GT-650

Pentium III/Celeron
w/VGA/LAN/Audio
w/Video Capture/GPIO
Embedded Board

User's Manual

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Check List

Before getting started, please check if your GT-650 package includes the following items:

- GT-650 Pentium III/Celeron Embedded board x 1pcs
- Driver & Utility CD_ROM x 1 pcs
- HDD cable x 1 pcs
- User's manual x 1pcs
- AD-011 8 ports Video input / GPIO adapter card, cable x 1pcs

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Chapter 1

Introduction

This manual describes the GT-650 single board computers. Chapter 1 provides general information and specifications. Chapter 2 contains jumper and connector information. Chapter 3 describes component installations. Chapter 4 describes AWARD BIOS setup information and BIOS POSTcode, and Chapter 5 for software setup procedure. Appendix A describes the network interface. Appendix B lists the connector pin assignment. Appendix C describes the updating the system BIOS. Appendix D for the mechanical drawing

1.2 General introduction

The GT-650 is a full featured, industrialized, single board computer with a high-frequency Intel Tualatin, Pentium III®, and Celeron® processor that brings advanced CPU technology and processing power to the latest PCI applications. The INTEL 815E AGP chipset built in to the single board computer is the most efficient and reliable way to upgrade existing ISA systems to Pentium III technology.

The GT-650 combines many features needed for system operation into one compact single board computer, including 2D/3D graphics accelerator, 10/100 TX Ethernet adapter, Two USB ports, Two Ultra/DMA IDE drive controllers, Two high performance serial ports, enhanced parallel port, and the latest BIOS features. Additional enhancements to the GT-688V include a sixteen-channel maximum video input interface. Two dual in-line memory module (DIMM) sockets support up to 512MB of synchronous DRAM (SDRAM) memory.

The INTEL 815E includes a highly integrated graphics accelerator. Its architecture consists of dedicated multi-media engines executing in parallel to deliver high performance 3D, 2D and motion compensation video capabilities.
The 3D and 2D engines are managed by a 3D / 2D pipeline processor allowing a sustained flow of graphics data to be rendered and displayed. The 815E directly drive a standard progressive scan monitor up to a resolution of 1280x1024.

The INTEL 815E AGP chipset in the GT-650 incorporates the latest microprocessor technology from Intel to provide the increased bandwidth needed to operate your system bus at speeds up to 133MHz. (The 815E AGP chipset uses one chipset for both 66MHz, 100MHz and 133MHz system designs in Pentium III and Celeron processors with speeds up to 1GHz.)

The Intel 815E AGP chipset is a two-chip set comprised of the Intel 82815 (GMCH) Host Bridge with graphics accelerator and the Intel 82801BA (ICH2) I/O subsystem. The 64-bit main memory interface in the GMCH provides optimized support for SDRAM at 133 and 66/100MHz. The ICH2 is a PCI Rev 2.1 compliant PCI bridge that supports 3.3V and 5V 33MHz PCI operations. The ICH2 chip includes Desktop Power Management support, enhanced DMA controller and an integrated IDE controller with Ultra DMA66/100 support. In addition, it provides USB host interface support for four USB ports and a System Management Bus (SMB) with support for DIMM Serial PD.

1.2 Specifications

Processors Supported

• Socket 370 Processor
  Intel Tualatin Processor up to 1.4GHz, FSB: 66/100/133 MHz
  Intel Pentium III Processor up to 1GHz, FSB: 66/100/133 MHz
  Intel Celeron Processor up to 1 GHz, FSB: 66/100/133 MHz

Memory

• 512MB maximum
• 2 x 168-pin DIMM sockets
• Supports PC-100 / PC-133 SDRAM
• Support only 3.3V SDRAM DIMM

BIOS

• Licensed AWARD BIOS, 4M bit Flash ROM, Plug-and-Play compatible
• Full support for Year 2000 and leap-year date functions

Chip Set

• Intel 815E AGP chipset
  82815E Graphics and Memory Controller Hub (GMCH)
  82801BA I/O Controller Hub 2 (ICH2).

Video Interface

• Conexant Bt878 Video decoder processor. Support up to 16-channels video input.

Display

• Intel 82815E Graphics Accelerator.

- Support non-interlace CRT monitors, 1280x1024 24-bit colors
- Display connector: DB-15 VGA connector for CRT monitor

LAN Controller

• Realtek 8100B Ethernet controller, 10/100 TX with RJ-45 connector.

Audio

• AC97 V2.1 compliant Audio CODEC with 3D sound.

EIDE Disk Controller (dual port)

• Up to four fixed disk drives supported
• PIO Mode 4 and Ultra DMA33/66/100 supported.
• Full support for LS-120 HD floppy drive.

Floppy Ports

• One 26 pin slim type floppy disk interface.

Serial Ports

• One RS-232 serial ports, with 16C550-compatible, FIFO buffer
• One RS-232/RS-422/RS-485 selectable serial port with 16C550-compatible, FIFO buffer

Parallel Port

• Single parallel port controller with bi-directional compatibility
• EPP and ECP enhanced port modes.

PS/2 Keyboard / Mouse port

• Microsoft compatible
• Two six-pin mini-DIN connector at rear panel
• Power supplied through +5VDC self-healing fuse

Universal Serial Bus (USB)

• Two USB connectors at rear panel.
• Two USB pin header connectors for internal USB device.
• Power supplied through +5VDC self-healing fuse

Power connector (ATX)

• Universal ATX power connector configuration

Dimension

• L x W: 246.89mm x 146.05mm (9.72" x 5.75")

Operating Environment

Temperature
• 0 to 55°C
Humidity
• 5 to 90% RHNC

Storage Environment

Temperature
• 0 to 65°C
Humidity
• 5 to 95% RHNC

Current Requirements

• +5V typical current draw: 6 - 10A
• +5V maximum current draw: 8 - 18A
• +12V maximum current draw: 600mA
Note: 1) +5V current draw is processor dependent.

Chapter 2 Jumpers and Connectors

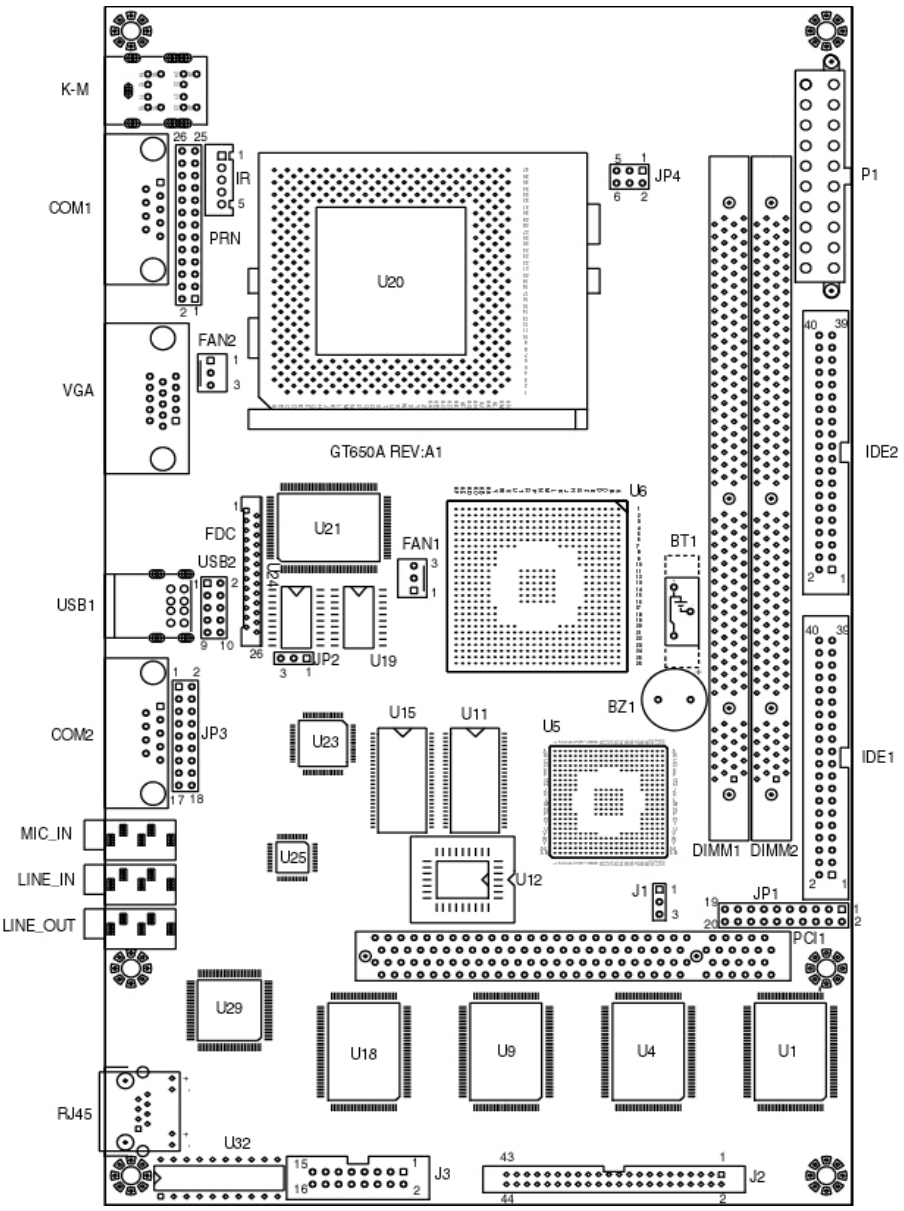

Figure 2-1 Jumper of GT-650

2.1 Jumpers setting

Power Switch for ATX power supply (JP1)

Signals	JP1
Power ON/OFF	1-3

Reset/LED/Speaker (JP1)

Signals	JP1
Power LED, Pin 9+, Pin10-	9-10
External speaker	14-20
HDD LED, Pin8+, Pin7-	7-8
System reset switch	5-6
SUSLED Pin4+, Pin2-	2-4

PS. For the AT system (short pin 10 & pin12) for power on

Internal USB connector (USB2)

Signals	USB2-1	USB2-2
Power	1	10
Data -	3	8
Data +	5	6
USB GND	7	4
CHS GND	9	2

External power connector (P1)

Signals	P1
+12V	10
+5V	4,6,19,20
-12V	12
-5V	18
+3.3V	1,2
5VSB	9
PS-ON	14
POWER-OK	8
Ground	3,5,7,13,15,16,17

CMOS Clear (J1)

	J1
POWER OFF and Move jumper from pin 1-2 to pin2-3 of J1, Reminding POWER OFF 1minute. Then Move JUMPER back to 1-2 OF J1	

TV-out mode Select (JP2) (Option)

Mode	JP2
NTSC	1-2
PAL	2-3

COM2 mode Select (JP3)

Mode	JP3
RS-232	3-5, 4-6, 9-11, 10-12, 17-18
RS-422	1-3, 2-4, 7-9, 8-10, 15-16
RS-485	1-3, 2-4, 7-9, 8-10, 13-14

CPU FSB Select (JP4)

Function	JP4
Auto by CPU	1-3, 2-4
66 MHz	3-5, 4-6

FAN control (FAN1, 2)

Function	FAN1,2
Sense	3
+12V	2
PWM control	1

2.2 Connectors

The connectors allow this main board to connect with other parts of the system. Some problems encountered with your system may be caused by loose or improper connections. Ensure that all connectors are in place and firmly attached.

Component	Label
HDD (IDE) connector	IDE 1,IDE2
Slim FDD connector	FDC
Internal USB connector	USB2
Reset switch connector	JP1 (6-5)
External speaker connector	JP1 (14-20)
HDD LED connector	JP1 (7-8)
External power connector	P1
Serial Port	COM1,2
Audio OUT	LINE_OUT
Audio IN	LINE_IN
MIC	MIC_IN
CD IN	CD_IN
LAN	RJ-45
Video INPUT	J2
CMOS RAM clear	J1
Audio/GPIO	J3
IR	IR
CPU FAN	FAN1,2
Printer	PRN

Chapter 3
Installation

This chapter describes the procedures for installing the GT-650 into your system.

The following is a list of typical peripherals required to build a minimum system:

- Power supply
- IBM PC/AT keyboard
- Display monitor
- Hard disk with MS-DOS or CD_ROM Windows driver

To setup the system may require installing board components (such as CPU, memory), configuring the system (setting jumper for component compatibility or to enable functions), connects the input / output devices, and setting up the operating system. For the location of the components and connectors, please refer to the chapter 2 for detail.

3.1 Installing the DIMMs

The GT-650 single board computer accepts from 32 MB up to 512 MB of SDRAM Module. The two 168-pin SDRAM Dual Inline Memory Module (DIMM) sockets will accept 64 bits DIMM modules (3.3V memory – UN-buffered SDRAM only).

The single board computer will accept only DIMM with gold-plated contacts. To ensure reliable operation at zero wait states, use only 7.5ns or faster SDRAM DIMM for bus speeds 133MHz. If more then two DIMM sockets are used, they may be filled with different size memory, but the DIMMs should be made by the same manufacturer and must be the same speed.

Note: Before performing the following procedures, remove the board from the backplane and lay it on a flat ESD protected, non-static surface.

1. Move the module release levers (on each end of the socket) outward, away from the socket. (Please see the Figure 3-1)
2. Place the DIMM so that the two notches on the contact edge line up with the two alignment nodes in the DIMM socket. Insert the DIMM into the socket at a 90-degree angle.

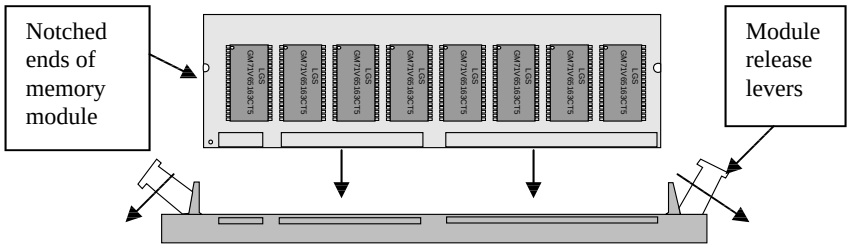

Figure 3-1: DIMM Orientation

3. Using both hands, press downward and guide the DIMM into socket. The module release levers will return to their upright position when the DIMM is completely seated in the socket. The pegs on the tips of the release levers should align with the notches on the both ends of the DIMM.

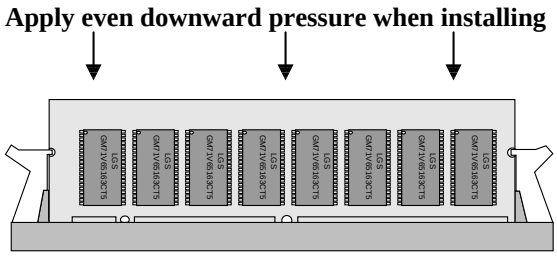

Figure 3-2: DIMM Installation

4. Repeat Steps 1-3 for the remaining DIMM in DIMM 2. You can install two DIMMs on the board.

3.2 Installing the CPU

1. Match key pin on the CPU with key pin of the PGA370 socket. Please see the figure 3-3 for detail.
2. To complete the installation, gently press the CPU onto place.
3. Double-checks the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.
4. Add the heat sink on the top of CPU properly. It is very important to have property heat sink for different speed CPU.

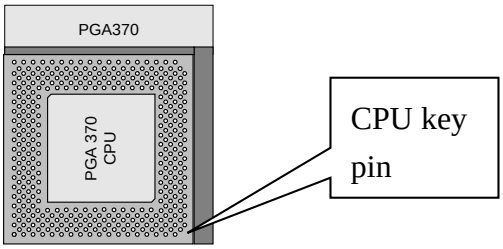

Figure 3-3: PGA 370 socket

3.3 Completing the Installation

To complete the installation, the following steps should be followed:

1. Make sure the power is off.
2. Set the configuration jumpers in accordance with Chapter 2.
   Power button will be connected to pin 1-3 of JP1.
3. Connect the ATX power supply to ATX connector on GT-650.
4. Connect the applicable I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply and etc.
   Note: *the color of pin one is usually red or blue, while others are gray.*
5. Turn on the power by power button.

Chapter 4. AWARD BIOS Setup

4.1 Introduction

This manual discusses Award™ Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The AwardBIOS™ installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means that it supports Intel/Cyrix/AMD processors in a standard IBM-AT compatible input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

The AwardBIOS™ has been customized by adding important, but non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

Starting Setup

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

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

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

   Press DEL to enter SETUP.

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

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Using Setup

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

Key	Function
↑ key	Move to the previous item
↓ key	Move to the next item
← key	Move to the item on the left (menu bar)
→ key	Move to the item on the right (menu bar)
Esc key	Main Menu: Quit without saving changes Sub-menus: Exit Current page to the next higher level menu
Enter key	Select the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit without saving changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Table 4-1 Legend Keys

Navigating through the menu bar

Use the left and right arrow keys to choose the menu you want to be in.
To display a sub menu, use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "Ø" pointer marks all sub menus.

Getting Help

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

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings, which resets your system to its defaults.

The best advice is to only alter settings that you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

A Final Note About Setup

Not all systems have the same Setup. While the basic look and function of the Setup program remains the same for all systems, individual motherboard and chipset combinations require custom configurations. For example, you may find that your Setup main menu has a different number of entries from the main menu displayed in this manual. These are simply features not supported (or not user configurable) on your system.

The final appearance of the Setup program also depends on the Original Equipment Manufacturer (OEM) who built your system. If your OEM has decided that certain items should only be available to their technicians, those items may very well be removed from the Setup program.

4.2 Main Menu

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

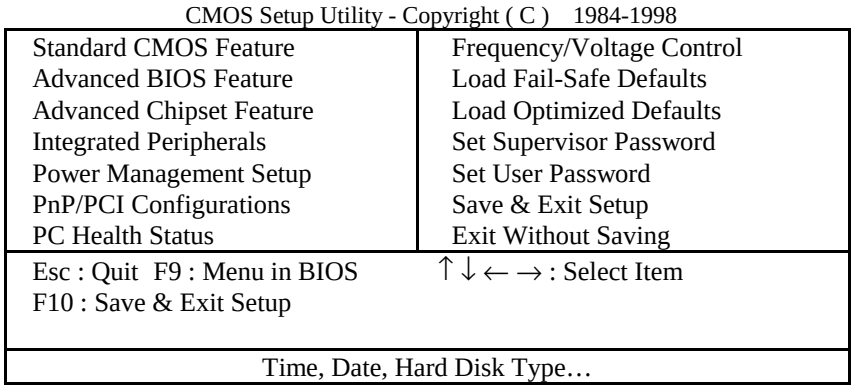

Figure 4-1 Main Menu

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration. See Section 4.3 for the details.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system. See Section 4.4 for the details.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance. See section 4.5 for the details.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals. See section 4.6 for the details.

Power Management Setup
Use this menu to specify your settings for power management. See section 4.7 for the details.

PnP / PCI Configuration
This entry appears if your system supports PnP / PCI. See section 4.8 for the details.

PC Health Status
Use this menu to monitor the CPU and system temperature, CPU fan speed the voltage of the onboard regulators. See section 4.9 for the details.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control. See section 4.9 for the details.

Load Fail-Safe Defaults
Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. See section 4.10 for the details.

Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs. See section 4.10 for the details.

Supervisor / User Password
Use this menu to set User and Supervisor Passwords. See section 4.11 for the details.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup. See section 4.12 for the details.

Exit Without Save
Abandon all CMOS value changes and exit setup. See section 4.12 for the details.

4.3 Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

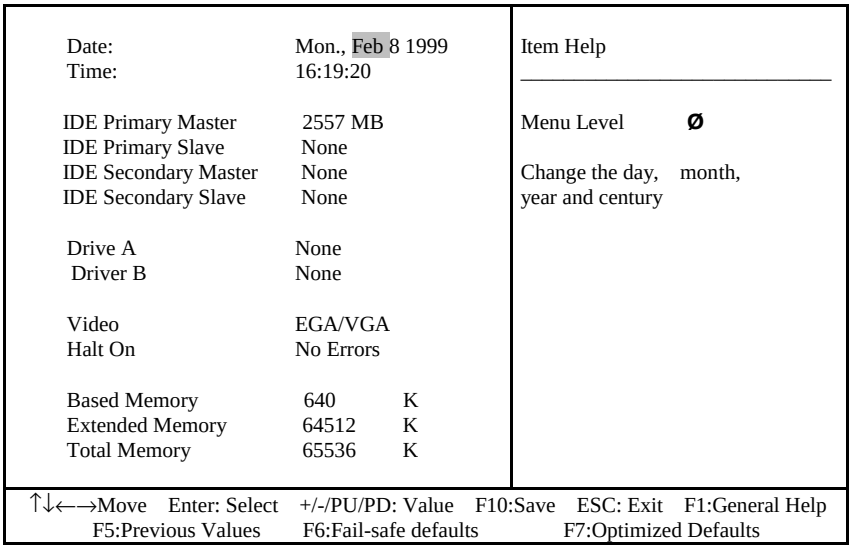

Figure 4-2: Standard CMOS features Menu

Standard CMOS Selections

This table shows the selections that you can make on standard CMOS Menu

Item	Options	Description
Date	Week,Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu (described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Slave	Options are in its sub menu (described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the correct video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

Table 4-2 Standard CMOS Selections

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.
Figure 4-3 shows the IDE primary master sub menu.

