

HS-7000

PGA 478 Pentium® 4

Industrial Single Board Computer

- Full-size • All-in-One • CRT • ATA/33/66/100 •
- Three LAN • Audio • PC/104 • IrDA • USB •
- DOC • WDT • H/W Monitor •
- PICMG Bus Industrial Single Board computer •

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Safety Instructions

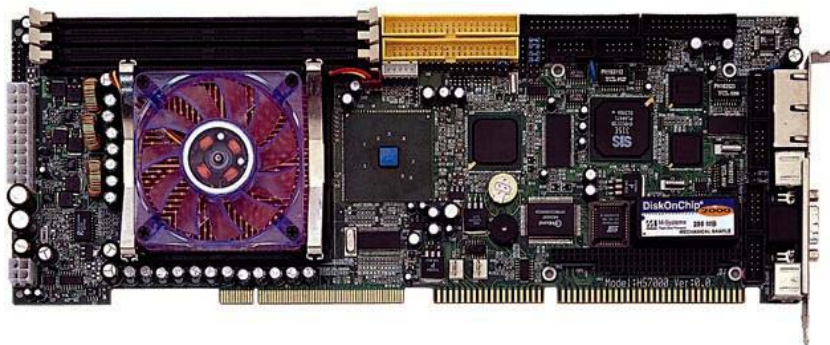
Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components. Fasten the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please wear and connect the strap before handle the HS-6252 to ensure harmlessly discharge any static electricity through the strap.
- Please use an anti-static pad when putting down any components or parts or tools outside the computer. You may also use an anti-static bag instead of the pad. Please inquire from your local supplier for additional assistance in finding the necessary anti-static gadgets.

NOTE: *DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.*

Chapter 1

General Description



The HS-7000 is an Intel® 82845 chipset-based board designed for PICMG Bus PGA 478 Intel® Pentium® 4 1.2~2.2GHz CPU compatibility. These features combine and make the HS-7000 an ideal all-in-one industrial single board computer. Additional features include an enhanced I/O with CRT, three LAN and 2 COM ports interface.

Its onboard ATA/33/66/100 to IDE drive interface architecture allows the HS-7000 to support data transfers of 33, 66 or 100MB/sec. to each IDE drive connection. Designed with the Intel® 82845 core logic chipset, the board supports all PGA 478 Pentium® 4 CPU series operating at 1.2GHz to 2.2GHz. The CRT display controller is SiS 315E with 16MB or 32MB memory supporting 3D display.

System memory is also sufficient with the three DIMM sockets that can support up to 1.5GB.

Additional onboard connectors include an advanced USB and IrDA ports providing faster data transmission, a DOS-compatible DiskOnChip™ socket with a maximum capacity of 288MB, and two external RJ-45 or three internal 5x2 connectors for 10/100 Base-TX Ethernet use.

To ensure the reliability in an unmanned or standalone system, the Watchdog Timer (WDT) onboard HS-7000. If any program causes unexpected halts to the system, the onboard Watchdog Timer (WDT) will automatically reset the CPU or generate an interrupt to resolve such condition.

1.1 Major Features

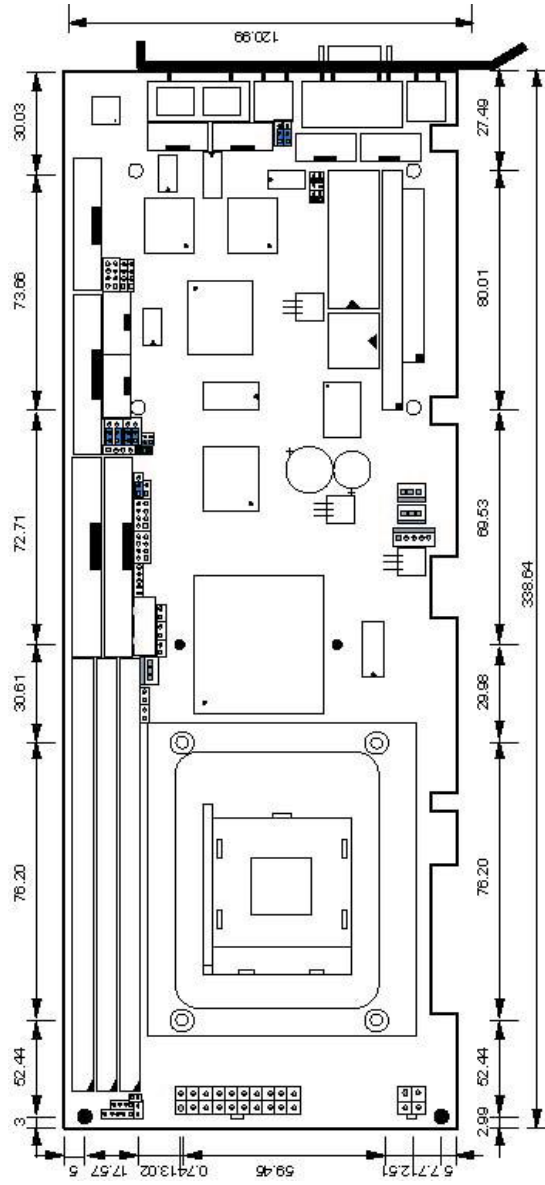
The HS-7000 comes with the following features:

- PGA 478 for Intel® Pentium® 4 1.2~2.2GHz CPU
- Three DIMM sockets providing up to 1.5GB
- Fast PCI ATA/33/66/100 IDE controller supporting four IDE disk drives
- One RS-232 and one RS-232/422/485 serial ports with 16-byte FIFO
- One enhanced bi-directional parallel port supporting SPP/ECP/EPP modes
- Onboard PS/2 Keyboard and PS/2 Mouse connectors
- Onboard Winbond 83627 super I/O chipset
- SiS 315E with 16MB or 32MB memory supporting 3D display
- Two Intel® 82559 and Intel® 82562 10/100 Based three LAN
- DiskOnChip™ memory size up to 288MB
- PC/104 Bus connector

1.2 Specifications

- **CPU:** PGA 478 for Intel® Pentium® 4 1.2~2.2GHz CPU
- **Bus Interface:** PICMG Bus
- **Memory:** Three DIMM sockets providing up to 1.5GB
- **Chipset:** Intel® 82845/82801BA
- **I/O Chipset:** Winbond 83627
- **VGA:** SiS 315E with 16MB or 32MB memory supporting 3D display
- **IDE:** Four IDE disk drives supporting ATA/33/66/100 and with transfer rates of up to 33/66/100MB/sec.
- **FDD:** Supports up to two floppy disk drives
- **Parallel:** One enhanced bi-directional parallel port supporting SPP/ECP/EPP
- **LAN:** Two Intel® 82559 and one Intel® 82562 10/100 Based LAN
- **Audio:** AC97 3D audio controller
- **Serial Port:** 16C550 UART-compatible RS-232 x 1 and RS-232/422/485 x 1 serial ports with 16-byte FIFO
- **PC/104:** PC/104 connector for 16-bit ISA Bus
- **IrDA:** One IrDA TX/RX header
- **USB:** Four USB connectors
- **Keyboard:** PS/2 6-pin Mini DIN or 5-pin connector
- **Mouse:** PS/2 6-pin Mini DIN
- **DiskOnChip™:** DiskOnChip™ socket supporting memory sizes of up to 288MB
- **BIOS:** AMI PnP Flash BIOS
- **Watchdog Timer:** Jumper selectable for system Reset and NMI; software programmable time-out intervals from 1~256 sec.
- **CMOS:** Battery backup
- **Fuse:** Automatically resumes poly switch resettable fuse
- **DMA Channels:** 7
- **Interrupt Levels:** 15
- **Power Connector:** One 4-pin and one 20-pin ATX power connector
- **Operating Temperature:** 0~60°C
- **Hardware Monitor:** Winbond W83627
- **Board Size:** 33.6 x 12.1 cm

1.3 Board Dimensions



Chapter 2

Unpacking

2.1 Opening the Delivery Package

The HS-7000 is packed in an anti-static bag. The board has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

2.2 Inspection

After unpacking the board, place it on a raised surface and carefully inspect the board for any damage that might have occurred during shipment. Ground the board and exercise extreme care to prevent damage to the board from static electricity.

Integrated circuits will sometimes come out of their sockets during shipment. Examine all integrated circuits, particularly the BIOS, processor, memory modules, ROM-Disk, and keyboard controller chip to ensure that they are firmly seated. The HS-7000 delivery package contains the following items:

- HS-7000 Board x 1
- Utility CD Disk x 1
- ATA/100 IDE flat cable x 2
- FDD flat cable x 1
- Printer cable with bracket x 1
- Two RS-232 COM Port cable with bracket x 1
- 8-pin USB split type cable with bracket x 1
- MIC/Audio IN 8-pin cable x 1
- 10-pin LAN flat cable x 1
- ATX 5-pin power cable x 1
- Jumper Bag x 1
- User's Manual

It is recommended that you keep all the parts of the delivery package intact and store them in a safe/dry place for any unforeseen event requiring the return shipment of the product. In case you discover any missing and/or damaged items from the list of items, please contact your dealer immediately.

Chapter 3

Hardware Installation

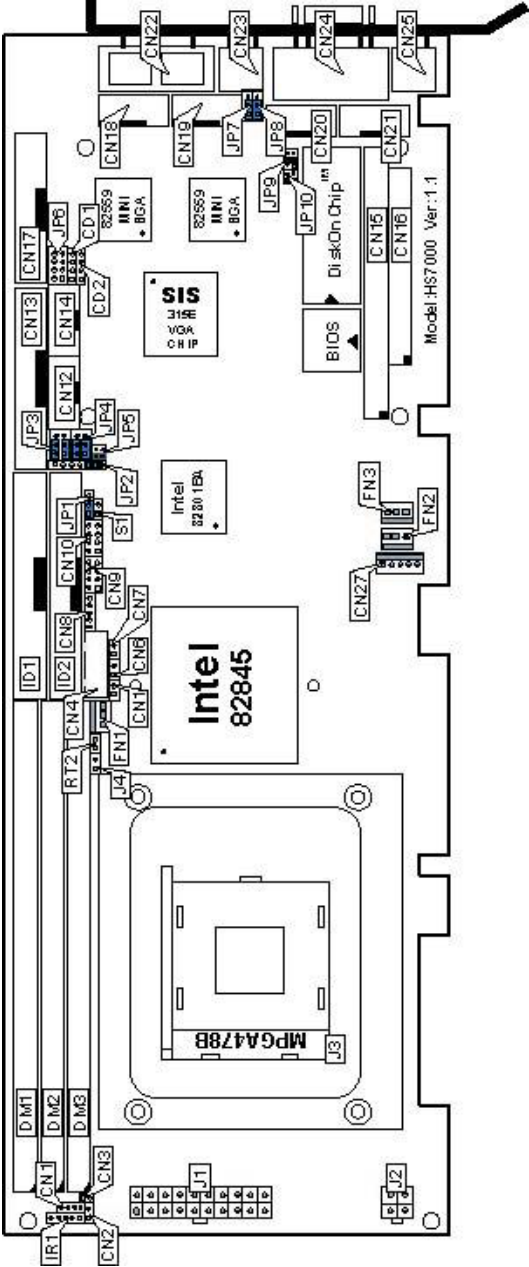
This chapter provides the information on how to install the hardware using the HS-7000. This chapter also contains information related to jumper settings of switch, watchdog timer, and the DiskOnChip™ address selection etc.

3.1 Before Installation

After confirming your package contents, you are now ready to install your hardware. The following are important reminders and steps to take before you begin with your installation process.

1. Make sure that all jumper settings match their default settings and CMOS setup correctly. Refer to the sections on this chapter for the default settings of each jumper. (Set JP1 1-2)
2. Go through the connections of all external devices and make sure that they are installed properly and configured correctly within the CMOS setup. Refer to the sections on this chapter for the detailed information on the connectors.
3. Keep the manual and diskette in good condition for future reference and use.
4. Make sure your power supply is using for P4 only. One of 4-pin connector is for +12V lead which should connect to J2 connector of HS-7000.

3.2 Board Layout



3.3 Jumper List

Jumper	Default Setting	Setting
JP1	Clear CMOS: 2-3	1-2
JP2	RS-422/485 Enable/Disable: <i>Enable</i>	Short
JP3	RS-232/422/485 Function: <i>RS-232</i>	1-3, 2-4 Short
JP4	RS-232/422/485 Function: <i>RS-232</i>	1-3, 2-4 Short
JP5	RS-422/485 Transceiver Enable/Disable: <i>Enable</i>	3-4 Short
JP7	LAN2 Enable/Disable: <i>Enable</i>	1-2 Short
JP8	LAN3 Enable/Disable: <i>Enable</i>	1-2 Short
JP9	DiskOnChip Address Select: <i>D000</i>	3-4 Short
JP10	DiskOnChip Address Select: <i>D000</i>	1-2 Short

3.4 Connector List

Connector	Definition	Page
CD1	Line In Analog Input Connector	26
CD2	CD Analog Input Connector	26
CN1	Speaker Connector	24
CN2	Reset Connector	23
CN3	Green LED Connector	23
CN4	5-pin Keyboard Connector	22
CN5	2-pin ATX Power ON/OFF Switch	20
CN6	SMI Switch Connector	13
CN7	HDD LED Connector	23
CN8	Keylock Connector	23
CN9	USB3, USB4 Connector	19
CN10	USB1, USB2 Connector	19
CN12	RS-422/485 Connector (5x2 header)	16
CN13	Floppy Connector	15
CN14	LAN3 Connector	18
CN15	PC/104 64-pin Connector	27
CN16	PC/104 40-pin Connector	27
CN17	Parallel Connector	18
CN18	LAN1 Connector	18
CN19	LAN2 Connector	18
CN20	COM1 Connector	16
CN21	COM2 Connector	16
CN22	Dual RJ-45 Connector	18

... More on next page ...

Connector	Definition	Page
CN23	PS/2 6-pin Mini DIN Mouse Connector	22
CN24	CRT Connector	13
CN25	PS/2 6-pin Mini DIN Keyboard Connector	22
CN26	COM1 Connector (DB9)	16
CN27	5-pin ATX Power Control	20
FN1	Chassis Fan	20
FN2	CPU Fan	20
FN3	PWR Fan	20
ID1	IDE1 Connector	14
ID2	IDE2 Connector	14
IR1	IrDA Connector	16
J1	20-pin ATX Power Connector	20
J2	4-pin ATX Power Connector	20
JP6	MIC In/Audio Out	26
S1	Case Open Connector	20

3.5 Configuring the CPU

The HS-7000 offers the convenience in CPU installation with its auto-detect feature. After installing a new microprocessor onboard, the HS-7000 automatically identifies the frequency and clock speed of the installed microprocessor chip, thereby eliminating the need for user to do additional CPU configuration or hardware settings related to it.

3.6 System Memory

The HS-7000 provides three DIMM sockets at locations *DM1*, *DM2* and *DM3*. The maximum capacity of the onboard memory is 1.5GB. Please note that only memory modules complying with PC100 or PC133 standard are compatible with the HS-7000.

3.7 DiskOnChip™ Address Setting

The DiskOnChip™ function allows the system to boot or operate without a FDD or a HDD. DiskOnChip™ modules may be formatted as drive C or A. With DiskOnChip™, user may also execute DOS commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc.

The U24 location onboard the HS-7000 is the DiskOnChip™ module socket. Jumper *JP9* & *JP10* assigns the starting memory address of the installed module. If you have another memory device that has a similar memory capacity with that of the DOC in your system, please set both at different memory address mapping to avoid the mapping area conflicts. Failing to do so will not make the HS-7000 and the additional memory device function properly.

