LI7WM

Socket 370 810E Chipset
Custom LPX from Factor Motherboard

User's Manual

Version 1.0A

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Chapter 1 Introduction

This manual is designed to give you information on the LI7WM motherboard. It is divided into the following sections:

- **Introduction**
- **Specifications**
- **Hardware Description**
- **Configuring the Motherboard**
- **Installation**
- **BIOS and System Setup**
- **Audio Driver Installation Guide**
- **VGA Driver Installation Guide**
- **LAN Driver Installation Guide**
- **System Monitor Utility User's Guide**

Checklist

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- The LI7WM Motherboard with the BL7WM Riser Card
- 1 40-pin IDE ribbon cable (14 cm)
- 1 40-pin CD-ROM ribbon cable (8 cm)
- 1 34-pin FDD ribbon cable (20 cm)
- 1 16-pin game port cable

Chapter 2 Specifications

The LI7W is a high-performance Intel Celeron (PGA370)/ Pentium® III motherboard that offers flexibility in terms of CPU frequency and bus speeds. The main features of the motherboard consist of the following:

CPU Socket

PGA370 Socket

Processor

Intel Celeron (PGA370) and Pentium III (FC-PGA370).
300MHz~1GHz

L2 Cache

CPU integrated L2 cache

Chipset

Intel 810E (GMCH in 421 BGA and ICH in 241 BGA)

Year 2000 Compliant BIOS

The onboard Award BIOS is Year 2000 Compliant and will pass software applications that have the tendency to invoke INT1AH function 04H such as year 2000.exe utility released by NSTL. The BIOS comes with ISA Plug and Play (PnP) extension, DMI, bootable CD-ROM and power-management features.

Power Connector

ATX power supply connector (*Use an ATX power supply with 3.3V power.*)

Onboard Audio

Onboard AC97 Codec with external connectors for Line out, Line in, Mic, and Game port.

Onboard VGA

The highly integrated graphics accelerator consists of dedicated multimedia engines executing in parallel to deliver high performance 3D, 2D and motion compensation video capabilities. The 3D and 2D engines are managed by a 3D/2D pipeline preprocessor allowing a sustained flow of graphics data to be rendered and displayed. It als o features a 4MB display cache buffer. Onboard TV-out connectors support S-VHS and RCA specifications.

TV-Out

Chrontel's CH7007 digital PC to TV encoder is a stand-alone integrated circuit which provides a PC 99 compliant solution for TV output. Suggested for application use with the Intel 810 chipset and Intel 810E chipset, it provides a universal digital input port to accept a pixel data stream from a compatible VGA controller (or equivalent) and converts this directly into NTSC or PAL TV format.

Expansion Slots on Riser Card BL7WM

Two PCI 32-bit slots

Panel Link Support

The Sil154 transmitter uses PanelLink® digital technology to support display ranging from VGA to SXGA resolutions (25-112MPps) in a single link interface. The Sil154 transmitter has a highly width 12-bit (1/2 pixel) or 24-bit 1 pixel /clock input for true color (16.7 million) support. In 24-bit mode, the data may be latch on the positive or negative edge of the clock. In 12-bit mode, multiple clocking options exist: with a signal clock, data will be clocked on the falling and the rising edge; with dual clocks data can be clocked on either the falling edge of the rising edge of both clocks.

Onboard Ethernet Controller

The onboard Intel 82559B Ethernet controller is compatible with both the traditional 10Mbps and advanced 100Mbps LAN facilities. An RJ45 connector and Wake on LAN are supported by LI7WM.

DMI BIOS Support

Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size.

PCI Bus Master IDE Controller (Ultra DMA/33)

Supports two connectors for up to four IDE devices in two channels such as ATAPI Tape Backup and CD-ROM drives, PIO Mode 3/4 and Bus Mastering Ultra DMA/33/66 Hard Disk Drives.

Super I/O

Winbond 83627 HF with 1x ECP, 1x IrDA, 2x UART, 1xfdc, 3x fan, speed monitoring and 7x voltage monitoring and 2x temperature monitoring.

Keyboard and Mouse Connectors

PS/2 type

USB Connector

2 ports onboard

Win95/98 shut-off

Allows shut-off control from within Windows 95/98

Modem-ring-on

Supports PC powering on through an external modem.

Board Dimensions

11.91" x 11.80" (30.3cm x 30.0cm)

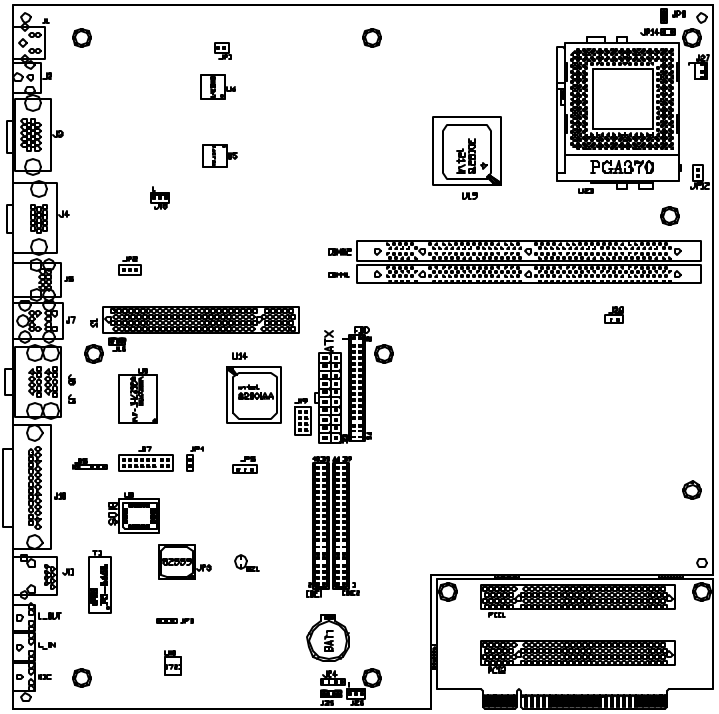


Figure 1: Layout of the LI7WM Motherboard

Chapter 3 Hardware Description

This chapter briefly describes each of the major features of the LI7WM motherboard. The layout of the board in Figure 1 shows the location of the key components. The topics covered in this chapter are as follows:

3.1 Processor.....11
3.2 L2 Cache.....11
3.3 BIOS.....11
3.4 Main Memory.....9
3.5 I/O Port Address Map.....9
3.6 DMA Channels.....9
3.7 Onboard PCI-IDE.....10
3.8 Interrupt Request (IRQ) Lines.....10
3.9 Onboard Multi-I/O.....11
3.10 Onboard VGA.....11
3.11 Onboard Audio.....12
3.12 Onboard Ethernet Controller (option).....13
3.13 Hardware Monitoring IC.....13

3.1 Processor

The LI7WM motherboard is designed to take a Intel 810E processor running from 300/ 333/ 366/ 400/ 433/ 466/ 500/ 533/ 566/ 600 to 633MHz at 66MHz CPU bus speed or 550/ 600/ 650/ 700/ 750/ 800/ 850/ 900/ 950MHz at 100MHz CPU bus speed or 600/ 666/ 733/ 800/ 866/ 933 at 133MHz CPU bus speed with its Socket 370 processor connector.

3.2 L2 Cache

The L2 cache is integrated in the Intel 810E processor. The private L2 cache bus is not connected to package pins; rather its signals are routed between the two cavities using standard package techniques.

3.3 DMA Channels

There are seven DMA channels available on the motherboard. Only DMA2 is used by the floppy controller. In the case that ECP mode on the parallel port is utilized, DMA1 or DMA3 will be used.

3.4 BIOS

The BIOS on the LI7WM motherboard provides the standard BIOS functions plus the following additional feature:

Power Management

The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen and stopping the HDD spindle motor. The BIOS fully conforms to ACPI (Advanced Configuration and Power Interface) specification.

3.5 Onboard Multi-I/O

Onboard AC97 Codec with external connectors for Line out, Line in, Mic, and Game port.

3.6 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K port address space available. The following table lists the I/O port addresses used on the motherboard.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock,, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
378h - 3FFh	Parallel Port #1(LPT1)
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

3.7 Onboard PCI-IDE

The PCI-IDE controller is a part of the Intel 810E chipset. It supports PIO mode 3/4 and bus mastering Ultra DMA/33 and DMA/66. The peak transfer rate of PIO mode 3/4 can be as high as 17MB/sec. Using HDDs that support Ultra DMA/33, the peak transfer rate can reach 33 and 66MB/sec. There are two IDE connectors - primary IDE and secondary IDE. With two devices per connector, up to four IDE devices can be supported.

3.8 Main Memory

The LI7WM motherboard supports two 168-pin DIMM (Dual In-line Memory Module) sockets to form a memory configuration from 64MB to 512MB. DIMM modules can be 64M and 256MB in SDRAM. In populating the DIMM sockets, any socket can be populated first. Refer to the following table on how to do the memory configuration.

(DIMM1)	(DIMM2)	Total Memory
64MB	-----	64MB
128MB	-----	128MB
64MB	64MB	128MB
128MB	64MB	192MB
128MB	128MB	256MB
256MB	64MB	320MB
256MB	128MB	384MB
256MB	256MB	512MB

3.9 Interrupt Request (IRQ) Lines

There are a total of 15 IRQ lines available on the motherboard. Peripheral devices use an interrupt request to notify the CPU for the service required. The following table shows the IRQ lines used by the devices on the motherboard:

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah or PCI Slot Int#
IRQ10	Reserved or PCI Slot Int#
IRQ11	Reserved or PCI Slot Int#
IRQ12	PS/2 Mouse or PCI Slot Int#
IRQ13	Co-Processor
IRQ14	Primary IDE
IRQ15	Secondary IDE
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Parallel Port #2 or PCI Slot Int#
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1

3.10 Onboard VGA

The Intel 810E chipset is the result of new design approach to optimize the shared memory architecture while maintaining the cost benefits of integration through Direct AGP and Dynamic Video Memory Technology.

a. Direct AGP

Direct AGP delivers AGP class graphics performance to PCs at reduced cost. Rather than simply combining two semiconductor cell libraries for component reduction, Intel architects combined the 2D and 3D video capabilities with the memory control unit. This functional overlap within the Graphics and Memory Controller (Intel® 82810E) enables Direct AGP. Direct AGP provides an integrated graphics part with the capability to make direct memory set-up calls (similar to those associated with standard AGP protocol) to system memory. Direct AGP calls can dynamically allocate and de-allocate system memory for complex 3D textures, preserving the benefits of standard AGP add-in solutions.

b. Dynamic Video Memory Technology

Dynamic Video Memory Technology (DVMT) enables breakthrough graphics and memory performance for all PC segments through Direct AGP and highly efficient memory use. DVMT ensures the most efficient use of all available memory – regardless of whether a frame buffer is present or the size of the main memory– for maximum 3D graphics performance. DVMT also responds to application requirements by automatically allocating the proper amount of display and texturing memory. For example, a 3D application might require more texture memory to enhance the richness of 3D objects. The operating system (OS) views the Intel 810 and 810E chipset driver as an application which uses Direct AGP to request re-allocation of additional memory for 3D applications and returns memory when not required. DVMT is highly scalable — as additional memory is added to the system, more memory will be available to enhance 3D applications. DVMT works dynamically and modulates the bandwidth available to the CPU, graphics and I/O interface, through the intelligent arbitration built into the Intel 82810E. This hard-coded logic evaluates the operating environment and prioritizes traffic to maximize bandwidth for memory intense multimedia applications.

c. Memory Usage with DVMT

The operating system requires allocation of up to 1Mbyte of system memory to support legacy VGA. System properties will display up to 1Mbyte less than physical system memory available to the operating system. The graphics driver for the Intel 810E/810 chipsets configurations will request up to 4Mbyte of memory from the OS to implement a maximum 1024 x768 screen resolution, 2Mbyte for a command buffer and 4Mbyte used for zbuffering. For high-end 3D applications, the drivers request allocation of system memory from the OS for graphics textures. When the 3D application is closed, the O/S will re-allocate system memory back for generic use.

3.11 TV-Out

Chrontel's CH7007 digital PC to TV encoder is a stand-alone integrated circuit which provides a PC 99 compliant solution for TV output. Suggested application use with the Intel 810 chipset and Intel 810E chipset. It provides a universal digital input port to accept a pixel data stream from a compatible VGA controller (or equivalent) and converts this directly into NTSC or PAL TV format.

