# USER'S MANUAL

PB4 PCI MAIN BOARD

Recycled Papers

Part Number: MN-074-B12-91
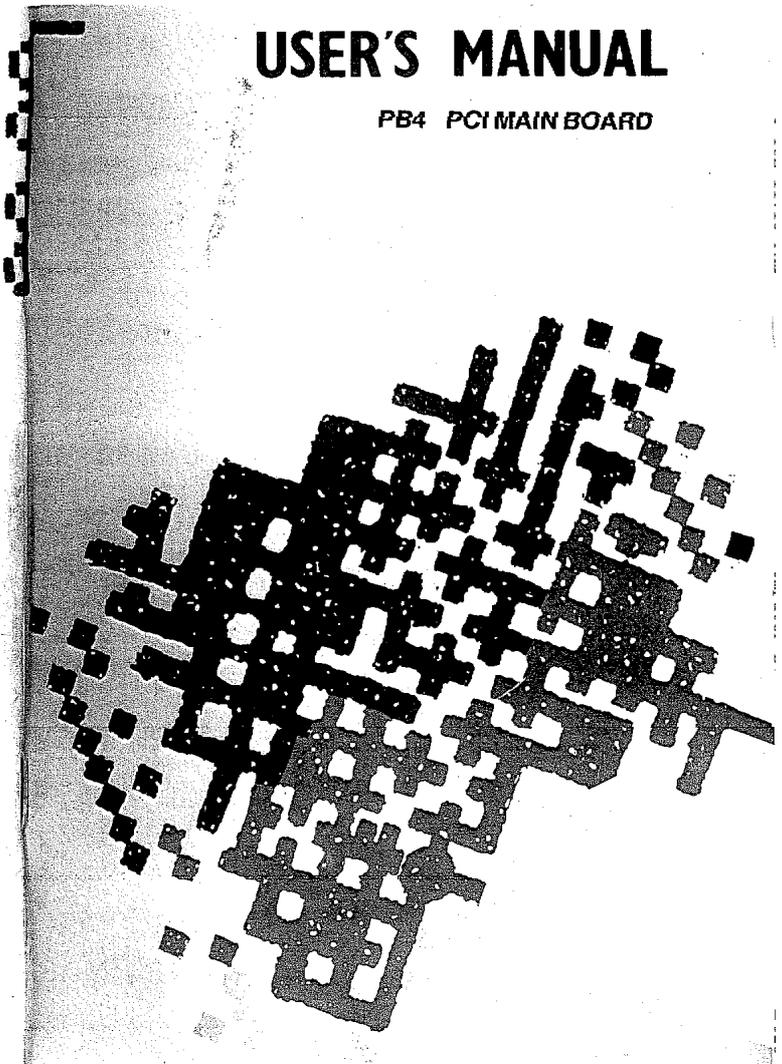
PCI Local Bus introduction

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 commponents 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 transfer rate)

- Concurrency with processor/memory

- Synchronous bus operating at up to 33 MHz

- Auto configuration support for PCI Local Bus add-on boards

- Processor independence

- Multi-master capability

High Performance Cache
486 PCI Mainboard

USER'S MANUAL

Table of Contents

Chapter 1

System Board Overview

1.1   The mainboard specifications

1.	CPU:	Intel 80486 DX/DX2, DX4(P24C), P24D, P24T Cyrix DX-V/DX2-V (5V, 3.xxV), M1SC AMD486 DX2/DX4 (NV8T), Enhanced AM486 (SV8B)
2.	On board Local Bus IDE	Two IDE channels, supports up to 4 Hard Drives.
3.	On board FDC	Supports two floppy disk drives for type 360KB/1.2MB/1.44MB.
4.	Serial ports	Two high speed 16550 compatible UARTs.
5.	Parallel port	1. Standard & Bidirectional Parallel port. 2. Enhanced Parallel Port (EPP) compatible. 3. Extended Capabilities Port (ECP) compatible.
6.	Cache memory:	L2 Cache : 0/128/256 KB
7.	I/O slots:	Three 32-bit PCI slots, four ISA slots.
8.	Memories:	Two 72-pin SIMM modules.
9.	BIOS :	Award BIOS.
10.	Green PC functions:	APM compatible.
11.	Special feature:	Supports EDO DRAM Supports for Asymmetrical and Symmetrical DRAM