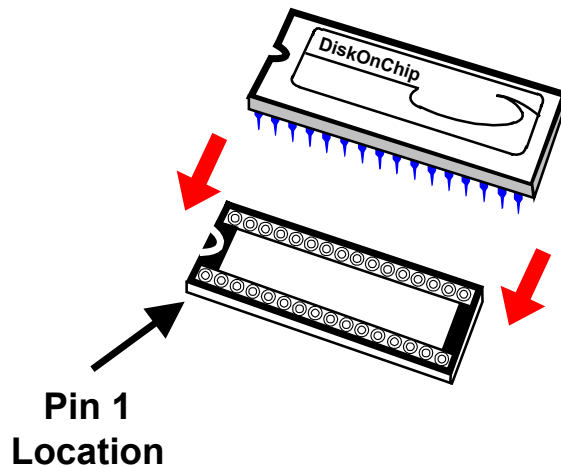
● JP9, JP10: DiskOnChip™ Address Select

Address	JP9	JP10
D000 (default)	3-4 Short	1-2 Short
D800	5-6 Short	1-2 Short

3.7.1 Installing DiskOnChip™ Modules

When installing a DiskOnChip™ module onto your board, please take note of the following:

1. Orient yourself properly with the location of the DiskOnChip™ socket. Try to locate the pin 1 location on your socket. Pin numbers are usually printed on either the component side or the solder side of your board.
2. Locate the Pin 1 location on your DiskOnChip™ module. More often than not, Pin 1 can be found on the lower right corner of the chip. Please refer to the diagram for the exact location.
3. Once you have figured out where the pin 1 locations are on both chip and socket, align the module's pins on an upright angle against the socket. Using both thumbs, gently press the module into the socket until all the pins are secured to their designations.



4. The installation is now complete and your module is now ready for use.

NOTE: *If you encounter difficulty installing your DiskOnChip™ module, please consult a qualified technician or engineer to perform the installation.*

3.7.2 Removing DiskOnChip™ Modules

When removing a DiskOnChip™ module from its socket, please take note of the following:

1. Loosen the contact of the module from its socket using a screwdriver.
2. Insert the screwdriver's flat head into a gap on either end of the socket. Do not insert the screwdriver head on either side where the pins are located. Doing so might damage the pins in the process.
3. Slowly lift the screwdriver handle upwards. This will disengage the module from its socket.

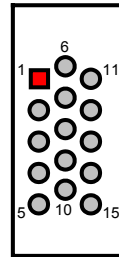
NOTE: *If you encounter difficulty removing your DiskOnChip™ module, please consult a qualified technician or engineer to remove it for you.*

3.8 VGA Controller

The onboard SiS 315E with 16MB or 32MB memory supporting 3D display and CRT displays. The HS-7000 provides one connection method of a VGA device. CN24 offers a single standard CRT connector (DB15).

- **CN24: 15-pin CRT Connector (DB15)**

PIN	Description	PIN	Description
1	Red	2	Green
3	Blue	4	N/C
5	GND	6	GND
7	GND	8	GND
9	N/C	10	GND
11	N/C	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCK		



3.9 SMI Signal Input Switch

HS-7000 has an SMI connector at location CN6. If there is an external SMI Signal Input Switch, this input switch will be able to receive signals.

- **CN6: SMI Signal Input Switch**

PIN	Description
1	EXT_SMI
2	GND

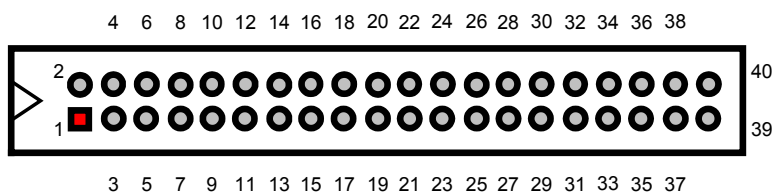


3.10 PCI E-IDE Drive Connector

IDE1 and *IDE2* are standard 40-pin connector daisy-chain driver connector serves the PCI E-IDE drive provisions onboard the HS-7000. A maximum of four ATA/33/66/100 IDE drives can connect to the HS-7000 via *IDE1* and *IDE2*.

- **IDE1 and IDE2: IDE Connector**

PIN	Description	PIN	Description
1	RESET	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	PDREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	PIORDY	28	PR1PD1-
29	RPDACK-	30	GND
31	IRQ	32	N/C
33	RPDA1-	34	PATA66
35	RPDA0-	36	RPDA2-
37	RPCS1-	38	RPCS3-
39	IDE LED	40	GND

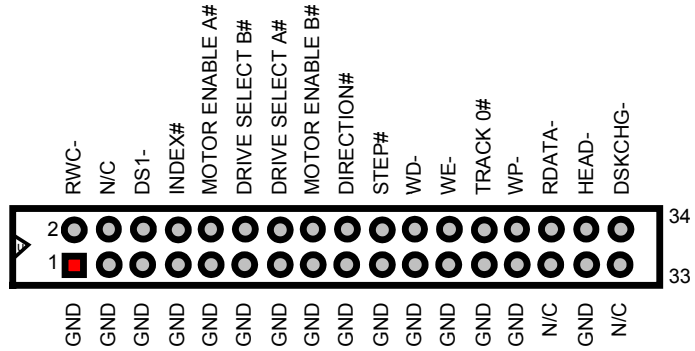


3.11 Floppy Disk Drive Connector

The HS-7000 uses a standard 34-pin header connector, CN13, for floppy disk drive connection. A total of two FDD drives may be connected to CN13 at any given time.

- **CN13: FDD Connector**

PIN	Description	PIN	Description
1	GND	2	RWC-
3	GND	4	N/C
5	GND	6	DS1-
7	GND	8	Index#
9	GND	10	Motor Enable A#
11	GND	12	Drive Select B#
13	GND	14	Drive Select A#
15	GND	16	Motor Enable B#
17	GND	18	Direction#
19	GND	20	Step#
21	GND	22	WD-
23	GND	24	WE-
25	GND	26	Track 0#
27	GND	28	WP-
29	N/C	30	RDATA-
31	GND	32	HEAD-
33	N/C	34	DSKCHG-

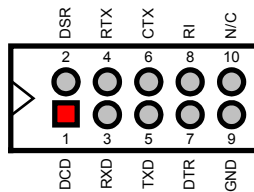


3.12 Serial Port Connectors

The HS-7000 offers ONE NS16C550 compatible UARTs with Read/Receive 16-byte FIFO serial ports and two internal 10-pin headers.

- **CN20 and CN21: COM1/COM2 Connectors (5x2 Header)**

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTX
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	N/C



- **JP2: RS-422/485 Enabled/Disabled Select**

JP2	Description
Open	Disabled
Short	Enabled (default)

- **JP5: RS-422/485 Transceiver Enabled/Disabled Select**

JP5	Description
Short 1-2	Always Enable
Short 3-4	Enable by "-RTS" signal

The onboard COM2 may be configured as RS-232, RS-422/485. If we RS-422/485, please connect device to CN12.

- **CN12: RS-422/485 Connector**

PIN	Description	PIN	Description
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	RTS-
7	RTS+	8	CTS+
9	CTS-	10	N/C

- **JP3: RS-232/422/485 Function Select**

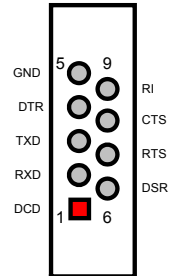
JP3	Description
Short 1-3, 2-4	RS-232 (default)
Short 3-5, 4-6	RS-422/485

- **JP4: RS-232/422/485 Function Select**

JP4	Description
Short 1-3, 2-4	RS-232 (default)
Short 3-5, 4-6	RS-422/485

- **CN26: COM1 Connector (DB9)**

PIN	Description
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI



- **IR1: IrDA Connector**

PIN	Description
1	VCC
2	N/C
3	IRRX
4	GND
5	IRTX

3.13 Parallel Connector

CN17 is a standard 26-pin flat cable connector designed to accommodate parallel port connection onboard the HS-7000.

- **CN17: Parallel Connector**

PIN	Description	PIN	Description
1	Strobe	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	Acknowledge
11	Busy	12	Paper Empty
13	Printer Select	14	Auto Form Feed
15	ERROR#	16	Initialize
17	SLIN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	N/C

3.14 Ethernet Connector

The HS-7000 provides three 10/100 Base-TX LAN interface connector. Please refer to the following for its pin information.

- **CN22: Dual RJ-45 Connectors (The third LAN use 5x2 Connector)**

PIN	Description	PIN	Description
1	1_TX+	2	1_TX-
3	1_RX+	4	75Ω Pull GND
5	75Ω Pull GND	6	1_RX-
7	75Ω Pull GND	8	75Ω Pull GND
9	2_TX+	10	2_TX-
11	2_RX+	12	75Ω Pull GND
13	75Ω Pull GND	14	2_RX-
15	75Ω Pull GND	16	75Ω Pull GND
17	1_LILED-	18	1_LILED+
19	1_ACTLED-	20	1_ACTLED+
21	2_SPLED-	22	2_SPLED+
23	2_ACTLED-	24	2_ACTLED+

- **JP7 and JP8: LAN2/LAN3 Enable/Disable Select**

Options	Settings
Disable	2-3
Enable	1-2

- **CN18, CN19 and CN14: LAN1/LAN2/LAN3 Connectors (5x2 Header)**

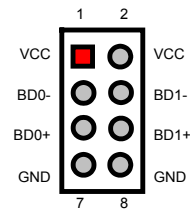
PIN	Description
1	3V_SB
2	LINK_LED
3	RX+
4	RX-
5	ACTIVE_LED
6	75Ω Pull GND
7	SPEED_LED
8	75Ω Pull GND
9	TX+
10	TX-

3.15 USB Connector

The HS-7000 provides two 8-pin connectors, at locations CN9 and CN10, for four USB connections to the HS-7000.

- **CN9 and CN10: USB Connector**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	BD0-	4	BD1-
5	BD0+	6	BD1+
7	GND	8	GND



3.16 CMOS Data Clear

The HS-7000 has a Clear CMOS jumper on *JP1*.

- **JP1: Clear CMOS**

Options	Settings
Normal Operation	Short 1-2
Clear CMOS	Short 2-3

IMPORTANT: The default setting of JP1 is short 2-3. Before you turn on the power of your system, please set JP1 to short 1-2 for normal operation.

3.17 Power and Fan Connectors

HS-7000 provides one 4-pin and one 20-pin ATX power connectors at *J2* and *J1*.

HS-7000 must using P4 power supply. One of 4-pin connector is for +12V lead which should connect to *J2*.

20-pin ATX Power Connector can connect to Backplane or to *J1*. If 20-pin ATX Power Connector connect to Backplane, please make sure CN27 and Backplane's 5-pin ATX controller is connected together!

- **J1: ATX Power Connector**

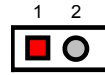
PIN	Description	PIN	Description
1	3.3V	2	3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PG
9	5Vsb	10	+12V
11	3.3V	12	-12V
13	GND	14	PS_ON
15	GND	16	GND
17	GND	18	-5V
19	+5V	20	+5V

- **J2: 4-pin ATX Power Connector**

PIN	Description	PIN	Description
1	GND	2	GND
3	12V	4	12V

- **CN5: 2-pin ATX Power On/Off Switch**

PIN	Description
1	5VSTBY
2	GND



- **CN27: 5-pin ATX Power Control (Connector to BOSER's HPCI or HPP serial backplane)**

PIN	Description	PIN	Description
1	VCC	2	V5_STBY
3	+12V	4	PS_ON
5	GND		



Connector *FN1*, *FN2* and *FN3* onboard HS-7000 are 3-pin chassis, CPU, PWR fan connector. If chassis is open, S1 switch should be closed.

- **FN1, FN2 and FN3: Chassis/CPU/PWR Fan Connector**

PIN	Description
1	FAN Speed
2	+12V
3	GND

- **S1: Chassis Open Switch Connector**

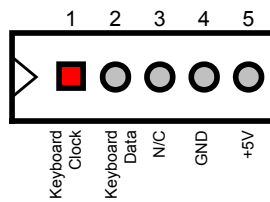
PIN	Description
1	Open Single#
2	GND

3.18 Keyboard Connectors

The HS-7000 offers two possibilities for keyboard connections. The connections are via CN25 for an external PS/2 type keyboard or via CN4 for an internal 5-pin cable converter to an AT keyboard.

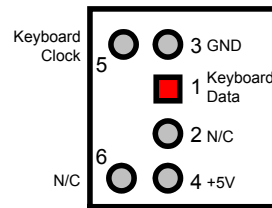
- **CN4: 5-pin Keyboard Connector**

PIN	Description
1	Keyboard Clock
2	Keyboard Data
3	N/C
4	GND
5	+5V



- **CN25: PS/2 6-pin Mini DIN Keyboard Connector**

PIN	Description
1	Keyboard Data
2	N/C
3	GND
4	+5V
5	Keyboard Clock
6	N/C

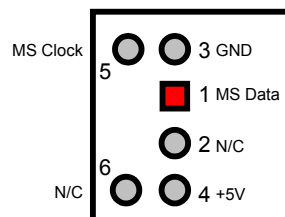


3.19 PS/2 Mouse Connector

CN23 is a 6-pin mini DIN connector for connections to an external PS/2 mouse connector.

- **CN23: PS/2 6-pin Mini Din Mouse Connector**

PIN	Description
1	MS Data
2	N/C
3	GND
4	+5V
5	MS CLK
6	N/C



3.20 System Front Panel Connectors

The HS-7000 has one LED at location *CN7* that indicates the power-on status. This visual feature of the IDE LED may also be connected to an external IDE LED via connector *CN7*.

- **CN7: IDE LED Connector**

PIN	Description
1	150Ω Pull +5V
2	HDD ACTIVE#

CN8 and *CN2* are the Keylock and Reset Button connectors onboard. The *CN3* is Green function LED indicates.

- **CN3: Green LED Connector**

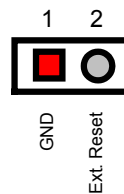
PIN	Description
1	150Ω Pull +5V
2	ACTIVE#

- **CN8: Keylock Connector**

PIN	Description
1	220Ω Pull +5V
2	N/C
3	GND
4	Keylock#
5	GND

- **CN2: Reset Button Connector**

PIN	Description
1	GND
2	External Reset



3.21 External Speaker

Aside from the buzzer at location *BZ1* onboard, the HS-7000 also offers a connector (*CN1*) for an external speaker connection. The table below lists the pin assignments of *CN1*.

- **CN1: External Speaker Connector**

PIN	Description
1	VCC
2	GND
3	GND
4	Speaker Signal

3.22 Watchdog Timer

Once the Enable cycle is active, a Refresh cycle is requested before the time-out period. This restarts counting of the WDT period. When the time counting goes over the period preset of WDT, it will assume that the program operation is abnormal. A System Reset signal to re-start when such error happens.

The following sample programs show how to Enable, Disable and Refresh the Watchdog Timer:

```

-----
; Enter the WDT function mode, interruptible double-write
-----
MOV     DX, 2EH
MOV     AL, 87H
OUT     DX, AL
OUT     DX, AL
MOV     DX, 2EH
MOV     AL, 07H
OUT     DX, AL
MOV     DX, 2FH
MOV     AL, 08H
OUT     DX, AL
MOV     DX, 2EH
MOV     AL, F5H           ; select CRF0
OUT     DX, AL
MOV     DX, 2FH
MOV     AL, 80H
OUT     DX, AL
MOV     DX, 2EH
MOV     AL, F7H
OUT     DX, AL
MOV     DX, 2FH

MOV     AL, 00H
OUT     DX, AL
MOV     DX, 2EH
MOV     AL, F6H
OUT     DX, AL
MOV     DX, 2FH
MOV     AL, 00H         ; * 00H=Disabled
OUT     DX, AL
-----
; Exit extended function mode
-----
MOV     DX, 2EH
MOV     AL, AAH
OUT     DX, AL

```

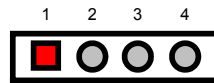
* User can also use AL, 00H's defined time for reset purposes, e.g.00H for Disable, 01H = 1sec, 02H = 2sec.....FFH = 255sec

3.23 Audio Connectors

The HS-7000 has an onboard AC97 3D audio interface. The following tables list the pin assignments of the CD-ROM Analog Input, the Line_ In analog Input and the MIC In / Audio Out connectors.

