

## **HS-6050**

**Socket 370 133MHz FSB PICMG Bus  
Industrial Single Board Computer**

- Full Size • All-in-One • CRT • 133MHz FSB •
  - ATA/33/66/100 • Dual LAN • Audio •
  - RS-232/422/485 • PC/104 • IrDA • USB •
  - DOC • WDT • H/W Monitor •
- PICMG Bus Industrial Single Board computer •

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## Safety Instructions

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

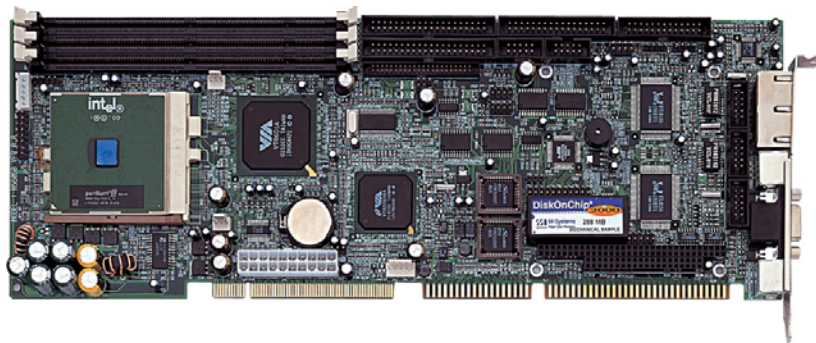
- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components. Fasten the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please wear and connect the strap before handle the HS-6050 to ensure harmlessly discharge any static electricity through the strap.
- Please use an anti-static pad when putting down any components or parts or tools outside the computer. You may also use an anti-static bag instead of the pad. Please inquire from your local supplier for additional assistance in finding the necessary anti-static gadgets.

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

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# Chapter 1

## General Description



The HS-6050 is a 133MHz FSB VIA VT8601 chipset-based board designed for PICMG Bus Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU. These features combine and make the HS-6050 an ideal all-in-one industrial single board computer. Additional features include an enhanced I/O with 2 COM ports, dual LAN and CRT interface.

Its onboard ATA/33/66/100 to IDE drive interface architecture allows the HS-6050 to support data transfers of 33, 66 or 100MB/sec. to each IDE drive connection. Designed with the VIA VT8601 core logic chipset, the board supports Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU. The 8601 integrated Trident 3D supporting AGP Bus

For suitable installation into any size system with 8/16/32-bit ISA and/or PCI slots operation, the board's advanced PCI and ISA bus add-on feature allows user to easily obtain both ISA's 16-bit and PCI's 32-bit full set signals from a full-size PICMG slot. System memory is also sufficient with the three DIMM sockets that can support up to 1.5GB.

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

To ensure the reliability in an unmanned or standalone system, the Watchdog Timer (WDT) onboard HS-6050 is designed with pure hardware that does not need the arithmetical functions of a real-time clock chip. If any program causes unexpected halts to the system, the onboard Watchdog Timer (WDT) will automatically reset the CPU or generate an interrupt to resolve such condition.

## 1.1 Major Features

The HS-6050 comes with the following features:

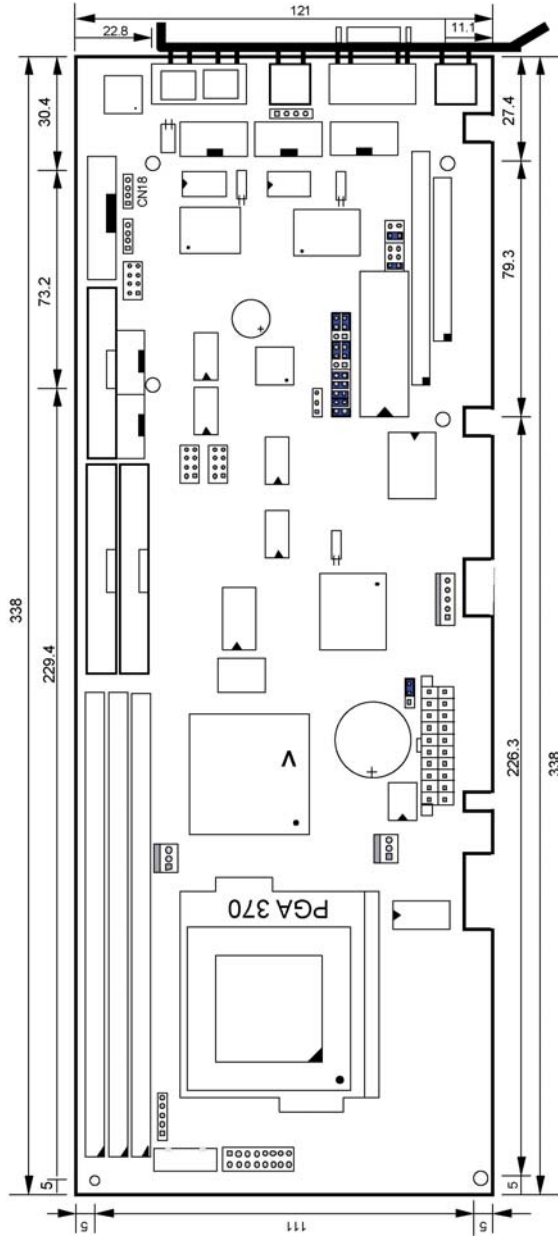
- Socket 370 for Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU
- VIA VT8601/VT86C686B system chipset
- Supports 66/100/133MHz FSB
- Three DIMM sockets with a max. capacity of 1.5GB
- VIA VT82C686B super I/O chipset
- Fast PCI ATA/33/66/100 IDE controller
- One RS-232 and one RS-232/422/485 serial ports
- PC/104 Bus connector
- VIA VT8601 CRT display controller
- Dual RealTek RTL8100 10/100 Based LAN
- AC97 3D audio controller
- DiskOnChip™ socket supports memory sizes of up to 288MB
- Supports Hardware Monitor function