3.12 Panel Link Support

The Sil154 transmitter uses PanelLink® digital technology to support display ranging from VGA to SXGA resolutions (25-112MPps) in a single link interface. The Sil154 transmitter has a highly with 12-bit (1/2 pixel) or 24-bit 1 pixel /clock input for true color (16.7 million) support. In 24-bit mode, the data may be latch on the positive or negative edge of the clock. In 12-bit mode, multiple clocking options exist: with a signal clock, data will be clocked on the falling and the rising edge; with dual clocks data can be clocked on either the falling edge of the rising edge of both clocks.

3.13 Onboard Ethernet Controller

The onboard Intel 82559B Ethernet controller features the following:

- PCI local bus
- IEEE802.3u auto-negotiation for automatic speed selection
- 10/100Mbps operation in a single port PCI bus master architecture
- Wake On LAN function support

Chapter 4 Configuring the Motherboard

The following sections describe the necessary procedures and proper jumper settings to configure the LI7WM motherboard. For the locations of the jumpers, refer to Figure 2.

4.1 CPU Frequency Selection 15

4.2 Clear CMOS Select: JP5 15

4.3 Onboard Audio Enable/ Disable: JP2 16

4.4 Onboard Lan Enable/ Disable: JP3.....16

The following examples show the conventions used in this chapter.

	Jumper Open
	Jumper Closed/Short

4.1 CPU Frequency Selection

Setting CPU Speed in the BIOS Setup

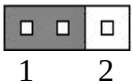
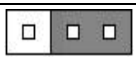
The LI7WM motherboard allows users to set the CPU speed through the BIOS Setup. The parameters used in configuring the CPU speed include *CPU Clock Multiplier* (X3, X3.5, X4, X4.5, X5, X5.5, X6, X6.5, X7, X7.5, X8) and *CPU Clock* (66MHz, 68MHz, 75MHz, 83MHz or 100MHz, 103MHz, 112MHz, 133MHz).

In the initial setup, the system automatically detects the base Frequency of the CPU (66MHz or 100MHz/133MHz). Under the under *CPU Speed Setting* section, use the ↑ and ↓ keys to easily change the CPU speed or press the PageUp or PageDown key to see more options.

Overclocking could cause the system not to boot in the process of setting the CPU speed. When this happens, turn off the computer by pressing the power button and turn it on again by pressing the **Insert** key and the power button simultaneously. When the system is turned on, press the **Delete** key to enter BIOS Setup and configure the CPU speed.

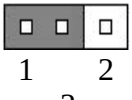
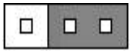
4.2 Clear CMOS Select: JP5

Use JP5, to clear the contents of the CMOS RAM. Do not clear the CMOS RAM unless it is absolutely necessary. Before clearing CMOS, you should disconnect the ATX-power connector from the motherboard.

JP5	Jumper Setting	Function
	pin 1-2: short	Clear CMOS
	pin 2-3: short	Normal

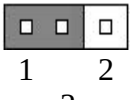
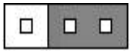
4.3 JP2: Onboard Audio Enable/Disable

Onboard AC '97 codec support the Audio function. Please refer to the default jumper setting before you proceeding with system installation.

JP2	Jumper Setting	Function
	pin 1-2: short	Onboard Audio Disabled
	pin 2-3: short	Onboard Audio Enabled

4.4 JP3: Onboard Lan Enable/Disable

JP2, a 3-pin header, is the onboard Intel 82559B Ethernet controller. Please refer to the default jumper setting before you proceeding with system installation.

JP3	Jumper Setting	Function
	pin 1-2: short	Onboard LAN Disabled
	pin 2-3: short	Onboard Audio Enabled

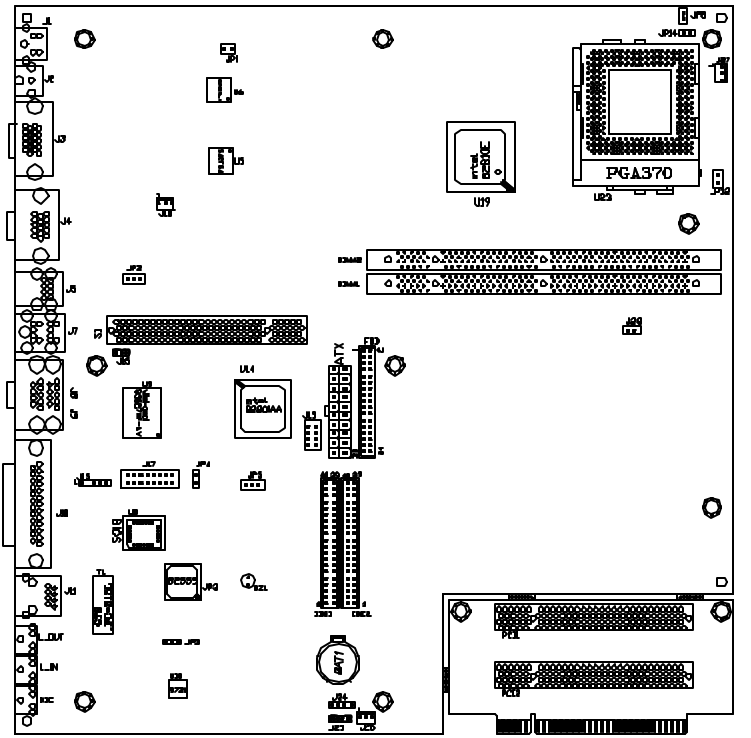


Figure 1: Layout of the LI7WM Motherboard

Chapter 5 Installation

This chapter describes the interface that the LI7WM provides for creating a working system. Refer to Figure 3 for the location of the connectors.

The following items are covered in this chapter:

5.1 I/O Connectors 20
5.2 J1: S-VHS Connector 20
5.3 J2: RCA Connector 20
5.4 J3: Panel Link Connector 21
5.5 J4: CRT Connector 21
5.6 J5: USB Connector 22
5.7 J6/J7: PS/2 Keyboard and PS/2 Mouse Connectors 22
5.8 J8/J9: Serial Ports 23
5.9 J10: Parallel Port Connector 23
5.10 J11: RJ45 Connector 24
5.11 J12, J13, J14: Line Out, Line In, Mic Connectors 24
5.12 J15: IrDA Connector 24
5.13 J16: WOL(Wake On Lan)Connector 24
5.14 J17: Game Port Connector 25
5.15 J18: Chassis Fan Power Connector 25
5.16 J19: Front Bezel Connector 25
5.17 J20: ATX Power Supply Connector 26
5.18 J21: Floppy Drive Connector 26
5.19 J22, J23: IDE1 and IDE2 Connectors 27
5.20 J24, J25: CD-ROM Audio In Connectors 28
5.21 J26: Chassis Fan Power Connector 28
5.22 J27: CPU Fan Power Connector 28
5.23 J28: Reset Switch 28

5.24 JP1: TV-Out: PAL/NTSC 29
5.25 JP2: Onboard Audio In Connector 29
5.26 JP3: Onboad Lan Enable/ Disable 29
5.27 JP4: Boot Block Lock/Unlock 30
5.28 JP5: Clear CMOS Select 30
5.29 S1: BL7WM Riser Card Connector 30

5.1 I/O Connectors

The I/O connectors connect the LI7WM to the most common peripherals. To attach cables to these connectors, carefully align Pin 1 of the cables to that of the connectors. Refer to Figure 4 for the location and orientation of the connectors.

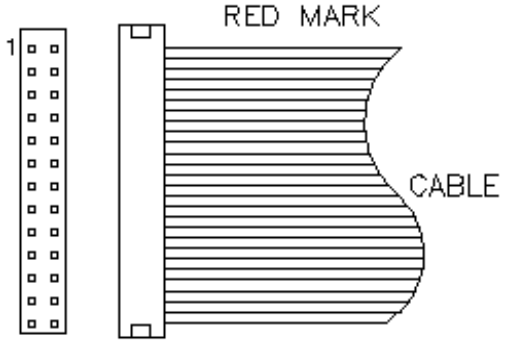
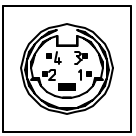


Figure 4: Orientation of the I/O Connector

5.2 J1: S-VHS Connector

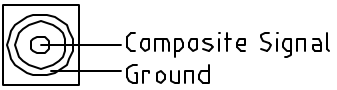
The J1 S-VHS connector is for the TV-Out feature of the onboard VGA controller. Below are the pin-out assignments of the connectors.



Pin #	Signal Name
1	Ground
2	Ground
3	Luma Output
4	Chroma Output

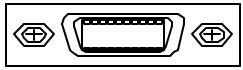
5.3 J2: RCA Connector

The J2 RCA connector is for the TV-Out feature of the onboard VGA controller.



5.4 J3: Panel Link Connector (option)

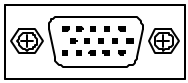
Below are the pin-out assignments of the connectors.



Signal Name	Pin #	Pin #	Signal Name
TXOUT 1+	1	11	TXOUT 2+
TXOUT 1-	2	12	TXOUT 2-
Ground	3	13	Ground
Ground	4	14	Ground
TXCLKOUT+	5	15	TXOUT 0+
TXCLKOUT-	6	16	TXOUT 0-
Ground	7	17	No Connect
Vcc	8	18	Panel detection
No Connect	9	19	Panel ID SDA
No Connect	10	20	Panel ID SCL

5.5 J4: CRT Connector

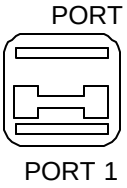
J4 is a DB-15 VGA connector. The following table shows the pin-out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
Ground	5	6	Ground
Ground	7	8	Ground
+5V	9	10	Ground
N.C.	11	12	Monitor ID SDA
HSYNC	13	14	VSYNC
Monitor ID SCL	15		

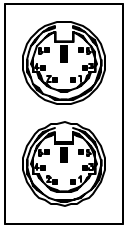
5.6 J5: USB Connector

J5 is the standard USB external connector consisting of two ports. USB support allows connections of up to 64 plug and play external peripherals per channel. The following table shows the pin outs of these ports.



Pin #	Signal Name
1	Vcc
2	USB-
3	USB+
4	Ground

5.7 J6/J7: PS/2 Keyboard and PS/2 Mouse Connectors

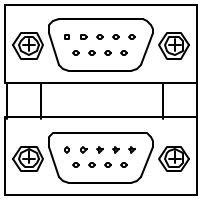


Below are the pin-out assignments of the connectors.

Signal Name	Keyboard	Mouse	Signal Name
Keyboard data	1	1	Mouse data
No Connect	2	2	No Connect
Ground	3	3	No Connect
5V	4	4	5V
Keyboard clock	5	5	Mouse Clock
No Connect	6	6	No Connect

5.8 J8/J9: Serial Ports

The onboard serial ports of the LI7WM are two DB-9 external connectors.

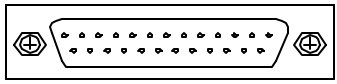


The table below shows the pin-out assignments of these connectors.

Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	6	DSR, Data set ready
RXD, Receive data	2	7	RTS, Request to send
TXD, Transmit data	3	8	CTS, Clear to send
DTR, Data terminal ready	4	9	RI, Ring indicator
GND, ground	5	10	Not Used

5.9 J10: Parallel Port Connector

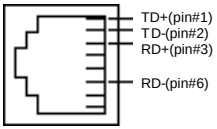
J10 is a DB-25 external connector as seen in the above figure. The following table describes the pin-out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

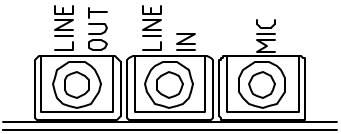
5.10 J9: RJ45 Connector (option)

This connector is for the 10/100Mbps Ethernet capability of the CPU card. The figure below shows the pin out assignments of this connector and its corresponding input jack.



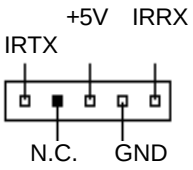
5.11 J10, J11, J12: Line Out, Line In, Mic Connectors

The Line Out (J12), Line In (J13) and Mic (J14) connectors, as shown in the figure below, are used in conjunction with the audio function of the onboard audio controller.



5.12 J15: IrDA Connector

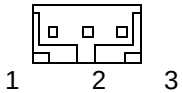
This connector is used for an IrDA connector that supports infrared wireless communication.



Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

5.13 WOL(Wake on LAN) Connector: J16

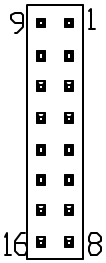
J16 is a 3-pin header for the Wake on LAN function. Wake on LAN will function properly only with an ATX power supply with 5VSB that has 200mA.



Pin #	Signal Name
1	+5VSB
2	Ground
3	Wake on LAN

5.14 J17: Game Port Connector

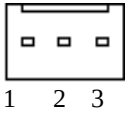
J17 is a 16-pin header connector for the game port cable that comes with the motherboard. It is part of the functions provided by the onboard audio controller.