CMOS Setup Utility – Copyright © 1984-1998 Award Software
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	Menu Level
Access Mode	Auto	
capacity	8455MB	To auto-detect the HDD's size, head... on this channel
Cylinder	16383	
Head	16	
Precomp	0	
Landing Zone	16382	
Sector	63	

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

Figure 4-3 IDE Primary Master sub menu

Use the legend keys to navigate through this menu and exit to the main menu.
Use Table 4-3 to configure the hard disk.

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	Normal LBA Large Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Set a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Table 4-3 Hard disk selections

4.4 Advanced BIOS Features

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

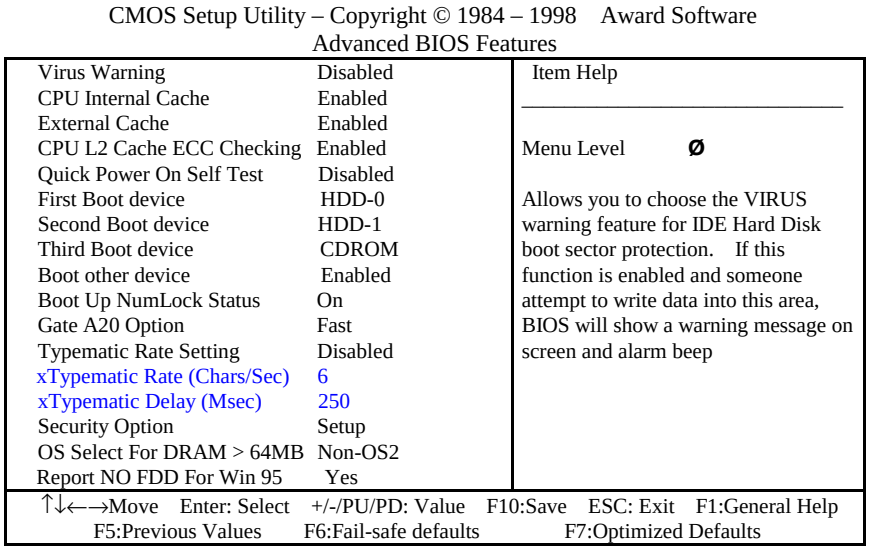

Figure 4-4 Advanced BIOS features

Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and alarm beep.

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

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU / chipset design.

Enabled	Enable cache
Disabled	Disable cache

CPU L2 Cache ECC Checking

This item allows you to enable/disable CPU L2 Cache ECC checking.
The choice: Enabled, Disabled.

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
The Choice: Floppy, LS/ZIP, HDD, SCSI, CDROM, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.
The choice: Enabled/Disabled.

Gate A20 Option

Select if chipset or keyboard controller should control GateA20.

Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

Typematic Rate Setting

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.
The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a key stroke when you hold the key down.
The choice: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.
The choice: 250, 500, 750, and 1000.

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

OS Select For DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Report No FDD for Win 95

Whether report no FDD for Win 95 or not.
The choice: Yes, No.

4.5 Advanced Chipset Features

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Advanced Chipset Features

SDRAM CAS Latency Time	3	Item Help
SDRAM Cycle Time Tras/Trc	7/9	Menu Level
SDRAM RAS-to-CAS Delay	3	
SDRAM RAS Precharge Time	3	
System BIOS Cacheable	Disabled	
Video BIOS Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
CPU Latency Timer	Enabled	
Delay Transaction	Enabled	
AGP Graphics Aperture Size	64MB	
Display Cache Frequency	100MHz	
System Memory Frequency	Auto	
On-Chip Video Window Size	64MB	
* **Onboard Display Cache Setting ***		
CAS# Latency	3	
Paging Mode Control	Open	
RAS-to-CAS Override	By CAS# LT	
RAS# Timing	Fast	
RAS# Precharge Timing	Fast	

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

Figure 4-5 Advanced Chipset features

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

DRAM Settings

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

SDRAM CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.
The Choice: 2, 3

SDRAM Cycle Time Tras/Trc

Select the number of SCLKs for an access cycle.
The Choice: 5/7, 7/9.

SDRAM RAS-to- CAS Delay

This field let's you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system.
The Choice: 2, 3.

SDRAM RAS Precharge Time

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. *Fast* gives faster performance; and *Slow* gives more stable performance. This field applies only when synchronous DRAM is installed in the system.
The Choice: 2, 3.

System BIOS Cacheable

Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.
The choice: Enabled, 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 Choice: Enabled, Disabled.

Memory Hole At 15M-16M

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 requirements.
The Choice: Enabled, Disabled.

CPU Latency Timer

When enabled this item, the CPU cycle will only be deferred after it has been held in a "Snoop Stall" for 31 clocks and another ADS# has arrived. When disabled, the CPU cycle will be deferred immediately after the GMCH receives another ADS#.
The Choice: Enabled, Disabled.

Delayed Transaction

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

AGP Graphics Aperture Size

This field determines the effective size of the Graphic Aperture used for a particular GMCH configuration. It can be updated by the GMCH-specific BIOS configuration sequence before the PCI standard bus enumeration sequence takes place. If it is not updated then a default value will select an aperture of maximum size.
The choice: 4, 8, 16, 32, 64, 128, 256

Display Cache Frequency

You can use this item to select the frequency of the display cache.
The Choice: 100MHZ, 133MHZ.

System Memory Frequency

You can use this item to select the operating frequency for the main system memory.
The Choice: Auto, 100MHZ, 133MHZ.

On-Chip Video Window Size

Select the on-chip video window size for VGA drives use.
The Choice: 32MB, 64MB, Disabled.

Onboard Display Cache Settings

Setting the onboard display cache timing.

CAS Latency
Select the local memory clock periods.

The Choice: 2, 3

Paging Mode Control
Select the paging mode control.

The Choice: Close, Open.

RAS-to- CAS Override
Select the display cache clock periods control.

The Choice: by CAS# LT , Override(2).

RAS Time
This item controls RAS# active to Protegra, and refresh to RAS# active delay (in local memory clocks).

The Choice: Fast , Slow.

RAS Precharge Time
This item controls RAS# precharge (in local memory clocks).

The Choice: Fast , Slow.

4.6 Integrated Peripherals

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Integrated Peripherals

OnChip Primary PCI IDE	Enabled	Item Help
OnChip Secondary PCI IDE	Enabled	
IDE Primary Master PIO	Auto	Menu Level Ø
IDE Primary Slave PIO	Auto	If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Enabled	
USB Mouse Support	Disabled	
Init Display	Onboard / AGP	
AC97 Audio	Auto	
IDE HDD Block Mode	Enabled	
POWER ON Function	BUTTON ONLY	
xKB Power ON Password	Enter	
xHot Key Power On	Ctrl-F1	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
xRxD , TxD Active	Hi, Lo	
xIR Transmission Delay	Enabled	
xUR2 Duplex Mode	Half	
xUse IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	
Watch Dog Timer Select	Disable	

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

Figure 4-6 Integrated Peripherals

On Chip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select ***Enabled*** to activate each channel separately.
The choice: Enabled, Disabled.

IDE Primary/Secondary Master/Slave PIO

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.
The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33 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, select Auto to enable BIOS support.
The Choice: Auto, Disabled.

USB Controller

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.
The choice: Enabled, Disabled.

USB Keyboard/Mouse Support

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard/Mouse.
The choice: Enabled, Disabled.

Init Display First

This item allows you to decide to active whether PCI Slot or on-chip VGA first
The choice: PCI Slot, Onboard/AGP.

AC97 Audio

This item allows you to enable/disable to support AC97 Audio.
The choice: Enabled, Disabled.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector 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 choice: Enabled, Disabled

POWER On Function

This item allows you the select power on event.
The choice: Password, Hot Key, Mouse Left, Mouse Right, Any Key, Button Only, Keyboard 98.

KB Power ON Password

This item allows you to set the keyboard power on password.

Hot Key Power On

This item allows you to select the hot key of the keyboard power on.
The choice: Ctrl-F1~F12.

Onboard Serial Port 1/Port 2/Port3/Port4

Select an address and corresponding interrupt for the first and second serial ports.
The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART Mode Select

This item allows you to select UART mode.
The choice: IrDA, ASKIR, Normal.

RxD, TxD Active

This item allows you to determine the active of RxD, TxD.
The Choice: "Hi, Hi", "Lo, Lo", "Lo, Hi", "Hi, Lo".

IR Transmission delay

This item allows you to enable/disable IR transmission delay.
The choice: Enabled, Disabled.

UR2 Duplex Mode

This item allows you to select the IR half/full duplex funcion.
The choice: Half, Full.

Use IR Pins

This item allows you to select IR transmission routes, one is RxD2m, TxD2 (COM Port) and the other is IR-Rx2Tx2.
The choice: IR-Rx2Tx2, RxD2,TxD2.

Onboard Parallel Port

This item allows you to determine access onboard parallel port controller with which I/O addresses.
The choice: 3BC/IRQ7, 378/IRQ7, 278/IRQ5, Disabled.

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select *Normal, Compatible,* or *SPP* unless you are certain your hardware and software both support one of the other available modes.
The choice: SPP, EPP, ECP, ECP+EPP.

EPP Mode Select

Select EPP port type 1.7 or 1.9.
The choice: EPP1.7, 1.9.

ECP Mode Use DMA

Select a DMA channel for the parallel port for use during ECP mode.
The choice: 3, 1.

PWRON After PWR-Fail

This item allows you to select if you want to power on the system after power failure.
The choice: Off, On, Former-Sts.

Watch Dog Timer Select

This item allows you to define your system if you want the watch dog timer function enable or disable.
The choice: Enable, Disable.

4.7 Power Management Setup

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

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Power Management Setup

ACPI Function	Disabled	Item Help
ACPI Suspend Type	S1(POS)	
Power Management	User Define	Menu Level Ø
Video Off Method	DPMS	
Video off In Suspend	Yes	
Suspend Type	Stop Grant	
MODEM Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
Wake-Up by PCI card	Disabled	
Power On By Ring	Enabled	
USB KB Wake-Up From S3	Disabled	
PWRON After PWR-Fail	Former-Sts	
CPU Thermal-Throttling	50.0%	
Resume by Alarm	Disabled	
X Date(of Month) Alarm	0	
X Time(hh:mm:ss) Alarm	0 0 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ [A-D]#	Disabled	

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

Figure 4-7 Power Management Setup

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).
The choice: Enabled, Disabled.

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down
2. Doze Mode
3. Suspend Mode

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU's**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Video Off Method

This determines the manner in which the monitor is blanked.

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	Initial display power management signaling.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.
The choice: Enabled, Disabled.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
The choice: Enabled, Disabled.

Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off State when the system has "hung."
The choice: Delay 4 Sec, Instant-Off.

Wake-Up by PCI Card

An input signal from PME on the PCI card awakens the system from a soft off state.
The choice: Enabled, Disabled.

Power On by Ring

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.
The choice: Enabled, Disabled.

Wake Up On LAN

This item allows you to wake up the system from LAN from remote host.
The choice: Enabled, Disabled.

USB KB Wake-Up from S3

This item will enable you to wake-up the system by USB keyboard when you shut down the computer in S3 mode.
The choice: Enabled, Disabled.

CPU Thermal-Throttling

Select the CPU THRM-Throttling rate.
The choice: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

Resume by Alarm

When *Enabled*, your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.
The choice: Enabled, Disabled.

PM Events

PM events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode.
In effect, the system remains alert for anything, which occurs to a device that is configured as *Enabled*, even when the system is in a power down mode.

Primary IDE 0
Primary IDE 1
Secondary IDE 0
Secondary IDE 1
FDD, COM, LPT Port
PCI PIRQ[A-D] #

4.8 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI (**P**ersonal **C**omputer **I**nterconnect) is a system which allows I/O devices to operate at speeds nearing the speed of CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

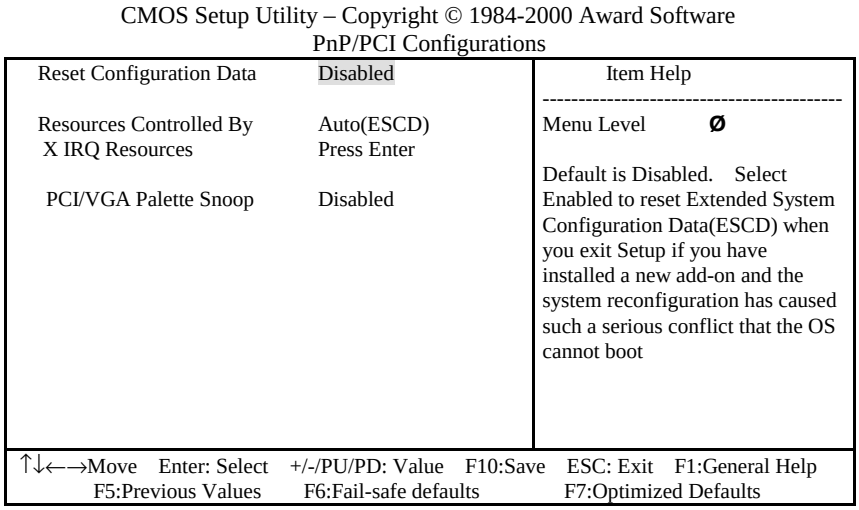

Figure 4-8 PnP/PCI Configurations

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.
The choice: Enabled, Disabled.

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "Ø").
The choice: Auto (ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

PCI/VGA Palette Snoop

Leave this field at *Disabled*.
The choice: Enabled, Disabled.

4.9 PC Health Status

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PC Health Status

CPU Warning Temperature	Disabled	Item Help
Current System Temp.		
Current CPU1 Temperature		Menu Level Ø
Current CPU2 Temperature		
Current CPUFAN1 Speed		
Current CPUFAN2 Speed		
Current CPUFAN3 Speed		
IN0(V)		
IN1(V)		
IN2(V)		
+ 5 V		
+12 V		
-12 V		
- 5 V		
VBAT(V)		
5VSB(V)		
Shutdown temperature	Disabled	

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

Figure 4-9 PC Health Status

CPU Warning Temperature

This item will prevent CPU from overheating.
The choice: 30-120.

Current System Temp.

Show you the current system temperature.

Current CPU1 Temperature

Show you the current CPU1 temperature.

Current CPUFAN 1/2/3 Speed

Show you the current CPUFAN operating speed.

IN0/1/2 (V)

Show you the voltage of Vin (0)/(1)/(2).

+5V/+12V/-12V/-5V

Show you the voltage of +5V/+12V/-12V/-5V.

Shutdown Temperature

This item allows you to set up the CPU shutdown Temperature. This item only effective under Windows 98 ACPI mode.

The Choice: Disabled, 60°C/140°F, 65°C/149°F, 70°C/159°F, 75°C/167°F.

Frequency/Voltage Control

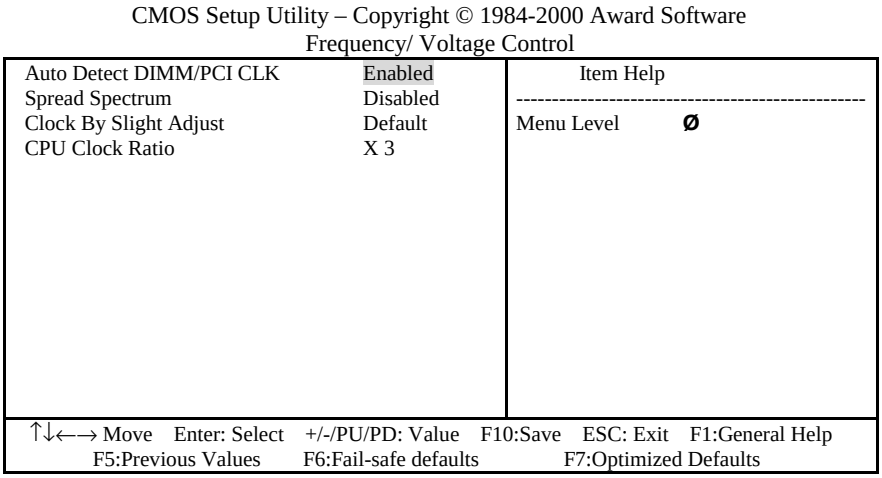


Figure 4-10 Frequency/ Voltage Control

Auto Detect DIMM/PCI CLK

When enabled, this item will auto detect if the DIMM and PCI socket have devices and will send clock signal to DIMM and PCI devices. When disabled, it will send the clock signal to all DIMM and PCI socket.
The choice: Enabled, Disabled.

Spread Spectrum

This item allows you to enable/disable the spread spectrum modulates.
The choice: Enabled, Disabled.

CPU Clock Ratio

This item allows you to set up the CPU clock ratio, but this function depends on different CPU performance. It is only effective for those clock ratios hasn't been locked.
The choice: X3.0~X8.0.

4.10 Defaults Menu

Selecting "Defaults" from the main menu shows you two options, which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

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

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.11 Supervisor/User Password Setting

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

Supervisor password: can enter and change the options of the setup menus.

User password: just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

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

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

PASSWORD DISABLED.

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

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

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

4.12 Exit Selecting

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

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

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

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

4.13 POST Messages

During the Power On Self-Test (POST), if the BIOS detect an error requiring you to do something to fix, it will either sound a beep code or display a message.
If a message is displayed, it will be accompanied by:
PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there are two kinds of beep codes in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

Error Messages

One or more of the following messages may be displayed if the BIOS detect an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. A weak battery may have caused this error. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA Configuration Checksum Error
PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA Configuration Is Not Complete
PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT
Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration
PLEASE RUN EISA CONFIGURATION UTILITY
The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

KEYBOARD ERROR OR NO KEYBOARD PRESENT
Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.
If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory Address Error at...
Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at...
Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED SINCE LAST BOOT
Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory Verify Error at...
Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS NOT FOUND
This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

OFFENDING SEGMENT:
This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT
This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT
When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT...
Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found
PLEASE RUN EISA CONFIGURATION UTILITY
A valid board ID was found in a slot that was configured as having no boards ID.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should Have EISA Board But Not Found
PLEASE RUN EISA CONFIGURATION UTILITY
The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot Not Empty
Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT...
Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong Board in Slot
PLEASE RUN EISA CONFIGURATION UTILITY
The board ID does not match the ID stored in the EISA non-volatile memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

FLOPPY DISK (S) fail (80) ® Unable to reset floppy subsystem.

FLOPPY DISK (S) fail (40) ® Floppy Type dismatch.

Hard Disk(s) fail (80) ® HDD reset failed

Hard Disk(s) fail (40) ® HDD controller diagnostics failed.

Hard Disk(s) fail (20) ® HDD initialization error.

Hard Disk(s) fail (10) ® Unable to recalibrate fixed disk.

Hard Disk(s) fail (08) ® Sector Verify failed.

Keyboard is locked out - Unlock the key.

BIOS detect the keyboard is locked. P17 of keyboard controller is pulled low.

Keyboard error or no keyboard present.
Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop.
System will repeat POST procedure infinitely while the P15 of keyboard controller is pull low. This is also used for M/B burn in test.

BIOS ROM checksum error - System halted.
The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail.
BIOS reports the memory test fail if the onboard memory is tested error.

4.14 POST Codes

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved

POST (hex)	Description
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved

POST (hex)	Description
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed…
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.