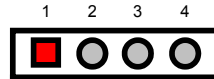
- **CD1: Line_In Analog Input Connector**

PIN	Description
1	LINE_IN_R
2	GND
3	GND
4	LINE_IN_L



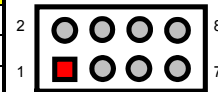
- **CD2: CD-ROM Analog Input Connector**

PIN	Description
1	CD_INR
2	CD_REF
3	CD_REF
4	CD_INL



- **JP6: Mic In / Audio Out Connector**

PIN	Description	PIN	Description
1	AOUT_L	2	AOUT_R
3	GND	4	GND
5	MIC_IN	6	N/C
7	GND	8	GND



3.24 PC/104 Connectors

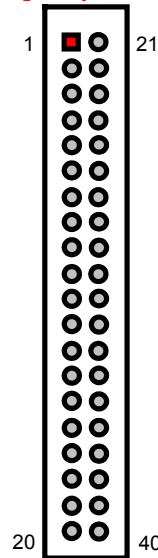
The PC/104 expansion bus offers provisions to connect all types of PC/104 modules. With the PC/104 bus being known as the new generation of industrial embedded 16bit PC standard bus, thousands of PC/104 modules from multiple vendors can be easily installed onboard. The detailed pin assignment of the PC/104 expansion bus connectors CN15 and CN16 are listed on the following tables:

NOTE : *The PC/104 connector allows direct plugging or stack-through piling of PC/104 modules without requiring the PC/104 mounting kit.*

● **CN16: 40-pin PC/104 Expansion Slot**

PIN	Description	PIN	Description
1	GND	21	GND
2	MEMCS16*	22	SBHE*
3	IOSC16*	23	LA23
4	IRQ10	24	LA22
5	IRQ11	25	LA21
6	IRQ12	26	LA20
7	IRQ15	27	LA19
8	IRQ14	28	LA18
9	DACK0*	29	LA17
10	DRQ0	30	MEMR*
11	DACK5*	31	MEMW*
12	DRQ5	32	SD8
13	DACK6*	33	SD9
14	DRQ6	34	SD10
15	DACK7*	35	SD11
16	DRQ7	36	SD12
17	+5V	37	SD13
18	MASTER*	38	SD14
19	GND	39	SD15
20	GND	40	GND

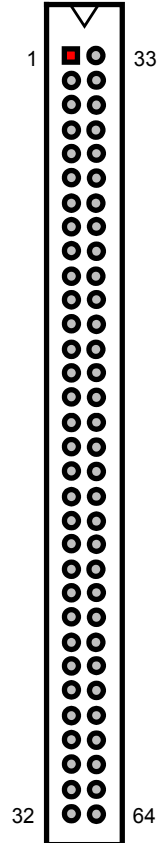
Connector diagram rotated 90 degrees clockwise from original position



● CN15: 64-pin PC/104 Expansion Slot

PIN	Description	PIN	Description
1	IOCHECK*	33	GND
2	SD7	34	RESETDRV
3	SD6	35	+5V
4	SD5	36	IRQ9
5	SD4	37	-5V
6	SD3	38	DRQ2
7	SD2	39	-12V
8	SD1	40	OWS*
9	SD0	41	+12V
10	IOCHRDY	42	GND
11	AEN	43	SMEMW*
12	SA19	44	SMEMR*
13	SA18	45	IOW*
14	SA17	46	IOR*
15	SA16	47	DACK3*
16	SA15	48	DRQ3
17	SA14	49	DACK1*
18	SA13	50	DRQ1
19	SA12	51	REFRESH*
20	SA11	52	SYSCLK
21	SA10	53	IRQ7
22	SA9	54	IRQ6
23	SA8	55	IRQ5
24	SA7	56	IRQ4
25	SA6	57	IRQ3
26	SA5	58	DACK2*
27	SA4	59	TC
28	SA3	60	BALE
29	SA2	61	+5V
30	SA1	62	OSC
31	SA0	63	GND
32	GND	64	GND

Connector diagram rotated 90 degrees clockwise from original position



Chapter 4

AMI BIOS Setup

The HS-7000 uses AMI BIOS for the system configuration. The AMI BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options that could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Starting Setup

The AMI BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing immediately after switching the system on, or
2. By pressing the key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

4.2 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the <PageUp> and <PageDown> keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.2.1 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

4.3 Main Menu

Once you enter the AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to enter the sub-menu.

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52 (C)2001 American Megatrends, Inc. All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup PCI / Plug and Play Setup Peripheral Setup Hardware Monitor Setup Auto-Detect Hard Disks Change User Password Change Supervisor Password Auto Configuration with Optimal Settings Optimal Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

NOTE: *A brief description of the highlighted choice appears at the bottom of the screen.*

- **Standard CMOS Setup**
This setup page includes all the items in a standard, AT-compatible BIOS.
- **Advanced CMOS Setup**
This setup page includes all the items of AMI special enhanced features.
- **Advanced Chipset Setup**
This setup page includes all the items of chipset special features.
- **Power Management Setup**
This entry only appears if your system supports Power Management, “Green PC”, standards.
- **PCI/Plug and Play Setup**
This entry appears if your system supports PNP/PCI.
- **Peripheral Setup**
This section page includes all the items of IDE hard drive and Programmed Input / Output features.

- **Hardware Monitor Setup**
This menu contains the system's auto-detect functions for CPU Vcore, CPU voltage, and CPU temperature.
- **Auto-Detect Hard Disks**
Automatically detect and configure hard disk parameters. The AMI BIOS includes this ability in the event you are uncertain of your hard disk's parameters.
- **Change User/Supervisor Password**
Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.
- **Auto Configuration with Optimal Settings**
The BIOS defaults have been set by the manufacturer and represent settings that provide the minimum requirements for your system to operate.
- **Auto Configuration with Fail Safe Settings**
The chipset defaults are settings that provide for maximum system performance. While AMI has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.
- **Save Settings and Exit**
Save CMOS value changes to CMOS and exit setup.
- **Exit Without Saving**
Abandon all CMOS value changes and exit setup.

4.4 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for the setup. When the IDE hard disk drive you are using is larger than 528MB, you must set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

AMIBIOS SETUP – STANDARD CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved									
Date (mm/dd/yyyy)	: Thu Jan 03, 2002				Base Memory	: 0 KB			
Time (hh/mm/ss)	: 19:04:12				Extd Memory	: 0 MB			
Floppy Drive A:	Not Installed								
Floppy Drive B:	Not Installed								
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO 32Bit Mode
Pri Master	: Not Installed								
Pri Slave	: Not Installed								
Sec Master	: Not Installed								
Sec Slave	: Not Installed								
Boot Sector Virus Protection	: Disabled								
Month:	Jan - Dec				ESC:Exit	↑↓:Sel			
Day:	01 - 30				PgUp/PgDn:	Modify			
Year:	1980 - 2099				F1:Help	F2/F3:Color			

- Date:**
 The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day, from Sun to Sat, determined by the BIOS and is display-only
date	The date, from 1 to 31 (or the maximum allowed in the month)
month	The month, Jan through Dec.
year	The year, from 1900 through 2099

- Time:**
 The time format is <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **Floppy A / B:**

The category identifies the types of floppy disk drive A or drive B that have been installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

- **Pri Master/Slave & Sec Master/Slave:**

The categories identify the types of 4 channels that have been installed in the computer. There are 45 predefined types with 4 user-definable types for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type user is user-definable.

Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type "User" to define your own drive type manually.

If you select Type "User", you will need to know the information listed below. Enter the information directly from the keyboard and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None".

If you select Type "Auto", BIOS will Auto-Detect the HDD & CD-ROM Drive at the POST stage and showing the IDE for HDD & CD-ROM Drive.

If a hard disk has not been installed select NONE and press <Enter>.

TYPE	drive type
CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precompensation
SECTORS	number of sectors
MODE	mode type

- **Boot Sector Virus Protection:**

If set to Enabled, this category will flash on the screen when there is any attempt to write to the boot sector or partition table of the hard disk drive. The system will halt and an error message will appear. You may run anti-virus program to locate the problem.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled (default)	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

4.5 Advanced CMOS Setup

This section allows you to configure your system for the basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

AMIBIOS SETUP – STANDARD CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Disabled	▲ Available Options: ▶ Disabled Enabled
1st Boot Device	Disabled	
2nd Boot Device	Disabled	
3rd Boot Device	Disabled	
Try Other Boot Devices	Yes	
S.M.A.R.T. for hard Disks	Disabled	
BootUp Num-Lock	Off	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Disabled	
Primary Display	Absent	
Password Check	Setup	
Boot To OS/2	No	
L1 Cache	Disabled	
L2 Cache	Disabled	
System BIOS Cacheable	Disabled	
C000,16k Shadow	Disabled	
C400,16k Shadow	Disabled	
C800,16k Shadow	Disabled	
CC00,16k Shadow	Disabled	
D000,16k Shadow	Disabled	
D400,16k Shadow	Disabled	
D800,16k Shadow	Disabled	
DC00,16k Shadow	Disabled	
		ESC:Exit ↑↓:Sel PgUp/PgDn: Modify ▼ F1:Help F2/F3:Color

- Quick Boot:**
When set as enabled, the program disables the DRAM testing function. The available options are Enabled, and Disabled.
- 1st Boot Device:**
This option sets the type of device from where the BIOS will FIRST seek to boot from after AMIBIOS POST completes. The available settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.
- 2nd Boot Device:**
This option sets the type of SECOND device from where the BIOS will seek to boot from, if and when the 1st Boot Device fails after AMIBIOS POST completes. The available settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.

- **3rd Boot Device:**
This option sets the type of THIRD device from where the BIOS will seek to boot from, if and when the 1st and 2nd Boot Devices fail after AMIBIOS POST completes. The available settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.
- **4th Boot Device:**
This option sets the type of FOURTH device from where the BIOS will seek to boot from, if and when the 1st, 2nd and 3rd Boot Devices fail after AMIBIOS POST completes. The available settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.
- **Try Other Boot Devices:**
Set this option to Yes to instruct AMIBIOS to attempt to boot from any other drive in the system. This is useful if the BIOS cannot find a boot drive among the drives specified in the 1st /2nd/3rd/4th Boot Devices. The available settings are Yes, and No.
- **Initial Display Mode:**
This feature can control the display on/off settings of your OEM full logo screen.
- **S.M.A.R.T. for Hard Disks:**
Self-Monitoring, Analysis and Reporting Technology. This option can help the BIOS in warning the user of possible device failure, giving user a chance to back up the device before actual failure happens. The available options are Enabled, and Disabled.
- **BootUp Num-Lock:**
When set as On, this option turns off numeric lock when the system is powered, allowing the end user to use the arrow keys on both the numeric keypad and the keyboard.
- **Floppy Drive Seek:**
Set this option to Enabled to specify that floppy drive A: will perform a Seek operation at system boot. The available options are Enabled, and Disabled.
- **PS/2 Mouse Support:**
When this option is enabled, BIOS allows the system to support a PS/2 type mouse. The available options are Enabled, and Disabled.

- **Primary Display:**
Select this option to configure the type of monitor attached to the computer. The available settings are Monochrome, Color 40x25, Color 80x25, VGA/PGA/EGA, and Absent.
- **Password Check:**
This option enables the password check option every time the system boots or the end user runs Setup. If set as Always, a user password prompt appears every time the computer is tuned on. If setup is chosen, the password prompt appears if BIOS is executed.
- **Boot To OS/2:**
Set this option to Enabled if running OS/2 operating system and using more than 64MB of system memory on the system board. The available options are Yes, and No.
- **L1 Cache:**
This option enables or disables the internal cache memory of the installed processor.
- **L2 Cache:**
This option enables/disables the secondary cache memory of your board. The available options are Enabled, and Disabled.
- **System BIOS Cacheable:**
When this option is enabled, the System ROM area from C000-DC00 is copied (shadowed) to RAM for faster execution.
- **C000,16k/C400,16k/C800,16k/ CC00,16k/D000,16k/D400,16k/D800,16k/ DC00,16k Shadow:**
These options enable shadowing of the contents of the ROM area named in the option title. The available settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

Enabled	Video ROM area from C0000-C7FFF is copied (shadowed) from ROM to RAM for faster execution.
Disabled	The contents of the video ROM are not copied to RAM
Cached	The contents of the video ROM area from C0000h-C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.

4.6 Advanced Chipset Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

AMIBIOS SETUP – ADVANCED CHIPSET SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
SDRAM Frequency	100Mhz	Available Options:
Configure SDRAM Timing by SPD	Disabled	▶ 100Mhz
SDRAM CAS# Latency	3 Clocks	133Mhz
SDRAM RAS# Precharge	3 Clocks	Auto
SDRAM RAS# to CAS# Delay	3 Clocks	
SDRAM Precharge Delay	7 Clocks	
SDRAM Idle Timer	Infinite	
SDRAM Read Thermal Management	Disabled	
DRAM Integrity Mode	Disabled	
Memory Hole	Disabled	
APIC Interrupt Mode	Disabled	
MPS Revision	1.1	
AGP Aperture Size	Disabled	
USB Controller	Disabled	
USB Device Legacy Support	Disabled	ESC:Exit ↑↓:Sel
Port 64/60 Emulation	Disabled	PgUp/PgDn: Modify
		F1:Help F2/F3:Color

4.7 Power Management Setup

The Power Management Setup allows user to configure the system for saving energy in a most effective way while operating in a manner consistent with his own style of computer use.

AMBIOS SETUP – POWER MANAGEMENT SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	No	▲ Available Options: ▶ No Yes
ACPI Standby State	S1/POS	
USB Device Wakeup From S3	Disabled	
Re-Call VGA BIOS at S3 Resuming	Disabled	
Power Management / APM	Disabled	
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	Reserved	
FDC / LPT / COM Ports	Ignore	
MIDI Ports	Ignore	
Primary Master IDE	Ignore	
Primary Slave IDE	Ignore	
Secondary Master IDE	Ignore	
Secondary Slave IDE	Ignore	
System Thermal	Disabled	
Thermal Active Temperature	40°C / 104°C	
Thermal slow Clock Ratio	Reserved	
Power Button Function	On / Off	
Restore on AC / Power Loss	Power Off	
Resume On Ring	Disabled	
Resume On LAN	Disabled	
Resume On PME#	Disabled	
Resume On RTC Alarm	Disabled	
RTC Alarm Date	Every Day	
RTC Alarm Hour	00	ESC:Exit ↑↓:Sel
RTC Alarm Minute	00	PgUp/PgDn: Modify
RTC Alarm Second	00	▼ F1:Help F2/F3:Color

- **ACPI Aware O/S:**
This item is the Advanced Configuration and Power Interface (ACPI) function switch. The available options are Yes, and No.
- **ACPI Standby State:**
This item serves as the switch setting of STR (S3) or POS (S1) function. Configuration options are S3/STR, and S1/POS.

- **Power Management/APM:**
Set this option to Enabled to switch on the APM (Advanced Power Management). The available options are Enabled, and Disabled.
- **Standby Time Out:**
This option specifies the length of system inactivity period while in the Standby state. When this length of time expires, the computer enters Suspend power state.
- **Keyboard & PS/2 Mouse, FDC/LPT/COM Ports, SB & MSS Audio Ports, MIDI Ports, ADLIB Ports, Primary Master IDE, Primary Slave IDE, Secondary Master IDE, Secondary Slave IDE:**
Enabling these options monitors the IRQ input of inactive and active devices. This allows the system to determine whether to enter Auto_mode/SMI_mode when it detects an inactive device, or Normal_mode once an active device is detected.
- **Restore on AC/Power Loss:**
This field registers the last power supply unit attached to your system. If an ATX power was last used before changing to AT power supply, setting this field to Last State (default) will NOT make the AT power supply function properly on your next boot up process. Setting this field to Power On auto-detects the power supply installed each time you boot up.
- **Wake Up On Ring:**
An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state. The available choices are Enabled, Disabled.
- **Wake Up On Lan**
An input signal on the local area network (LAN) awakens the system from a soft off state.
- **Wake Up On PME**
A PME# detected resumes or wakes the system from a Soft Off state.
- **Resume By Alarm**
When this option is set enabled, system will according to you set time then wakeup from soft off mode.
- **Alarm Date/Hour/Minute/Second**
You can set these fields to specify the alarm settings of your system.

