TES-8551

User’s Guide

Version: 1.1

Notice

Dear Customer,

Thank you for purchasing the TES-8551 board. This user's manual is designed to help you to get the most out of the TES-8551, please read it thoroughly before you install and use the board. The product that you have purchased comes with a one-year limited warranty, but we will not be responsible for misuse of the product. Therefore, we strongly suggest you to first read the manual before using the product.

To get the latest version of the user manual, please visit our

Web site

Table of Contents

Chapter 1 Introduction

Thanks for choosing the TES-8551 !!!

The TES-8551 is a Pentium M /Celeron M CPU based single board computer (SBC) with an dual independent different images based on Integrated AGP X4 2D/3D graphics accelerator, One Intel Gigabyte or 100 Megabyte Ethernet controller, 400MHZ PSB, on board 256~512MB DDR,. Onboard features include six internal high speed 16550 fast UART serial ports, six USB 2.0 USB ports ,one mini PCI port and 32 bit PCI Slot, and eight unit of programmable GPIOs. The built-in high speed IDE controller supports dual channel Ultra ATA-100. DVI interface is designed for digital video extension. TES-8551 can supports dual LCD panels with DVO~DVI adaptor. Compact Flash Socket is designed for embedded system OS application.

The TES-8551 also features power management to minimize power consumption. It complies with DC12V and the software watchdog timer can be programmed to reset the system in case the system stops due to a program bug or SMI.

*Subject to change without any notice

Chapter 2 Specification

CPU

- Support On-board 479uFC-BGA ULV Intel® Celeron® M or Intel® Celeron® M or 479 uFC-PGA Intel® Pentium® M to 1.8GHz+
- 400MHZ Processor Side Bus (PSB)

L2 Cache

- 1MB/2MB L2 cache(Pentium M), 2X32KB L1 Cache, CPU integrated

Chipset

- Intel 855GM/852GM GMCH Graphics and Memory Controller Hub
- Intel ICH4 82801DB IO Controller Hub4
- Winbond W83627HF LPC Super IO Chipset
- Winbond W83697UF LPC IO
- ICH4 Embedded MAC with Intel 82562EX PLC or Intel 82540EM Gigabit LAN Chipset

System BIOS

- Phoenix/Award PnP 4Mbit upgrade Flash ROM BIOS
- ACPI support suspend to RAM,USB wake up

Operating System

- DOS 6.22 or above version
- Windows 9X/ME/XP/2000
- Windows NT 4.0 or above version
- Linux™

System Memory

- On Board DDR Memory 256~512MB

Display Controller

- Intel GMCH Integrated Graphics Controller with 64MB sharing memory.
- Support analog display with 350MHZ integrated 24 bit RAMDAC, up to 1920X1440@60Hz
- Dual Independent Pipe supports Concurrent and Simultaneous display functions.
- Dedicated dual display with one2X24 bit LVDS supporting to SXGA+ (1400x1050@60HZ panel,. Another is on board 2X24-bit DVO to DVI transmitter.

LAN

- ICH4 embedded MAC with Intel 82562EZ PHY 10/100 Ethernet Controller or Intel 82540EM Gigabit LAN Chipset(optional)
- Wake-On-LAN(optional)
- External shielded RJ-45 modular jacks with LED indicators

ATA 100 IDE Interface

- Support Ultra ATA33 / 66 / 100 Master, BMIDE, PIO mode independent timing driver interface
- Support tri-state mode to enable swap bay.
- Dual channels supporting four enhanced IDE devices with dual 2.0mm 44 pin connectors

Compact Flash Connector

- Support one compact flash socket under secondary master device

Audio Codec

- 18 Bit Audio Codec Chip
- AC 97 2.3 complaint interface
- Support Line_in / Line_out / Mic_in
- Daughter Board 2Watts Amplifier (optional)

Printer Port

- Support on board printer port with SPP/EPP/ECP mode

Serial Port

- Six high speed 16550 fast UART serial ports with 12V/5V Power..

USB Port

- Support Six USB 2.0 ports,

Keyboard /Mouse Connector

- One 6 Pin Mini Din for PS/2 type keyboard and mouse at bracket
- Auxiliary connector for extending

TTL IO

- Support eight programmable TTL IO ports

PCI Slot Extension/Mini PCI Socket

- One 32 bit PCI slot and mini PCI Socket for Extension

H/W Monitoring

- Winbond 83627HF support 7 voltage, 3 temperature and 2 fan-speed control

Watchdog Timer

- Software Programmable Watchdog Timer with 1sec/minute timeout intervals range from 1 to 255 seconds/minutes

Real Time Clock

- 256 bytes CMOS RAM built-in ICH4 chipset
- Backup by non-rechargeable Lithium cell battery

Power Requirement

- 12V Single Power Required

Temperature

- Operating: -20°C to 60 °C

Relative Humidity

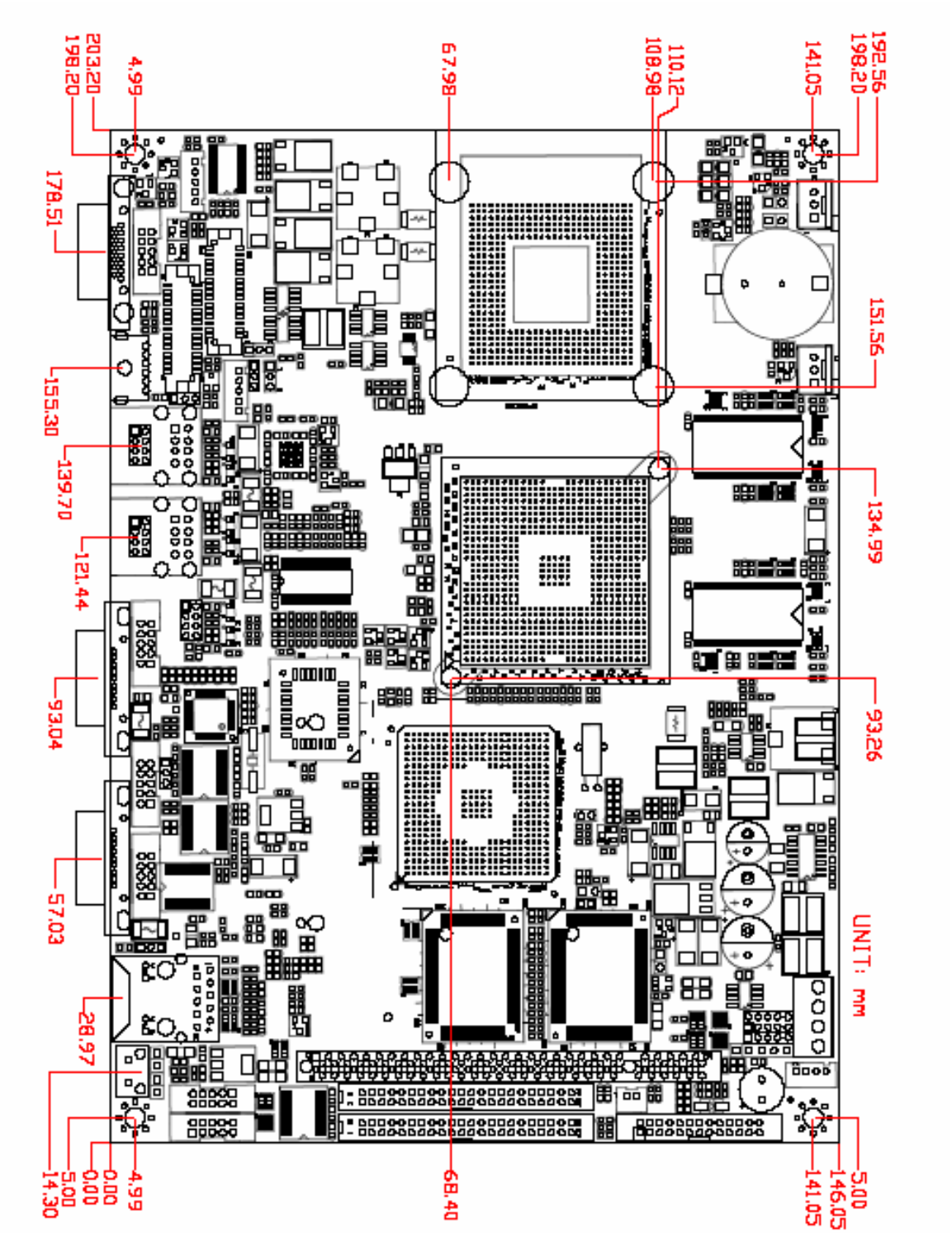
- Operating: 10% to 80% (non-condensing)

Size

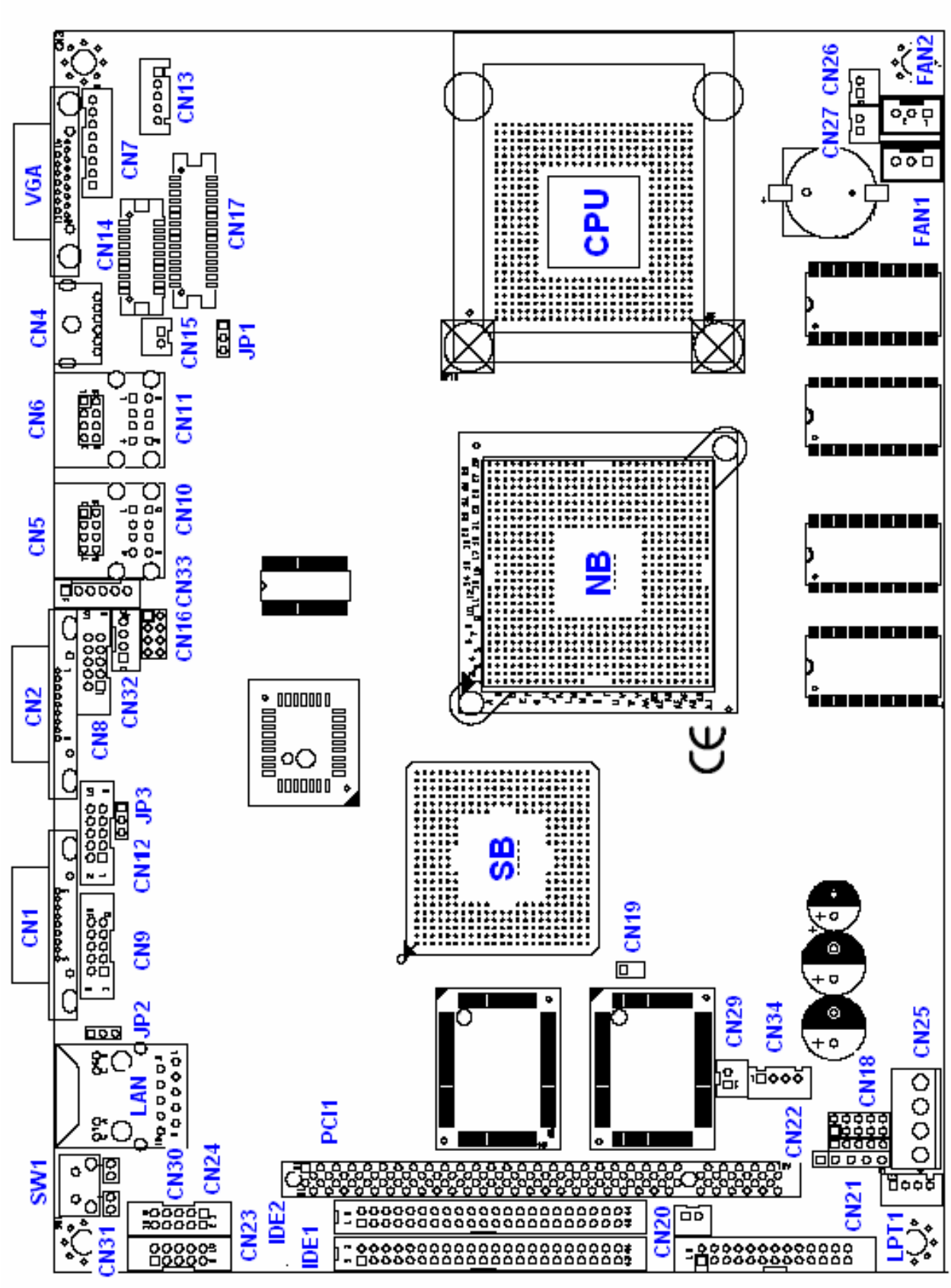
- 203mmX146mm

Chapter 3 HARDWARE CONFIGURATION

3-1 Board Dimension



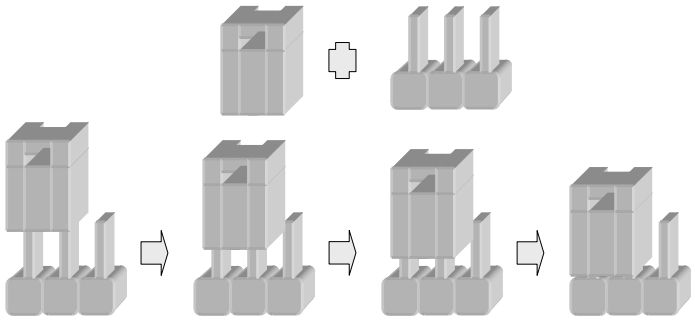
3-2 Board Outline



3-3 Jumper and Connector

How to Set the Jumper

In order to select the operation modes of your system, configure and set the jumpers on the TES-8551 to match the need of your application. To set a jumper, a black plastic cap containing metal contacts is placed over the jumper pins as designated by the required configuration as listed in this section. A jumper is said to be “on” or “1-2” when the black cap has been placed on two of its pins, as show in the figure below:

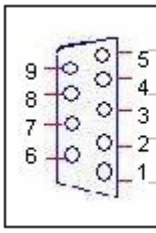


A pair of needle-nose pliers is recommended when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local sales representative before you make any changes. In general, you simply need a standard cable to make most connections.

3-3-1 Connectors

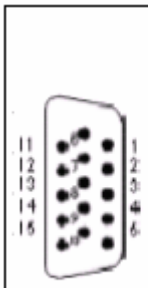
CN1/CN2:COM1/COM2 Ports.

Pin 9 can be default as connecting to VCC or 12V according to the setting of JP2/JP3



1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

CN3: VGA Connector

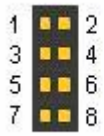


1	R	2	G
3	B	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	V_DATA
13	HSYNC	14	VSYNC
15	V_CLK		

CN4: KB/MS Mini Din Port

1	KDATA	2	MDATA
3	KMGND	4	KMVCC
5	KCLK	6	MCLK
7	GND	8	GND
9	GND		

CN5/CN6/CN16: USB Connector

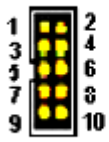


1	5VSB	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	5VSB

CN7: Auxiliary VGA Connector

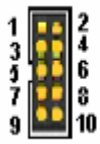
1	R	2	G
3	B	4	GND
5	V_DATA	6	V_CLK
7	HSYNC	8	VSYNC

CN8: Audio Connector



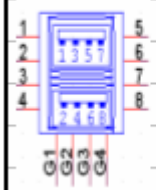
1	IN_L	2	AGND
3	AGND	4	IN_R
5	OUT_L	6	AGND
7	AGND	8	OUT_R
9	MIC IN	10	AGND

CN9/CN12/CN23/CN24:COM3/COM4/COM5/COM6



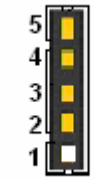
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	NC

CN10/CN11: USB Port



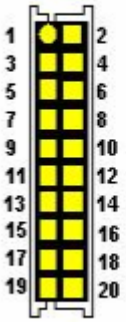
1	5VSB	5	GND
2	DATA-	6	DATA+
3	DATA+	7	DATA-
4	GND	8	5VSB
G1	GND	G2	GND
G3	GND	G4	GND

CN13: BackLight Connector of LVDS



1	P12V
2	GND
3	VCC
4	GND
5	ON/OFF

CN14: DVI Connector

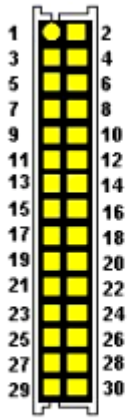


1	TX+	2	TX2+
3	TX-	4	TX2-
5	GND	6	GND
7	TX1+	8	TXC+
9	TX1-	10	TXC-
11	GND	12	GND
13	DCLK	14	GND
15	DDATA	16	GND
17	GND	18	GND
19	VCC	20	VCC

CN15/CN20: 5V Power supplier for touch panel or other devices.

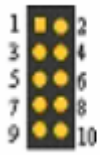
1	VCC
2	GND

CN17: LVDS Connector



1	LCD+	2	LCD+
3	YAP0	4	YAM0
5	YAP1	6	YAM1
7	YAP2	8	YAM2
9	YAP3	10	YAM3
11	CLKAP	12	CLKAM
13	NC	14	NC
15	GND	16	GND
17	YBP0	18	YBM0
19	YBP1	20	YBM1
21	YBP2	22	YBM2
23	YBP3	24	YBM3
25	CLKBP	26	CLKBM
27	(DDCPCLK)	28	(DDCPDATA)
29	GND	30	GND

CN18: GPIO

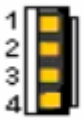


1	GPIP4	2	GPOP0
3	GPIP5	4	GPOP1
5	GPIP6	6	GPOP2
7	GPIP7	8	GPOP3
9	GND	10	VCC

CN19: Temperature Sensor

1	Sensor+
2	GND

CN25:12V Power input



1	VIN
2	VIN
3	GND
4	GND

CN26: Power Indicator

1	LED+
2	LED-

CN27: IDE Active Indicator

1	LED+
2	LED-

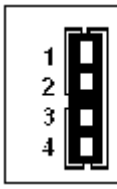
CN30: Reset Switch

1	RESET
2	GND

CN31/SW1: Auxiliary Connector of Push Button /Push Button Switch

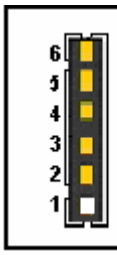
1	PSUHBN+
2	PUSHBN-

CN32: Big 4P Power Connector



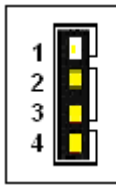
1	12V
2	GND
3	GND
4	5V

CN33: KB/MS Auxiliary Connector



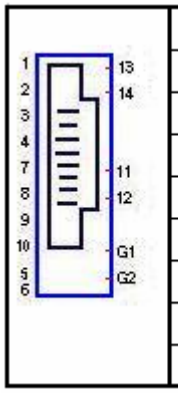
1	KDATA
2	MDATA
3	KMGND
4	KMVCC
5	KCLK
6	MCLK

CN34: ATX Stand By Power



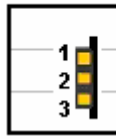
1	NC
2	5VSB
3	PSON
4	GND

LAN:



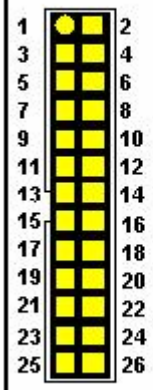
PIN	10/100	PIN	1000
1	TxD+	1	TxD0+
2	TxD-	2	TxD0-
3	RxD+	3	RxD0+
4	NC	4	RxD0-
5	NC	5	TxD1+
6	RxD-	6	TxD1-
7	NC	7	RxD1+
8	NC	8	RxD1-

FAN1/FAN2: CPU FAN



1	GND
2	12V
3	Sense

Printer:



1	STB	2	AFD
3	D0	4	ERR
5	D1	6	INIT
7	D2	8	SLIN
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	GND

JP1: LVDS Voltage Selection

1-2	3.3V
2-3	5V

JP2/JP3: Selection of Power to COM Port

1-2	5V
2-3	12V

J4: CMOS Setup

ON	Clear
OFF	Normal

Chapter 4 Driver Installation Guide

This Chapter will introduce the driver package for TES-8551 and give you the idea of how to install the system driver. The installation varies according to your computer's operating system. The following installation drivers are provided:

1. INF
2. VGA
3. LAN driver
4. USB
5. Audio

4-1 Driver Contents

INF:

The Intel(R) Chipset Software Installation Utility installs to the target system the Windows* INF files that outline to the operating system how the chipset components will be configured. INF files must be installed prior to any other driver.

VGA:

In VGA driver directory there are VGA drivers to support Window 2000, Window XP, Window 98 and Window NT

win2k_xp for Window 200 and Window XP

win981361 for Window 98

winnt41361 for Window NT

LAN:

In LAN directory there support Intel 82540QM/ER, Intel 82562EX/EZ LAN drivers under different OS.

USB

In USB directory there are USB drivers which support WIN 98, WIN2K and WIN_XP.

Audio Driver

In Audio directory there is Realtek audio driver wdm_a353 to support TES-8551.

