	1024	17
34	10MB	612	2	128	612	17
35	76MB	1024	9	65535	1024	17
36	68MB	1024	8	512	1024	17
37	40MB	615	8	128	615	17
38	24MB	987	3	987	987	17
39	57MB	987	7	987	987	17
40	40MB	820	6	820	820	17
41	40MB	977	5	977	977	17
42	40MB	981	5	981	981	17
43	48MB	830	7	512	830	17
44	68MB	830	10	65535	830	17
45	114MB	917	15	65535	918	17
46	152MB	1224	15	65535	1223	17

# High Performance Cache 486 PCI Mainboard

## USER'S MANUAL

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### 3.9 IDE HDD Auto Detection

This Main Menu item automatically detects the hard disk type and configures the STANDARD CMOS SETUP accordingly.

### 3.7 Load Setup Defaults

Setup Defaults indicates the values of system parameters which will give maximum performance. Choose this item and the following message appears:

“Load SETUP Defaults (Y/N)? N”

To use the SETUP defaults, change the prompt to “Y” and press <Enter>.

### 3.8 Password Setting

This Main Menu item lets you configure the system so that a password is required every time the system boots or an attempt is made to enter the Setup program. Change the password as follows:

1. Choose “PASSWORD SETTING” in the Main Menu and press <Enter>. The following message appears:

“Enter Password:”

2. Enter a password and press <Enter>.

(If you do not wish to use the password function, you can just press <Enter> and a “Password disabled” message appears.)

3. After you enter your password, the following message appears prompting you to confirm the new password:

“Confirm Password:”

4. Re-enter your password and then Press <ESC> to exit to the Main Menu.

**Important:** If you forget or lose the password, the only way to access the system is to set jumper JP21 to clear the CMOS RAM. All setup information is lost and you must run the BIOS setup program again.

## Chapter 1

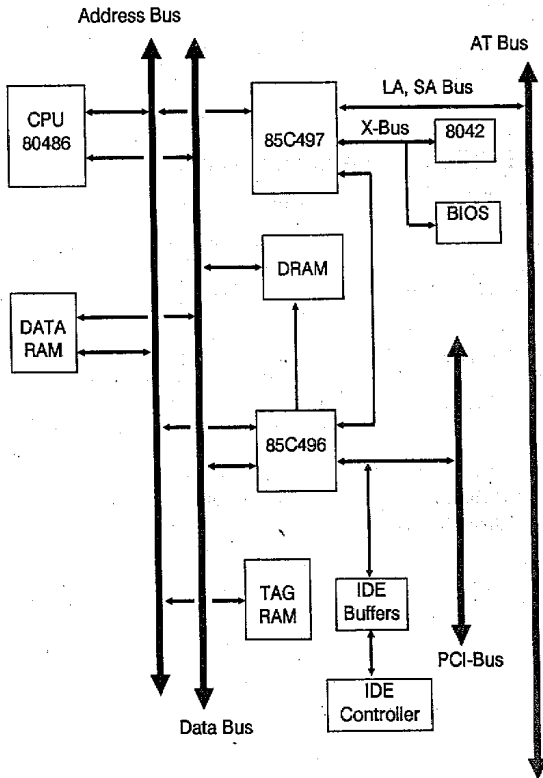
### System Board Overview

#### 1.1 The mainboard specifications

1. CPU: Intel 80486 DX/DX2/SX/SL, DX4\* (P24C), P24D, P24T  
Cyrix M7, M9 (M1-sc)  
AMD486 DX/DX2/DX4/DXL PLUS
2. Cache memories: Primary: Built-in 8KB in 80486  
Secondary: Standard 256KB  
Optional: 128/256/512/1024 KB
3. I/O slots: Three 32-bit PCI slots, four 16-bit slots for AT compatible add-on cards.
4. Memories: 128MB max on board  
Using 4-72pin SIMM modules.  
Supports from 1MB to 128MB.
5. BIOS: Award or AMI BIOS.
6. On board IDE: Two IDE (IDE1/IDE2) channels
7. Green PC function: Stop CPU CLOCK.  
Provides connector to turn off monitor AC power  
Monitor 2-serial ports, one parallel port, KBD/mouse, HDD activity.

\* Note: DX4\* is PI4T model only.

## 1.2 The system block diagram



**CPU -> PCI Mem Post Write Buf** Choose Enable (Default) or Disable. Enable: CPU access cache memory or no-board memory cycle can be executed concurrently with PCI memory write cycle. Basically it will increase CPU performance.

**PCI Master Burst Read/Write** Choose Enable (Default) or Disable. The memory access can be single or burst transfer. When PCI master access the cache memory or on board memory.

Note: M/B PCI Slot INT# hardware is designed as below:  
 "Slot1-INT#A", "Slot2-INT#D", and "Slot3-INT#C" are assigned to the same IRQ.  
 "Slot1-INT#B", "Slot2-INT#A", and "Slot3-INT#D" are assigned to the same IRQ.  
 "Slot1-INT#C", "Slot2-INT#B", and "Slot3-INT#A" are assigned to the same IRQ.  
 "Slot1-INT#D", "Slot2-INT#C", and "Slot3-INT#B" are assigned to the same IRQ.