4.8 PCI / Plug and Play Setup

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system that allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options: ▶ No Yes ESC:Exit ↑↓:Sel PgUp/PgDn: Modify F1:Help F2/F3:Color
Clear NVRAM	No	
PCT Latency Timer (PCI Clocks)	32	
Primary Graphics Adapter	AGP	
Allocate IRQ to PCI VGA	Yes	
PCI IDE BusMaster	Disabled	
OffBoard PCI IDE Card	Auto	
OffBoard PCI IDE Primary IRQ	Disabled	
OffBoard PCI IDE Secondary IRQ	Disabled	

- **Plug and Play Aware O/S:**
If enabled, BIOS will configure only PnP ISA boot devices (i.e., all PnP ISA cards with boot flag set) then configure all other devices. If disabled, the BIOS will configure all devices without following any sequence.
- **Clear NVRAM on Every Boot:**
When this option is set to Yes, the system can auto clear NVRAM.
- **PCI Latency Timer (PCI Clocks):**
This option specifies the latency timings (in PCI clocks) of PCI devices installed in the PCI expansion slots. The available settings are 32, 64, 96, 128, 160, 192, 224, and 248.
- **Allocate IRQ to PCI VGA:**
Set this option to Yes when allocating an IRQ to the VGA device on the PCI bus. The available settings are Yes, and No.

4.9 Peripheral Setup

The IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you can install up to four separate hard disks.

PIO means Programmed Input/Output. Rather than having the BIOS issue a series of commands to affect the transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is much simpler and more efficient (also faster).

AMIBIOS SETUP – PERIPHERAL SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
OnBoard IDE	Both	Available Options:
OnBoard LAN	Disabled	▶ Disabled
OnBoard AC'97 Audio	Auto	Primary
OnBoard FDC	Auto	Secondary
OnBoard Serial Port A	3F8/IRQ4	Both
OnBoard Serial Port B	2F8/IRQ3	
Serial Port B Mode	Normal	
IR Duplex Mode	Full Duplex	
IR Pin Select	SINB / SOUTB	
OnBoard Parallel Port	378/IRQ7	
Parallel Port Mode	Normal	
EPP Version	N / A	
Parallel Port IRQ	Auto	
Parallel Port DMA Channel	N / A	
OnBoard Midi Port	Disabled	
Midi IRQ Select	3	
OnBoard Game Port	Disabled	
Keyboard PowerOn Function	Disabled	ESC:Exit ↑↓:Sel
Specific Key for Power On	N / A	PgUp/PgDn: Modify
Mouse PowerOn Function	Disabled	F1:Help F2/F3:Color

- **OnBoard IDE/FDD:**
Set this option to Enabled to activate the floppy drive controller on the system board. The available settings are Auto (AMIBIOS automatically determines if the floppy controller should be enabled), Enabled, and Disabled.

- **OnBoard Parallel Port:**

This option specifies the base I/O port address of parallel port on the system board. The available settings are Disabled, 378h, 278h, and 3BCh.

- **Parallel Port Mode:**

This option specifies the parallel port mode. The available settings are Normal, Bi-Dir, EPP, and ECP.

Normal: The normal parallel port mode is used.

Bi-Dir: Use this setting to support bi-directional transfers on the parallel port.

EPP: The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.

ECP: The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bi-directional communication.

- **Parallel Port IRQ:**

This option specifies the IRQ used by the parallel port. The available settings are Auto, (IRQ)5, and (IRQ)7.

- **Parallel Port DMA Channel:**

This option is only available if the setting for the Parallel Port Mode option is ECP. This option sets the DMA channel used by the parallel port. The available settings are DMA Channel 0, 1, and 3.

4.10 Hardware Monitor Setup

AMIBIOS SETUP – HARDWARE MONITOR SETUP (C)2001 American Megatrends, Inc. All Rights Reserved	
CPU Ratio Selection	8.0x
*** System Hardware Monitor ***	
Chassis Intrusion	Disabled
Current CPU Temperature	
Current System Temperature	
Current CPU Fan Speed	
Current Chassis Fan Speed	
Current Power Fan speed	
Vcore	
Vtt	
Vio	
+ 5.000V	
+12.000V	
-12.000V	
- 5.000V	
Battery	
+5V SB	
ESC:Exit ↑↓:Sel PgUp/PgDn: Modify F1:Help F2/F3:Color	

- **System Hardware Monitor:**

This field determines which component will detect the CPU temperature. If your board comes with a provision for a thermal connector, you may set this field as Thermistor. Otherwise, please configure it as CPU (also default setting).



Current CPU Temperature:

This read-only field displays the current CPU temperature as part of the hardware monitoring feature of your board.



Current System Temperature:

This field displays the *current* system and power supply temperatures, if your computer contains a monitoring system. The available choices are Both and Supervisor.



Current CPU/Chassis/Power FAN Speeds:

These fields display the *current* speed of up to CPU, chassis (system) and Power supply fans, if your computer contains a monitoring system.



Vcore/Vtt/Vio/-5V/-12V/+5V/+12V/Battery/+5V SB:

Once the hardware monitoring IC detects the current voltages of voltage regulators and power supply unit, it shows the values on these fields for read-only purposes.

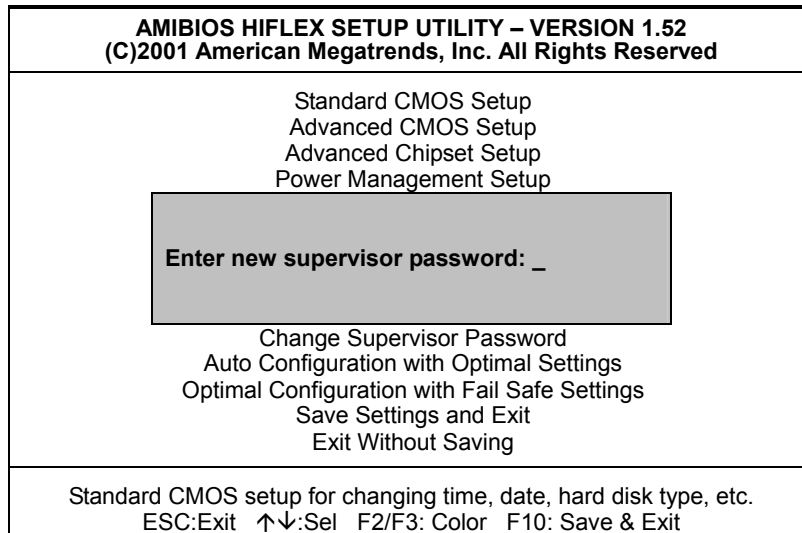
4.11 Auto-Detect Hard Disks

This option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.

Up to four IDE drives can be detected, with parameters for each appearing in sequence inside a box. To accept the displayed entries, press the “Y” key; to skip to the next drive, press the “N” key. If you accept the values, the parameters will appear listed beside the drive letter on the screen.

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52 (C)2001 American Megatrends, Inc. All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup PCI / Plug and Play Setup Peripheral Setup Hardware Monitor Setup Auto-Detect Hard Disks Change User Password Change Supervisor Password Auto Configuration with Optimal Settings Optimal Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

4.12 Change Supervisor/User Password



You can set either supervisor or user password, or both of them. The differences between are:

- **supervisor password:** can enter and change the options of the setup menus.
- **user password:** just can only enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.13 Auto Configuration with Optimal Settings

When you press <Enter> on this item you will get a confirmation dialog box with a message shown below. This option allows you to load/restore the BIOS default values permanently stored in the BIOS ROM. Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52 (C)2001 American Megatrends, Inc. All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup
Load high performance settings (Y/N) ? <u>N</u>
Change Supervisor Password Auto Configuration with Optimal Settings Optimal Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

4.14 Optimal Configuration with Fail Safe Settings

When you press <Enter> on this item you get a confirmation dialog box with a message similar to the figure below. This option allows you to load/restore the default values to your system configuration, optimizing and enabling all high performance features. Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52 (C)2001 American Megatrends, Inc. All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup
Load failsafe settings (Y/N) ? <u>N</u>
Change Supervisor Password Auto Configuration with Optimal Settings Optimal Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

4.15 Save Settings and Exit

Pressing <Enter> on this item asks for confirmation:

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52 (C)2001 American Megatrends, Inc. All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup
Save current settings and exit (Y/N) ? <u>Y</u>
Change Supervisor Password Auto Configuration with Optimal Settings Optimal Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

4.16 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)?

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

<p>AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52 (C)2001 American Megatrends, Inc. All Rights Reserved</p>
<p>Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup</p> <p>Quit without saving (Y/N) ? <u>N</u></p> <p>Change Supervisor Password Auto Configuration with Optimal Settings Optimal Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving</p>
<p>Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit</p>
<p>Abandon all Data & Exit Setup</p>

Chapter 5

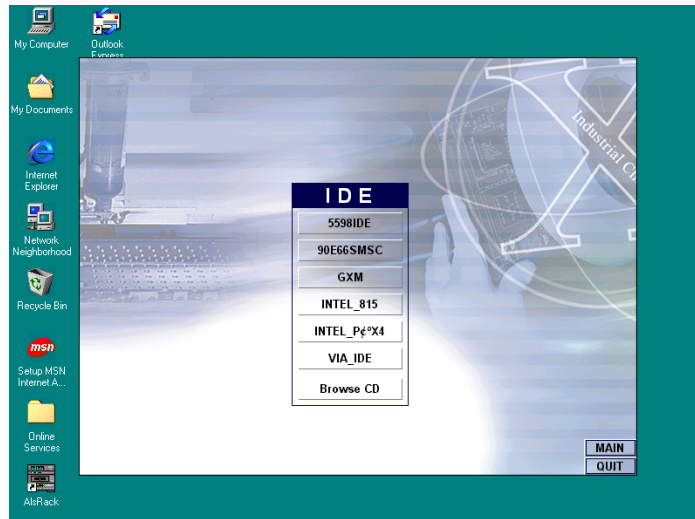
Software Utilities

This chapter contains the detailed information of IDE, VGA, LAN and Audio driver installation procedures. The utility disk that came with the delivery package contains an auto-run program that invokes the installation programs for the IDE, VGA, LAN and Audio drivers. The following sections describe the installation procedures of each driver based on Win 95/98, Win 2000 and Win NT operating systems. It is recommended that you install the drivers matching the sections listed in this chapter.

5.1 IDE Driver Installation

5.1.1 Installing Intel 815 Chipset Software

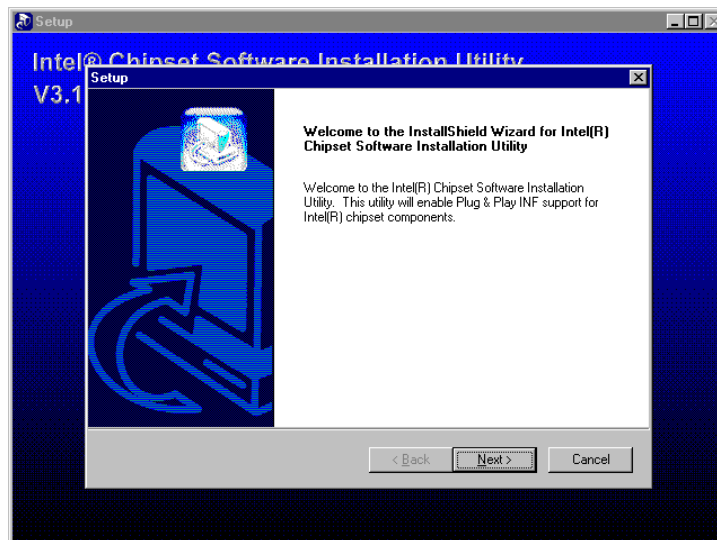
1. Insert Utility CD Disk to your CD ROM drive. The main menu will pop up as shown below. Select on the **IDE** button to launch the installation program.
2. Click on the **INTEL_815** button to continue.



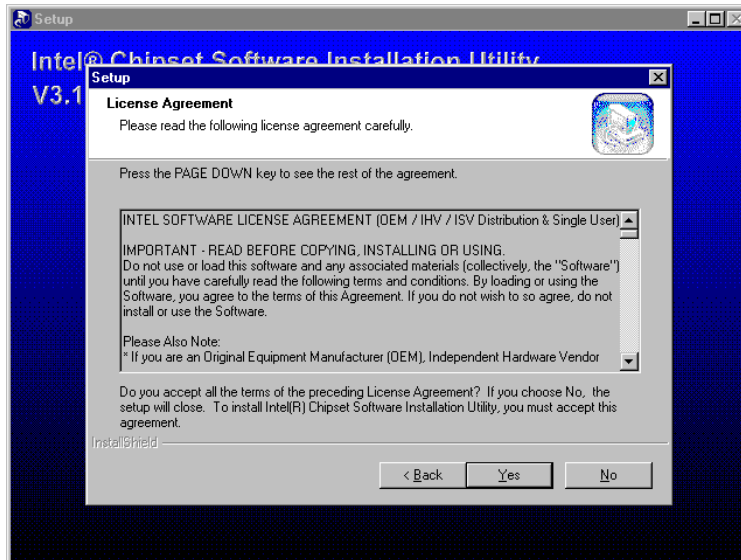
3. When the **IDE \ INTEL_815** box appears on your screen, click on the **INTEL_R&HIPSET_SOFTWARE_INS** to install the IDE plug and play information files into your system.



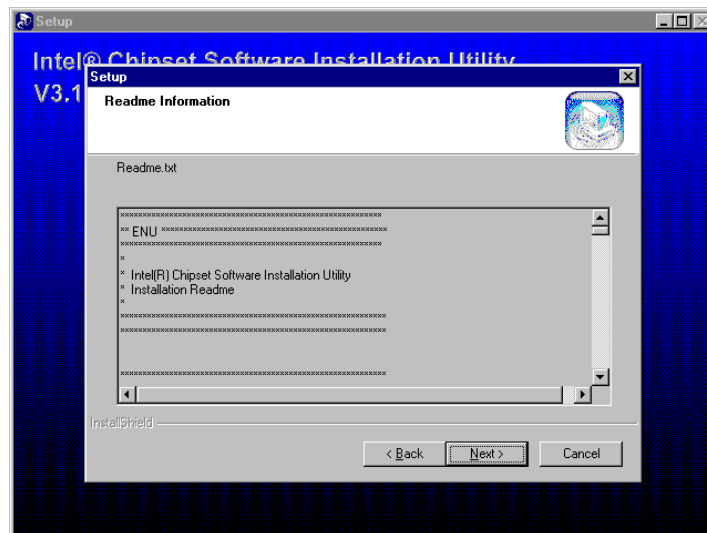
4. Immediately after clicking the IDE button in Step 1, the program launches the InstallShield Wizard that will assist you in the installation process. Click on the **Next >** button to proceed.



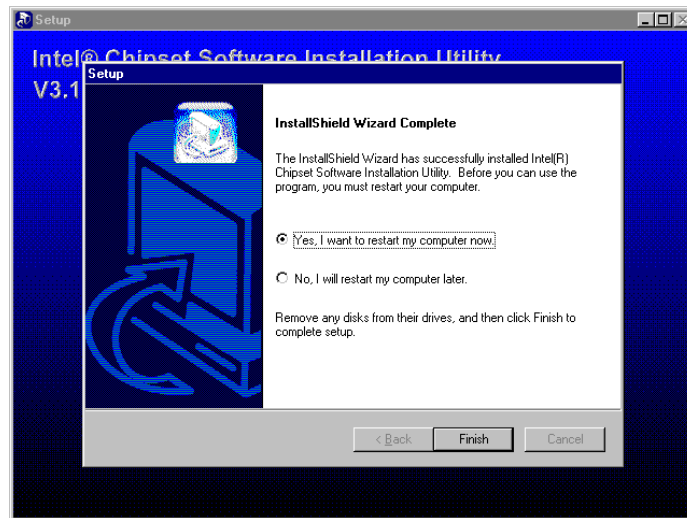
5. The Intel OEM Software License Agreement dialog box then appears on the screen. Choose **Yes** to proceed.



6. When the Readme Information dialog box pops up, just click on the **Next** button to proceed.



- Once the Install Shield Wizard finishes updating your system, it will prompt you to restart the computer. Tick on the **Yes, I want to restart my computer now** followed by a click on the **Finish** button to reboot. Only after your computer boots will the new settings take effect.