4-2 Guide of INF files Installations

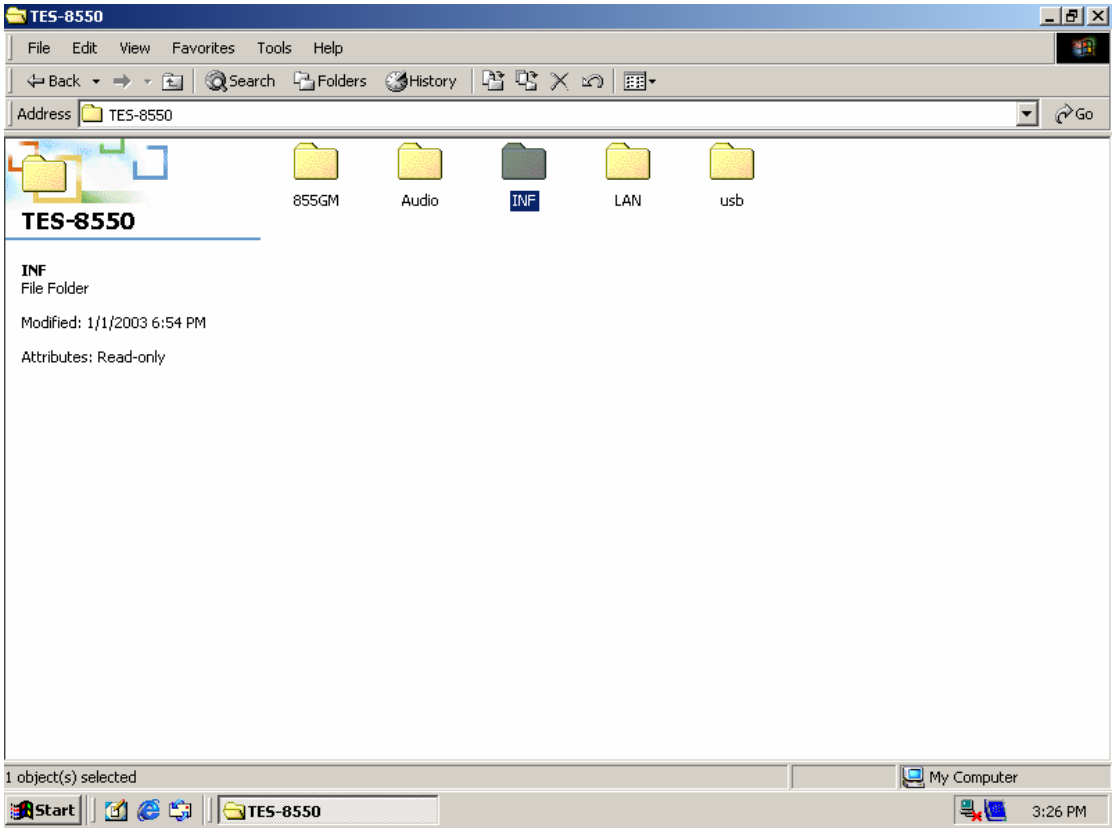
The Installation screens vary according to your operating system and the following installation guide is base on **Windows 2000. More information about other OS refers to readme.txt in INF directory.**

Note:

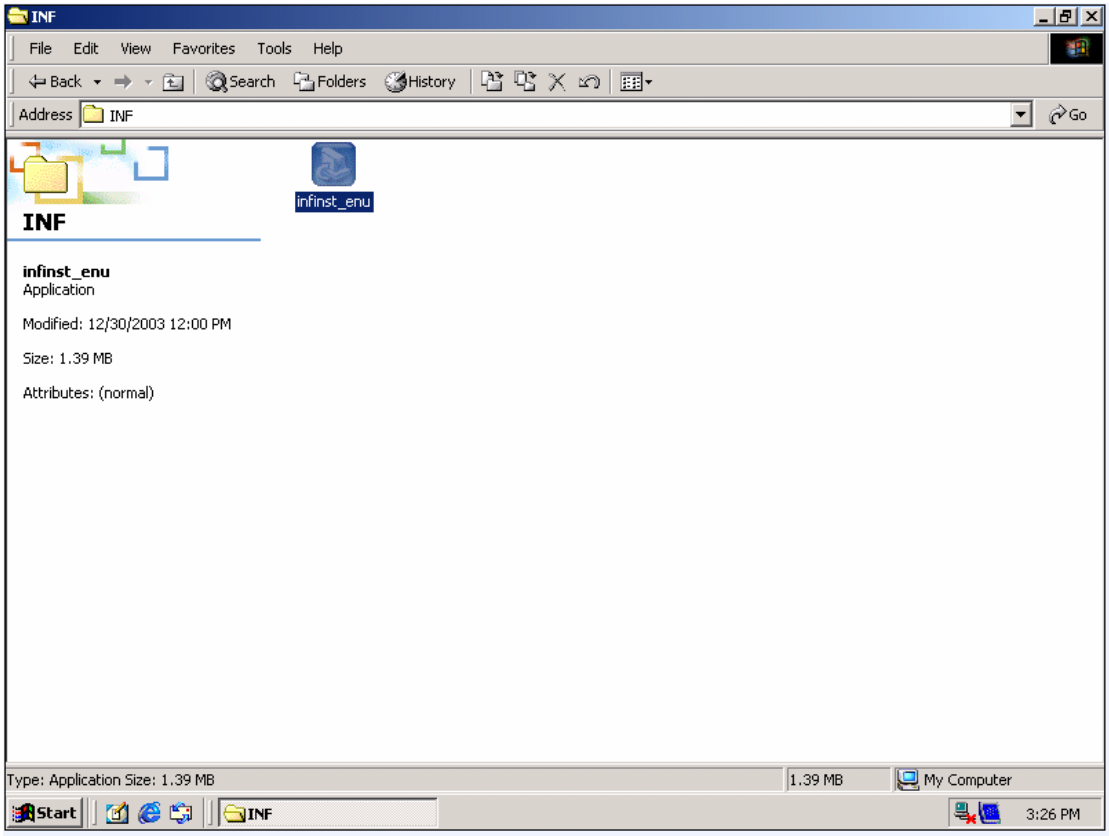
1. It is recommended that the software be installed on systems with at least 32MB of system memory when using Windows* 98SE and Windows* Me. Windows* 2000 requires at least 64MB of system memory.
2. It is recommended that there be a minimum of 5MB of hard disk space on the system, in order to install this software.
3. Check the System Requirements. The operating system must be fully installed and running on the system before running this software.
4. Close any running applications. Otherwise, you may experience difficulties.
5. It is recommended that the **Intel(R) Chipset Software Installation utility be installed onto the target system prior to the installation of other drivers.**

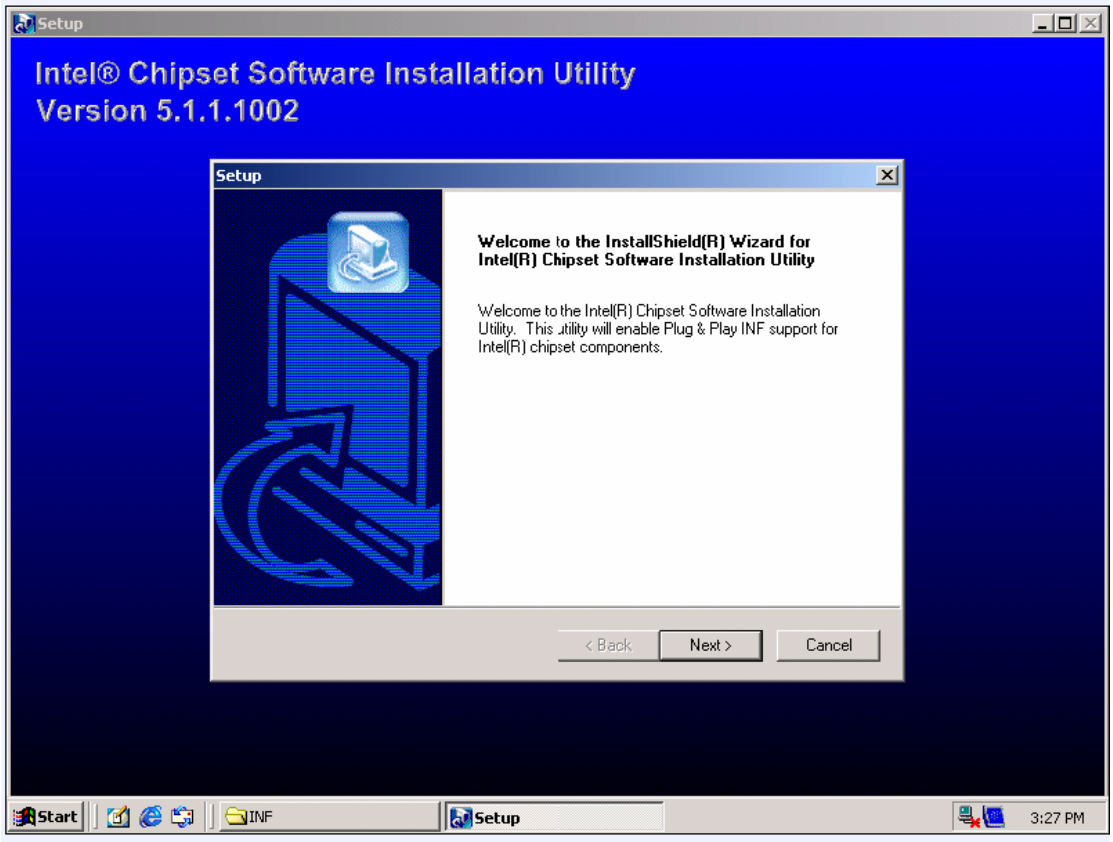
Install Procedure

1. Select the directory where INF files are

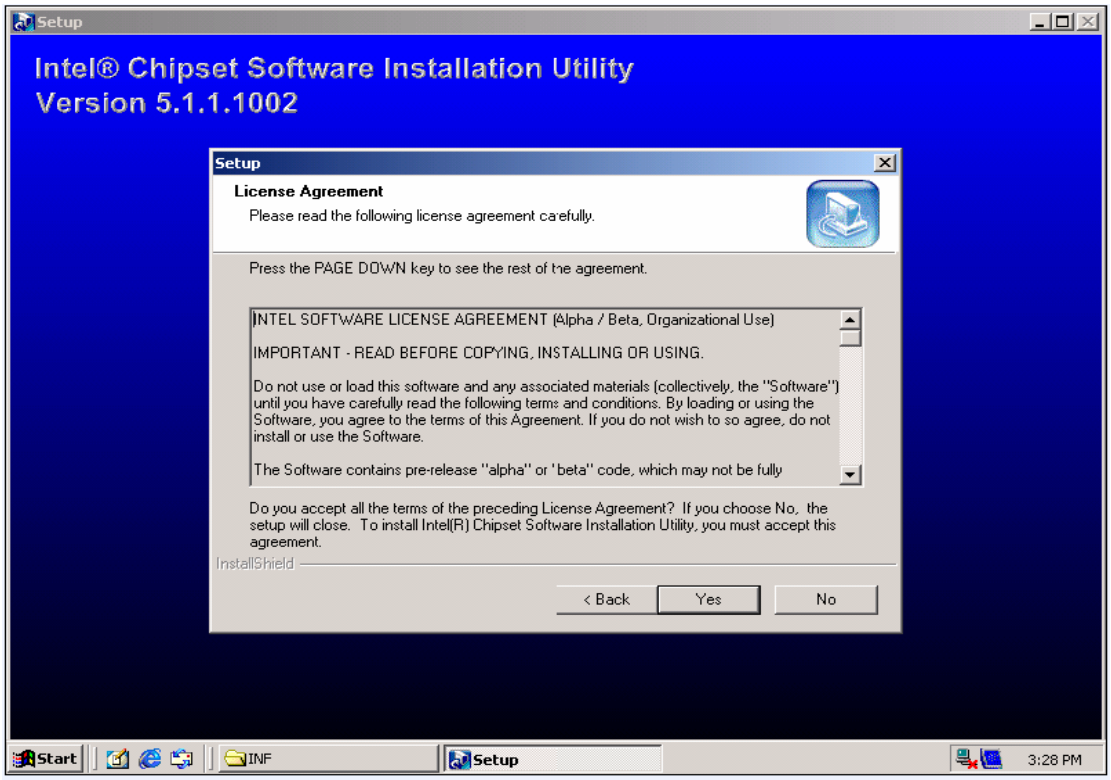


2. Double –click “infinst_enu” icon to run Intel Chipset installation utility as follow

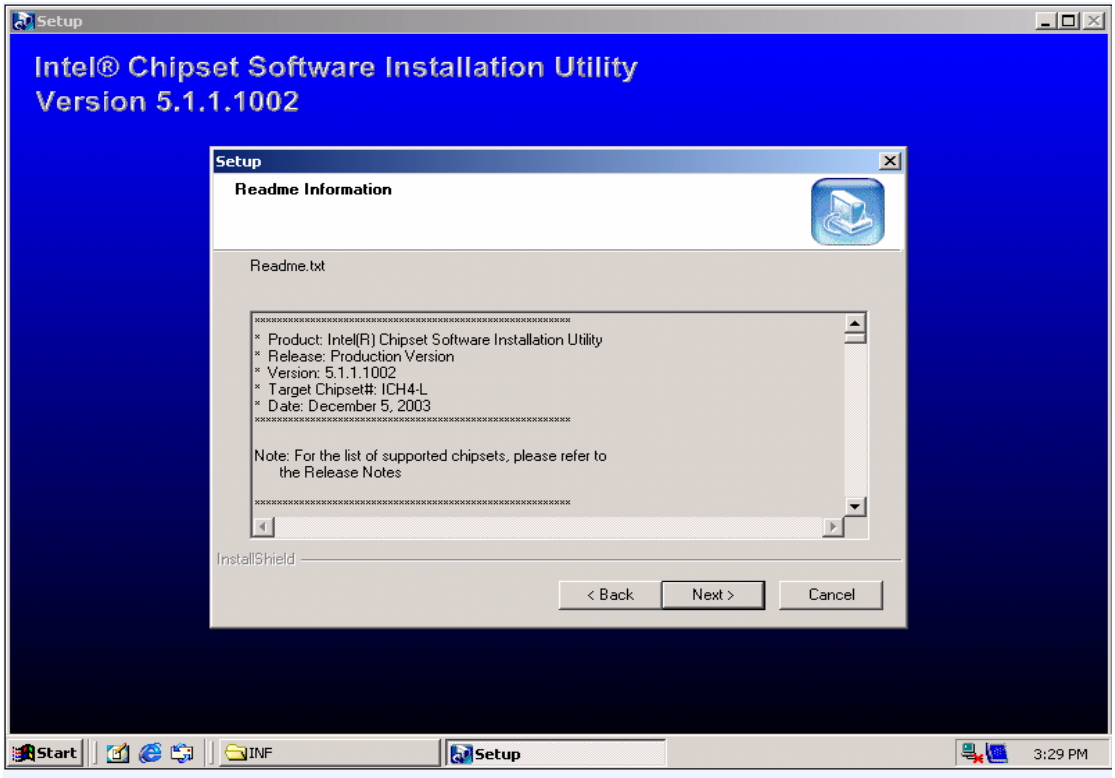




3. You will be prompted to agree to license agreement. If you don't agree, the installer will exit before extracting any files.



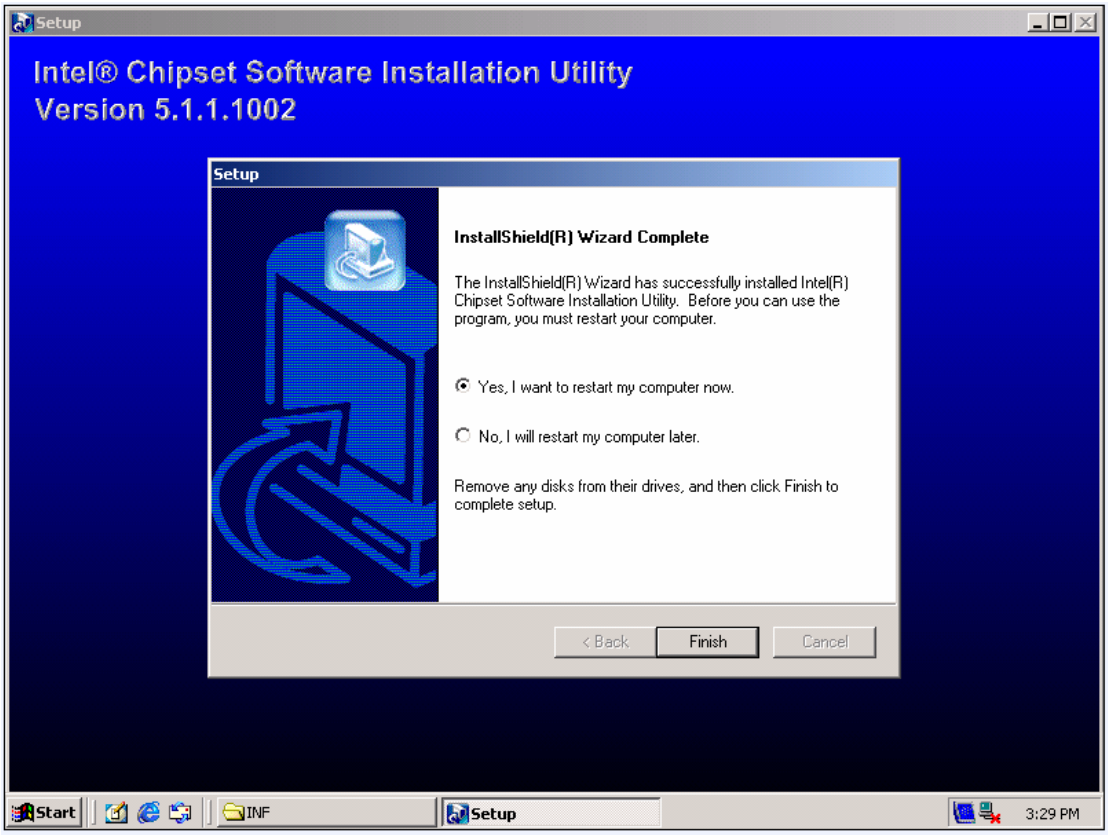
4. If you are freshman for driver installing you would like to readme file carefully.



5. After you read ReadMe file follow the on-screen instructions and use the default setting to complete the setup,

6. The setup complete Window appears. Select "Yes, I want to restart my computer

now" and click on the" Finish "button. You will be promoted to reboot when installation is complete.



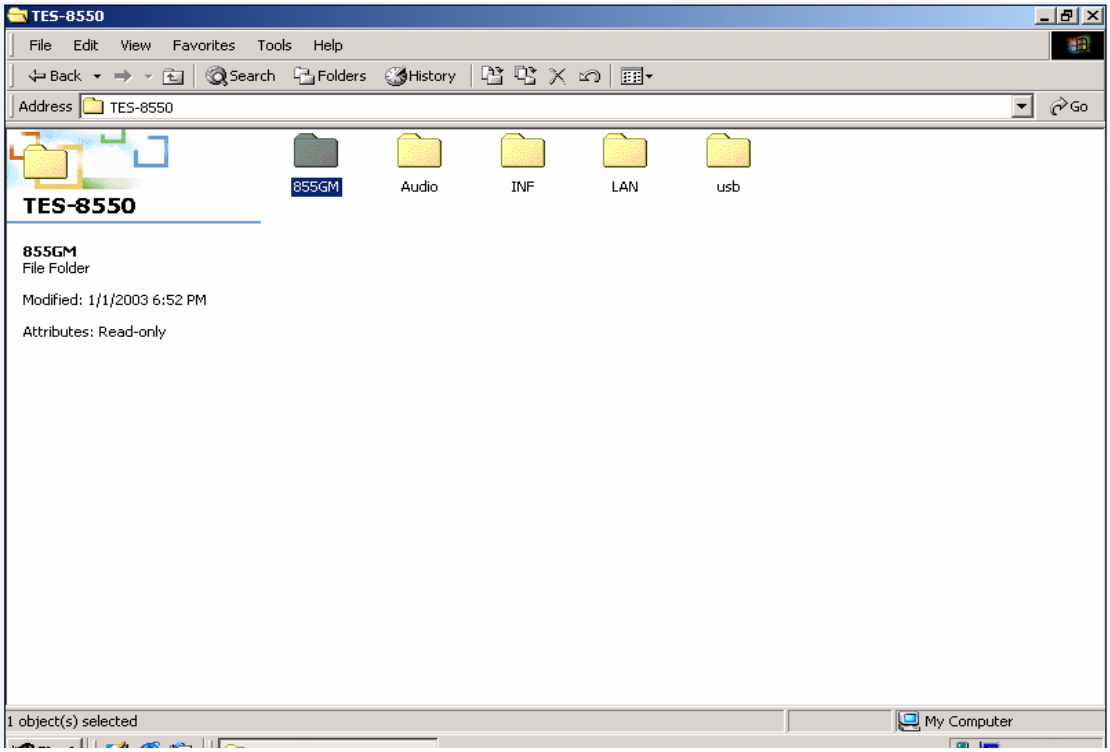
4-3 Guide of VGA Driver Installations

Notes:

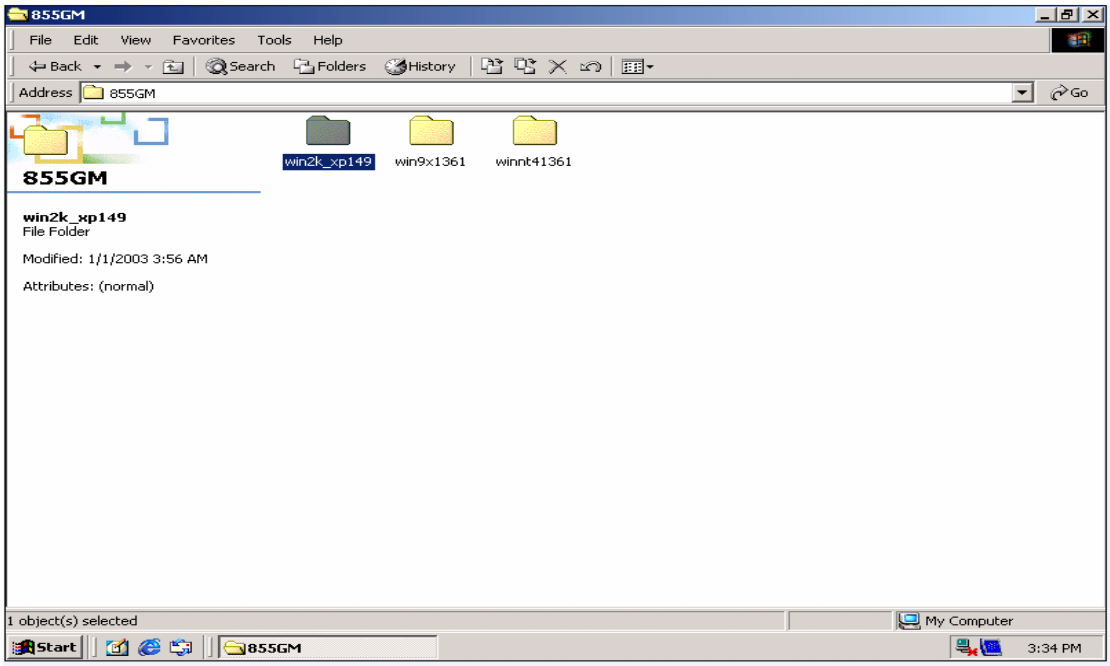
1. The software should be installed on systems with at least 128 MB of system memory.
2. There should be sufficient hard disk space in the<TEMP> directory on system in order to install this software.
3. The operating system must be installed prior to the installation of the driver.
4. This installation procedure is specific only to the version of driver and installation file in this release.
5. If a previous version of an Intel Graphics Driver is installed, remove it before proceeding with the installation procedure.
6. If you want to know more information about the Graphics Driver Installation Please refers to ReadMe file in Graphics directory
7. The operating system and the INF files must be installed on the system prior to VGA installation.