Example: Do not use Slot1-INT#A and Slot2-INT#D or Slot3-INT#C at the same time.

### 3.6 Load BIOS Defaults

BIOS Defaults indicates the values required by the system for the minimum performance. Choose this item and the following message appears:

" Load BIOS Defaults (Y/N)? N"

To use the BIOS defaults, change the prompt to "Y" and press <Enter> .

1st Available IRQ means BIOS will assign this IRQ to first INT found on the PCI slots (the assignment sequence is slot1, 2, 3).

**PCI IRQ Activated** Choose Level or Edge (Default).

By

**PCI IDE IRQ Map** PCI-Auto:

If the BIOS can detect PCI IDE on one of the PCI slots, then the appropriate INT# will be auto-assigned to IRQ14.

**PCI-slotX:**

If the BIOS can not detect a PCI IDE card, (because the IDE card does not support this function) the user needs to manually select the PCI-slot occupied by the PCI IDE card.

**Primary IDE INT#, Secondary IDE INT#:**

If the IDE card supports 2 IDE channels, the BIOS needs to assign 2 INT channels for the IDE card. (Don't select same INT#)

**ISA:**

This setting assigns no IRQs to the PCI slots. Use this setting with PCI IDE cards that connect IRQ14 and IRQ15 directly from an ISA slot using a cable from a legacy paddleboard.

**Note:** If a PCI IDE card is used set the "slot x using INT#" setting to "AUTO". (here x is the PCI slot number) Use the "PCI IDE IRQ Map to" item to set up the IDE card.

**Master Arbitration Protocol** Choose Weak (Default) or Strong. Weak means Weak CPU request: "Arbiter" grants bus control to CPU after a PCI or ISA Master cycle if no other pending request exists.

Strong means Strong CPU request: "Arbiter" always grants bus control to CPU after a PCI or ISA Master cycle. No matter there is my pending exist or not.

### 1.3 Placement

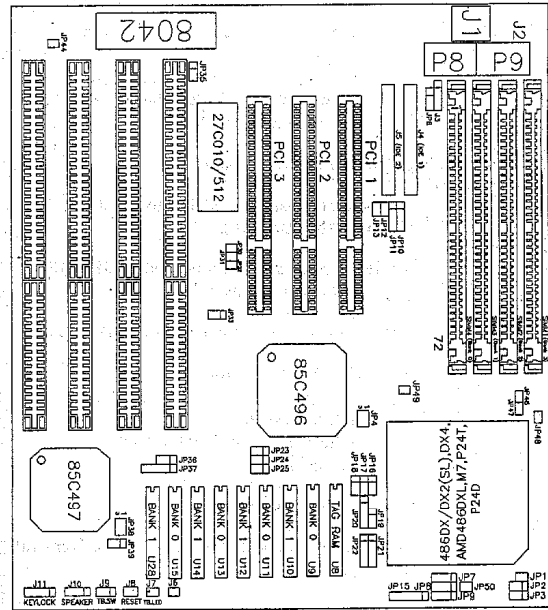


Figure 1-1



## 1.4 Quick reference for installation

- Step 1. Please verify the following jumpers:
- JP6, JP35 : A jumper at pin "1-2" for CMOS RAM normal operation.
  - JP4, JP7, JP8, JP15-JP22, JP30-JP33 and JP46-JP49 :  
Make sure the jumper setting is consistent with the installed CPU. (refer section 2.4)
- Step 2. Connect J1 to the keyboard.
- Step 3. Plug at least 1 DRAM module into the SIMM socket SIMM4(BANK0).
- Step 4. Verify the cache size selection jumpers JP23-JP25, JP36, JP37 (refer section 2.6).
- Step 5. Connect the following connectors to your case :
- J8 to H/W reset button.
  - J10 to speaker.
  - J9 to turbo switch.
  - J7 to turbo LED, the LED will light up.
  - J11 to keylock.
- Step 6. Connect IDE cable to the J4, J5
- Step 7. Plug in the display card and HDD/FDD driver card into slots.
- Step 8. Connect J2 to P8 and P9 of power supply.
- Step 9. Power on.
- Step 10. Enter the "Setup Menu" screen. Select the display type and drive type.
- Step 11. Quit the "Setup Menu" screen and then select "SAVE & EXIT SETUP" from BIOS Main Menu.

- 1-4 -

## 3.5 PCI Configuration Setup

The PCI Configuration Setup option lets you assign INT#s, IRQs, and other hardware settings to the mainboard's PCI slots.

ROM PCI/ISA BIOS (XXXXXXXX)  
PCI CONFIGURATION SETUP  
AWARD SOFTWARE, INC.