POST (hex)	Description
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD(optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h

POST (hex)	Description
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, and CDROM
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: wClear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices

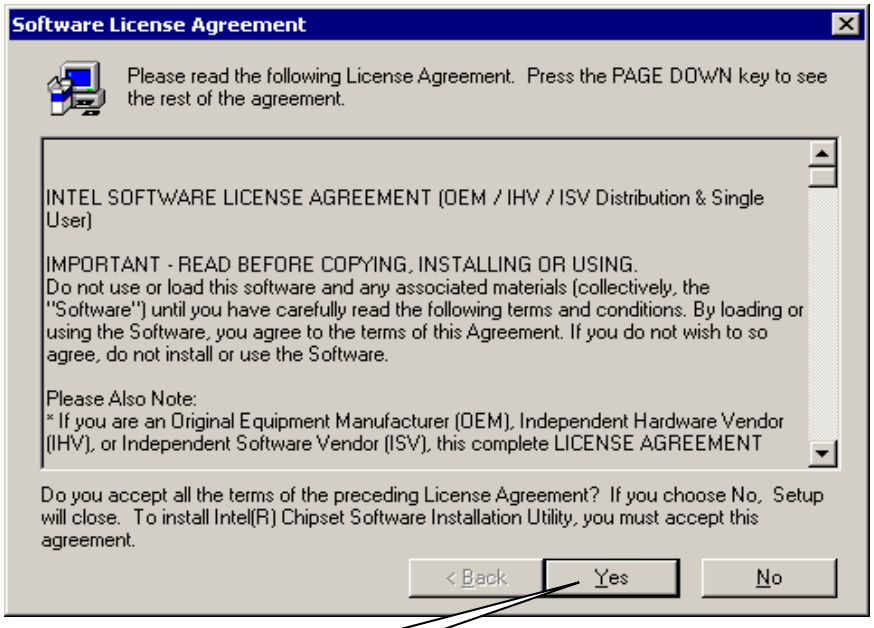
POST (hex)	Description
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

Chapter 5
Software Setup

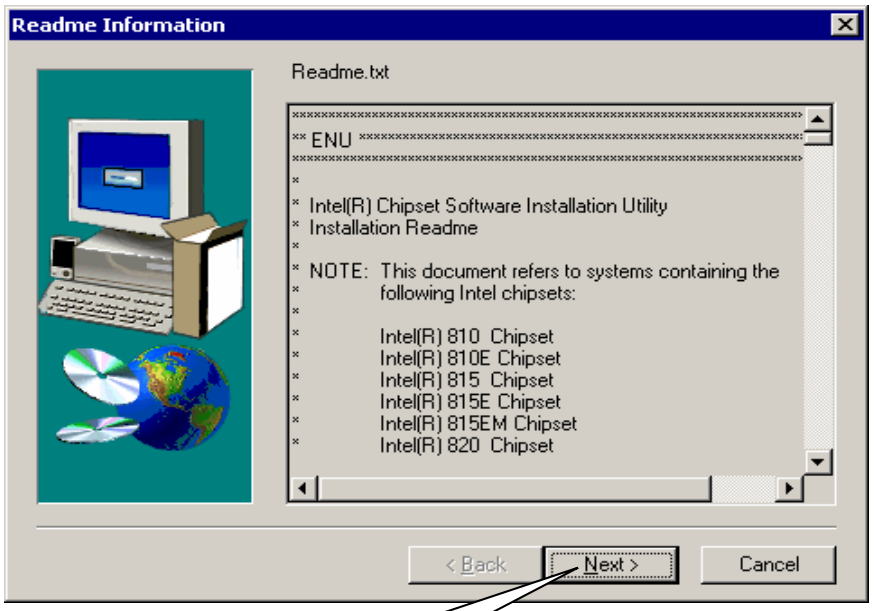
5.1 INF Update Utility for Intel 815E Chipset

Insert the CD that came with GT-650 single board computer into your CD_ROM driver, You will find the setup utility under different OS.
Change to the directory for different OS will find the "setup.exe" utility program, double-click on the setup utility to bring up to setup screen.

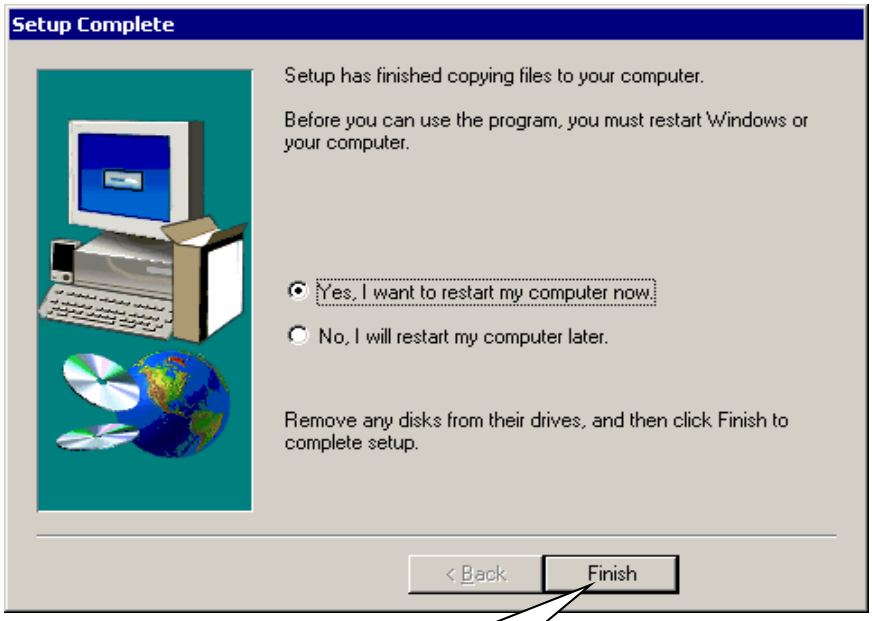
For Windows 98, Windows ME and Windows 2000 system, please following the step to complete the driver update.



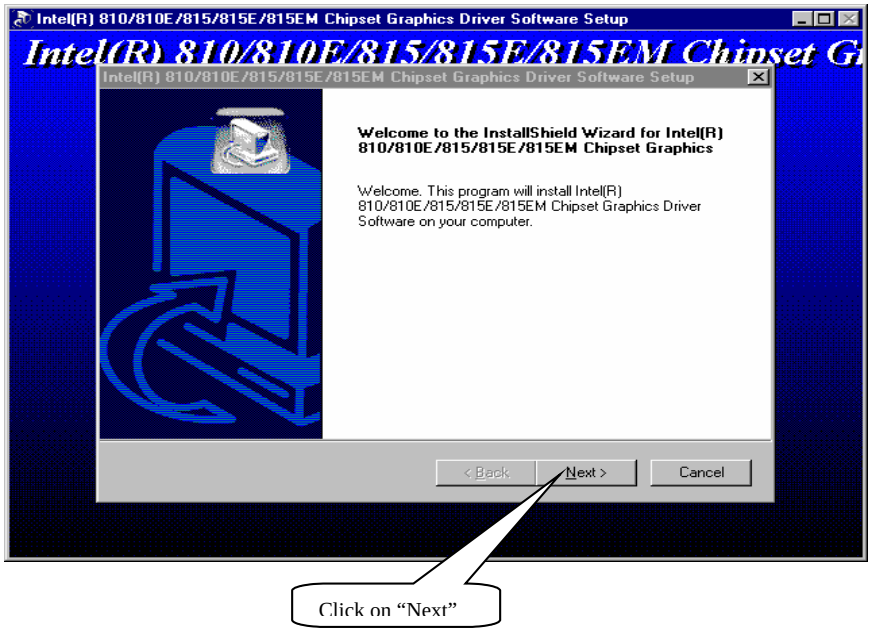
Click on "Yes"



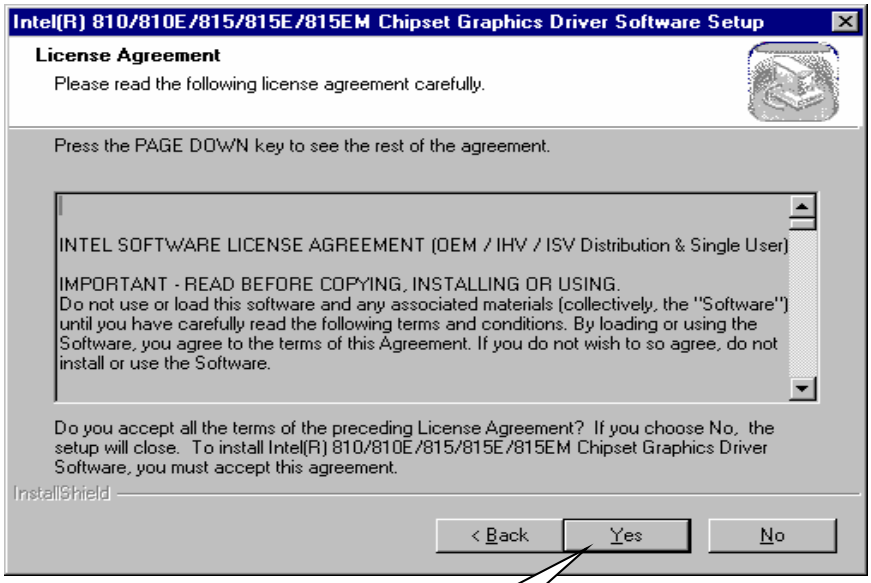
Click on "Next"


Setup Complete
Setup has finished copying files to your computer.
Before you can use the program, you must restart Windows or 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
Click "Finish" to restart computer

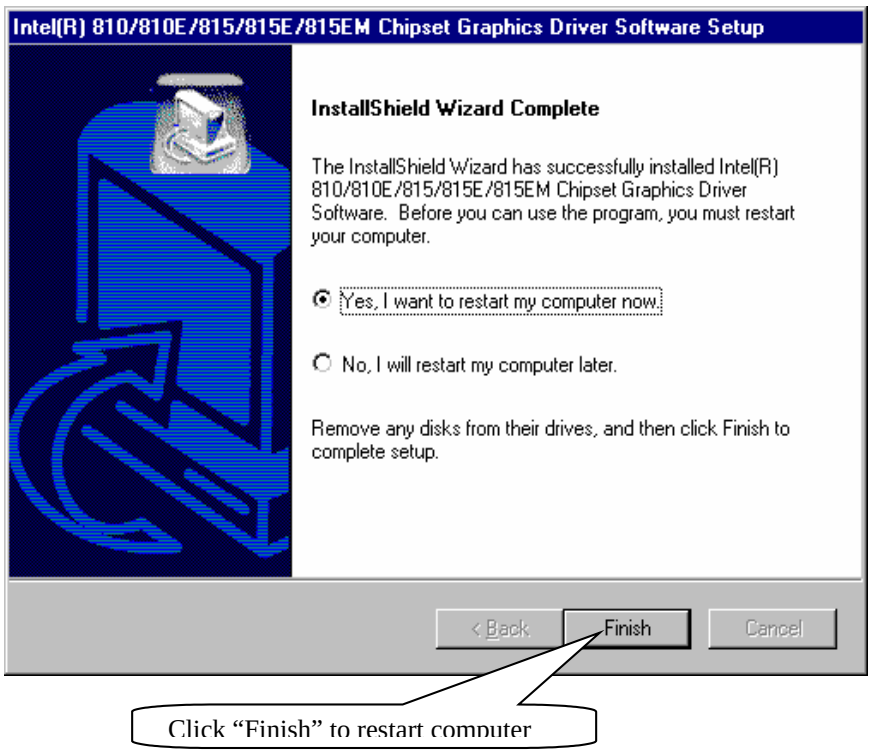
For Windows NT 4.0 system



Click on "Next"

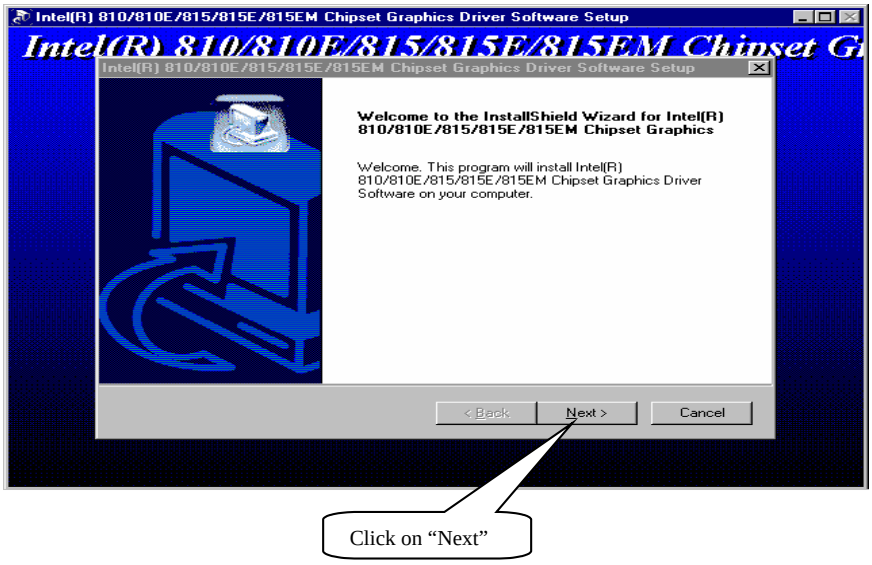


Click on "Yes"

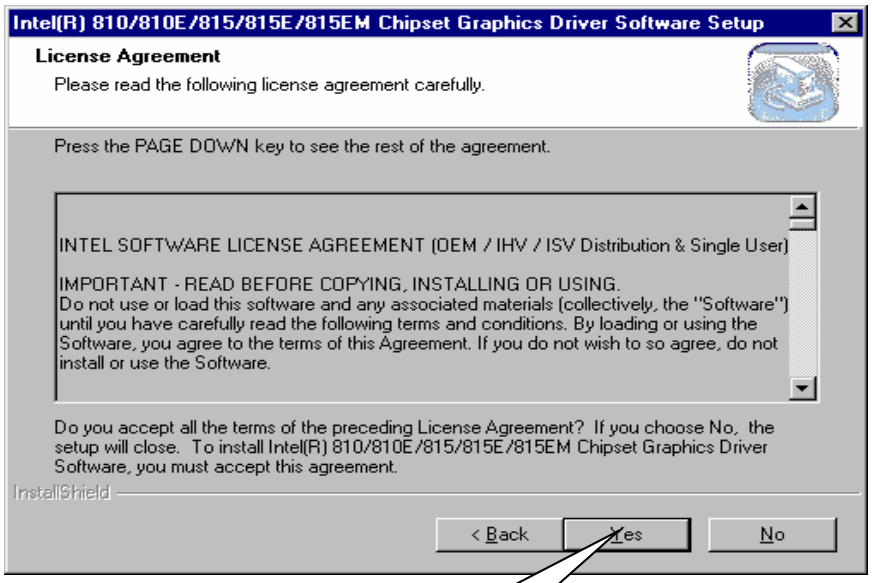

Intel(R) 810/810E/815/815E/815EM Chipset Graphics Driver Software Setup
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Intel(R) 810/810E/815/815E/815EM Chipset Graphics Driver Software. Before you can use the program, you must restart your computer.
Yes, I want to restart 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
Click "Finish" to restart computer

5.2 Intel 815E Chipset Graphic Control Driver

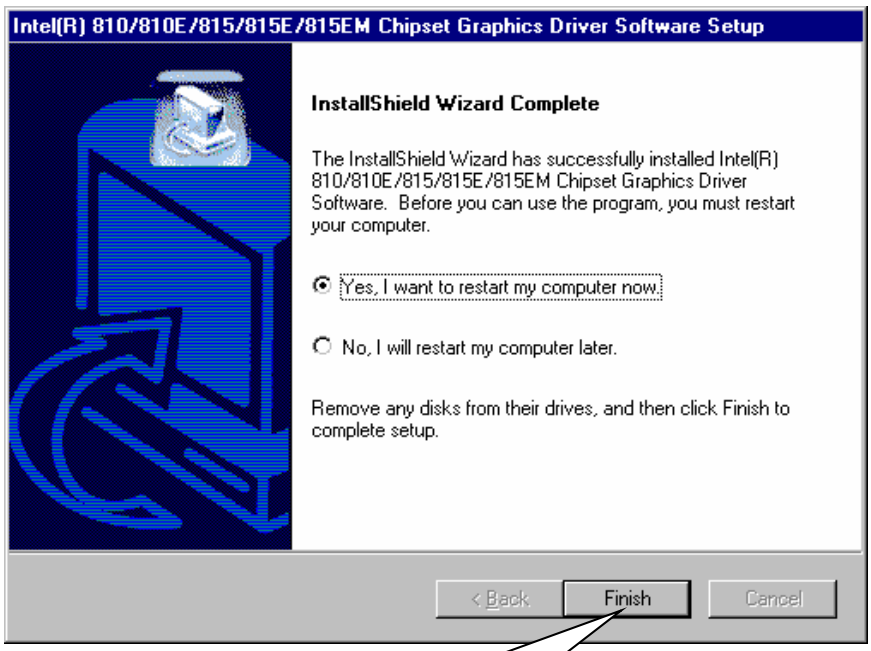
For Windows 98, Windows ME, Windows 2000 and Windows NT4.0 system



Click on "Next"



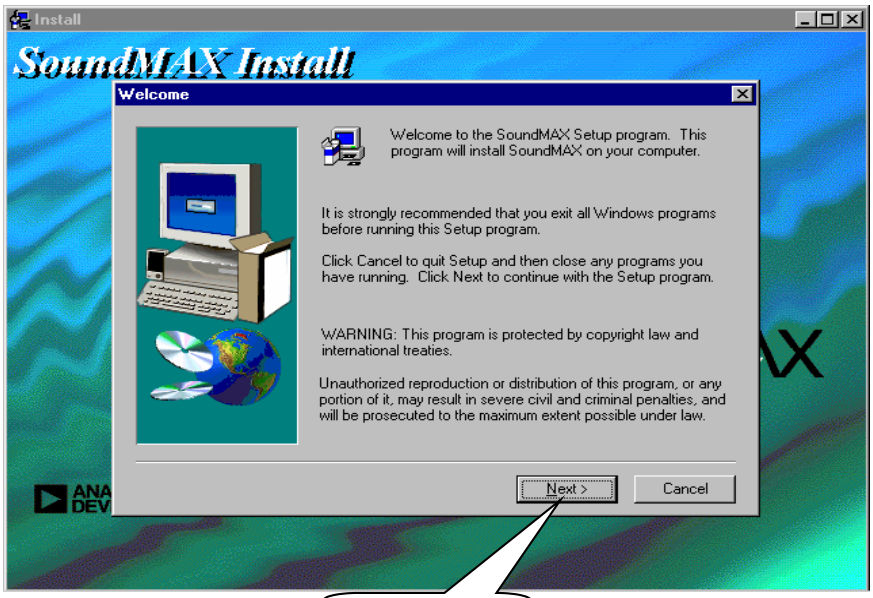
Click on "Yes"