## 1.2 Specifications

- **CPU:** Socket 370 for Intel® Celeron/Coppermine/Tualatin and VIA C3 800MHz~1.3GHz CPU
- **Bus Interface:** PICMG Bus
- **Memory:** Three DIMM sockets supporting up to 1.5GB
- **Chipset:** VIA VT8601/VT82C686B
- **I/O Chipset:** VIA VT82C686B
- **VGA:** VIA VT8601 integrated Trident 3D supporting AGP Bus
- **IDE:** Four IDE disk drives supporting ATA/33/66/100 and with transfer rates of up to 33/66/100MB/sec.
- **FDD:** Supports up to two floppy disk drives
- **Parallel:** One enhanced bi-directional parallel port supporting SPP/ECP/EPP
- **LAN:** Dual RealTek RTL8100 10/100 Based LAN
- **Audio:** AC97 3D audio controller supporting speaker out
- **Serial Port:** 16C550 UART-compatible RS-232/422/485 x 1 and RS-232 x 1 serial ports with 16-byte FIFO
- **PC/104:** PC/104 connector for 16-bit ISA Bus
- **IrDA:** One IrDA TX/RX header
- **USB:** Two USB connectors
- **Keyboard:** PS/2 6-pin Mini DIN or 5-pin connector
- **Mouse:** PS/2 6-pin Mini DIN or 4-pin connector
- **DiskOnChip™:** DiskOnChip™ socket supporting memory sizes of up to 288MB
- **BIOS:** AMI PnP Flash BIOS
- **Watchdog Timer:** Sets 1, 2, 10, 20, 110, 220 seconds, activity trigger with Reset or NMI
- **CMOS:** Battery backup
- **DMA Channels:** 7
- **Interrupt Levels:** 15
- **Operating Temperature:** 0~60°C
- **Hardware Monitor:** VIA VT82C686B
- **Board Size:** 33.8 x 12.1 cm

### 1.3 Board Dimensions



# Chapter 2

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## Unpacking

### 2.1 Opening the Delivery Package

The HS-6050 is packed in an anti-static bag. The board has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

### 2.2 Inspection

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

Integrated circuits will sometimes come out of their sockets during shipment. Examine all integrated circuits, particularly the BIOS, processor, memory modules, ROM-Disk, and keyboard controller chip to ensure that they are firmly seated. The HS-6050 delivery package contains the following items:

- HS-6050 Board x 1
- Utility CD Disk x 1
- ATA/100 IDE flat cable x 2
- FDD flat cable x 1
- Printer cable with bracket x 1
- RS-232 COM Port cables with bracket x 1
- 8-pin USB split type cable with bracket x 1
- MIC/Audio 8-pin cable + 2 phone jacks with bracket x 1
- Jumper Bag x 1
- User's Manual