Slot 1 Using INT#	: AUTO		
Slot 2 Using INT#	: AUTO		
Slot 3 Using INT#	: AUTO		
1st Available IRQ	: 0		
2nd Available IRQ	: 10		
3rd Available IRQ	: 11		
4th Available IRQ	: 12		
PCI IRQ Activated By	: Edge		
PCI IDE IRQ Map To	: PCI-AUTO		
Primary IDE INT#	: A		
Secondary IDE INT#	: B		
Master Arbitration Protocol	: Weak		
CRU->PCI Mem Post Write Buf	: Disable		
PCI Master Burst Read/Write	: Disable		
		Esc: Quit	↑ ↓ ← → : Select Item
		F1: Help	PUP/D/+/=: Modify
		F5: Old Values	(Shift)F2: Color
		F8: Load BIOS Defaults	
		F7: Load Setup Defaults	

Figure 3-6 PCI Configuration Setup Menu

### Slot X Using INT#

This category selects a INT# for a PCI slots. There are four INT#s(A, B, C, and D) that can be selected for each PCI slot. You can assign PCI slot x using INT#A, B, C, or D. The default is "AUTO", which means the BIOS will auto detect the INT channel for this slot. If the PCI device card does not support this function, the user needs to select an INT#. (Selection of INT channel depends on PCI device card hardware jumper settings or the card's BIOS setup; please refer to the PCI card's manual).

We recommend the setting all PCI card INT jumpers at INT#A.

### Available IRQ

These categories select a IRQ for INT#. There are ten IRQ selections (3, 4, 5, 7, 9, 10, 11, 12, 14, 15) for available IRQs.

- 3-13 -

**Video Ports Activities** Choose Disable or Enable (Default). If Enabled Video activity are monitored.

**IRQn** Disabled is the default setting for IRQ 8, the other IRQ defaults are Enabled.

3. After you have finished with the Power Management Setup, press the <ESC> key to return to the Main Menu.

**Step 12.** The system will re-boot.

**Step 13.** If DOS prompt appears on the screen, the installation is complete.

**Note :** If you have any problems during the installation, please refer to chapter 2.2 for a more detailed description of jumpers and connectors.

**System Standby** The default setting is Disabled. When the Power Management item is switched to "User Define" you can select a time interval from 20 sec to 40 min. When the set time elapses without activity the system enters Standby mode.

If the idle time for all PM events is greater than the Standby time you set the system will enter Standby mode, and the CPU speed slows down, and SM Out (JP38) changes to low. If the "Video Off Option" is set to "Sus, Stby—Off", the screen will shut off.

**System Suspend** The default setting is Disabled. When the Power Management item is switched to "User Define" you can select a time interval from 20 sec to 40 min. When the set time elapses without activity the system enters Suspend mode.

If the idle time for all PM events is greater than the Suspend time you set the system will enter Suspend mode, and the mainboard frequency drops to 8 MHz (SL enhanced CPUs drop to 0 MHz), and SM Out (JP38) changes to low. If the "Video Off Option" is set to "Suspend—Off", the screen will shut off.

About SM Out (JP38), please refer page 2-3

**PCI Master Activity** Choose Disable or Enable (Default). If Enabled the PCI Master (Device) card is monitored.

**COM Ports Activity** Choose Disable or Enable (Default). If Enabled the COM (Device) card is monitored.

**LPT Ports Activity** Choose Disable or Enable (Default). If Enabled the LPT (Device) card is monitored.

**HDD Ports Activity** Choose Disable or Enable (Default). If Enabled the HDD (Device) card is monitored.

**DMA Ports Activities** This item should always be Enabled (Default).

**Max Saving** Doze = 20 Sec  
Standby = 20 Sec  
Suspend = 20 Sec

**PM Control by APM** Choose No (Default) or Yes. APM stands for Advanced Power Management. "Yes" makes your power management more flexible.

**Video Off Method** Choose V/H Sync + Blank (Default) or Blank screen. With this item V/H SYNC is controlled by software. If you have a VGA card that is not compatible with this option, switch to "Blank screen", even though it consumes more power than "V/H SYNC + Blank".

**Video Off Option** Choose "Always On" (Default), "All Modes -- Off" (Suspend, Standby and Doze mode), "Susp, Stby -- Off". This item shuts the video off when entering Doze mode, Standby mode or Suspend mode.

**PM Interrupt Use** Choose IRQ12 (Default) or IRQ15. This function is only for Normal CPU (Non-SMI CPU).

**HDD Power Down** Choose a time interval from 1 to 15 minutes or "Disabled" (Default) or "Suspend". When the set time has elapsed, the BIOS sends a command to the HDD to enter idel (sleep) mode, turning off the motor. This function is only valid for IDE HDDs that support power saving function.

**System Doze** The default setting is Disabled. When the Power Management item is switched to "User Define" you can select a time interval from 20 sec to 40 min. When the set time elapses without activity the system enters Doze mode.

If the idle time for all PM events -- PCI Master Activity, COM Ports Activity, LPT Porst Activity, HDD Ports Activity, DMA Ports Activity, VGA Activity -- is greater than the Doze time you set the system will enter Doze mode, and the CPU speed slows down. If the Video Off Option is set to "All Modes -- Off", the screen shuts off.

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## Chapter 2

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### Hardware Setup

This chapter describes the mainboard's connectors and jumper settings.

#### 2.1 Power Precautions

Take the following precautions before you begin working with the mainboard and its components:

- Turn off the mainboard's power, and unplug the power cord.
- Unplug all cables that connect the mainboard to any external devices.