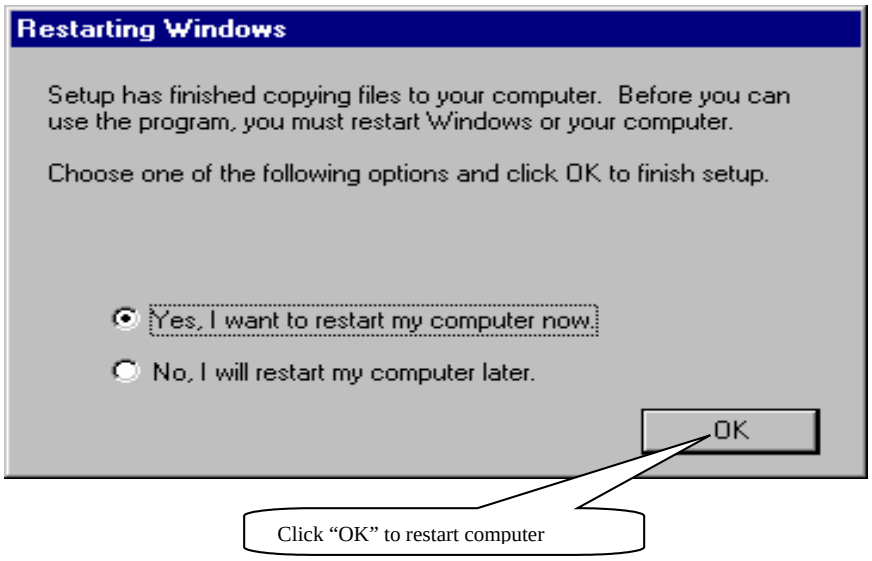


Click "Finish" to restart computer

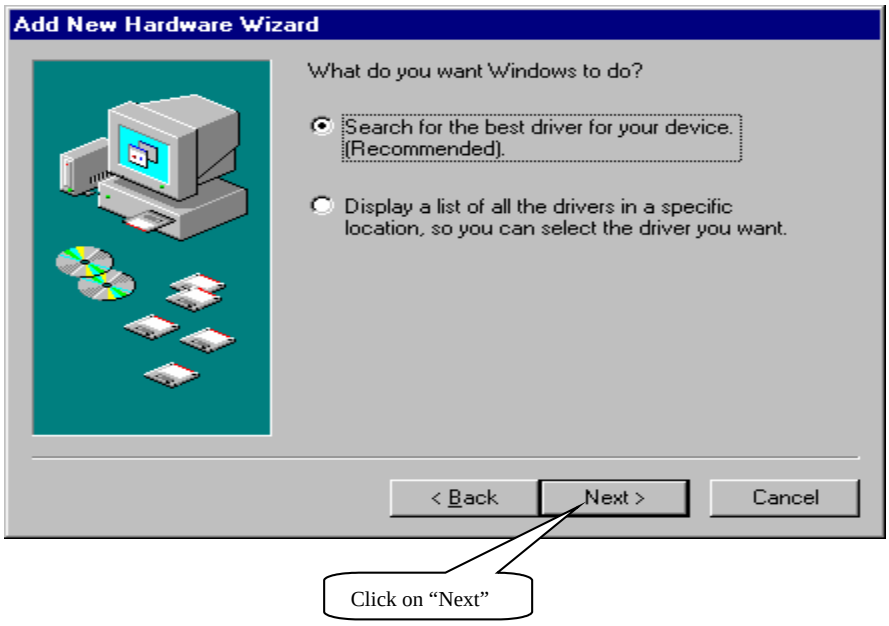
5.3 PCI Multimedia Audio Device

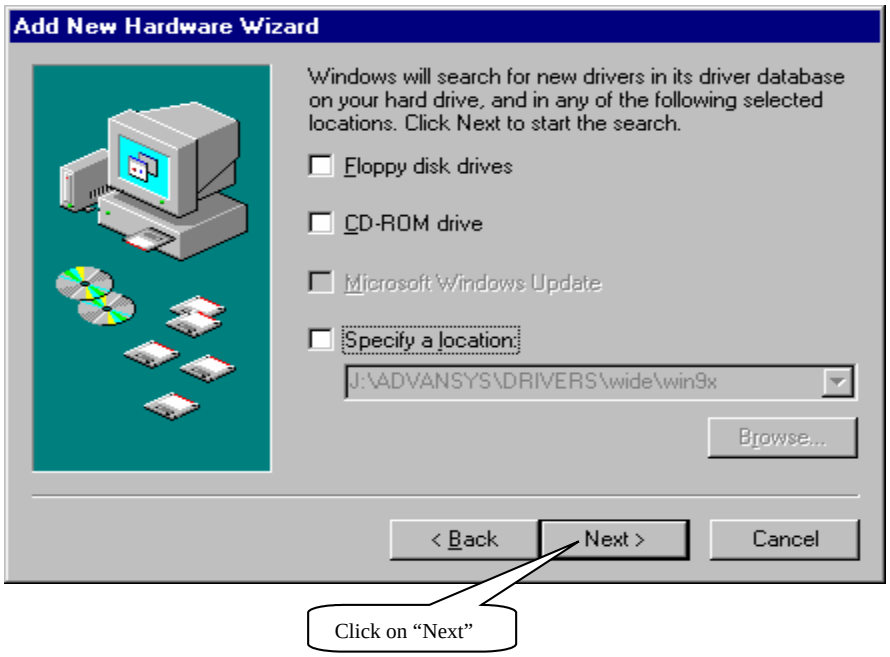
For Windows 98 and Windows ME system





5.3.1 PCI Multimedia Audio Device Found

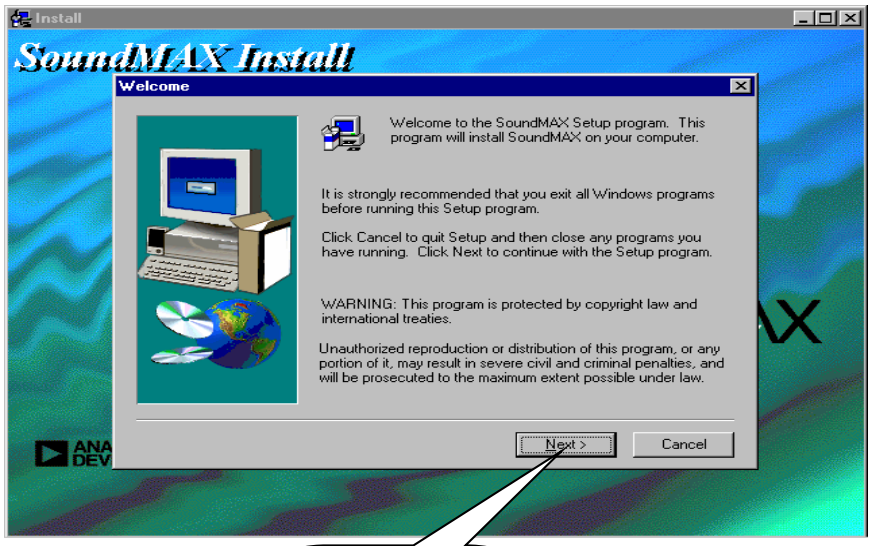



Add New Hardware Wizard
Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.
Floppy disk drives
CD-ROM drive
Microsoft Windows Update
Specify a location:
J:\ADVANSYS\DRIVERS\wide\win9x
Browse...
< Back
Next >
Cancel
Click on "Next"

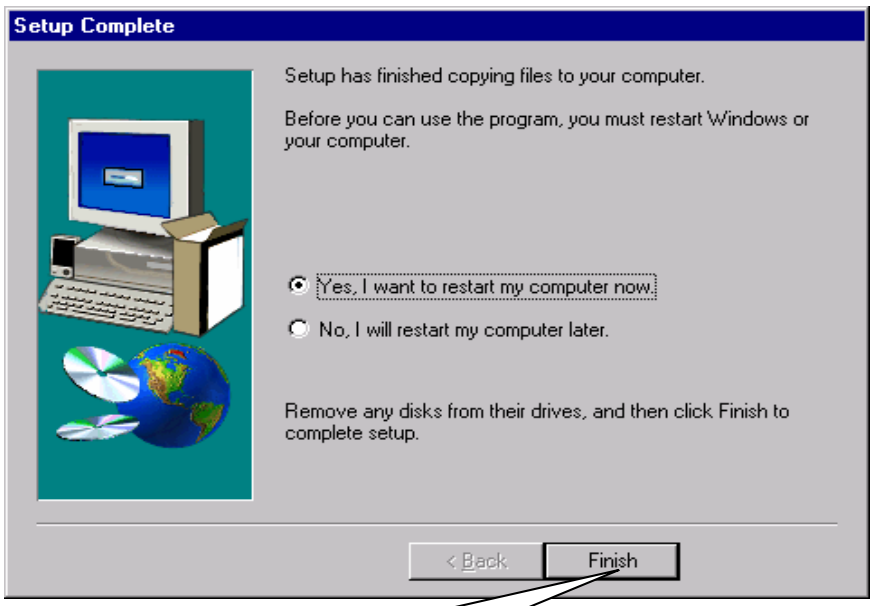
Add New Hardware Wizard
Windows driver file search for the device:
SoundMAX Integrated Digital Audio
Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.
Location of driver:
C:\WINDOWS\INF\OTHER\SMWDM.INF
< Back
Next >
Cancel
Click on "Next"

Add New Hardware Wizard
SoundMAX Integrated Digital Audio
Windows has finished installing the software that your new hardware device requires.
< Back
Finish
Cancel
Click "Finish"

For Windows 2000 and Windows NT4.0 system



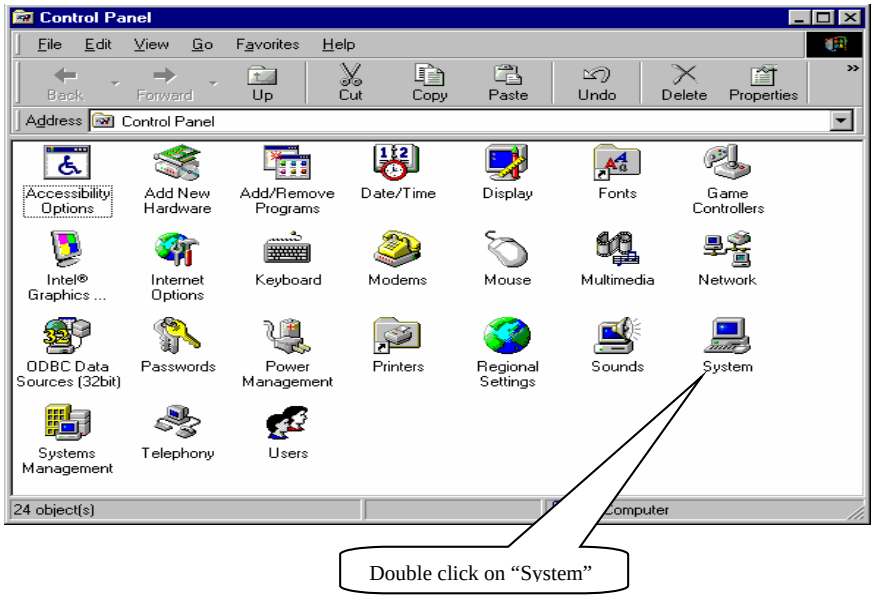
Click on "Next"

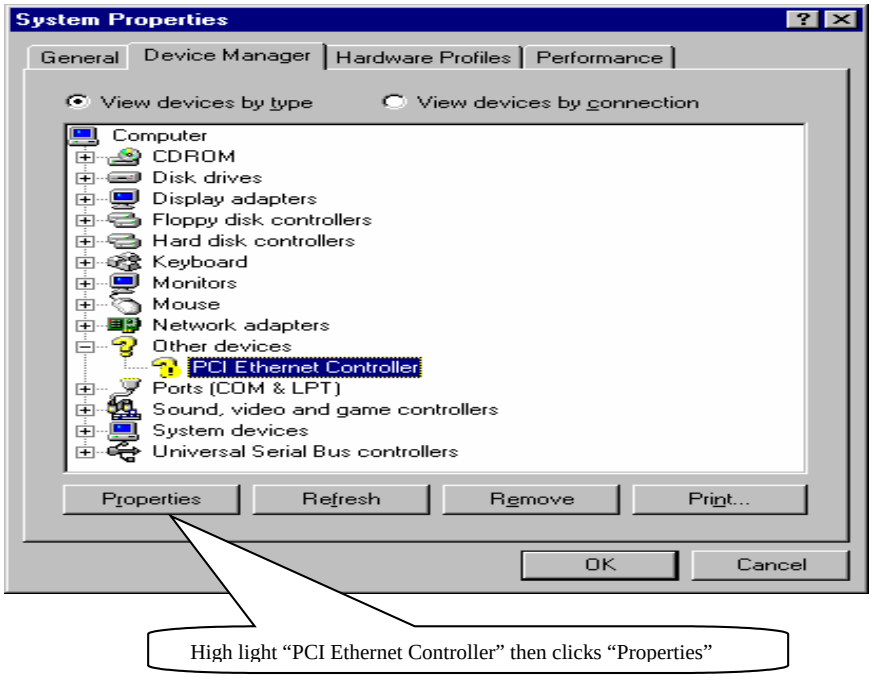


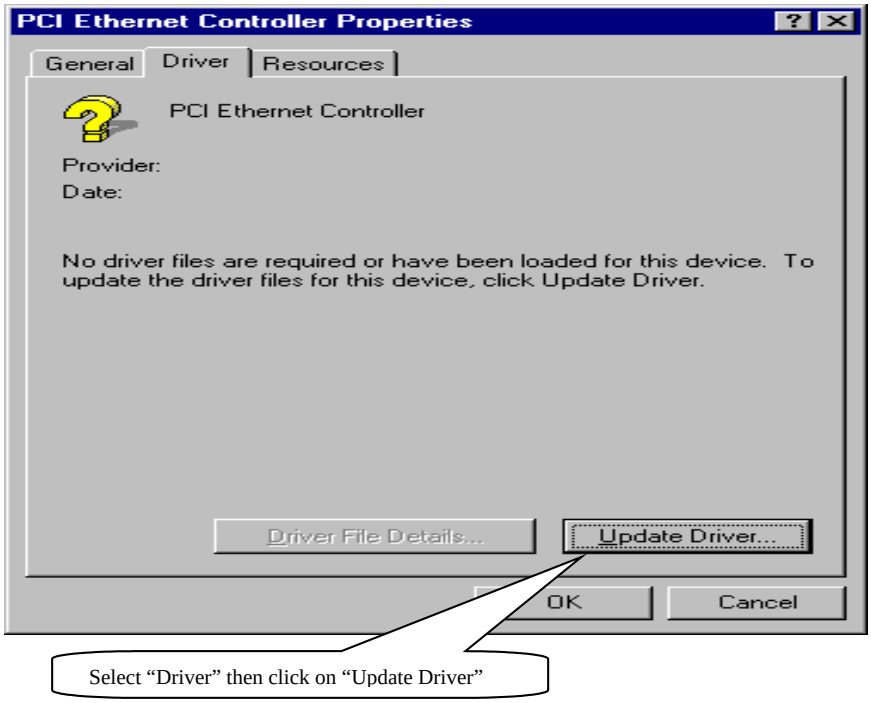
Click "Finish" to restart computer

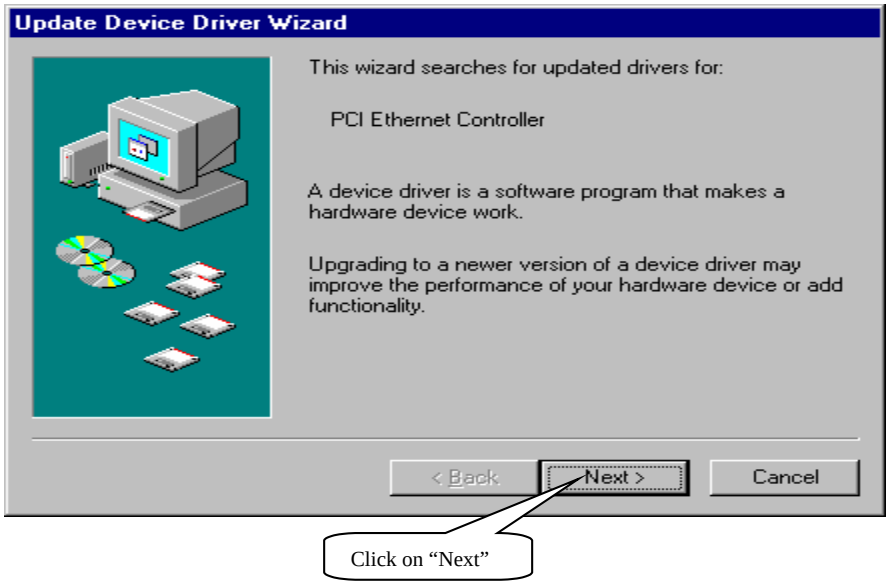
5.4 PCI Ethernet Controller Found

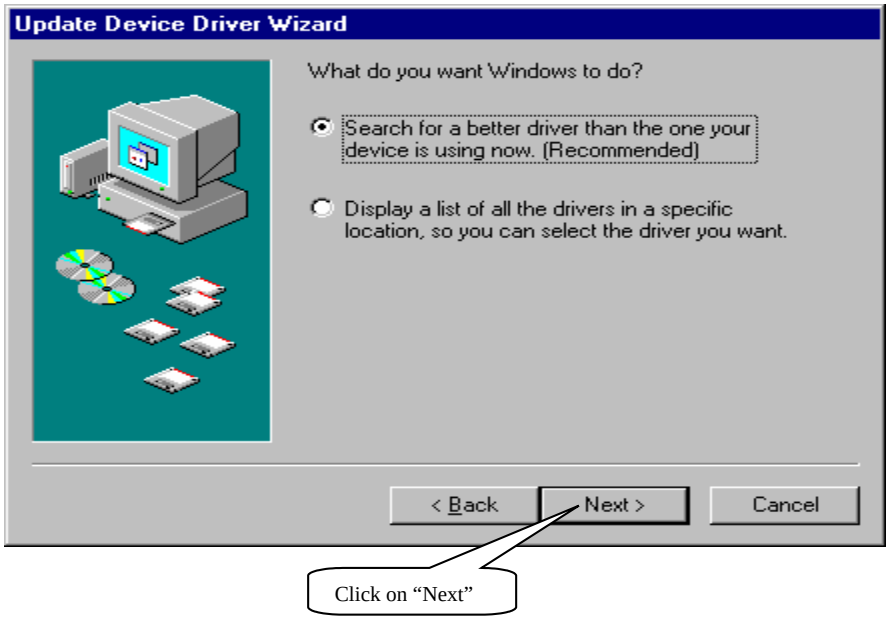
5.4.1 For windows 98

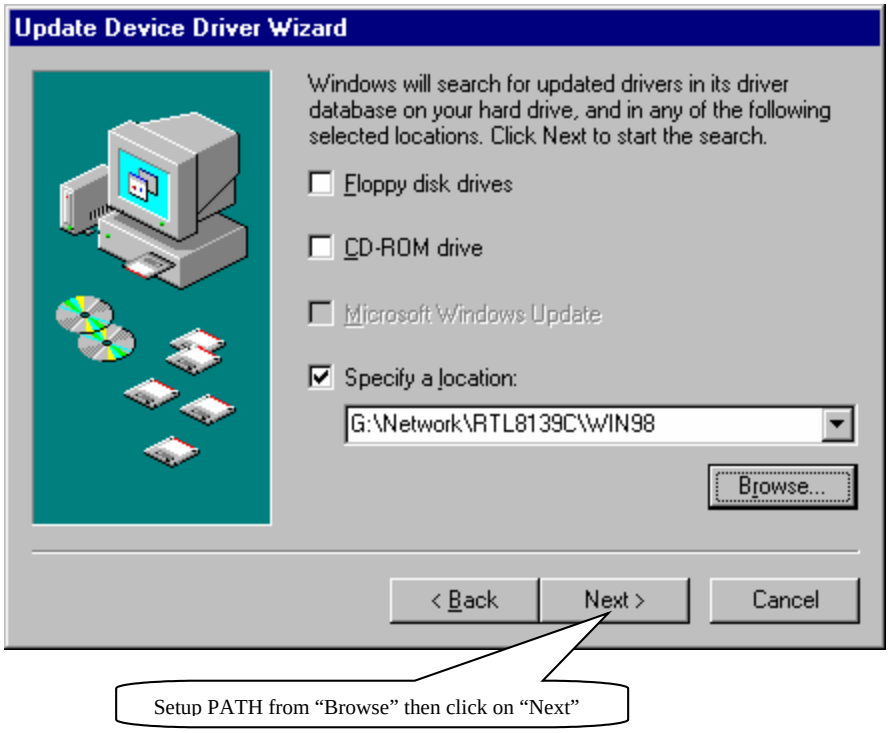


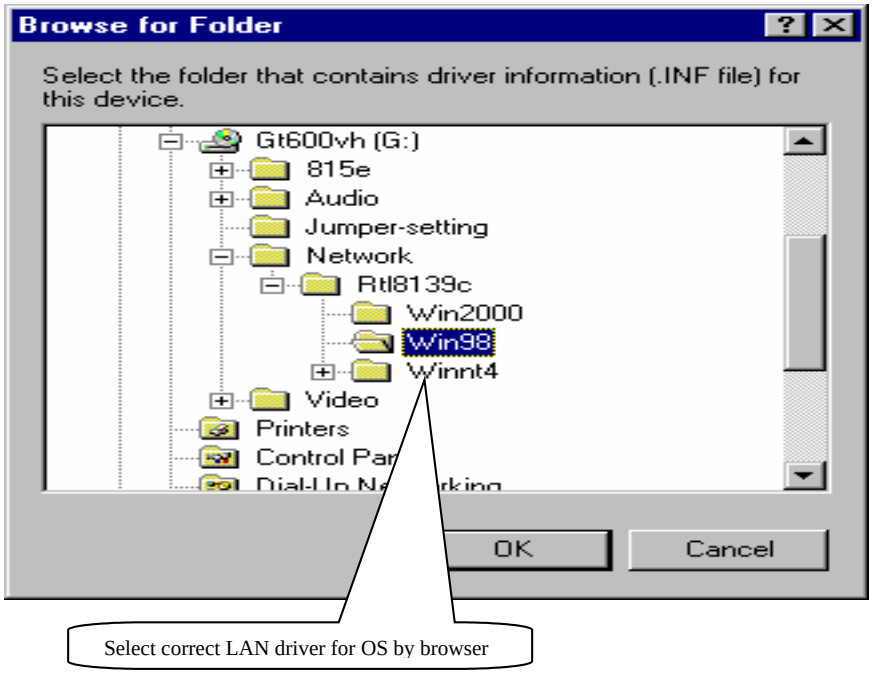



PCI Ethernet Controller Properties
General
Driver
Resources
PCI Ethernet Controller
Provider:
Date:
No driver files are required or have been loaded for this device. To update the driver files for this device, click Update Driver.
Driver File Details...
Update Driver...
OK
Cancel
Select "Driver" then click on "Update Driver"