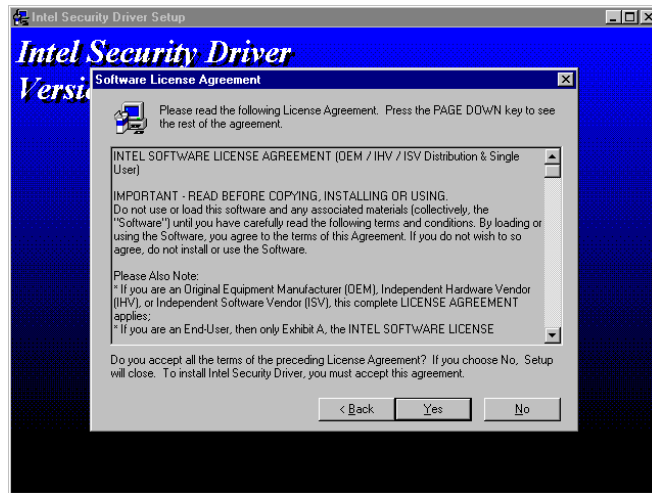


5.1.2 Installing Intel Security Driver

- Following Steps 1 ~ 3 of the Intel 815 chipset software (from the preceding section), click on the **INTEL_SECURITY_DRIVER** button. When the dialog box below appears, make sure you close all other Windows applications then click on the **Next >** button to proceed.



2. The Intel OEM Software License Agreement dialog box then appears on the screen. Choose **Yes** to proceed.



3. When the **Release Notes** box pops on the screen, read through any important information listed before clicking the **Next >** button.



4. Setup will then prompt you to specify the path where you would like the Security driver installed. Select the **Next >** button after you have made your path/installation choice.

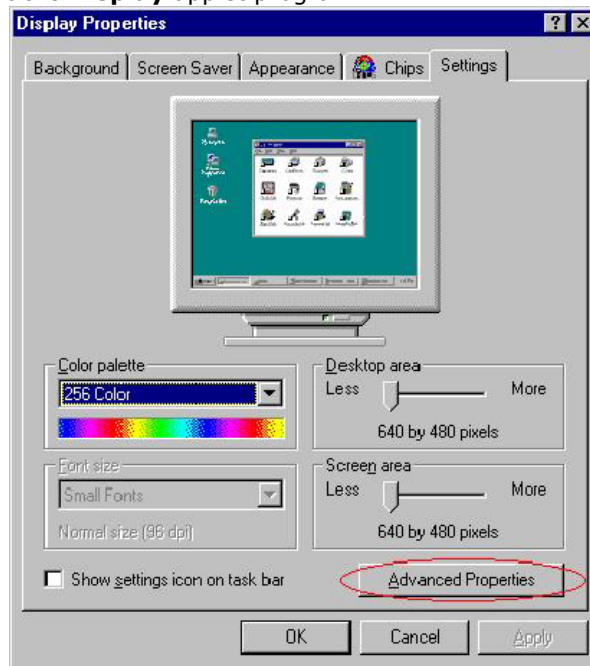


5. Once the setup program finishes copying files into your system, it will prompt you to restart the computer. Tick on the **Yes, I want to restart my computer now** followed by a click on the **Finish** button to reboot. Only after your computer boots will the new settings take effect.



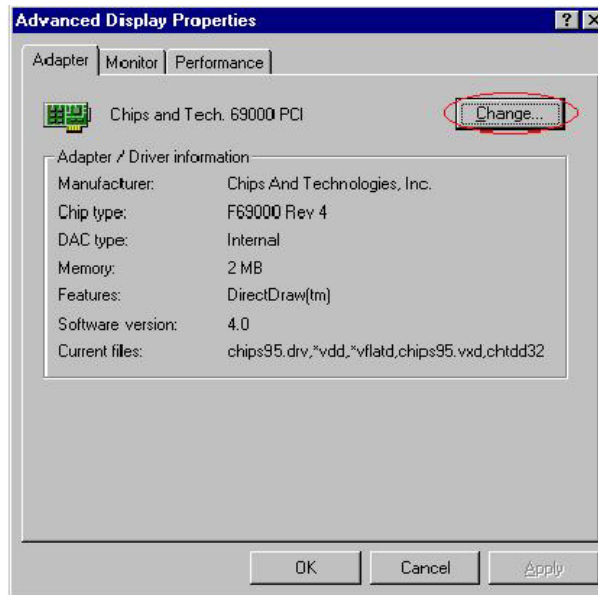
5.2 VGA Driver Installation for Win 95/98

1. Click **Start**, then **Setting**, then **Control Panel**.
2. Start the **Display** applet program.



3. Select the setting page, click on the **Advanced** properties button.

4. Press the **Change** button in the adapter area.



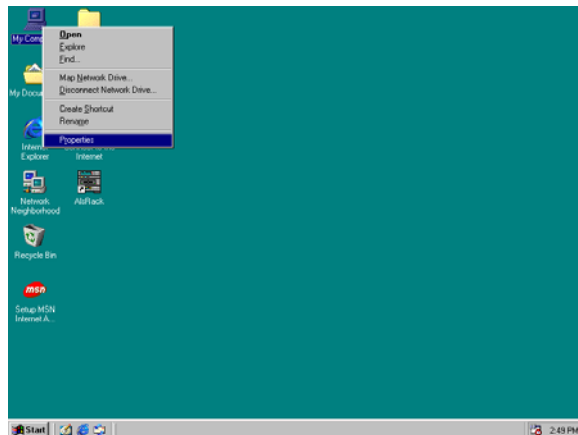
5. Click on **Next** to continue and then select
**Display a list of all drivers in a specific location,
so you can select the drivers you want.**
6. Click on **Next**.
7. Select the **Specify a location** checkbox then **Browse**.
8. Specify the path to the new driver and then press the <ENTER> key (if in driver A: select a:\win95).
9. Once completed, the **Select** device dialog box will appear. Choose on:
SiS 315 V2.04
10. Continue choosing until asked to restart machine.
11. After the system has restarted, you can go back into the display applet and select alternate screen resolutions and color depths.

NOTE: *Installation procedure for Windows 98 is similar to Windows95.*

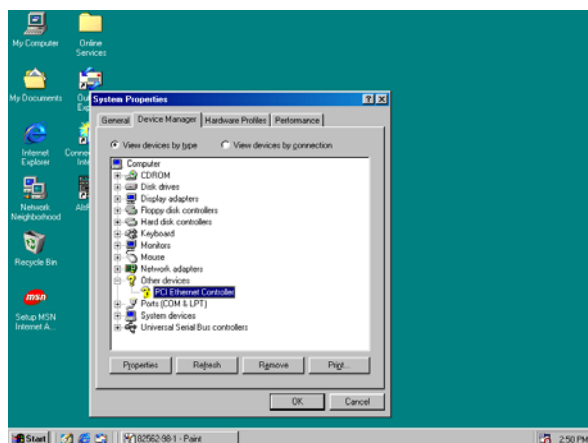
5.3 LAN Driver Installation

5.3.1 Win 95/98

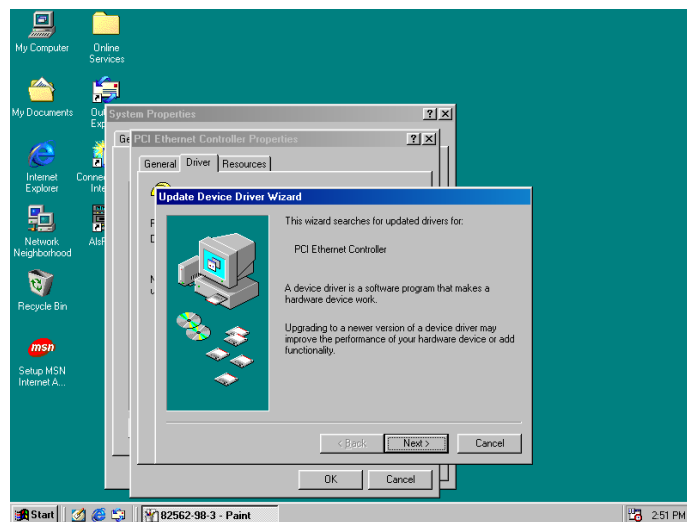
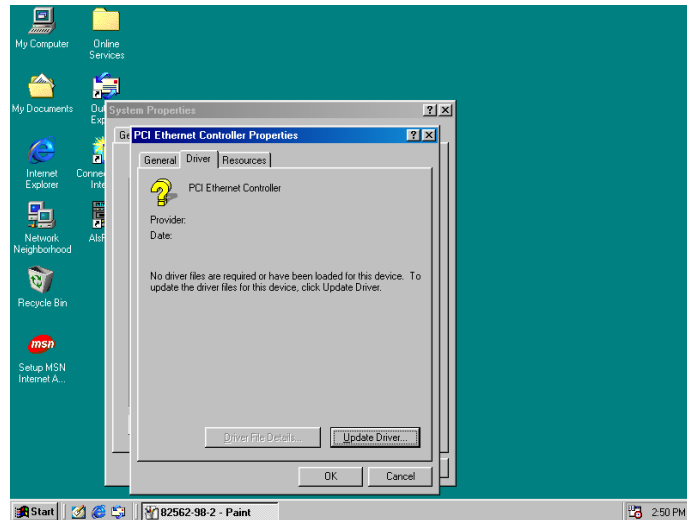
1. Right click on **My Computer** icon then scroll to the **Properties** item from the pop-up menu.



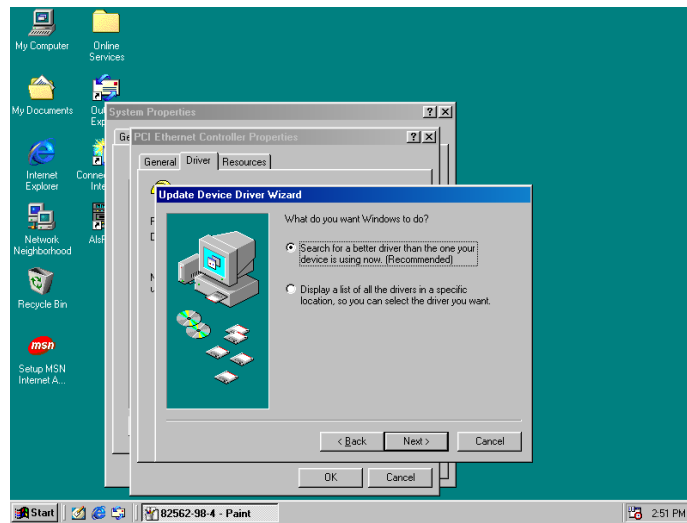
2. Select **Device Manager** from the top menu bar. A list of all devices installed appears, scroll down to the **Other devices** and then select on **PCI Ethernet Controller**. Select the Properties button to access the details of this *unknown* device. Refer to the following screen shot for a clearer explanation of this step.



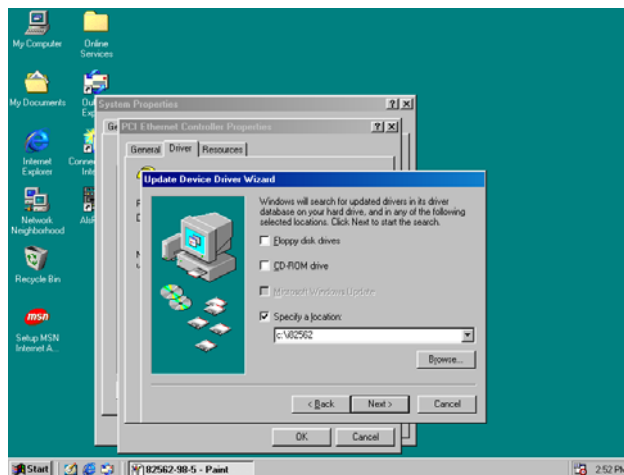
3. Once the **PCI Ethernet Controller Properties** screen pops on the screen, click on the **Update Driver ...** button to launch the **Update Device Driver Wizard** screen.

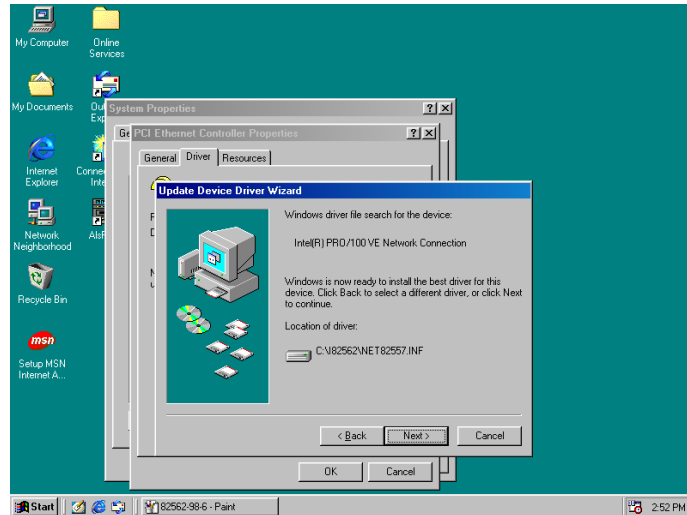


- The succeeding screen then lets you choose whether to search for a better driver for the LAN or display the available list of drivers. Select **Search for a better driver than the one your device is using now** followed by a click on the **Next >** button.

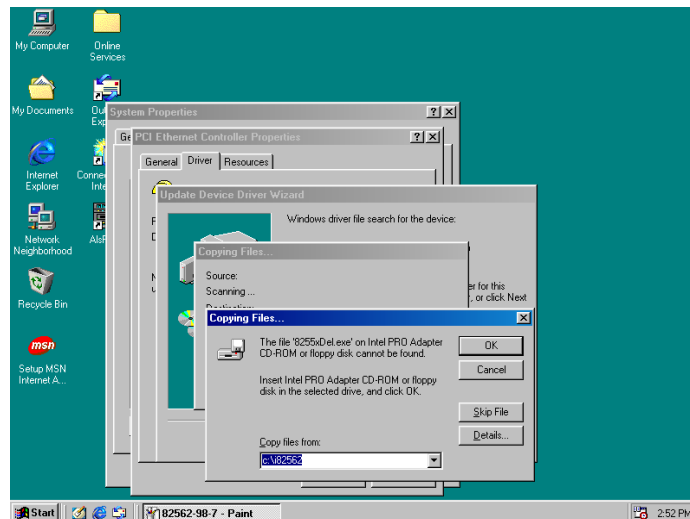


- The wizard program will then require you to specify the location of the driver file. Tick on the **Specify a location:** and type or select the path where the driver files exist (c:\i82562). Click on the **Next >** button to proceed.

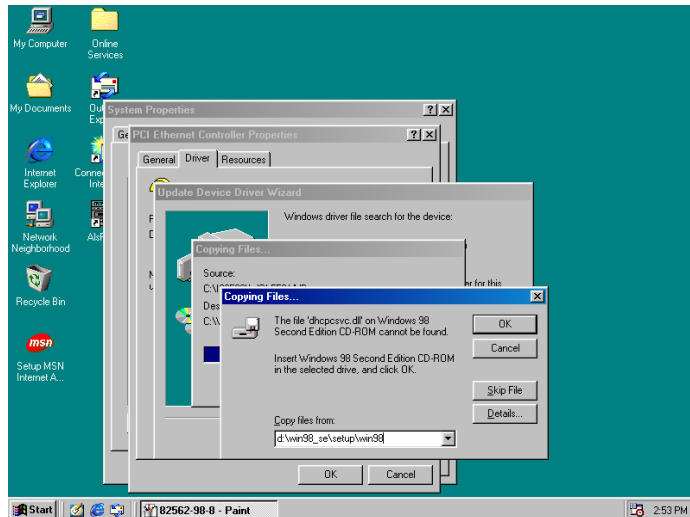




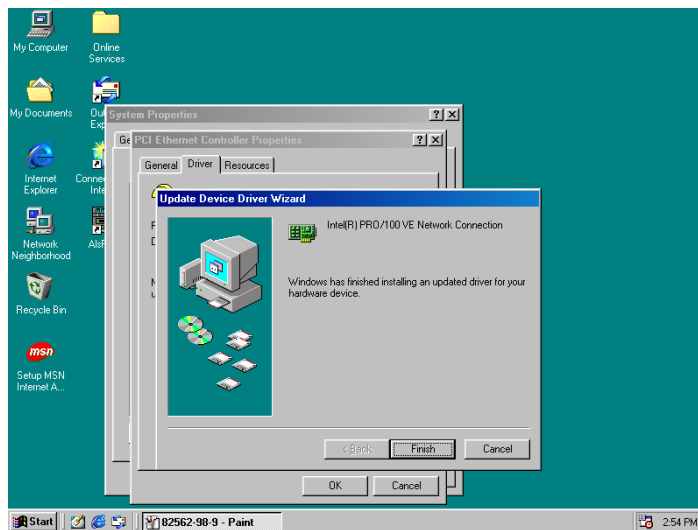
6. The program now starts copying the file(s) needed by your Win98. When the program fails to seek for 825xDel.exe file from your specified location, it will prompt you to specify the path where the Intel Pro Adapter exists.