#### 2.2 Connectors

Attach system components and case devices to the mainboard's connectors. A description of each connector and its pin assignments follows. Refer to Figure 1-1 for connector locations on the mainboard.

**Caution:** Make sure you first turn off all power to the system before attaching components to the mainboard.

Connector Name	Pin Assignments	Description
External Battery Connector: J3 (4 Pins)	Pin 1: 4.5V battery input Pin 2: NC. Pin 3: Ground. Pin 4: Ground.	If on-board battery no longer functions remove it from the mainboard and connect a 4.5V external battery to the 4 pin J3
Turbo Connector: J9 (3 Pins)	Pin 1: Ground. Pin 2: Turbo signal. Pin 3: +5VDC.	1-2: Low speed mode. 2-3: Turbo mode. Connect the pin2, pin3 to the cable of the chassis' turbo button.
Turbo LED Connector J7 (2 Pins)	Pin 1: Cathode terminal of LED. Pin 2: Anode terminal of LED.	If the connection is correct, the turbo LED will light up when the system is in turbo speed mode. Otherwise the turbo LED will be off.
Hardware Reset Connector: J8 (2 Pins)	Pin 1: Reset input Pin 2: Ground	Connect this switch to the cable of the chassis' reset button. Press and hold the reset button for at least one second to reset the system.
Keylock and Power LED connector: J11 (5 Pins)	Pin 1: +5VDC. Pin 2: No connection. Pin 3: Ground. Pin 4: Keyboard inhibit Signal. Pin 5: Ground.	Connect this switch to the cable of the chassis' keylock button.
Speaker connector: J10 (4 Pins)	Pin 1: Sound signal. Pin 2: Ground. Pin 3: Ground. Pin 4: +5VDC.	Connect to the speaker connector in the front panel of the chassis.
Keyboard connector: J1 (5 Pins)	Pin 1: Keyboard clock. Pin 2: Keyboard data. Pin 3: No connection. Pin 4: Ground. Pin 5: +5VDC.	Connect to the Keyboard connector.

### 3.4 Power Management Setup

The Power Management Setup option lets you set the system's power saving functions.

Run the Power Management Setup on SL-Enhanced CPU (SMI CPU) as follows.

- Choose "POWER MANAGEMENT SETUP" from the Main Menu and a screen with a list of items appears.

ROM PCI/ISA BIOS (00000000)  
POWER MANAGEMENT SETUP  
AWARD SOFTWARE, INC.

Power Management	: Disable	IRQ 4 (COM 1)	: Enable
PM Control by APM	: No	IRQ 5 (LPT 2)	: Enable
Video Off Option	: Always On	IRQ 6 (Floppy Disk)	: Enable
Video Off Method	: V/H SYNC+Blank	IRQ 7 (LPT 1)	: Enable
PM Interrupt Use	: IRQ12	IRQ 8 (RTC, Alarm)	: Disable
		IRQ 9 (IRQ2 FwdIn)	: Enable
		IRQ 10 (Reserved)	: Enable
		IRQ 11 (Reserved)	: Enable
		IRQ 12 (PS/2 Mouse)	: Enable
		IRQ 14 (Hard Disk)	: Enable
		IRQ 15 (Reserved)	: Enable
** PM Timers **			
HDD Power Down	: Disable		
System Doze	: Disable		
System Standby	: Disable		
System Suspend	: Disable		
** PM Event **			
PCI Master Activity	: Enable		
GDM Ports Activity	: Enable		
LPT Ports Activity	: Enable		
WDD Ports Activity	: Enable		
DMA Ports Activity	: Enable		
VGA Activity	: Disable		
IRQ 3 (COM 2)	: Enable		

Esc : Quit      ↑ ↓ ← → : Select Item  
F1 : Help      PUP/PD +/- : Modify  
F5 : Old Values (Shift) F2 : Color  
F8 : Load BIOS Defaults  
F7 : Load Setup Defaults

Figure 3-5 Power Management Setup Menu

- Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUp/PgDn/ +/- keys.

A short description of selected screen items follows:

<b>Power Management</b>	Options are as follows:
<b>User Define</b>	You define HDD and system power down times.
<b>Disabled</b>	Disables the Green PC Features. (Default)
<b>Min Saving</b>	Doze = 40 Min Standby = 40 Min Suspend = 40 Min

### 3.3 Chipset Features Setup Menu

The Chipset Features Setup option changes the values of the chipset registers. These registers control system options in the computer.

**Caution:** Do not change the default values shown below unless you are familiar with the mainboard's chipset.

Run the Chipset Features Setup as follows.