Update Device Driver Wizard
This wizard searches for updated drivers for:
PCI Ethernet Controller
A device driver is a software program that makes a hardware device work.
Upgrading to a newer version of a device driver may improve the performance of your hardware device or add functionality.
< Back
Next >
Cancel
Click on "Next"

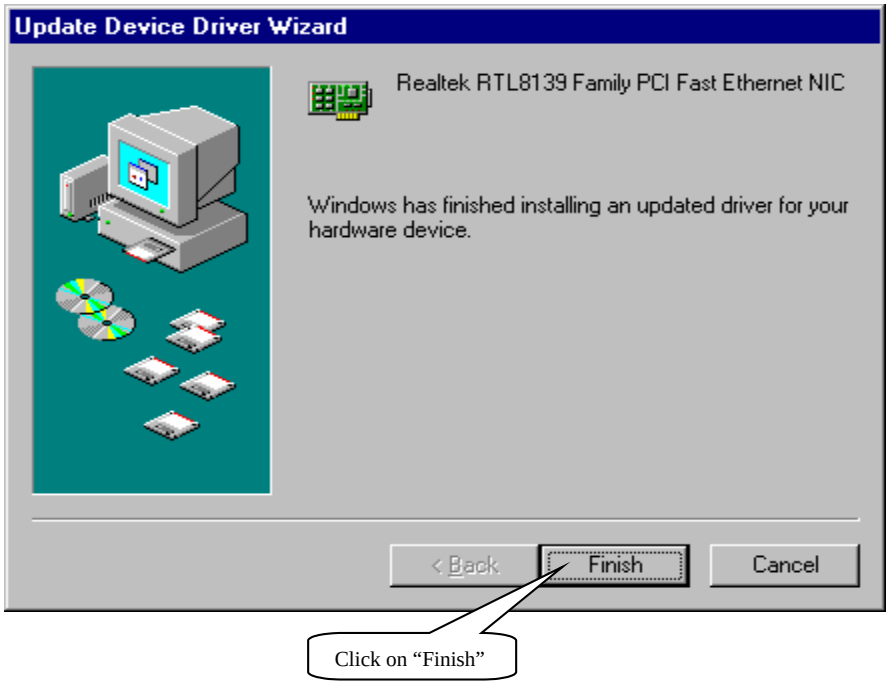

Update Device Driver Wizard
What do you want Windows to do?
Search for a better driver than the one your device is using now. (Recommended)
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel
Click on "Next"

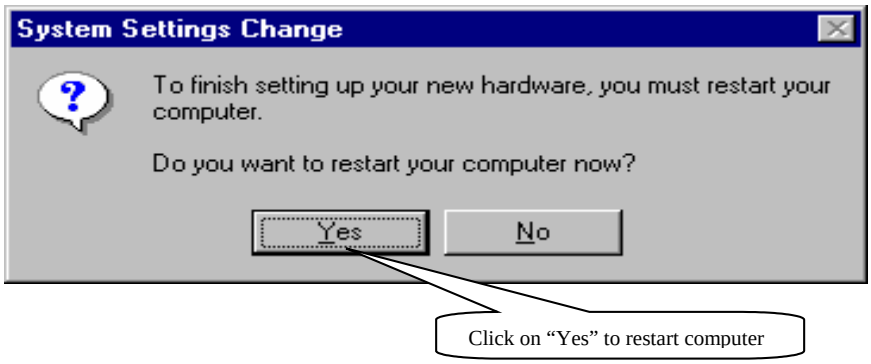

Update Device Driver Wizard
Windows will search for updated drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.
Floppy disk drives
CD-ROM drive
Microsoft Windows Update
Specify a location:
G:\Network\RTL8139C\WIN98
Browse...
< Back
Next >
Cancel
Setup PATH from "Browse" then click on "Next"



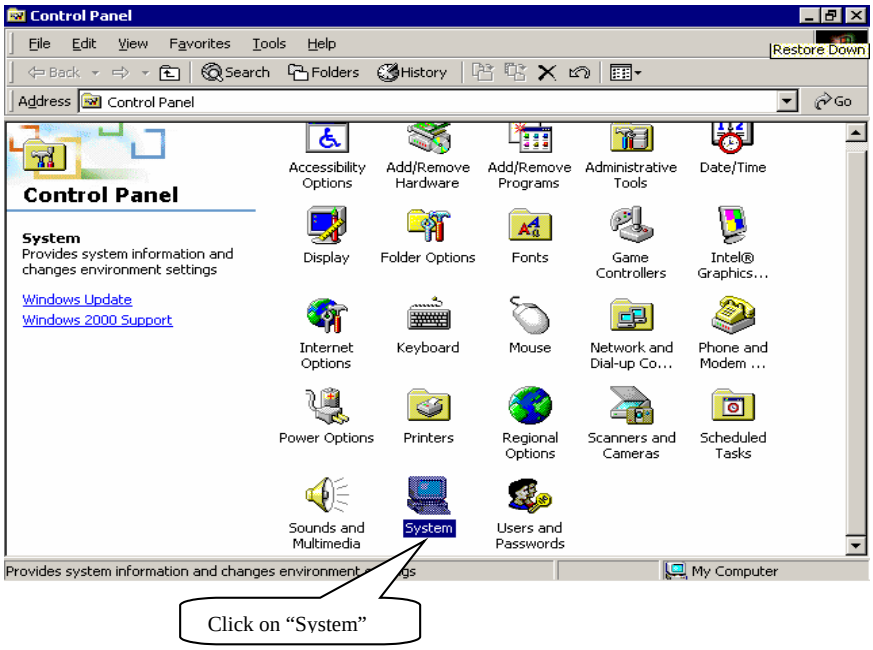
Select correct LAN driver for OS by browser

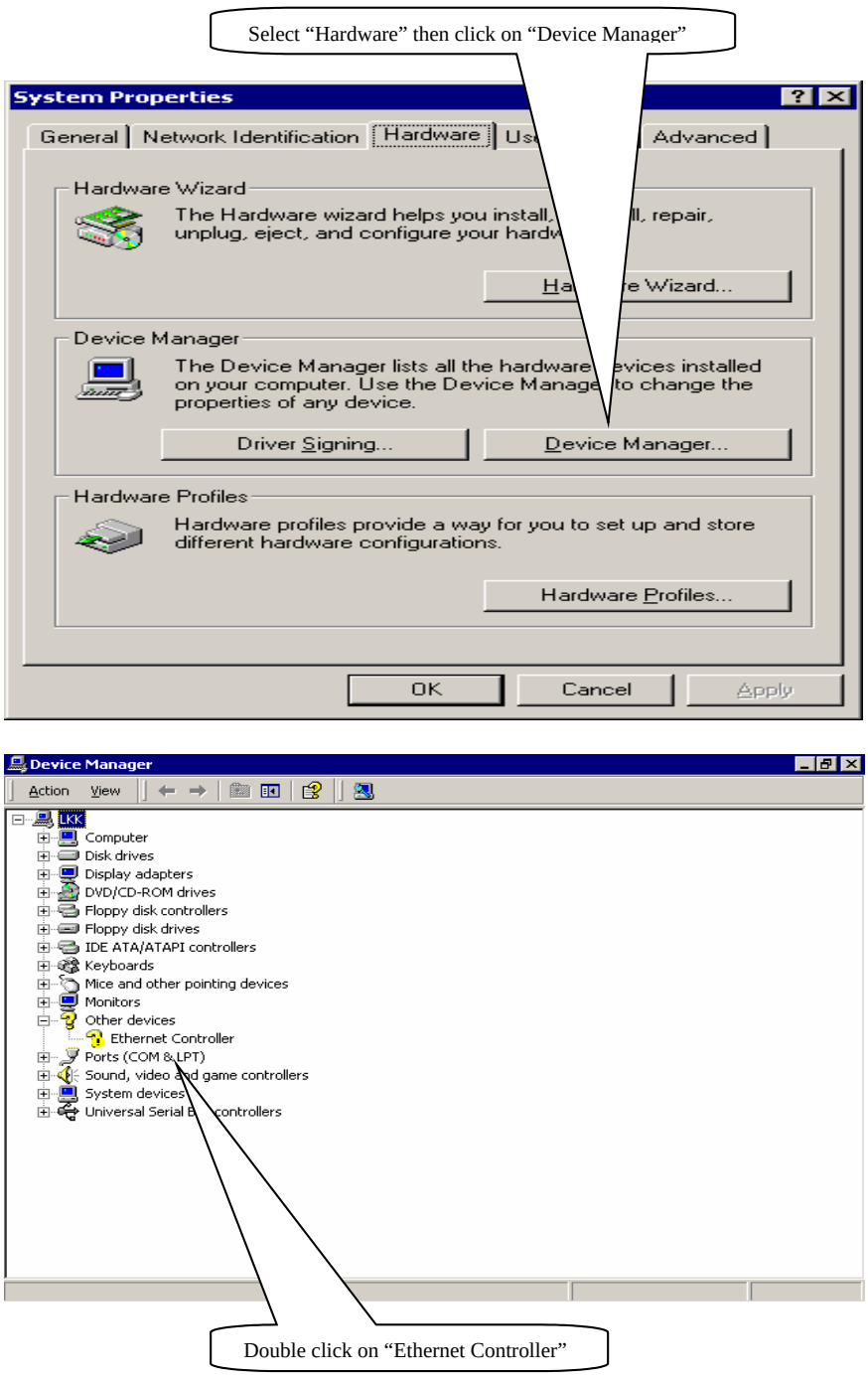
Click on "Next"

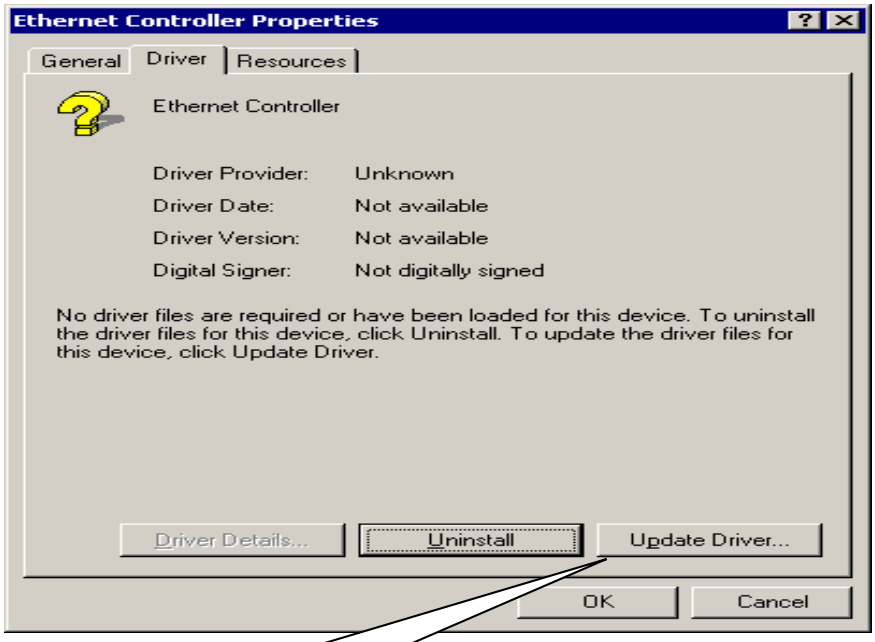

Update Device Driver Wizard
Realtek RTL8139 Family PCI Fast Ethernet NIC
Windows has finished installing an updated driver for your hardware device.
< Back
Finish
Cancel
Click on "Finish"


System Settings Change
To finish setting up your new hardware, you must restart your computer.
Do you want to restart your computer now?
Yes
No
Click on "Yes" to restart computer

5.4.2 For Windows 2000 system

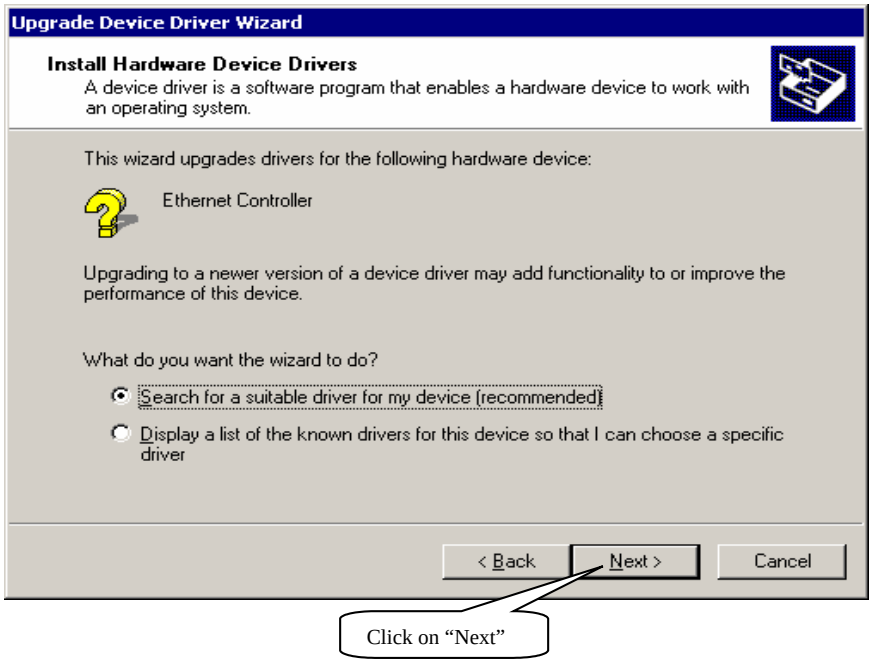



Select "Hardware" then click on "Device Manager"
System Properties
General
Network Identification
Hardware
Advanced
Hardware Wizard
The Hardware wizard helps you install, repair, unplug, eject, and configure your hardw
Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manage to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply
Device Manager
Action
View
LKK
Computer
Disk drives
Display adapters
DVD/CD-ROM drives
Floppy disk controllers
Floppy disk drives
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Other devices
Ethernet Controller
Ports (COM & LPT)
Sound, video and game controllers
System devices
Universal Serial B controllers
Double click on "Ethernet Controller"

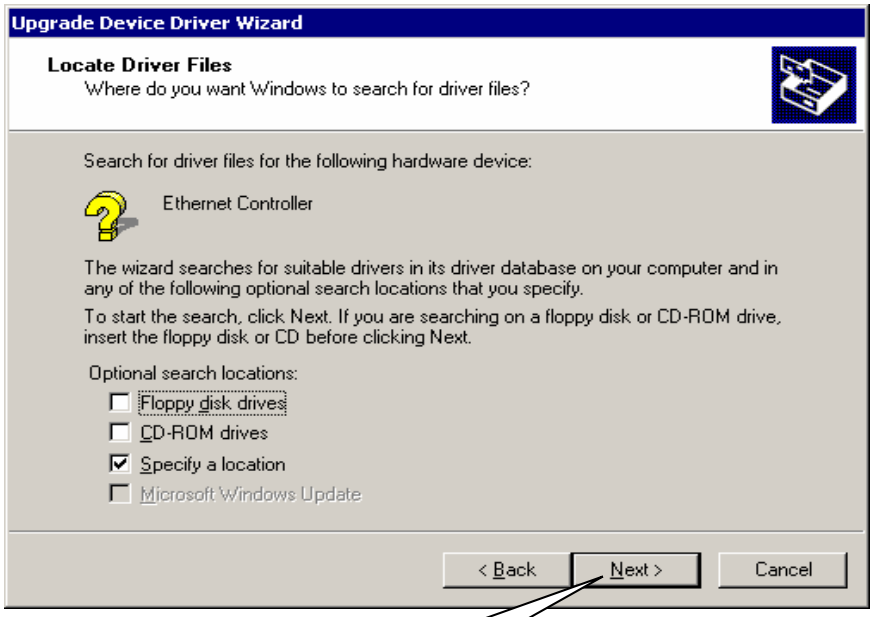


Select "Driver" then click on "Update

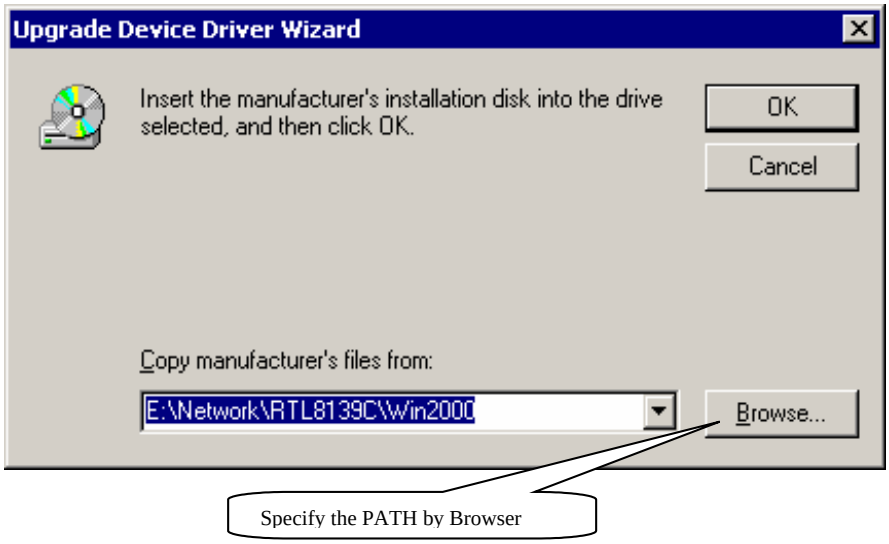
Click on "Next"

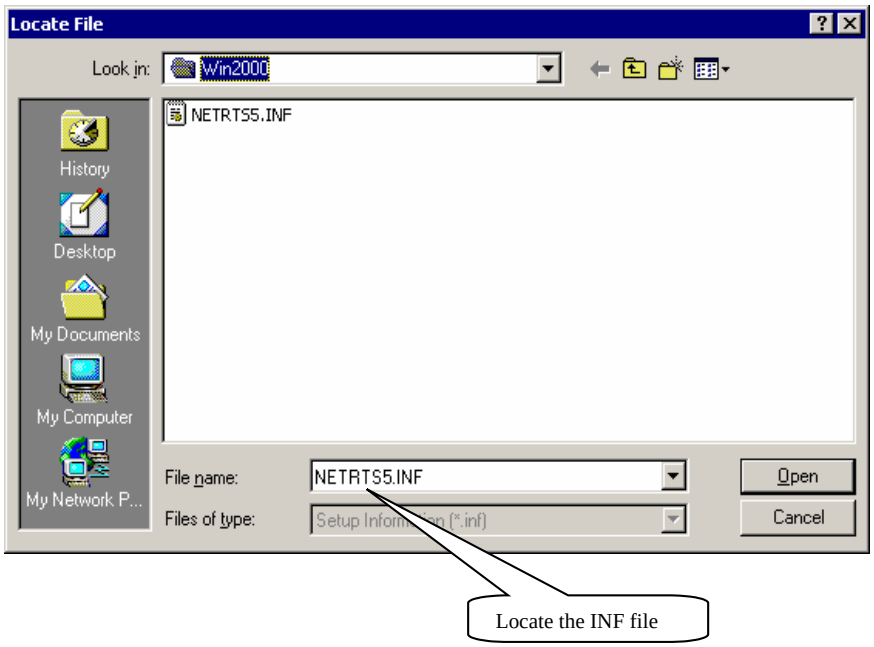


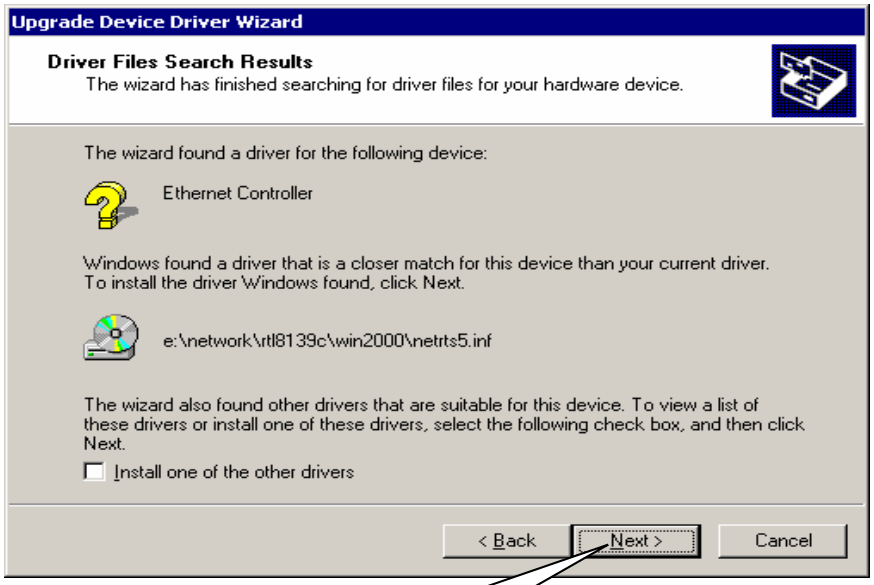
Click on "Next"