1.2 System block diagram
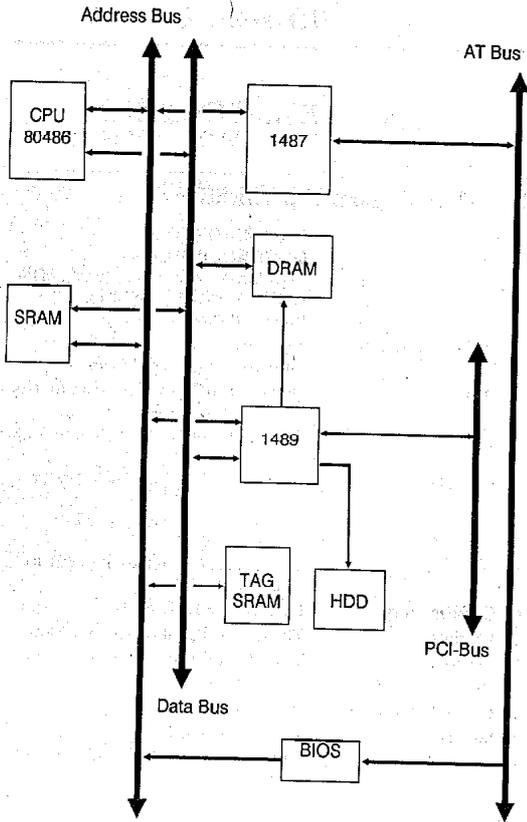
1.3 Placement Diagram
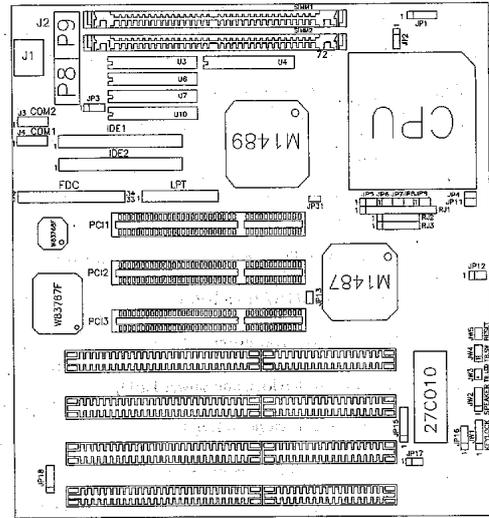
Figure 1-1

1.4 Quick reference for installation

Step 1.   Verify the following jumper settings:

A. JP17 : A jumper at pin "1-2" for CMOS
   RAM normal operation.
B. RJ1-RJ3, JP1, JP2, JP4, JP5, JP8, JP9, JP11, JP12, JP31:
   Make sure the jumper settings are consistent with the installed CPU. (refer section 2.6)

Step 2.   Connect keyboard to J1.

Step 3.   Plug at least 1 DRAM module into the any one of SIMM sockets.

Step 4.   Verify cache size selection jumpers JP3, (refer section 2.4).

Step 5.   Make the following connections to your case:

A. JW5 to H/W reset button.
B. JW2 to speaker.
C. JW4 to turbo switch.
D. JW3 to turbo LED, the LED will light up.
E. JW1 to keylock and power LED.

Step 6.   Connect IDE cable to IDE1

Step 7.   Connect floppy cable to FDC.

Step 8.   Connect COM1, COM2, LPT port on the main-board

Step 9.   Connect P1 to P8 and P9 of the power supply.

Step 10. Power on.

Step 11. Enter the "Setup Menu" screen. Select the display type and drive type.

Step 12. Quit the "Setup Menu" screen and then select "SAVE & EXIT SETUP" from BIOS Main Menu.

Step 14. If DOS prompt appears on the screen, installation is complete.

Note :   If you have any problems during installation, please refer to chapter 2 for a more detailed description of jumper settings and connectors.

Chapter 2

Hardware Setup

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

2.1 Power Precautions

Precautions as follow must be taken before doing any work on mother-board:

- Turn off the mainboard's power, and unplug the power cord.
- Unplug all cables connecting mainboard and external devices.

2.2 Connectors

Connect external device, switches and devices to motherboard through connectors. Descriptions of each connector and its pin assignment is as follow. Refer to Figure 1-1 for their locations on the mainboard.

Caution:	*Turn off the power and unplug the power cord before connecting any device and components.*

Connector Name	Pin Assignments	Description
External Battery Connector: JP18 (4 Pins)	Pin 1: Ground. Pin 2: Ground. Pin 3: NC. Pin 4: 4.5V battery input	If the on-board battery no longer functions, remove it from the mainboard and connect a 4.5V external battery to the 4 pin connector at JP18.
Turbo Connector: JW4 (3 Pins)	Pin 1: Turbo signal. Pin 2: Turbo signal. Pin 3: Ground	1-2: Turbo mode. 2-3: Low speed mode. Connect pin1 and pin2 to the chassis' turbo button cable.
Turbo LED Connector: JW3 (2 Pins)	Pin 1: Anode terminal of LED. Pin 2: Cathode 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: JW5 (2 Pins)	Pin 1: Reset input Pin 2: Ground	Connect to the chassis' reset button cable. Press and hold the reset button for at least one second to reset the system.
Keylock and Power LED connector: JW1 (5 Pins)	Pin 1: +5VDC. Pin 2: No connection. Pin 3: Ground. Pin 4: Keyboard inhibit Signal. Pin 5: Ground.	Connect to the chassis' keylock and Power LED cable.
Speaker connector: JW2 (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.