1. Choose "CHIPSET FEATURES SETUP" from the Main Menu and the following screen appears.

ROM PCI/ISA BIOS (00000000)			
CHIPSET FEATURES SETUP			
AWARD SOFTWARE, INC.			
Auto Configuration	: Enabled	Onboard IDE Port	: Both
ISA Bus Clock	: 7.158MHz	Onboard IDE-1 WS	: Faster
DRAM Speed	: Fastest	Onboard IDE-2 WS	: Faster
DRAM RAS to CAS Delay	: 3 CCLK		
DRAM Write Cycle	: 0 WS		
DRAM Write CAS Pulse	: 1 CCLK		
DRAM CAS Precharge Time	: 1 CCLK		
DRAM RAS to MA Delay	: 1 CCLK		
Cache Write Cycle	: 2 CCLK		
Cache Burst Read Cycle	: 1 CCLK		
Cache/DRAM Read Cycle WS	: 2 CCLK		
LED# Sample Point	: End of T2		
CPU Internal Cache	: Write Thru		
CPU Burst Write	: Disable		
DRAM Slow Refresh	: Disable		
Esc : Quit    ↓ ↑ → ← : Select Item F1 : Help    PU/PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F8 : Load BIOS Defaults F7 : Load Setup Defaults			

Figure 3-4 Chipset Feature Setup Menu

2. Use the arrow keys to move between items and select values. Modify selected fields using the PgUp/PgDn/ +/- keys.
3. After you have finished with the Chipset Features Setup, press the <ESC> key and follow the screen instructions to save or disregard your settings.

Connector Name	Pin Assignments	Function
Power input connector: J2 (12 Pins)	Pin 1: Powergood. Pin 2: +5V. Pin 3: +12V. Pin 4: -12V. Pin 5: Ground Pin 6: Ground Pin 7: Ground Pin 8: Ground Pin 9: -5V Pin10: +5V Pin11: +5V Pin12: +5V.	Connect to the power connector from the power supply. Be sure to connect the power connector in the correct position. Any mistake will cause the mainboard, power supply or add-on card to be damaged.

Jumper No.	No. of Pins	Description	Default Setting
JP38	4	1, 3 2-3 *SM Out Ground	
JP44	2	ON Color OFF Mono	ON
JP1	2	ON For Cx486S2 only	
JP2	3	1-2 For P24D L1 cache Write-Back 2-3 For P24D L1 cache Write-Through	
JP3	3	1-2 For P24T L1 cache Write-Back 2-3 For P24T L1 cache Write-Through	
JP12	2	ON For internal IDE CN1 (IRQ14)	
JP13	2	ON For internal IDE CN2 (IRQ15)	
JP10, JP11	4	HDD LED Connector	
J4	40	**IDE HDD Connector 1	
J5	40	**IDE HDD Connector 2	

Note: \*SM Out is the System Management Output control pin. This pin is used to control peripheral's power, clock .... etc, for power management. SM Out is an active-low signal.  
 \*\*IDE1, IDE2 are high performance PCI IDE connectors. Up to four IDE interface devices are supported.

## 2.3 Jumper Switches

Jumper switches are used on the mainboard to configure various hardware options. See Figure 1-1 for jumper locations.

Throughout this section the following symbols are used to indicate jumper settings.

For 3-pin jumpers, the symbols below are used:



Short Pins 1 and 2 with a jumper cap.



Short Pins 2 and 3 with a jumper cap.

For 2-pin jumpers, the following symbols are used:



Place the jumper cap over the two pins of the jumper to Short the jumper.



Remove the jumper cap to Open the jumper cap

**Note:** To avoid losing jumper caps, attach the removed jumper cap to one of the jumper pins.

“Setup”- If a password is set, the password prompt only appears if you attempt to enter the Setup program.

**Virus Warning** Enable this option and a warning message appears when anything attempts to access the boot sector or hard disk partition table.

**External Cache** This option enables/disables the external cache memory. (The Default setting is Enabled.)

**CPU Internal Cache** This option enables/disables the CPU's internal cache. (The Default setting is Enabled.)



**Video or Adaptor BIOS Shadow** BIOS shadow copies BIOS code from slower ROM to faster RAM. BIOS can then execute from RAM.

- Quick Power On Self Test** Enabled provides a fast POST at boot-up
- Memory Parity Check** Enabled this option for a Normal memory parity check. Disabled ignores memory parity check.
- IDE HDD Block Mode** This option enables/disables the IDE HDD Block Mode function. Older HDDs do not support this function. (The Default setting is Disabled.)
- IDE 32-bit Transfer Mode** Choose Enabled or Disabled. Only for on board IDE HDDs.
- Boot Up Num Lock Status** Choose On or Off. On puts numeric keypad in Num Lock mode at boot-up. Off puts this keypad in arrow key mode at boot-up.
- Boot Up Floppy Seek** Enable this item and the BIOS searches for installed floppy disk drives to determine if they are 40 tracks (360K drive) or 80 tracks (760K, 1.2M, or 1.44M drives). Disable this item and the BIOS does not search for floppy drive type by track number.
- Swap Floppy Drive** Enabled changes the sequence of the A: and B: drives. (The Default setting is Disabled.)
- Boot Sequence** The default setting attempts to first boot from drive A: and then from hard disk C:. You can reverse this sequence with "C: A:", but then drive A: cannot boot directly.
- Boot Up System Speed** Choose High or Low. This item selects the speed the system runs immediately after power up.
- Security Option** Choose Setup or System. Use this feature to prevent unauthorized system boot-up or use of BIOS Setup.

"System" - Each time the system is booted the password prompt appears.

### JP6, JP35 - CMOS Discharge Jumper

Jumpers JP6, and JP35 discharge CMOS memory. When you install the mainboard, make sure this jumpers are set for Normal Operation (short pins 1-2). Set the jumpers as below.

