MAT-E652

VIA C3 Low Power Processors Embedded SBC

User's Manual

Version 1.0

Manual edition 1.0, May.2002

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Chapter 1. General Information

1.1 Introduction

The MAT-E652 is a full function of 3.5" Embedded format SBC board use VIA VT8606 and VT82C686B chipset supports processors VIA Ezra/Eden (EBGA packaging) processors. The MAT-E652 supports CRT and 36-bit TFT panels, Realtek RTL8139C+ Ethernet chipset with RJ45 jack for 10/100Mbps and AC-97 Audio Interface.

The onboard features include three RS-232 and one RS-232/422/485 serial ports, one bi-directional parallel port and onboard SSD interface supports 50-pin CompactFlash socket for TypeI/II CompactFlash Card. The MAT-E652 supports up to 4 USB included two USB ports and pin-header for USB3/4, 8 Digital Input/8 Output as well as the Watchdog timer. For the expansion ability, the MAT-E652 reserved a PC/104 connector and proprietary PCI connector onboard.

1.2 Specification

CPU	VIA Ezra/Eden (EBGA package) processor
BIOS	Award® 256KB Flash BIOS
Chipset	VIA VT8606 + VT82C686B
I/O Chipset	Built-in VT82C686B + Winbond 83977EF
Memory	One 144-pin SO-DIMM socket support up to 512Mbytes SDRAM
Enhanced IDE	Support up to two IDE devices (Ultra DMA 33/66/100).
FDD interface	Support 34-pin header up to two floppy disk drives
Parallel port	One bi-directional parallel port. Support SPP/ECP/EPP
Serial port	Three RS-232 and one RS-232/422/485 serial ports.
IR interface	Support one IrDA Tx/Rx header
KB/Mouse connector	Support PC/AT keyboard and PS/2 mouse
USB connectors	Support four USB ports
Battery	Lithium battery for data retention up to 10 years(in normal condition)
Watchdog Timer	Can generate a system reset, or IRQ11. Support

	software selectable timeout interval.
Digital I/O	Eight digital output and eight input
PCI Connector	Optional proprietary PCI connector for PCI expansion
PC/104 Connector	One PC/104 connector
Power management	APM 1.1 compliant
Flat Panel/CRT Interface	
Chipset	VIA Twister chip with integrated Savage4 2D/3D/Video Accelerator
Display memory	Share system memory 8/16/32MB
Interface	4x AGP VGA/LCD interface, support for 9, 12, 15, 18, 24, 36 bit TFT and optional 16 or 24-bit DSTN Panel
Display type	Support CRT, 36bit TTL TFT LCD and LVDS interface
Ethernet Interface	
Chipset	Realtek RTL8139C+ 100Base-TX Fast Ethernet controller
Ethernet interface	PCI 100/10 Mbps Ethernet controller
SSD Interface	One 50-pin CompactFlash™ socket
Sound Interface (Optional via Audio Kit)	
Chipset	Option AC 97 codec
Audio controller	SoundBlaster Pro Hardware and Direct Sound Ready AC97 Digital Audio
Audio interface	Mic in,, Line in, Speaker out and CD audio in
Mechanical and Environmental	
Power supply voltage	VCC (4.75V to 5.25V)
Max. power requirements	4A @ 5 V, 200mA/+12V
Operating temperature	32 to 140°F (0 to 60°C)
Board size	5.7"(L) x 4"(W) (145mm x 102mm)
Weight	0.26 lb. (0.57 Kg) (bare)

1.3 MAT-E652 Package

Please make sure that the following items have been included in the package before installation.

1. MAT-E652 VIA C3 Single Board
2. Quick Setup
3. Cable: Please refer to Appendix F Optional Cables
4. CD-ROM which contains the following folders:

(1) Manual
(2) LAN Driver
(3) Tools
(4) Chipset Driver
(5) VGA Driver
(6) Sound Driver

If any of these items are missing or damaged, please contact your dealer from whom you purchased the board at once. Save the shipping materials and carton in the event that you want to ship or store the board in the future. After you unpack the board, inspect it to assure an intact shipment. Do not apply power to the board if it appears to have been damaged.

Leave the board in its original packing until you are ready to install

Precautions

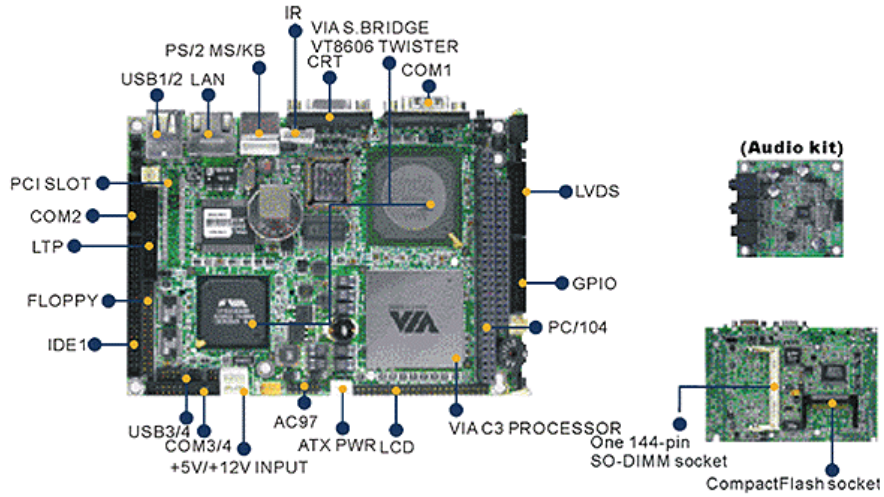
Please make sure you properly ground yourself before handling the MAT-E652 board or other system components. Electrostatic discharge can be easily damage the MAT-E652 board.

Do not remove the anti-static packing until you are ready to install the MAT-E652 board.

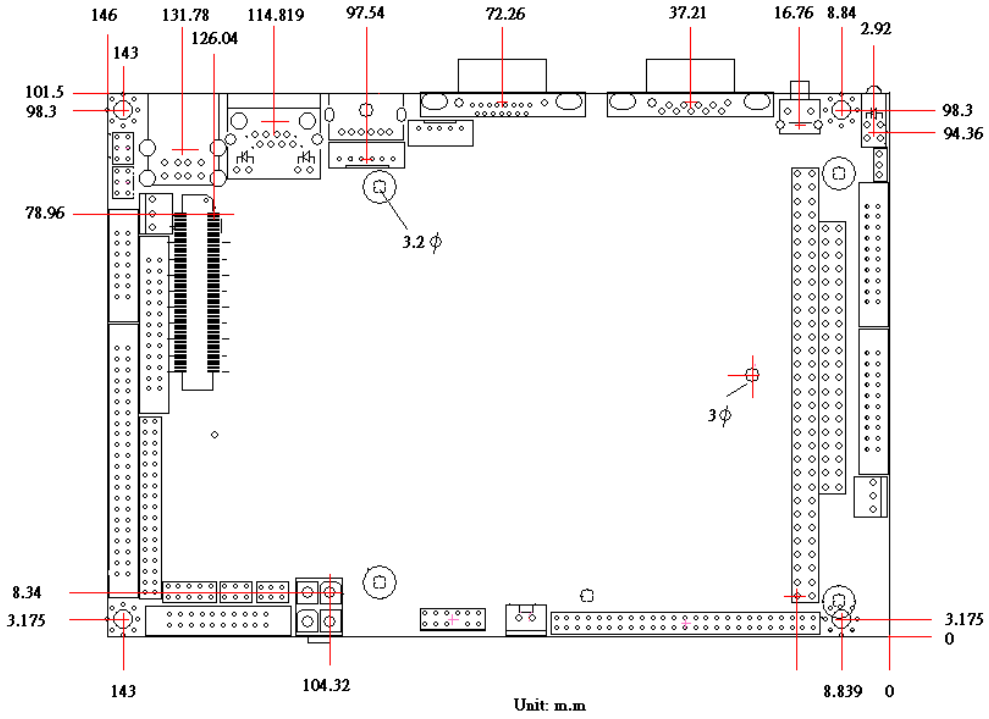
Ground yourself before removing any system component from it protective anti-static packaging. To ground yourself, grasp the expansion slot covers or other unpainted parts of the computer chassis.

Handle the MAT-E652 board by its edges and avoid touching its component.

1.4 Board Layout

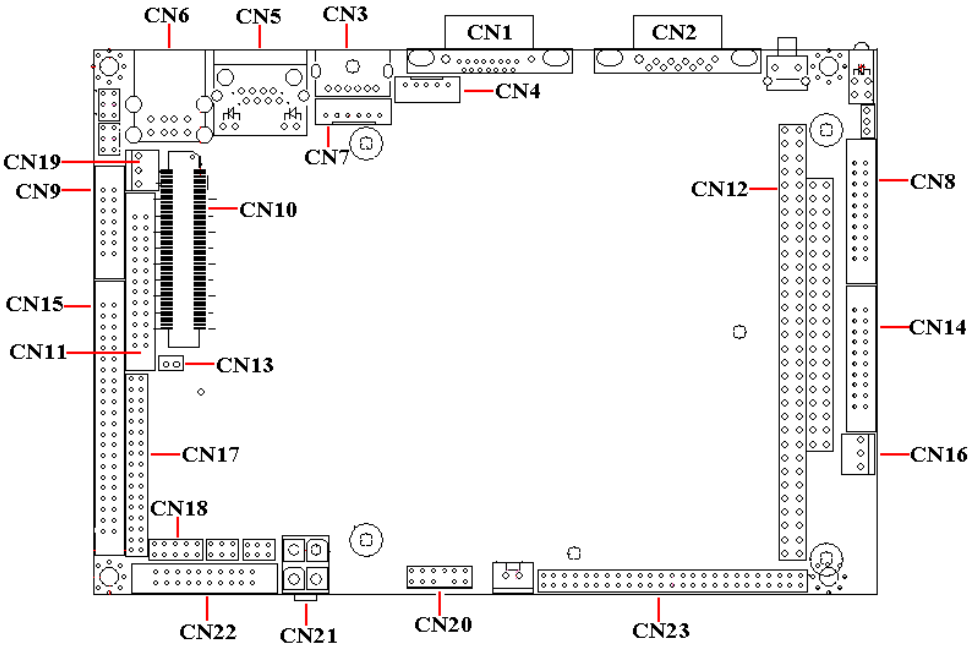


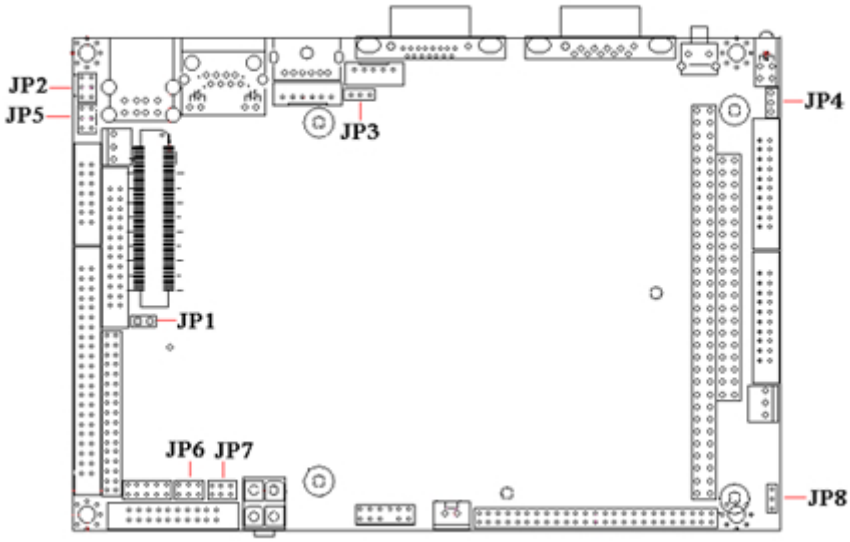
1.5 Board Dimension



Chapter 2. Connectors/Jumpers Location and Configuration

2.1 Connectors/Jumpers Location and Define





Connector	Description	Connector	Description
CN1	VGA Connector (D-Sub)	CN13	Power Button
CN2	COM1 Connector (D-Sub)	CN14	GPIO Port Connector
CN3	PS/2 KB/MS Connector (D-Sub)	CN15	IDE Connector
CN4	IR Connector	CN16	LCD Backlight Enable Connector
CN5	LAN Connector (RJ45)	CN17	Floppy Connector
CN6	USB Connector	CN18	USB3/4 Connector (Pin Header)
CN7	Internal KB/MS Connector(Hader)	CN19	ATX Power Connector
CN8	LVDS Connector	CN20	AC97 Connector
CN9	COM2 Connector(RS232/422/485)	CN21	+5V/+12V Input Connector
CN10	PCI Interface	CN22	COM3/COM4 Connector (Header)
CN11	LPT1 Connector (Pin Header)	CN23	LCD Display Connector
CN12	PC/104 Connector		
Pin	**Define**	**Pin**	**Define**
JP1	COM1 RI/Voltage Select	JP5	COM2 RI/Voltage Select
JP2	COM2 Mode Select	JP6	COM4 RI/Voltage Select
JP3	Clear CMOS	JP7	COM3 RI/Voltage Select
JP4	Watchdog Output Select	JP8	LCD Voltage Select

2.2. Onboard Processors

The MAT-E652 has onboard built-in VIA Ezra or EDEN EBGA Package processor. The CPU cooler fan will be mounted when board with 800MHz or 667MHz CPU and the high profile Heatsink will be mounted when 667MHz CPU.

2.3 Installing Memory

To insert a SO-DIMM Memory:

The MAT-E652 supports one 144-pin SO-DIMM sockets, memory up to 512Mbyte.

To Insert a SO-DIMM Memory*:* Please align the module with the socket key and press down until the levers at each end of the socket snap close up.

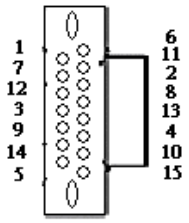
There is only one direction for installing a module in the socket. Do not attempt to force the module into the socket incorrectly.

To Remove a SO-DIMM Memory: To remove a SO-DIMM, press down on the levers at both end of the module until the module pops out

There is only one direction for installing a module in the socket. Do not attempt to force the module into the socket incorrectly.

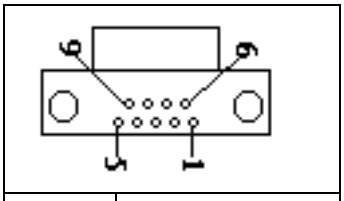
2.4 Connector and Jumper Settings

CN1: VGA Connector



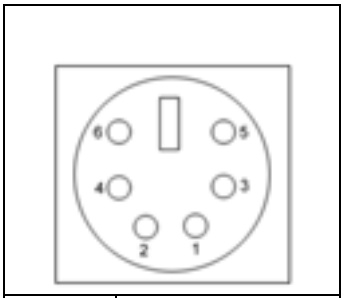
Pin	Define
1	Red
2	Green
3	Blue
4	MONID0
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V
10	Ground
11	MONID1
12	DDC Data
13	H-Sync
VGA Connector 14	V-Sync
15	DDC Clock

CN2: COM1 Connector (D-Sub)



Pin	Define
1	DCD
2	RXD
3	TXD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	RI

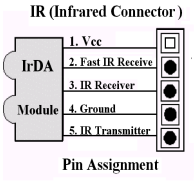
CN3: PS/2 Mouse/Keyboard Connector (MINI DIN Jack)



Pin	Define
1	KBDATA
2	MSDATA
3	Ground
4	+5V
5	KBCLK
6	MSCLK

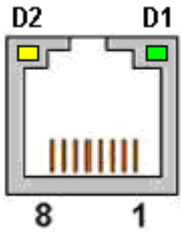
CN4: IR Connector

The onboard IR connector with a 2.0mm pitch pin header



Pin	Define
1	+5V
2	Fast IR Receive
3	IR Receiver
4	Ground
5	IR Transmitter

CN5: LAN Connector (JR-45)

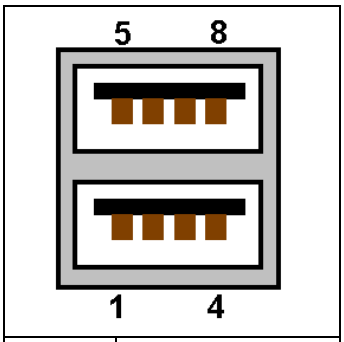


Pin	Define
1	TX0+
2	TX0-
3	RX0+
4	NC
5	NC
6	RX0-
7	NC
8	NC

LED:

D1: Speed indicated LED	
10 Mbps	DIM
100 Mbps	GREEN
D2 :Link/Activity LED	
Link	YELLOW
Activity	BLINKING

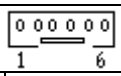
CN6: USB Connector



Pin	Define
1	5VUSB0
2	USBDT0-
3	USBDT0+
4	Ground
5	5VUSB0
6	USBDT1-
7	USBDT1+
8	Ground

CN7: Internal KB/MS Connec tor

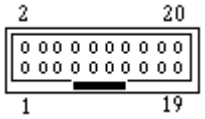
The MAT-E652 supports an internal keyboard/mouse with 2mm pitch pin header for flexible using.



Pin	Define
1	KB-CLK
2	KB-DATA
3	MS-CLK
4	Ground
5	KBMSVCC
6	MSDAA

CN8: LVDS Connector (DF13A-20DP-1.25V)

The MAT-E652 supports LVDS by using a 20-pin of connector for LVDS Panel

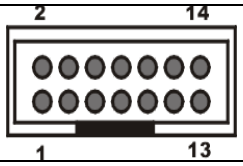


Pin	Define	Pin	Define
1	Y0P	2	Y1P
3	Y0M	4	Y1M
5	Ground	6	Ground

7	Y2P	8	NC
9	Y2M	10	NC
11	Ground	12	Ground
13	YCP	14	VCCLCD
15	YCM	16	Ground
17	Ground	18	NC
19	V12P0	20	V12P0

CN9: COM2 Connector

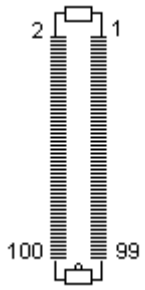
The MAT-E652 supports four serial ports, onboard COM2 with a 2.00mm pitch pin header.



Pin	Define
1	DCD2#N
2	DSR2#N
3	RXD2 IN
4	RTS#2OUT
5	TXD2OUT
6	CTS2#N
7	DTR#2OUT
8	RI#2_5V_12V
9	Ground
10	NC
11	485TXD+
12	485TXD-
13	485RXD+
14	485RXD-

CN10: PCI Interface

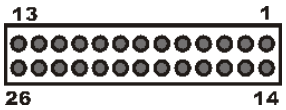
The MAT-E652 supports one micro PCI slot for expansion.



Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	26	PCICLK1	51	+3.3V	76	SERR-
2	GND	27	PCIRST-	52	+3.3V	77	AD15
3	+12V	28	GND	53	AD22	78	C/BE1-
4	+12V	29	GNT4-	54	AD21	79	AD13
5	GND	30	+5V	55	AD20	80	AD14
6	+5V	31	REQ2-	56	AD19	81	GND
7	+5V	32	+5V	57	AD18	82	GND
8	+5V	33	+5V	58	AD19	83	AD11
9	+5V	34	REQ4-	59	AD16	84	AD12
10	INTB-	35	+5V	60	C/BE2-	85	AD9
11	INTA-	36	AD31	61	GND	86	AD10
12	INTD-	37	AD30	62	GND	87	C/BE0-
13	INTC-	38	AD29	63	FRAME-	88	AD8
14	REQ3-	39	AD28	64	IRDY-	89	AD6
15	GND	40	+3.3V	65	GND	90	AD7
16	REQ1-	41	GND	66	GND	91	+5V
17	PCICLK2	42	GND	67	TRDY-	92	+5V
18	GNT3-	43	AD26	68	DEVSEL-	93	AD4
19	GND	44	AD27	69	GND	94	AD5
20	GND	45	AD24	70	PLOCK-	95	AD2
21	PCICLK3	46	AD25	71	GND	96	AD3
22	PCICLK0	47	GNT2-	72	GND	97	AD0
23	GND	48	C/BE3-	73	+3.3V	98	AD1
24	GND	49	+3.3V	74	PERR-	99	GND
25	GNT1-	50	AD23	75	PAR	100	GND

CN11: LPT Connector

The MAT-E652 supports a 26-pin pin header LPT connector by using 2mm pitch connector.