Signal Name	Pin #	Pin #	Signal Name
Vcc	1	9	Vcc
JOY4	2	10	JOY6
JOYTIME0	3	11	JOYTIME2
Ground	4	12	MIDI OUT
Ground	5	13	JOYTIME3
JOYTIME1	6	14	JOY7
JOY5	7	15	MIDI IN
Vcc	8	16	No Connect

5.15 J18: Chassis Fan Power Connector

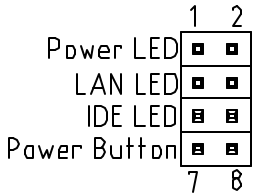
J26 is a 3-pin header for the chassis fan power connector. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

5.16 J19: Front Bezel Connectors

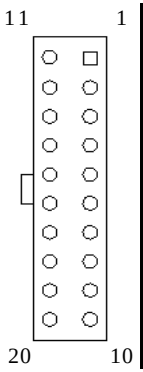
The front bezel of the case has a control panel that provides light indication of the computer activities and switches to change the computer status. J19 is an 8-pin header that provides the interfaces.



Pin #	Signal Name
1	+5V
2	Ground
3	5VSB
4	LAN Active LED
5	+5V
6	IDE LED
7	Ground
8	Power Button

5.17 J20: ATX Power Supply Connector

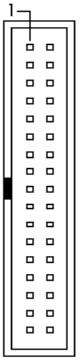
J20 should be used with an ATX power supply with 3.3V specification. Refer to the table below for the pin out assignments.



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

5.18 J21: Floppy Drive Connector

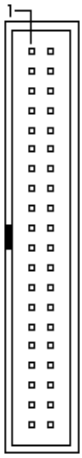
J21 of the LI7WM is a 34-pin header and will support up to 2.88MB floppy drives. The following table shows its pin-out assignments.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

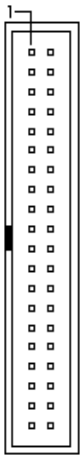
5.19 J22, J23: IDE1 and IDE2 Connectors

J22: Primary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	Cable ID
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

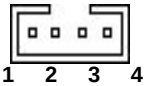
J23: Secondary IDE Connector



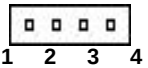
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
MIRQ0	31	32	No connect
Address 1	33	34	Cable ID
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

5.20 J24, J25: CD-ROM Audio In Connectors

J25 and J26 are the onboard CD-ROM audio in connectors. Below are their pin assignments.



J25

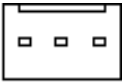


J24

Signal Name	Pin #	Pin #	Signal Name
Ground	1	1	Right
Left	2	2	Ground
Ground	3	3	Ground
Right	4	4	Left

5.21 J26: Chassis Fan Power Connector

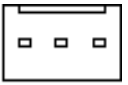
J26 is a 3-pin header for the chassis fan power connector. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

5.22 J27: CPU Fan Power Connector

J27 is a 3-pin header for the CPU fan power connector. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

5.23 J28: Reset Switch

The reset switch allows the user to reset the system without turning the main power switch off and then on again.

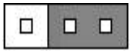
5.24 JP1: TV-Out: PAL/ NTSC

Chrontel's CH7007 digital PC to TV encoder is a stand-alone integrated circuit which provides a PC 99 compliant solution for TV output. It provides a universal digital input port to accept a pixel data stream from a compatible VGA controller (or equivalent) and converts this directly into NTSC or PAL TV format. Below are their pin assignments.

JP1	Function	JP1	Function
 On	PAL	 Off	NTSC

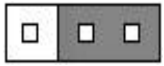
5.25 JP2: Onboard Audio In Connector

JP2, a 3-pin header jumper, is used to enabled/disabled Onboard Software audio. Please refer to the following pin assignment.

JP2	Jumper Setting	Function
 1 2 3	pin 1-2: short	Onboard Audio Disabled
 1 2 3	pin 2-3: short	Onboard Audio Enabled

5.26 JP3: Onboard LAN Enable/Disable

JP3 supports the function of 82559B chip. The table below shows the pin assignments of this connector.

JP5	Setting	LAN Function
 1 2 3	Pin 1-2	Enabled
 1 2 3	Pin 2-3	Disabled

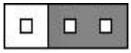
5.27 JP4: Boot Block Lock/Unlock

When the Boot Block is locked, BIOS flash update cannot be executed.

JP4	Function	JP4	Function
 On	Boot Block Unlock	 Off	Boot Block Locked

5.28 JP5: Clear CMOS Select

Use JP5, a 3-pin header, to clear the contents of the CMOS RAM. Do not clear the CMOS RAM unless it is absolutely necessary. You will lose your password, etc.

JP5	Jumper Setting	Function
 1 2 3	pin 1-2: short	Clear CMOS
 1 2 3	pin 2-3: short	Normal

Follow the steps below to clear CMOS data.

1. Disconnect the AC power cord.
2. Short JP12 (1-2) and wait for 3 seconds.
3. Short JP12 (2-3) and replace the AC power cord.
4. Turn on the system.

5.29 S1: BL21PI Riser Card Connector

J17 is a slot connector for the BL21PI riser card that comes with the LI7WM motherboard. The riser card comes with one PCI slot.

Chapter 6 BIOS and System Setup

This chapter describes the different settings available in the Award BIOS. The topics covered in this chapter are as follows:

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6.1 BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Celeron processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

6.2 BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

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

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

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

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. Another section at the bottom of the Main Menu just below the control keys section displays information on the currently highlighted item in the list.

NOTE: *After making and saving system changes with Setup, you find that your computer cannot boot, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

6.3 Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Standard CMOS Features

Date (mm:dd:yy)	Tue, Mar 26 1999	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master	Press Enter 13020 MB	Change the day, month,
IDE Primary Slave	Press Enter None	Year and century
IDE Secondary Master	Press Enter None	
IDE Secondary Slave	Press Enter None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is:

Hour	**:**	**00 to 23**
Minute :		**00 to 59**
Second :		**00 to 59**

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors
SIZE :	Automatically adjust according to the configuration

The Access Mode selections are as follows:

Auto	
Normal	(HD < 528MB)
Large	(for MS-DOS only)
LBA	(HD > 528MB and supports Logical Block Addressing)

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

NOTE: *The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in these fields. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.*

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

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

6.4 Advanced BIOS Features Setup

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Advanced BIOS Features

Virus Warning	**Disabled**	ITEM HELP
CPU Internal Cache	Enabled	Menu Level
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Allows you choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	LS/ZIP	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up Numlock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	Yes	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

NOTE: *Many disk diagnostic programs, which attempt to access the boot sector table, can cause the virus warning. If you will run such a program, disable the Virus Warning feature.*

CPU Internal Cache / External Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are ***Enabled***.

CPU L2 Cache ECC Checking

This field enables or disables the ECC (Error Correction Checking) checking of the CPU level-2 cache. The default setting is ***Enabled***.

Quick Power On Self Test
When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS/ZIP*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *LAN* and *Disable*.

Boot Other Device
These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks. By default, this field is set to ***Enabled.***

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system. By default, the system boots up with ***NumLock*** On.

Boot Up System Speed
This has no function and selects the default system speed ***(High).***

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB. The default setting is ***Fast.***

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option
This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

OS Select for DRAM > 64MB
This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95
This option allows Windows 95 to share with other peripherals IRQ6, which is assigned to a floppy disk drive if the drive is not exist.

6.5 Advanced Chipset Features Setup

This Setup menu controls the configuration of the motherboard chipset.

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Advanced Chipset Features

SDRAM CAS Latency Time	Auto	ITEM HELP
SDRAM Cycle Time Tras/Trc	6/8	Menu Level
SDRAM RAS-to-CAS Delay	3	
SDRAM RAS Precharge Time	3	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Enabled	
Memory Hole At 15M-16M	Disabled	
CPU Latency Timer	Enabled	
Delayed Transaction	Enabled	
On-Chip Video Window Size	64MB	
* Onboard Display Cache Setting *		
CAS# Latency	3	
Paging Mode Control	Open	
RAS-to-CAS Override	By CAS# LT	
RAS# Timing	Fast	
RAS# Precharge Timing	Fast	

SDRAM CAS Latency Time
You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The choices are ***Auto***, ***2*** and ***3***.

SDRAM Cycle Time Tras/Trc
The settings available for the SDRAM Cycle Time Tras/Trc are *6/8* and *5/7*. The default setting is ***6/8***.

SDRAM RAS-to-CAS Delay
You can select RAS to CAS Delay time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The choices are ***2*** and ***3***.

SDRAM RAS Precharge Time
This option defines the length of time for Row Address Strobe is allowed to precharge. The choices are ***2*** and ***3***.

System BIOS Cacheable
The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable
The Setting *Enabled* allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

CPU Latency Timer
This field enable or disable the CPU latency timer. The default setting is ***Enabled***.

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

On-Chip Video Window Size
The setting choices for the On-Chip Video Window Size are *64MB* and *32MB*. By default, this option is set to ***64MB***.

Onboard Display Cache Setting
The default setting and optional setting for the onboard display cache functions are as follows:

CAS# Latency	3(default), 2(option)
Paging Mode Control	Open (default), Close (option)
RAS-to-CAS Override	by CAS# LT (default), Override (2)(option)
RAS# Timing	Fast (default), Slow (option)
RAS# Precharge Timing	Fast (default), Slow (option)

6.6 Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Advanced Chipset Features

On-Chip Primary PCI IDE	Enabled	ITEM HELP
On-Chip Secondary PCI IDE	Enabled	Menu Level
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Disabled	
Init Display First	PCI Slot	
AC97 Audio	Enabled	
AC97 Modem	Disabled	
IDE Block Mode	Enabled	
POWER ON Function	Button Only	
KB Power ON Password	Enter	
Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD, TxD Active	Hi, Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half (Full)	
Use IR Pins	IR, Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	
Game Port Address	201	
Midi Port Address	330	
Midi Port IRQ	10	

OnChip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate the channels.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 66Mb/sec with the Ultra DMA/66 feature. The options are *Auto* and *Disabled*.

USB Controller
The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

USB Keyboard Support
By default, the USB Keyboard Support field is set to ***Disabled***.

Init Display First
This field allows the system to initialize first the VGA card on chip or the display on the PCI Slot. By default, the *PCI Slot* VGA is initialized first.

AC97 Audio
By default, the AC97 Audio is set to ***Enabled***.

AC97 Modem
By default, the AC97 Modem is set to ***Disabled***.

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

POWER ON Function
This field allows powering on by the following methods:

Password	Keyboard 98
Hot KEY	BUTTON ONLY

Onboard FDD Controller
Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port
These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select
This field determines the UART mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

Onboard Parallel Port
The setting for this field are *378/IRQ7*, *278/IRQ5*, *2BC/IRA7* and *Disabled*. By default, the onboard parallel port is set to ***378/IRQ7***.

Onboard Parallel Port
The setting for this field are *378/IRQ7*, *278/IRQ5*, *2BC/IRA7* and *Disabled*. By default, the onboard parallel port is set to ***378/IRQ7***.

RxD, TxD Active
The settings for this field are *Hi,Lo, Lo,Hi, Lo,Lo,* and *Hi,Hi*.

IR Transmission Delay
By default, this field is set to ***Enabled***.

UR2 Duplex Mode
The settings available for this field are *Half* (default) and *Full*.

Use IR Pins
The settings for this field are *IR, Rx2Tx2* (default) and *RxD2, TxD2*.

PWRON After PW-Fail
In case of power failure, the system can be configured to power on or to remain off when the power returns. These two settings are ***Former-Sts*** and ***Off*** respectively. The default setting for this field is ***Off***.

Game Port Address
The settings for this field are *201* (default), *209* and *Disabled*.

Midi Port Address
The option settings for this field are *330, 300, 290* and *Disabled*. The default setting is ***330***.

Midi Port IRQ
The option settings for this field are *5* and *7*. The default setting is ***7***.

6.7 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn off video display after a period of inactivity.

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Power Management Setup

ACPI Function	Enabled	ITEM HELP
ACPI Suspend Type	S1 (POS)	Menu Level
Power Management	User Define	
Video Off Method	DPMS	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
Modem Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
Wake-Up by PCI Card	Disabled	
PW On by Modem/LAN	Enabled	
CPU Thermal-Throttling	62.5%	
Resume by Alarm	Disabled	
Date (of Month) Alarm	0	
Time (hh:mm:ss) Alarm	0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ[A-D] #	Disabled	

ACPI Function

This field allows you to enable or disable the ACPI (Advanced Configuration Power Interface) function on the motherboard. By default, this field is set to ***Disabled***

ACPI Suspend Type

The options for the ACPI Suspend Type field are *S1(POS)* and *S3(STR)*. The default setting for this field is ***S1(POS)***.
Note: The S3(STR) hardware is optional.