Install Procedures

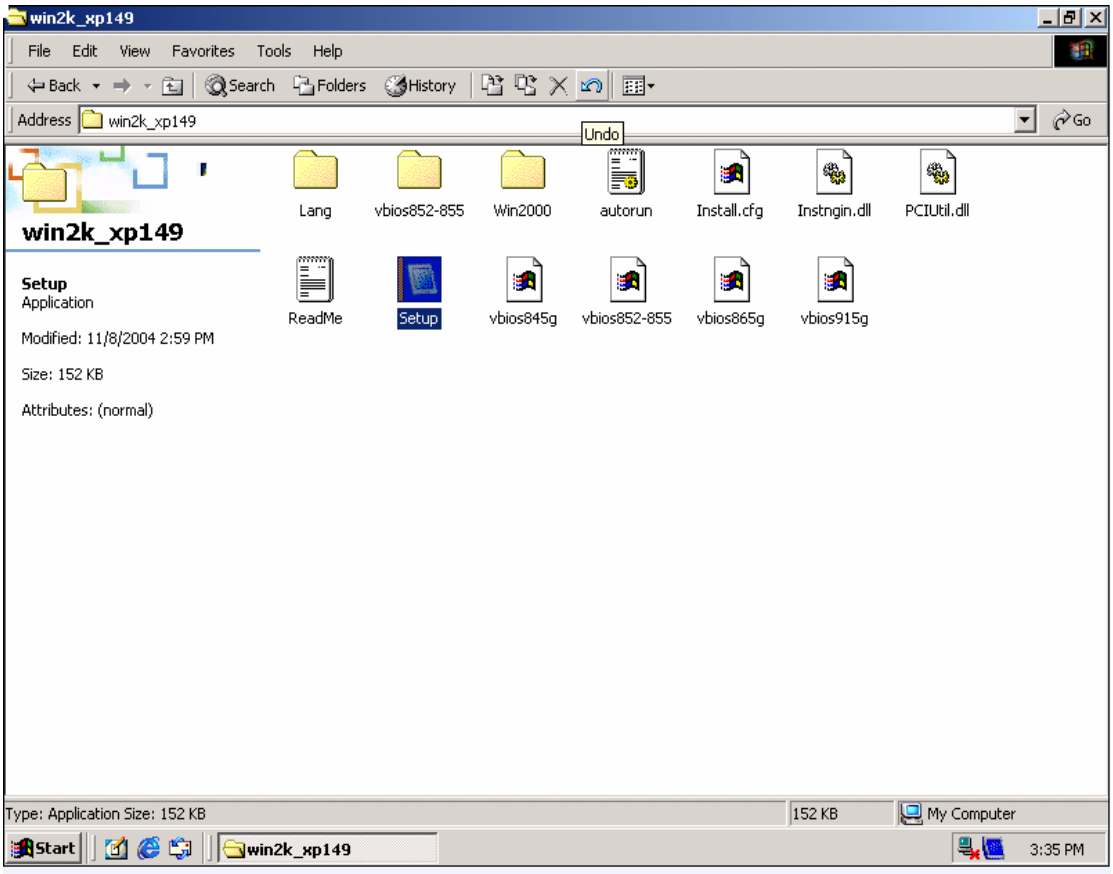
1. Select the directory where driver of graphic display is.



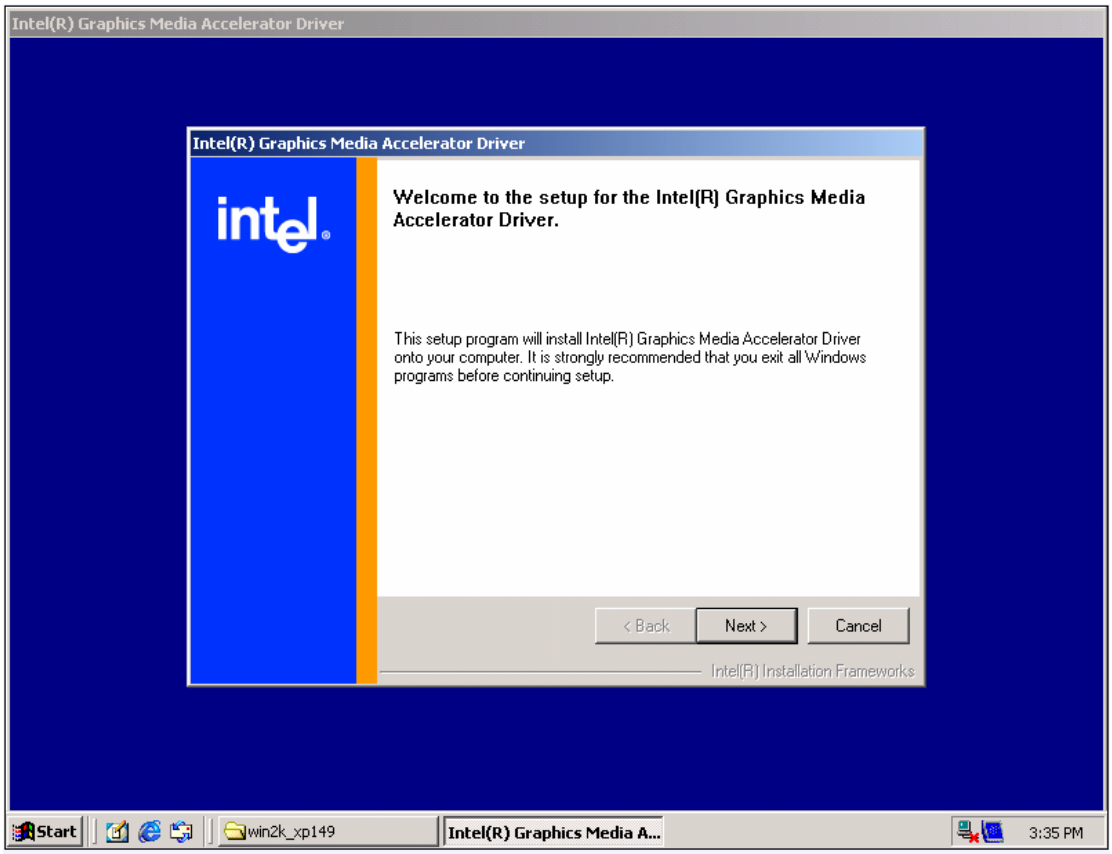
2. Select the sub-director win2k_xp149 where driver for WIN2k or WINXP is

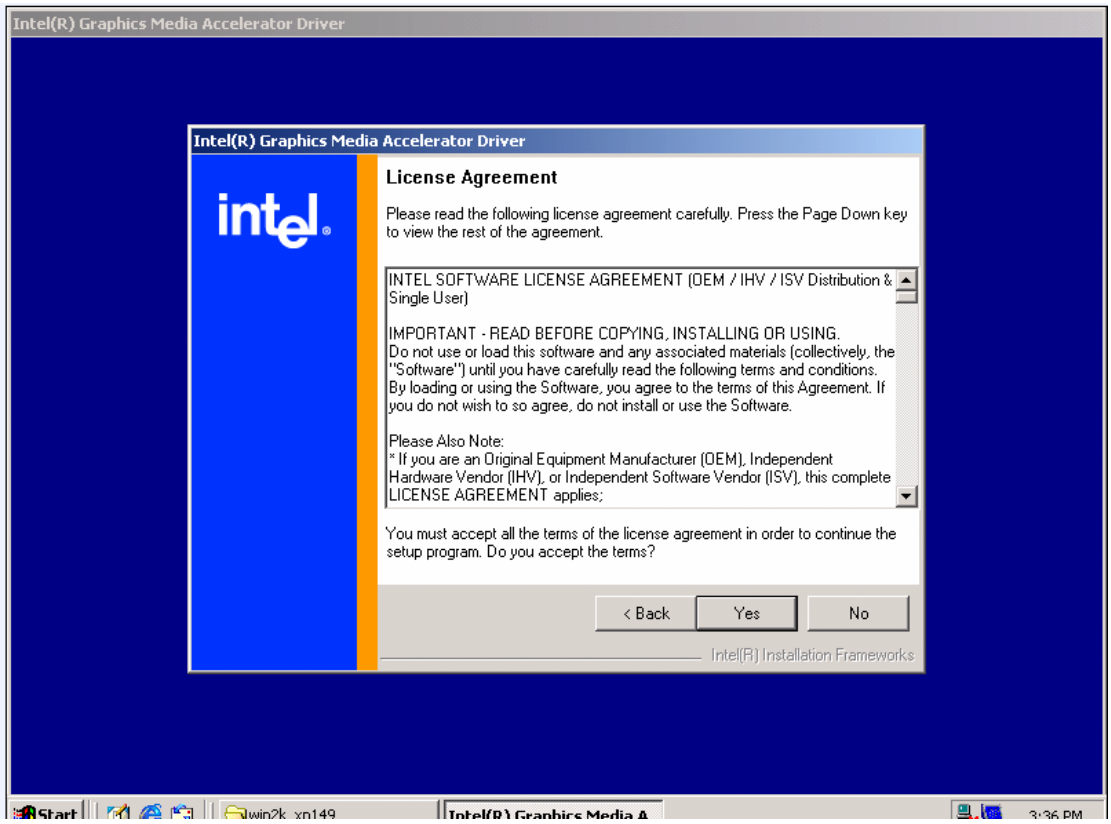


3. Double click “setup” to install driver of graphic display

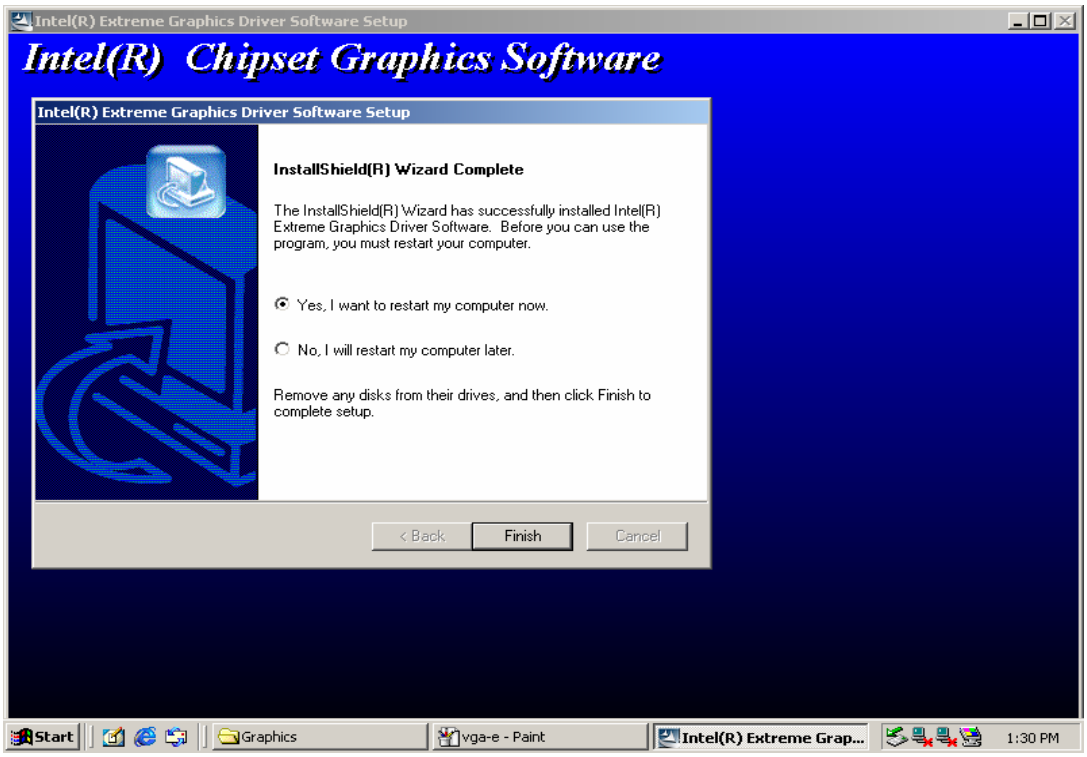


4. Welcome screen will appear and agree to license agreement. If you don’t agree, the installer will exit before extracting any files





5. The Setup Complete window appears. Select "Yes, I want to restart my computer now" and click on the "Finish" button. You will be prompted to reboot when installation is completed.

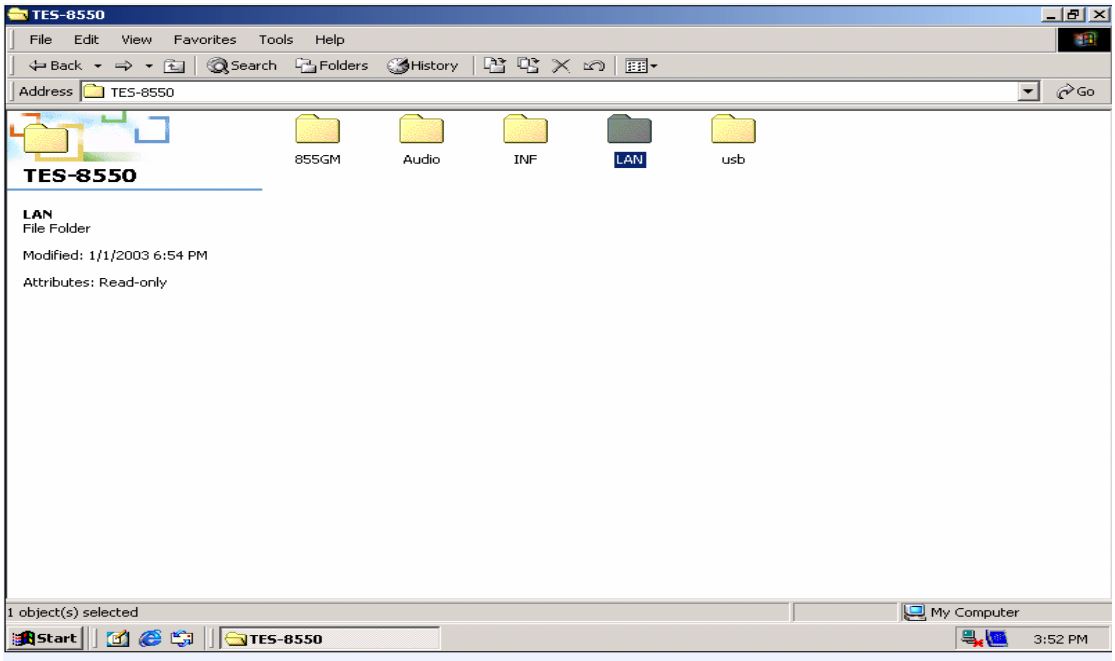

Intel(R) Extreme Graphics Driver Software Setup
Intel(R) Chipset Graphics Software
Intel(R) Extreme Graphics Driver Software Setup
InstallShield(R) Wizard Complete
The InstallShield(R) Wizard has successfully installed Intel(R) Extreme Graphics Driver Software. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel
Start
Graphics
vga-e - Paint
Intel(R) Extreme Grap...
1:30 PM

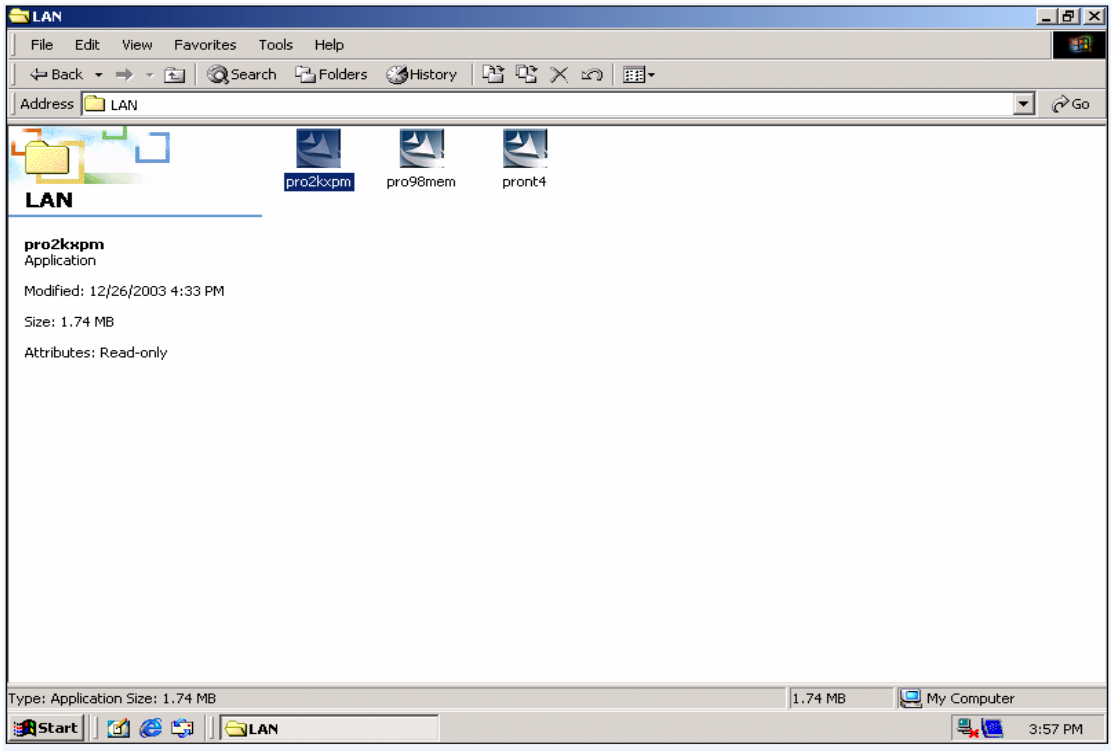
4-4 Guide of LAN Driver installations

In this section explain the installation procedure with Intel 82562 LAN Chipset. TES-8551 supports LAN chipsets 8255X, 82540. The installation procedure is similar. If you want to know the more information please refer to: http://support.intel.com

Install Procedure

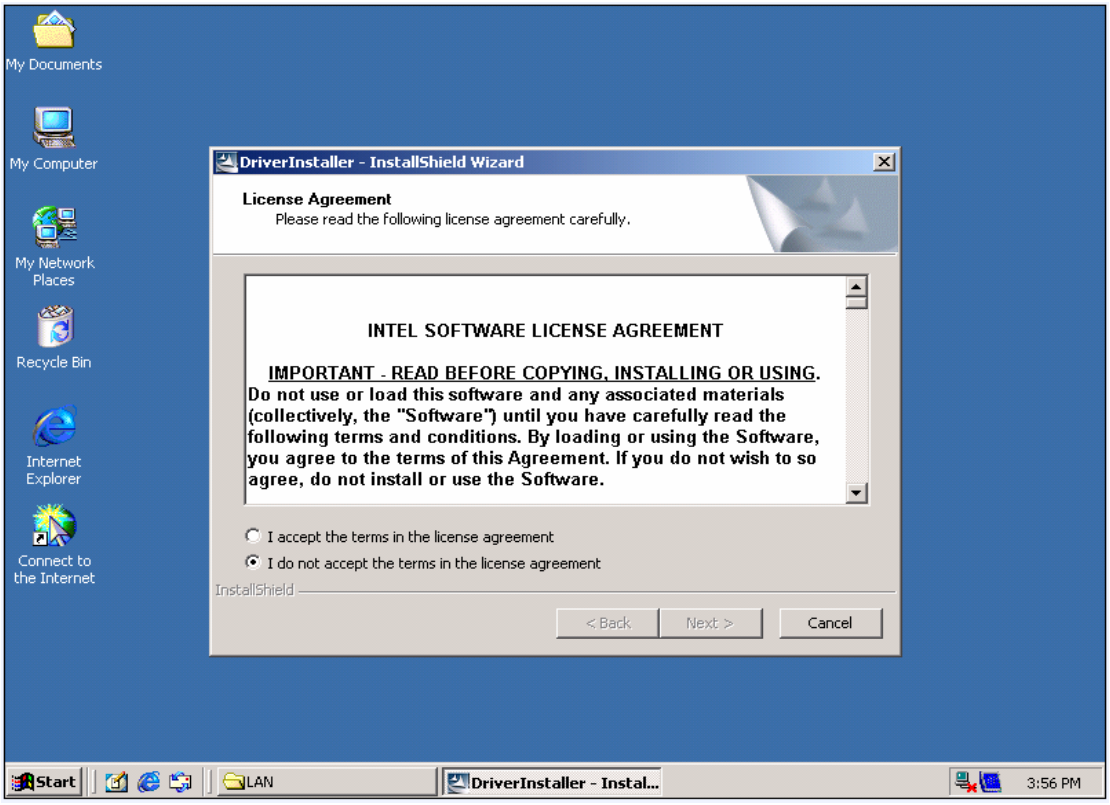
1. Click the directory where LAN chipset Driver Installer is, then Double-Click the Intel PRO Intelligent Installer to run installation.