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

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

# Chapter 3

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## Hardware Installation

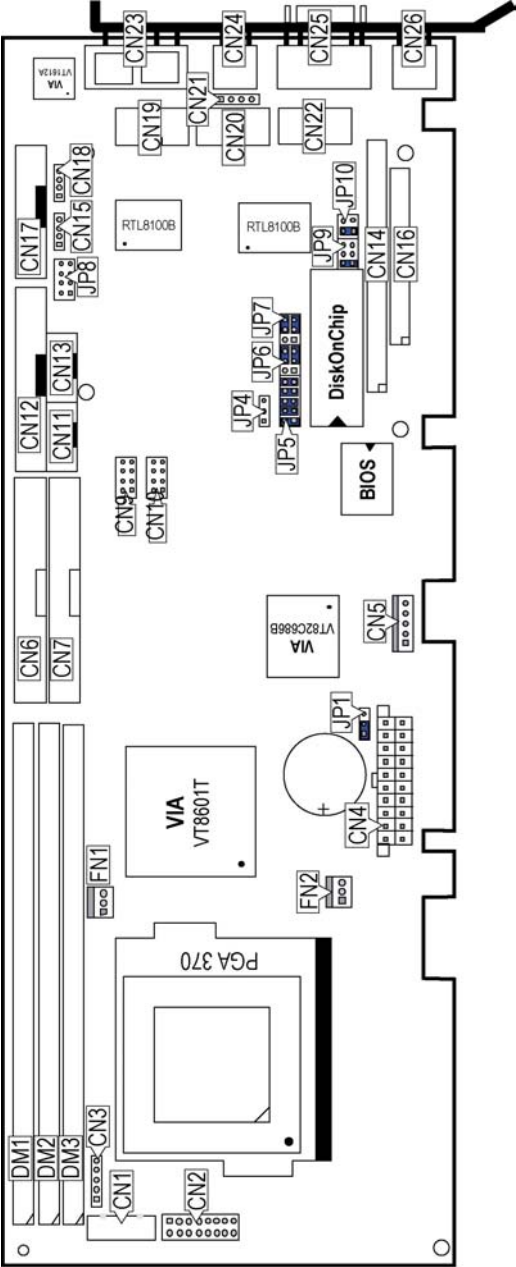
This chapter provides the information on how to install the hardware using the HS-6050. This chapter also contains information related to jumper settings of switch, watchdog timer, and the DiskOnChip™ address selection etc.

### 3.1 Before Installation

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

1. Make sure that all jumper settings match their default settings and CMOS setup correctly. Refer to the sections on this chapter for the default settings of each jumper.
2. Go through the connections of all external devices and make sure that they are installed properly and configured correctly within the CMOS setup. Refer to the sections on this chapter for the detailed information on the connectors.
3. Keep the manual and diskette in good condition for future reference and use.
4. The default setting of JP1 is Short 1-2. Before you turn on the power of your system, please check JP1 to Short 1-2 for normal operation.

### 3.2 Board Layout



### 3.3 Jumper List

Jumper	Default Setting	Setting
<b>JP1</b>	Clear CMOS: <i>Normal Operation</i>	Short 1-2
<b>JP4</b>	WDT Active Type Setting: <i>Disabled</i>	Open
<b>JP5(1-4)</b>	DiskOnChip Address Select: <i>D000</i>	Short 1-2
<b>JP5(5-10)</b>	WDT Timer Select: <i>1sec.</i>	Short 5-6, 7-8, 9-10
<b>JP6</b>	RS-232 or RS-422/485 Select: <i>RS-232</i>	Short 3-5, 4-6
<b>JP7</b>	RS-232 or RS-422/485 Select: <i>RS-232</i>	Short 3-5, 4-6
<b>JP9</b>	RS-422/485 Transceiver Enable/Disable Select: <i>Enable</i>	Short 1-2
<b>JP10</b>	RS-422/485 Receiver Enable/Disable Select: <i>Enable</i>	Short 1-2

### 3.4 Connector List

Connector	Definition
<b>CN1</b>	5-pin Keyboard Connector
<b>CN2</b>	Front Panel Signal Connector
<b>CN3</b>	IrDA Connector
<b>CN4</b>	ATX Power Connector
<b>CN5</b>	5-pin ATX Power Controller
<b>CN6</b>	Primary IDE Connector
<b>CN7</b>	Secondary IDE Connector
<b>CN9</b>	USB 3 & 4
<b>CN10</b>	USB 1 & 2
<b>CN11</b>	COM 1 Connector
<b>CN12</b>	FDD Connector
<b>CN13</b>	COM 2 Connector
<b>CN14</b>	PC/104 64-pin Connector
<b>CN15</b>	CD_IN Connector
<b>CN16</b>	PC/104 40-pin Connector
<b>CN17</b>	Parallel Connector
<b>CN18</b>	LINE_IN Connector
<b>CN19</b>	Internal LAN 1 Connector
<b>CN20</b>	Internal LAN 2 Connector
<b>CN21</b>	4-pin Mouse Connector
<b>CN22</b>	RS-422/485 Connector
<b>CN23</b>	Dual RJ-45 Connector
<b>CN24</b>	6-pin Mini DIN Mouse Connector
<b>CN25</b>	VGA Connector
<b>CN26</b>	6-pin Mini DIN Keyboard Connector

... More on next page ...