Pin	Define	Pin	Define
1	PT_STB#	14	PTAFD#
2	PT_D0	15	PTERROR#
3	PT_D1	16	PTINT#
4	PT_D2	17	PTSLIN#
5	PT_D3	18	Ground
6	PT_D4	19	Ground
7	PT_D5	20	Ground
8	PT_D6	21	Ground
9	PT_D7	22	Ground
10	PTACK#	23	Ground
11	PTBUSY	24	Ground
12	PTPE	25	Ground
13	PTSLCT	26	Ground

CN12: PC/104 Connector

CN12 is a standard PC/104 bus connector, and it is fully occupied with the signals of the "ISA" (PC/AT) bus. It offers full architecture, hardware and software compatibility with the ISA bus and can accept ultra-compact (3.6" x 3.8") stackable modules.

Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
Ground	C0	Ground	D0	IOCHCHK	A1	Ground	B1
SBHE*	C1	MEMCS16*	D1	SD7	A2	RESET	B2
LA23	C2	IOSC16*	D2	SD6	A3	+5V	B3
LA22	C3	IRQ10	D3	SD5	A4	IRQ9	B4
LA21	C4	IRQ11	D4	SD4	A5	NC	B5
LA20	C5	IRQ12	D5	SD3	A6	NC	B6
LA19	C6	IRQ15	D6	SD2	A7	NC	B7
LA18	C7	IRQ14	D7	SD1	A8	0 wait state	B8
LA17	C8	DACL0*	D8	SD0	A9	+12V	B9
MEMR*	C9	DRQ0*	D9	IOCHRDY	A10	Ground	B10
MEMW*	C10	DACK5*	D10	AEN	A11	SMEMW#	B11
SD8	C11	DRQ5	D11	SA19	A12	SMEMR*	B12
SD9	C12	DACK6*	D12	SA18	A13	IOW*	B13
SD10	C13	DRQ6	D13	SA17	A14	IOR*	B14
SD11	C14	DACK7*	D14	SA16	A15	DACK3*	B15
SD12	C15	DRQ7	D15	SA15	A16	DRQ3	B16
SD13	C16	+5V	D16	SA14	A17	DACK1*	B17
SD14	C17	MASTER*	D17	SA13	A18	DRQ1	B18
SD15	C18	Ground	D18	SA12	A19	REFRESH*	B19
Ground	C19	Ground	D19	SA11	A20	SYSCLK	B20
				SA10	A21	IRQ7	B21
				SA9	A22	IRQ6	B22
				SA8	A23	IRQ5	B23
				SA7	A24	IRQ4	B24
				SA6	A25	IRQ3	B25
				SA5	A26	NC	B26
				SA4	A27	TC	B27
				SA3	A28	BALE	B28
				SA2	A29	+5V	B29
				SA1	A30	OSC	B30
				SA0	A31	Ground	B31
				Ground	A32	Ground	B32

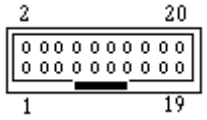
Please see how to install the PC/104 module in Appendix C.

CN13: Power Button

Pin	Define
1	PWBTN#
2	Ground

CN14: GPIO Port Connector

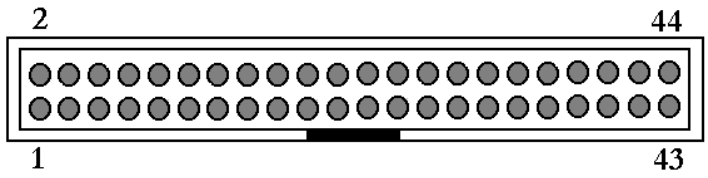
The onboard supports eight digital input and eight output which using a 2.0mm pitch connector



Pin	Define	Pin	Define
1	V5P0	2	V3P3
3	GPIN0	4	GPIN1
5	GPIN2	6	GPIN3
7	GPIN4	8	GPIN5
9	GPIN6	10	GPIN7
11	Ground	12	Ground
13	GPOUT0	14	GPOUT1
15	GPOUT2	16	GPOUT3
17	GPOUT4	18	GPOUT5
19	GPOUT6	20	GPOUT7

CN15: IDE Connector

The MAT-E652 supports one 2.0mm pitch 44-pin pin header for up to two IDE devices.

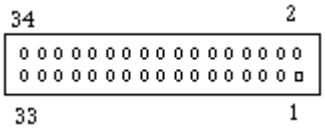


Pin	Define	Pin	Define
1	RSTPIDE#	2	Ground
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	Ground	20	NC
21	PDDREQ	22	Ground
23	PDIOW#	24	Ground
25	PDIOR#	26	Ground
27	PDIORDY	28	Ground
29	PDDACK#	30	Ground
31	IRQ14	32	V5P0
33	PDA1	34	PD66#
35	PDA0	36	PDA2
37	PDCS#1	38	PDCS#3
39	PIDELED	40	Ground
41	V5P0	42	V5P0
43	Ground	44	Ground

CN16: LCD Backlight Connector

Pin	Define
1	V12P0
2	Ground
3	ENABKL

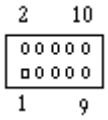
CN17: Floppy Connector



Pin	Define	Pin	Define
1	Ground	2	DEN0
3	Ground	4	NC
5	NC	6	DEN1
7	Ground	8	INDEX#
9	Ground	10	MTR#0
11	Ground	12	DS#1
13	Ground	14	DS#0
15	Ground	16	MTR#1
17	Ground	18	DIR#
19	Ground	20	STEP#
21	Ground	22	WDATA#
23	Ground	24	WGATE#
25	Ground	26	TRAK0#
27	Ground	28	WP#
29	Ground	30	RDATA#
31	Ground	32	HDSEL#
33	Ground	34	DSKCHG#

CN18: USB3/4 Connector (Pin-Header)

The MAT-E652 supports four USB ports, CN18 with 2.0mm pitch pin header for USB3/4.

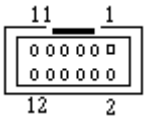


Pin	Define	Pin	Define
1	5VUSB1	2	5VUSB1
3	USBDT2-	4	USBDT3-
5	USBDT2+	6	USBDT3+
7	Ground	8	Ground
9	NC	10	Ground

CN19: ATX Power Connector

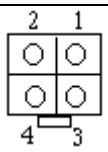
Pin	Define
1	5V_SB
2	PWR_TYPE
3	PS_ON#

CN20: AC97 Connector



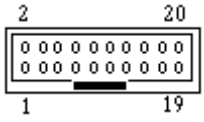
Pin	Define	Pin	Define
1	V12P0	2	Ground
3	Ground	4	AC97_BITCLK
5	V3P3	6	NC
7	AC97_DIN	8	AC97_SYNC
9	Ground	10	AC97_RST
11	AC97_DOUT	12	SPKR

CN21: +5V/+12V Input Connector



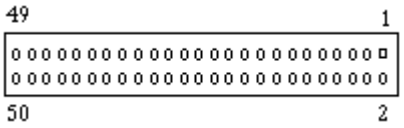
Pin	Define
1	V5P0
2	Ground
3	V12P0
4	Ground

CN22: COM3/COM4 Connector (Pin-Header 2.0mm)



Pin	Define	Pin	Define
1	DCD3#IN	2	DSR3#IN
3	RXD3_IN	4	RTS#3OUT
5	TXD3_OUT	6	CTS3#IN
7	DTR#3OUT	8	RI3#_5V_12V
9	Ground	10	NC
11	DCD4#IN	12	DSR4#IN
13	RXD4_IN	14	RTS#4OUT
15	TXD4OUT	16	CTS4#IN
17	DTR#4OUT	18	RI4#_5V_12V
19	Ground	20	NC

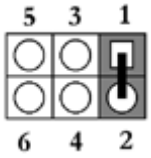
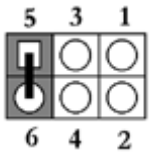
CN23: LCD Display Connector



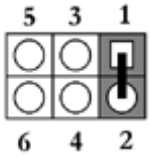
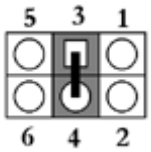
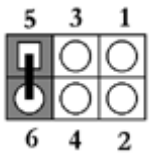
Pin	Define	Pin	Define
1	SPD1	2	SPCLK1
3	Ground	4	Ground
5	VCCLCD	6	VCCLCD
7	PCIRST	8	Ground
9	FP_D0	10	FP_D1
11	FP_D2	12	FP_D3
13	FP_D4	14	FP_D5
15	FP_D6	16	FP_D7
17	FP_D8	18	FP_D9
19	FP_D10	20	FP_D11
21	FP_D12	22	FP_D13
23	FP_D14	24	FP_D15
25	FP_D16	26	FP_D17
27	FP_D18	28	FP_D19
29	FP_D20	30	FP_D21
31	FP_D22	32	FP_D23
33	FP_D024	34	FP_D25
35	FP_CLK	36	FP_VS
37	FP_DEN	38	FP_HS
39	Ground	40	ENABKL
41	FP_D26	42	FP_D27
43	FP_D28	44	FP_D29
45	FP_D30	46	FP_D31
47	FP_D32	48	FP_D33
49	FP_D34	50	FP_D35

Note: The factory default at +3.3V, please make sure your Panel Voltage setting by JP8

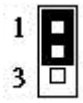
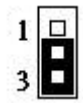
JP1: COM1 Voltage Select

Setting		Define
	1-2	Ring (Default)
	3-4	5V
	5-6	12V

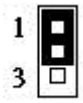
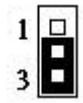
JP2: COM2 Mode Select (RS232/422/485)

Setting		Define
	1-2	RS-232 (Default)
	3-4	RS-422
	5-6	RS-485

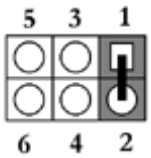
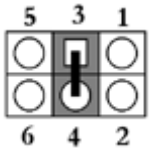
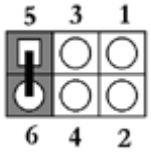
JP3: Clear CMOS

Setting		Define
	1-2	Hold Data (Default)
	2-3	Clear CMOS

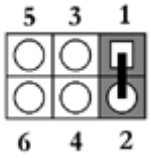
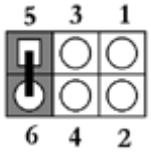
JP4: Watchdog Output Select

Setting		Define
	1-2	IRQ11
	2-3	Reset (Default)

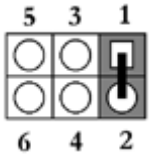
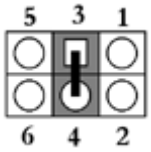
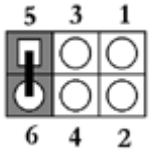
JP5: RI/Voltage Select for COM2

Setting		Define
	1-2	RI (Default)
	3-4	+5V
	5-6	+12V

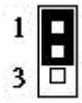
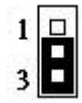
JP6: RI/Voltage Select for COM4

Setting		Define
	1-2	Ring (Default)
	3-4	5V
	5-6	12V

JP7: RI/Voltage Select for COM3

Setting		Define
	1-2	Ring (Default)
	3-4	5V
	5-6	12V

JP8: LCD Voltage Select

Setting		Define
	1-2	+5V
	2-3	+3.3V (Default)

Chapter 3. BIOS Setup

The ROM chip of your MAT-E652 board is configured with a customized Basic Input/Output System (BIOS) from Phoenix-Award BIOS. The BIOS is a set of permanently recorded program routines that give the system its fundamental operational characteristics. It also tests the computer and determines how the computer reacts to instructions that are part of programs.

The BIOS is made up of code and programs that provide the device-level control for the major I/O devices in the system. It contains a set of routines (called POST, for Power-On Self Test) that check out the system when you turn it on. The BIOS also includes CMOS Setup program, so no disk-based setup program is required CMOS RAM stores information for:

- Date and time
- Memory capacity of the main board
- Type of display adapter installed
- Number and type of disk drives

The CMOS memory is maintained by battery installed on the MAT-E652 board. By using the battery, all memory in CMOS can be retained when the system power switch is turned off. The system BIOS also supports easy way to reload the CMOS data when you replace the battery of the battery power lose.

3.1 Quick Setup

In most cases, you can quickly configure the system by choosing the following main menu options:

1. Choose "Load Optimized Defaults" from the main menu. This loads the setup default values from the BIOS Features Setup and Chipset Features Setup screens.
2. Choose "Standard COS Features" from the main menu. This option lets you configure the date and time, hard disk type, floppy disk drive type, primary display and more.
3. In the main menu, press F10 ("Save & Exit Setup") to save your changes and reboot the system.

3.2 Entering the CMOS Setup Program

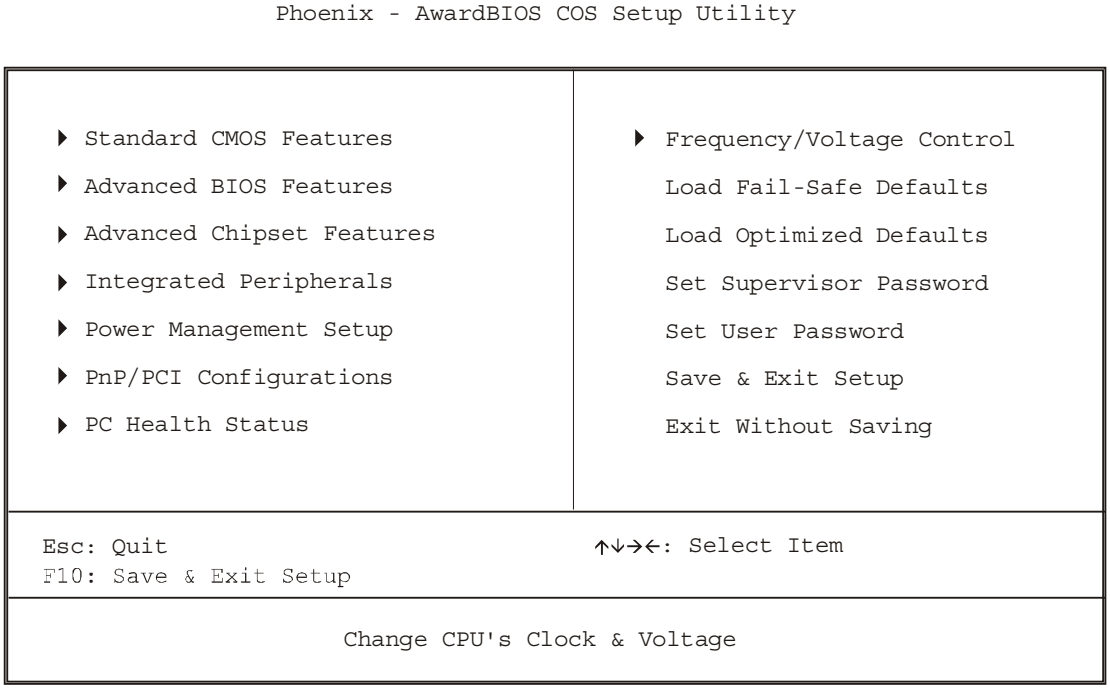
Use the CMOS Setup program to modify the system parameters to reflect the options installed in your system and to customized your system. For example, you should run the Setup program after you:

- Received an error code at startup
- Install another disk drive
- Use your system after not having used it for a long time
- Find the original setup missing
- Replace the battery
- Change to a different type of CPU
- Run the Phoenix-Award Flash program to update the system BIOS

Run the CMOS Setup program after you turn on the system. On-screen instructions explain how to use the program.

⇩ **Enter the CMOS Setup program's main menu as follows:**

1. Turn on or reboot the system. After the BIOS performs a series of diagnostic checks, the following message appears:
   "Press DEL to enter SETUP"
2. Press the <DEL> key to enter CMOS Setup program. The main menu appears:



3. Choose a setup option with the arrow keys and press <Enter>. See the following sections for a brief description of each setup option.

In the main menu, press F10 ("Save & Exit Setup) to save your changes and reboot the system. Choosing "EXIT WITHOUT SAVING" ignores your changes and exits the program. Pressing <ESC> anywhere in the program returns you to the main menu.

3.3 Menu Options

The main menu options of the CMOS Setup program are described in the following and the following sections of this chapter.

STANDARD CMOS FEATURES:
Configure the date & time, hard disk drive type, floppy disk drive type, primary display type and more

ADVANCED BIOS FEATURES:
Configure advanced system options such as enabling/disabling cache memory and shadow RAM

ADVANCED CHIPSET FEATURES:
Configure advanced chipset register options such DRAM timing

INTEGRATED PERIPHERALS:
Configure onboard I/O functions

POWER MANAGEMENT SETUP:
Configure power management features such as timer selects

PNP/PCI CONFIGURATION:
Configure Plug & Play IRQ assignments and PCI slots

PC HEALTH STATUS:
Configure the CPU speed and, if the optional Winbond W83627HF system monitor IC is installed, view system information

FREQUENCY/VOLTAGE CONTROL
Use this menu to specify your settings for frequency/voltage control

LOAD FAIL-SAFE DEFAULT:
Loads BIOS default values. Use this option as diagnostic aid if your system behaves erratically

LOAD OPTIMIZED DEFAULTS:
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations.

SET SUPERVISORS & USER PASSWORD:
Configure the system so that a password is required when the system boots or you attempt to enter the CMOS setup program. When you log in with this password, you will be able to enter the COS Setup main menu, but you can not enter other menus in the CMOS Setup program.

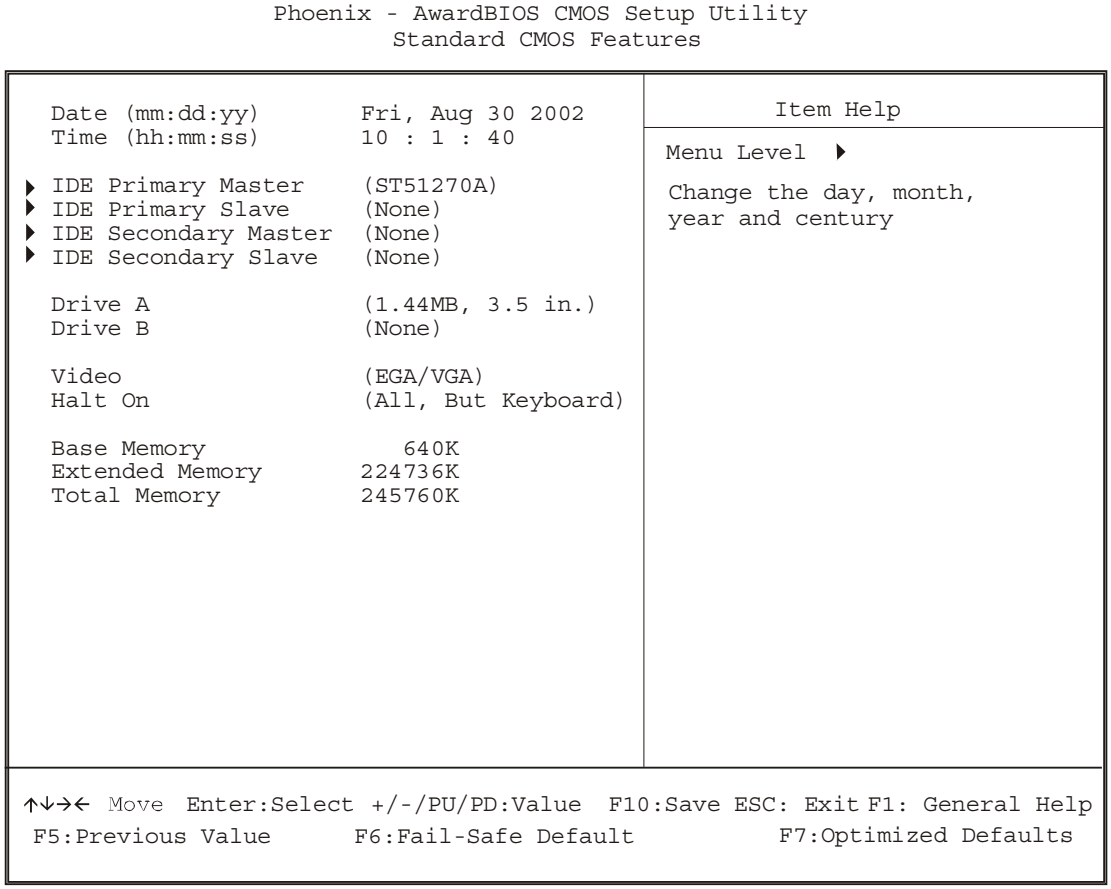
SAVE & EXIT SETUP:
Save changes of values to CMOS and exit the CMOS setup program

EXIT WITHOUT SAVING:
Abandon all CMOS changes and exit the CMOS setup program

Standard CMOS Features Setup

⇩ **Use the Standard CMOS Setup option as follows:**

1. Choose "Standard CMOS Features" from the main menu. The following screen appears:



2. Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDN/+/- keys. Some fields let you enter numeric values directly.