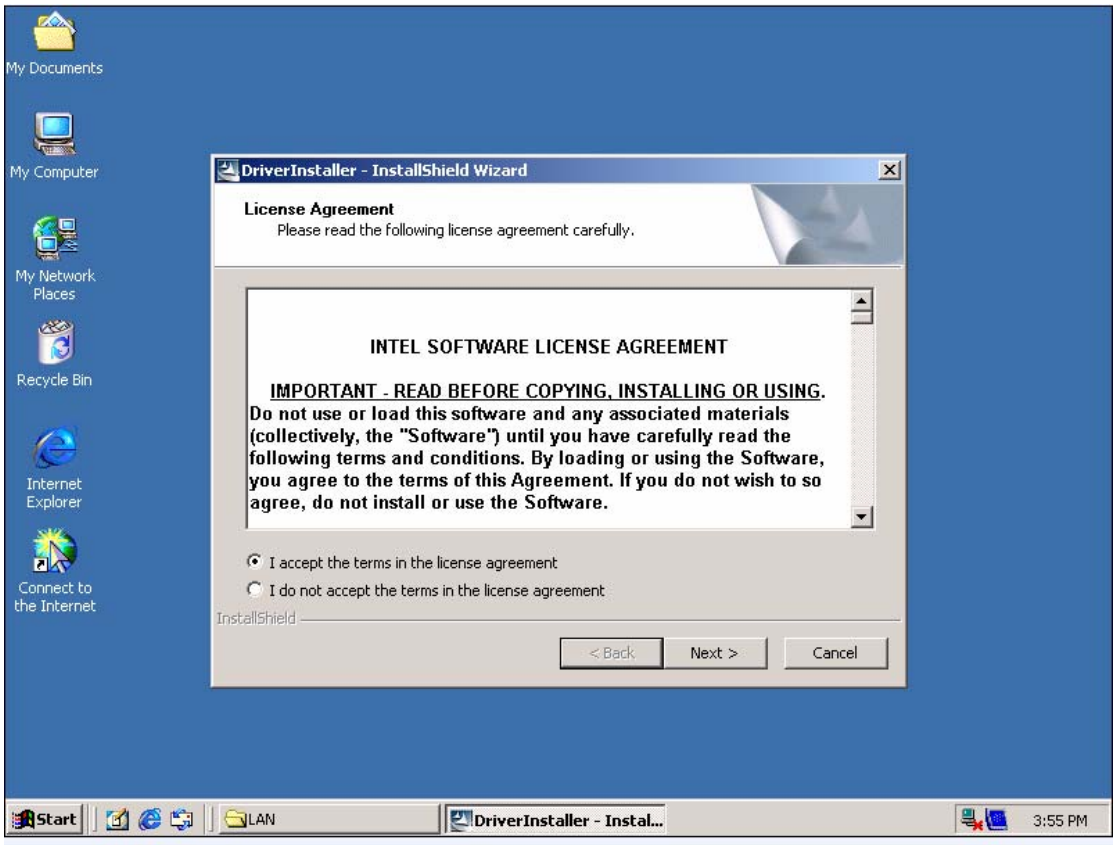




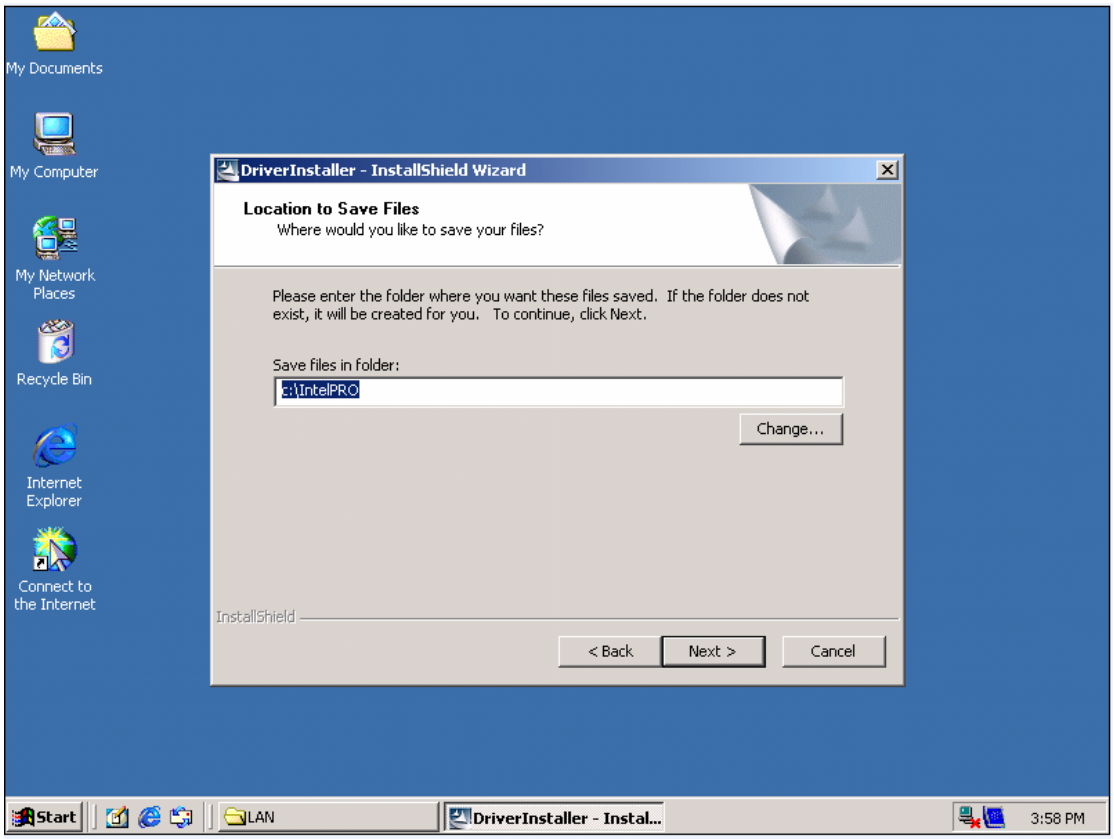
2. The Software License Agreement window appears. If you do not agree to these

terms, the installing will exit. If you agree to these terms click on the Yes button and the driver begins to install.





3. Make a sub-directory to store the LAN drivers.

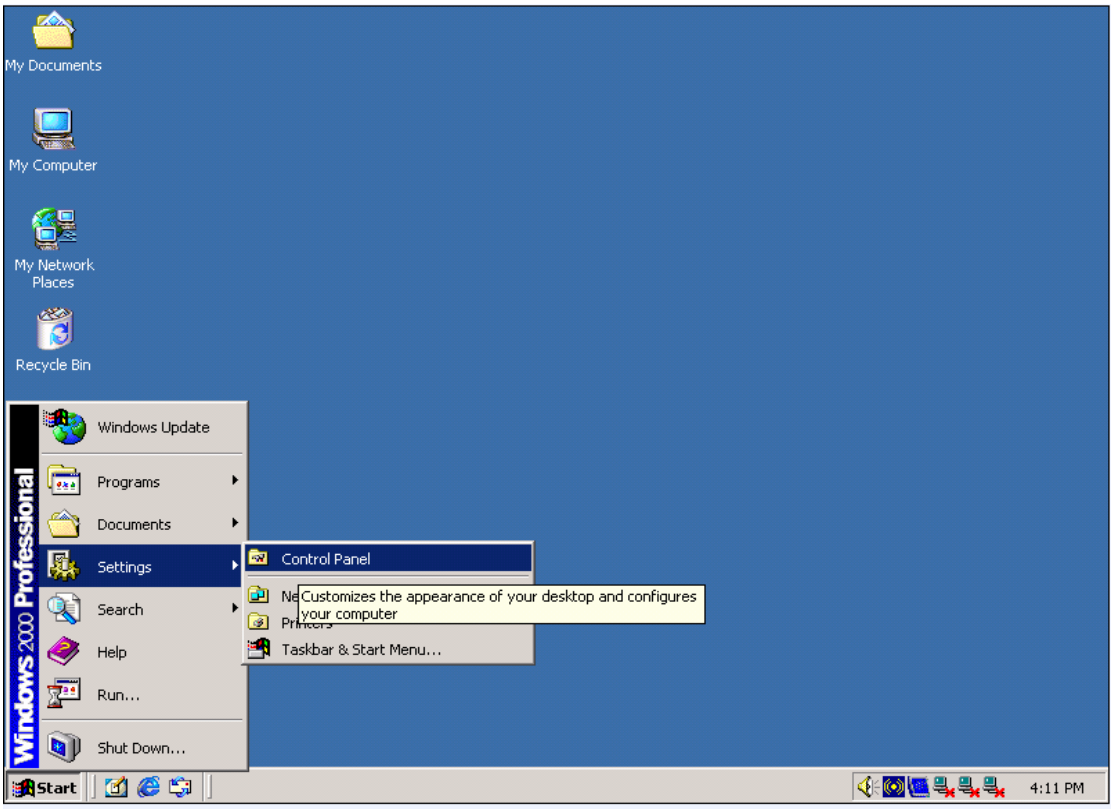


4. After the following appears click "Install Base Driver" to install LAN drivers

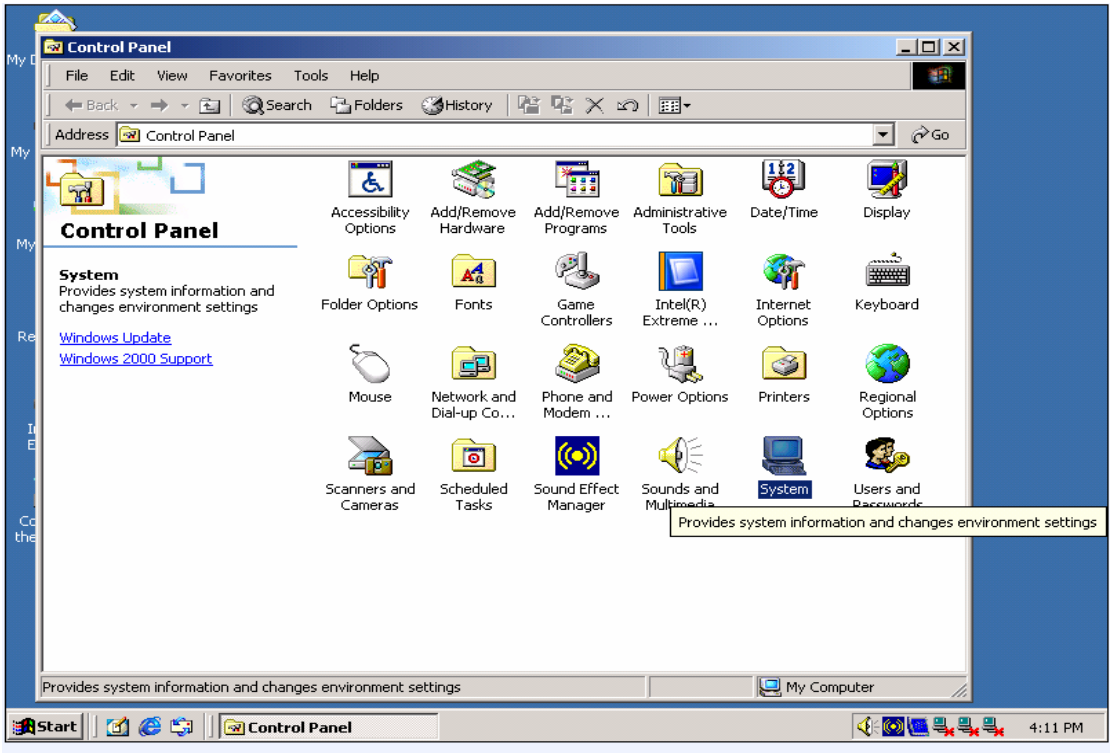
5. Next click "Make Driver Disk" to store applied drivers in assigned directory. The setup complete Window appears. Click on the" Finish "button to complete installation.

4-5 Guide of USB Drivers Installations

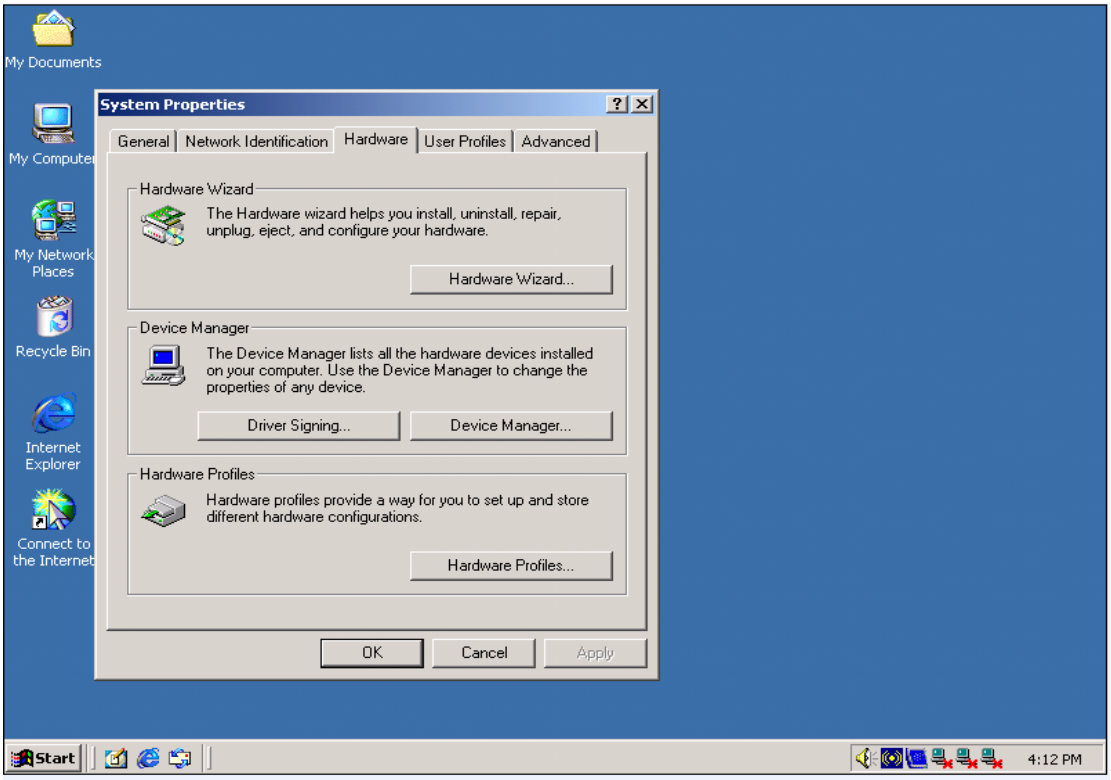
1. Click the 'Start' button in the task bar, click 'Settings' and then select "Control Panel"



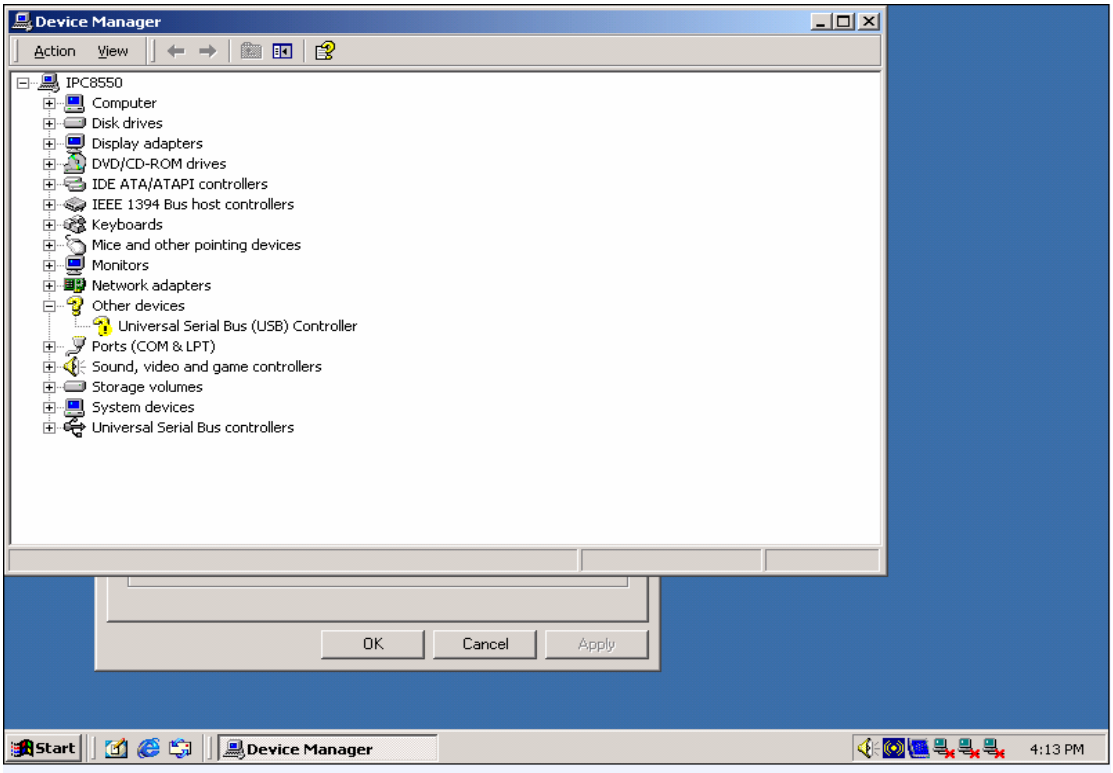
2. Enter into Control panel and Double click "System" to review System Properties.



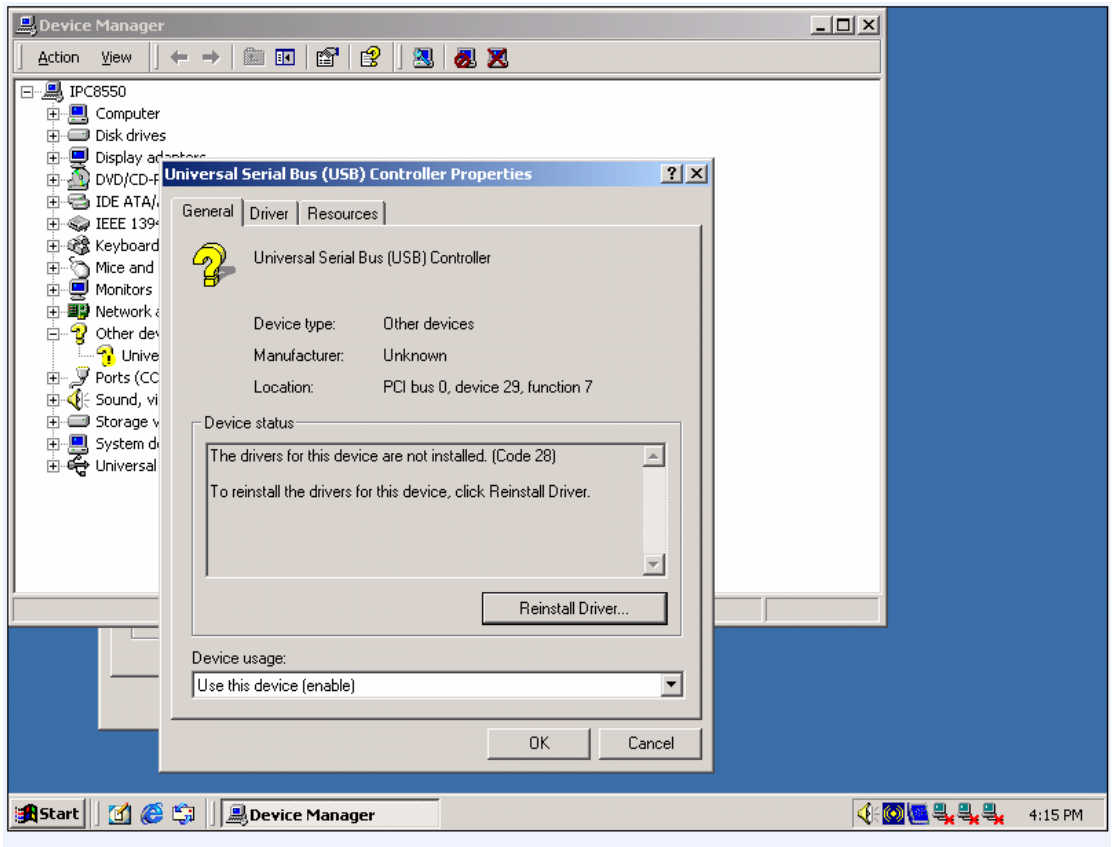
3. Select general item to check USB device in "Device Manager".