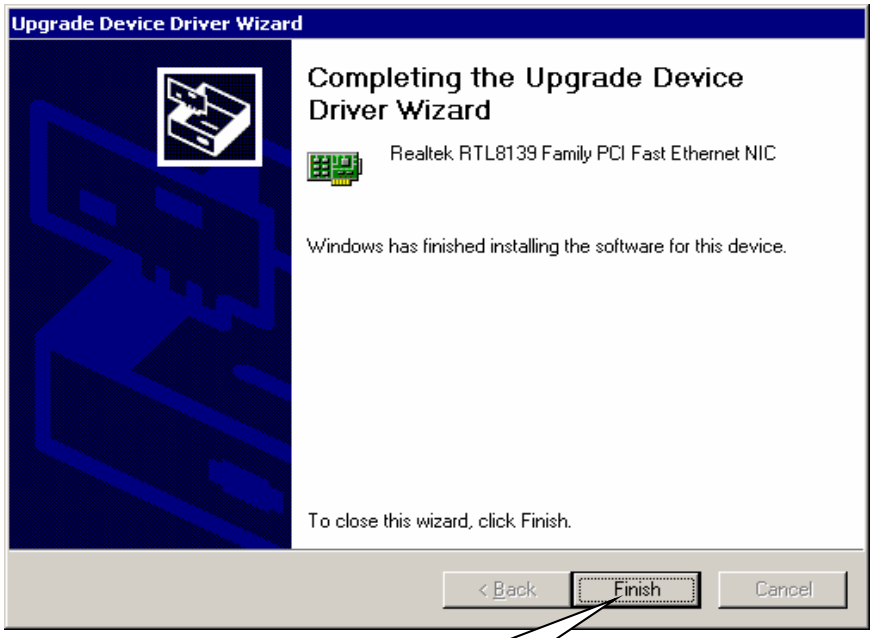
Click on "Next"


Upgrade Device Driver Wizard
Insert the manufacturer's installation disk into the drive selected, and then click OK.
OK
Cancel
Copy manufacturer's files from:
E:\Network\RTL8139C\Win2000
Browse...
Specify the PATH by Browser

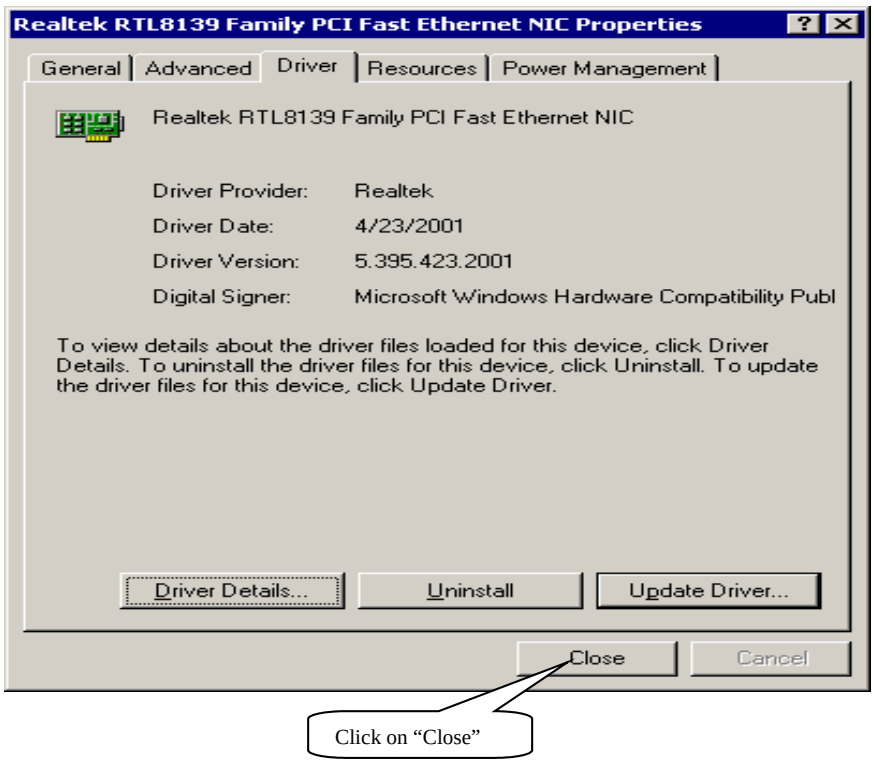

Locate File
Look in:
Win2000
NETRTS5.INF
History
Desktop
My Documents
My Computer
My Network P...
File name:
NETRTS5.INF
Files of type:
Open
Cancel
Locate the INF file



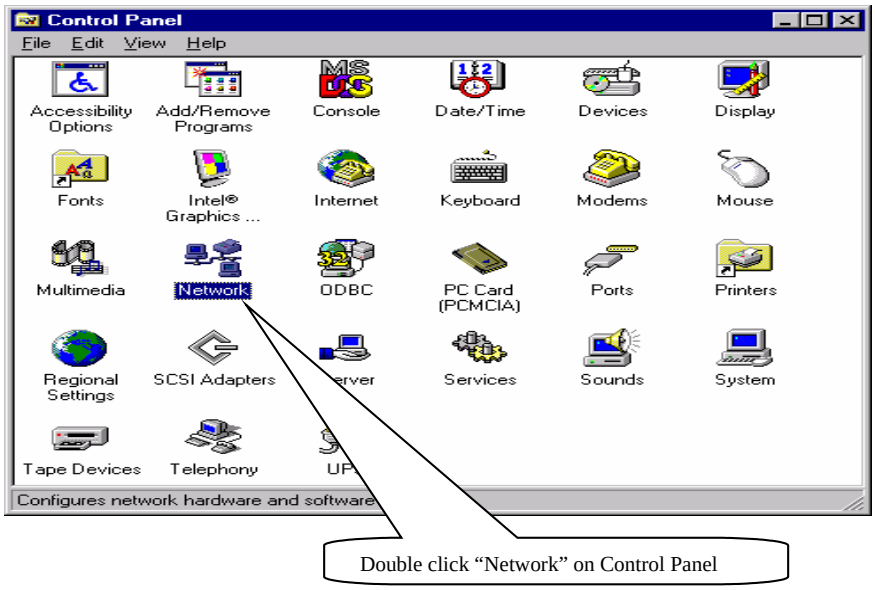
Click on "Next"

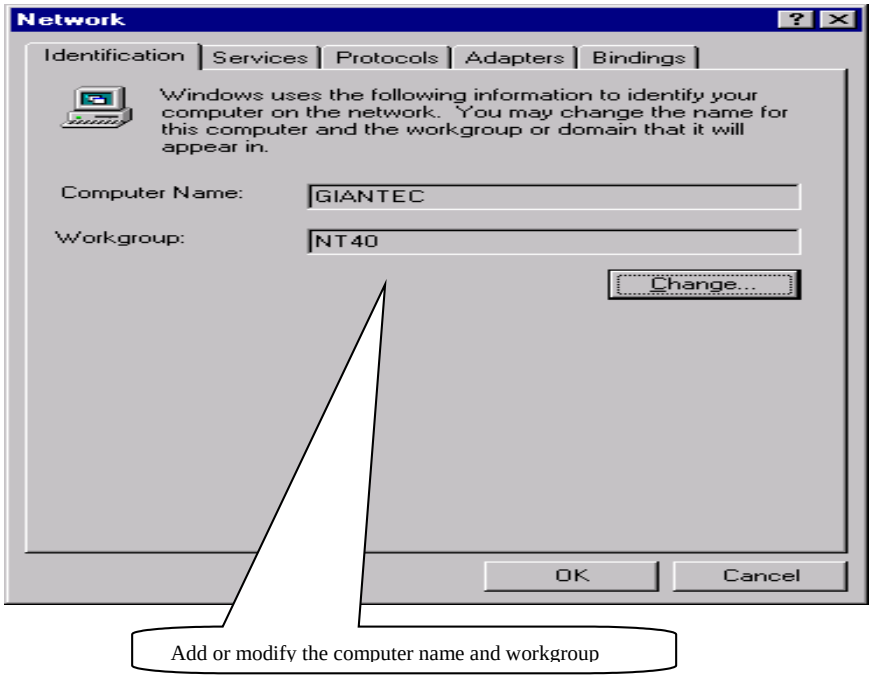


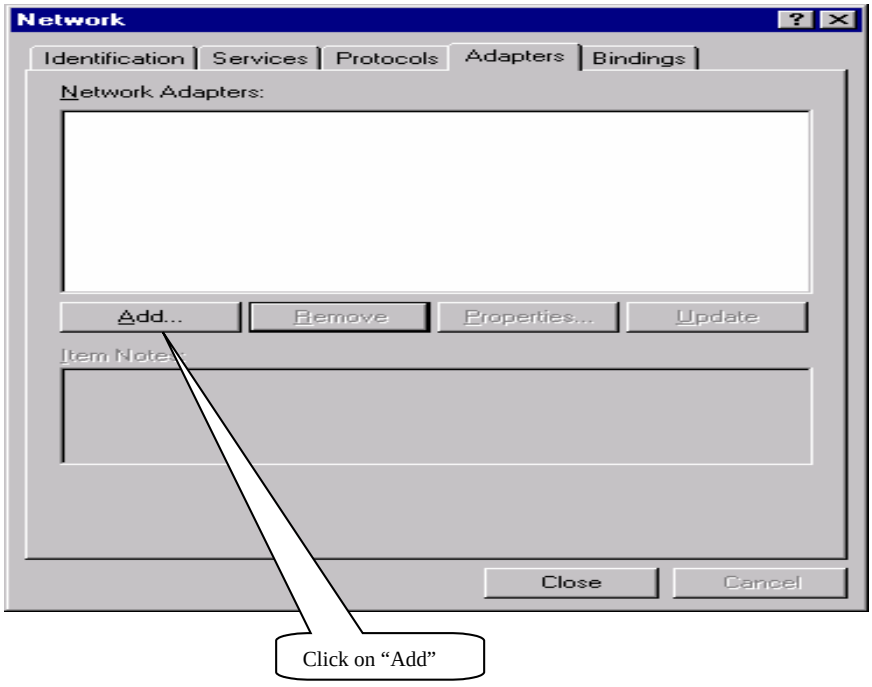
Click on "Finish"

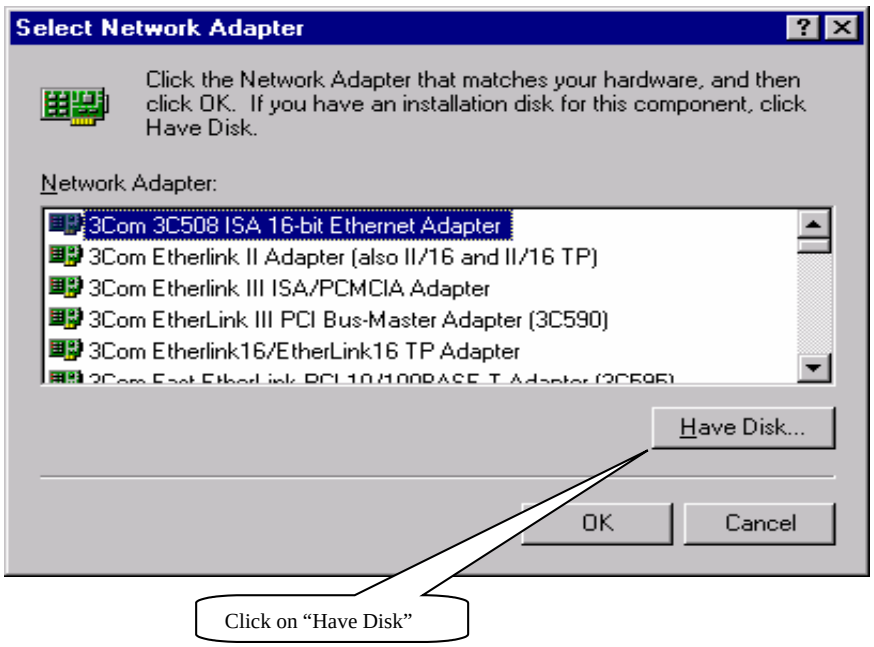

Realtek RTL8139 Family PCI Fast Ethernet NIC Properties
General
Advanced
Driver
Resources
Power Management
Realtek RTL8139 Family PCI Fast Ethernet NIC
Driver Provider: Realtek
Driver Date: 4/23/2001
Driver Version: 5.395.423.2001
Digital Signer: Microsoft Windows Hardware Compatibility Publ
To view details about the driver files loaded for this device, click Driver Details. To uninstall the driver files for this device, click Uninstall. To update the driver files for this device, click Update Driver.
Driver Details...
Uninstall
Update Driver...
Close
Cancel
Click on "Close"

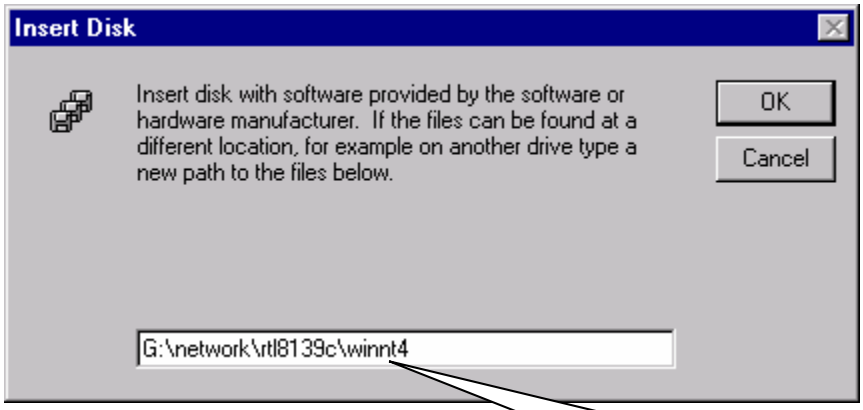
5.4.3 Windows NT4.0 system

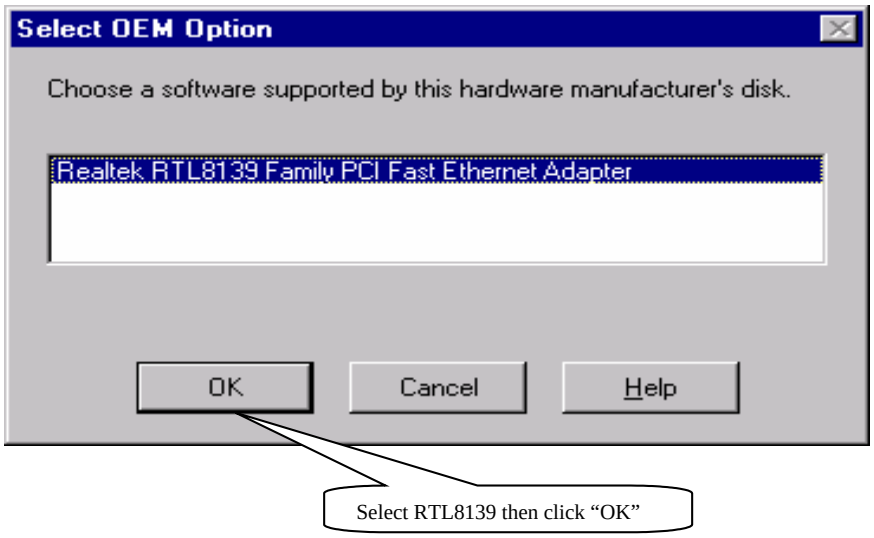


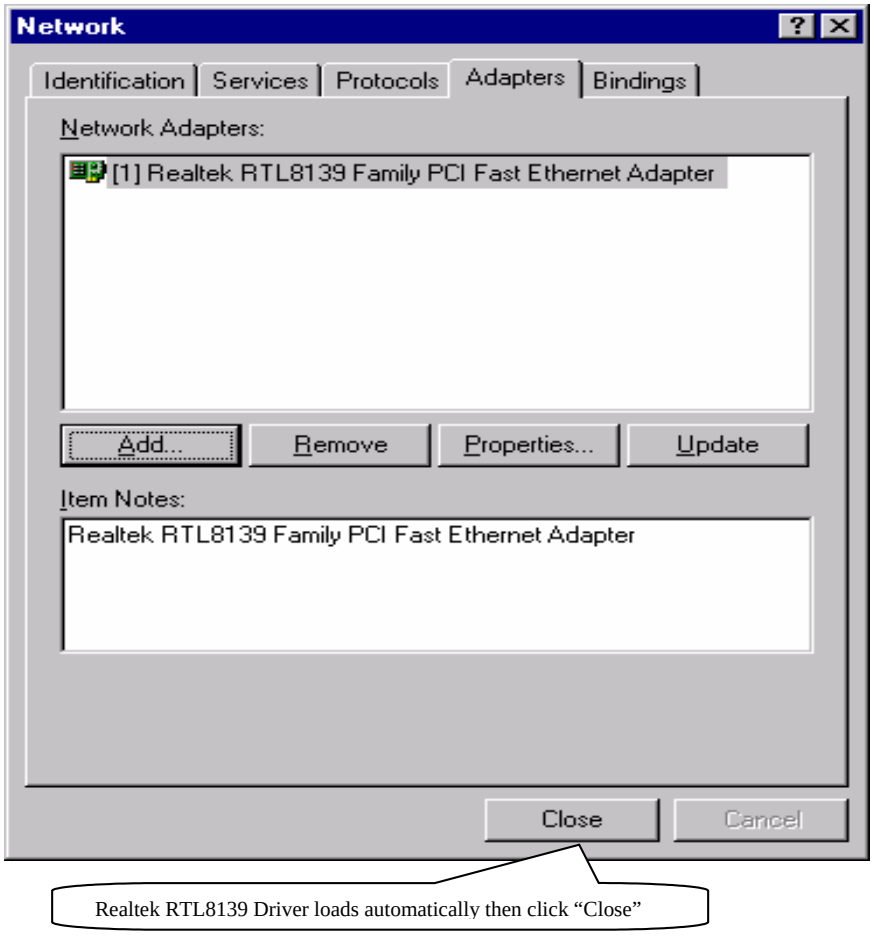


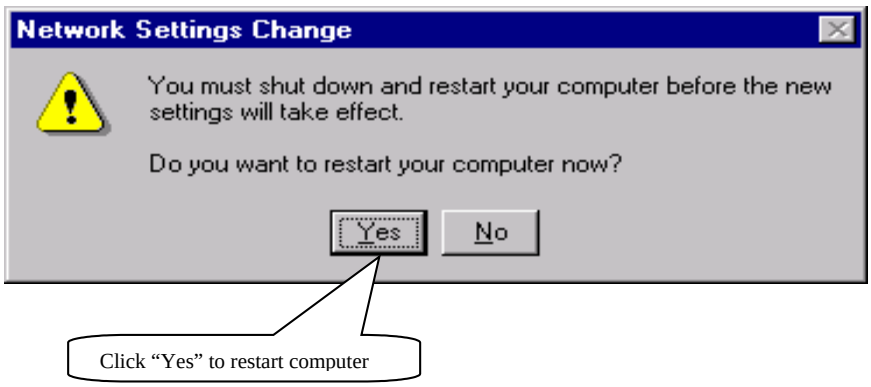

Network
Identification
Services
Protocols
Adapters
Bindings
Network Adapters:
Add...
Remove
Properties...
Update
Item Notes:
Close
Cancel
Click on "Add"