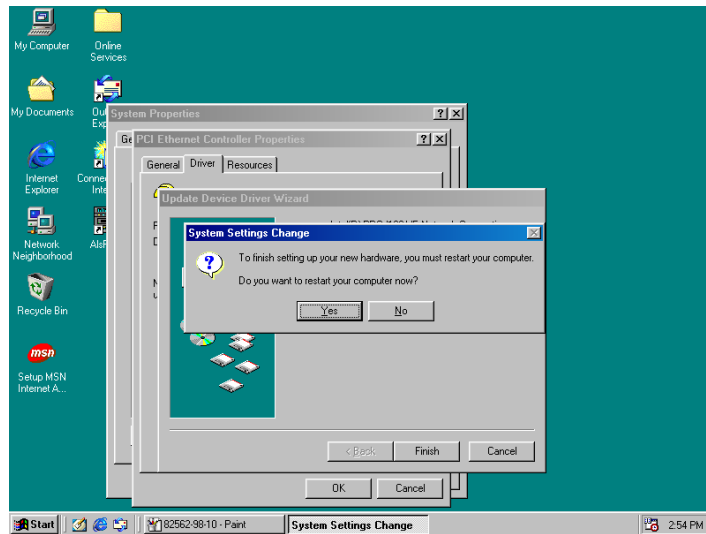
7. With the Utility CD Disk on your CD drive, key in `d:\win98_se\setup\win98` on the blank space below **copy files from:** then press the **OK** button.



8. When the program finishes updating and copying files for the Intel Pro/100VE Network Connection, click on the **Finish** button to proceed.

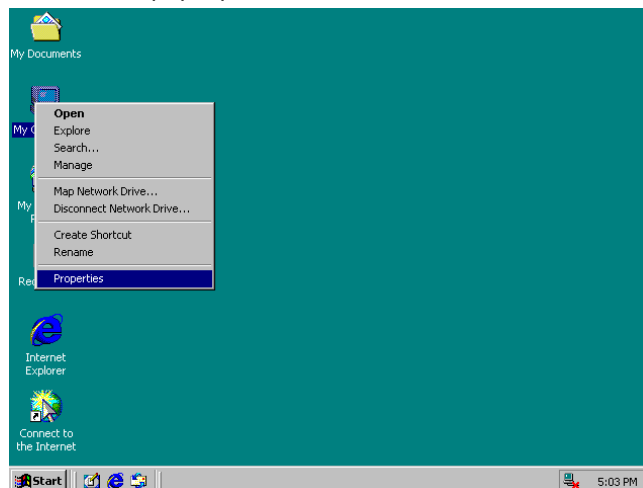


9. For the new hardware settings to take effect and to complete the installation process, you must restart your computer when the **System Settings Change** window below pops up. Click on the **Yes** button to complete the installation.

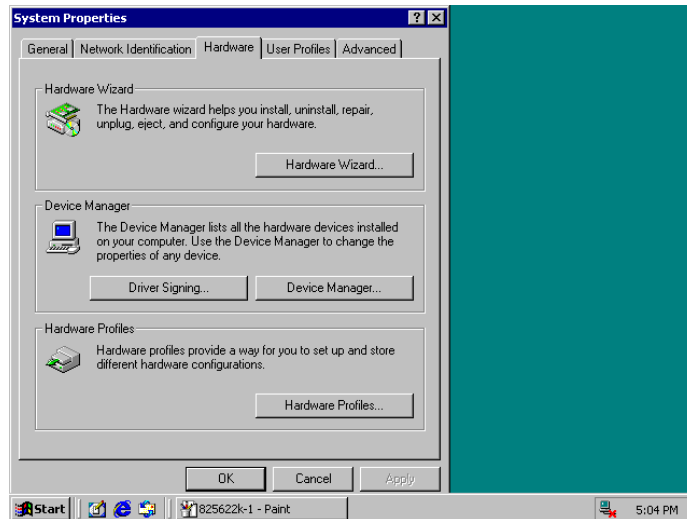


5.3.2 Win 2000

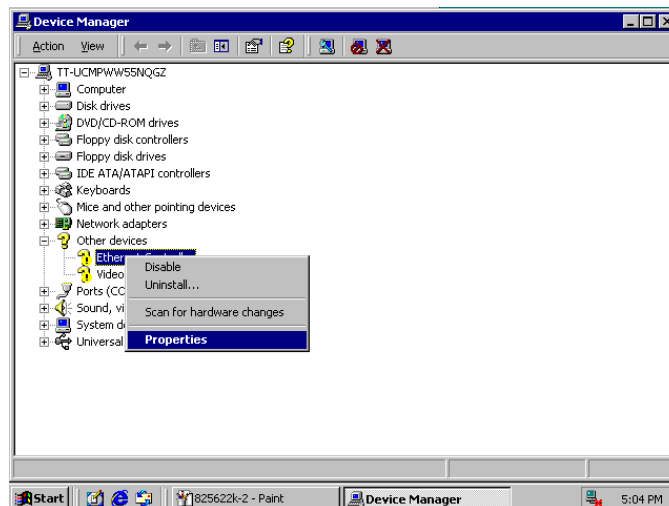
1. Right click on **My Computer** icon then scroll to the **Properties** item from the pop-up menu.



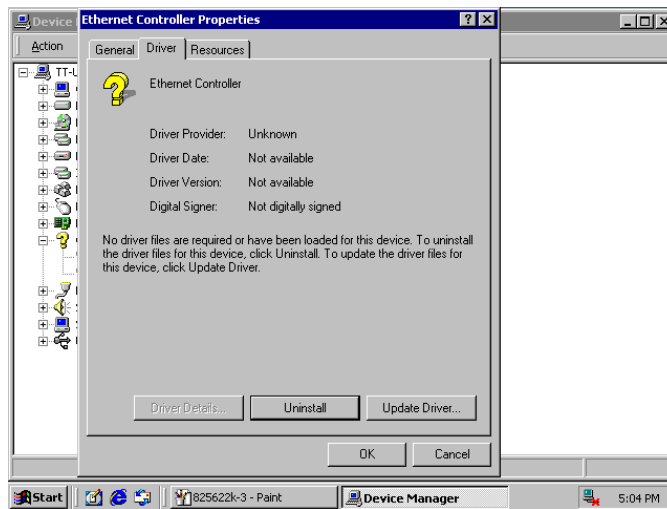
2. When the System Properties window pops up on the screen, click on the **Device Manager** button.



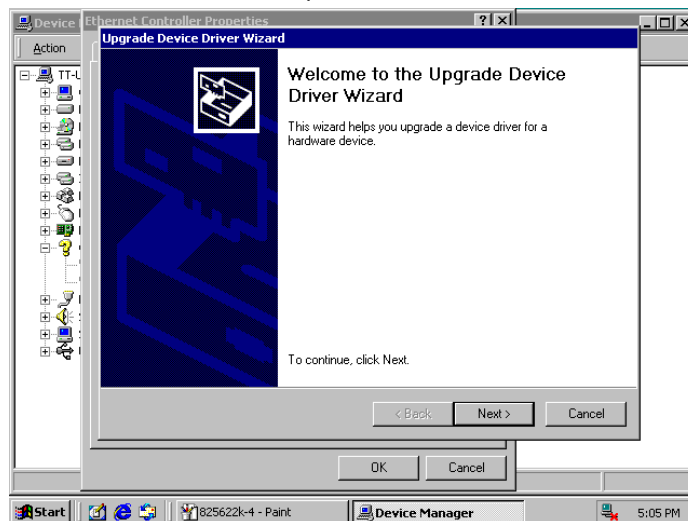
3. A list of all devices installed appears, scroll down to the **Other devices** and then right click on **Ethernet Controller** to select the Properties button Refer to the following screen shot for a clearer explanation of this step.



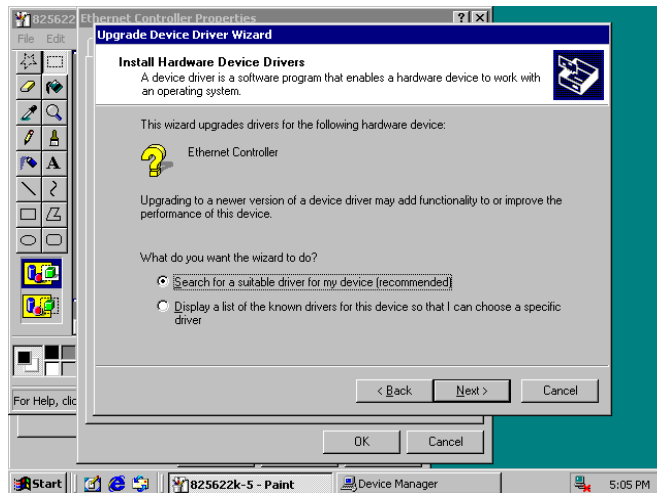
- Once the **Ethernet Controller Properties** screen pops on the screen, click on the **Update Driver ...** button to launch the **Update Device Driver Wizard** screen. Once the **Upgrade Device Driver Wizard** screen pops on the screen, click **Update Driver ...** to launch the Win 2000 driver installation program.



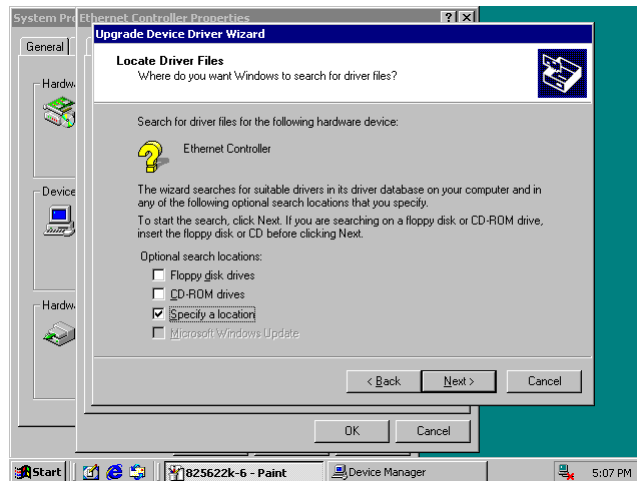
- Click on **Next >** button to proceed with the installation.



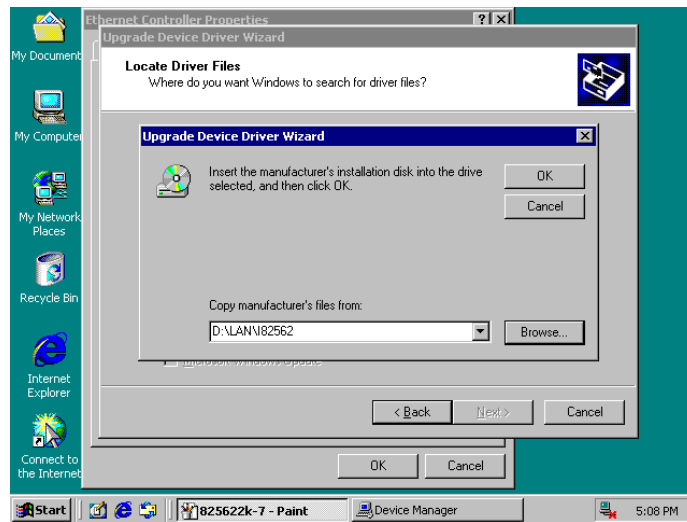
- The wizard will then inform you the unknown device it detected from the system. Since the Win200 drivers list do not include Intel chip driver onboard HS-6238, tick **Search for a better driver than the one your device is using now** followed by a click on the **Next >** button to continue.



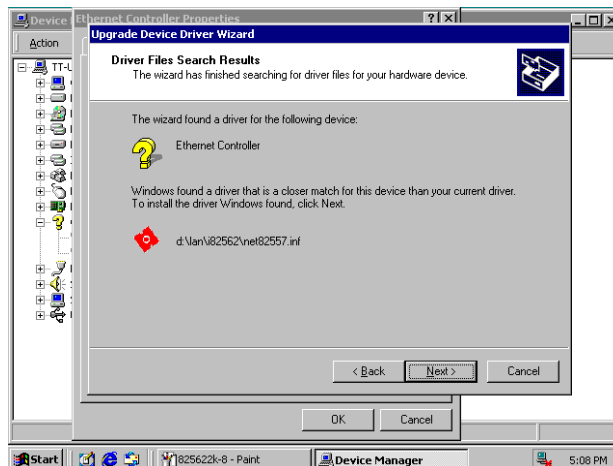
- The wizard program will then prompt you to specify the location where it will start searching for the driver. Tick on the **Specify a location:** and then click on the **Next >** button to proceed.



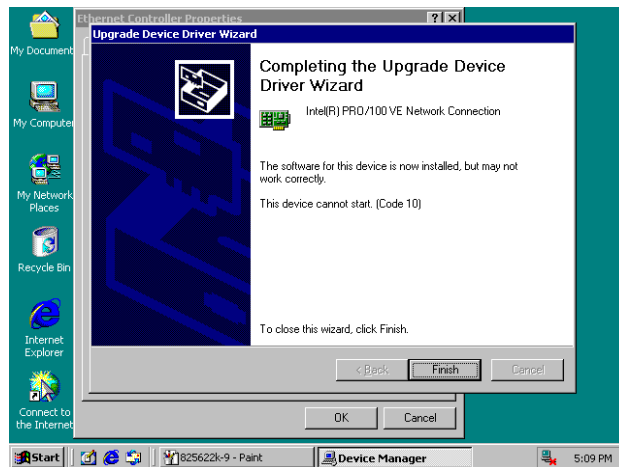
8. The wizard program will then require you to insert the manufacturer disk at your specified location (entered at the **Copy manufacturer's files from:** space) of the driver file. With your Utility CD disk inserted in the drive, type `d:\an\i82562` then click on the **OK** button to proceed.



9. The wizard program will start to scan and search for the driver(s) located at your specified location. After which, the wizard program will show the result of its search. When it finds a more suitable driver fitting your device, it will list the driver name and path. Just click on the **Next >** button to continue installing.



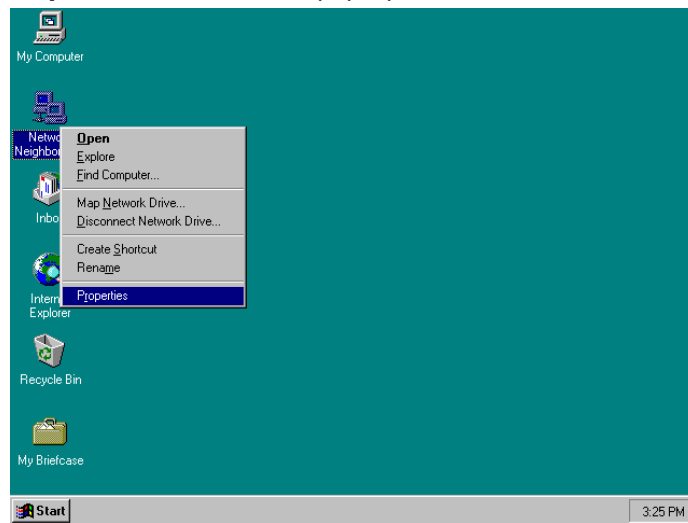
10. When the program finishes updating and copying files for the Intel Pro/100VE Network Connection, click **Finish** to proceed.