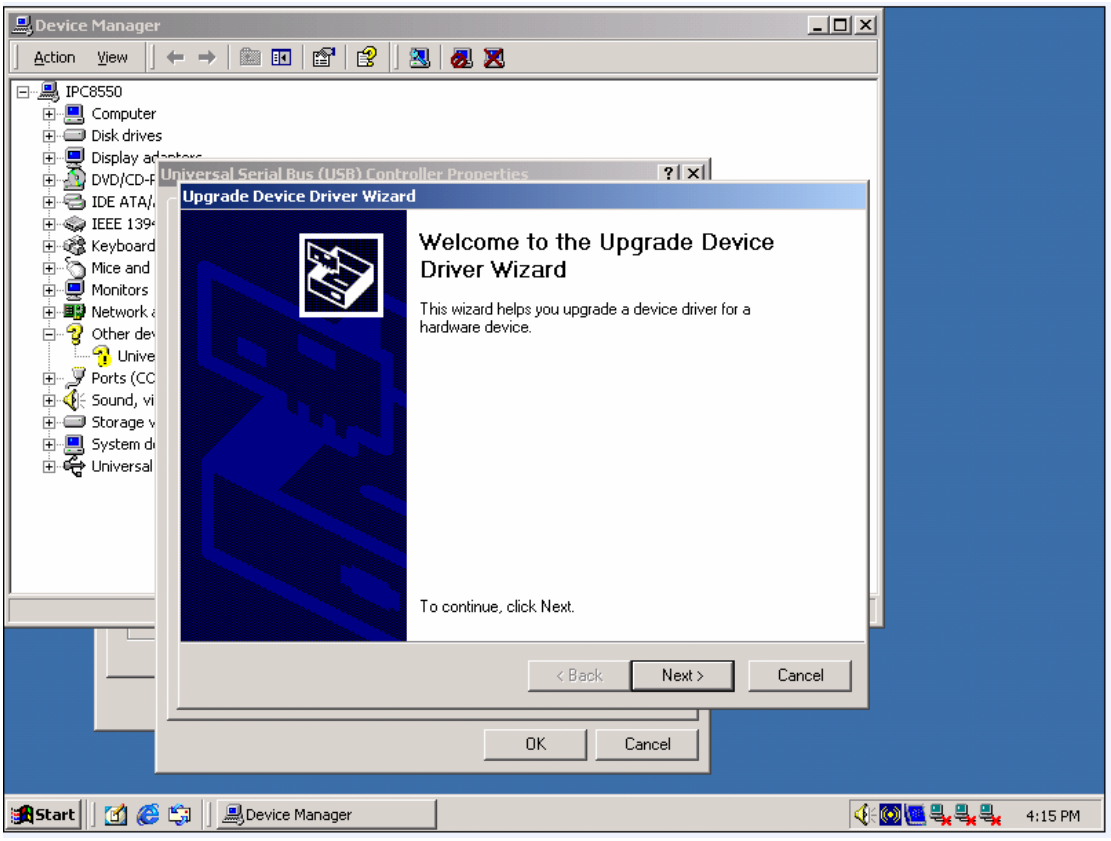


4. If the USB Driver has been installed there is no question mark to appear. If there is device un-normal Yellow Question will appear

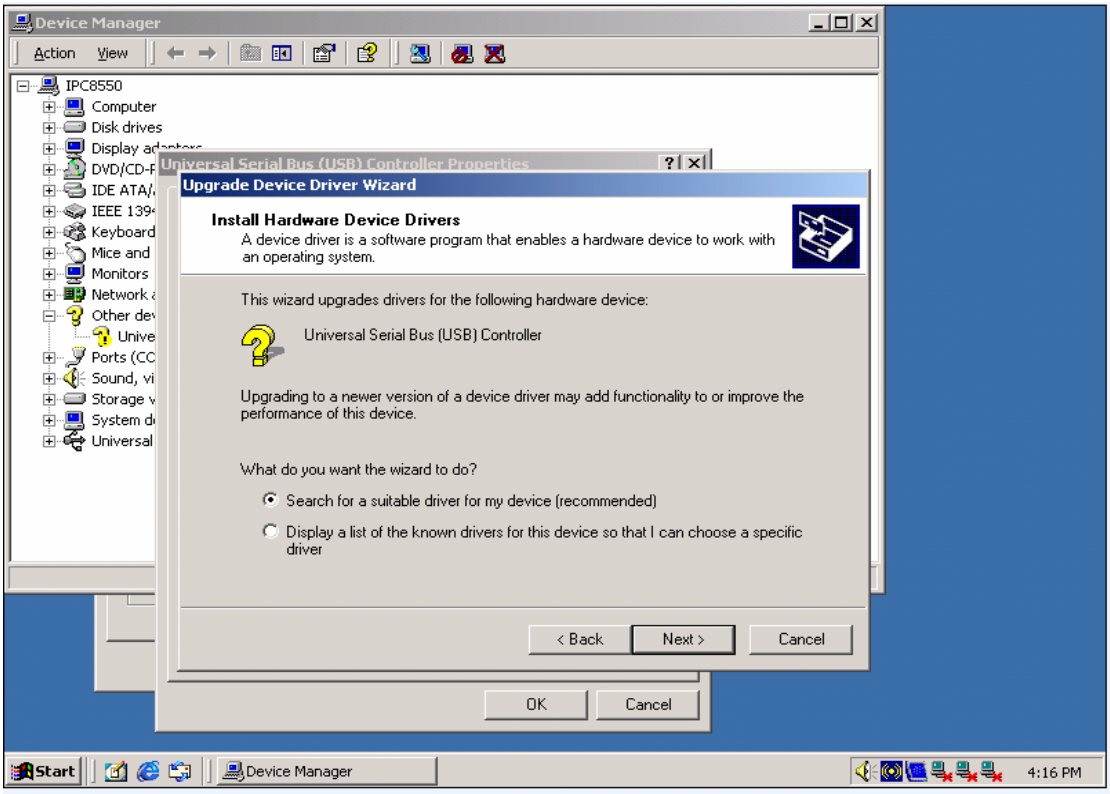


5. Click the question mark to find USB devices. A request of reinstall screen appears.

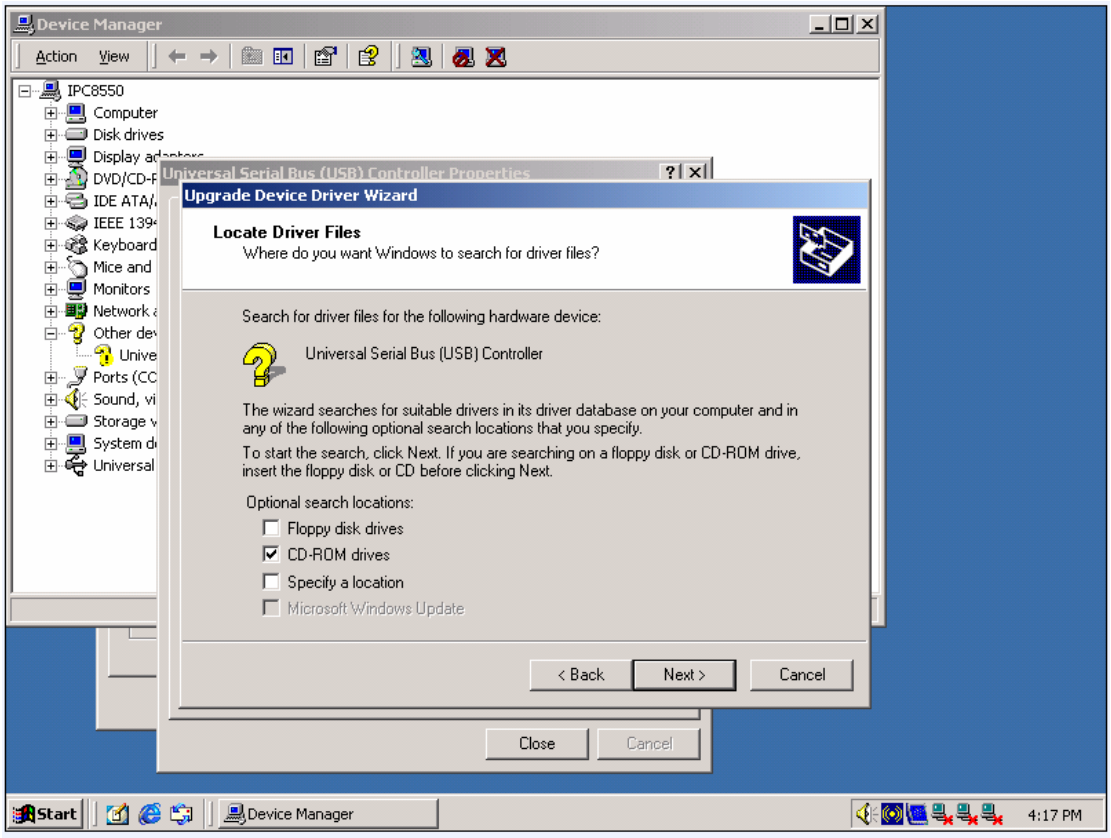




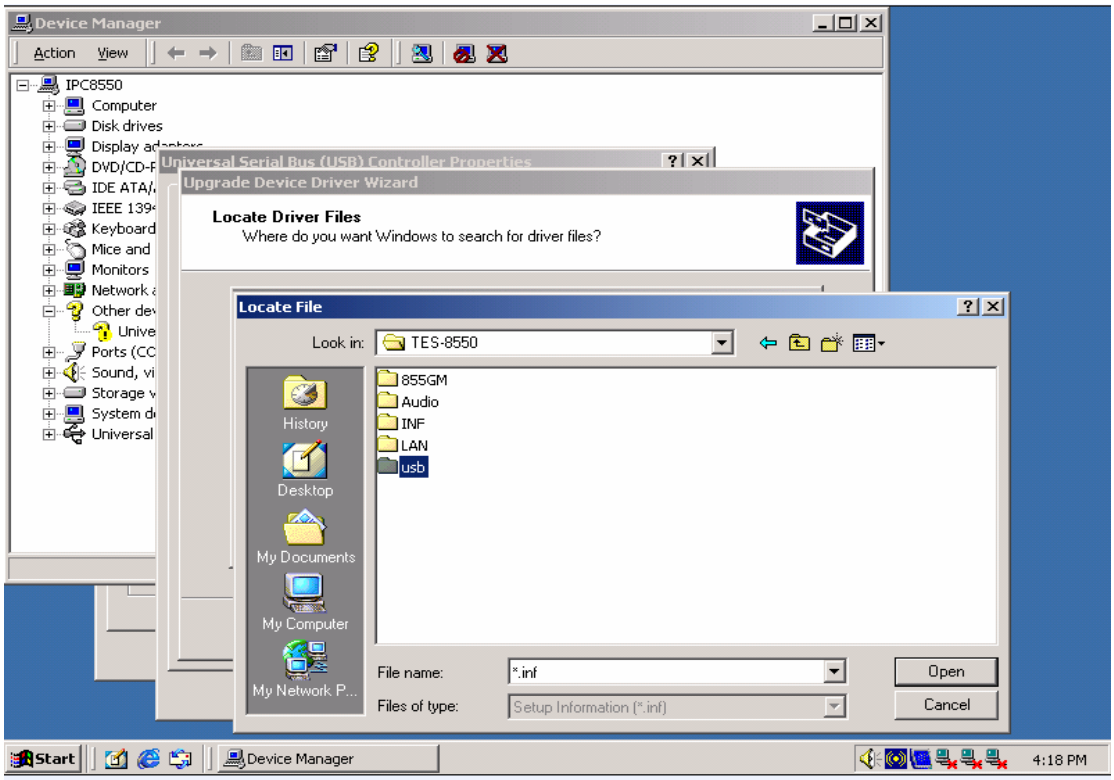
6. Select the option to search an optimal driver to USB devices.



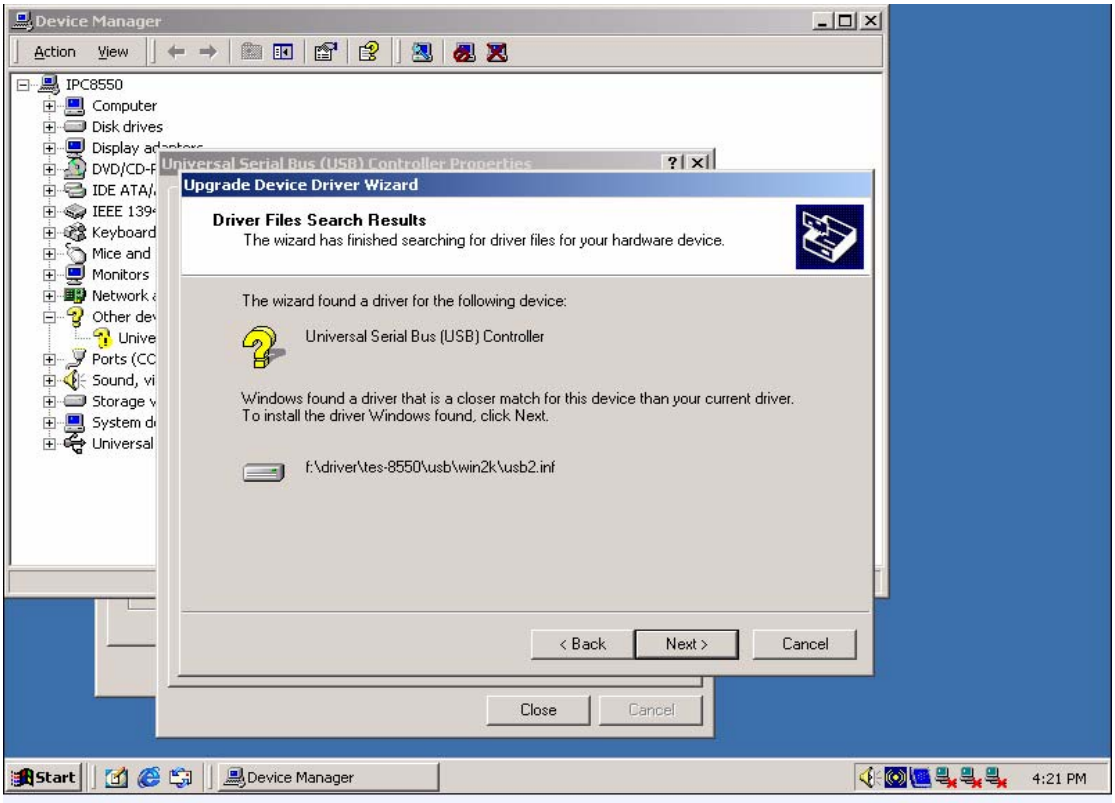
7. Locate where is USB drivers



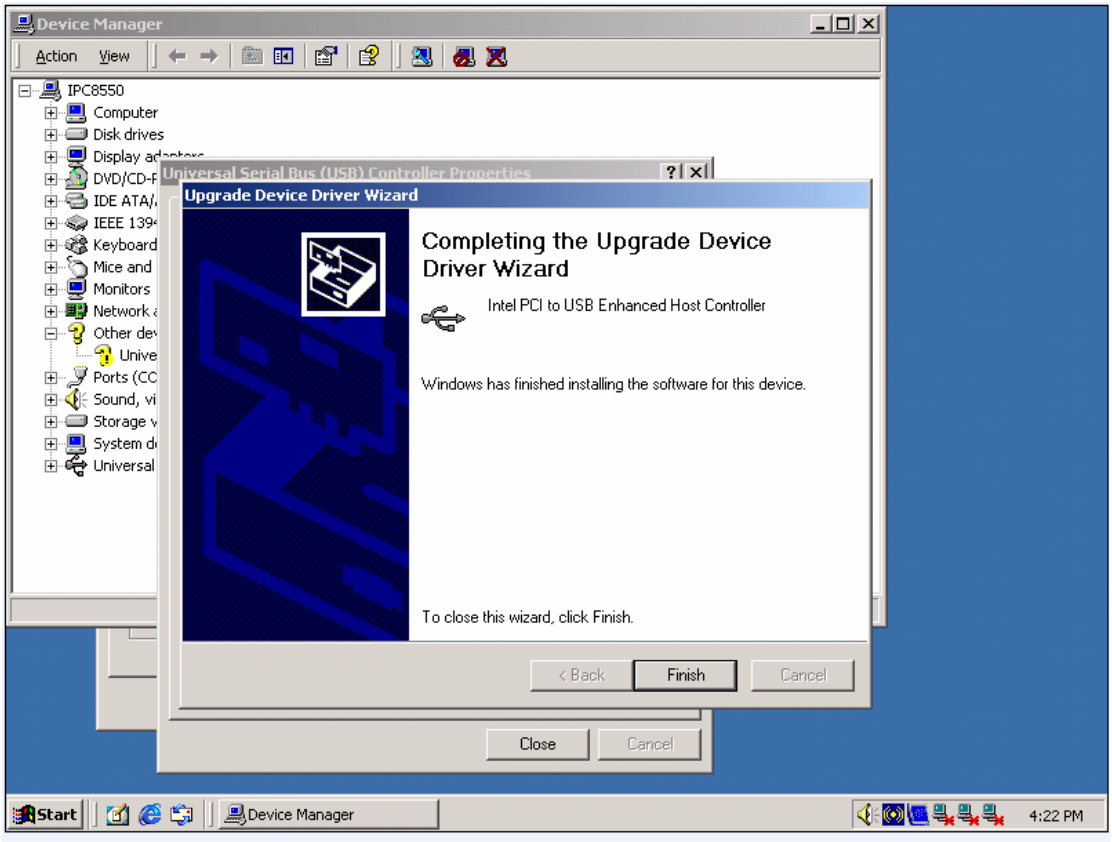
8. Find out the directory where the driver matches the existing operating system.