Select Network Adapter
Click the Network Adapter that matches your hardware, and then click OK. If you have an installation disk for this component, click Have Disk.
Network Adapter:
3Com 3C508 ISA 16-bit Ethernet Adapter
3Com Etherlink II Adapter (also II/16 and II/16 TP)
3Com Etherlink III ISA/PCMCIA Adapter
3Com EtherLink III PCI Bus-Master Adapter (3C590)
3Com Etherlink16/EtherLink16 TP Adapter
Have Disk...
OK
Cancel
Click on "Have Disk"


Insert Disk
Insert disk with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.
OK
Cancel
G:\network\rtl8139c\winnt4
Entry the Path then click "OK"

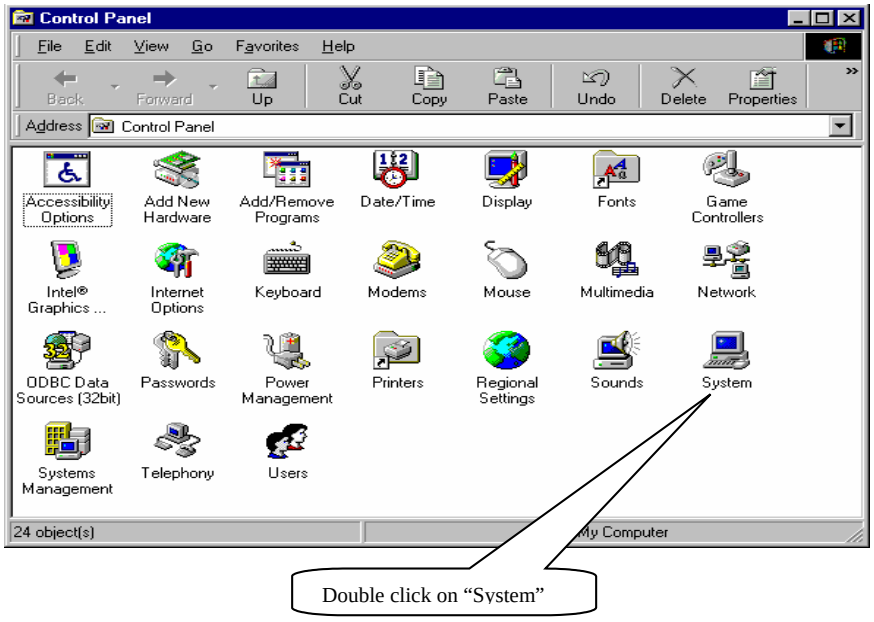

Select OEM Option
Choose a software supported by this hardware manufacturer's disk.
Realtek RTL8139 Family PCI Fast Ethernet Adapter
OK
Cancel
Help
Select RTL8139 then click "OK"

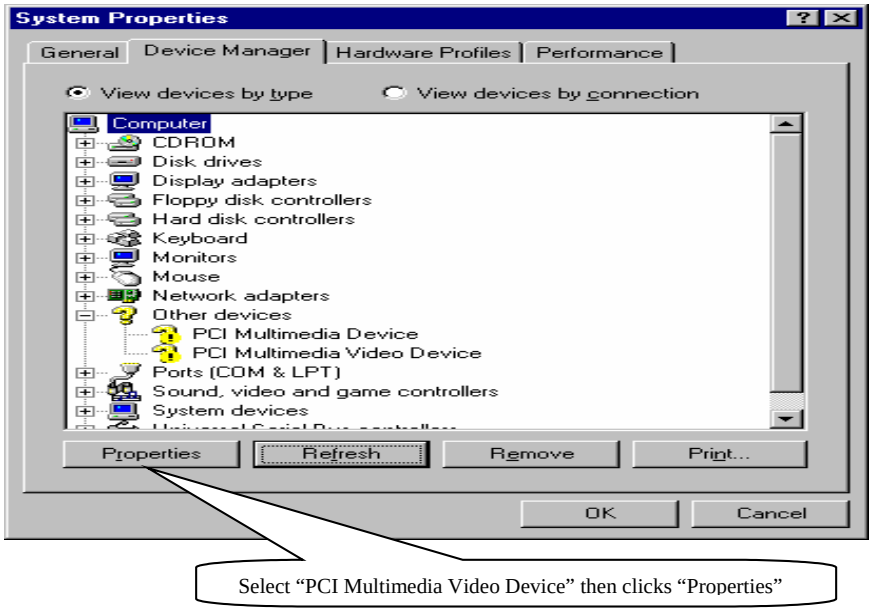

Network
Identification
Services
Protocols
Adapters
Bindings
Network Adapters:
[1] Realtek RTL8139 Family PCI Fast Ethernet Adapter
Add...
Remove
Properties...
Update
Item Notes:
Realtek RTL8139 Driver loads automatically then click "Close"
Close
Cancel


Network Settings Change
You must shut down and restart your computer before the new settings will take effect.
Do you want to restart your computer now?
Yes
No
Click "Yes" to restart computer

5.5 PCI Multimedia Video Device Found

5.5.1 For Windows 98 and Windows ME

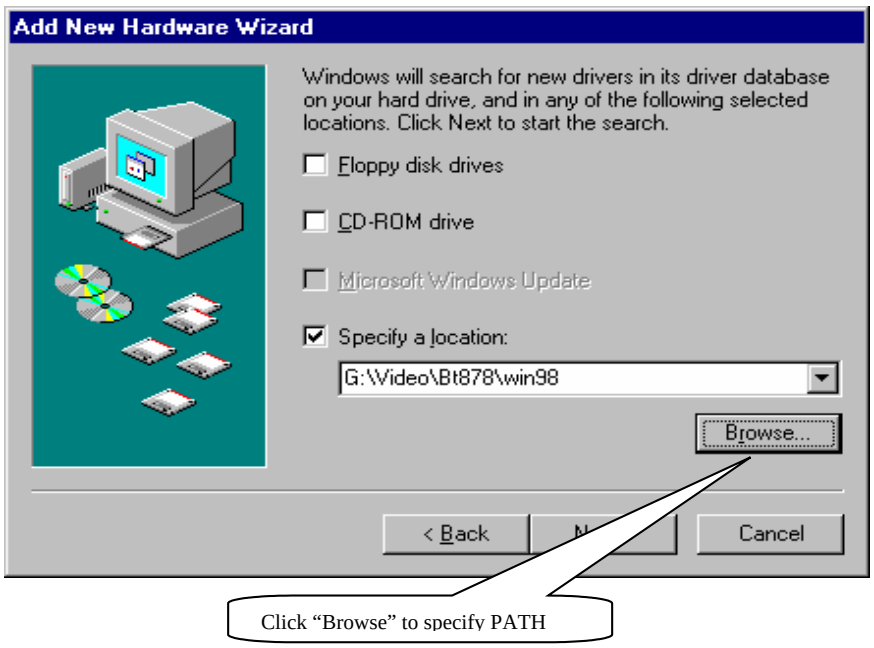


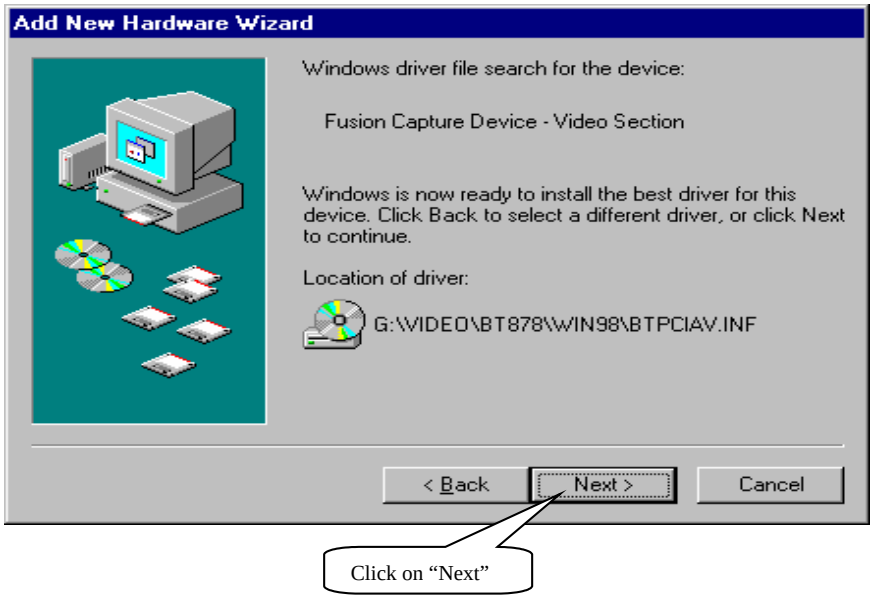


Select "Driver" then click on "Update Driver"

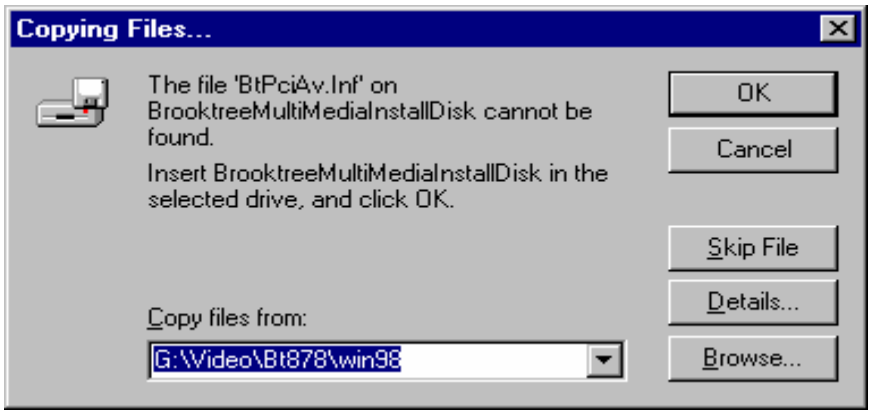
Click on "Next"

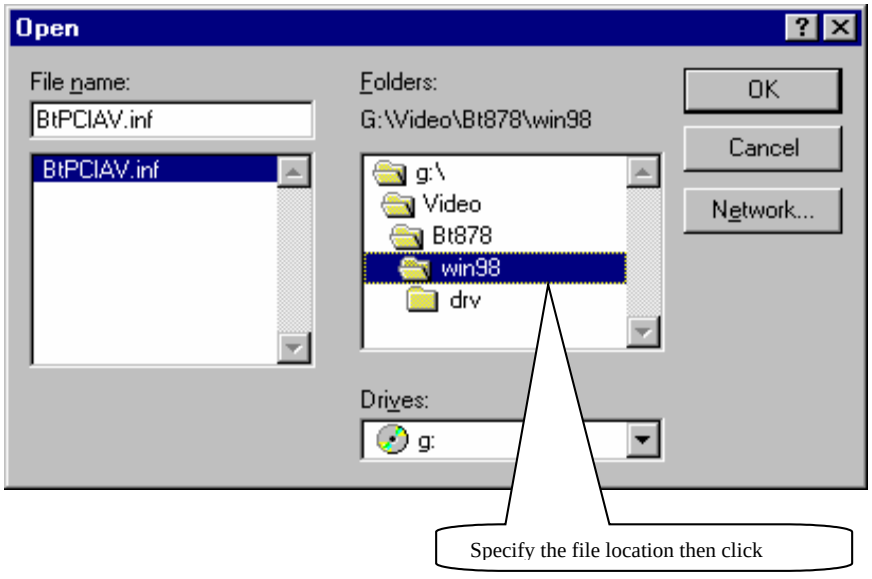
Add New Hardware Wizard
What do you want Windows to do?
Search for the best driver for your device. (Recommended).
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel
Click on "Next"


Add New Hardware Wizard
Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.
Floppy disk drives
CD-ROM drive
Microsoft Windows Update
Specify a location:
G:\Video\Bt878\win98
Browse...
< Back
Cancel
Click "Browse" to specify PATH


Add New Hardware Wizard
Windows driver file search for the device:
Fusion Capture Device - Video Section
Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.
Location of driver:
G:\VIDEO\BT878\WIN98\BTPCIAV.INF
< Back
Next >
Cancel
Click on "Next"

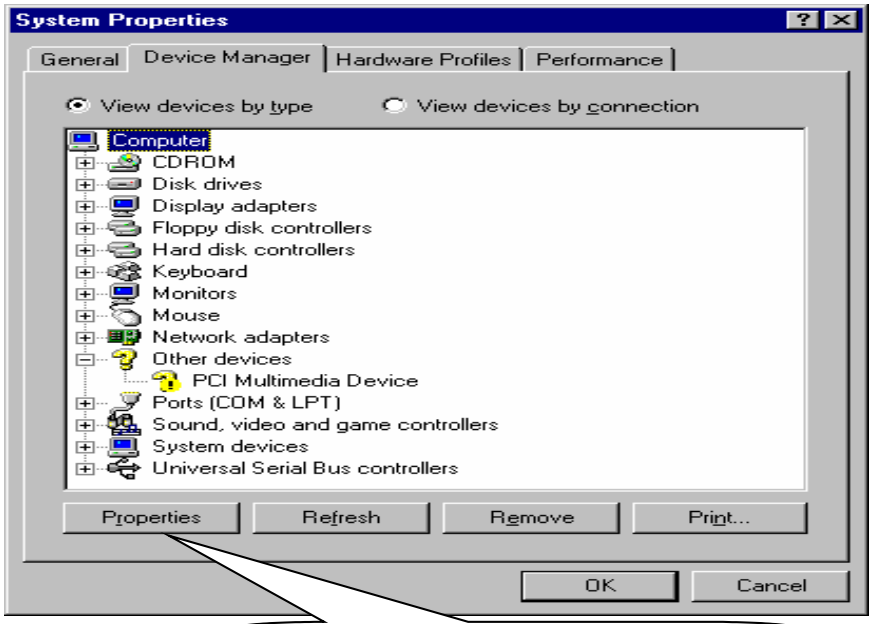
Insert Disk
Please insert the disk labeled 'BrooktreeMultiMediaInstallDisk', and then click OK.
OK
Click "OK"


Copying Files...
The file 'BtPciAv.Inf' on BrooktreeMultiMediaInstallDisk cannot be found.
Insert BrooktreeMultiMediaInstallDisk in the selected drive, and click OK.
OK
Cancel
Skip File
Details...
Browse...
Copy files from:
G:\Video\Bt878\win98

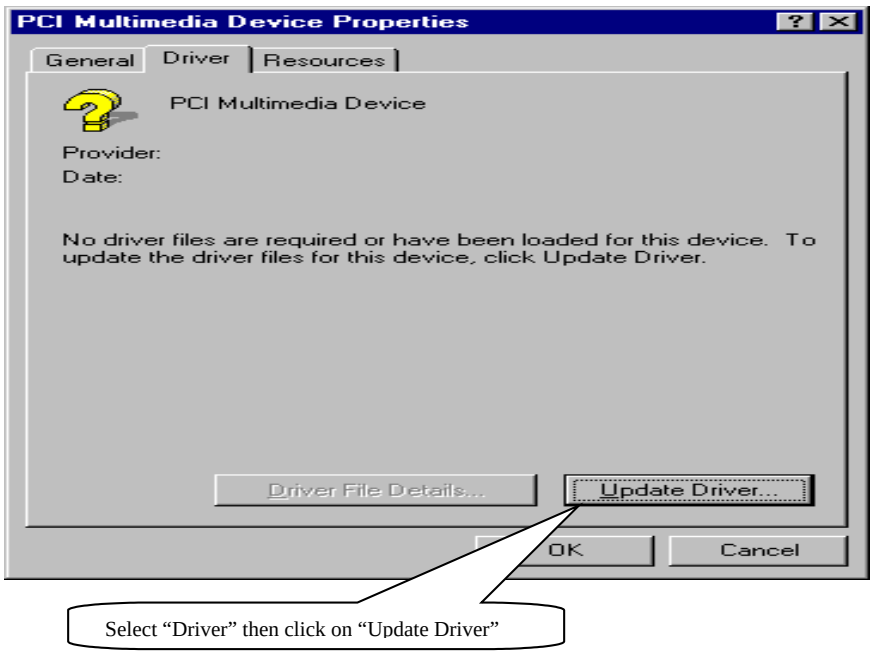

Open
File name:
BtPCIAV.inf
BtPCIAV.inf
Folders:
G:\Video\Bt878\win98
g:\
Video
Bt878
win98
drv
OK
Cancel
Network...
Drives:
g:
Specify the file location then click

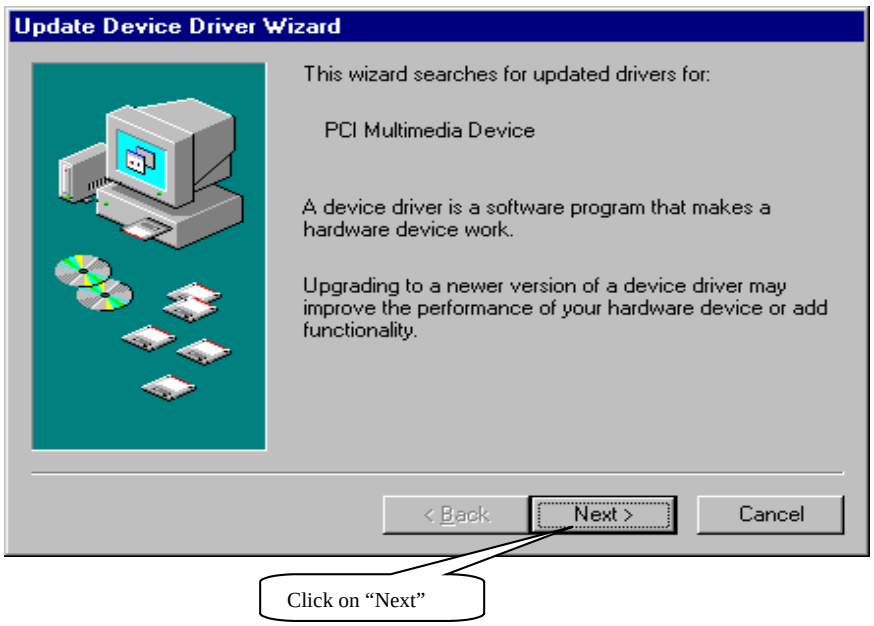
Add New Hardware Wizard
Fusion Capture Device - Video Section
Windows has finished installing the software that your new hardware device requires.
< Back
Finish
Cancel
Click on "Finish"

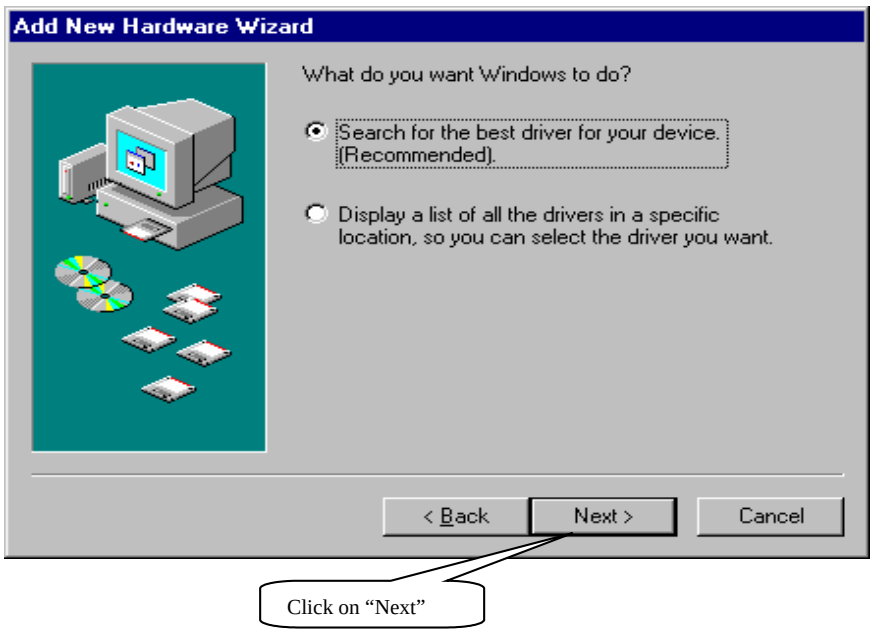
Click on "Close"



Select "PCI Multimedia Device" then clicks "Properties"


PCI Multimedia Device Properties
General
Driver
Resources
PCI Multimedia Device
Provider:
Date:
No driver files are required or have been loaded for this device. To update the driver files for this device, click Update Driver.
Driver File Details...
Update Driver...
OK
Cancel
Select "Driver" then click on "Update Driver"


Update Device Driver Wizard
This wizard searches for updated drivers for:
PCI Multimedia Device
A device driver is a software program that makes a hardware device work.
Upgrading to a newer version of a device driver may improve the performance of your hardware device or add functionality.
< Back
Next >
Cancel
Click on "Next"


Add New Hardware Wizard
What do you want Windows to do?
Search for the best driver for your device. (Recommended).
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel
Click on "Next"

Add New Hardware Wizard
Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.
Floppy disk drives
CD-ROM drive
Microsoft Windows Update
Specify a location:
G:\Video\Bt878\win98
Browse...
< Back
Next >
Cancel
Click on "Next"

Add New Hardware Wizard
Windows driver file search for the device:
Fusion Capture Device - Audio Section
Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.
Location of driver:
C:\WINDOWS\INF\BTPCIAV.INF
< Back
Next >
Cancel
Click on "Next"

Add New Hardware Wizard
Fusion Capture Device - Audio Section
Windows has finished installing the software that your new hardware device requires.
< Back
Finish
Cancel
Click on "Finish"

Appendix A
Ethernet Software Configuration

On board Ethernet supports all major network operating systems. I/O address and interrupts are easily configured via the RSET8139.EXE program. To execute the configuration, to view the current configuration, or to run diagnostics, do the following:

1. Power on the All-in-One board. Ensure that the RSET8139.EXE file is located in the working drive.
2. At the prompt type RSET8139.EXE and press <Enter>. The Ethernet configuration program will then be displayed.
3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and Down keys. To change a selected item, press <Enter>, and a screen will appear with available options. Highlight your option and press <Enter>. Each highlighted option has a help message guide displayed at the bottom of the screen for additional information.
4. After you have made your selection and are certain with your choice, press ESC. A prompt will appear asking if you want to save the configuration. Press "Y" if you want to save.