Option	Description
Date (mm:dd:yy)	Type the current date
Time (hour:min:sec)	Type the current time (24-hour clock)
Hard Disks	Choose from "Auto", "User", or "None" If your drive is not one of the predefined types, choose "User" and enter the following drive specifications: Cylinders, heads, Wpcom, L-Zone, sectors, and mode Consult the documentation received with the drive for the values that will give you optimum performance.

Drive A Drive B	Choose: None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5" 2.88M, 3.5"
Video	Choose: EGA/VGA CGA 40 CGA 80 Mono
Halt On	Controls whether the system stops in case of an error detected during power up. Choose: All Errors (Default) No Errors All, But Keyboard All, But Diskette All, But Disk/Key

3. After you have finished with the Standard CMOS Features program, press the <ESC> key to return to the main menu.

Advanced BIOS Features Setup

⇩ **Use the Advanced BIOS Features Setup option as follows:**

1. Choose "Advanced BIOS Features Setup" from the main menu. The following screen appears:

```
                  Phoenix - AWardBIOS CMOS Setup Utility
                          Advanced BIOS Features

   Virus Warning                <Disabled>  |       Item Help
   CPU Internal Cache           <Enabled>   |
   External Cache               <Enabled>   | Menu Level  ▶
   CPU L2 Cache FCC Checking    <Enabled>   | Allow you to change
   Processor Number Feature     <Enabled>   | the VIRUS warning
   Quick Power On Self Test     <Enabled>   | feature for IDE Hard
   First Boot Device            <Floppy>    | Disk boot sector
   Second Boot Device           <HDD-0>     | protection. If this
   Third Boot Device            <Ls120>     | function is enabled
   Boot Other Device            <Enabled>   | and someone attempt to
   Swap Floppy Drive            <Disabled>  | write data into this
   Boot Up Floppy Seek          <Enabled>   | area.  BIOS will show
   Boot Up Numlock Status       <On>        | a warning message on
   Gate A20 Option              <Fast>      | screen and alarm beep
   Typematic Rate Setting       <Disabled>  |
 X Typematic Rate (Chars/Sec)   6           |
 X Typematic Delay (Msec)       250         |
   Security Option              <Setup>     |
   OS Select For DRAM > 64MB    <Non-OS2)   |
   Video BIOS Shadow            <Enabled>   |
   C8000-CBFFF Shadow           <Disabled>  |
   CC000-CFFFF Shadow           <Disabled>  |
   D0000-D3FFF Shadow           <Disabled>  |
   D4000-D7FFF Shadow           <Disabled>  |
   D8000-DBFFF Shadow           <Disabled>  |
   DC000-DFFFF Shadow           <Disabled>  |
   Small Logo (EPA) Show        <Disabled>  |

↑↓→← Move  Enter:Select +/-/PU/PD:Value  F10:Save ESC: Exit F1: General Help
 F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUP/PgDN keys. Press the <F1> "Help" key for information on the available options:

Option	Description
Virus Warning	When enabled, any attempt to write to the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus-free, bootable floppy disk to reboot and clean your system. The default setting is **Disabled**.
CPU Internal/External Cache	Cache memory is an additional memory that is

	much faster than the conventional DRAM (system memory). CPUs with 486-type contain internal cache memory; most PCs have external cache memory. When CPU requests data, the system transfers the data from the main DRAM into cache memory, for even faster access by the CPU. The External Cache wouldn't appear if the system using does not have external cache memory. Choose: Enabled / Disabled
CPU L2 Cache FCC Checking	When enabled, memory checking is enabled when the external cache contains ECC SRAMs. Choose: Enabled / Disabled
Processor Number Feature	This is for Pentium III processor. When enabled, it will check the CPU serial number. If users don't want the system to know the serial number, you could disable this option. Choose: Enabled / Disabled
Quick Power on Self Test	When enabled, the reducing time required runs the power-on-self-test (POST); a quick POST could skip certain steps. We recommend users disable quick POST normally. Choose: Enabled / Disabled
First/Second/Third Boot Device	The BIOS attempts to load the operating system from the devices in the sequence selected in these items. Choose: Floppy, LS-120, HDH-0, 1, 2, 3, SCSI, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled
Boot other Device	If your boot device is not included in the following choices of Floppy---LS120, HDD0, HDD1, HDD2, SCSI, CDROM---you may set First/Second/Third Boot devices to disable and enable the "Boot Other Device" function. The system will automatically boot the other device. Choose: Enabled / Disabled
Swap Floppy Drive	This would be effective only in systems with two floppy drives. To select enable assigns physical drive B to logical drive A, and physical drive A to

	logical drive B. Choose: Enabled / Disabled
Boot Up Floppy Seek	When enabled, the BIOS seeks floppy drives to decide the tracks—40 or 80. 360KB floppy drives have 40 tracks; 720KB floppy drives, 1.2MB, and 1.44MB capacity all have 80 tracks. Few modern PCs have 40-tracks floppy drives; therefore, we recommend that you would disable this option to save time. Choose: Enabled / Disabled
Boot Up NumLock Status	Choose On or Off. On puts the numeric keypad in Num Lock mode at boot-up. Off puts the numeric keypad in arrow key mode at boot-up
Gate A20 Option	Choose Enabled or Disabled. Enable this option to allow RAM accesses faster than normal, and is useful in networking operating systems.
Typematic Rate Setting	Choose Enabled or Disabled. Enable this option to adjust the keystroke repeat rate. Adjust the rate via Typematic Rate Delay and Typematic Rate
Typematic Rate (Chars/Sec)	Choose the rate at which character keeps repeating
Typematic Delay (Msec)	Choose the delay between holding down a key and when the character begins repeating
Security Option	Choose Setup or System. This lets you specify whether a password is required every time the system boots or only when an attempt is made to enter the CMOS Setup program. "Setup" – The password prompt only appears if you attempt to enter the CMOS setup program. "System" – The password prompt appears each time the system is booted. ***Note: The password function is disabled by default. For a description of enabling the password function, refer to the section: Supervisor Password & User Password later in this chapter.***
OS Select for DRAM > 64MB	Set to OS/2 if your system is using OS/2 and has a memory size of more than 64MB
Small Logo	Choose: Enabled / Disabled

User's manual

Advanced Chipset Features Setup

⇩ Use the Advanced Chipset Features Setup option as follows:

1. Choose "Advanced Chipset Features Setup" from the main menu. The following screen appears:

```
                Phoenix - AwardBIOS CMOS Setup Utility
                      Advanced Chipset Features

  DRAM Timing By SPD           <Enabled>
X DRAM Clock                    Host CLK      |          Item Help
X SDRAM Cycle Length            3             |
X Bank Interleave               Disabled      | Menu Level ▸
  Memory Hole                  <Disabled>     |
  P2C/C2P Concurrency          <Enabled>      |
  System BIOS Cacheable        <Disabled>     |
  Video RAM Cacheable          <Disabled>     |
  Frame Buffer Size            <8M>           |
  AGP Aperture Size            <64M>          |
  AGP-4X Mode                  <Enabled>      |
  Panel Type                   <07>           |
  Boot Device Select           <Auto>         |
  OnChip USB                   <Enabled>      |
  USB Keyboard Support         <Disabled>     |
  OnChip Sound                 <Auto>         |
  OnChip Modem                                |
  CPU to PCI Write Buffer      <Enabled>      |
  PCI Dynamic Bursting         <Enabled>      |
  PCI Master 0 WS Write        <Enabled>      |
  PCI Delay Transaction        <Disabled>     |
  PCI#2 Access #1 Retry        <Enabled>      |
  AGP Master 1 WS Write        <Disabled>     |
  AGP Master 1 WS Read         <Disabled>     |

↑↓→← Move  Enter:Select  +/-/PU/PD:Value F10:Save ESC: Exit F1: General Help
  F5:Previous Value     F6:Fail-Safe Default     F7:Optimized Defaults
```

2. Move between items and select values by using the arrow keys. Modify the selected fields using the PnUP/PgDN keys. For information on the various options, press <F1> key.

Option	Description
DRAM Timing By SPD	It lets you select the value in this field, depending on the board paged DRAMs or EDO (Extended Data Output) DRAMS. Choose: Enabled / Disabled
DRAM Clock	It lets you control the DRAM speed. Choose: Host Clock, HCLK-33M, HCLK+33M
SDRAM Cycle Length	It sets the CAS latency timing. Choose: 3 / 2
Bank Interleave	Choose: 2 Bank / 4 Bank / Disabled
Memory Hole At 15M-16M	Choose Enabled or Disabled. You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirement.
P2C/C2P Concurrency	It lets you enable or disable the PIC to CPU or CPU to PCI. Choose: Enabled / Disabled
System BIOS Cacheable	Choose Enabled or Disabled. When enabled, caching of the system BIOS at F0000h-FFFFFh, enhancing system performance. However, if any program writes to this memory area, a system error may result.
Video RAM Cacheable	Choose: Enabled / Disabled
Frame Buffer Size	Choose: 2M / 4M / 8M / 16M / 32M
AGP Aperture Size (MB)	Select the size of AGP aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycle that hit the aperture range are forwarded to the AGP without any translation. 64MB
AGP-4X Mode	When 4X mode enabled, it will enhance your system performance. Choose: Enabled / Disabled
OnChip USB	You could enable this function if the system contains USB (Universal Serial Bus) controller and USB keyboard. When disabled, the system will not be able to access USB keyboard.

	Choose: Enabled / Disabled
USB Keyboard Support	You could enable this function if the system contains USB controller and USB keyboard. Choose: Enabled / Disabled
OnChip Sound	It lets you control the onboard VIA 1611 audio. Choose: Auto / Disabled
CPU to PCI Write Buffer	When enabled, writes from CPU to PCI bus are buffered. It also compensate the speed differences Between the CPU and PCI bus. Otherwise, when disabled, the writes are not buffered. The CPU must wait until the write is completed starting another write cycle. Choose: Enabled / Disabled
PCI Dynamic Bursting	When enabled, each write transaction goes to the write buffer. Then, burstable transactions burst on the PCI bus and nonburstable truncations don't. Choose: Enabled / Disabled
PCI Master 0 WS Write	When enabled, writes to the PCI bus are executed with zero waiting states. Choose: Enabled / Disabled
PCI Delay Transaction	The chipset with an embedded 32-bit posted write buffer supports delay transaction cycles. Choose "enable" to support compliances with PCI specification, version 2.1. Choose: Enabled / Disabled
PCI#2 Access #1 Retry	When enabled, PCI#2 will be unconnected if max retries attempt to be without success. Choose: Enabled / Disabled
AGP Master 1 WS Write	When enabled, the system will run single wait state delay before writing data from buffer; if users disable the system, it will run twice wait states and the system can be stable. Choose: Enabled / Disabled
AGP Master 1 WS Read	When enabled, the system will run single wait state delay before reading data from buffer; if users disable the system, it will run twice wait states and the system can be stable. Choose: Enabled / Disabled

Integrated Peripherals

⇩ **Use the Integrated Peripherals Setup option as follows:**

1. Choose "Integrated Peripherals Setup" from the main menu. The following screen appears:

2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. Please press the <F1> key for information on the various options.

```
Phoenix - AwardBIOS CMOS Setup Utility
       Integrated Peripherals

  On-Chip IDE Channel0          <Enabled>      Item Help
  On-Chip IDE Channel1          <Enabled>
  IDE Prefetch Mode             <Enabled>      Menu Level ▶
  Primary Master   PIO          <Auto>
  Primary Slave    PIO          <Auto>
  Secondary Master PIO          <Auto>
  Secondary Slave  PIO          <Auto>
  Primary Master   UDMA         <Auto>
  Primary Slave    UDMA         <Auto>
  Secondary Master UDMA         <Auto>
  Secondary Slave  UDMA         <Auto>
  Init Display First            <AGP>
  IDE HDD Block Mode            <Enabled>
  Onboard FDD Controller        <Enabled>
  Onboard Serial Port 1         <3F8/IRQ4>
  Onboard Serial Port 2         <2F8/IRQ3>
  UART 2 Mode                   <Standard>
X IR Function Duplex             Half
x TX RX inverting enable         No, Yes
  Onboard Parallel Port         <378/IRQ7>
  Onboard Parallel Mode         <Normal>
X ECP Mode Use DMA               3
X Parallel Port EPP Type         EPP1.9

↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC: Exit F1: General Help
F5:Previous Value      F6:Fail-Safe Default        F7:Optimized Defaults
```

Option	Description
On-Chip IDE Channel 0	The system chipset contains a PIC IDE interface, which supports two IDE channels. When enabled, it will activate the primary and/or secondary IDE interface. When disabled, it will deactivate the interface. Choose: Enabled / Disabled
On-Chip IDE Channel 1	The system chipset contains a PCI IDE interface, which supports two IDE channels. When enabled, it will activate the secondary IDE interface. When disabled, it will deactivate the interface. Choose: Enabled / Disabled
IDE Prefetch Mode	The onboard IDE drive interfaces support IDE prefetch, which are faster drive accesses. If the interface doesn't support prefetch, users could choose "disable" when installing the primary and/or secondary add-in IDE interface. Choose: Enabled / Disabled
IDE Primary/Secondary Master/Slave PIO	Auto/Mode0/Mode1/Mode2/Mode3/Mode4 The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
IDE Primary/Secondary Master/Slave UDMA	Auto, Mode0, Mode1, Mode2, Mode3, Mode4 UltraDMA33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your system software both support UltraDMA33/66/100, select Auto to enable BIOS support.
Init Display First	Default: Onboard/AGP This option lets you choose the priority of AGP & PCI VGA card
IDE HDD Block Mode	Enabled/Disabled the IDE HDD Block Mode function. *Note: Not all drives support this function*
Onboard FDC Controller	Enabled/Disabled. Select enabled if your system has a floppy disk controller installed on the system board and

	you wish to use it. If the system has no floppy drive, select Disabled in this field.
Onboard Serial Port1/2	Choose: 3F8/IRQ4, 2F8/IRQ3 Select an address and corresponding interrupt for the first and second serial ports.
UART 2 Mode	Select an operating mode for the second serial port: **Normal** RS-232C serial port **Standard** RS-232C serial port **IrDA 1.0** Infrared port compliant with IrDA 1.0 specification **IrDA SIR** IrDA-compliant serial Infrared port **IrDA MIR** 1 MB/sec infrared port **IrDA FIR** Fast infrared standard **FIR** Fast infrared standard **MIR 0.57M** 0.57 MB/sec infrared port **MIR 1.15M** 1.15 MB/sec infrared port **Sharp IR** 4 MB/sec data transmission **HPSIR** IrDA-compliant serial infrared port **ASKIR** Amplitude shift keyed infrared port
IR Function Duplex	Choose the requiring value of the IR device and connect to the IR port. Full duplex mode allows two directions transmission simultaneously. Half duplex mode allows only one direction at the same time. Choose: Full / Half
TX RX inverting enable	Check your IR peripheral documentation to select the correct setting. Choose: Yes/No, Yes/Yes, No/Yes, No/No
Onboard Parallel Port	Choose: 378/IRQ7 This option lets you to determine onboard parallel port controller I/O address setting.
Parallel Port Mode	Default Setting: SPP Select an operating mode for the onboard parallel port.
ECP Mode Use DMA	Select a DMA channel for the port Choose: 3 / 1

Parallel Port EPP Type	Select EPP port type 1.7 or 1.9 Choose: EPP1.9 / EPP1.7

Power Management Setup

The Power Management Setup controls the board's "green" features. To save energy these features shut down the video display and hard disk drive.

⇩ **Use the Power Management Setup option as follows:**

1. Choose "Power Management Setup" from the main menu. The following screen appears.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    Power Management Setup

                                                     Item Help
 ▶ ACPI Function            <Enabled>
   Power Management         <Press Enter>     Menu Level  ▶
   PM Control by APM        <Yes>
   Video Off Option         <Suspend -> Off>
   Video Off Method         <V/H SYNC+Blank>
   MODEM Use IRQ            <3>
   Soft-Off by PWRTBN       <Instant-Off>
   Wake Up Events           <Press Enter>

↑↓→← Move  Enter:Select +/-/PU/PD:Value  F10:Save ESC: Exit F1: General Help
 F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

2. Move between items and select values by using the arrow keys. Modify the selected field the PgUP/PgDN keys. For information on the various options, press <F1> key.

Option	Description
ACPI Function	Enables/Disables the ACPI function
Power Management	Choose Disable, User Define, Min Saving or Max. Saving. "User Define" – Lets you specify when the HDD and system will shut down "Min Saving" - Predefine timer value of 4-12 min. "Max Saving" – Predefine timer value of 1 minute
PM Control by APM	When the advanced power management is installed on the system, users would select "Yes" to save more power. Choose: Yes / No
Video off Option	Select the power saving modes when the monitor is blank.

	Always on	Monitor remains "on" during power saving modes.
	Suspend-off,	Monitor is blank when system is in suspension mode
	Suspend, Standby-off	Off monitor is blank when the system is in either suspension or standby mode.
	All modes-off	Monitor is blank when the system is in any power saving mode.
Video Off Method	Choose V/H SYNC+Blank, DPMS, Blank Screen When power management blanks the screen and turns off vertical and horizontal scanning. The DPMS (Display Power Management System) setting allows the BIOS to control the video card if it has the DPMS features. If you don't have a Green monitor, use the Blank Screen option	
MODEM Use IRQ	Choose the IRQ used by the modem. Default: Disabled	

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

PNP/PCI Configuration

This option is used to configure Plug and Play assignments and route PCI interrupts to designated ISA interrupts.

⇩ **Use the PNP/PCI Configuration Setup option as follows:**

1. Choose "PNP/PCI Configuration Setup" from the main menu, the following screen appears.

```
                Phoenix - AwardBIOS CMOS Setup Utility
                        PnP/PCI Configurations

                                           |          Item Help
   PNP OS Installed          <No>          | Menu Level  ▶
   Reset Configuration Date  <Disabled>    |
                                           | Select Yes if you are
   Resources Controlled By   <Audo(ESCD)>  | using a Plug and Play
 X IRQ Resources              Press Enter  | capable operating
 X DMA Resources              Press Enter  | system Select No if
                                           | you need the BIOS to
   PCI/VGAS Palette Snoop    <Disabled>    | configure non-boot
   Assign IRQ For VGA        <Enabled>     | devices
   Assign IRQ For USB        <Enalbed>     |

↑↓→← Move  Enter:Select +/-/PU/PD:Value  F10:Save ESC: Exit F1: General Help
 F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. For information on the various options, please press <F1> key.