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min. (Default)

NOTE: *In order to enable the CPU overheat protection feature, the Power Management field should not be set to Disabled.*

Video Off Method
This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows the BIOS to control the video display card if it supports the DPMS feature.
Blank Screen	This option only writes blanks to the video buffer.

Video Off in Suspend
When enabled, the video is off in suspend mode. The default setting is ***Yes***.

Suspend Type
The settings for this field are *Stop Grant* (default) and *PwrOn Suspend*.

Modem Use IRQ
This field sets the IRQ used by the Modem. By default, the IRQ used is ***3***.

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.

Soft-Off by PWR-BTTN
This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds. The default value is ***Instant Off***.

Wake-Up by PCI Card
The settings for this field are *Enabled* and *Disabled* (default).

PWR On by Modem/LAN
This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

CPU Thermal-Throttling
The CPU Thermal Throttling function, by default, is set to 62.5%

Resume by Alarm
This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Reload Global Timer Events
The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

6.8 PNP/PCI Configuration

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
PnP/PCI Configurations

Reset Configuration Data	Disabled	ITEM HELP
		Menu Level
Resources Controlled By	Auto (ESCD)	
IRQ Resources	Press Enter	Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
PCI/VGA Palette Snoop	Disabled	

Reset Configuration Data
This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled By
The settings for this field are *Auto (ESCD)* (default) and *Manual*.

IRQ Resources
To configure the IRQ Resources, the *Resource Controlled By* field should be set to *Manual*.

PCI/VGA Palette Snoop
Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA Cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA Card.

6.9 PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

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PC Health Status

		ITEM HELP
CPU Warning Temperature	66°C/151°F	
Current System Temp.	32°C/89°F	
Current CPU Temperature	38°C/100°F	
Current CPUFAN Speed	4470 RPM	
Current AMR/PCI Speed	0 RPM	
Current Chassis FAN Speed	0 RPM	
VCCP(V)	1.98 V	
+1.8V(V)	1.76 V	
+3.3V (V)	3.34 V	
+ 5 V	4.97 V	
+12 V	11.91V	
-12 V	12.03V	
- 5 V	5.04 V	
VBAT (V)	3.50 V	
5VSB (V)	5.29 V	
Shutdown Temperature	75°C/167°F	

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware mo nitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help damage to the system that is caused by overheating.

6.10 Frequency/Voltage Control

This section shows the user how to configure the key components.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Frequency/Voltage Control

		ITEM HELP
Auto Detect DIMM/PCI Clk	Disabled	
Spread Spectrum	Disabled	Menu Level
Host CPU/PCI Clock	Default	
CPU Clock Ratio	X3	

Auto Detect DIMM/PCI Clk
The settings for this field are *Enabled* and *Disabled* (default).

Spread Spectrum
This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

Host CPU/PCI Clock
The Host CPU/PCI Clock has a default setting of ***Default*** which is either 66/33MHz or 100/33MHz as automatically detected by the system. The options are as follows: For CPU with 66MHz FSB, the options are *66/33MHz* (Default), 75*/37MHz*, and 80*/40 MHz*. For CPU with 100MHz FSB, options are *100/33MHz* (Default), *112/37MHz*, *117/39MHz*, *129/43MHz*, *133/33MHz*, *138/46MHz*, *140/35MHz*, 150/37*MHz*, *166/41MHz*, *180/30MHz*, *190/31MHz* and *200/33MHz*.

NOTE*: Overclocking could cause the system not to boot. When this happens, turn off the computer by pressing the power button and turn it on again by pressing the* ***Insert*** *key and the power button simultaneously. Then press the* ***Delete*** *key to enter BIOS Setup and configure the CPU speed.*

CPU Clock Ratio
The CPU Ratio, also known as the CPU bus speed multiplier, can be configured as *3*, *3.5*, *4*, *4.5*, *5*, *5.5*, *6*, *6.5*, *7*, *7.5*, and *8*.

The above setup is for Intel 810E chipset use only. For motherboards with Intel 810 (MI6WBML), the options for Spread Spectrum and Host CPU/PCI Clock are not available. An extra option is the **CPU Clock/SpreadSpectrum**. The setting for the CPU Clock is 66MHz~150MHz, while the settings for Spread Spectrum are off and on.

6.11 Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Load Fail-Safe Defaults

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	**Load Fail-Safe Defaults**
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	

6.12 Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

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Load Optimized Defaults

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	**Load Optimized Defaults**
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	

6.13 Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

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Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	**Set Supervisor Password**
Power Management Setup	**Set User Password**
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item

6.14 Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Save & Exit Setup

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	**Save & Exit Setup**
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	

6.15 Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

CMOS Setup Utility – Copyright © 1984-1999 Award Software
Exit Without Saving

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	

Chapter 7 Audio Driver Installation Guide

This chapter describe the audio driver installation procedure for the onboard Intel 810E + AC97. With a PCI Bus Mastering interface with DOS compatibility, it supports 32 voices wavetable, surround sound, 3D audio, and audio effects such as reverb and chorus. Creative Labs ES1373 uses single, shareable PCI interrupt and is AC97 compliant.

For normal operations and to maximize the audio functions of the motherboard, follow the audio driver installation procedure below.

Installing The Audio Drivers For Windows 95/98

For Analog Device AC97 Codec Audio Driver (CD Ver. 1.8)
If the CD that comes with your motherboard is Ver. 1.8, complete steps 1-4. If the CD is Ver. 1.9, run the **setup.exe** file which is located in the directory **\Intel\i810\sound\AD1881** of the CD and the Welcome screen will appear. (Refer to step 3.)

1. After you have installed Windows 95/98, install the Intel 82810 audio driver. Insert the driver disk provided with the mo therboard. Once it is inserted, the following screen appears.

1. 

2. Click **Intel M/B Drivers** and the following screen appears.

3. Click **Intel 82810 Drivers**, then **Intel 82810 PCI Multimedia Audio Driver**. When the Welcome screen appears, click **Next** to start copying files.

4. Confirm the remove command by clicking OK.

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Chapter 8 VGA Driver Installation Guide

This chapter describes the VGA onboard with the installation procedures necessary to take advantage of the features of the ATI 3D RAGE LT PRO. The topics covered in this chapter are as follows:

8.1 Introduction 63

8.2 Windows 95/98 Driver Installation 64

8.3 Windows NT 4.0 Driver Installation 66

8.1 Introduction

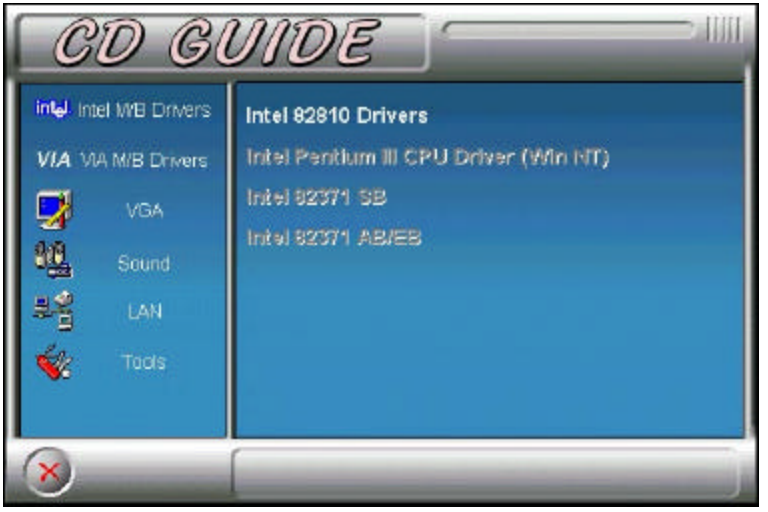
The onboard *ATI 3D RAGE LT PRO* utilizes AGP (Accelerated Graphics Port) bus to achieve rich 3D and video graphics display. It enables 3D graphics capabilities including support for z-buffering, alpha blending and faster texture mapping. Onboard TV-out connectors support S-VHS and RCA specifications. The unique features of the *3D RAGE LT PRO* are as follows:

- **TV-Out**. An integrated TV encoder with on-chip triple-DAC allows simultaneous CRT/LCD/TV output.
- Dual CRT Controller Support. Two independent CRT controllers support two asynchronous simultaneous displays (LCD/CRT, CRT/TV)
- **Floating-Point Set-up Engine**. The *3D RAGE LT PRO* integrates a floating-point set-up engine capable of processing up to 1.2 million triangles per second. By off-loading the set-up function from the CPU, allowing it to focus on 3D geometry and lighting transformation, the *3D RAGE LT PRO* dramatically improves the performance of the entire 3D pipeline.
- **DVD and Video Support**. DVD and video features include enhanced motion compensation acceleration and a 4-tap horizontal and 2-tap vertical high quality DVD video scaler, providing smooth images without the jagged edges common to today's video products. The scaler provides true color video display, independent of the graphics mode used.
- **AGP 2X mode**. With AGP 2X (133MHz) mode support, the *3D RAGE LT PRO* offers a peak bandwidth in excess of 500MB/s, which is twice the output of the AGP 1X (66MHz) mode. It also supports AGP's pipeline and sideband protocols that significantly improved the sustained bandwidth that is critical to the enhanced 3D and video performance.

8.2 Windows 95/98 Driver Installation

1. After you have installed Windows 95/98, install the Intel 82810 VGA driver. Insert the driver disk provided with the motherboard. Once it is inserted, the following screen appears.

2. Click **Intel M/B Drivers** and the following screen appears.



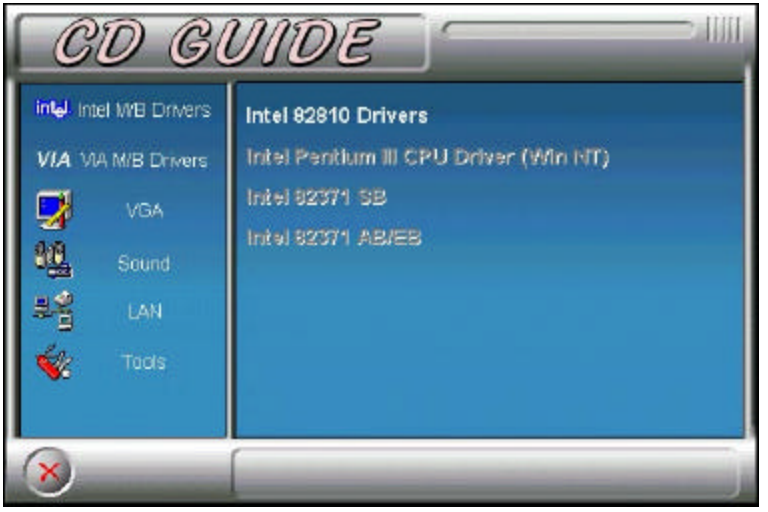
3. Click **Intel 82810 Drivers**, then **Intel 82810 VGA Driver**. When the Welcome screen appears, click **Next**.

4. When the Choose Destination Location window appears, click **Next** to start copying of files. After the files are copies, restart your computer for changes to take effect.

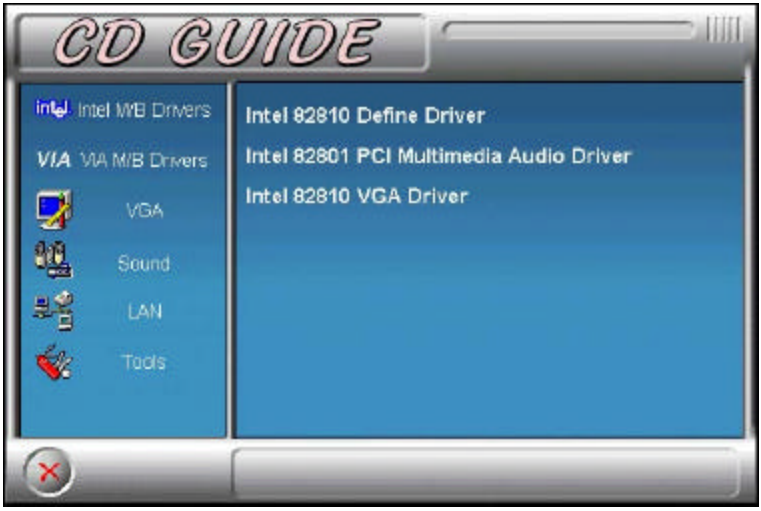
8.3 Windows NT 4.0 Driver Installation

1. After you have installed Windows NT, install the Intel 82810 VGA driver. Insert the driver disk provided with the motherboard. Once it is inserted, the following screen appears.