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 cards to be damaged.
IDE LED Connector: JP16 (4 Pins)	Pin 1: Anode terminal of LED. Pin 2: Cathode terminal of LED. Pin 3: Cathode terminal of LED. Pin 4: Anode terminal of LED.	Connect HDD LED to Pin1-2 or Pin3-4, when IDE channel 1, 2 active the LED will light up.

| Jumper No.	No. of Pins		Description	Default Setting
JP13	2		Suspend switch	OFF
JP15	6	1-2,5-6	12V Flash ROM	
		2-3,4-5	5V EPROM	
IDE1	40		*IDE HDD Connector 1	
IDE2	40		*IDE HDD Connector 2	
FDC	34		Floppy Disk Connector	
LPT	26		Printer Connector	
COM1 (J4)	10		Serial port Connector	
COM2 (J3)	10		Serial port Connector	

Notes: *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.

The illustrations below are examples of the settings for 2-pin and 3-pin jumpers.

For 3-pin jumpers, these settings are used:
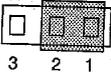
Pin 1-2   Short Pins 1 and 2 with a jumper cap.

3   2   1
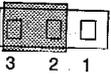
Pin 2-3   Short Pins 2 and 3 with a jumper cap.

3   2   1

For 2-pin jumpers, these settings are used:

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

2   1

OFF   Remove the jumper cap to Open the jumper cap

2   1

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

JP17 - CMOS Discharge Jumper

Jumpers JP17 discharges the CMOS memory. When you install the mainboard, make sure this jumper is set for Normal Operation (short pins 1-2). Set the jumper as below.

Setting	JP17
Normal Operation (Default)	3 2 1
Discharge CMOS	3 2 1
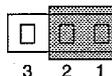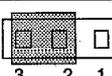
JP14: Factory Reserved

This jumper is for the manufacturer's use only. Make sure this jumper is set at its default setting as shown below.

Jumper No.	No. of Pins	Description	Default Setting
JP14	3	Factory reserved.	OFF

2.4 Installation of Cache memory

This mainboard supports a variety of Cache SRAM configurations: 128KB, and 256KB.

Main Board Cache Size		128KB	256KB
Data SRAM	Location	U3, U6, U7, U10	U3, U6, U7, U10
	Type	32Kx8	64K8
TAG SRAM	Location	U4	
	Type	16K8/32K8	
Jumper setting	JP3	1-2	2-3
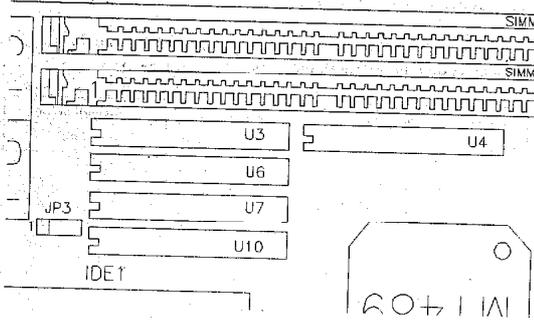
2.5 Installation of DRAMs

System memory can be added to the mainboard via two 72-pin SIMM sockets on the mainboard. One 72-pin SIMM with or without parity, single or double density modules may be installed in each socket.

There are no jumpers to set for memory configuration, you can insert the SIMM memory into any one of SIMM sockets. The BIOS will detect the memory location, type and size automatically.

This mainboard supports almost the full range of RAM module sizes: 1x32(4M), 2x32(8M), 4x32(16M), 8x32(32M), 256Kx32(1M), and 512Kx32(2M).

The AB-PB4 support EDO (Extended Data Output) DRAM and asymmetrical DRAM (4K Refresh DRAM).

There is physical difference on the dimension and users can plug either type into SIMM socket.

2.6 Installation of CPU

The mainboard is equipped with a 237 pin ZIF socket to accomodate various CPUs: Intel 80486 DX/DX2/SL, P24T, P24D, AMD DX2/DX4/Enhanced AM486, Cyrix 486DX/DX2/DX4/Cx5x86. Since there are many types of CPUs available, check your CPU type carefully before installation. Follow the three steps below to set the mainboard jumpers for your CPU:

Setp 1. Select different brand, type of CPU.