Option	Description
PNP OS Installed	Choose "Yes" when the system operating environment is "Plug and Play aware", for example, Win95. Choose "No" if users need the BIOS to configure non-boot devices. Choose: Yes / No
Reset Configuration Data	Choose Enable or Disable "Enable" – PNP configuration data is reset in BIOS "Disable" – PNP configuration date is retained in BIOS
Resources Controlled By	Choose Auto or Manual. This option specifies whether resources are controlled by automatic or manual configuration
IRQ Resources	IRQ-3 Assigned to <PCI Device>

	IRQ-4 Assigned to <PCI Device> IRQ-5 Assigned to <PCI Device> IRQ-7 Assigned to <PCI Device> IRQ-9 Assigned to <PCI Device> IRQ-10 Assigned to <PCI Device> IRQ-11 Assigned to <PCI Device> IRQ-12 Assigned to <PCI Device> IRQ-14 Assigned to <PCI Device> IRQ-15 Assigned to <PCI Device>
DMA Resources	Assigning every DMA channel a type when resources are controlled manually. This would depend on the type of device using the DMA channel.
PCI/VGA Palette Snoop	Enabling this item informs the PCI/VGA card to keep silent when palette register is updated
Assign IRQ for VGA	Choose Enabled/Disabled to specify whether the VGA uses on IRQ or not.
Assign IRQ for USB	Choose Enabled/Disabled to specify whether the USB uses an IRQ or not.

3. Please press the <ESC> key to return the main menu after finishing with the PNP/PCI Configuration Setup.

PC Health Status Configuration Setup

Choose "PC Health Status Configuration Setup" from the main menu, the following screen appears:

```
Phoenix - AwardBIOS Setup Utility
PC Health Status

Current CPU Temp.          30/86          |  Item Help
Current CPUFAN Speed       31/87          |
Vcore                      1.16 V         |  Menu Level  ▸
 2.5V                      2.61 V         |
 3.3V                      3.38 V         |
   5V                      5.30 V         |
  12V                     15.54 V         |

↑↓→← Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC: Exit  F1: General Help
 F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

Frequency/Voltage Control Option

Choose the "Frequency/Voltage Control" from main menu, the following screen appears:

```
Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

VIA C3 Clock Ration          <Default>      | Item Help
Auto Detect DIMM/PCI Clk     <Enabled>      |
Spread Spectrum Modulated    <Disabled>     | Menu Level ▸
CPU Host Clock (CPU/PCI)     <Defualt>      |
                                            | This item is for VIA
                                            | C3 CPU Ratio
                                            | adjustment

↑↓→← Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC: Exit  F1: General Help
F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

Load Fail-Safe Defaults

This option loads the troubleshooting default values permanently stored in the BIOS ROM. This is useful if you are having problems with the main board and need to debug or troubleshoot the system. The loaded default settings do not affect the Standard CMOS Setup screen.

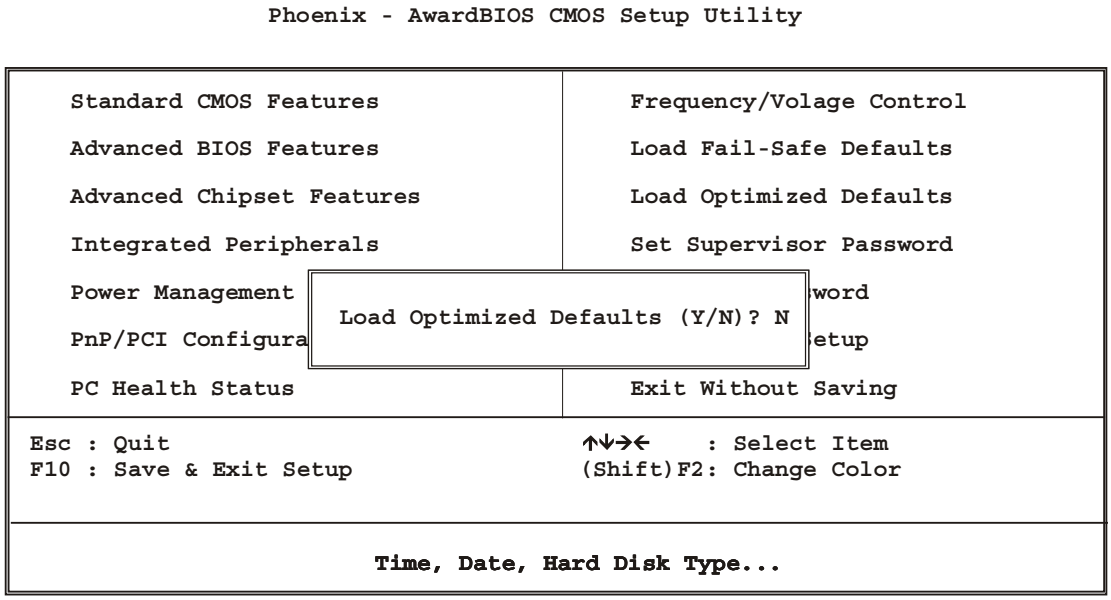
To use this feature, highlight it on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the BIOS default values. Pres the <Y> key and then press <Enter> if you want to load the BIOS default.

```
Poenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features          | Frequency/Volage Control
Advanced BIOS Features          | Load Fail-Safe Defaults
Advanced Chipset Features       | Load Optimized Defaults
Integrated Peripherals          | Set Supervisor Password
Power Management                | word
PnP/PCI Configura               | etup
PC Health Status                | Exit Without Saving

Esc : Quit                      ↑↓→←    : Select Item
F10 : Save & Exit Setup         (Shift)F2: Change Color

        Load Fail-Safe Defaults (Y/N)? N

                Time, Date, Hard Disk Type...
```

Load Optimized Defaults

This option loads optimized settings stored in the BIOS ROM. The auto-configured settings do not affect the Standard CMOS Setup screen.

To use this feature, highlight it on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Optimized Default Values. Press the <Y> key and then press <Enter> if you want to load the SETUP default.



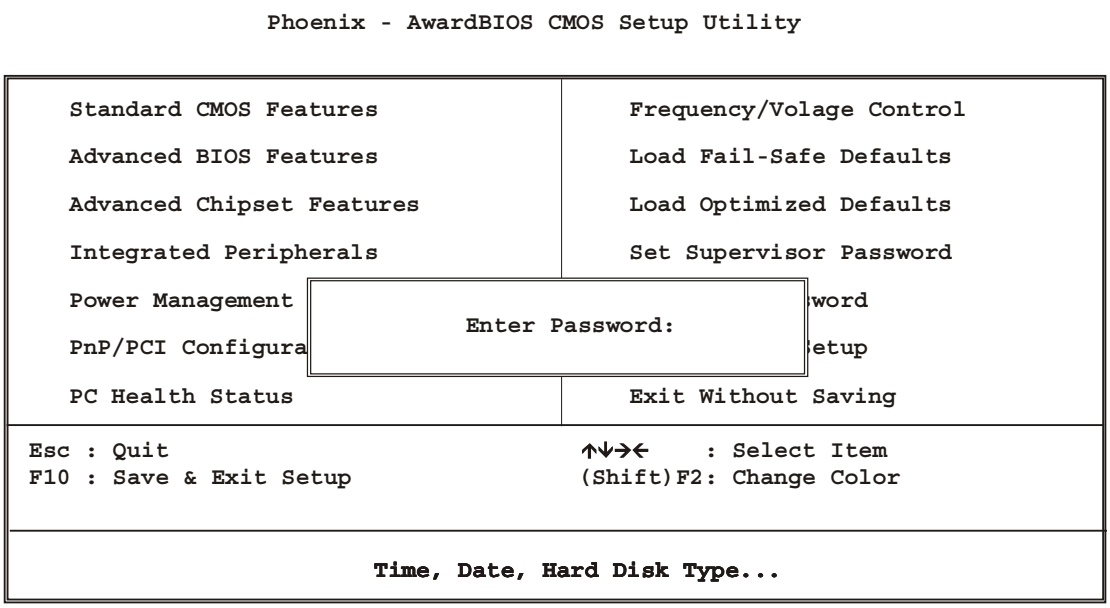
Supervisor/User Password

The password options let you prevent unauthorized system boot-up or unauthorized use of CMOS setup. The Supervisor Password allows both system and CMOS Setup program access; the User Password allows access to the system and the CMOS Setup Utility main menu.

The password functions are disabled by default. You can use these options to enable a password function or, if a password function is already enabled, change the password.

To change a password, first choose a password option from the main menu and enter the current password. Then type your new password at the prompt. The password is case sensitive and you can use up to 8 alphanumeric characters. Press <Enter> after entering the password. At the Next Prompt, confirm the new password by

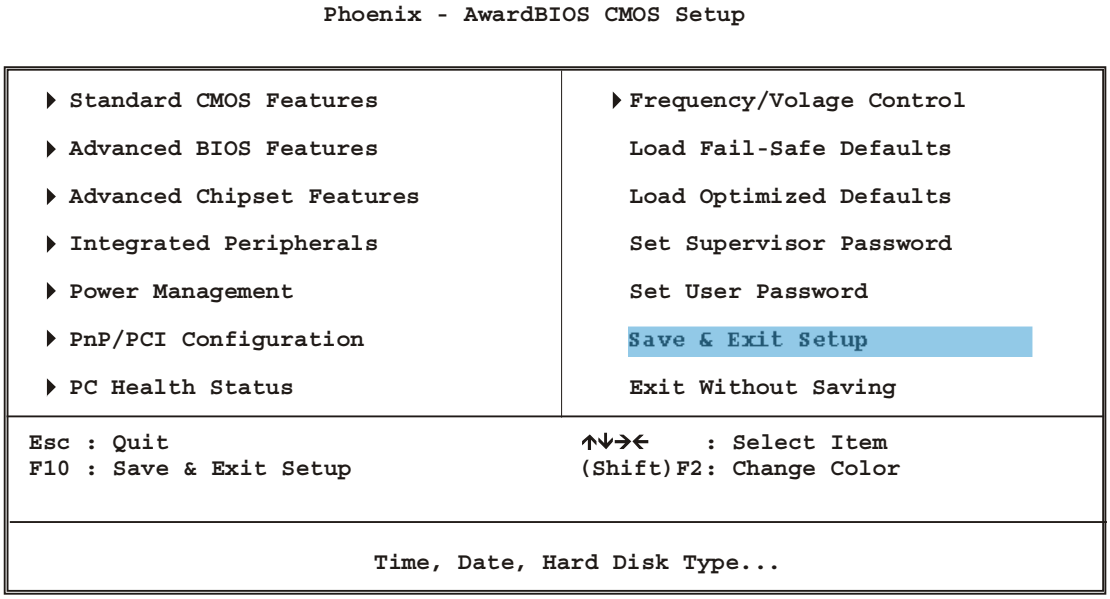
typing it and pressing <Enter> again.



After you use this option to enable a password function, use the "Security Option" in "BIOS Feature Setup" to specify whether a password is required every time the system boots or only when an attempt is made to enter the CMOS Setup program.

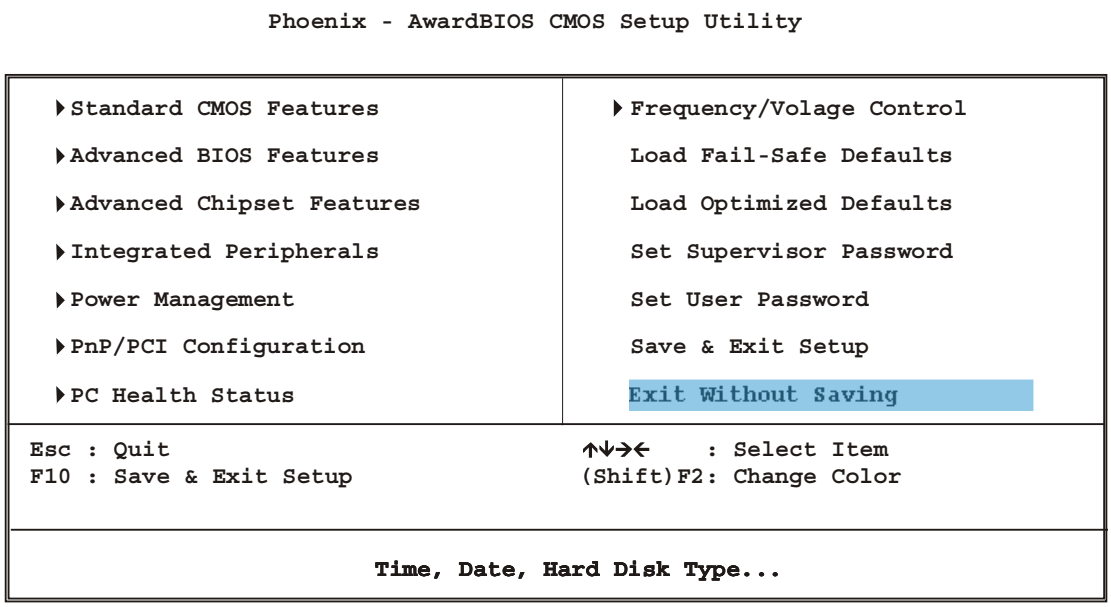
Save and Exit Setup

This function automatically saves all CMOS values before exiting Setup.



Exit Without Saving

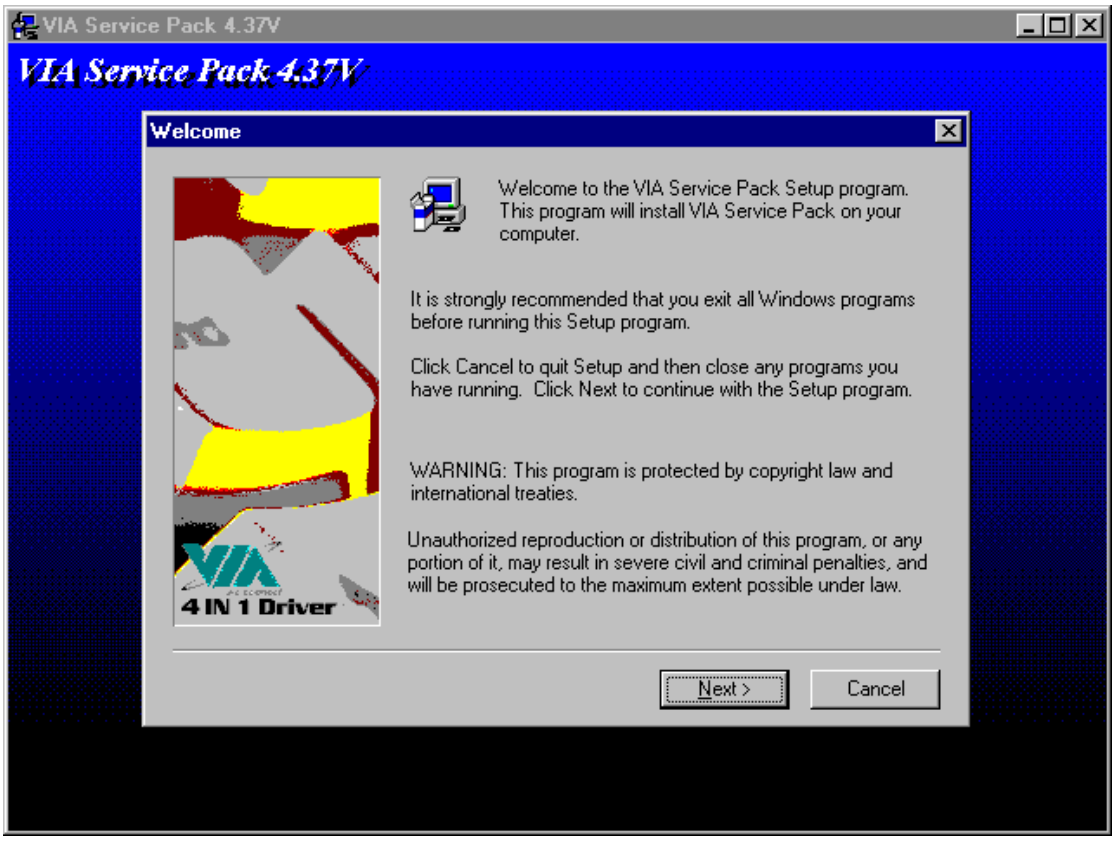
Use this function to exit Setup without saving the CMOS value.



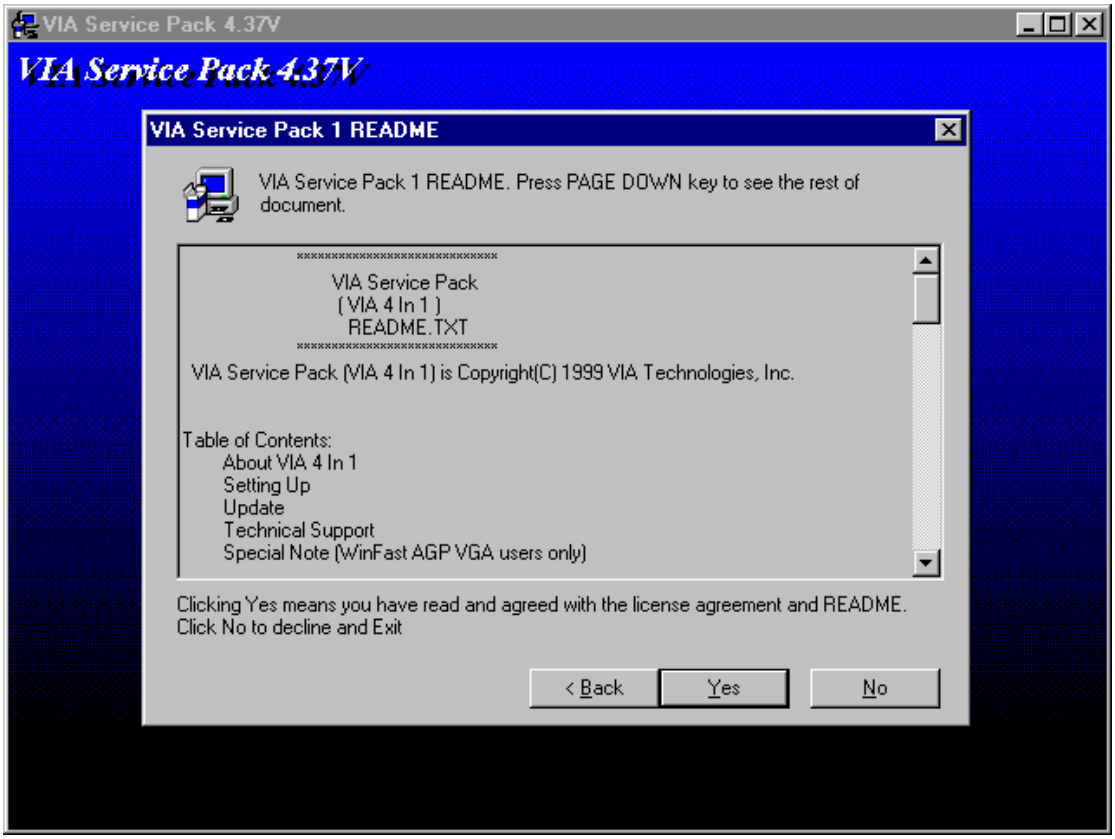
Chapter 4. Driver Utility

The system driver installation procedure must be performed first.