5. Click **Intel M/B Drivers** and the following screen appears.



6. Click **Intel 82810 Drivers**, then **Intel 82810 VGA Driver**. When the Welcome screen appears, click **Next**.



7. Click **Next** when the Welcome screen appears. Click **Yes** when the Software License Agreement screen appears. When the Choose Destination Location window appears, click **Next** to start copying of files. After the files are copies, restart your computer for changes to take effect.

Chapter 9 LAN Driver Installation Guide

This chapter gives a brief introduction to the Intel 82559B Fast Ethernet PCI controller.

The following items are covered in this chapter:

9.1 Introduction 69
9.2 Features 69
9.3 LAN Driver Installation for Windows 95/98.....70
9.4 LAN Driver Installation for Windows NT 4.0 82
9.5 Running Diagnostics.....83

9.1 Introduction

Intel 82559B is a 32-bit 10/100MBps Ethernet controller for PCI local bus-compliant PCs. It supports the bus mastering architecture, and Auto-negotiation feature which make it possible to combine one common type of Ethernet cabling – an RJ-45 connector for twisted-pair cabling that can be used for both 10Mbps and 100Mbps connection. Extensive driver support for commonly used network operating systems is also provided.

9.2 Features

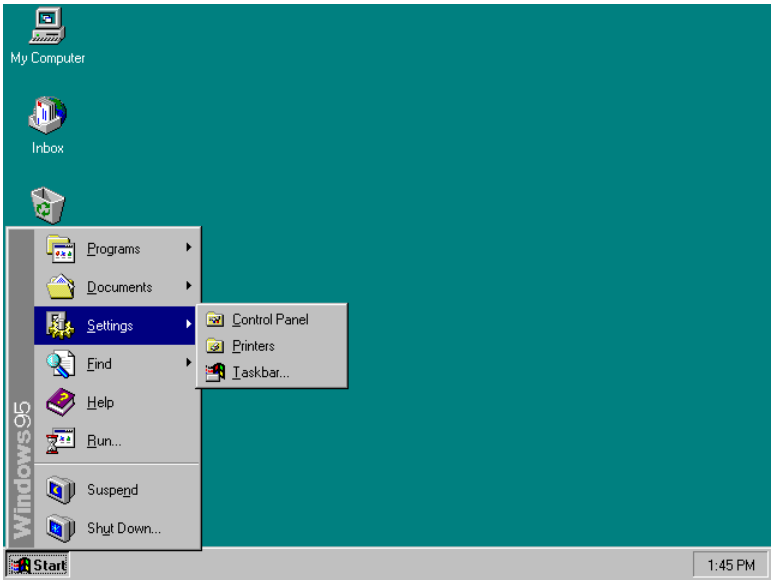
- Conforms to the Ethernet IEEE 802.3u standard
- Compatible with PCI Local Bus Revision 2.1 specification
- IEEE 802.3u Auto-Negotiation for automatic speed selection
- Supports Full-Duplex/Half-Duplex Operation
- Provides 32-bit bus mastering data transfer
- Supports 10Mbps and 100Mbps operation in a single port
- Supports remote wake-up (Magic Packet*) in APM and ACPI mode

* *Requires ATX power supply with 5VSB, 720mA*

9.3 LAN Driver Installation for Windows 95/98

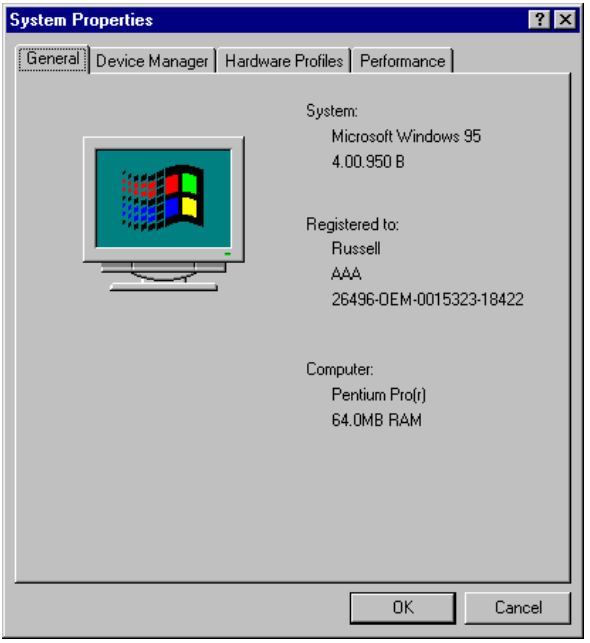
The LI7WM comes with a diskette labeled Intel 82559B LAN Windows 95/98 & Windows NT 4.0 Drivers that is to be used in conjunction with the LAN drivers installation. You must use the correct drivers in order for LAN to function properly. Follow the steps below to install the drivers for Windows 95.

1. Click Start Þ Select Settings Þ Select Control Panel.

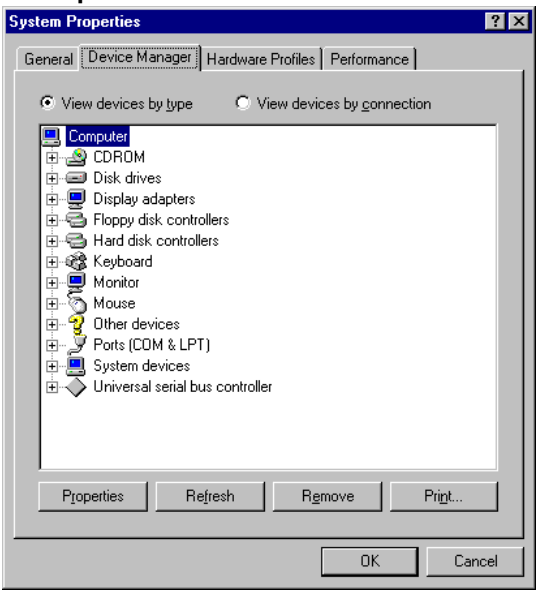


2. Click System.

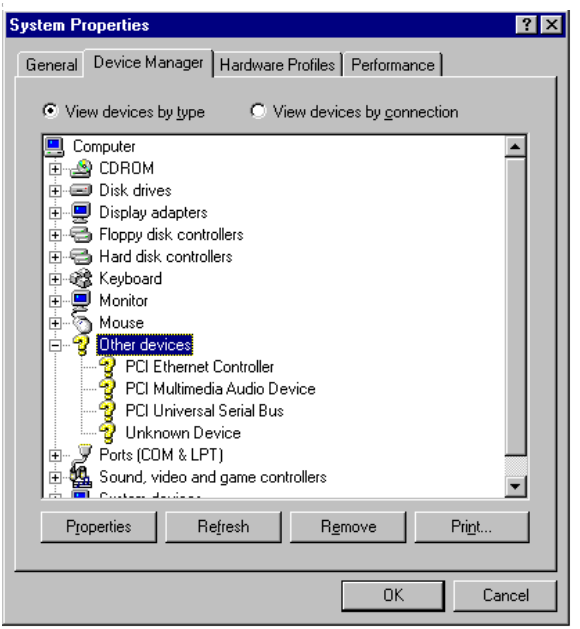
3. Click Device Manager.



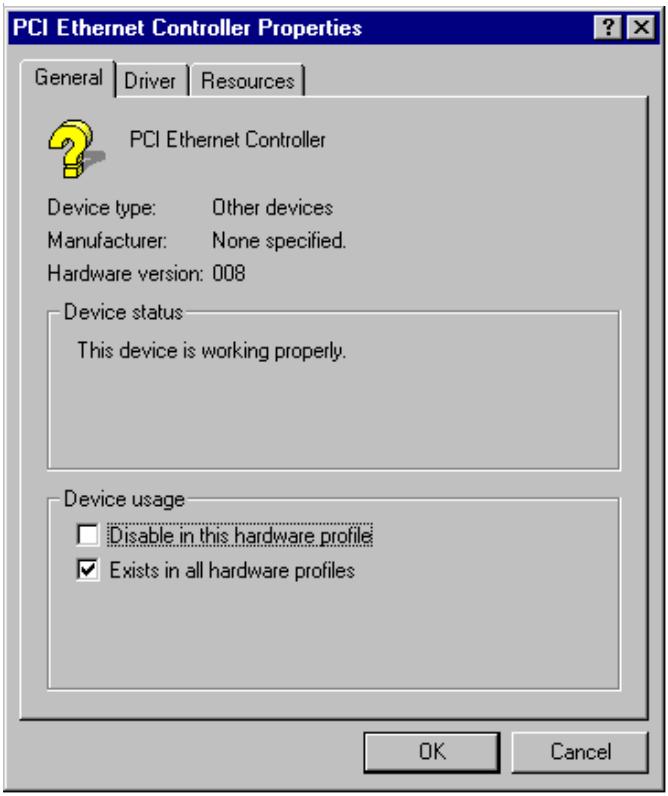
4. Expand Other Devices.



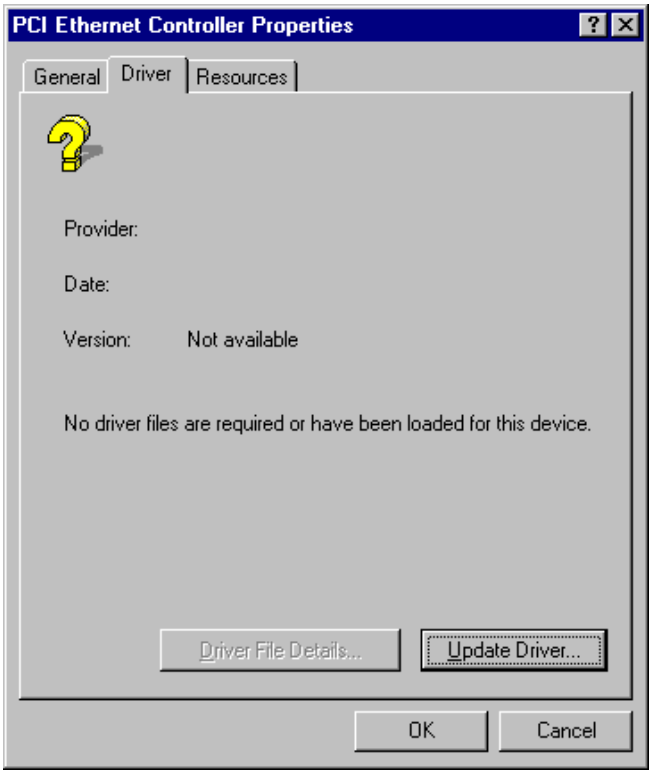
5. Select PCI Ethernet Controller, then click Properties.



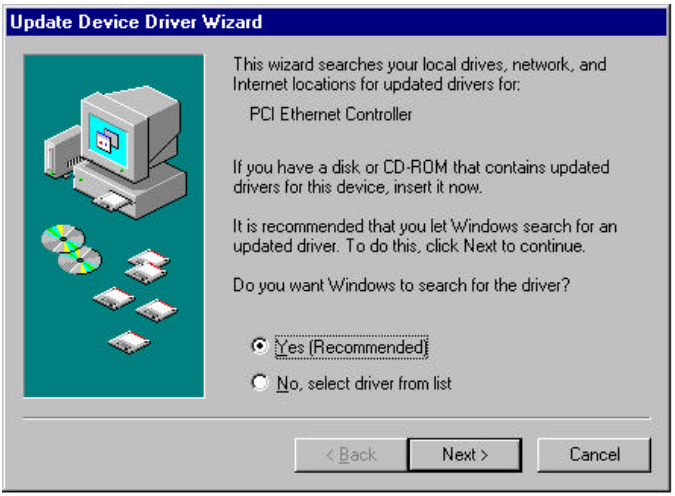
6. Click Driver.



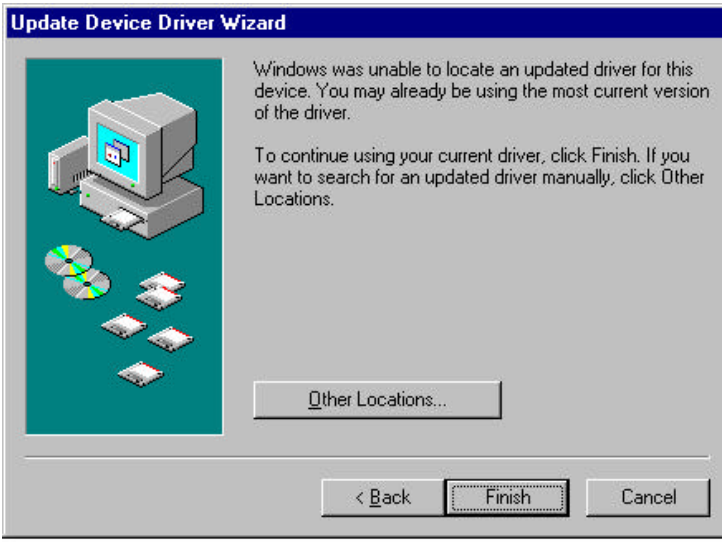
7. Click Update Driver.