Connector	Definition
<b>CN27</b>	COM 1 Connector (DB9)
<b>DM1, 2, 3</b>	168-pin DIMM Socket
<b>FN1</b>	FAN1 Connector
<b>FN2</b>	FAN2 Connector
<b>JP8</b>	Line Out/MIC In Connector

### 3.5 Configuring the CPU

The HS-6050 offers the convenience in CPU installation with its auto-detect feature. After installing a new microprocessor onboard, the HS-6050 automatically identifies the frequency and clock speed of the installed microprocessor chip, thereby eliminating the need for user to do additional CPU configuration or hardware settings related to it.

### 3.6 System Memory

The HS-6050 provides three DIMM sockets at locations *DM1*, *DM2* and *DM3*. The maximum capacity of the onboard memory is 1.5GB.

### 3.7 DiskOnChip™ Address Setting

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

The U18 location onboard the HS-6050 is the DiskOnChip™ module socket. Jumper *JP5 (1-4)* assigns the starting memory address of the installed module. If you have another memory device that has a similar memory capacity with that of the DOC in your system, please set both at different memory address mapping to avoid the mapping area conflicts. Failing to do so will not make the HS-6050 and the additional memory device function properly.

- **JP5(1-4): DiskOnChip™ Address Select**

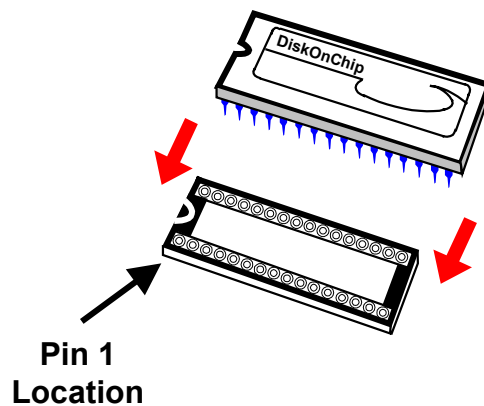
Address	PINS 1-2	PINS 3-4
* <b>D000</b>	Short	Short
<b>D800</b>	Open	Short



### 3.7.1 Installing DiskOnChip™ Modules

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

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



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

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

### 3.7.2 Removing DiskOnChip™ Modules

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

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

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

## 3.8 VGA Controller

The HS-6050 provides one connection method of a VGA device. CN25 offers a single standard CRT connector (DB15).

### ● CN25: CRT Connector

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

### 3.9 PCI E-IDE Drive Connector

CN6, CN7 are standard 40-pin connector daisy-chain driver connector serves the PCI E-IDE drive provisions onboard the HS-6050. A maximum of four ATA/33/66/100 IDE drives can connect to the HS-6050 via CN6, CN7.

- **CN6, CN7: Primary/Secondary IDE Connector**

<b>PIN</b>	<b>Description</b>	<b>PIN</b>	<b>Description</b>
<b>1</b>	RESET	<b>2</b>	GND
<b>3</b>	DATA 7	<b>4</b>	DATA 8
<b>5</b>	DATA 6	<b>6</b>	DATA 9
<b>7</b>	DATA 5	<b>8</b>	DATA 10
<b>9</b>	DATA 4	<b>10</b>	DATA 11
<b>11</b>	DATA 3	<b>12</b>	DATA 12
<b>13</b>	DATA 2	<b>14</b>	DATA 13
<b>15</b>	DATA 1	<b>16</b>	DATA 14
<b>17</b>	DATA 0	<b>18</b>	DATA 15
<b>19</b>	GND	<b>20</b>	N/C
<b>21</b>	PDREQ	<b>22</b>	GND
<b>23</b>	IOW#	<b>24</b>	GND
<b>25</b>	IOR#	<b>26</b>	GND
<b>27</b>	PIORDY	<b>28</b>	PR1PD1-
<b>29</b>	RPDACK-	<b>30</b>	GND
<b>31</b>	IRQ14/15	<b>32</b>	N/C
<b>33</b>	RPDA1-	<b>34</b>	PATA66
<b>35</b>	RPDA0-	<b>36</b>	RPDA2-
<b>37</b>	RPCS1-	<b>38</b>	RPCS3-
<b>39</b>	HDD ACTIVE	<b>40</b>	GND

### 3.10 Floppy Disk Drive Connector

The HS-6050 uses a standard 34-pin header connector, *CN12*, for floppy disk drive connection. A total of two FDD drives may be connected to *CN12* at any given time.