9. The wizard will found a driver which match USB device on your system. Click "NEXT" to install the driver window found

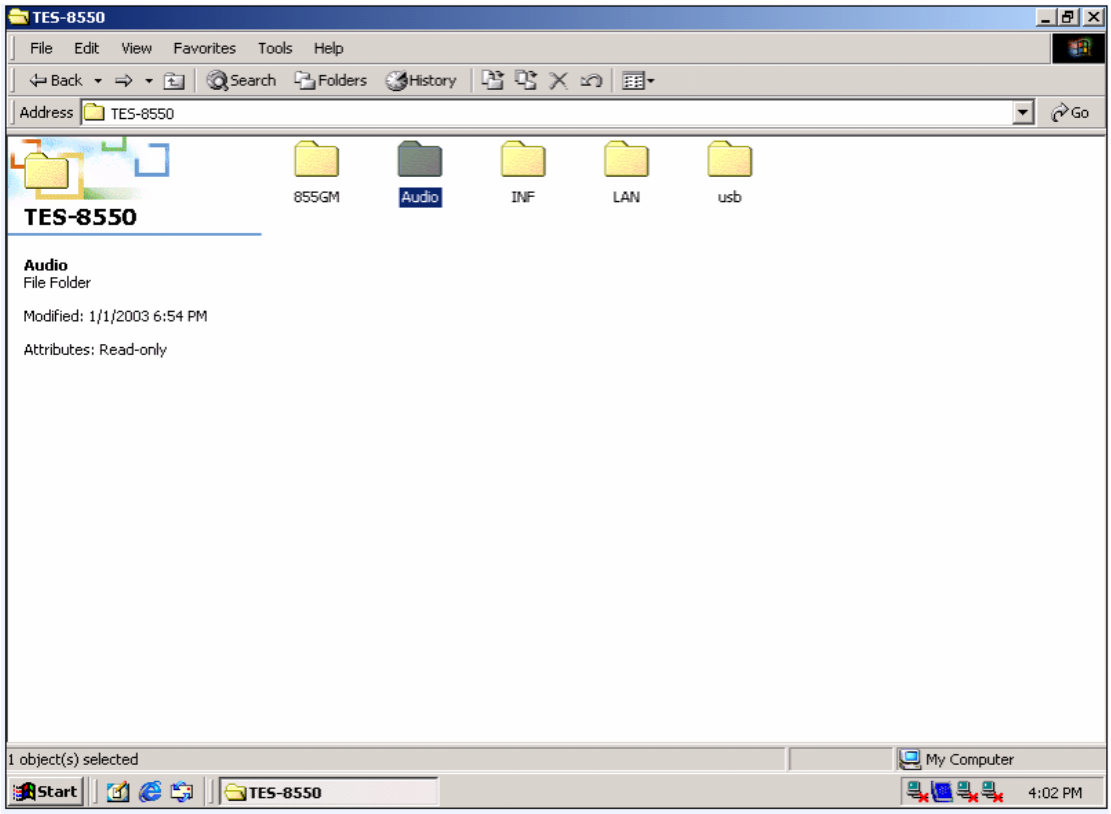


10. After Window finish installing the software to the device Click "finish" to complete USB installing

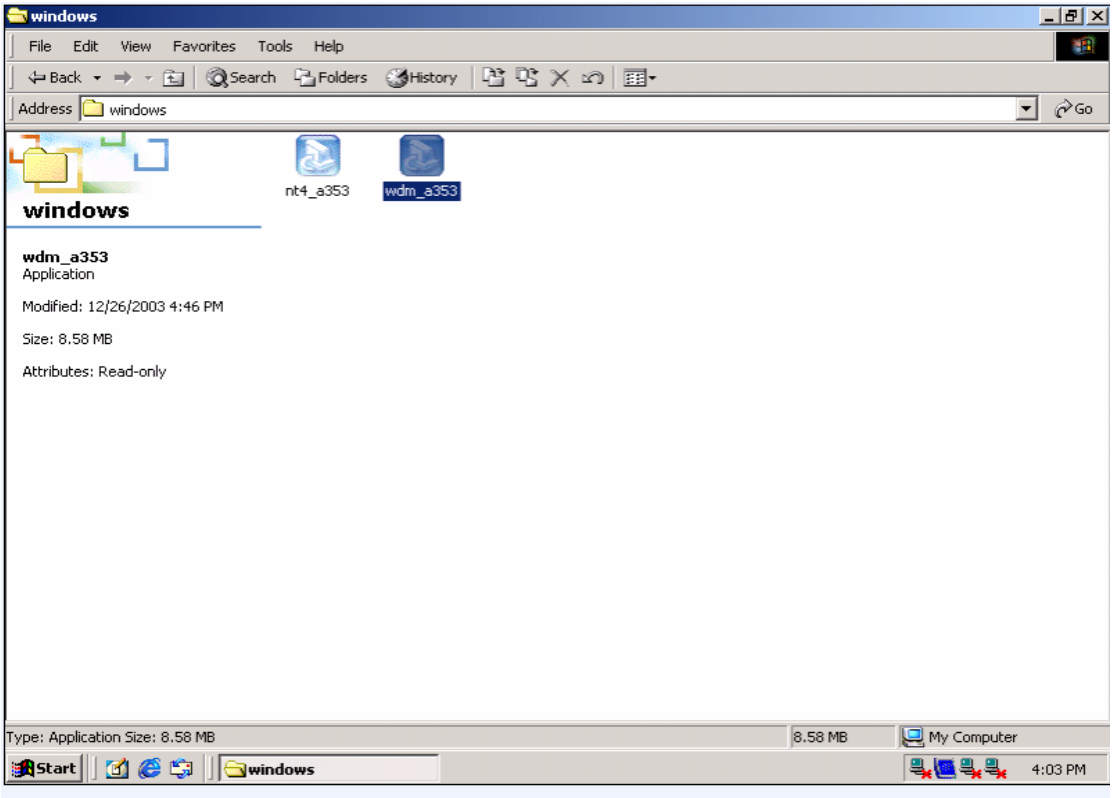

Device Manager
Action View
IPC8550
Computer
Disk drives
Universal Serial Bus (USB) Controller Properties
Upgrade Device Driver Wizard
Completing the Upgrade Device Driver Wizard
Intel PCI to USB Enhanced Host Controller
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel
Close
Cancel
Start
Device Manager
4:22 PM

4-6 Guide of Audio Driver Installation

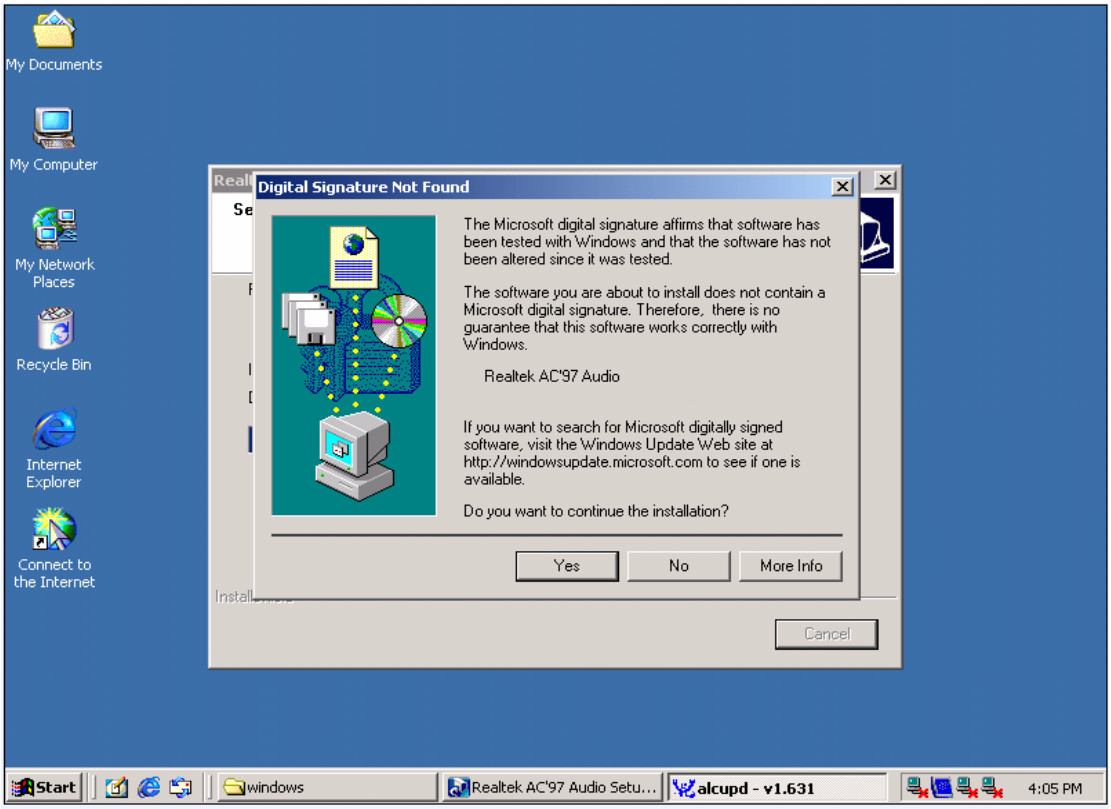
1. Select the directory where audio driver is



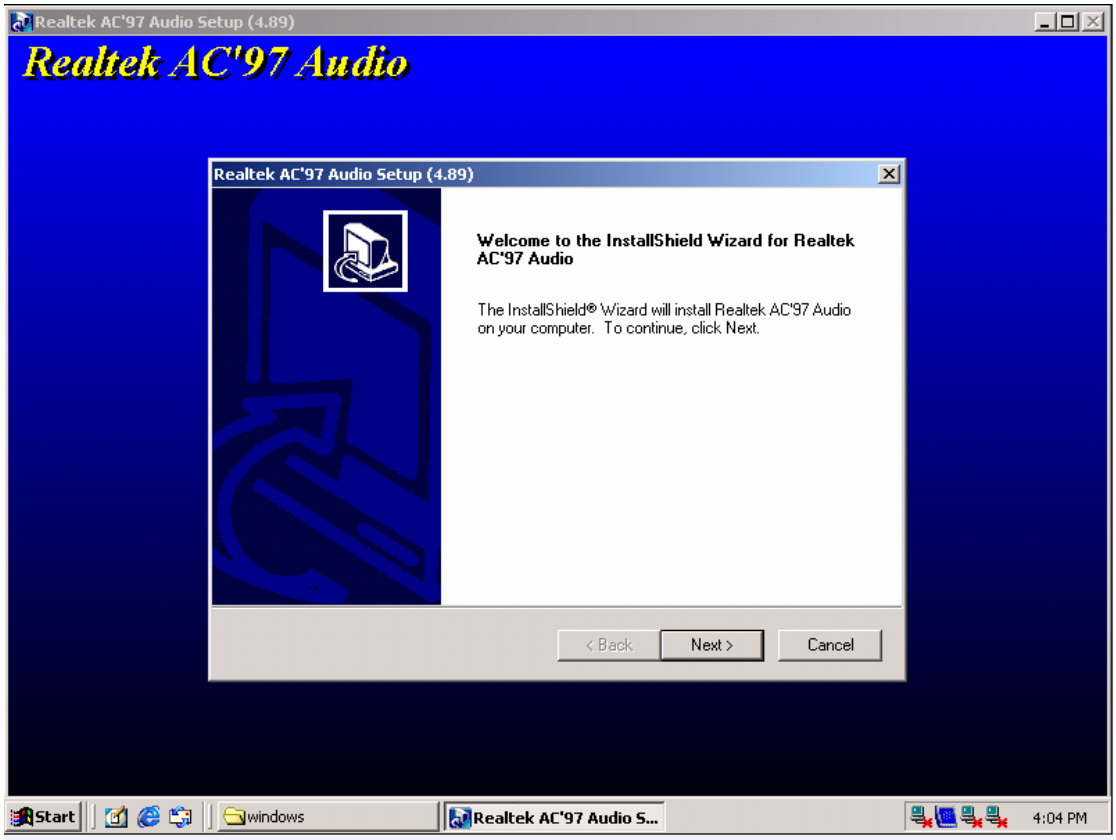
2. Entering directory select audio driver and then double click “wdm_a353” “driver icon to extract and install audio driver



3. Click “NEXT” ,The Install Shield Wizard will install Realtek AC976 to your



4. Installation is complete when following screen appear



Chapter 5 Watchdog Timer Programming

TES-8551 is built with software programmable WDT and software programmable general purpose IOs. The description of registers and software examples will be explained in this section.

5-1 Watchdog Timer (WDT)

Winbond LPC IO W83627HF which is built with Watch Dog Timer is designed in TFB-8551. To utilize the feature of WDT users first study the registers in chipset. If users have interest to study it please download W83627HF data sheet from www.winbond.com.tw.
We will introduce the registers related with Watch Dog Timer and how to access these registers.

5-1-1 Introduction of PNP protocol

The W83627HF uses compatible PNP protocol to access configuration registers for setting up different typed of configurations. The registers of WDT belong to **Logical Device 8**. Each Logical device has its own configuration registers (above CR30).**Host can access those registers by writing an appropriate logical device number into logical device select register at CR7**.
In compatible PNP, a specific value (87h) must be written twice to the **Extended Function Enable Register** (**EFER** IO address 2Eh or 4Eh). Secondly, an index value must be written to the **Extended Function Index Register** (**EFIR** IO port address2Eh or 4Eh same as Extended Function Enable Register) to identify which configuration register is to be accesses. The designer can access the desired configuration register through the **Extended Function Data Register** (**EFDR** IO Port address 2Fh or 4Fh).
After programming of configuration register is finished, an additional value (AAh) should be written to **EFER** to exit the Extended Function mode to prevent unintentional access to these configuration register.

5-1-2 Function of Registers in Extended mode

EFER (Extended Function Enable Registers)
Before the W83627HF enters the extended function mode, a specific value must be programmed into the Extended Function Enable Register (EFER) so that the extended function register can be accessed. The specific value is 2Eh or 4Eh depending on the HEFRAS value.
EFIR (Extended Function Index Register) and **EFDR** (Extended Function Data Register)
After the extended function mode is entered, the Extended Function Index Register (EFIR) must be loaded with an index value to access Configuration Registers through the Extended Function Data Register (EFDR).

5-2 Configuration Sequence of WDT

To program configuration registers in W83627HF, the following configuration sequence must be followed:
(1) Enter the extended function mode
(2) Configure the configuration registers
(3)Exit the extended function mode
The following is the program to WDT in assembly language.

```
;--------------------------------------------------------------------------------------------------
; Enter the extended function mode, Interrupt double-write
; Because hardware design EFER is assumed at 2Eh, so that is located at 2Fh
;--------------------------------------------------------------------------------------------------.
MOV     DX,2EH       ; Enter the extended function mode
MOV     AL,87h
OUT      DX, AL
```

```
OUT       DX, AL
;-------------------------------------------------------------------------------------------------
MOV     DX, 2EH       ; Configuration logic device 8
MOV     AL, 07H
OUT       DX, AL
;-------------------------------------------------------------------------------------------------
MOV     DX, 2FH        ; load logical device number
MOV     AL, 08H
OUT       DX, AL
;-------------------------------------------------------------------------------------------------
MOV     DX, 2EH        ; activate GPIO/WDT
MOV     AL, 30H
OUT       DX, AL
MOV     DX, 2FH
MOV     AL, 01H
OUT       DX, AL
;-------------------------------------------------------------------------------------------------
MOV     DX, 2EH       ; set WDT count in sec
MOV     AL,F5H
OUT       DX, AL
MOV     DX, 2FH
MOV     AL, 00H
OUT       DX, AL
;-------------------------------------------------------------------------------------------------
MOV     DX, 2EH       ; load WDT =255 sec
MOV     AL,F5H
OUT       DX, AL
MOV     DX, 2FH
MOV     AL, FFH
OUT       DX, AL
;-------------------------------------------------------------------------------------------------
MOV     DX, 2EH       ; exit extended function mode
MOV     AL, AAH
OUT       DX, AL
```

Chapter 6 BIOS Configuration

6-1 BIOS Configuration Overview

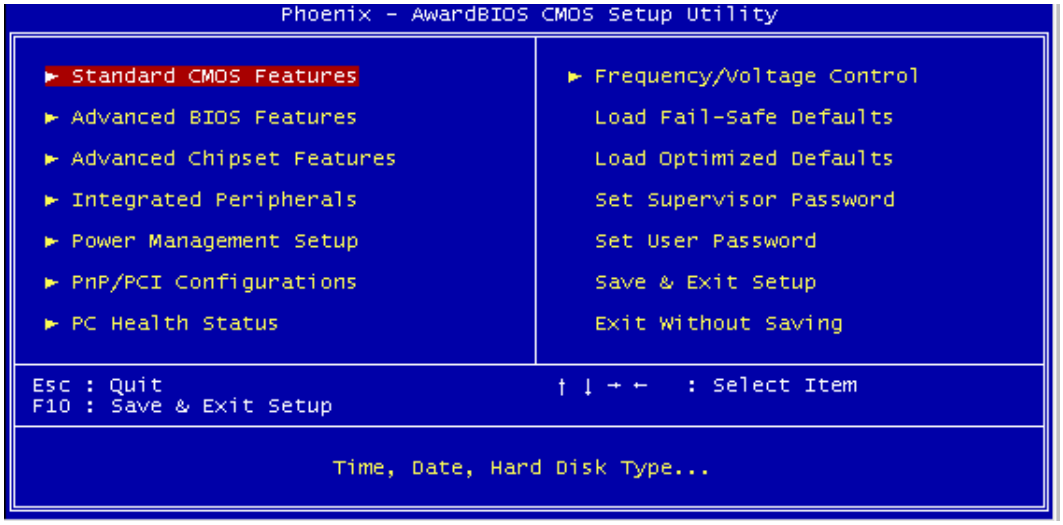
The main board employs the latest Award BIOS with Plug and Play. The BIOS (Basic Input and Output System) is a program used to initialize and set up basic I/O system of the computer, which includes the PCI bus and connected devices such as the diskette drive, the keyboard and so on.

In this chapter we will introduce the contents of BIOS used in TFB-8551. Through understanding BIOS setting will be helpful in application of TFB-8551. Exceptional the default settings will be described in each section.

6-2 Entering BIOS Setup

When the computer is turned on, the BIOS will perform Power-On Self Test (POST) on the system and display the size of the memory that is being tested. Press the [***Del***] key to enter the BIOS Setup utility, and then the main menu will show on the screen.

The BIOS Setup main menu includes some options as the following screen. Use the [***Up/Down***] arrow key to highlight the option that you wish to modify, and then press the [***Enter***] key to select the option and configure the functions.



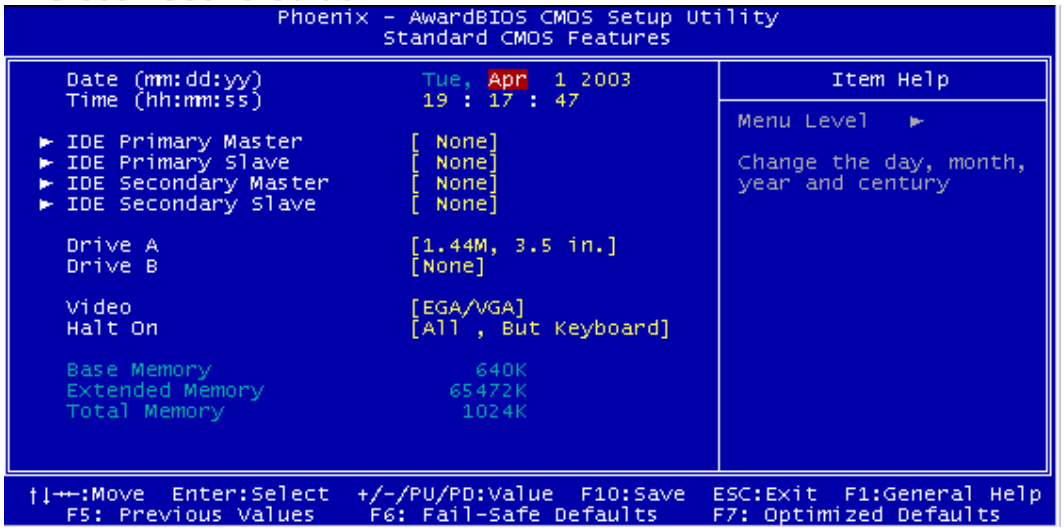
- CMOS Setup Main Menu -

CAUTION:

1. In the TFB-8551 BIOS the factory-default setting is the <***Load Optimized Defaults***>. We recommend using the BIOS default settings, unless you are very familiar with the settings function, or you can contact the technical support engineers (FAE).
2. If the BIOS lose the settings, the CMOS will detect the <***Load Fail-Safe Defaults***> to boot the operating system. This option will reduce the performance of the system. We recommend choosing the <***Load Optimized Defaults***> in the main menu. This option gives best-case values that should optimize system performance.

6-3 Standard CMOS Features

The ***<Standard CMOS Features>*** option allows you to set some basic system hardware configurations and set the system clock and error handling. If the CPU board is already installed in a working system, you will not need to select this option anymore.



- Standard CMOS Features -

Date & Time Setup

Highlight the <Date> field and then press the [Page Up] / [Page Down] or [+]/ [-] keys to set the current date. Follow the month, day and year format.
Data：Month, Day, Year

Highlight the <Time> field and then press the [Page Up] / [Page Down] or [+]/ [-] keys to set the current date. Follow the hour, minute and second format.
Time：Hour, Minute, and Second. Use 24 Hour clock format.

IDE Devices Setup

This computer has two IDE channels <Primary and Secondary> and each channel can be installed with one or two devices <Master and Slave>. So the user can install up to two hard disks. For the master and slave jumpers, please refer to the manual from the hard disk's manufacturer.

You can select <AUTO> under the <TYPE> and <MODE> fields. This will enable auto detection of your IDE drives during boot up. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard disk drives, which do not support this feature, then you must configure the hard disk drive in the standard method as described above by the <USER> option.

Floppy Setup

The <Standard CMOS Setup> option records the types of floppy disk drives installed in the system. To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the left-or right-arrow key.

Video

"Video" refers to the type of video display card your system has. The five options are：

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters.
MONO	Monochrome adapter. Includes high-resolution monochrome adapters.
CGA 40	Color Graphics Adapter. Power up in 40-column mode.
CGA 80	Color Graphics Adapter. Power up in 80-column mode. You should select the setting that matches your video

	display card. If you have a VGA or any higher resolution card, choose the EGA/VGA setting.

Mono type, CGA 40 type, and CGA 80 type video monitor are seldom used now.

Halt On

The "Halt On" controls whether the system stops in case of the following error. The options are：

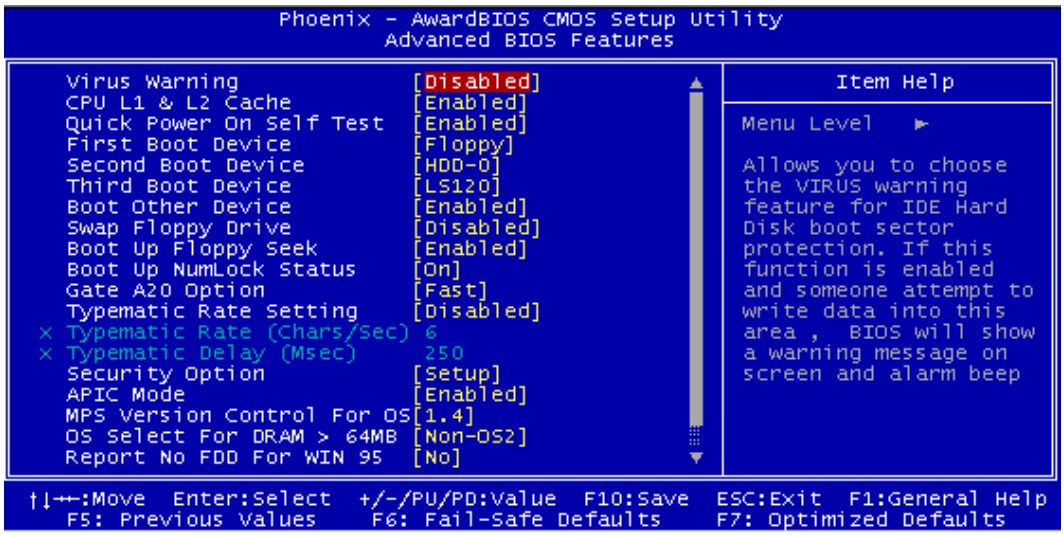
All Errors	The system boot will stop whenever the BIOS detect a non-fatal error.
No Errors	The system boot will not stop for any errors detected.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a disk or keyboard error; it will stop for all other errors.