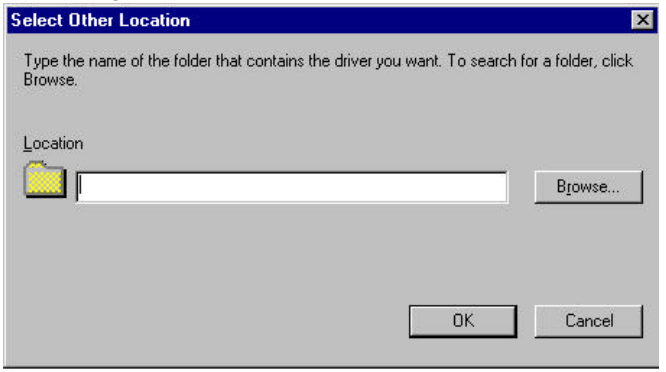
8. Insert the diskette labeled Intel 82559B LAN Windows 95 & 98 & Windows NT 4.0 Drivers into the floppy disk drive, then click Next.



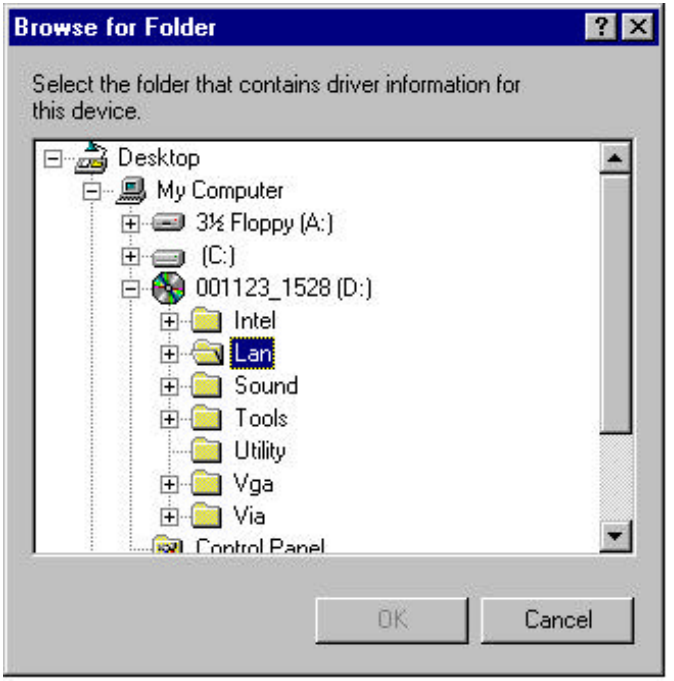
9. You have to select the Other Location in order to continue the process.



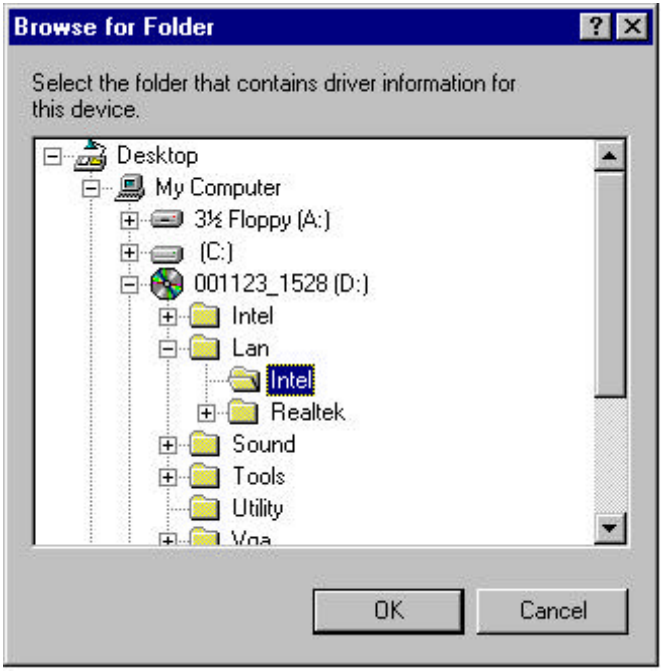
10. After select the Other Location, You need to look for your windows 95 CD ROM location and then type click OK. For example: d:\.



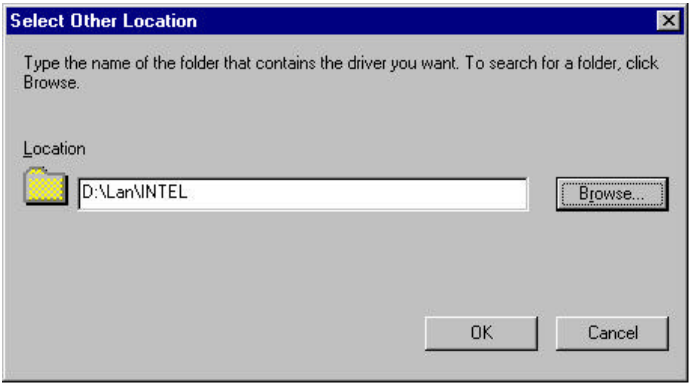
11. If you do not know how to type it, you can click browse and select LAN from your CD-ROM items.



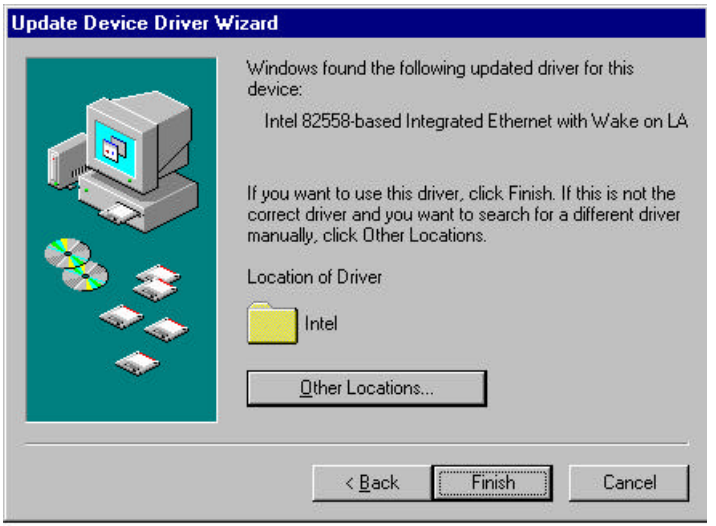
12. Choose Intel, and click OK.



13. Type correct the name of the folder and then, click OK.

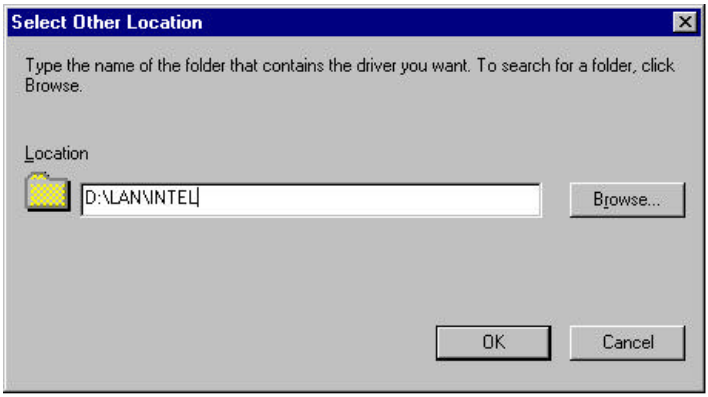


14. Click Other Location, You can find out the correct location; but if you select Finish, you will see the performance below.

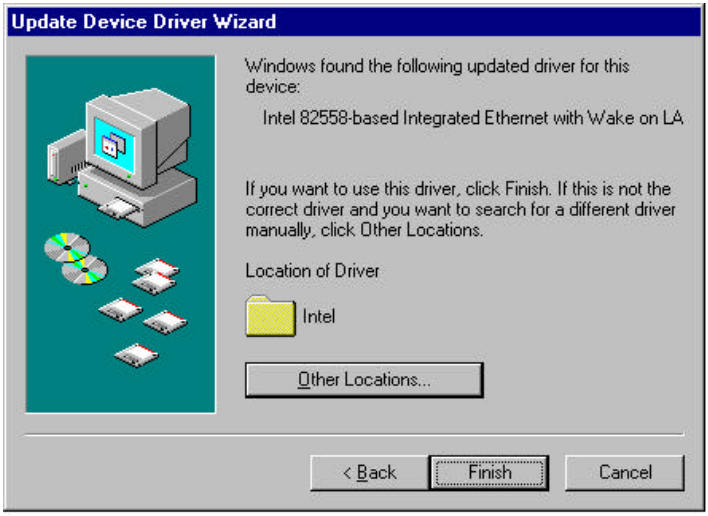


15. This performance present what you click FINISH from your computer.

16. Click OK.



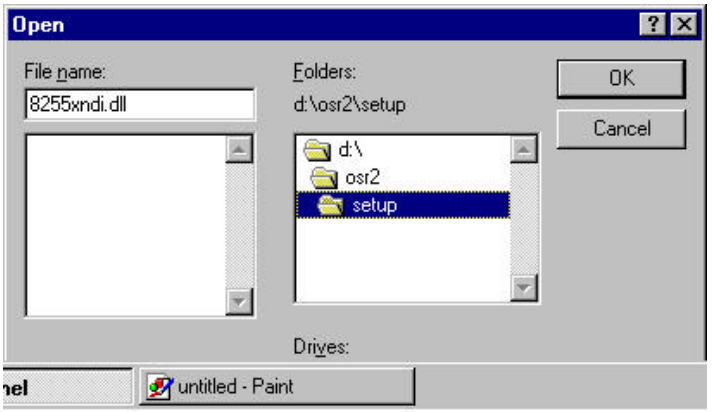
17. Click Finish.



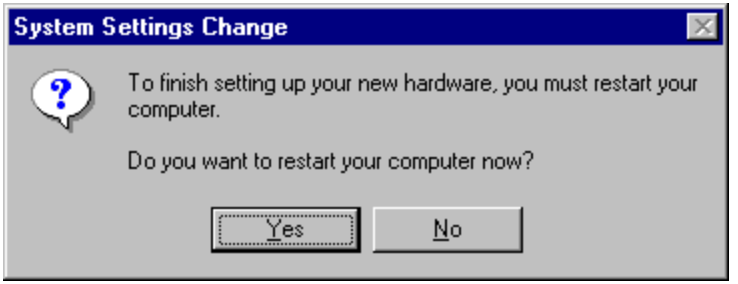
18. Insert the correct CD-ROM.

19. Click Browse.

20. Insert the WINDOWS 95 CD-ROM, click OK after you click setup twice.



21. Finally, Click Yes to restart the computer and for the settings to take effect.



9.5 LAN Driver Installation for Windows NT 4.0

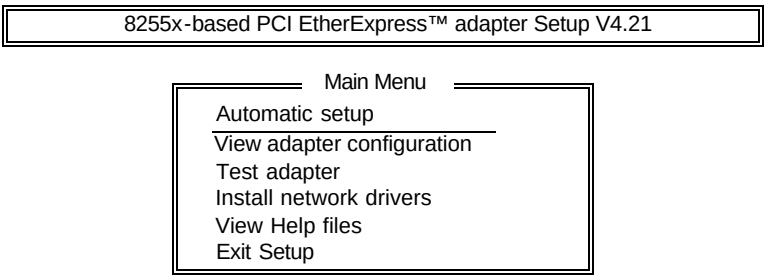
LI7WM comes with a diskette labeled Intel 82559B LAN Windows 95/98 & Windows NT 4.0 Drivers that is to be used in conjunction of the LAN drivers installation. Follow the steps below to install the drivers for Windows NT 4.0.

1. Click Start ⇒ Settings ⇒ Control Panel.
2. Click Network.
3. Click Yes.
4. Select Wired to the network, then click Next.
5. Click from the list.
6. Click Have Disk.
7. Insert the diskette labeled Intel 82559B LAN Windows 95/98 & Windows NT 4.0 Drivers into the floppy disk drive then click OK.
8. Click OK.
9. Click Next.
10. Select the Protocol that you want then click Next.
11. Select Network Services then click Next.
12. Click Next.
13. Insert the Windows NT 4.0 CD into the CD-ROM drive. For example: type d:\ then click Continue.
14. Click NO
15. Type your IP Address.
16. Click Next.
17. Click Next.
18. Type your Workgroup then click Next.
19. Click Finish.
20. Click Yes to restart the computer and for the settings to take effect.