Setting	JP6, JP35
Normal Operation (Default)	
Discharge RTC CMOS	

### JP14, JP26-JP28, JP40, JP43: Factory Reserved

These jumpers are for the manufacturer's use only. Make sure these jumpers are set at their default settings as shown below.

Jumper No.	No. of Pins	Description	Default Setting
JP14	3	Factory reserved	2-3
JP26	3	Factory reserved	2-3
JP27	3	Factory reserved	2-3
JP28	5	Factory reserved.	2-3, 4-5
JP40	3	Factory reserved.	1-2
JP43	3	Factory reserved	2-3



## 2.4 Installation of Cache memory

This mainboard supports very flexible Cache SRAM configuration: 128KB, 256KB, 512KB, and 1MB.

Main Board Cache Size		128KB	256KB	512KB	1MB
TAG SRAM	Location	U8			
	Type	32Kx8		64Kx8	
Data SRAM	Location	U9, U11, U19, U24	U9, U10, U11, U14, U19, U20, U24, U25	U9, U11, U19, U24	U9, U10, U11, U14, U19, U20, U24, U25
	Type	32Kx8		128Kx8	
Jumper setting	JP23	1-2	2-3	2-3	2-3
	JP24	1-2	1-2	1-2	2-3
	JP25	1-2	2-3	1-2	2-3
	JP36	1-2	1-2	2-3	1-2
	JP37	1-2, 3-4	2-3, 4-5	1-2, 3-4	2-3, 4-5

## 2.5 CPU frequency selection

	JP30	JP31	JP32	JP33
DX-25MHz	OFF	OFF	OFF	1-2
DX-33MHz	OFF	ON	ON	1-2
DX-40MHz	OFF	OFF	ON	2-3
DX-50MHz	OFF	ON	OFF	2-3
DX2 25/50MHz	OFF	OFF	OFF	1-2
DX2 33/66MHz	OFF	ON	ON	1-2
DX2 40/80MHz	OFF	OFF	ON	2-3
DX4 25/75MHz	OFF	OFF	OFF	1-2
DX4 33/100	OFF	ON	ON	1-2

## 3.2 BIOS Features Setup Menu

The BIOS Features setup program is equipped with a series of help screens and accessed by the <F1> key, which will display the available options for a particular configuration feature and special help for some of the options. If you don't really understand the meanings of each item, please don't change the following default values.

ROM PCI/ISA BIOS (XXXXXX00)  
BIOS FEATURES SETUP  
AWARD SOFTWARE, INC.

Typematic Rate Setting	: Enabled	CPU Internal Cache	: Enabled
Typematic Delay (Msec)	: 250	Video BIOS Shadow	: Enabled
Typematic Rate (Chars/Sec)	: 30	C8000-CFFFF Shadow	: Disabled
Quick Power on Self Test	: Enabled	D0000-D7FFF Shadow	: Disabled
Memory Parity Check	: Enabled	D8000-DFFFF Shadow	: Disabled
IDE HDD Block Mode	: Disabled		
IDE 32-bit Transfer Mode	: Disabled		
Boot Up NumLock Status	: On		
Boot Up Floppy Seek	: Enabled		
Swap Floppy Drive	: Disabled		
Boot Sequence	: A, C		
Boot Up System Speed	: High		
Security Option	: Setup		
Virus Warning	: Disabled		
External Cache	: Enabled		

Esc: Quit                                    ↑ ↓ ← →: Select Item  
F1: Help                                     PU/PD/+/=: Modify  
F5: Old Values (Shift)F2: Color  
F8: Load BIOS Defaults  
F7: Load Setup Defaults

Figure 3-3 BIOS Feature Setup

A short description of screen items follows:

- Typematic Rate Setting** Enable this option to adjust the keystroke repeat rate.
- Typematic Delay (Msec)** Choose how long after you press a key that a character begins repeating.
- Typematic Rate (Chars/Sec)** Choose the rate a Character keeps repeating.

**LBA mode:** Logical Block Addressing mode is a new HDD accessing method to overcome the 528 Megabytes bottleneck. The number of cylinders, heads, and sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing the IDE controller will transform the logical address described by cylinder, head, and sector number into its own physical address inside the HDD. The maximum HDD size supported by the LBA mode is 8.4 Gigabytes.

**LARGE mode:** Some IDE HDDs contain more than 1024 cylinders without LBA support. This access mode tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. The maximum HDD size supported by LARGE mode is 1 Gigabytes.