- **CN12: FDD Connector**

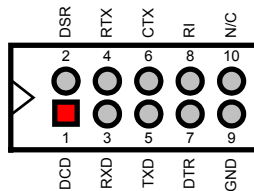
<b>PIN</b>	<b>Description</b>	<b>PIN</b>	<b>Description</b>
<b>1</b>	GND	<b>2</b>	RWC-
<b>3</b>	GND	<b>4</b>	N/C
<b>5</b>	GND	<b>6</b>	DS1-
<b>7</b>	GND	<b>8</b>	Index#
<b>9</b>	GND	<b>10</b>	Motor Enable A#
<b>11</b>	GND	<b>12</b>	Drive Select B#
<b>13</b>	GND	<b>14</b>	Drive Select A#
<b>15</b>	GND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

### 3.11 Serial Port Connectors

The HS-6050 offers one NS16C550 compatible UARTs with Read/Receive 16-byte FIFO serial ports and two internal 10-pin headers. CN22 is the onboard serial port supporting RS-422/485. Please refer to the following JP6 and JP7 settings when enabling/disabling the RS-232 or RS-422/485 function.

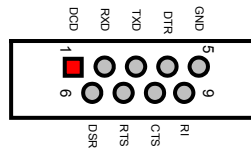
- **CN11, CN13: COM1/COM2 Connectors (5x2 Header)**

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



- **CN27: COM1 Connector (DB9)**

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



- **CN22: RS-422/485 Connector (5x2 Header)**

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

- **JP10: RS-422/485 Receiver Enabled/Disabled Select**

Options	Settings
Always Enable	Short 1-2
Enable by “-RTS” signal	Short 3-4
* Always Disabled	OPEN

- **JP9: RS-422/485 Transceiver Enabled/Disabled Select**

Options	Settings
Always Enable	Short 1-2
Enable by “-RTS” signal	Short 3-4
Enable by writing the REG:2 EFH BIT0=1	Short 5-6
* Always Disabled	OPEN

- **JP6, JP7: RS-232 or RS-422/485 Selection**

Serial Port Setting	JP6	JP7
* RS-232	Short 3-5, 4-6	Short 3-5, 4-6
RS-422/485	Short 1-3, 2-4	Short 1-3, 2-4

## 3.12 Parallel Connector

CN17 is a standard 26-pin flat cable connector deigned to accommodate parallel port connection onboard the HS-6050.

- **CN17: Parallel Connector**

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

### 3.13 Ethernet Connector

The HS-6050 provides one external dual RJ-45 10/100 Based LAN interface connector. Please refer to the following for its pin information.

- **CN23: Dual RJ-45 Connector**

PIN	Description	PIN	Description
1	1TX+	2	1TX-
3	1RX+	4	1RC-GND
5	1RC-GND	6	1RX-
7	1RC-GND	8	1RC-GND
9	2TX+	10	2TX-
11	2RX+	12	2RC-GND
13	2RC-GND	14	2RX-
15	2RC-GND	16	2RC-GND

- **CN19, CN20: Internal LAN1 and LAN2 Connector**

PIN	Description	PIN	Description
1	VCC3	2	LINK LED
3	RRX+	4	RRX-
5	ACTIVE LED	6	LANC1
7	SPEED LED	8	LANC2
9	TTX+	10	TTX-

### 3.14 IrDA Connector

CN3 is a 5-pin internal IR communication connector for connection of an IrDA device.

- **CN3: IrDA Connector**

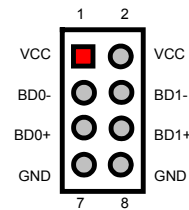
PIN	Description
1	VCC
2	N/C
3	IRRX
4	GND
5	IRTX

### 3.15 USB Connector

The HS-6050 provides two 8-pin connectors, at locations *CN9* and *CN10*, for four USB connections to the HS-6050.

- **CN9, CN10: USB Connector**

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



### 3.16 CMOS Data Clear

The HS-6050 has a Clear CMOS jumper on *JP1*.

- **JP1: Clear CMOS**

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

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

### 3.18 Power and Fan Connectors

HS-6050 provides one 2-pin power button connector at *CN2*. If you need to use the board on a non-backplane system, power supply connections to both *CN5* is a must.

- **CN5: 5-pin ATX Power Controller**

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



- **CN4: ATX Power Connector**

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

Connector *FN1*, *FN2* onboard HS-6050 are 3-pin fan power output connectors.

- **FN1, FN2: Fan1/Fan2 Connectors**

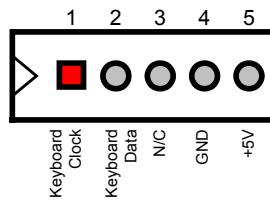
PIN	Description
1	Fan Speed
2	+12V
3	GND

### 3.19 Keyboard Connectors

The HS-6050 offers two possibilities for keyboard connections. The connections are via *CN26* for an external PS/2 type keyboard or via *CN1* for an internal 5-pin cable converter to an AT keyboard.