Base/Extended/Total Memory

These items are automatically detected by the system at start up time. These are display only field. You cannot make changes to these fields.

6-4 Advanced BIOS Features

The <Advanced BIOS Features> option consists of configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Note that the page has a scroll-bar to scroll down to more items.



- Advanced BIOS Features -

Virus Warning

When enable, any attempt to write to the boot sector or partition table of the hard disk drive will arise the system halted and the warning Message appearing in the mean time. The default value is “Disabled”.

CPU L1 &L2 Cache

This setting enables the CPU internal cache (L1&L2 cache). The default setting is “Enabled”. Enable Cache will increase the system performance.

Quick Power On Self-Test

This will skip some check items during POST to speeds up the booting process. The default value is “Enabled”.

1st /2nd /3rd /Boot Other Device

Use these four items to select the priority and order of the devices. The BIOS will boot the operating system according to the sequence of the drive selected. The default setting is “Floppy”, “HDD-0”, “LS120” and “Enabled” respectively.

Swap Floppy Drive

If you have two floppy diskette drives in your system, this option allows you to swap the assigned drive letters so that drive A becomes drive B, and drive B becomes drive A. The default setting is “Disabled”.

Boot up Floppy Seek

When enabled, the BIOS will check whether the function of floppy disk drive is normal or not on booting. Note that BIOS cannot distinguish between 720K, 1.2M, 1.44M and 2.88M drive types, as they boot. When disabled, the BIOS will not check to speed the booting. The default value is “Enabled”.

Boot up NumLock Status

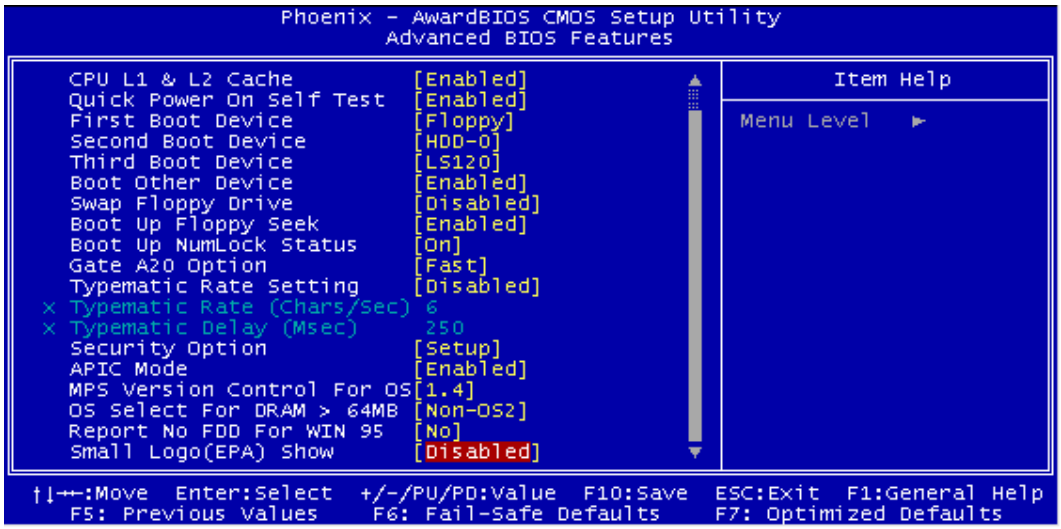
When set to “Disable”, the cursor controls will function on the numeric keypad. When set to “Enable” the numeric keypad function as numerical key. The default value is “Enable”.

Gate A20 Option
This option accesses memory above 1 MB using the fast gate A20 line when set to "Fast". The default setting is "Fast".

Typematic Rate Setting
When enabled, you can set the Typematic Rate and Typematic Delay. The default setting is "Disabled".

Typematic Rate (Chars/Sec)
This selection allows you to select the char's rate at which the keys are keyed. The default value is **6**. Set the maximum Typematic rate from 6 chars. per second to 30 chars.

Typematic Delay (msec)
This selection allows you to select the delay between when the key was first depressed and when the acceleration begins. There are four delay choices: 250ms, 500ms, 750ms and 1000ms. The default value is **250** ms.



Security Option
This field controls the password feature. The options are "Setup" and "System". Selecting "Setup" will protect the BIOS setting from being tampered with. Select "System" if you want to use the password feature every time the system boots up and BIOS setting. The default setting is "Setup". You can create your password by using the "Supervisor/User Password" utility in the main program screen.

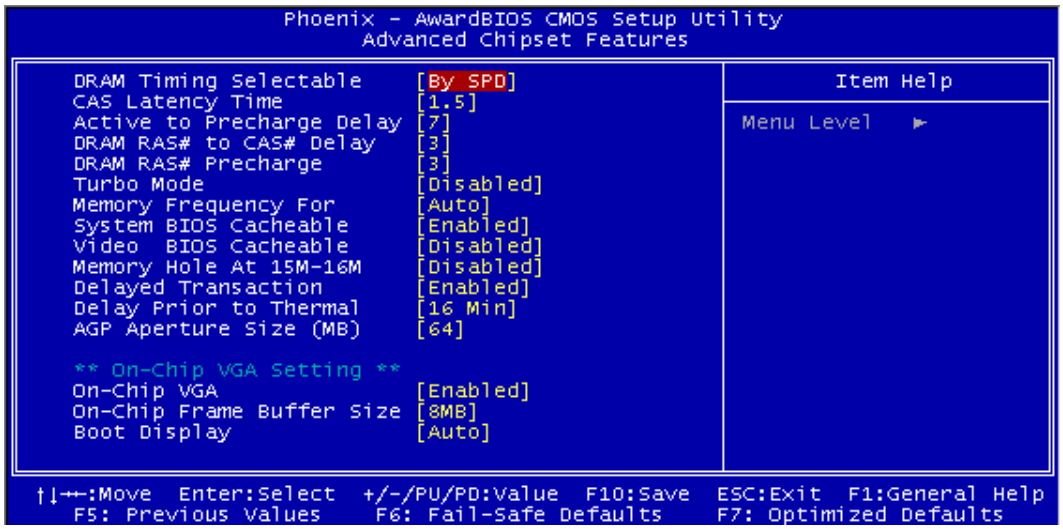
APIC Mode
APIC is advanced programmed interrupt controller. TFB-8551 supports IOAPIC through the system BIOS. Enable "APIC" lets the IO APIC capability to 24 interrupts.

MPS Version Control for OS
In this option there are "1.1" MPS and "1.4" MPS for OS. The default is "1.4" version for MPS control.

Report NO FDD For WIN 95
If no FDD is connected there is a report on WIN95 OS. In this option user selects "YES" setting NO FDD report will reveal.

6-5 Advanced Chipset Features

This section describes the configuration of chipsets on board. Control keys for this screen are the same as for the previous screen.



- Advanced Chipset Features -

DRAM Timing Selectable

SPD (Serial Presence Detect) takes accord the chip types, capacity, timing, voltage data. The system can auto adjust memory according to the data to reach the best situation. The default setting is “By SPD”. If user selects “Manual” there is the following setting needed to be adjusted...

CAS Latency Time

CAS latency time is the delay clock between CAS and write or between CAS and read. Optimal delay clock depends on the specification of SDRAM module.

Active to Precharge Delay

This option controls the number of clocks that a DRAM bank can remain open. After this time period, the DRAM control will guarantee to precharge the bank. Note that this time period may or may not set to overlap with time period that requires a refresh to happen. There are three clocks 5/6/7 for selection.

DRAM RAS# to CAS# Delay

When CPU accesses data from memory CPU first sends RAS# to memory chip, then sends CAS# to memory. There is delay clock between these signals. Adequate delay clock will be necessary for a stable system. User can set two clock delays first and runs for two weeks. If the system is not stable user can re-set delay clock to be three clocks?

DRAM RAS# Precharge

This option is to select the duration between two “RAS” signals. The shorter precharge is, the faster system is, but too short precharge will result in the system unstable.

Turbo Mode

User can select memory run under “Turbo Mode” or not. The default setting is”Disable”.

Memory Frequency For

This option is to select the memory frequency “DDR200” or”DDR266” or “Auto”. The default

setting is "Auto".

System BIOS Cacheable
When this option is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached to improve the system performance, provided that the cache controller is enabled. The default value is "Disabled."

Video BIOS Cacheable
Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default setting is "Disable".

Memory Hole AT 15M-16M
In order to improve system performance, certain space (15MB-16MB) in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB. When enabled, the CPU assumes the 15-16MB memory range is allocated to the ISA address range instead of the actual system DRAM. When disabled, the CPU assumes the 15-16MB address range actually contains DRAM memory. The default value is "Disabled."

Delayed Transaction
Because there is a transaction delay between PCI device and ISA device owing to the slow of ISA bus clock user must be "Enable" this item to complete the transaction between PCI and ISA device. If there is no any ISA device users should be "disable" this item.

AGP Aperture Size (MB)
This option determines the effective size of the AGP Aperture, where memory-mapped graphic data structures are located at system memory.

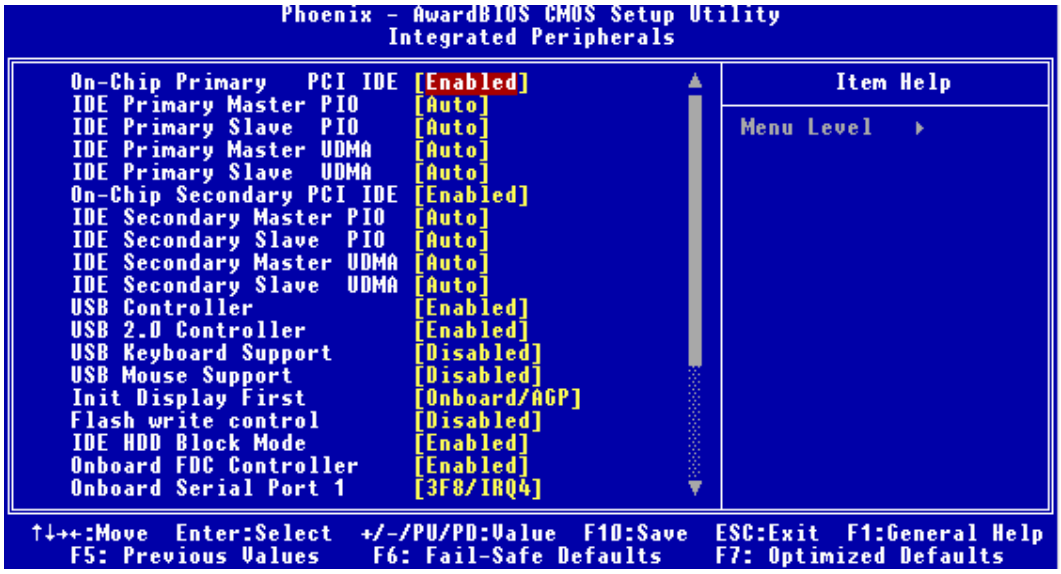
On-Chip VGA
This option determines the function of on-chip VGA. The default setting is "Enable".

On-Chip Frame Buffer Size
When you select this option, a dialog box will allow you to change the memory size that you want to share for video memory. For TFB-8551 the maximum sharing memory is 32MB.

Boot Display
This option is to select the display devices when the system is booted. There are four choices "Auto/CRT/TV/EFP". The default setting is "Auto".

6-6 Integrated Peripherals

This section is used to configure the peripheral chipset features.



- Integrated Peripherals Setup -

On-Chip Primary /Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the Primary /Secondary IDE interface. Select Disabled to deactivate this interface. The default setting is "Enabled".

Primary/Secondary Master/Slave PIO

The five 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. The Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

Primary/Secondary Master/Slave UDMA

Ultra DMA-33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA-33/66/100, select Auto to enable BIOS support. The Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

USB Controller

This item allows you to activate the function of USB on-board. Two choices "Enable" and "Disable" are supported. The default setting is "Enable".

USB 2.0 Controller

ICH4 Chipset supports USB2.0. It is recommended to set "Enable" in this item.

USB Keyboard/Mouse Support

These items allow users to set Keyboard/Mouse 'Enable" on USB ports. The default setting is "Enable"

Init Display First
This item allows you to decide to active Display whether the add-on display card on AGP bus or internal VGA display controller chip. The default setting for TFB-8551 is "internal"

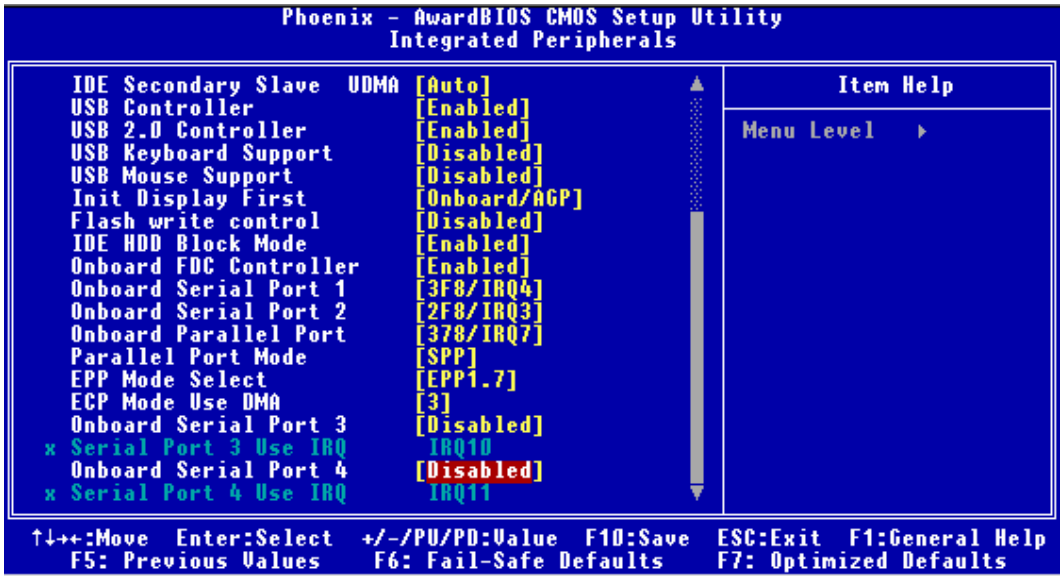
Flash Write Control
TFB-8551 do not support flash write function. The default setting is "Disable".

IDE HDD Block Mode
Block mode is also called block transfer, multiple commands, or multiple sectors read/write. If your IDE hard drive supports block mode (most new drives do), select "Enabled" for automatic detection of the optimal number of block read/writes per sector the drive can support. The default setting is "Enabled".

Onboard FDD Controller
Select "Enabled" if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. The default setting is "Enabled".

Onboard Serial Port 1/Port 2
Select an address and corresponding interrupt for the first and second serial ports. The default setting is "Auto".

Onboard Parallel Port
This item allows you to determine onboard parallel port controller I/O address setting. The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled,



Onboard Parallel Mode
Select an operating mode for the onboard parallel (printer) port. Select Normal, Compatible, or SPP. The choice: Normal, EPP, ECP and ECP/EPP Mode Use DMA. Select a DMA channel for the parallel port for use during ECP mode. DMA1 and DMA3 are the only two channels assigned for ECP/EPP mode printer. The default setting is "3".

Parallel Port EPP Type
If user's select 'EPP" mode as printer mode user will select EPP port type 1.7 or 1.9.

Onboard Serial Port 3/Port 4

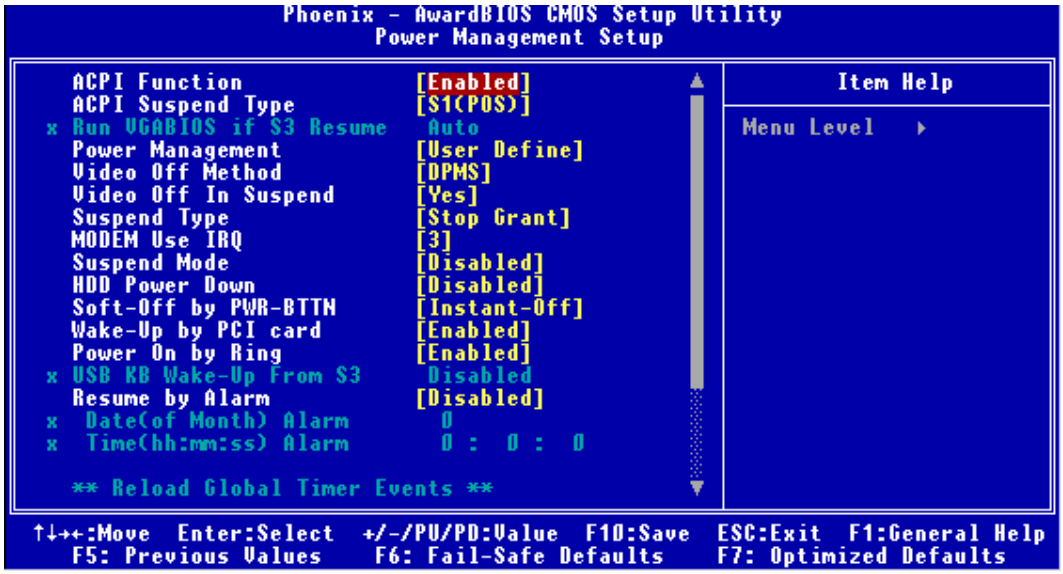
If user will increase serial port, TFB-8551 supports PC104 port and PC104 Serial Port Module to implement the requirement. This field determines the serial port IO address. For general use 3E8H/2E8H is recommended.

Serial Port 3/4 Use IRQ

This item allows you to determine IRQ setting of Serial port 3/4.

6-7 Power Management Setup

Power Management Setup allows the users to configure the system to the most effectively save energy while operation in a manner consistent with your own style of computer use.



- Power Management Setup -

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The default setting is “Enabled”.

ACPI Suspend Type

This field is used to select the type of Suspend mode. There are two types for choice: SI (POS) and S3 (STR). But TFB-8551 does not support S3. Therefore users don’t set any. The default setting is S1 (POS).

Power Management

This option is the master control for the power saving modes, Display Turn off and HDD Power Down that together form the hardware power conservation scheme. There are three settings: User Define, Max Saving, and Min Saving. User set the HDD/Doze mode/Suspend Mode to one own requirement to achieve power saving.

Video off Method

This option determines the manner in which the monitor is under power saving mode.

V/H SYNC+ Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

Video Off in Suspend

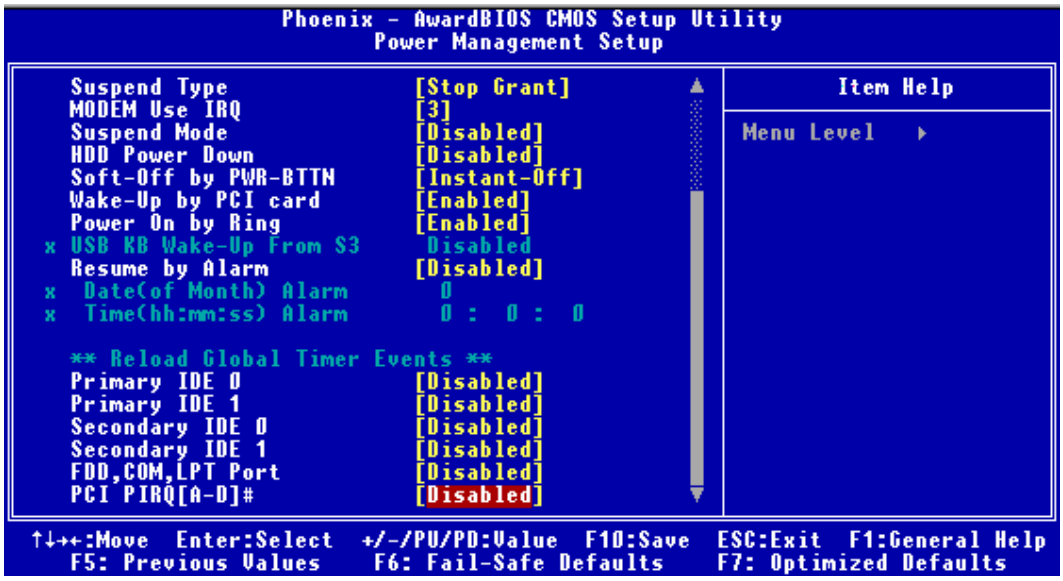
This option determines video whether video off takes effective during suspend mode. The default is "YES" to indicate video off takes off during suspend mode.

Suspend Type

This option controls processor power control in two states "PwrOn Suspend" and "Stop Grant". User can select the state depending on your need. It is recommended to select "PwrOn Suspend". The default is "PwrOn Suspend".

MODEM Use IRQ

This item determines the IRQ in which the MODEM can use. The options are: 3 (Default setting), 4, 5, 7, 9, 10, and 11, NA



Suspend Mode

System will enter suspend mode to save power after the duration when system is idle. This option is to set the duration or disable that function system enters into suspend mode.

HDD Power Down

This option is to set the duration when HDD is idle. HDD will power down to save power after the duration when HDD is idle. This option is to set the duration or disable power down function.

Soft-Off by PWRBTN

This item lets user select the function of PWRBTN as "Soft Off" or "Instant Off". "Soft Off "is to press the power button for more than 4 seconds to force the system into off state when the system has "hung." The choice: Delay 4 Sec, Instant-Off.