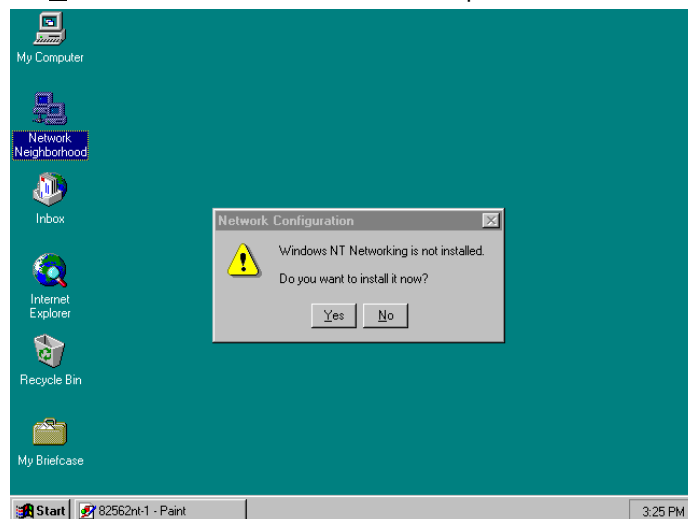
11. For the new hardware settings to take effect and to complete the installation process, you must restart your computer when the **System Settings Change** window below pops up. Click on the **Yes** button to complete the installation.

5.3.3 Win NT

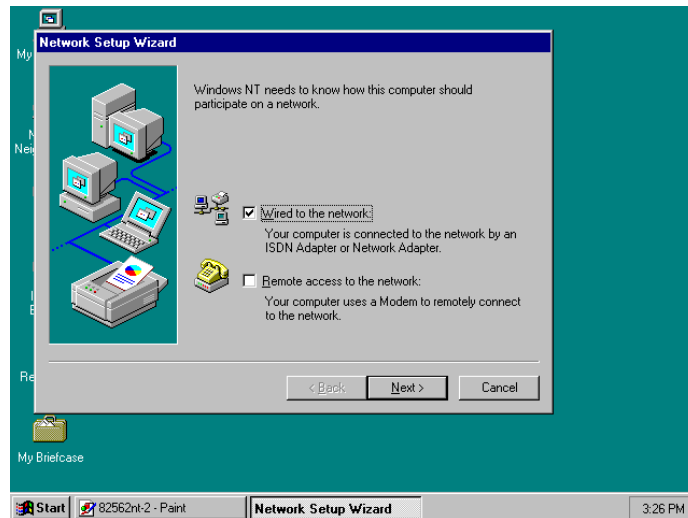
1. Right click on **Network Neighborhood** icon then scroll to the **Properties** item from the pop-up menu.



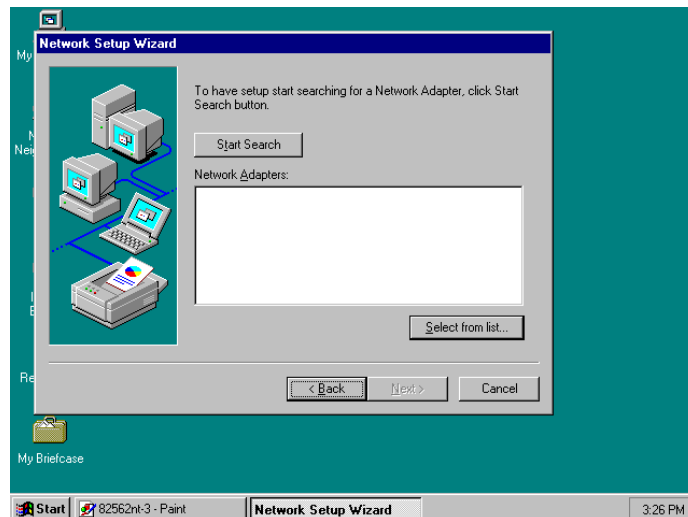
2. The Network Configuration dialog box then appears, notifying the user that there is no Windows NT Networking available. Click on the **Yes** button to start the installation process.



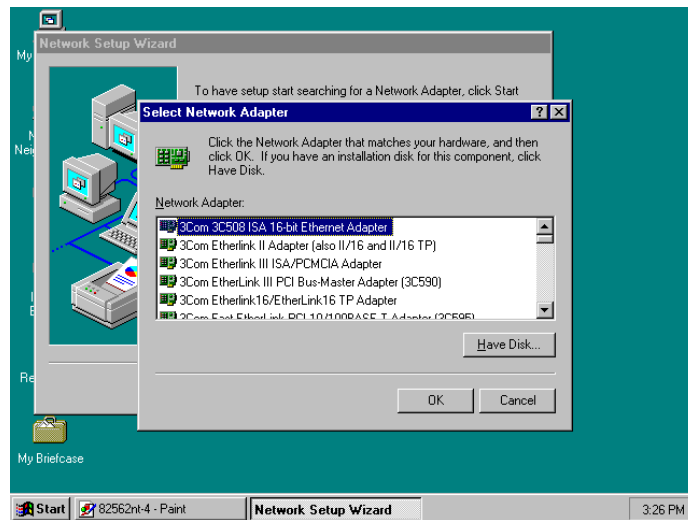
- The Network Setup Wizard will then ask you to identify the network connection of your computer. Select **Wired to the network** and click on the **Next >** to continue.



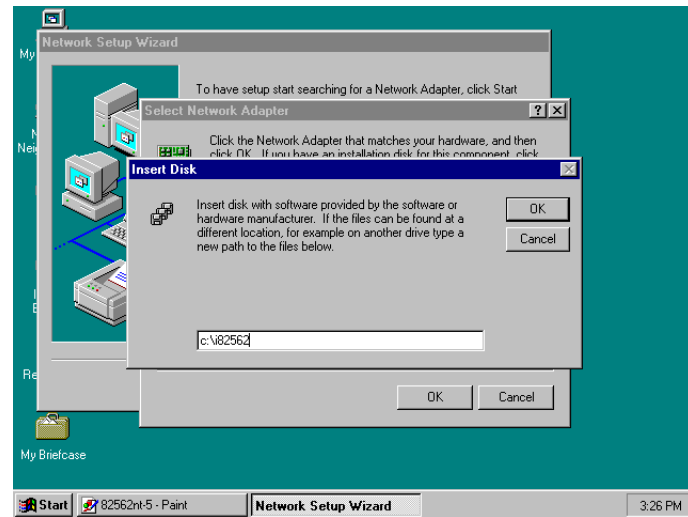
- The succeeding screen then indicated that the wizard will initially search for Network Adapter from the available list of drivers. Select on **Start Search**.



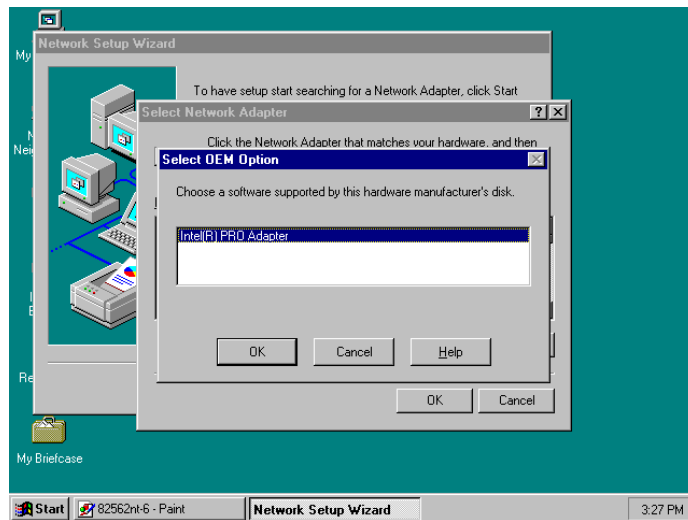
- When it is done searching for available network drivers, the wizard will show a list and allow you to locate and choose the appropriate Network Adapter. Since the LAN device driver is in the Utility CD Disk, select on Have Disk ... to proceed.



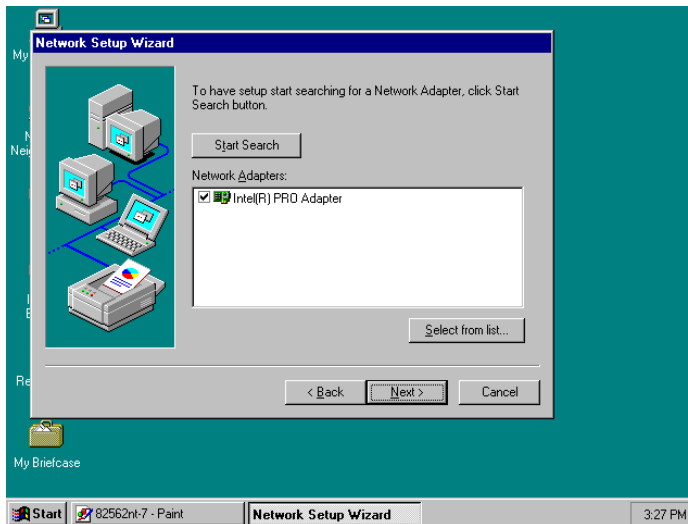
- The wizard program will then require you to insert the manufacturer disk and specify the location of the driver file (i.e., c:\i82562). Click on the **OK** button to proceed.



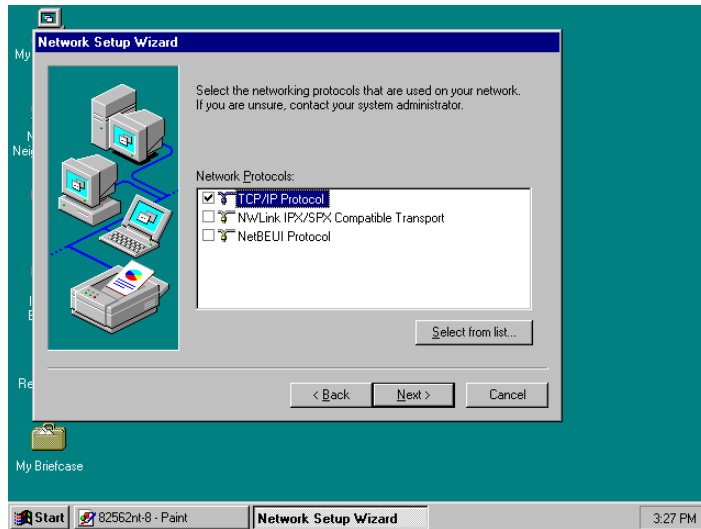
7. The Select OEM Option then appears, prompting you to select the software supported by the network hardware device you will install. Select Intel(R) PRO Adapter and click on the **OK** button to continue installing.



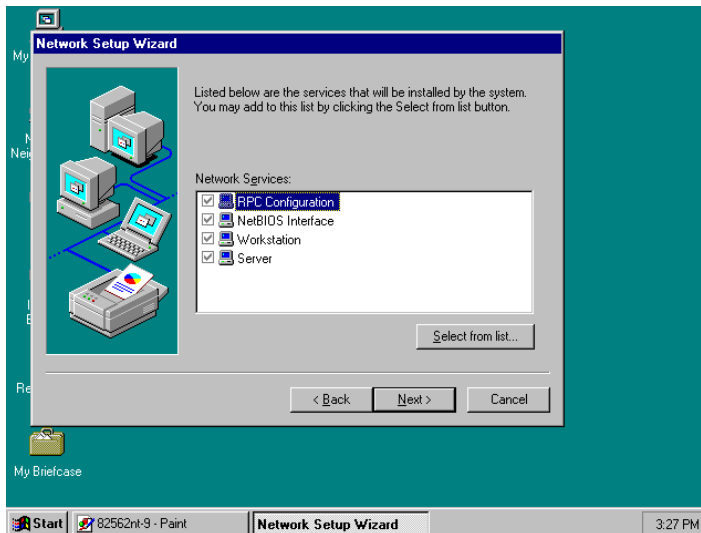
8. The wizard program now displays on the screen that it has detected the Intel() PRO Adapter. Click on the **Next >** button to continue installing.



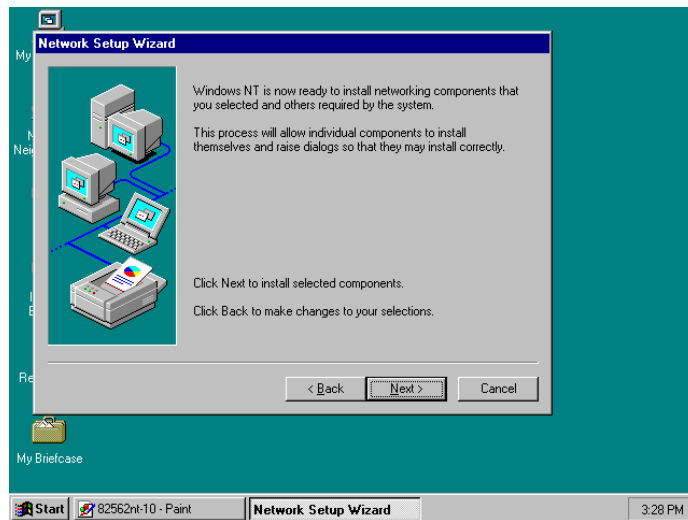
9. The wizard program now prompts you to specify the networking protocols used on your network structure. Tick on the TCP/IP Protocol and click on the **Next >** button to proceed.



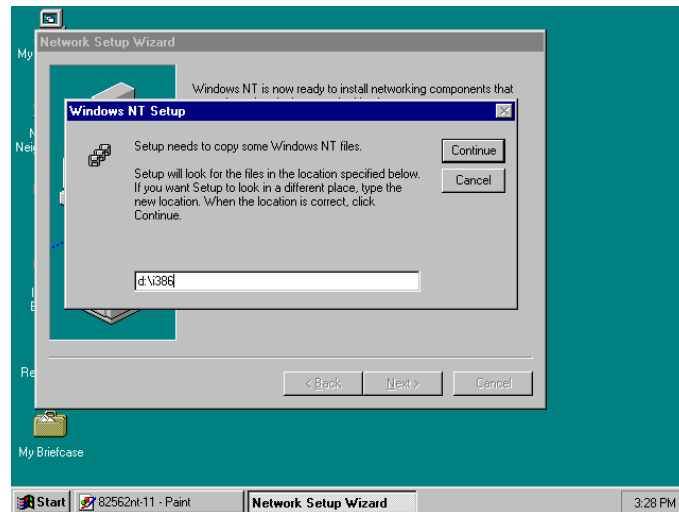
10. The next screen will allow you to customize the Network Services the wizard program intends to install. Tick services as needed and then click on the **Next >** button to continue.



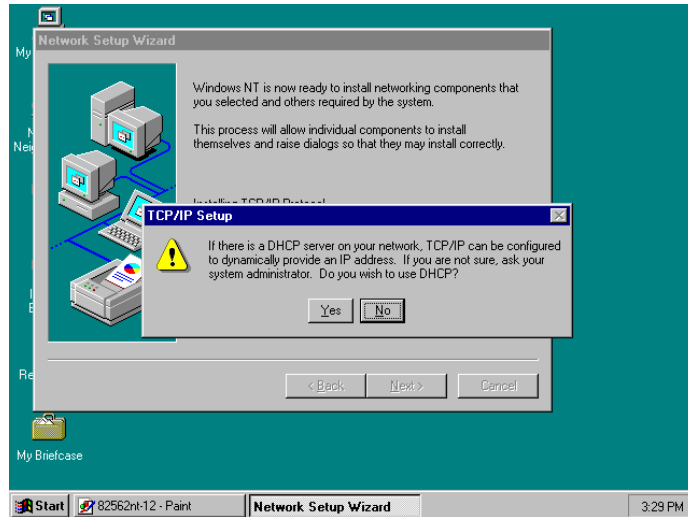
11. The Network Setup Wizard then prompts you that it is ready to install the network components based on your selection. You may start installing by clicking on the **Next >** button or make modifications on your choices using the **< Back** button.