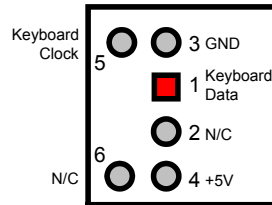
- **CN1: 5-pin Keyboard Connector**

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



- **CN26: PS/2 6-pin Mini DIN Keyboard Connector**

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

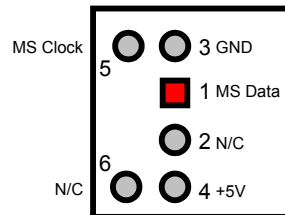


### 3.20 PS/2 Mouse Connector

The HS-6050 offers two possibilities for keyboard connections. The connections are via CN24 for an external PS/2 type keyboard or via CN21 for an internal 4-pin connector.

- **CN24: PS/2 6-pin Mini Din Mouse Connector**

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



- **CN21: 4-pin Mouse Connector**

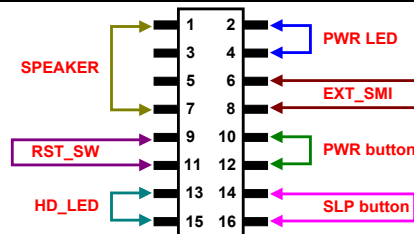
PIN	Description
1	MS CLK
2	MS Data
3	VCC
4	GND

## 3.21 System Front Panel Connectors

The HS-6050 has one IDE LED, Reset, SLP button at location CN2.

- **CN2: System Front Panel Connector**

PIN	Description	PIN	Description
1	VCC	2	330Ω Pull +5V
3	GND	4	GND
5	N/C	6	EXT SMI
7	Speaker	8	GND
9	GND	10	Power Bottom
11	Reset Switch	12	GND
13	330Ω Pull +5V	14	SLPB
15	HDD LED	16	GND



## 3.22 Watchdog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable are the three access cycles of Watchdog Timer. The Enable cycle proceeds via READ PORT 443H whereas the Disable cycle proceeds via READ PORT 045H. A continued Enable cycle after a first Enable cycle means Refresh.

Once the Enable cycle is active, a Refresh cycle is requested before the time-out period. This restarts counting of the WDT period. When the time counting goes over the period preset of WDT, it will assume that the program operation is abnormal. A System Reset signal to re-start or a NMI cycle to the CPU transpires when such error happens. Jumper *JP4* is used to select the function of Watchdog Timer.

- **JP4: Watchdog Timer Active Type Setting**

Options	Settings
Active NMI	Short 1-2
System Reset	Short 2-3
* Disabled Watchdog Timer	Open

- **JP5(5-10): WDT Timeout Period Select**

<b>Period</b>	<b>PINS 5-6</b>	<b>PINS 7-8</b>	<b>PINS 9-10</b>
<b>* 1 sec</b>	Short	Short	Short
<b>2 sec</b>	Open	Short	Short
<b>10 sec</b>	Short	Open	Short
<b>20 sec</b>	Open	Open	Short
<b>110 sec</b>	Short	Short	Open
<b>220 sec</b>	Open	Short	Open

The Watchdog Timer is disabled after the system Power-On. It can be enabled via an Enable cycle and reading the control port (443H), or via a Refresh cycle and reading the control port (443H), or via a Disable cycle and reading the disable control port (045H).

After an Enable cycle of WDT, user must immediately execute a Refresh cycle to WDT before its period setting comes to an end every 1, 2, 10, 20, 110 or 220 seconds. If the Refresh cycle does not activate before WDT period cycle, the onboard WDT architecture will issue a Reset or NMI cycle to the system. There are three I/O ports that control the Watchdog Timer.

<b>443H</b>	I/O Read	The Enable cycle
<b>443H</b>	I/O Read	The Refresh cycle
<b>045H</b>	I/O Read	The Disable cycle

The following sample program shows how to Enable, Disable and Refresh the Watchdog Timer:

```
WDT_EN_RF    EQU    0433H
WDT_DIS      EQU    0045H

WT_Enable    PUSH    AX                ; keep AX DX
              PUSH    DX
              MOV     DX,WDT_EN_RF    ; enable the WDT
              IN     AL,DX
              POP     DX                ; get back AX, DX
              POP     AX
              RET

WT_Refresh   PUSH    AX                ; keep AX, DX
              PUSH    DX
              MOV     DX,WDT_ET_RF    ; refresh the WDT
              IN     AL,DX
              POP     DX                ; get back AX, DX
              POP     AX
              RET

WT_DISABLE   PUSH    AX
              PUSH    DX
              MOV     DX,WDT_DIS      ; disable the WDT
              IN     AL,DX
              POP     DX                ; get back AX, DX
              POP     AX
              RET
```