## 2.6 Installation of CPU

The mainboard is equipped with a 237 pin socket for various CPUs: 80486 SX/DX/DX2/486SL, M7, DX4, P24T, P24D to be selected by following jumpers :

Jumper setting	JP4	JP7	JP8	JP9	JP15	JP16	JP17	JP18	JP19	JP20	JP21	JP22	JP39
486DX/DX2	1-2 3-4	OFF	OFF	1-2 3-4	3-4	2-3	OFF	OFF	OFF	OFF	OFF	OFF	1-2
486DX/DX2 (SL)*	1-2 3-4	3-4	OFF	1-2 3-4	3-4	2-3	OFF	1-2	OFF	2-3	1-2	4-5	1-2
486SX	1-2 3-4	OFF	OFF	2-3	OFF	2-3	OFF	OFF	OFF	OFF	OFF	OFF	1-2
486SX(SL)	1-2 3-4	3-4	OFF	2-3	OFF	2-3	OFF	1-2	OFF	2-3	1-2	4-5	1-2
AMD DX/DX2 (5V)	1-2 3-4	OFF	OFF	1-2 3-4	3-4	2-3	OFF	OFF	OFF	OFF	OFF	OFF	1-2
AMD DX2/DX4 (3.45V)	OFF	OFF	OFF	1-2 3-4	3-4	2-3	OFF	OFF	OFF	OFF	OFF	OFF	1-2
AMD486DXL PLUS	1-2 3-4	3-4	OFF	1-2 3-4	3-4	2-3	OFF	1-2	2-3	2-3	4-5	4-5	1-2
486DX4** (SL)	OFF	3-4	OFF	1-2 3-4	3-4	2-3	OFF	1-2	OFF	2-3	1-2	4-5	OFF
M7 (5V)	1-2 3-4	2-3	2-3	1-2 3-4	3-4	2-3	2-3	1-2	OFF	1-2	OFF	2-3	1-2
M7 (3.3xV)	OFF	2-3	2-3	1-2 3-4	3-4	2-3	2-3	1-2	OFF	1-2	OFF	2-3	1-2
P24T	1-2 3-4	3-4	1-2	1-2 3-4	2-3	1-2	1-2	1-2	OFF	2-3	OFF	1-2	1-2
P24D	1-2 3-4	1-2 3-4	OFF	1-2 3-4	3-4	1-2	1-2	1-2	1-2	2-3	2-3	4-5	1-2

Note: 486DX/DX2(SL)\* is the default setting.

486DX4\*\* is for PI4T R1 model only.

When JP4 is OFF, you must take special care to make sure the jumper settings are correct. The following tables emphasizes the correct jumper settings.

CPU Type	JP46	JP47	JP48	JP49	JP50	Note
DX4-75, Cx486DX2-50	ON	OFF	OFF	OFF	OFF	3.30V
DX4-100, AMD486DX/DX4	OFF	ON	OFF	ON	OFF	3.45V
AMD 486DX2	OFF	ON	OFF	ON	ON	3.45V
Cx486DX2-V80	OFF	OFF	OFF	ON	OFF	4.04V
Cx486DX2-V66	OFF	OFF	ON	OFF	OFF	3.60V

## 2.7 Installation of DRAMs

System memory is added to the mainboard via four 72-pin SIMM sockets on the mainboard. Each socket is equal to one bank: Bank 0 ~ Bank 3. You can install 72-pin SIMMs — with or without parity, single side or double side modules — in each socket.

Note that there are no jumpers to set for memory configuration. The BIOS detects the type and size of SIMM modules installed automatically. You only need to plug in SIMM modules according to any of the combinations listed below.

For the table below:

(S)	Single density 72pin SIMM	
(D)	Double density 72pin SIMM	
256K-S	= 256K x 32bits	= 1MBytes
1M-S	= 1M x 32bits	= 4MBytes
4M-S	= 4M x 32bits	= 16MBytes
16M-S	= 16M x 32bits	= 64MBytes
512K-D	= 2 x 256K x 32bits	= 2MBytes
2M-D	= 2 x 1M x 32bits	= 8MBytes
8M-D	= 2 x 4M x 32bits	= 32MBytes

Bank 0 (SIMM4)	Bank 1 (SIMM3)	Bank 2 (SIMM2)	Bank 3 (SIMM1)	TOTAL
256K-S	-----	-----	-----	1MB
256K-S	256K-S	-----	-----	2MB
256K-S	256K-S	512K-D	-----	4MB
256K-S	256K-S	1M-S	-----	6MB
256K-S	256K-S	512K-D	1M-S	8MB
256K-S	256K-S	1M-S	1M-S	10MB
256K-S	256K-S	4M-S	-----	18MB
512K-D	-----	-----	-----	2MB
512K-D	512K-D	-----	-----	4MB
512K-D	1M-S	-----	-----	6MB
512K-D	512K-D	1M-S	-----	8MB

## 3.1 Standard CMOS Setup Menu

The items in Standard CMOS Setup Menu are divided into several categories. Each category includes none, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Date (mm/dd/yy) : Wed, Apr 21 1993																	
Time (hh:mm:ss) : 14:53:31																	
HARDS DISKS	Type	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE									
Primary Master	: None	0	0	0	0	0	0	-----									
Primary Slave	: None	0	0	0	0	0	0	-----									
Secondary Master	: None	0	0	0	0	0	0	-----									
Secondary Slave	: None	0	0	0	0	0	0	-----									
Drive A: 1.2M, 5.25 in.																	
Drive B: None																	
Video : MONO																	
Hall On : All Errors																	
<table border="1"> <tr> <td>Base Memory :</td> <td>640K</td> </tr> <tr> <td>Extended Memory :</td> <td>3328K</td> </tr> <tr> <td>Expanded Memory :</td> <td>0K</td> </tr> <tr> <td>Other Memory :</td> <td>128K</td> </tr> <tr> <td colspan="2">Total Memory: 4096K</td> </tr> </table>								Base Memory :	640K	Extended Memory :	3328K	Expanded Memory :	0K	Other Memory :	128K	Total Memory: 4096K	
Base Memory :	640K																
Extended Memory :	3328K																
Expanded Memory :	0K																
Other Memory :	128K																
Total Memory: 4096K																	
Esc : Quit		↓ ↑ ← → : Select Item			PU/PD/+/-: Modify												
F1 : Help		(Shft)F2 : Change Color			F3 : Toggle Calendar												