Jumper setting	RJ1	RJ2	RJ3	JP5	JP6	JP7	JP8	JP9
486DX/DX2/DX4 (Intel)	1-8	1-8	OFF	OFF	1-2	OFF	OFF	OFF
Intel P24T	7-14	1-8	OFF	OFF	1-2	OFF	OFF	OFF
Intel P24D	3-10	1-8	OFF	2-3	1-2	OFF	OFF	1-2
AM486DX2 AMD	1-8	1-8	OFF	OFF	2-3	OFF	OFF	OFF
AM486DX4* (NV8T) AMD	1-8	1-8	OFF	OFF	2-3	OFF	OFF	OFF
AMD5x86-133/160	3-10	1-8	OFF	2-3	1-2	ON	OFF	1-2
Enhanced AM486 (SV8B) AMD, AMD 5x86-150	3-10	1-8	OFF	2-3	1-2	OFF	OFF	1-2
Cyrix DX4/DX2(M7)	1-8	OFF	1-8	1-2	1-2	OFF	OFF	2-3
Cyrix Cx5x86 (M1sc)	1-8	1-8	OFF	2-3	1-2	OFF	OFF	1-2

Note: AM486DX4* is the default setting. Changes from the default settings are underlined for emphasis.
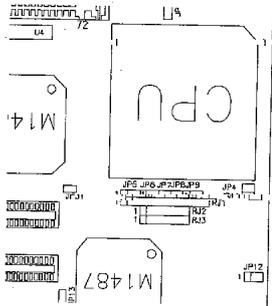
Step 2. Select CPU voltage.

CPU voltage	CPU Type	JP1	JP2
3.45V	Intel DX4, AMD486DX4, AMD486DX2-80, Cyrix DX4, AMD(Cx5x86)	1-2	2-3
3.6V	Cx486DX2-V50, V66	2-3	2-3
4.0V	Cx486DX2-V80	4-5	2-3
5V	P24T, DX, Over Driver, 5V CPU	1-2	1-2
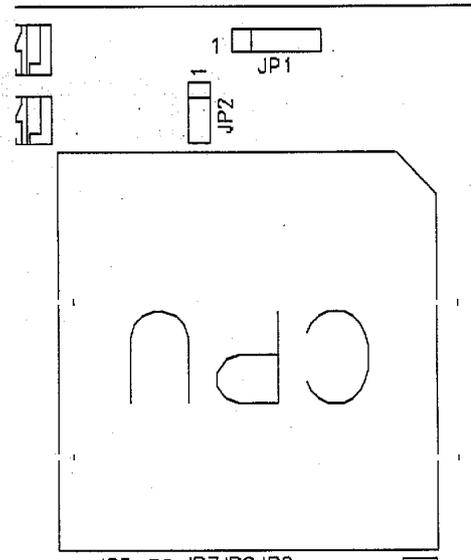
Step 3. Select CPU clock frequency.

Frequency	CPU	JP4	JP11	JP12	JP31
25MHz	DX-25	OFF	OFF	1-2	OFF
	DX2-50				
	DX4-75				
	P24T-63				
33MHz	DX-33	ON	ON	1-2	OFF
	DX2-66				
	DX4-100				
40MHz	DX-40	ON	OFF	1-2	OFF
	DX2-80				
	DX4-120				
	X5-160				
50MHz	X5-150	OFF	ON	2-3	ON
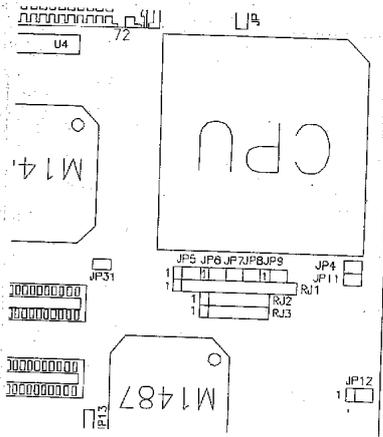
2.6.1 Jumper setting for popular CPU types

Jumper setting	Enhanced AM486 (SV8B-100)	Enhanced AM486 (SV8B-120)	Cx5x86-100 (M1sc)	AM486DX4-100 (NV8T)
JP11	ON	OFF	ON	
RJ1	3-10		1-8	
JP5	2-3			OFF
JP6	1-2			2-3
JP9	1-2			OFF
JP1	1-2			
JP2	2-3			
JP4	ON			
JP7	OFF			
JP8	OFF			
RJ2	1-8			
RJ3	OFF			

This table lists all of the jumper settings for some of the most popular CPUs. These are only listed here for easy reference, the settings are the same as those shown on the previous pages.