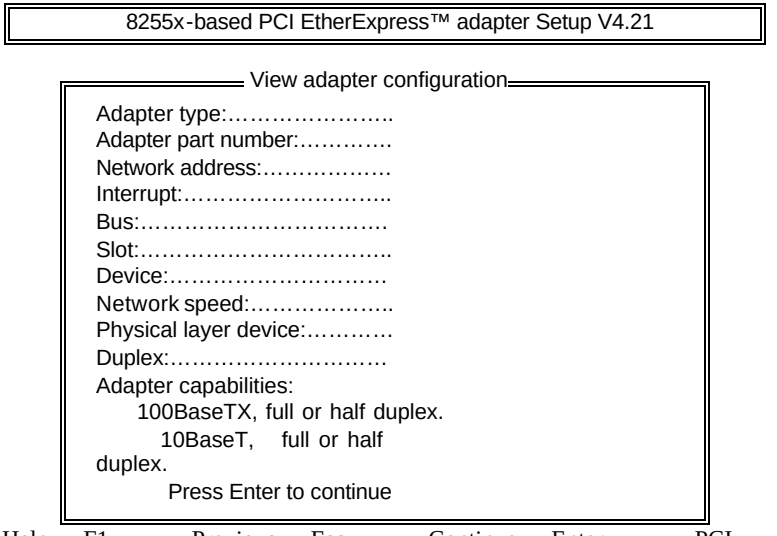
9.6 Running Diagnostics

The LI7WM comes with a diskette containing a diagnostic software supporting the Intel 82558B Ethernet controller. Follow the steps below to use the *Setup Utility*.

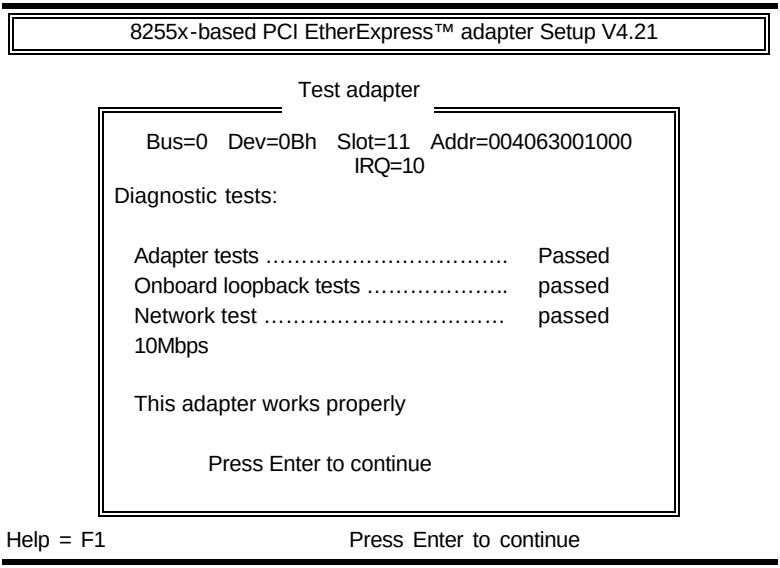
1. Run the file SETUP.EXE typing a:\setup in the DOS prompt, assuming your floppy disk drive is drive A. Upon doing so, the system starts the *Setup Utility* and shows the following screen.



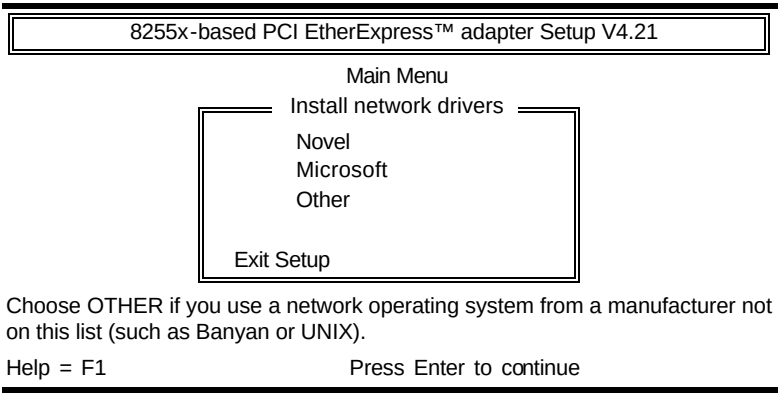
2. Selecting View adapter configuration will show the following.



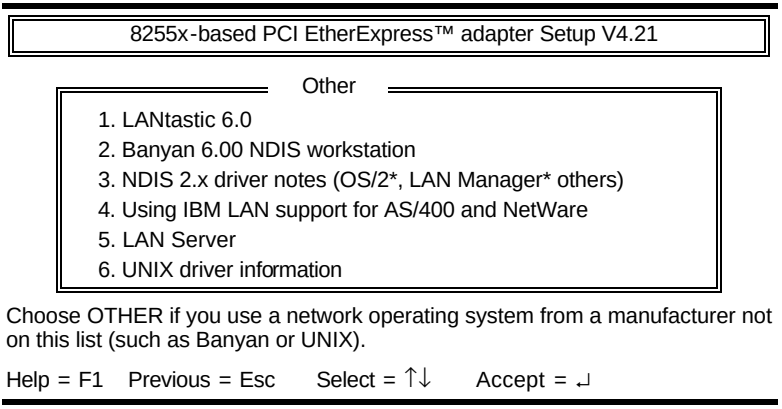
3. Selecting Test adapter will show the following screen.



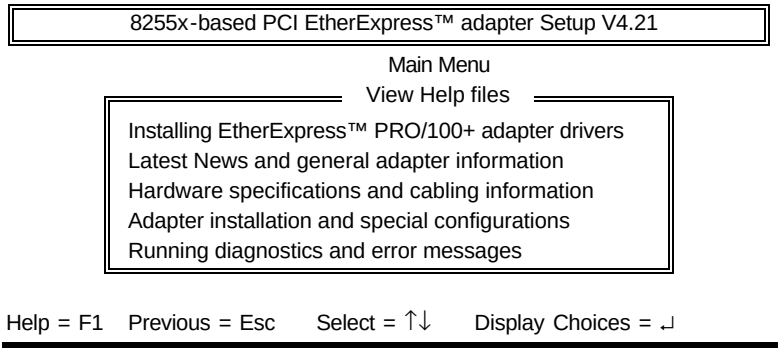
4. Selecting Install network drivers will show the following screen.



5. Upon selecting Others under the Install network drivers main menu screen, the following screen will appear.



6. Selecting View Help files under the Main menu will show the following screen.



Chapter 10 System Monitor Utility User's Guide

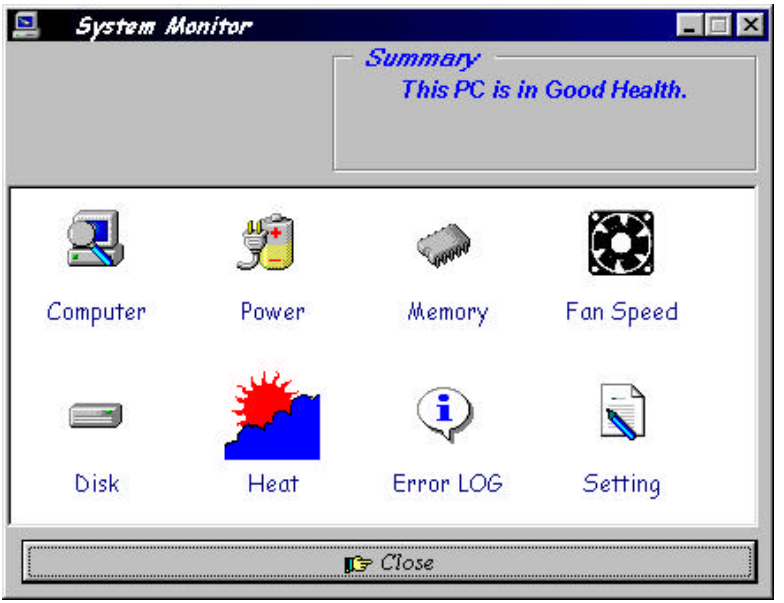
This chapter introduces System Monitor Utility that comes with the motherboard in conjunction with the onboard hardware monitoring IC. The sections below give the functions of the utility.

System Monitor is a software utility that oversees the general performance of systems, covering areas like system temperature, system voltage, CPU and system fan rotational speeds. If conditions become adverse, that is, when voltages are erratic or CPU temperature exceeds the safe limits, an alarm will be sounded; thereby preventing system crashing and ensuring overall stability.

NOTE: *System Monitor currently supports English and Chinese under Windows 95/98 and Windows NT. English will be used for other language environments.*

When System Monitor is initiated, the icon below appears in the task bar in the Windows environment.

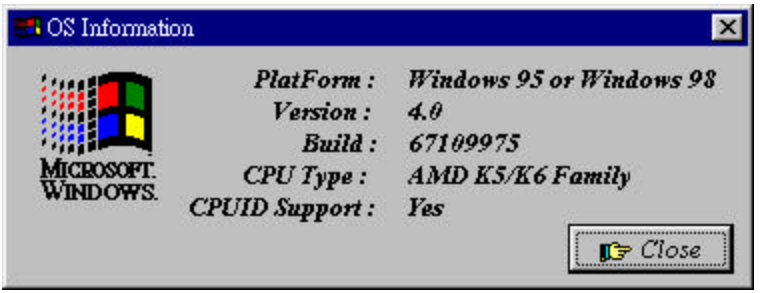
The following screen appears upon clicking on the System Monitor icon.



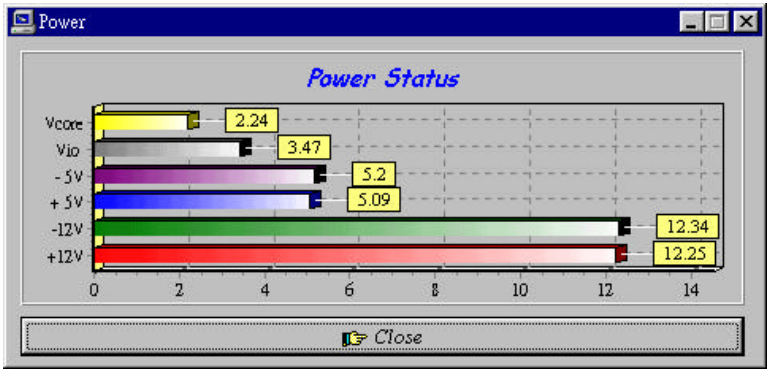
Clicking on the upper left corner button would show you the latest company information. "Summary" provides the current system status.

The section below describes the different functions of System Monitor.

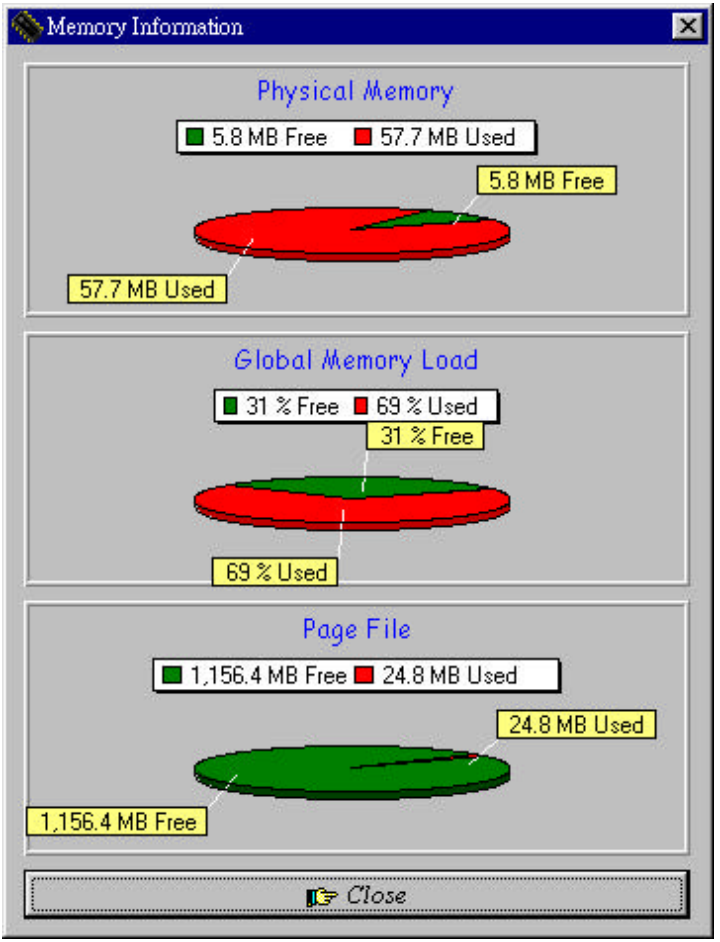
1. Computer - displays the current working system version and processor type.