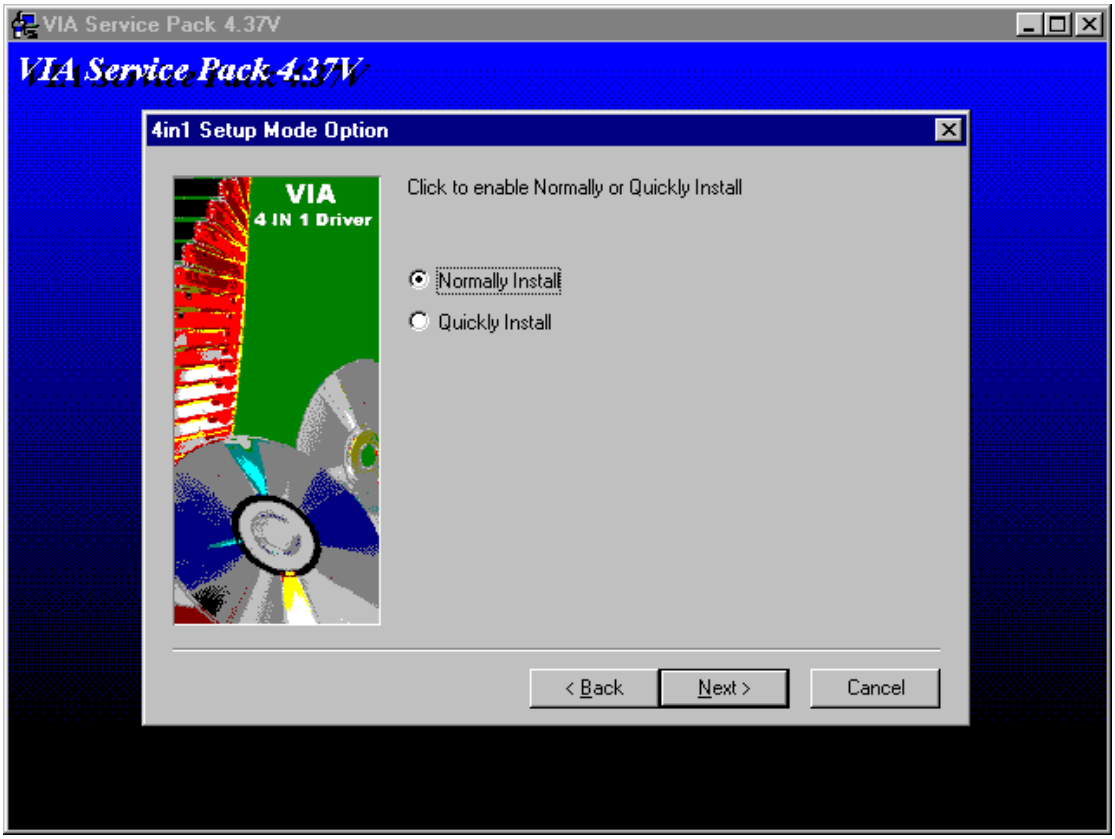
1. Insert the MAT-E652 CD-ROM driver into the CD-ROM Drive
2. Select the Drivers\system file to click the Setup icon.
3. Click **Next**



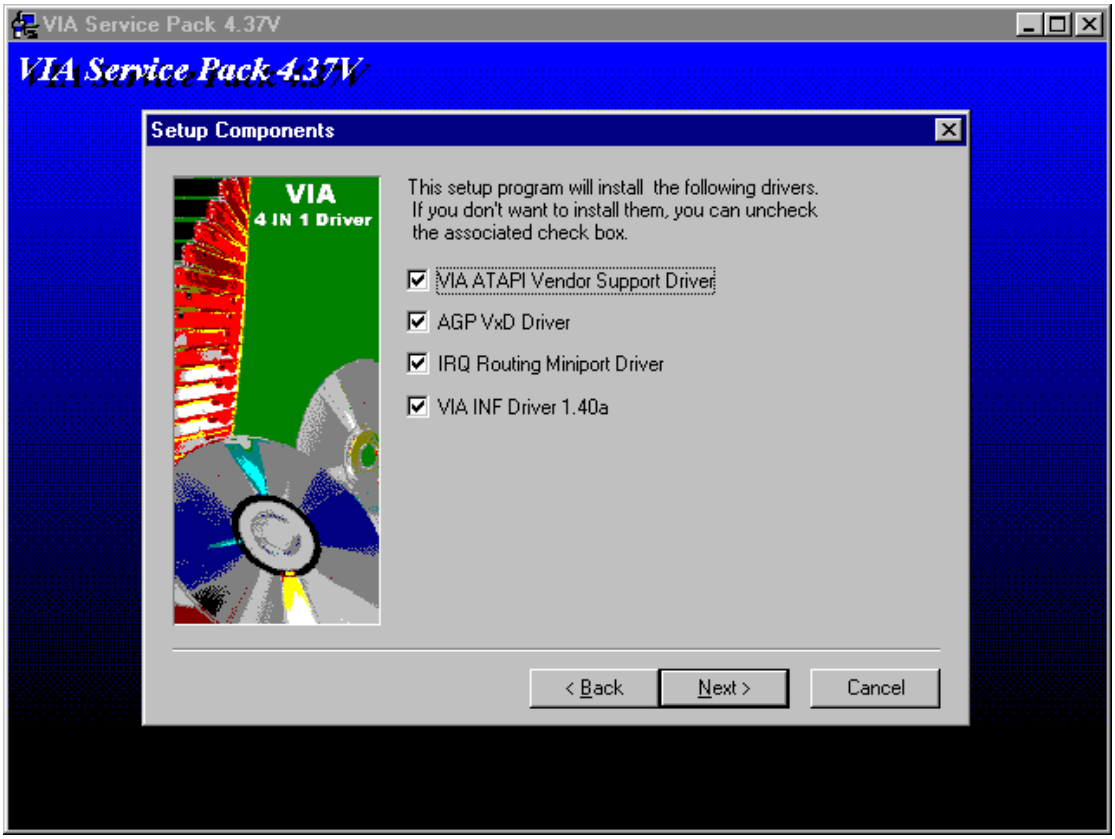
4. Click **Yes**



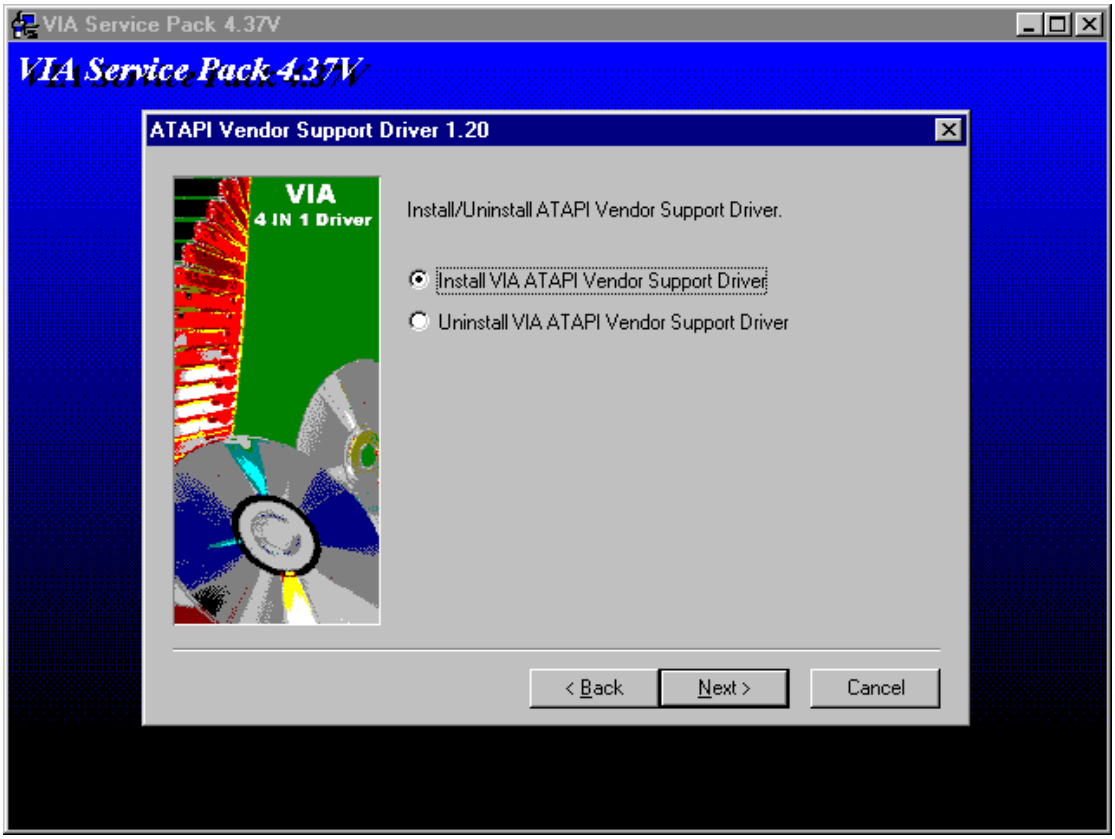
5. Select **Normally Install,** and then click **Next**



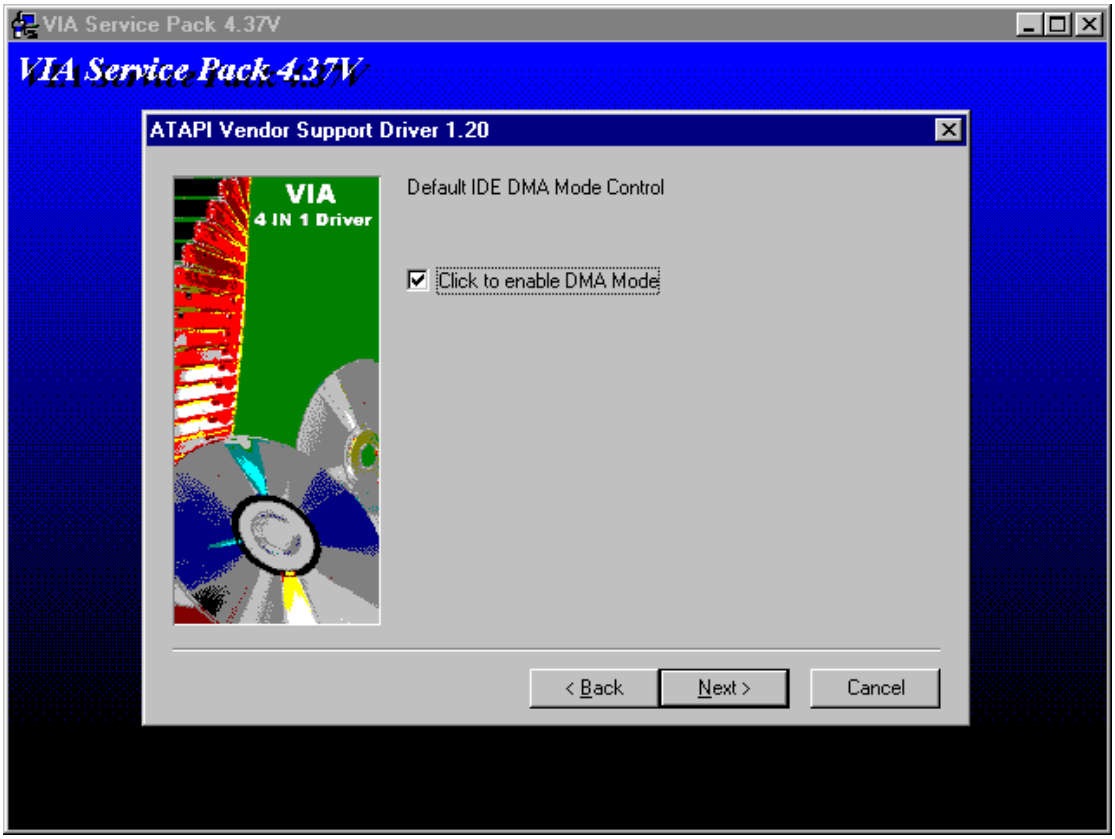
6. Remain the default setting, and then click **Next**



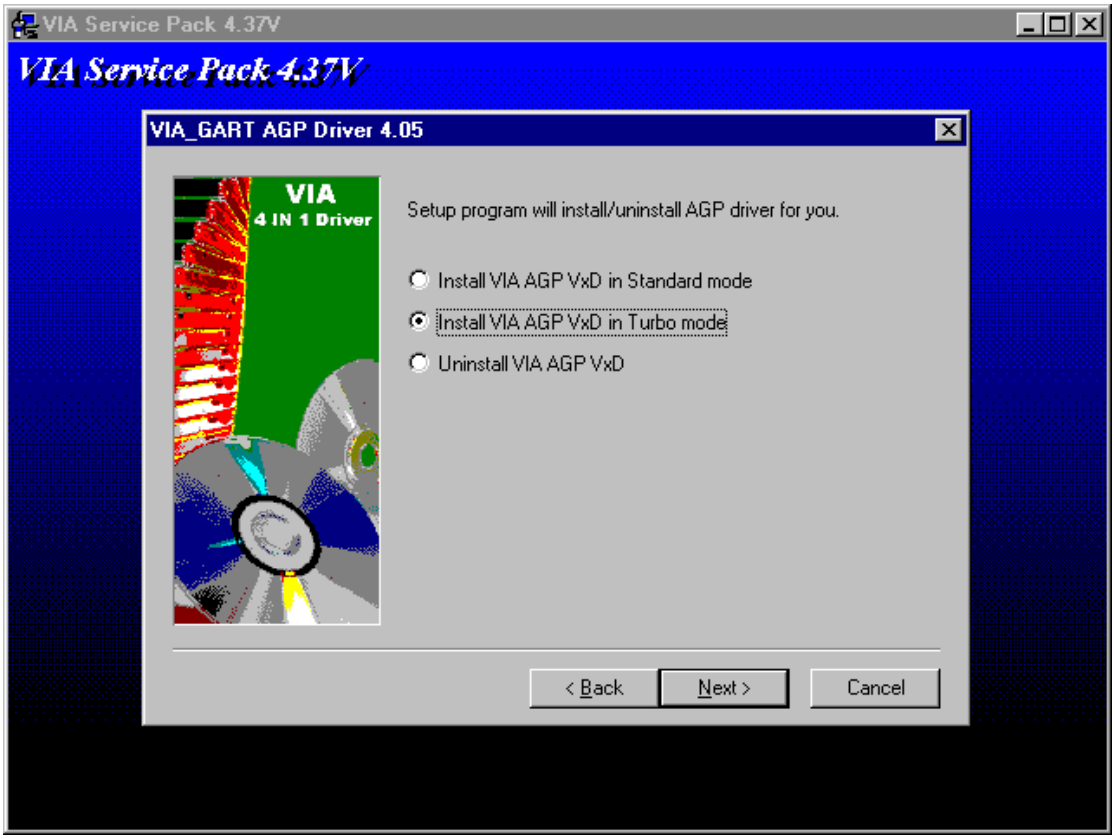
7. Click **Next**



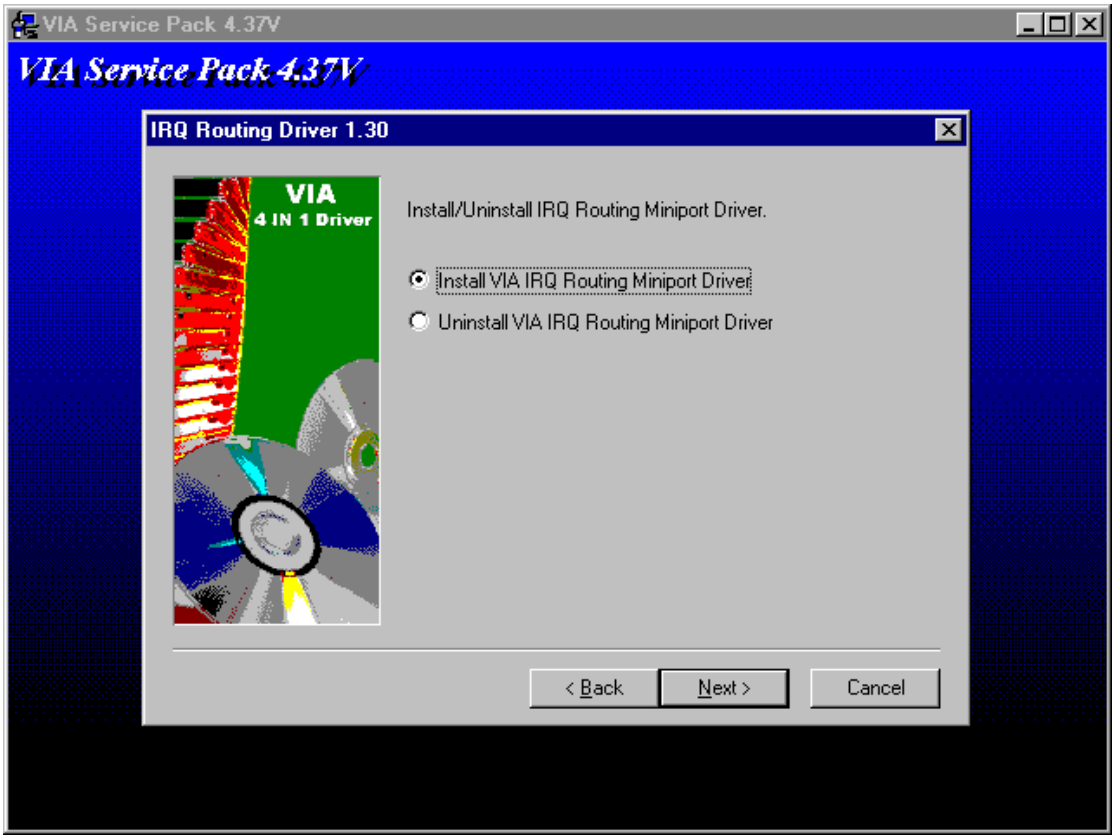
8. As the following picture, click **Next**



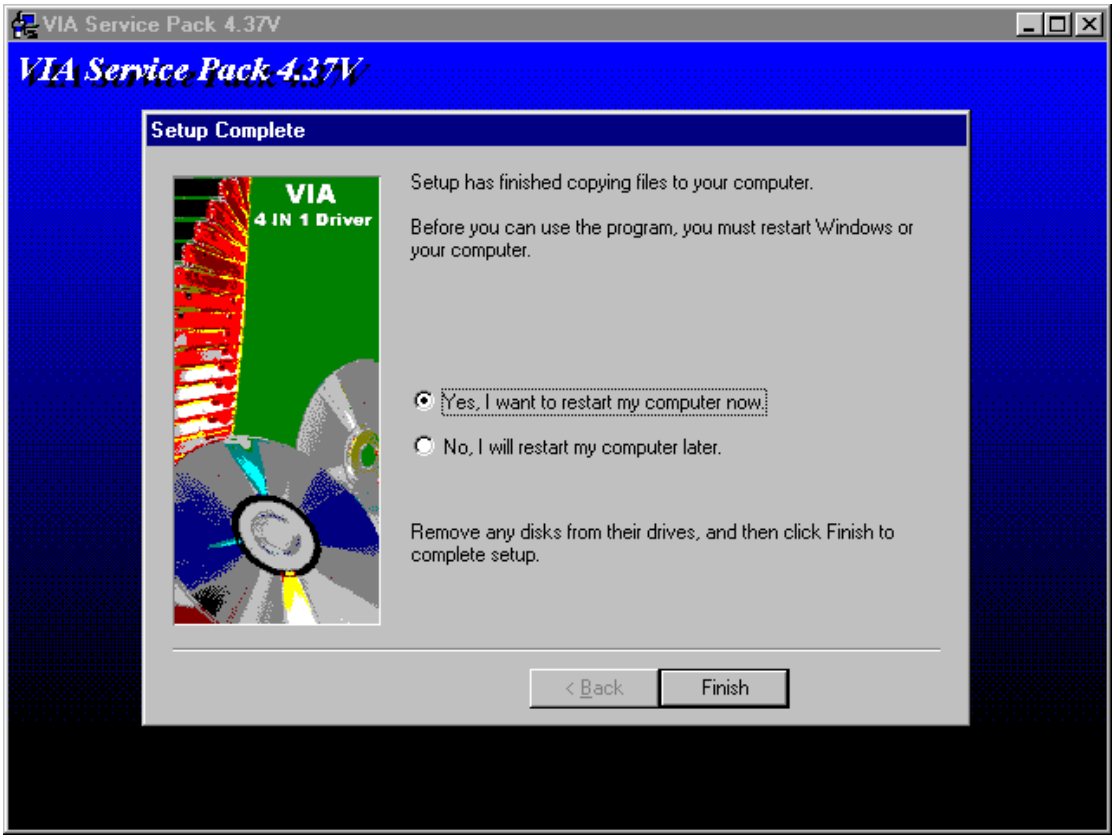
9. Select **Install VIA AGP VxD in Turbo Mode,** and click **Click**