Cyrix 486DX4 CPU Type Jumper setting:

Cyrix DX4 ^{100} Cx486DX4-100GP 3.45V	Cyrix DX4 ^{100} Cx486DX4-100GP DX4-P/O 3.45V
↓	↓
Used Cyrix Cx486DX2/DX4-Vxx Jumper setting Voltage: 3.45V	Used Cyrix Cx5x86 Jumper setting Voltage: 3.45V
Type: A	Type: B
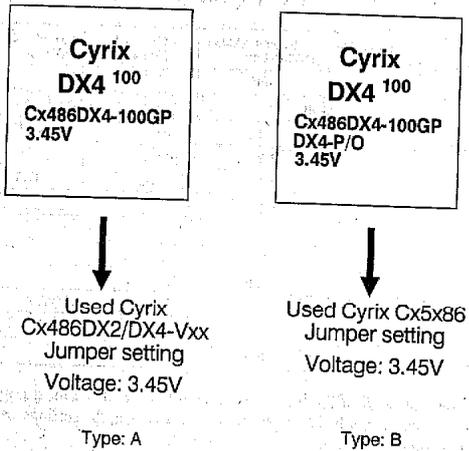
Figure:1

Caution: Installation of Cyrix DX4-100
User must be aware of following important notice for installation of Cyrix DX4-100 CPUs.

Important: Different jumper settings for Cyrix DX4-100 Follow instructions hereunder to install your Cyirx DX4-100.

1. Identify your Cyrix DX4-100 according to figure: 1. They can be easily differentiated from the "DX4-P/O" notified on top of Type:B Cyrix DX4-100.

2. Apply jumper settings accordingly,
   Cx486DX2/DX4-Vxx   for Type: A Cyrix DX4-100
   Cyrix Cx5x86   for Type: B Cyrix DX4-100

Chapter 3

Award BIOS Setup

All personal computer use a BIOS, or Basic Input/Output system, to porvide control for the hadrware 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 system memory and cache 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 (Include NCR PCI SCSI BIOS) or expansion BIOS to perform initialization and driver link to the system.

Award's BIOS ROM has a built-in setup program that allows 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 powered 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"

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

Figure 3-1 Main Menu

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: 1.44M, 3.5 in.                                          │
  │ Drive B: None          ┌──────────────────────────────┐         │
  │                        │  Base Memory:    640K         │         │
  │ Video : EGA/VGA        │  Extended Memory : 3328K      │         │
  │                        │  Expanded Memory:   0K        │         │
  │ Halt On : All, But keyboard │ Other Memory:  128K      │         │
  │                        │  Total Memory: 4096K          │         │
  ├────────────────────────┴──────────────────────────────┤         │
  │ Esc : Quit    ↓ ↑ → ← : Select Item     PU/PD/+/-: Modify │      │
  │ F1 : Help     (Shift)F2 : Change Color   F3 : Toggle Calender │   │
  └────────────────────────────────────────────────────────────────┘
```

Figure 3-2 Standard CMOS Setup Menu

The setup program is completly 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 options of each entry.

3. Use **Esc** to exit.

3.1.1 Hard Disk size selection

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.

LBA mode: Logical Block Addressing mode is a new HDD accessing method designed to overcome the 528 Megabytes limitation. 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 dividng it by 2. At the same time, the number of heads is multipiled by 2. The maximum HDD size supported by LARGE mode is 1 Gigabyte.

3.2 BIOS Features Setup Menu

The BIOS Features setup program is equipped with a series of help screens 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 (XXXXXXXX)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning            : Disabled   Video BIOS Shadow      : Enabled
CPU Internal Cache       : Enabled    C8000-CFFFF Shadow     : Disabled
External Cache           : Enabled    D0000-D7FFF Shadow     : Disabled
Quick Power on Self Test : Enabled    D8000-DFFFF Shadow     : Disabled
Boot Sequence            : A, C
Swap Floppy Drive        : Disabled
Boot Up Floppy Seek      : Disabled
Boot Up NumLock Status   : On
Typematic Rate Setting   : Enabled
Typematic Rate (Chars/Sec): 30
Typematic Delay (Msec)   : 250
Security Option          : Setup
PCI/VGA Palette Snoop    : Disabled

Esc : Quit          ↓ ↑ → ← : Select Item
F1 : Help           PU/PD/+/-: Modify
F5 : Old Values    (Shift)F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults
```

Figure 3-3   BIOS Feature Setup

A short description of screen items follows:

Virus Warning — Enable this option and a warning message appears when there is any attempt to access the boot sector or hard disk partition table.

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

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

Quick Power On Self Test — Enabled provides a fast POST at boot-up

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.

Swap Floppy Drive   Enabled changes the sequence of the A: and B: drives. (The Default setting is Disabled.)

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 (720K, 1.2M, 1.44M, or 2.88MB drives). Disable this item and the BIOS does not search for floppy drive type by track number.

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.

Typematic Rate Setting   Enable this option to adjust the keystroke repeat rate.

Typematic Rate (Chars/Sec)   Choose the rate a Character keeps repeating.

Typematic Delay (Msec)   Choose how long after you press a key that a character begins repeating.

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.

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

PCI/VGA Palette Snoop   Choose Enable or Disable (Default). Used to alter VGA pallete setting while graphic signals pass through feature connector of PCI VGA card and processed by MPEG card.