### 3.23 PC/104 Connectors

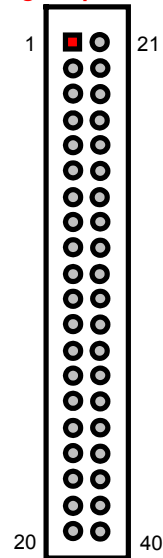
The PC/104 expansion bus offers provisions to connect all types of PC/104 modules. With the PC/104 bus being known as the new generation of industrial embedded 16-bit PC standard bus, thousands of PC/104 modules from multiple vendors can be easily installed onboard. The detailed pin assignment of the PC/104 expansion bus connectors CN14 and CN16 are listed on the following tables:

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

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

PIN	Description	PIN	Description
1	GND	21	GND
2	MEMCS16*	22	SBHE*
3	IOCS16*	23	SA23
4	IRQ10	24	SA22
5	IRQ11	25	SA21
6	IRQ12	26	SA20
7	IRQ15	27	SA19
8	IRQ14	28	SA18
9	DACK0*	29	SA17
10	DRQ0	30	MEMR*
11	DACK5*	31	MEMW*
12	DRQ5	32	SD8
13	DACK6*	33	SD9
14	DRQ6	34	SD10
15	DACK7*	35	SD11
16	DRQ7	36	SD12
17	+5V	37	SD13
18	MASTER*	38	SD14
19	GND	39	SD15
20	GND	40	N/C

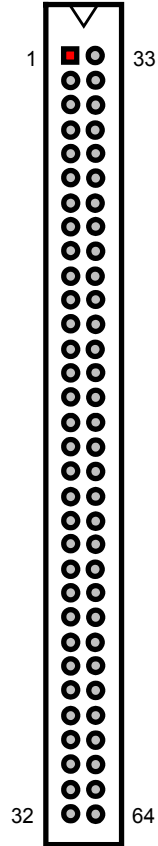
Connector diagram rotated 90 degrees clockwise from original position



● CN14: 64-pin PC/104 Expansion Slot

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

Connector diagram rotated 90 degrees clockwise from original position



## 3.24 Audio Connector

The HS-6050 has an onboard AC97 audio interface. The following tables list the pin assignments of the CD In, Line In and Line Out connectors. This CD In, Line In and Line Out port supports a preamp function that allows user to connect either a passive set of speakers or earphones.

- **JP8: Line Out Connector**

PIN	Description	PIN	Description
1	AOUTL	2	AOUTR
3	GND	4	GND
5	MIC In	6	N/C
7	GND	8	GND

- **CN18: Line In Connector**

PIN	Description	PIN	Description
1	Line R	2	GND
3	GND	4	Line L

- **CN15: CD In Connector**

PIN	Description	PIN	Description
1	CDL	2	CD GND
3	CD GND	4	CDR



# Chapter 4

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## AMI BIOS Setup

The HS-6050 uses AMI BIOS for the system configuration. The AMI BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options that could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

### 4.1 Starting Setup

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

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

1. By pressing <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**

## 4.2 Using Setup

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

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

### 4.2.1 Getting Help

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

## 4.3 Main Menu

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

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.54 (C)2001 American Megatrends, Inc. All Rights Reserved
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup PCI / Plug and Play Setup Peripheral Setup Hardware Monitor Setup Auto-Detect Hard Disks Change User Password Change Supervisor Password Auto Configuration with Optimal Settings Auto Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

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

## 4.4 Standard CMOS Setup

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

AMIBIOS SETUP – STANDARD CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved										
Date (mm/dd/yyyy)	: Thu Jan 03, 2002				Base Memory : 0 KB					
Time (hh/mm/ss)	: 19:04:12				Extd Memory : 0 MB					
Floppy Drive A:	1.44MB, 3.5"									
Floppy Drive B:	Not Installed									
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit Mode
Pri Master	: Auto									
Pri Slave	: Auto									
Sec Master	: Auto									
Sec Slave	: Auto									
Boot Sector Virus Protection :	Disabled									
Month:	Jan - Dec					ESC:Exit    ↑↓:Sel				
Day:	01 - 30					PgUp/PgDn: Modify				
Year:	1980 - 2099					F1:Help    F2/F3:Color				