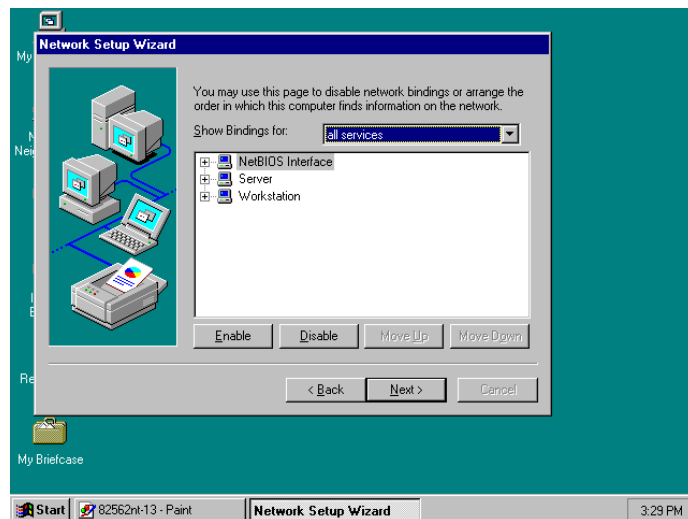
12. The Network Setup Wizard will then need to copy the drive file(s). Specify the path of your device driver(s) (i.e., d:\i386) and click the **Continue** button.



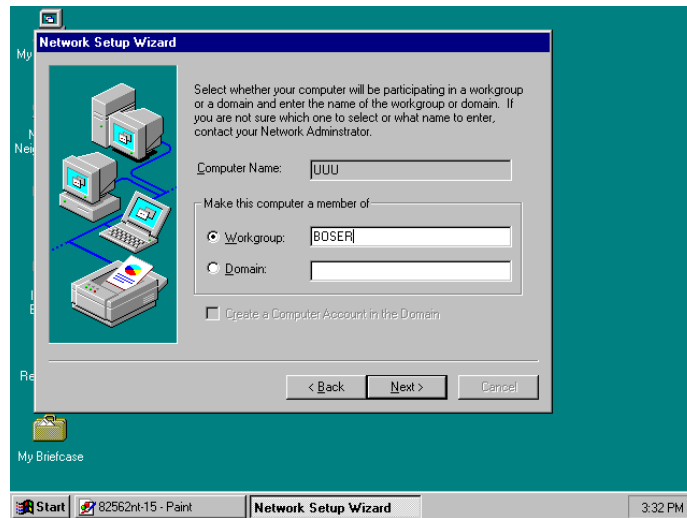
13. Choose the default entry, **No**, when the following screen pops on the screen.



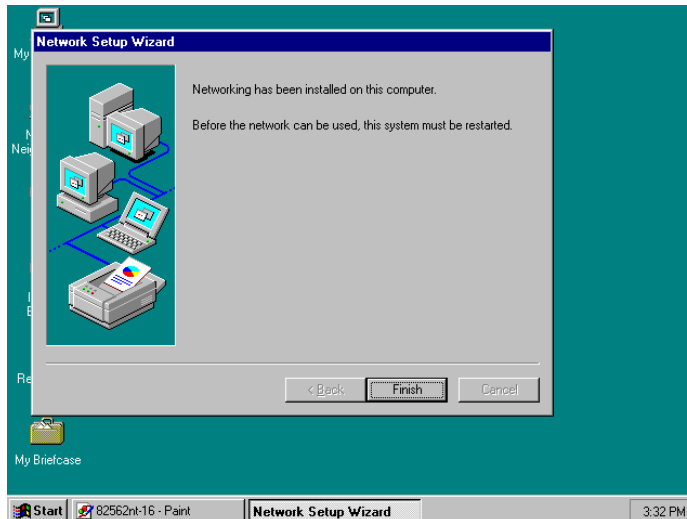
14. If you need to disable network bindings on the network services installed, select the service and then click on the **Disable** button. Otherwise, proceed by clicking on the **Next >** button.



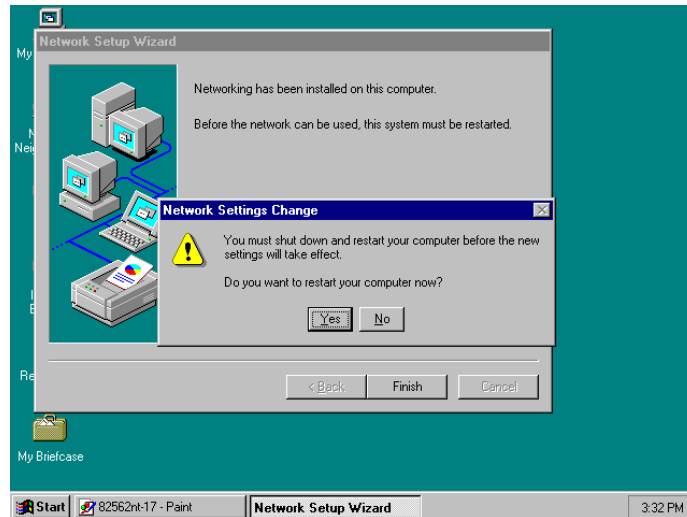
15. Specify the network participation type of your computer, either to a Workgroup or a Domain. Click on the **Next >** button after identifying the network group installed on your computer.



16. The wizard program then informs you that Networking is now installed on your system. You must restart your computer to make the setting changes take effect. Click on the **Finish** button to close the wizard program.



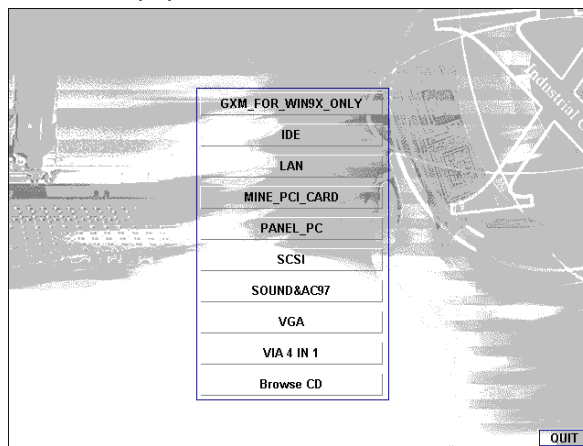
17. When the following dialog box pops on your screen, click on the **Yes** button to restart your computer and make the setting changes take effect.



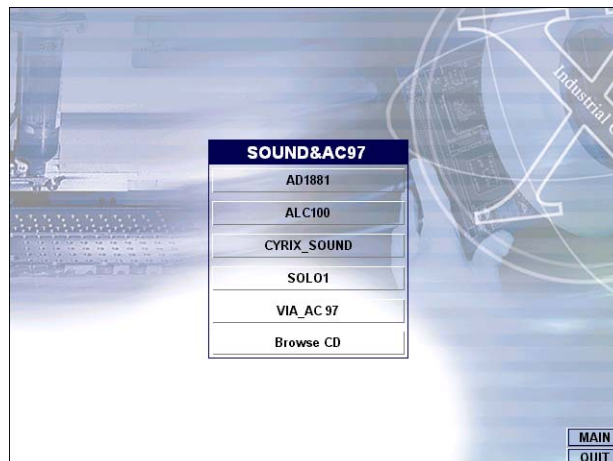
5.4 Audio Driver Installation

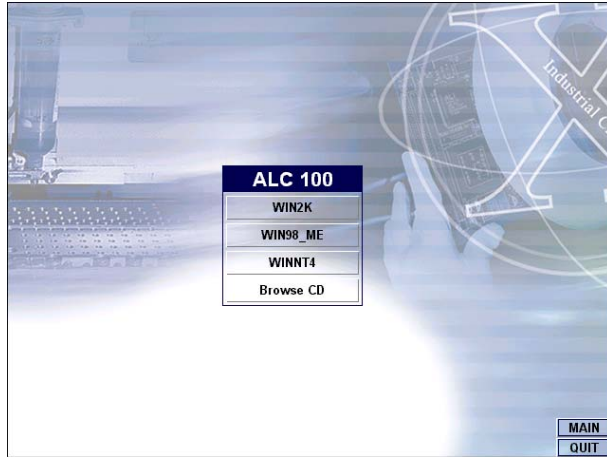
5.4.1 Win 95/98

1. After loading the Utility CD-ROM, the program automatically runs the utility. Press **Enter** to proceed installing. When the main utilities window pops on the screen, select **SOUND&AC7**.

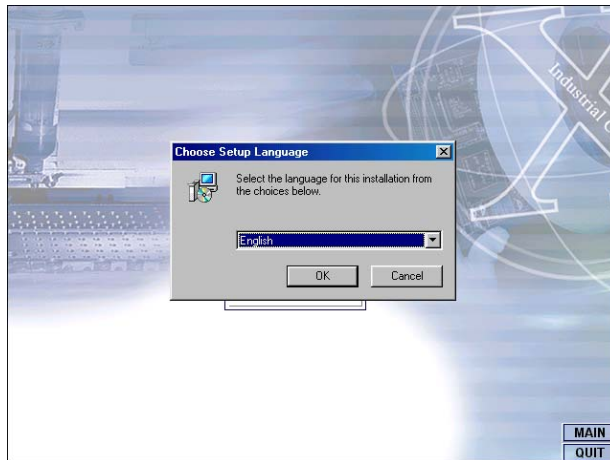


2. The succeeding screen will then show you the **SOUND&AC97** main menu. Select on **ALC 100** to continue installation. When the ALC100 dialog box appears, pick on **WIN98_ME** and it will take you to the ALC 100 menu. Refer to the following screen shots for a graphical description of this step.

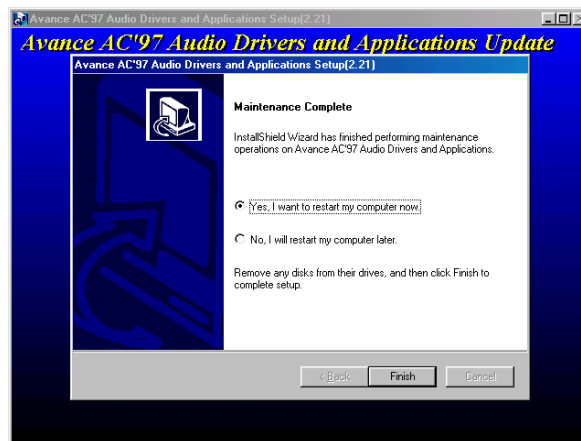




3. Select the language you intend to use for the installation. The default is **English**. After making your choice, press on the **OK** button to proceed.

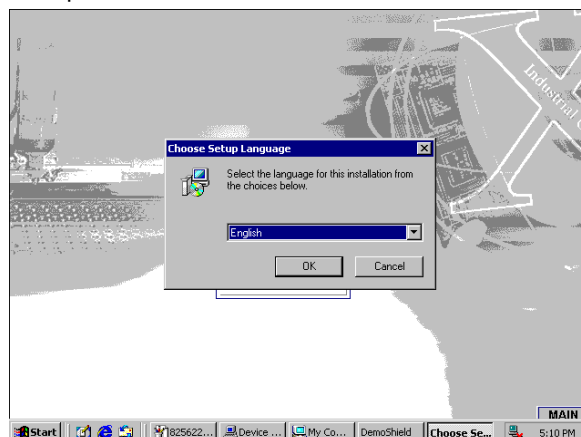


- Once the InstallShield Wizard completes the operation and update of your AC'97 driver, it will ask you to remove disks from their drives, and prompt you to restart your system. Tick on the **Yes, I want to restart my computer now**. Afterwards, click on the **Finish** button to complete the installation process. The system changes you made will take effect after the system restarts.

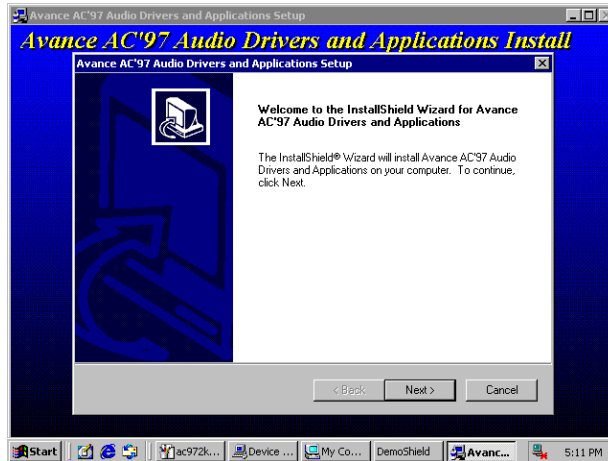


5.4.2 Win 2000

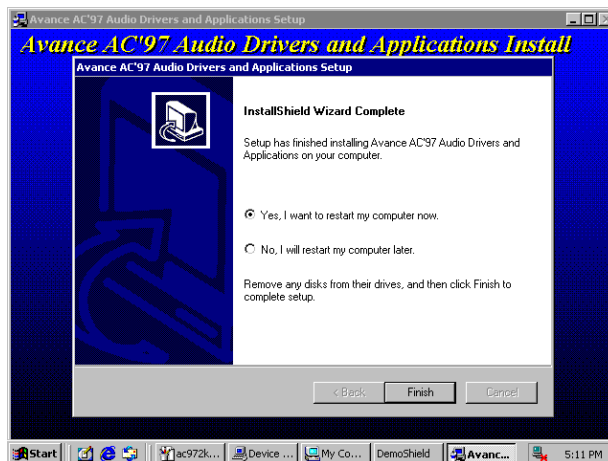
- Following steps 1 and 2 of the Win95/98 AC97 installation, select **WIN2K** button when the ALC100 dialog box appears screen.
- Select the language you intend to use for the installation. The default is **English**. After making your choice, press on the **OK** button to proceed.



3. Immediately after clicking on the **OK** button from the preceding step, the **Avance AC'97 Audio Drivers and Applications Setup** dialog box will appear on screen. Just click on the **Next >** button to continue.

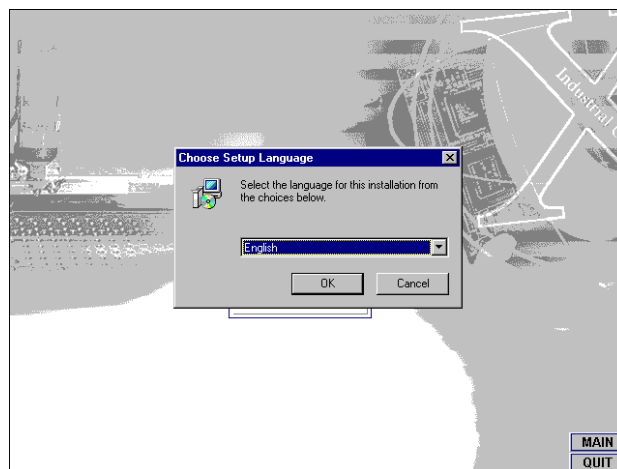


4. Once the InstallShield Wizard completes the operation and update of your AC'97 driver, it will ask you to remove any disks from their drives, and prompt you to restart your system. Tick on the **Yes**, I want to restart my computer now. Afterwards, click on the **Finish** button to complete the installation process. The system changes you made will take effect after the system restarts.

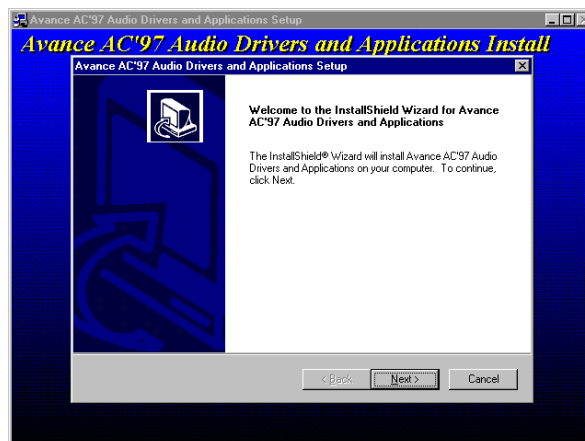


5.4.3 Win NT

1. Following steps 1 and 2 of the Win95/98 OR step 1 of Win 2000 AC97 installation, select **WINNT** button when the ALC100 dialog box appears screen.
2. Select the language you intend to use for the installation. The default is **English**. After making your choice, press on the **OK** button to proceed.



3. Immediately after clicking on the **OK** button from the preceding step, the **Avance AC'97 Audio Drivers and Applications Setup** dialog box will appear on screen. Just click on the **Next >** button to continue.



- Once the InstallShield Wizard completes the operation and update of your AC'97 driver, it will ask you to remove any disks from their drives, and prompt you to restart your system. Tick on the **Yes**, I want to restart my computer now. Afterwards, click on the **Finish** button to complete the installation process. The system changes you made will take effect after the system restarts.