10. Click **Next**



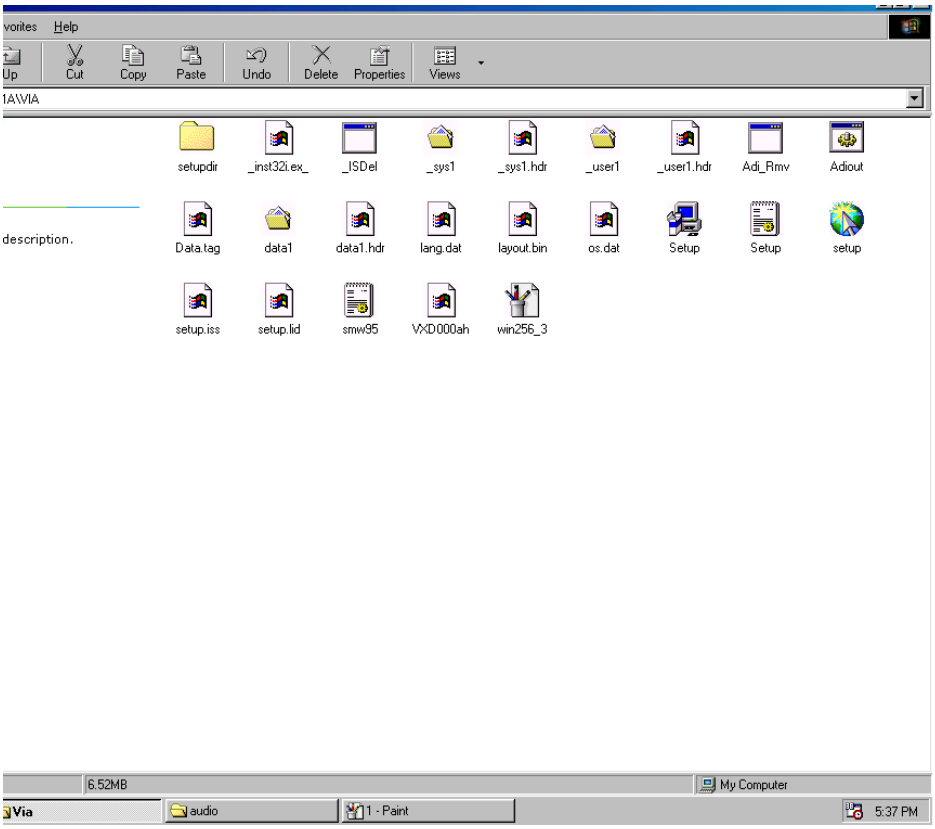
11. Click **Finish**

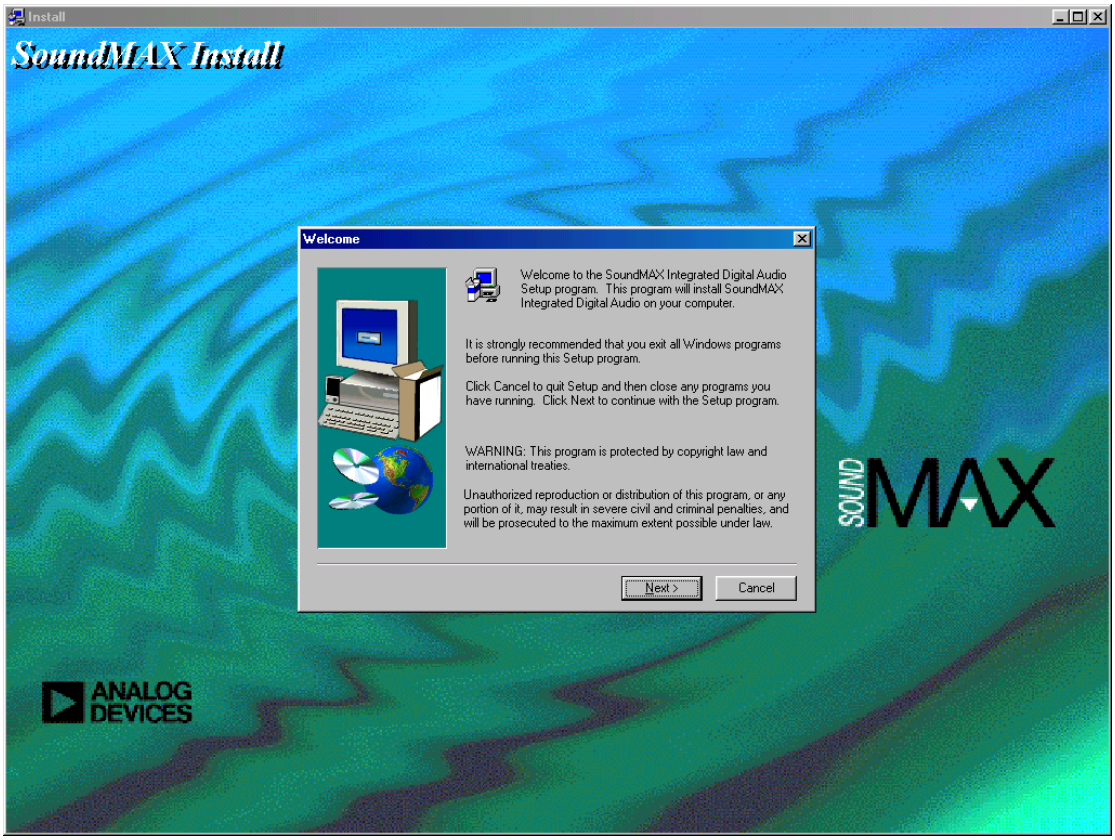


Installation process is completed and allowed the system to reboot.

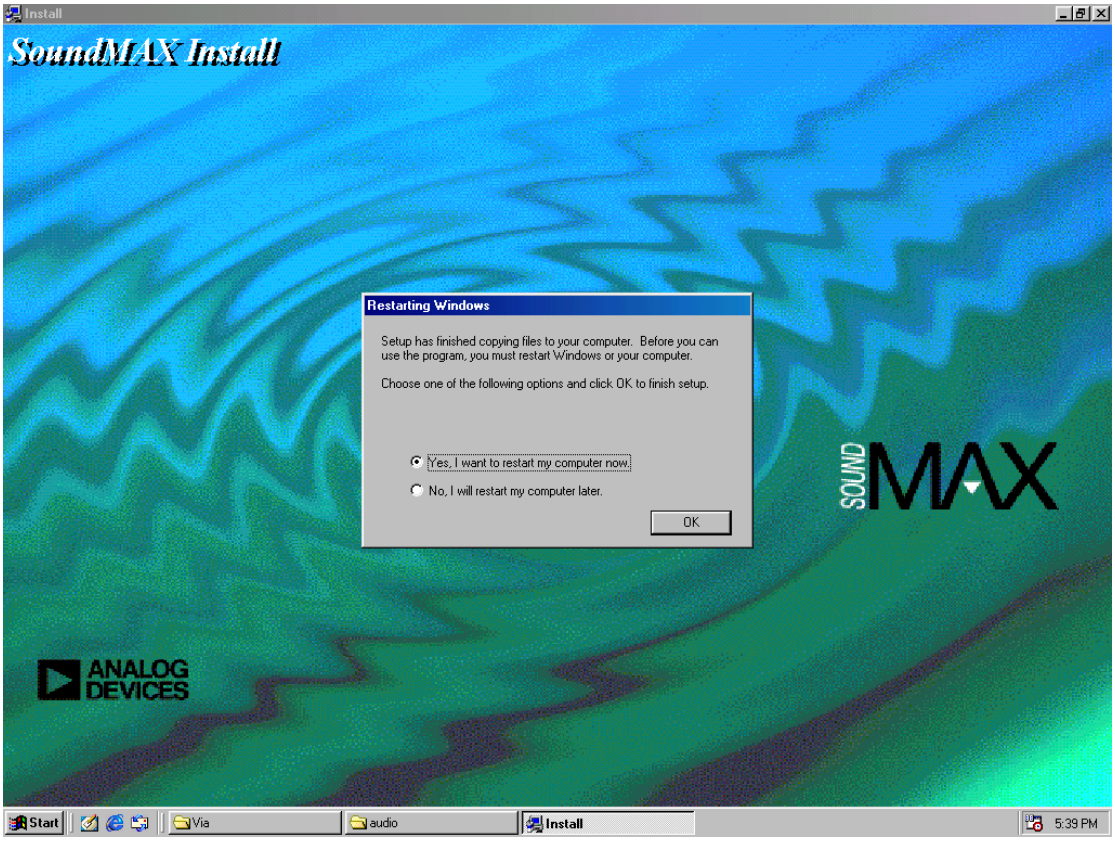
Audio Driver Installation

1. Insert the MAT-E652 CD ROM into the CD-ROM Drive
2. Select the Drivers\audio\ad1881 file to click the Setup icon





(3) Click **Next**



(4) Click "OK"

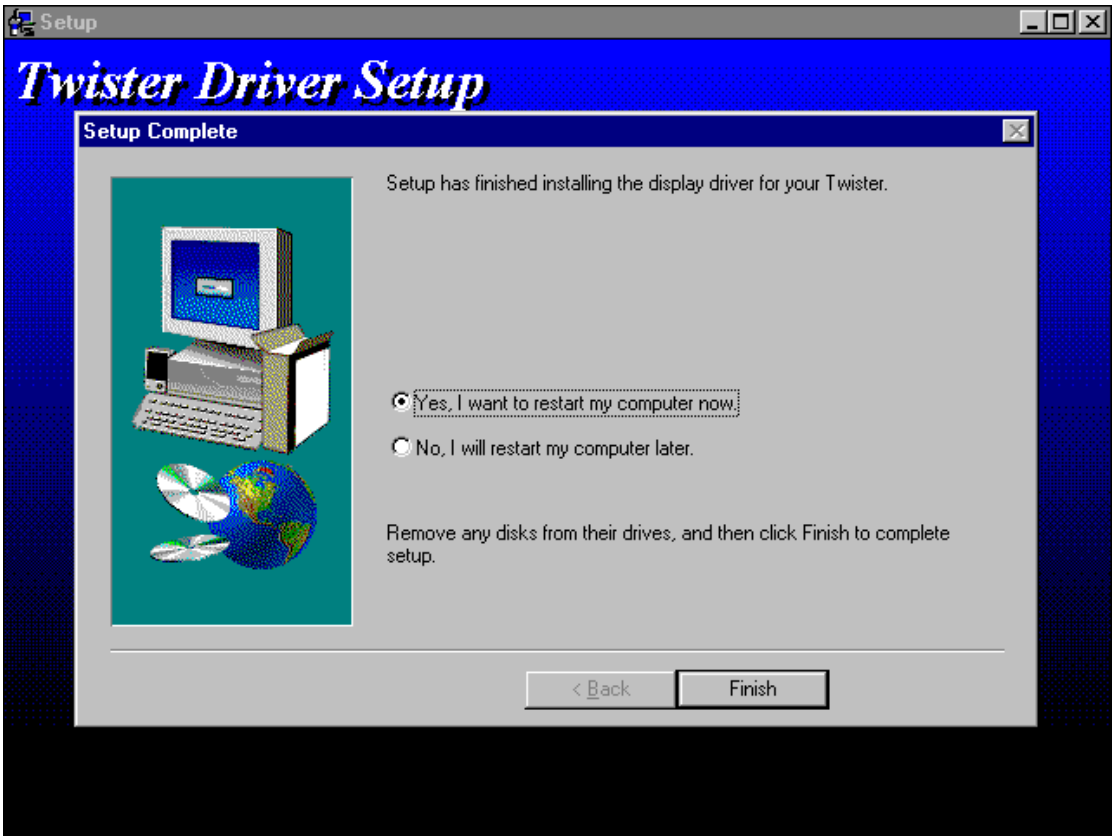
VGA Driver Installation

1. Install the MAT-E652 CD ROM into the CD-ROM Drive
2. Select the Drivers\vga\Win9x ME file to click the Setup icon

A driver installation screen will appear, please follow the onscreen instruction to install the driver in sequence

3. At last, click **Next**

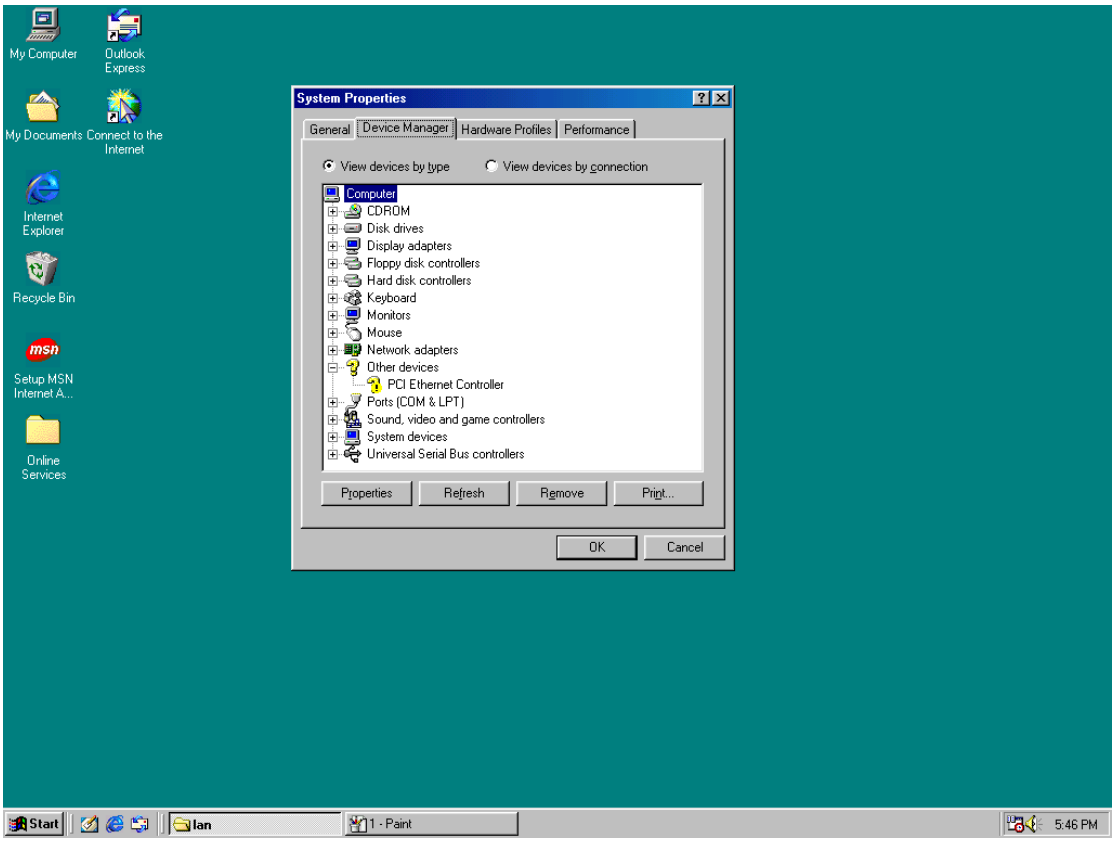
4. Click **Next**



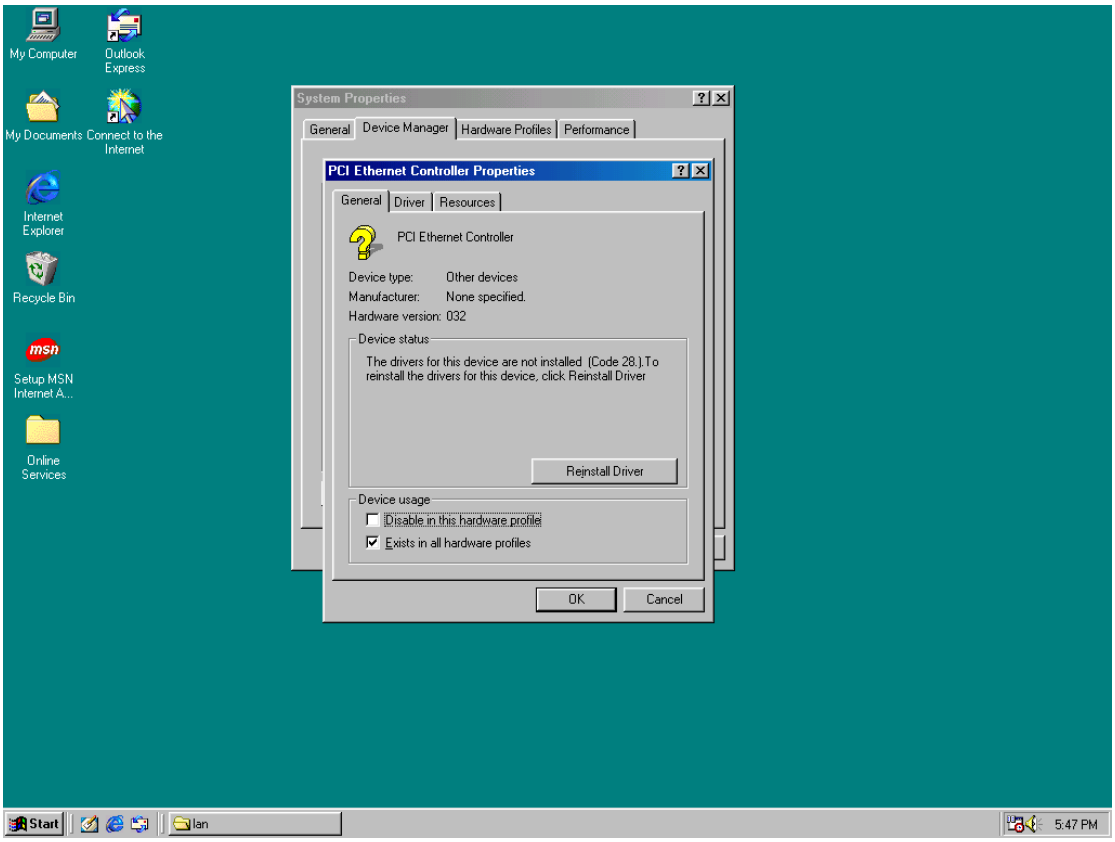
Installation process is completed and allowed the system to reboot

Ethernet Driver Installation

1. Insert the MAT-E652 CD ROM into the CD-ROM Drive
2. Click the **Start** button
3. Select the **Setting** item
4. Click the **Control Panel** item
5. Select the **Systems** icon to open the **System Properties** box
6. Click the **Device Manager** tab