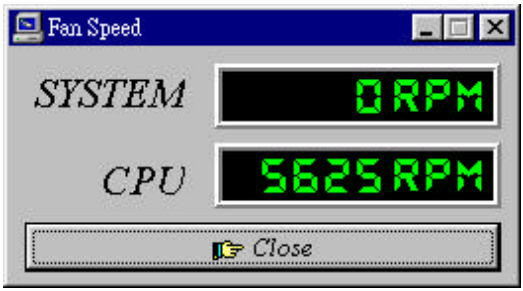
2. Power - displays the current voltage status.



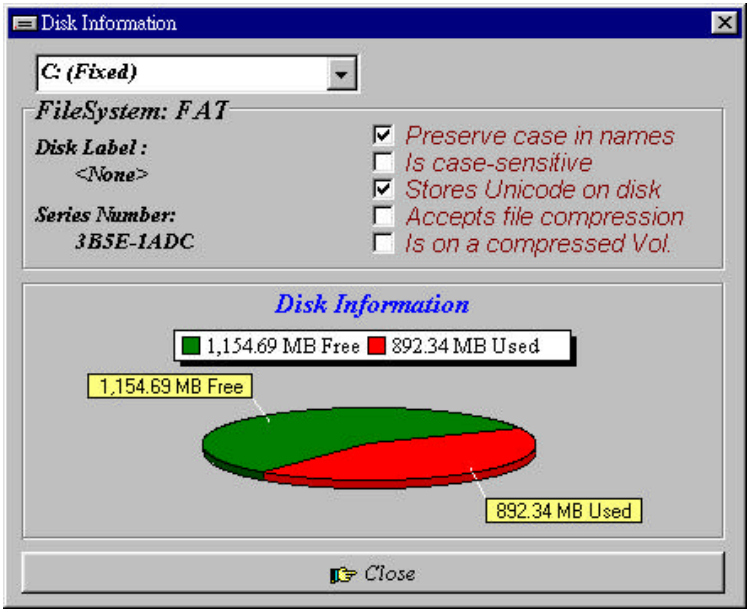
3. Memory - displays the current memory usage status.



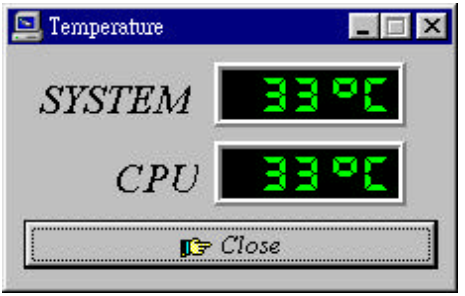
4. Fan Speed - displays the current rotational speeds of CPU and Chassis fans.



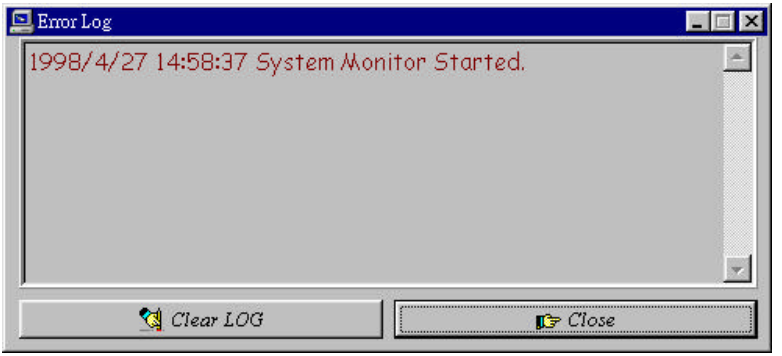
5. Disk - displays the supported disk formats and disk space.



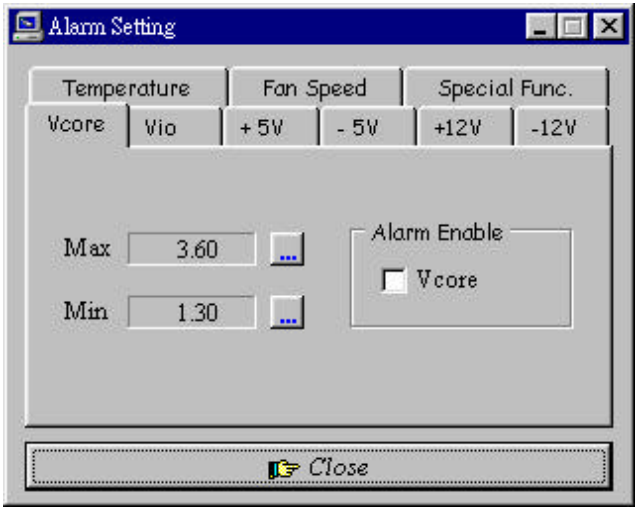
6. Heat - displays the CPU and system temperatures.



7. Error Log - displays errors occurring after System Monitor is started.



8. Setting - sets the values at which an alarm is sounded.



Voltage : the acceptable voltage range between the "MAX"

Temperature : temperature threshold.

Fan Rotation Speed : the minimum rotation speed.

NOTE: *Intel has defined a margin of difference for the voltages as below:*
12 Volts - 10% (10.8V ~ 13.2V)
5 Volts - 5% (4.75 ~ 5.25%)
Vio - 5% (Vio for P54C CPU is 3.5V. Vio for P55C is 3.3V.)
Vcore- 5%

WARNING: *Micro ATX power supplies do not support -5V voltage. DISABLE the alarm of this item after you have installed the System Monitor utility to prevent the system from sending a 'false' alarm.*

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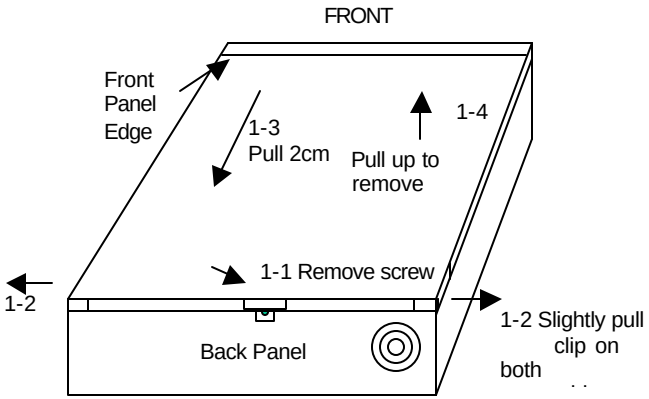
Chapter 11 LI7WM and the Databook Case

This chapter provides a step-by-step guide describing the procedure of installing the LI7WM motherboard into its databook case. Carefully read the instructions and follow the procedures one step at a time.

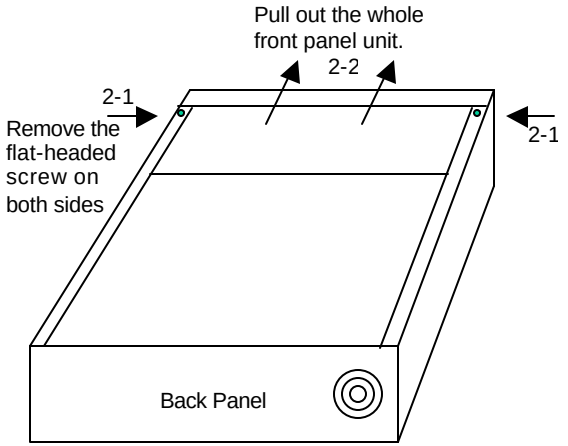
1. Removing top cover.
   1-1. Remove the middle upper screw at the back of the case.
   1-2. Slightly pull out the two clips on the two sides of the top cover. Make sure the clips are now 'unlocked' before proceeding to the next step.
   1-3. Pull the top cover towards the back of the case by 2cm.
   1-4. Remove the top cover in an upward direction.



2. Removing the front panel section.

2-1. Remove the two flat-head screws on the two front corners of the case.

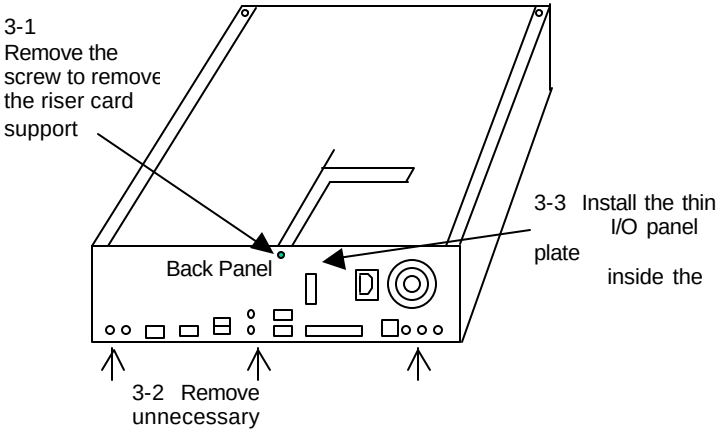
2-2. Pull out the whole front panel section. The front panel section has room for an FDD, HDD and CD-ROM drive.



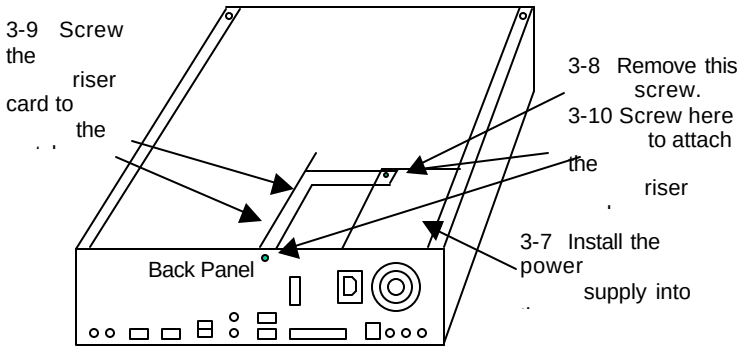
3. Installing the main components

3-1. Remove the riser card support by removing the screw from the back panel.

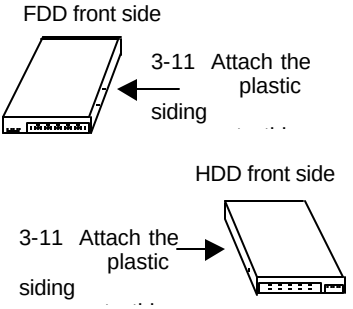
3-2. Remove unnecessary I/O cover plates from the back panel. Check the external I/O connectors on the motherboard to determine which plates should be removed.



3-3. Install the thin I/O panel plate inside the case. Be careful not to cut yourself in doing so. The thin metal plate has six protruding clips that should be inserted to their respective hole on the back panel.
3-4. Install the CPU retention module to the LI7WM motherboard.
3-5. Install the motherboard into the case.
3-6. Install the game port cable onto the motherboard (J17 header) and screw the connector onto the case.
3-7. Install the power supply onto the case.
3-8. Remove the power supply top screw diagonally opposite the corner of the case. This screw will be used to fix the riser card metal support.
3-9. Insert the BL21PI Riser Card onto the motherboard. Screw the card onto the riser card metal support.
3-10. Screw the metal support to the power supply. Use the screw that was remove from the power supply as mentioned in 3-8.



3-11. Screw the FDD plastic siding onto the left side of the floppy disk drive. Refer to the figure on the next page. Note that the FDD plastic siding has six holes on it while the HDD plastic siding has two holes. **Make sure to use the small-thread 'mm' screws for the FDD and CD-ROM drives and use the big-thread 'inch' screws for HDD drive to avoid damage to the drives.**
3-12. Install the floppy disk drive into the front panel unit.



3-13. Screw the HDD plastic siding onto the right side of the hard disk drive.

3-14. Install the hard disk drive and CD-ROM into the front panel unit.

3-15. Install the CPU.

3-16. Install the front panel unit back to the case.

3-17. Connect the cables for FDD, HDD, CD-ROM, and mini cables for HDD LED, power LED, LAN LED and reset switch.

3-18. Screw the front panel section back to the case. Refer to 2-1.

3-19. Return the top cover with a gap of 1cm (**Do not exceed 1cm.**) between it and the front panel edge. Refer to 1-3.

3-20. Press down the top cover and push it to the front until the two clips on the sides of the cover lock in place. Refer to 1-2.

3-22. Stick the four base supports supplied to the designated points at the bottom side of the case.

4. Installing an additional PCI expansion card.

4-1. Remove the top cover. Refer to sections 1-1 ~ 1-4.

4-2. Remove the left-side screw at the back of the case and the small plate. And then remove either one of the expansion slot cover.

4-3. Install the PCI expansion card.

4-4. Return the left-side plate and its screw.

4-5. Screw the PCI card into place