"Enable" - MPEG connecting through VGA feature connector installed. Enable to adjust PCI/VGA pallete.

"Disable" - Ordinary system without MPEG or with MPEG connecting through external connection.

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

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 (XXXXXXXX)
                  CHIPSET FEATURES SETUP
                  AWARD SOFTWARE, INC.

Auto Configuration      : Enabled    Onboard FDD Controller  : Enabled
AT-BUS Clock            : CLK/4      Onboard Serial Port 1   : COM1 (3F8H)
DRAM Read Timing        : Normal     Onboard Serial Port 2   : COM2(2F8H)
DRAM Write Timing       : Normal     Onboard Parallel Port   : 378H
SRAM Read Timing        : 2-1-1-1    - Parallel Port Mode    : Normal
SRAM Write Timing       : 0 Wait

ISA I/O Recovery        : Enabled
PCI Fast-Back-to-Back   : Disabled
Hidden Refresh          : Disabled
CPU Internal Cache WB/WT : WB

IDE HDD Block Mode      : Enabled
Onboard IDE Controller  : Enabled
- IDE-2 Controller      : Enabled
- Buffer for DOS & Win  : Enabled   Esc : Quit       ↓ ↑ → ← : Select Item
- IDE-1 Master PIO Mode : Auto      F1 : Help      PU/PD/+/-: Modify
- IDE-1 slave PIO Mode  : Auto      F5 : Old Values  (Shift)F2 : Color
- IDE-2 Master PIO Mode : Auto      F6 : Load BIOS Defaults
- IDE-2 Slave PIO Mode  : Auto      F7 : Load Setup Defaults
```

Figure 3-4   Chipset Feature Setup Menu

Note:

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 Enabled.)

Onboard IDE Controller — This option enables or disables the one board PCI IDE controller.

IDE Buffer for DOS & Win — If you do not use DOS & Windows. Please change to "Disabled". (The Default setting is Enabled.) This function can not work with some OSes (like UNIX, OS/2, Windows NT, ...). It only for DOS & Windows.

IDE Master(Slave) PIO Mode — Choose Mode 0 ~ Mode 4, or Auto (Default) to change IDE data transfers speed.

Onboard FDD Controller — This option enables or disables the on-board floppy disk controller.

Onboard Serial Port 1 — Choose Disable, COM3/3E8h, or COM1/3F8h (Default) to set the on-board serial port 1, and the interrupt map to IRQ4.

Onboard Serial Port 2 — Choose Disable, COM4/2E8h, or COM2/2F8h (Default) to set the on-board serial port 2, and the interrupt map to IRQ3.

Onboard Parallel Port — Choose Disable, 3BCh, 278h, or 378h (Default) to set the on-board parallel port, and the interrupt map to IRQ7.

Parallel Port Mode — Choose EPP, ECP, ECP+EPP, or Normal (Default) mode. ECP Mode used DMA channel 3.

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 new settings.

3.4 Power Management Setup

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

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

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

Power Management    : Disable      IRQ 3 (COM 2)        : ON
PM Control by APM   : Yes          IRQ 4 (COM 1)        : ON
Video Off Option    : Always On    IRQ 5 (Reserved)     : ON
Video Off Method    : V/H SYNC+Blank IRQ 6 (Floppy Disk): ON
                                   IRQ 7 (LPT 1)        : ON
                                   IRQ 8 (RTC,Alarm)    : OFF
    ** PM Timers **                IRQ 9 (IRQ2 Redir)   : ON
HDD Power Down      : Disable      IRQ 10 (Reserved)    : ON
Doze Mode           : Disable      IRQ 11 (Reserved)    : ON
Standby Mode        : Disable      IRQ 12 (PS/2 Mouse)  : ON
Suspend Mode        : Disable                  IRQ 13 (Coprocessor): ON
                                   IRQ 14 (IDE-1)       : ON
    ** PM Event **                 IRQ 15 (IDE-2)       : ON
VGA                 : OFF
FDD (3FXh)          : ON
LPT & COM           : LPT/COM      Esc : Quit        ↓↑→← : Select Item
HDD (1FXh & 17Xh)   : ON           F1 : Help      PU/PD/+/-: Modify
NMI                 : OFF          F5 : Old Values   (Shift)F2 : Color
                                   F6 : Load BIOS Defaults
                                   F7 : Load Setup Defaults
```

Figure 3-5 Power Management Setup Menu

2. 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:

Power Management

Options are as follows:

User Define	You define HDD and system power down times.
Disabled	Disables the Green PC Features. (Default)
Min Saving	Doze = 1 Hour Standby = 1 Hour Suspend = 1 Hour
Max Saving	Doze = 10 Sec Standby = 10 Sec Suspend = 10 Sec

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

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

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

HDD Power Down Choose a time interval from 1 to 15 minutes or "Disabled" (Default). 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.