Figure 3-2 Standard CMOS Setup Menu

The setup program is completely menu-driven:

1. Use arrow keys to select entry of **Date, Time, Hard Disk, Floppy, Display and Keyboard.**
2. Use **PgUp/PgDn** key to modify the option of each entry.
3. Use **Esc** to exit.

The Award BIOS supports three HDD modes: **NORMAL, LBA, and LARGE.**

**NORMAL mode:** Generic access mode in which neither the BIOS nor the IDE controller will make any transformation during accessing. The maximum HDD size supported by the **NORMAL** mode is 528 Megabytes.

is displayed. If the [Del] key or Ctrl-Alt-Esc is pressed, the screen will be cleared and then the following message will be shown:

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

STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PCI CONFIGURATION SETUP LOAD BIOS DEFAULTS	LOAD SETUP DEFAULTS PASSWORD SETTING IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↓ ↑ → ← : Select Item (Shift)F2 : Change Color
Description of each function	

Figure 3-1 Main Menu

Bank 0 (SIMM4)	Bank 1 (SIMM3)	Bank 2 (SIMM2)	Bank 3 (SIMM1)	TOTAL
512K-D	512K-D	1M-S	1M-S	12MB
512K-D	512K-D	4M-S	-----	20MB
512K-D	512K-D	1M-S	4M-S	24MB
512K-D	512K-D	4M-S	4M-S	36MB
1M-S	-----	-----	-----	4MB
1M-S	1M-S	-----	-----	8MB
1M-S	1M-S	1M-S	-----	12MB
1M-S	1M-S	1M-S	1M-S	16MB
1M-S	4M-S	-----	-----	20MB
1M-S	1M-S	4M-S	-----	24MB
1M-S	4M-S	4M-S	-----	36MB
1M-S	1M-S	4M-S	4M-S	40MB
2M-D	-----	-----	-----	8MB
2M-D	2M-D	-----	-----	16MB
2M-D	2M-D	2M-D	-----	24MB
2MD-	2M-D	2M-D	2M-D	32MB
4M-D	-----	-----	-----	16MB
4M-D	4M-D	-----	-----	32MB
4M-D	4M-D	4M-D	-----	48MB
4M-D	4M-D	4M-D	4M-D	64MB
256K-S	1M-S	-----	-----	5MB
256K-S	4M-S	-----	-----	17MB
256K-S	16M-S	-----	-----	65MB
1M-S	16M-S	-----	-----	68MB
1M-S	1M-S	16M-S	-----	72MB
4M-S	16M-S	-----	-----	80MB
4M-S	4M-S	16M-S	-----	96MB
16M-S	-----	-----	-----	64MB

Bank 0 (SIMM4)	Bank 1 (SIMM3)	Bank 2 (SIMM2)	Bank 3 (SIMM1)	TOTAL
16M-S	16M-S	-----	-----	128MB
1M-S	8M-D	-----	-----	36MB
1M-S	8M-D	8M-D	-----	68MB
1M-S	1M-S	8M-D	-----	40MB
1M-S	1M-S	8M-D	8M-D	72MB
4M-S	8M-D	-----	-----	48MB
4M-S	8M-D	8M-D	-----	80MB
4M-S	4M-S	8M-D	-----	64MB
4M-S	4M-S	8M-D	8M-D	96MB
8M-D	-----	-----	-----	32MB
8M-D	8M-D	-----	-----	64MB
8M-D	8M-D	8M-D	-----	96MB
8M-D	8M-D	8M-D	8M-D	128MB

## Chapter 3

### Award BIOS Setup

All personal computer use a BIOS, or Basic Input/Output system, to provide control for the hardware functions. When system is powered on or reset, the CPU is reset and BIOS will do the following:

- Self-test on CPU.
- Verify ROM BIOS checksum.
- Verify CMOS configuration chip.
- Initialize timer.
- Initialize DMA controller.
- Verify RAM memory.
- Install all BIOS function call utilities.
- Verify/initialize all system configurations, like keyboard, floppy drive, hard disk, initialize EGA or VGA if there is any.
- Hook to the add-in BIOS or expansion BIOS to perform initialization and driver link to the system.

Award's BIOS ROM has a built-in setup program that allow users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that the setup information is retained when the power is turned off. When the system is power on or reset, the Award BIOS will display a copyright message on the screen, then the BIOS will perform the system diagnostics test and initialization. When all of the above tests have been passed, the message:

**"TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC OR DEL KEY**