The Ethernet Setup Menu also offers three useful diagnostic functions. They are:

1. Run EEPROM test
2. Run Diagnostics on Board
3. Run Diagnostics on Network

Each option has its own display screen, which shows the format and result of any diagnostic test undertaken.

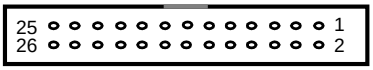
Ethernet Driver Support

The directory, labeled RTL 8139C, which comes with CD_ROM contains all the software drivers available for various operation system. Different drivers are stored in separate subdirectories, which also include a text file. Select the driver you need and refer to the text file for the installation procedure.

Appendix B

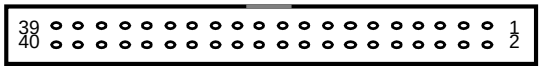
Connectors' Pin Assignment

• Parallel/Printer connector (PRN)



Pin no.	Signal
1	Strobe
2	Data 0
3	Data 1
4	Data 2
5	Data 3
6	Data 4
7	Data 5
8	Data 6
9	Data 7
10	-Acknowledge
11	Busy
12	Paper Empty
13	+ Select
14	- Auto Feed
15	- Error
16	- INIT Printer
17	- Select Input
18-26	Ground

• HDD Connector (IDE1, 2)



Pin no.	Signal	Pin no.	Signal
1	- RST	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	BALE
29	N.C.	30	GND
31	IRQ	32	-IO CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND

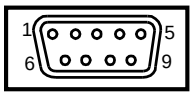
FDD Connector (FDC)

FDD

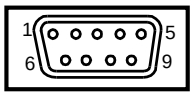
Drawing of FDD 26 pin box header

Pin no.	Signal
1,3,5	+5V
7,11,13,19,21	Unused
2	Index
4	Driver Select
6	Disk Change
8	High Density
9	RPM
10	Motor Select
12	Direction
14	Step Pulse
16	Write Data
18	Write Enable
20	Track 0
22	Write Protect
24	Read Data
26	Select Head
15,17,23,25	Ground

• RS-232 (COM1), RS-232 / RS-422 / RS-485 (COM2)



COM1



COM2

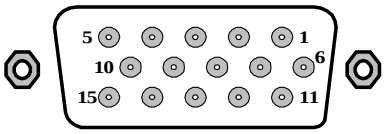
RS-232 Connector (COM1)

Pin no.	Signals
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

RS-232/RS-422/RS-485 Connector (COM2) (Please setup mode type by JP3)

Pin no.	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	
4	DTR	RX-	
5	GND	GND	GND
6	DSR	RTS +	
7	RTS	RTS -	
8	CTS	CTS +	
9	RI	CTS -	

CRT Display Connector (VGA)



Pin no.	Signal
1	RED
2	GREEN
3	BLUE
4	N/C
5	GND
6	GND
7	GND
8	GND
9	N/C
10	GND
11	N/C
12	N/C
13	H-SYNC
14	V-SYNC
15	N/C

Keyboard / Mouse connector (Mini_Din)

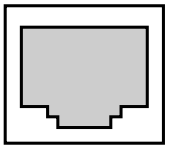
PS/2 Key board

PS/2 Mouse

Pin no.	K/B Signals (Mini Din)	Mouse Signals (Mini Din)
1	KB data	MS data
2	NC	NC
3	GND	GND
4	VCC	VCC
5	KB clock	MS clock
6	NC	NC

Ethernet connector (RJ-45)

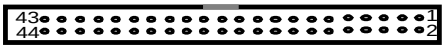
LAN



Drawing of Ethernet connector RJ-45

Pin no.	signals
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

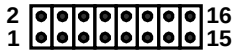
Video Input (J2)



Pin no.	signals	Pin no.	signals
1	VCC	2	V-I-OE00
3	GND	4	V-I-OE01
5	VIN00	6	V-I-OE02
7	VIN01	8	V-I-OE03
9	VIN02	10	AGND
11	VIN03	12	V-I-OE30
13	AGND	14	V-I-OE31
15	VIN30	16	V-I-OE32
17	VIN31	18	V-I-OE33
19	VIN32	20	AGND
21	VIN33	22	V-I-OE20
23	AGND	24	V-I-OE21
25	VIN20	26	V-I-OE22
27	VIN21	28	V-I-OE23
29	AGND	30	AGND
31	VIN22	32	V-I-OE10
33	VIN23	34	V-I-OE11
35	AGND	36	V-I-OE12
37	VIN10	38	V-I-OE13
39	VIN11	40	AGND
41	VIN12	42	GND
43	VIN13	44	VCC

Note: VIN xx is analog video input channel xx.
V-I-OExx is Odd / Even field information of video input channel xx.

General Purpose Input / Output (J3)

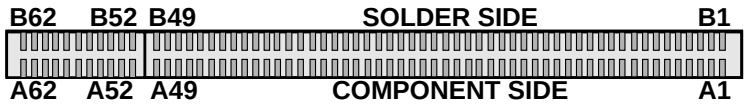


Pin no.	signals	Pin no.	signals
1	GPIO-0	2	Audio IN3
3	GPIO-1	4	AGND
5	GPIO-2	6	Audio IN2
7	GPIO-3	8	AGND
9	GPIO-4	10	Audio IN1
11	GPIO-5	12	AGND
13	GPIO-6	14	Audio IN0
15	GPIO-7	16	GND(for GPIO)

Infra-Red (IR)

Pin no.	signals
1	VCC
2	IRRX
3	GND
4	IRTX
5	CIRRX

PCI bus pin assignment



Pin no.	A	B	Pin no.	A	B
1	TRST*	-12V	32	AD16	AD17
2	+12V	TCK	33	VCC3	C/BE2*
3	NC	GND	34	FRAME*	GND
4	NC	NC	35	GND	IRDY*
5	+5V	+5V	36	TRDY*	VCC3
6	INTA*	+5V	37	GND	DEVSEL*
7	INTC*	INTB*	38	STOP*	GND
8	+5V	INTD*	39	VCC3	LOCK*
9	NC	PREN1*	40	SDONE	PERR*
10	+5V	NC	41	SBO*	VCC3
11	NC	PREN2*	42	GND	SERR*
12	GND	GND	43	PAR	VCC3
13	GND	GND	44	AD15	C/BE1*
14	3VSB	NC	45	VCC3	AD14
15	RST*	GND	46	AD13	GND
16	+5V	CLK	47	AD11	AD12
17	GNT0*	GND	48	GND	AD10
18	GND	REQ0*	49	AD9	GND
19	PME*	+5V	50	KEY	KEY
20	AD30	AD31	51	KEY	KEY
21	VCC3	AD29	52	C/BE0*	AD8
22	AD28	GND	53	VCC3	AD7
23	AD26	AD27	54	AD6	VCC3
24	GND	AD25	55	AD4	AD5
25	AD24	VCC3	56	GND	AD3
26	AD16	C/BE3*	57	AD2	GND
27	VCC3	AD23	58	AD0	AD1
28	AD22	GND	59	+5V	+5V
29	AD20	AD21	60	REQ64*	ACK64*
30	GND	AD19	61	+5V	+5V
31	AD18	VCC3	62	+5V	+5V

Appendix C
Updating BIOS

The updating procedures as the following:

1. It is recommended you copy the utility "AWDFLASH.EXE" in driver CD and BIOS binary files into floppy disk. Or copy these two files into the directory you made in hard disk.
2. Restart your computer into MS-DOS mode or command prompt only for windows, go into the directory where the new BIOS file located use the utility AWDFLASH.EXE to update the BIOS.
3. Type "AWDFLASH new bios filename" under the prompt.
4. Turn off the power after the system updates the BIOS.
5. Turn on the power again.

Appendix D
Watchdog Timer

The function of the watchdog timer is to reset the system automatically when watchdog time out. It contains a one-second resolution down counter (in CRF6 of logical device 8 of super I/O chip) and two Watchdog control registers (CRF5 and CRF7 of logical device 8). We can uses compatible PnP protocol to access configuration registers for setting up watchdog timer configuration.

In compatible PnP, a specific value (87h) must be written twice to the EFER, Secondly, an index value must be written to the Extended Functions Index Register (I/O port 2Eh or 4Eh same as Extended Functions Enable Register) to identify which configuration register is to be accessed. (the Logical Device 8). The designer can then access the desired configuration registers (CRF5, CRF6, CRF7) through the Extended Functions Data Register (I/O port address 2Fh or 4Fh)

After programming of configuration register is finished, Exit the extended function mode by writing 0AAh to the Extended Functions Enable Register EFER (I/O port address 2Eh or 4Eh).

Extended Functions Enable Registers (EFERs)

After a power-on reset, the super I/O enters the default operating mode, Before 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.

Extended Functions Index Registers (EFIRs), Extended Functions Data Registers (EFDRs),

After the extended function mode is entered, the Extended Function Index Register (EFIR) must be loaded with index value (02h, 07h~FEh) to access Configuration Register 0 (CR0), Configuration Register7 (CR07) to Configuration Register FE (CRFE), and so forth through the extended Function Data Register (EFDR). The EFIRs are write only register with port address 2Eh or 4Eh. The EFDRs are read/write registers with port address 2Fh or 4Fh.

Configuration Sequence

To program configuration registers, the following configuration sequence must as be followed.

1. Enter the extended function mode:
   To place the chip into the extended function mode, Two successive writites of 0x87 must be applied to the Extended Functions Enable Register EFER (I/O port address 2Eh or 4Eh).
2. Configure the configuration registers:
   The chip selects the logical device and activates the desired logical devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR), EFIR is located at the same address as EFER, and EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e., 0x07) to the EFIR and then write the number of desired logical device to the EFDR. Secondly, write the address of desired configuration register within the logical device to EFIR and then write (or read) the desired configuration register through EFDR.
3. Exit the extended function mode:
   After programming of configuration register is finished. Exit the extended function mode by writing 0xAAh to the Extended Functions Enable Register EFER (I/O port address 2Eh or 4Eh).
   Once the chip exits the extended function mode, it is the normal running mode and is ready to enter the configuration mode.

Data Register information (Logical Device 8)

CRF5 (Default 0x00)

Bit 7-6: Select PLED mode
Bit 5-4: Reserved
Bit3: Select Watchdog count mode
- = 0 second
- = 1 mintue

Bit2: Enable the rising edge of keyboard Reset to force Time-out event.
- = 0 Disable
- = 1 Enable

Bit 1-0: Reserved

CRF6 (Default 0x00)

Watchdog timer time out value. Writing a non-zero value to this register causes the counter to load the value to Watchdog Counter and start counting down. If the Bit 7 and Bit 6 are set, any mouse interrupt or Keyboard Interrupt event will also cause the reload of previously-loaded non-zero value to Watchdog Counter and start counting down. Reading this register returns current value in Watchdog Counter instead of Watchdog Timer time-out value.

Bit 7-0:

= 0x00	Time-out Disable
= 0x01	Time-out occurs after 1 second/mintue
= 0x02	Time-out occurs after 2 second/mintue
= 0x03	Time-out occurs after 3 second/mintue
.	
.	
.	
= 0xFF	Time-out occurs after 255 second/mintue

CRF7 (Default 0x00)

Bit 7: Mouse interrupt reset Enable or Disable

= 1	Watchdog Timer is reset upon a Mouse interrupt
= 0	Watchdog Timer is not affected by Mouse interrupt

Bit 6: Keyboard interrupt reset Enable or Disable

= 1	Watchdog Timer is reset upon a Keyboard interrupt
= 0	Watchdog Timer is not affected by Keyboard interrupt

Bit 5: Force Watchdog Timer time-out, write only*

= 1	Force Watchdog Timer time-out event, this bit is self-clearing.

Bit 4: Watchdog Timer Status, R/W

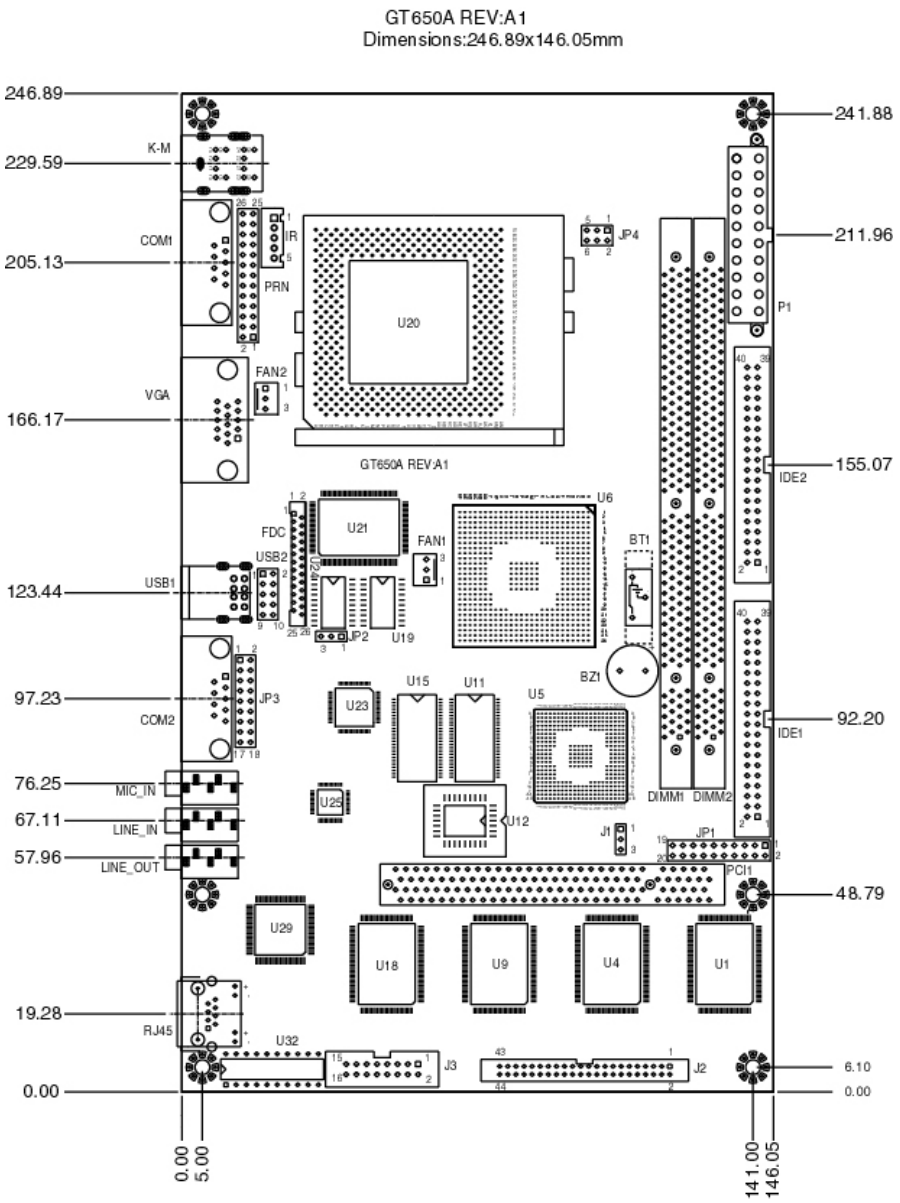
= 1	Watchdog Timer time-out occurred.
= 0	Watchdog Timer counting.

Bit 3-0: These bits select IRQ resource for Watchdog. Setting of 2 selects SMI.

Software programming example

The following example is written in Intel 8086 assembly language. It assumes that the EFER is located at 2Eh, so the EFIR is located at 2Eh and EFDR is located at 2Fh. It will reset the system in 30 seconds. We can use both keyboard interrupt and mouse interrupt to cause the watchdog to reload and start to count down from the value of CRF6.

```
.model small
.code
.startup
begin:
        ;--------------------------------------------------------------------------|
        ; Enter the extend function mode, interrupt double-write          |
        ;--------------------------------------------------------------------------|
         mov     dx,2eh
         mov     al,87h
         out     dx,al
         out     dx,al
         mov     dx,2eh
         mov     al,2bh              ;CR2B,    bit4-> 0 = WDTO
                                             ;bit4-> 1 = GP24
         out     dx,al
         mov     dx,2fh
         mov     al,0c0h
         out     dx,al
        ;--------------------------------------------------------------------------|
        ; Configurate logical device 8, configuration register CRF0          |
        ;--------------------------------------------------------------------------|
         mov     dx,2eh
         mov     al,07h
         out     dx,al               ;point to logical device number register
         mov     dx,2fh
         mov     al,08h              ;device 8
         out     dx,al

         mov     dx,2eh
         mov     al,30h
         out     dx,al
         mov     dx,2fh
         mov     al,01h              ;enable device 8
         out     dx,al

         mov     dx,2eh
         mov     al,07h
         out     dx,al
         mov     dx,2fh
         mov     al,08h              ;device 8
         out     dx,al

         mov     dx,2eh
         mov     al,0f7h
         out     dx,al               ;device 8,CRF7
         mov     dx,2fh
         mov     al,0c0h
         out     dx,al

         mov     dx,2eh
         mov     al,07h
         out     dx,al
         mov     dx,2fh
         mov     al,08h
         out     dx,al               ;device 8
```

```
        mov     dx,2eh
        mov     al,0f5h         ;device 8, CRF5
        out     dx,al
        mov     dx,2fh
        mov     al,00h          ;bit3 -> 0 = counter resolution in 1 second
        out     dx,al           ;bit3 -> 1 = counter resolution in 1 minute

        mov     dx,2eh
        mov     al,07h
        out     dx,al
        mov     dx,2fh
        mov     al,08h
        out     dx,al           ;device 8

        mov     dx,2eh
        mov     al,0f6h         ;device 8, CRF6
        out     dx,al
        mov     dx,2fh
        mov     al,1fh          ;The value is to control the watchdog
        out     dx,al           ;timer. 1fh=30 seconds (or minutes)
        ;------------------------------
        ; Exit extend function mode
        ;------------------------------
        mov     dx,2eh
        mov     al,0aah
        out     dx,al
.exit
end
```

Appendix E
Mechanical Drawing