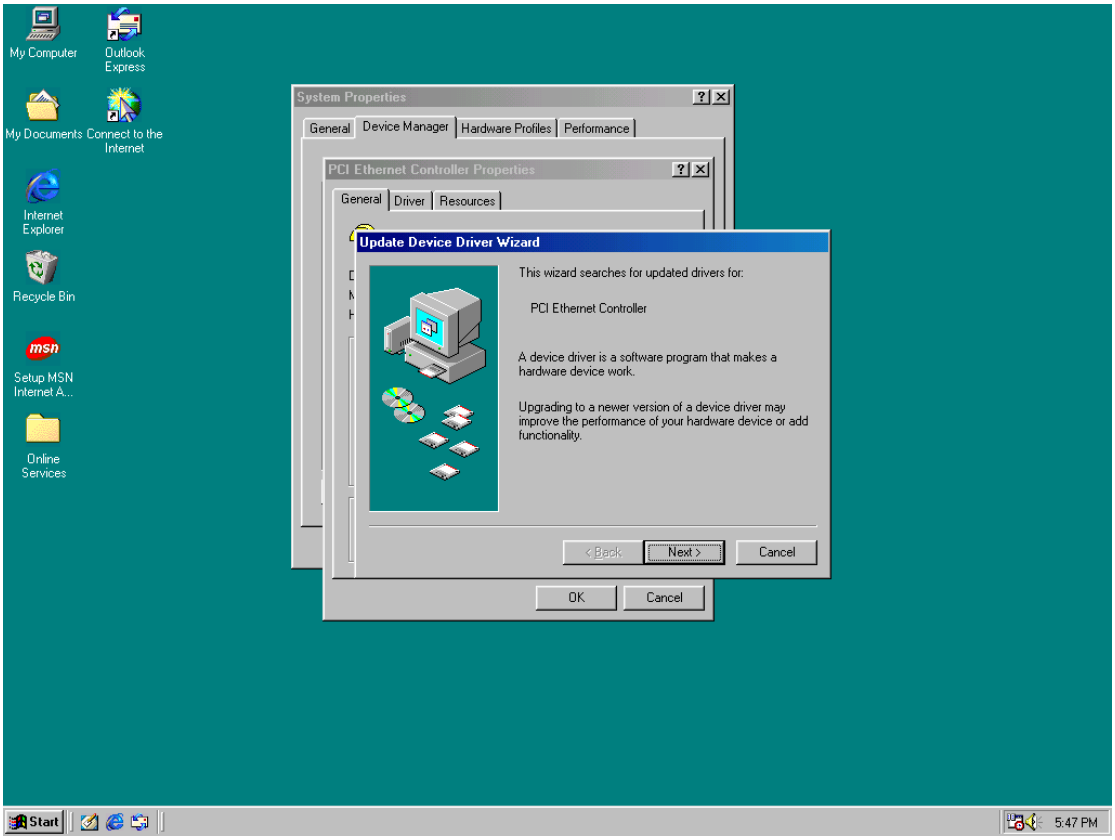
7. Select the **Network Adapters** item



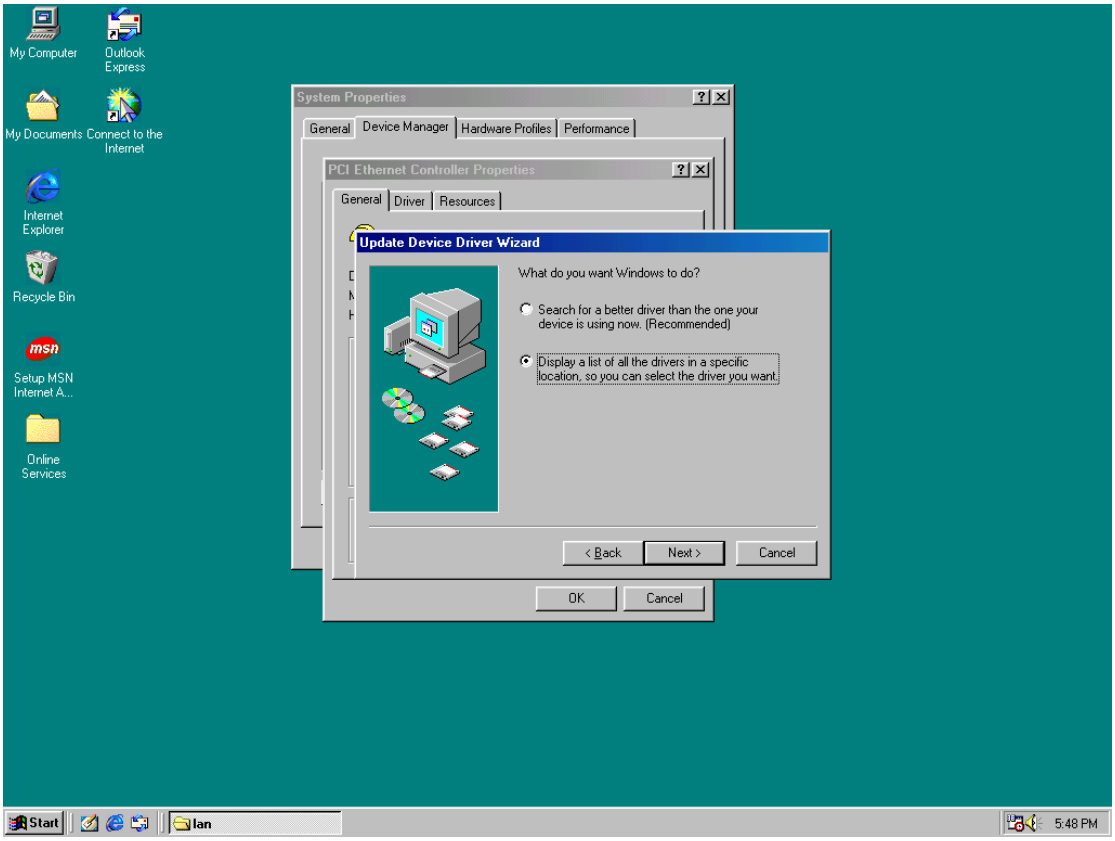
Another file will appear below this file, and then click on the file

8. Click the **Driver** Tab
9. Click the **Update Driver** Button

The **Update Device Driver Wizard** will appear

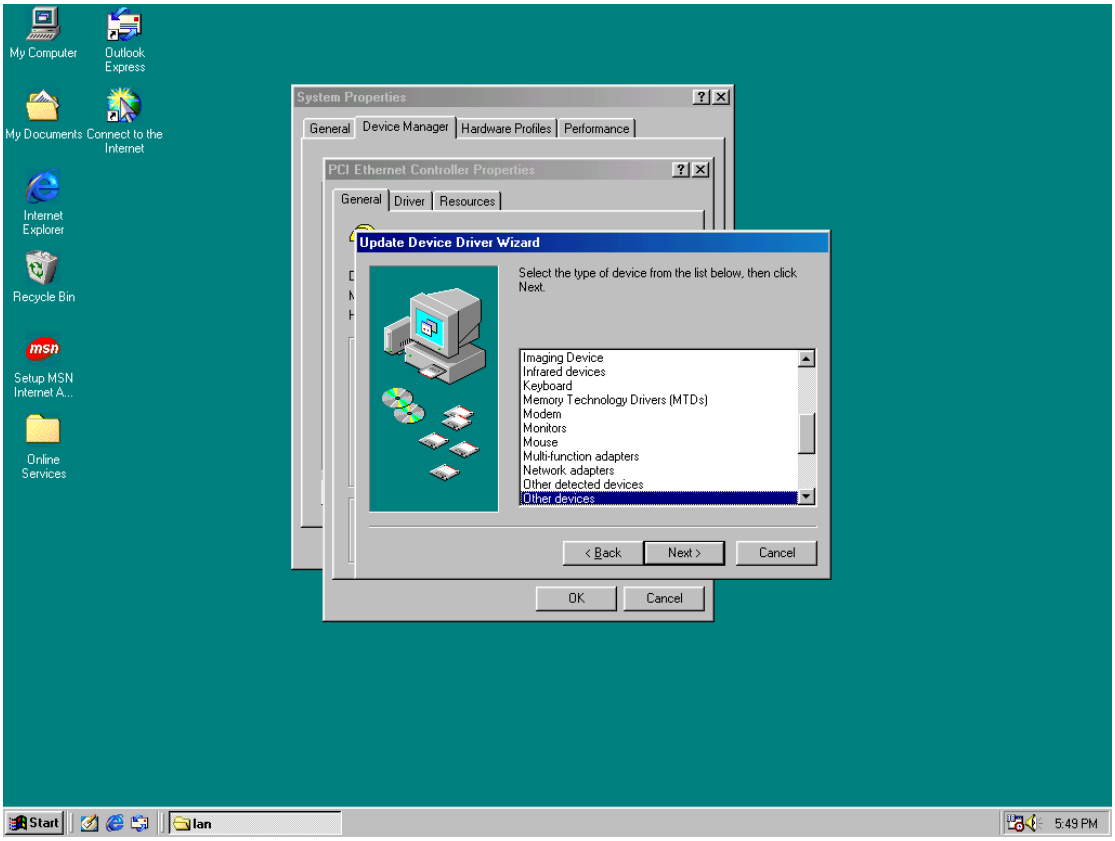


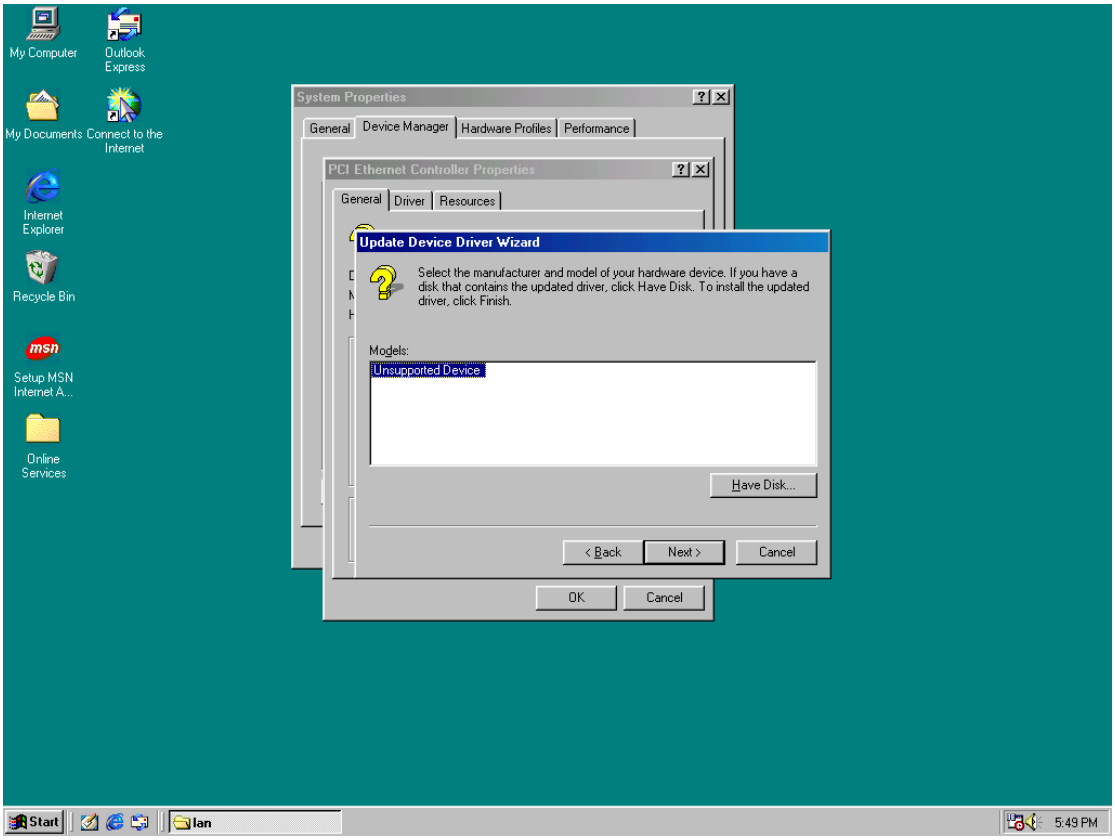
10. Click **Next**

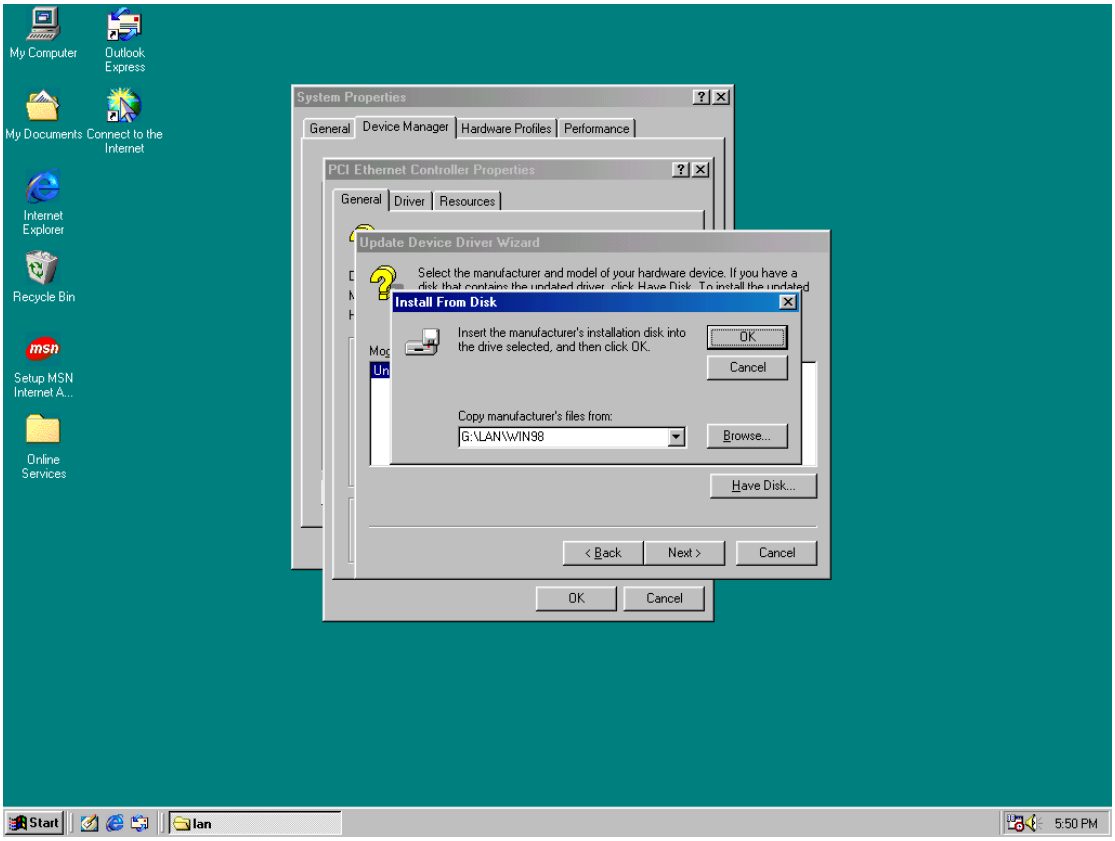


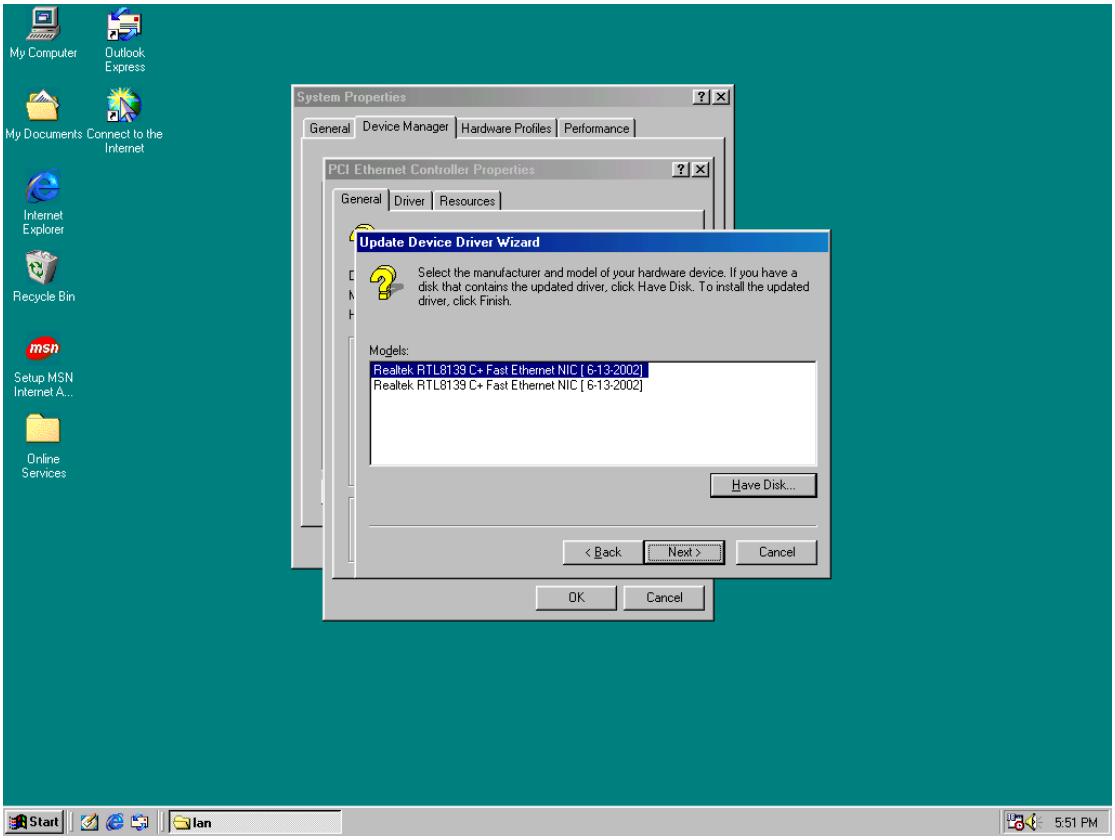
11. Select CD ROM Drive, **Drivers\lan\Win98,** and click **Next**

Notice: We take the LAN installation under Win98 for example only, please choose the file depending on your Windows OS.

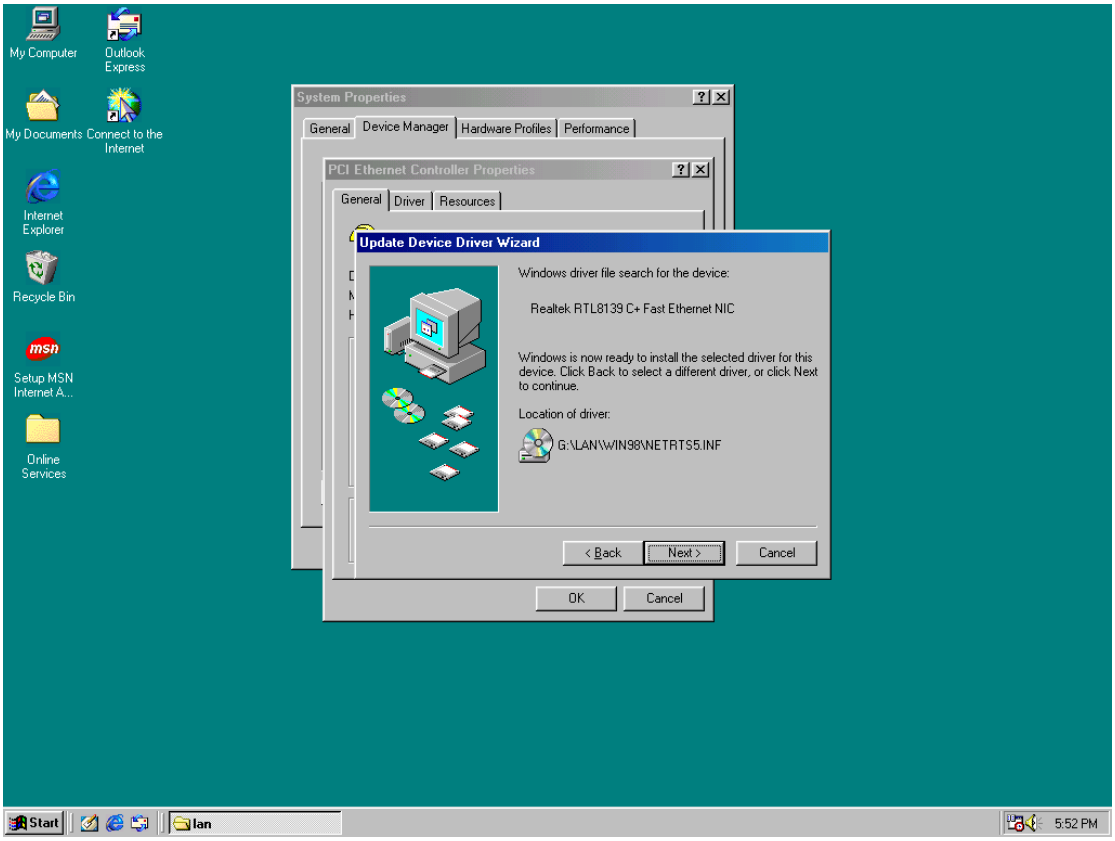



My Computer
Outlook Express
My Documents
Connect to the Internet
Internet Explorer
Recycle Bin
Setup MSN Internet A...
Online Services
System Properties
General
Device Manager
Hardware Profiles
Performance
PCI Ethernet Controller Properties
General
Driver
Resources
Update Device Driver Wizard
Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Models:
Unsupported Device
Have Disk...
< Back
Next >
Cancel
OK
Cancel
Start
lan
5:49 PM