Doze Mode The default setting is Disabled. When the Power Management item is switched to "User Define" you can select a time interval from 10 sec to 1 hour. When the set time elapses without activity the system enters Doze mode.

If the idle time for all PM events — NMI Activity, COM Ports Activity, LPT Porst Activity, HDD Ports Activity, IRQn 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 "Doze, Susp -- Off", the screen shuts off.

Standby Mode

The default setting is Disabled. When the Power Management item is switched to "User Define" you can select a time interval from 10 sec to 1 hour. 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 CPU speed slows down. If the "Video Off Option" is set to "Sus, Stby — Off", the screen will shut off.

Suspend Mode

The default setting is Disabled. When the Power Management item is switched to "User Define" you can select a time interval from 10 sec to 1 hour. 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 CPU speed slow down (SL enhanced CPUs drop to 0 MHz). If the "Video Off Option" is set to "Suspend — Off", the screen will shut off.

PM Events

There are several power Management events can be selected ---VGA, FDD, LPT & COM, HDD, NMI, IRQn. If Choose "ON" the event will be monitored.

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

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.

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 setting all PCI card INT jumpers at INT#A.

Xth 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.

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 IDE 2nd Channel Choose Disable or Enable (Default). If the 2nd channel is not used on the PCI IDE card, switch the option to "Disable". Or IRQ15 can not work on the ISA slots.

PCI IDE IRQ Map to 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 PCI 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.

CPU to PCI Write Buffer Choose Enabled or Disabled (Default). Improve the CPU to PCI write performance.

CPU to PCI Byte Merge Choose Enable (Default) or Disable. Improve the CPU to PCI write performance.

PCI to DRAM Buffer Choose Enabled (Default) or Disabled. Improve the PCI to DRAM read performance.

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. (Do not use them at the same time.)
"Slot1-INT#B", "Slot2-INT#A", and "Slot3-INT#D" are assigned to the same IRQ. (Do not use them at the same time.)
"Slot1-INT#C", "Slot2-INT#B", and "Slot3-INT#A" are assigned to the same IRQ. (Do not use them at the same time.)
"Slot1-INT#D", "Slot2-INT#C", and "Slot3-INT#B" are assigned to the same IRQ. (Do not use them 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>.

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 Setting Password

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 the CMOS RAM discharge jumper to clear the CMOS RAM. All setup information is lost and you must run the BIOS setup program again.

3.9 IDE HDD Auto Detection

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

3.10 HDD Low Level Format

This main menu item can preformat IDE Hard Disk and all data on the HDD will be destroy. Before your perfromt IDE Hard Disk, must change HDD Mode to "Normal"!

3.11 Standard types of hard disks

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

Chapter 4

IDE Device Driver installation

Improving HDD interface performance with various enhanced IDE PIO mode requires that both HDD and installed software driver support the PIO mode specified.

To support enhanced IDE, specific driver must be installed for various operating system to transfer data in enhanced mode. Installation procedure described as follow.

4.1 For Windows, MSDOS drivers

To install enhanced IDE device driver for WINDOWS, and MSDOS, please insert the released diskette into your floppy drive and run program : install

The following messages will show on screen :

```
    Setup utility for ALi IDE DOS/Windows driver V1.06
           (C) Copyright Acer Laboratories Inc.  1995.
```

```
  Driver mode                           Normal Mode
   VESA/PCI Local Bus Speed                 33MHz
 = = = = Automatical detect hardware configuration = = = =
  AUTO DETECT
 = = = = = = Secondary IDE Controller Information = = = = = = =
 = = = = = = = = = = = = = = = = = = = = = = = = = = = =
                                                        20MHz
   Secondary  Channel's  IRQ      IRQ                   25MHz
 = = = = = = = = = =TYPE   PIO    Blk    IO32   LBA     33MHz
   Pri-Master:   DISK    Auto   N/A    N/A    N/A       40MHz
 = = More = >                                           50MHz
                                                     User  keyin
                                                     = = End = =
```

```
 Up/Down - Change, Enter - Select, Escape - Exit & Save
```

Please assign the VESA/PCI local bus speed of you computer, example:
486DX-33, DX2-66, DX4-100 -> 33 MHz
486DX2-50, DX4-75, P24T-63 -> 25 MHz
486DX2-80, DX4-120 -> 40MHz

4.2 For Windows NT

To install device driver WINDOWS NT ..