Wake Up By PCI Card

Wake Up events are I/O events whose occurrence can restart/start the system into normal operation. Users can select the IO device which wakes up the system.

Power On by Ring

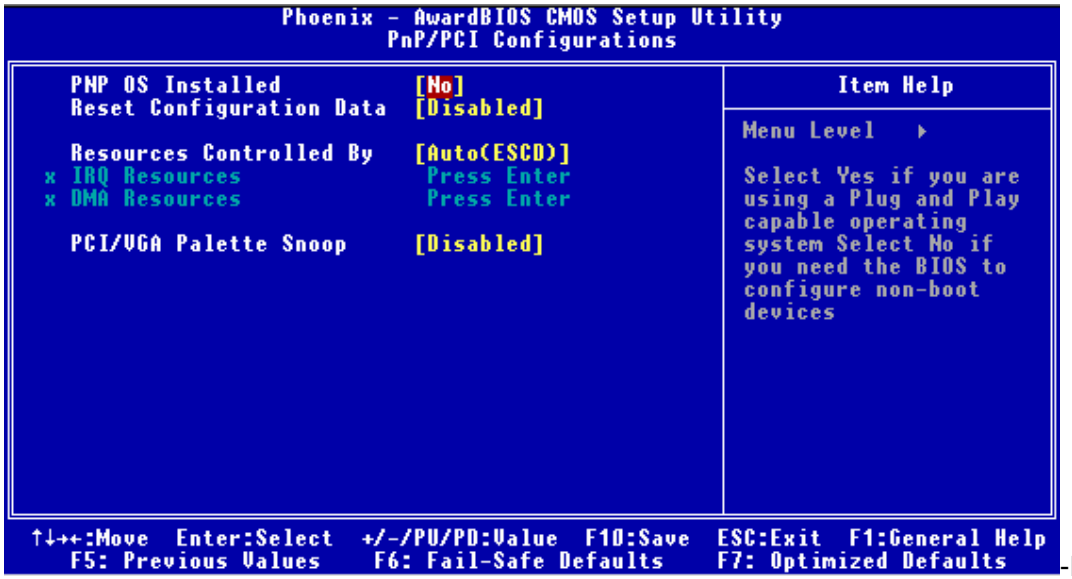
System can be waked up by Ring signal from telephone line. This option is to set "Power on by Ring "function to be "Enable" or "Disable".

Resume by Alarm

System resumes from power down mode by external events, LAN, Ring, or internal RTC alarm. This option is to set the function "Resume by Alarm" to be "Enable" or "Disable".

6-8 PnP/PCI Configurations

This section is used to configure PnP & PCI Configurations. The <PnP & PCI Configurations> option configures the PCI bus slots. All PCI bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.



-PnP / PCI Configurations-

PnP OS Installed

This item allows you to determine operating system installed with PnP or not. The default setting choice: Yes. In general Win9X, and above Win98 has PNP function.

Reset Configuration Data

The default value is" Disabled". Normally, you leave this field "Disabled". Select "Enabled" to reset the Configuration Data, when you have installed a new add-on and the system has a serious configuration conflict, which causes the operating system to not boot.

Resource Controlled by

The default value is "Auto".
The Plug-and-Play BIOS can automatically configure all the boot and Plug-and-Play compatible devices according to ESCD (Extended System Configuration Data) If you select "Auto". Almost all the add-on cards support PNP. The resource control is set "Auto". If the add-on card is legacy ISA or without PNP function users should select "MANUAL" in this item.

PCI/VGA Palette Snoop

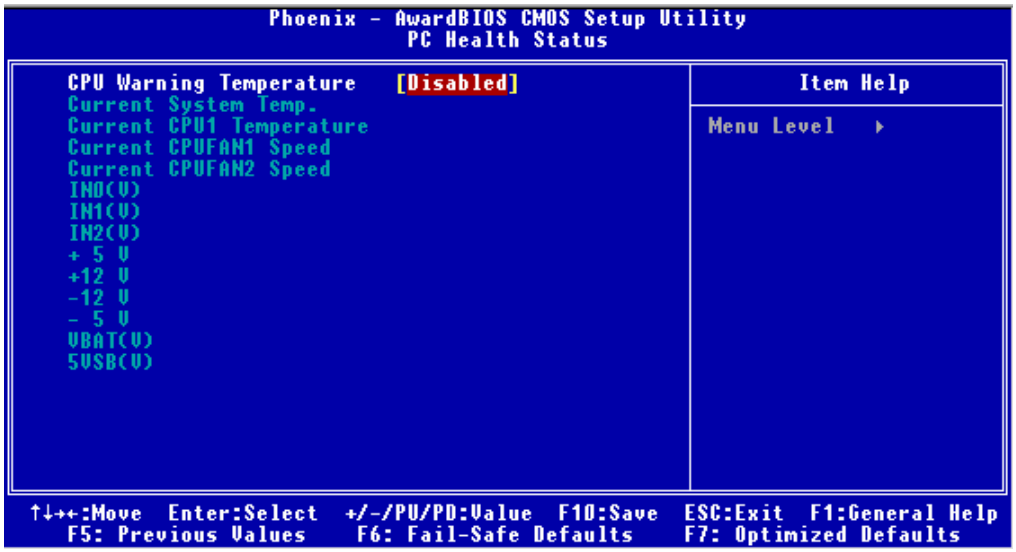
This item set enable or disable for the snoop of display card to Palette. Leave this field at "Disabled" unless the display is abnormal... The default setting is "Disabled".

6-9 PC Health Status

From this manual user can inspect the important voltage level in TFB-8551, fan speed and internal temperature**.**

CPU Warning Temperature

This item provides user to set specific temperature over which CPU will slow down the speed to prevent the over temperature of system. The default setting is " Disable".



- PC Health Status -

6-10 Frequency / Voltage Control

In this section user can adjust the multiplier of CPU clock manually, set the auto detection of PCI CLK, Enable spread spectrum of main board.

Frequency and Voltage control setting allows users to determine multiplier of CPU clock.

CPU Clock Rate

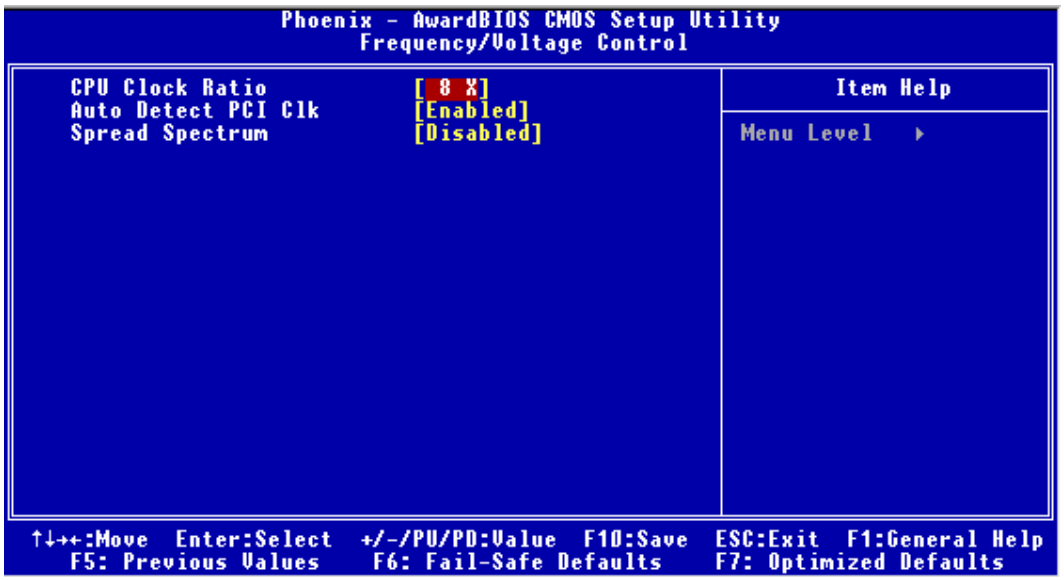
Users can determine the multiplier of CPU clock manually. But for the most of SBCs on market are designed with self-adjustment. It is unnecessary to set this item.

Auto Detect PCI CLK

This option is used to set the system detect PCI Clock automatically or not. The default is "Auto".

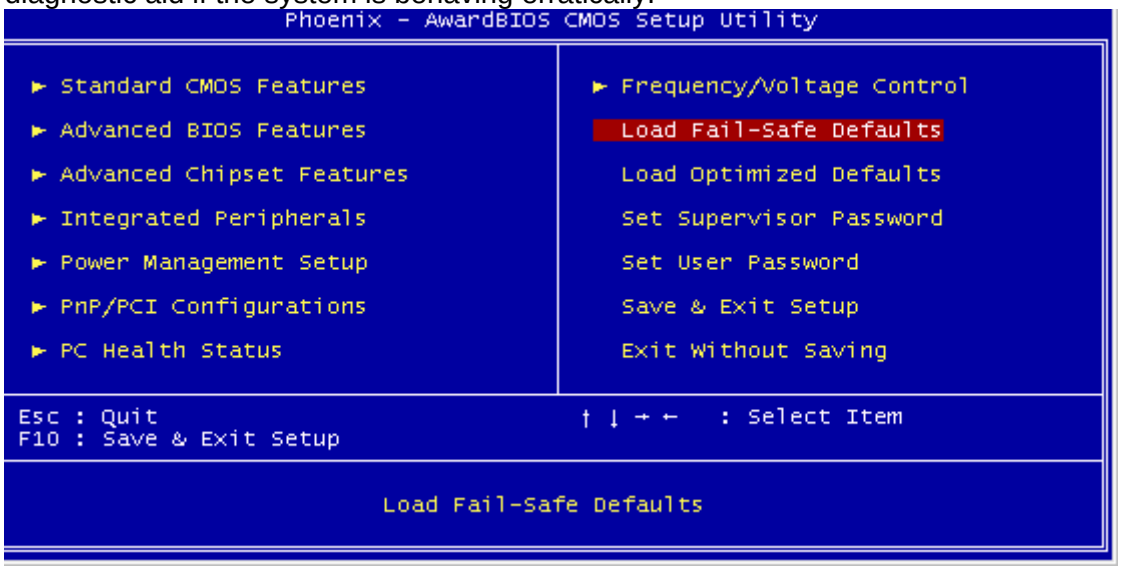
Spread Spectrum

User can enable or disable spread spectrum function. The default setting is "Disable".



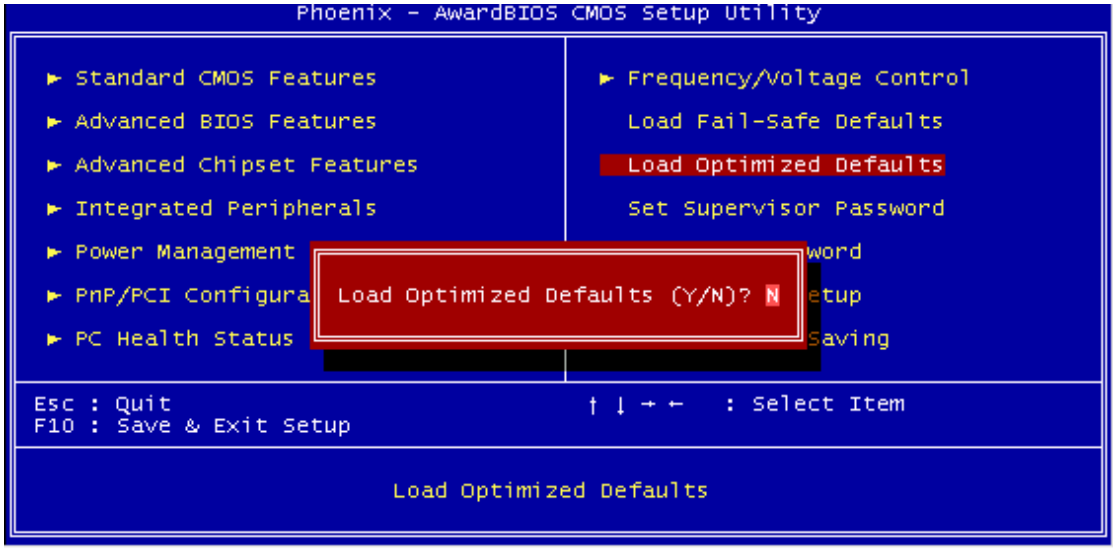
6-11 Load Fail-Safe Defaults

The user can load the Fail-Safe BIOS Setup option settings by selecting the Fail-Safe item from the Default section of the BIOS Setup main menu. The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.



6-12 Load Optimized

This section permits users to select a group of settings for all BIOS Setup options. Not only can you use these items to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration related problems.

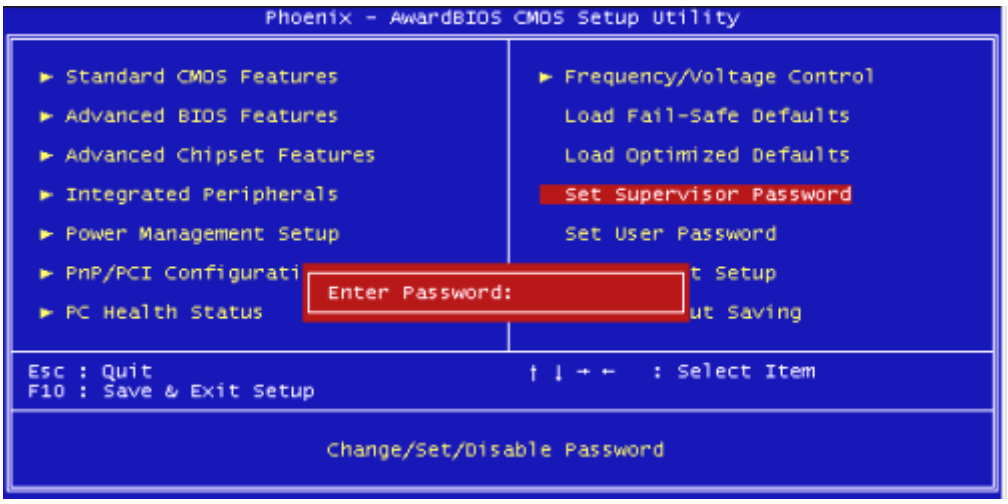


- Load Optimized -

6-13 Set Supervisor Password

Select the appropriate password icon (Supervisor or User) from the Security section of the BIOS Setup main menu. Enter the password and press [Enter]. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press [Enter].

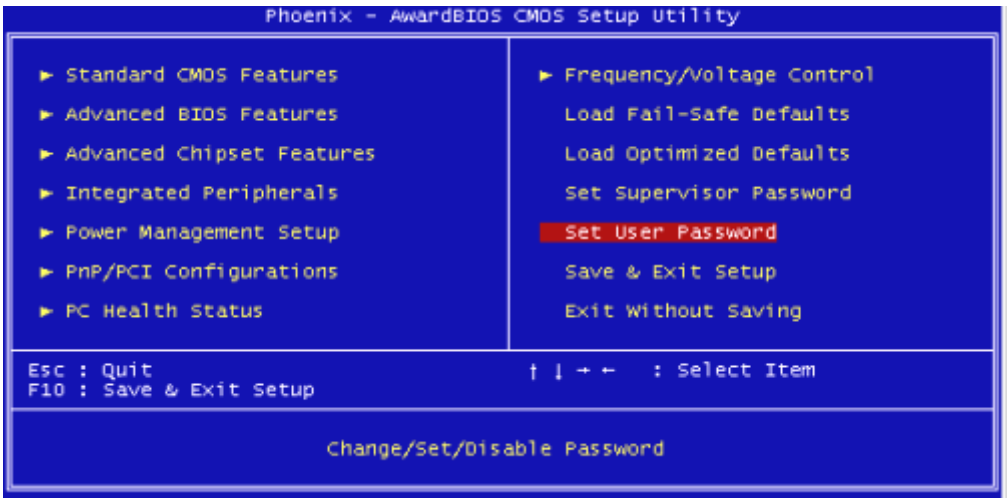
If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press [Esc] to return to the BIOS Main Menu. The password is stored in CMOS RAM after the BIOS is exited and saved. The next time the system boots, you are prompted for the password.



- Set Supervisor Password -

6-14 Set User Password

The password check option is enabled in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when BIOS is run). The password is stored in CMOS RAM. User can enter a password by typing on the keyboard. As user select Supervisor or User. The BIOS prompts for a password, user must set the Supervisor password before user can set the User password. Enter a 1 to 6 characters password. The password does not appear on the screen when typed. Make sure you write it down.

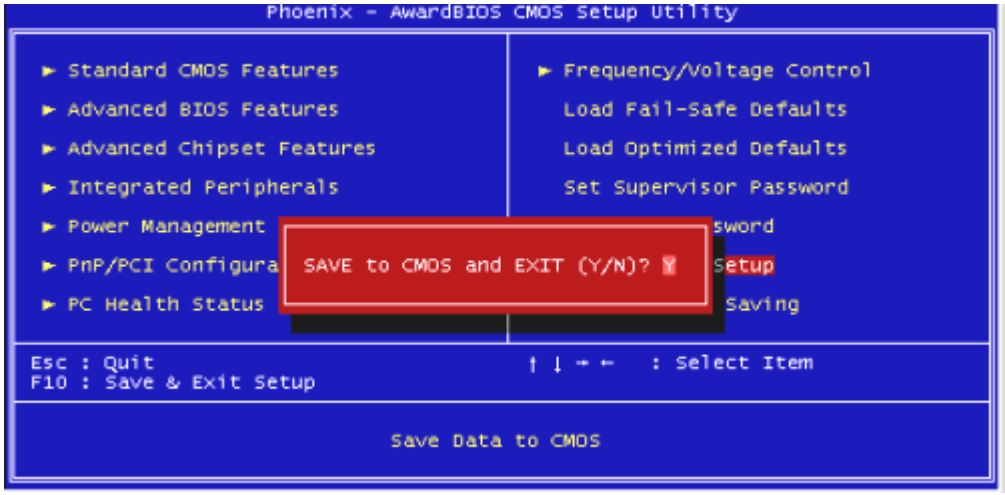


- Set User Password -

6-15 Save & Exit Setup

This item is in the <Standard CMOS Setup>, <Advanced CMOS Setup>, <Advanced Chipset Setup> and the new password (if it has been changed) will be stored in the CMOS. The CMOS checksum is calculated and written into the CMOS. When you select this function, the following message will appear at the center of the screen to assist you to save data to CMOS

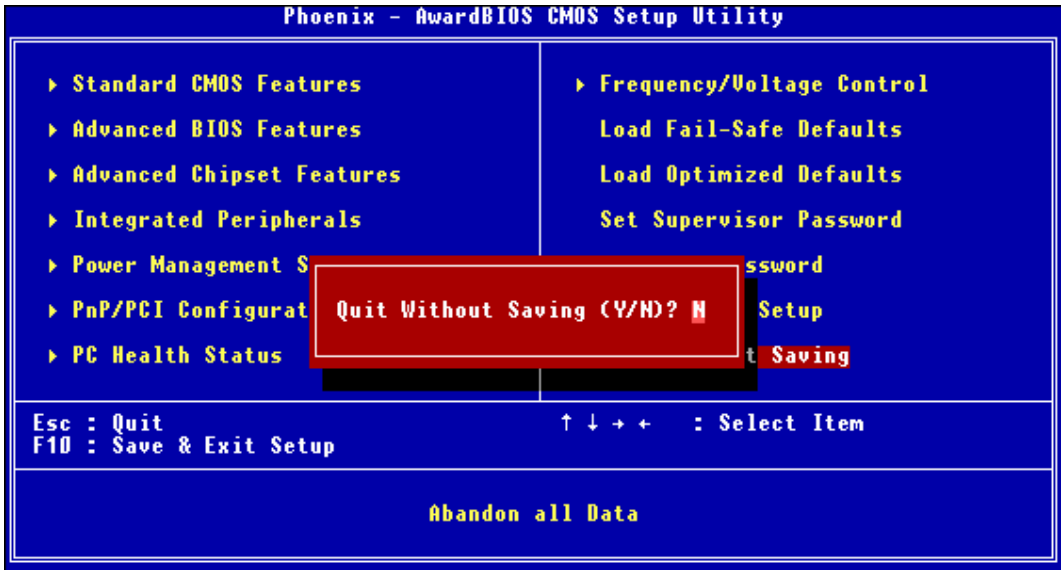
and Exit the Setup.



– Save & Exit Setup –

6-16 Exit Without Saving

When you select this option, the following message will appear at the center of the screen to help to abandon all the modified data and Exit Setup.



– Exit & Without Saving –

Chapter 7 Package List

Package List

1. TES-8551 Full Size CPU BoardX1
2. 2.00mm 44PIN ATA IDE CableX1
3. 2.00mm Printer CableX1
4. 2.00mm Serial PortX1
5. 2.00mm USB CableX1
6. KB/MS Y CableX1
7. 12V Power Input CableX1
8. Quick Start ManualX1
9. Driver & Manual CDX1

Optional Accessories

1. 2.0mm 44pin IDE Cable
2. Audio Set
3. 2X24-bit Dual Channel LVDS LCD Cable
4. Push Button Cable

Order Information

Model	TES-8551-B	TES-8551-A	TES-8551-C
CPU	600MHZ	1GHZ	479 SOCKET
DVI	X	X	DVI