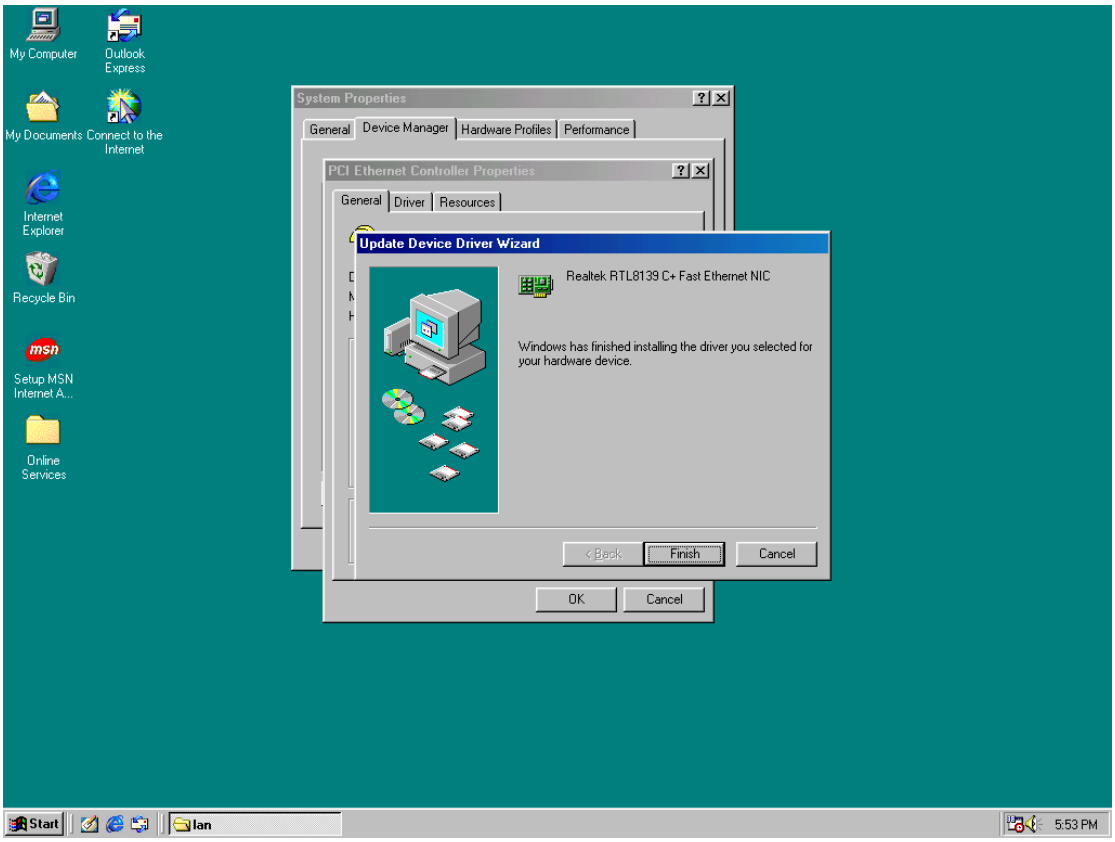

My Computer
Outlook Express
My Documents
Connect to the Internet
Internet Explorer
Recycle Bin
Setup MSN Internet A...
Online Services
System Properties
General
Device Manager
Hardware Profiles
Performance
PCI Ethernet Controller Properties
General
Driver
Resources
Update Device Driver Wizard
Select the manufacturer and model of your hardware device. If you have a
Install From Disk
Insert the manufacturer's installation disk into the drive selected, and then click OK.
OK
Cancel
Copy manufacturer's files from:
G:\LAN\WIN98
Browse...
Have Disk...
< Back
Next >
Cancel
OK
Cancel
Start
lan
5:50 PM


My Computer
Outlook Express
My Documents
Connect to the Internet
Internet Explorer
Recycle Bin
Setup MSN Internet A...
Online Services
System Properties
General
Device Manager
Hardware Profiles
Performance
PCI Ethernet Controller Properties
General
Driver
Resources
Update Device Driver Wizard
Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Models:
Realtek RTL8139 C+ Fast Ethernet NIC [6-13-2002]
Realtek RTL8139 C+ Fast Ethernet NIC [6-13-2002]
Have Disk...
< Back
Next >
Cancel
OK
Cancel
Start
lan
5:51 PM

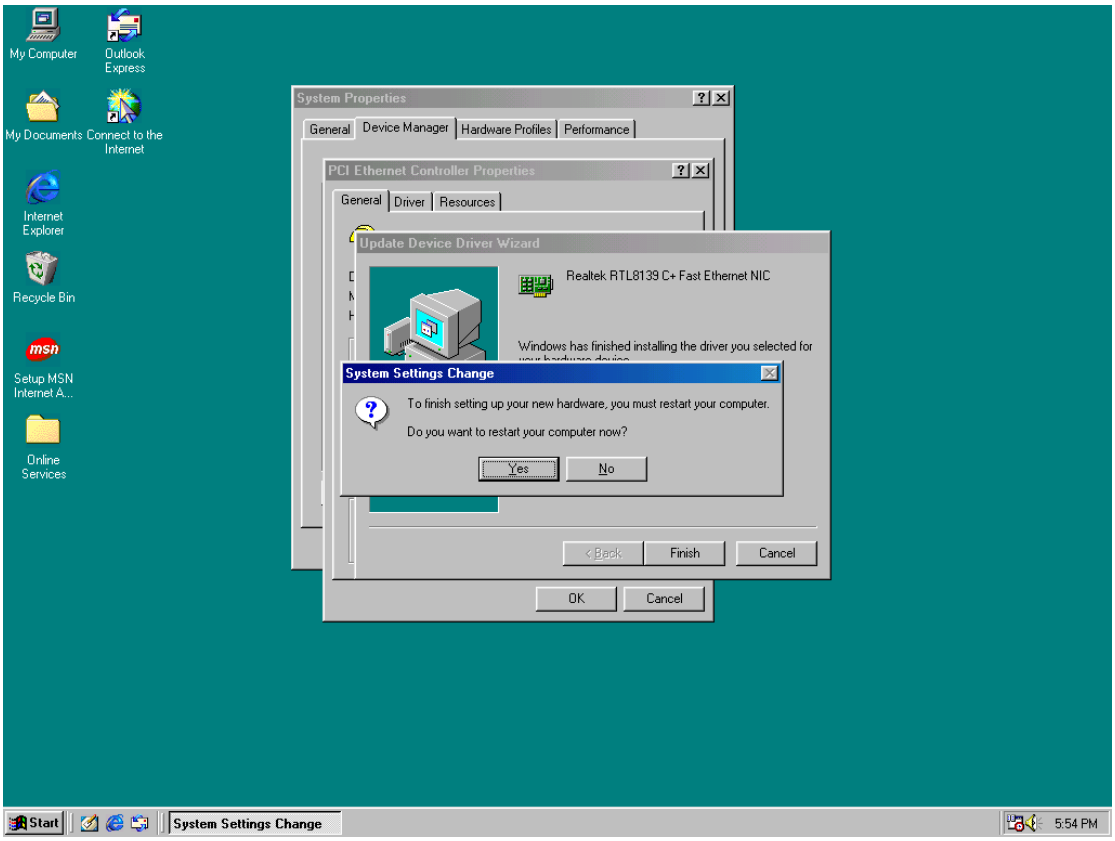
Click **Next**


My Computer
Outlook Express
My Documents
Connect to the Internet
Internet Explorer
Recycle Bin
Setup MSN Internet A...
Online Services
System Properties
General
Device Manager
Hardware Profiles
Performance
PCI Ethernet Controller Properties
General
Driver
Resources
Update Device Driver Wizard
Windows driver file search for the device:
Realtek RTL8139 C+ Fast Ethernet NIC
Windows is now ready to install the selected driver for this device. Click Back to select a different driver, or click Next to continue.
Location of driver:
G:\LAN\WIN98\NETRTS5.INF
< Back
Next >
Cancel
OK
Cancel
Start
lan
5:52 PM

Click **Finish**



Installation process is completed shutdown the computer and will allow the system to reboot



Appendix A: Programming the Watchdog Timer

The MAT-E652 provides a watchdog timer that resets the CPU or generates an interrupt if processing comes to a stop. This function ensures greater system reliability in industrial stand-alone and unmanned environments.

In order to enable the watchdog timer, you have to output the value of the watchdog timer interval to the controller. The value range is from 01H to FFH, and the related time watchdog timer interval is 1 sec to 255 sec.

Data	Timer interval
00	Disabled
01	1 sec
02	2 sec
*	*
*	*
FF	255 sec

If you want to program the watchdog timer, you must write timer value to I/O port 444 (hex).

For example:

ASSEMBLY LANGUAGE

Start Watchdog Timer	DOS Debug

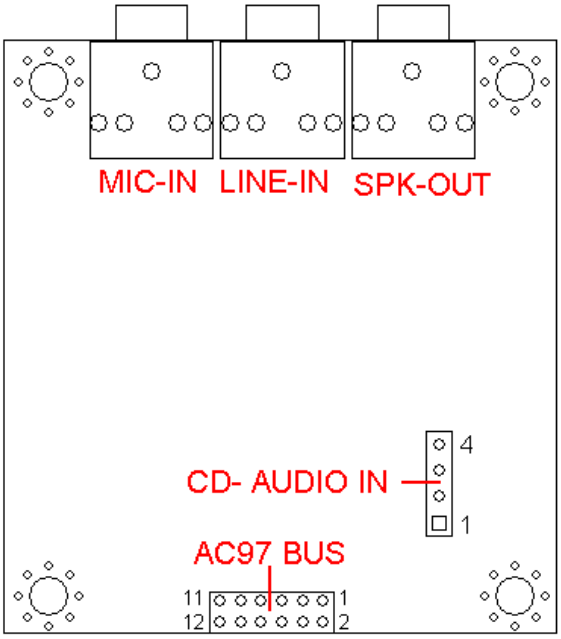
MOV DX, 444H
MOV AL, XXH
OUT DX, AL
	OUT 444, XX

Stop Watchdog Timer	DOS Debug
MOV DX, 441H IN AL, DX	IN 441

Note: "XX" timer value

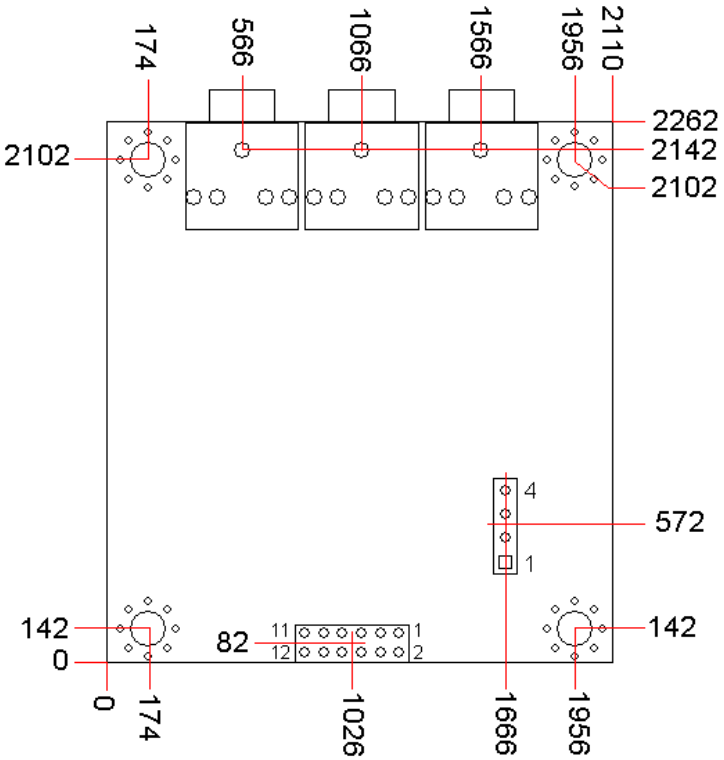
Appendix B: Audio Kit

1. Board Layout

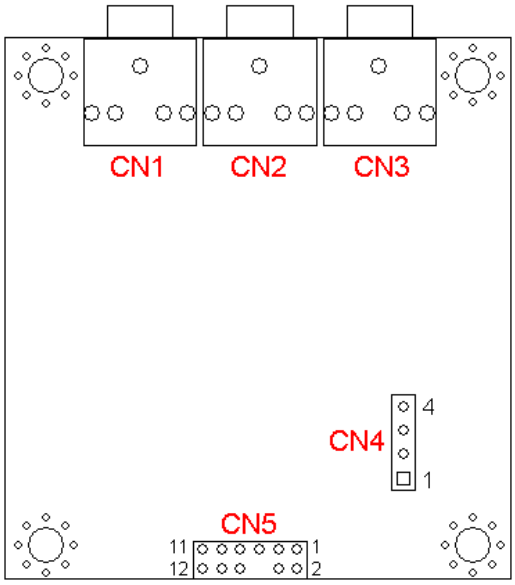


2.Board Dimension

Board Dimension (mil)



3.Location of Connectors



4.List of Connectors

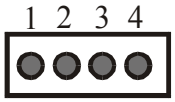
Connectors	Description
CN1	Micro-Phone Input
CN2	Line-In
CN3	Speaker-Out
CN4	CD Audio Input
CN5	AC97 Audio Input

CN1: This MIC-In jack connects to a microphone

CN2: This Line-In jack connects to a tape player or other audio sources.

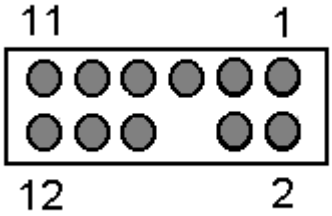
CN3: This Speaker-Out jack connects to a headphone or a speaker.

CN4: CD Audio Input Connector



Pin	Signal
1	CD AIDIO-L
2	GND
3	GND
4	CD AUDIO-R

CN5: AC-97 Audio Input Connector



Pin	Signal	Pin	Signal
1	+12V	2	GND
3	GND	4	AC97-BTCLK
5	+3.3V	6	KEY PIN
7	AC97-SDIN0	8	AC97-SYNC
9	GND	10	AC97-RESET
11	AC97-SDOUT	12	PC-BEEP

Appendix C: Programming the GPIO Port

The MAT-E652 provides an 8-bit GPI port and an 8-bit GPO port that you can use to read and write data through. The GPIO Port Base Address is 440 (hex).

Reading the GPIO Data

MOV DX, 440 : the GPIO address
IN AL, DX : read the data into AL register

Writing the GPIO Data

MOV DX, 440 : the GPIO address
MOV AL, XXH : output data value "XX"
OUT DX, AL

bit0 : GPI(O)0
bit1 : GPI(O)1
bit2 : GPI(O)2
bit3 : GPI(O)3
bit4 : GPI(O)4
bit5 : GPI(O)5
bit6 : GPI(O)6
bit7 : GPI(O)7

Appendix D: System Resource

Interrupt Controller

The MAT-E652 is a fully PC compatible control board, it consists of 16 ISA interrupt request lines and most of them already in used by other part of the board. Both of ISA and PCI expansion cards may need to use IRQs, please make sure that the IRQs do not conflict if you would like to use extra add-on cards.

System IRQs are available to cards installed in the ISA expansion Bus first. Any remaining IRQs then may be assigned to this PCI Bus. You are able to use the AMI Diagnostic utility to see their map.

IRQ	Assignment
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial Port 2
IRQ4	Serial Port 1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	Math Coprocessor
IRQ14	Primary IDE Controller
IRQ15	Secondary IDE Controller

DMA Channel Assignment

Channel 4 is by default used to cascade the two controllers

Channel	Assignment
DMA0	**Available for PCI and ISA Slot**
DMA1	**Sound Card**
DMA2	**Floppy Disk Controller**
DMA3	**ECP Printer Port**
DMA4	**Cascade**
DMA5	**Sound Card**
DMA6	Available for PCI and ISA Slot
DMA7	Available for PCI and ISA Slot

Memory Map

The following table indicates memory of MAT-E652. The address ranges specify the runtime code length.

Memory below 1MB (1Mb ~ 640KB)

Address Range	Type	Owner
A0000~AFFFF	**ISA**	**VGA Adapter**
B0000~BFFFF	**ISA**	**VGA Adapter**
C0000~C7FFF	**ISA**	**Adapter ROM**
C8000~CBFFF	**ISA**	**Adapter ROM**
F0000~FFFFF	**ISA**	**System BIOS**

Memory above 1MB (1MB ~ 142336KB)

Address Range	Type	Owner
40011000~40011D7F	**PCI**	**Multimedia Audio**
40012000~400120FF	**PCI**	**Bridge Device**
40800000~40FFFFFF	**PCI**	**VGA Adapter**
D0000000~D00000FF	**PCI**	**Ethernet Controller**
D0004000~D0004FFF	**PCI**	**USB Controller**

System Memory Map

Start High	**Start Low**	**Size High**	**Size Low**	**Type**
00000000	00000000	00000000	0009FC00	Available
00000000	0009FC00	00000000	00000400	Available
00000000	000F0000	00000000	00010000	Reserved
00000000	FFFF0000	00000000	00010000	Reserved
00000000	00100000	00000000	08B00000	Available

I/O Map

The addresses shown in the table are typical locations.

I/O Port	Assignment
0 ~ F	**AT DMA Controller**
20 ~ 21	**AT Interrupt Controller**
40 ~ 43	**82C54 Compatible Programmable Timer**
60	**8042 Compatible keyboard Controller**
61	**AT Style Speaker**
64	**8042 Compatible keyboard Controller**
70 ~ 71	**Real Time Clock**
81 ~ 83	**AT DMA Controller**
87	**AT DMA Controller**
89 ~ 8B	**AT DMA Controller**
8F ~ 91	**AT DMA Controller**
A0 ~ A1	**AT Interrupt Controller**
C0 ~ DF	**AT DMA Controller**
F0 ~ FF	**Math Coprocessor**
170 ~ 177	**IDE Controller**
1F0 ~ 1F7	**IDE Controller**
220 ~ 22E	**Sound Card**
2F8 ~ 2FF	**Communication Port (COM2)**
330	**Midi**
376	**IDE Controller**
378 ~ 37A	**LPT1**
3B0 ~ 3BB	**VGA Adapter**
3C0 ~ 3DF	**VGA Adapter**
3F0 ~ 3F5	**FDD Controller**
3F6	**IDE Controller**

3F7	**FDD Controller**
3F8 ~ 3FF	**Communication Port (COM1)**
480 ~ 48F	**PCI Bus**
4D0 ~ 4D1	**PCI Bus**
778 ~ 77A	**Printer Port**
CF8 ~ CFF	**PCI Bus**
E000 ~ E0FE	**Ethernet Controller**
F000 ~ F00E	**IDE Controller**

Appendix E: Optional Cable List

Part Number	Cable Description	MAT-E652 Connector	Terminating Connector
46-I00IDE-00	IDE Cable	CN15	44-pin Dual IDE Cable, 20cm
46-IFDC01-00	Floppy Cable	CN17	2.54mm-2.0mm Floppy Cable
46-ICOM02-00	COM2 Cable	CN9	COM2 Cable
46-ICOM03-00	COM3/4 Cable	CN22	I/O Cable
46-ILPT01-00	LPT Cable	CN11	25-pin D-Sub LPT Cable
46-IPW402-00	ATX Power Cable	CN19	4-pin to 20-pin ATX Power Cable
46-IPW404-00	AT Power Cable	CN19	4-pin to 4-pin AT Power Cable
46-IUSB03-00	USB Cable	CN6	2-Channels USB Cable
46-IPS266-00	Internal KB/MS Cable	CN7	KB/MS Cable