1. From the Program Manager, double click on "Windows NT Setup" in the main group.
2. After Click on "Options", a submenu will appear. Select "Add/Remove SCSI Adapters".
3. The "SCSI Adapter Setup" box will appear. Click on Add. "Setup Message" box will appear. Just click "OK".
4. "Select SCSI Adapter Option" dialog will appear, select "Other (Requires a disk from a hardware manufacturer)" from the "Adapter:" list box.
5. Insert Disk "dialog box will appear, Insert the ALI IDE driver disk into drive A: or B: and type "A:\NT" or B:\NT into dialog box. Clock on "OK".
6. Click on "OK", when the "Select OEM Option" box appear.
7. "Select SCSI Adapter Option" will appear again, then click on "Install".
8. "Windows NT Setup" dialog box appear, click on "Continue".
9. If installation is successful, the "SCSI Adapter Setup" dialog box will reappear, and "Mxxxx 32-Bit Local Bus IDE Adaoter" will be listed as an installed driver.
10. Reboot your system to load the ALI IDE driver. Verify that it is working properly.
11. In order for the ALI IDE driver to work in best performance, you must specify your computer's VESA/PCI Local Bus clock soeed in MHz. Valid values are between 20 and 50.

Caution: Please use 50MHz(default) for Local Bus speed, if you are not sure of your VESA/PCI Local Bus clock speed.

Examples:

From the Program Manager, select File/Run and type in "REGEDT32".

In the HKEY_LOCAL_MACHINE subwindows, open the SYSTEM/CurrentControlSet/Services/ALIHDD/Parameters folder.

Double click on "LocalBusSpeed:REG_DWORD:0x32".
The "DWORD Edito box will appear. Enter your VESA /PCI Local Bus clock speed. Be sure to enter number in right radix before click "OK".

4.3 For OS/2

To install the IDE device driver, the OS/2 Device Driver install is used. Please follow the instructions below:

1. Insert the device driver floppy into floppy drive A.
2. Use mouse to execute the system-setup\Device Driver install.
3. Click the 'Change' under the 'Source directory'.
4. Select the A:\OS2 directory and click 'Set'.
5. Click the 'Install ...'.
6. If you are installing over the OS/2 V2.x, select the 'ALI IDE Device Driver for OS/2 V2.x'. If you are installing over the OS/2 V3.0, select the 'ALI IDE Device Driver for OS/2 V3.0'.
7. Click the "OK".
8. Click the "Exit" to exit from the Device Driver install.
9. Restart the OS/2 system.

Notice: a. After the installation of all IDE driver, please remark the original OS/2 IDE driver in CONFIG.SYS.
ie. In file Config.sys, please change the line:
     BASEDEV = IBM1S506.ADD
to
     REM BASEDEV = IBM1S506.ADD

b. The parameter '/CLK:' for ALI.ADD indicates the Bus Speed of your computer. Change this parameter to a proper value so that you can get the best performance of your IDE devices.

4.4 For SCO UNIX

To install device driver SCO UNIX ..

1. Boot your SCO UNIX system and bring it into signle user mode.
2. Install:

    Install
    # mkdir /alihdd
    # doscp a:/sco-unix/alihdd.tar /alihdd
    # cd /alihdd
    # tar xf - < alihdd.tar

    # ./istl.alihdd

3. when you see:
    Do you want to install the IDE disk driver
    with channel 0 and 1 share the IRQ 14?
4. Please answer "Y", if secondary channel share the IRQ 14 with primary channel. Otherwise, answer "N". Be careful, this driver will not work if answer the question incorrectly.
5. When you see:
    --- Please specify VESA/PCI Local Bus speed ---

    1)   20 MHz\n\
    2)   25 MHz\n\
    3)   30 MHz\n\
    4)   33 MHz\n\
    5)   40 MHz\n\
    6)   50 MHz\n\

6. Please assign the VESA/PCI local bus speed of you computer.
    Example:

    486DX-33   -> 33MHz
    486DX-40   -> 40MHz
    486DX-50   -> 50MHz
    486DX2-50   -> 25MHz
    486DX2-66   -> 33MHz
    486DX2-80   -> 40MHz

7. When you see:

    A new kernal must be built and rebooted.
    Would you like to relink at this time?"

    Press "Y".

4.5 For Windows 95

To install device driver Windows 95 ..

1. Popup "Control Panel" and open "Add New Hardware".
2. Choice "Next".
3. Switch to "No" - don't let Windows to search for your new hardware, and click the "Next".
4. Select "Hard disk controller" and click "Next".
5. Click the button "Have Disk" (or press Alt + H).
6. Make sure the install disk is in drive A (or drive B), and then click "OK".
7. A "Select Device" dialog box will be popup.
8. Select the device that you wish to install and click "Next".
9. After this install procedure is complete, you may need to restart the computer.

<u>PROBLEM REPORT FORM</u>   DATE: /   /

COMPANY NAME :   TEL:
CONTACT PERSON: FAX:

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

PROBLEM DESCRIPTION:

_____
_____
_____
_____
_____
_____
_____