## 4.5 Advanced CMOS Setup

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

AMIBIOS SETUP – STANDARD CMOS SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Enabled	▲ Available Options:
1st Boot Device	Floppy	▶ Disabled
2nd Boot Device	IDE-0	Enabled
3rd Boot Device	CD-ROM	
Try Other Boot Devices	Yes	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	On	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To OS/2	No	
CPU MicroCode Updation	Enabled	
CPU Serial Number	Enabled	
L1 Cache	Enabled	
L2 Cache	Enabled	
System BIOS Cacheable	Enabled	
C000,32k Shadow	Disabled	
C800,16k Shadow	Disabled	
CC00,16k Shadow	Disabled	
D000,16k Shadow	Disabled	
D400,16k Shadow	Disabled	
D800,16k Shadow	Disabled	
DC00,16k Shadow	Disabled	
		ESC:Exit    ↑↓:Sel
		PgUp/PgDn: Modify
		▼ F1:Help    F2/F3:Color

## 4.6 Advanced Chipset Setup

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

<b>AMIBIOS SETUP – ADVANCED CHIPSET SETUP</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b>		
***** DRAM Timing *****		Available Options:
Configure SDRAM Timing by SPD	Enabled	▶ Disabled
DRAM Frequency	Auto	Enabled
SDRAM CAS# Latency	3	
DRAM Bank Interleave	Enabled	
Memory Hole	Disabled	
AGP Mode	4x	
AGP Read Synchronization	Enabled	
AGP Fast Write	Enabled	
AGP Aperture Size	64MB	
AGP Master 1 W/S Write	Disabled	
AGP Master 1 W/S Read	Disabled	
Search for MDA Resources	Yes	
PCI Delay Transaction	Enabled	
ISA Bus Clock	PCI CLK/4	
USB Controller	All USB Port	
USB Device Legacy Support	Disabled	ESC:Exit    ↑↓:Sel
Port 64/60 Emulation	Disabled	PgUp/PgDn: Modify
ATX Power Supply	Enabled	F1:Help    F2/F3:Color

## 4.7 Power Management Setup

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

AMIBIOS SETUP – POWER MANAGEMENT SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	No	▲ Available Options:
ACPI Standby State	Auto	▶ No
USB Device Wakeup From S3-S5	Disabled	Yes
Re-Call VGA BIOS at S3 Resuming	Enabled	
Power Management / APM	Enabled	
Video Power Down Mode	Disabled	
Hard Disk Power Down Mode	Disabled	
Standby Time Out (Minute)	Disabled	
Suspend Time Out (Minute)	Disabled	
Throttle Slow Clock Ratio	50%~56.25%	
Display Activity	Ignore	
IRQ3	Ignore	
IRQ4	Ignore	
IRQ5	Monitor	
IRQ7	Ignore	
IRQ9	Ignore	
IRQ10	Monitor	
IRQ11	Ignore	
IRQ12	Ignore	
IRQ13	Ignore	
IRQ14	Ignore	
IRQ15	Ignore	
System Thermal	Disabled	
Thermal Active Temperature	65°C / 149°F	
Thermal Slow Clock Ratio	50%~56.25%	
Power Button Function	On / Off	
Restore on AC / Power Loss	Last State	
Resume On Ring	Disabled	
Resume On LAN	Disabled	
Resume On PME#	Disabled	
Resume On KBC	Disabled	
Wake-Up Key	N/A	
Wake-Up Password	N/A	
Resume On PS/2 Mouse	Disabled	
Resume On RTC Alarm	Disabled	
RTC Alarm Date	15	
RTC Alarm Hour	12	ESC:Exit      ↑↓:Sel
RTC Alarm Minute	30	PgUp/PgDn: Modify
RTC Alarm Second	30	▼ F1:Help      F2/F3:Color

## 4.8 PCI / Plug and Play Setup

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

<b>AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b>		
Plug and Play Aware O/S	No	Available Options:
Clear NVRAM	Yes	▶ No
OnChip VGA Frame Buffer Size	None	
PCT Latency Timer (PCI Clocks)	32	Yes
Allocate IRQ to PCI VGA	No	
PCI IDE BusMaster	Enabled	
PCI SLOT1 IRQ Priority	Auto	
PCI SLOT2 IRQ Priority	Auto	
PCI SLOT3 IRQ Priority	Auto	
PCI SLOT4 IRQ Priority	Auto	
DMA Channel 0	PnP	
DMA Channel 1	PnP	
DMA Channel 3	PnP	
DMA Channel 5	PnP	
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
IRQ10	PCI/PnP	
IRQ11	PCI/PnP	ESC:Exit      ↑↓:Sel
IRQ14	PCI/PnP	PgUp/PgDn: Modify
IRQ15	PCI/PnP	F1:Help      F2/F3:Color



## 4.9 Peripheral Setup

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

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

<b>AMIBIOS SETUP – PERIPHERAL SETUP</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b>		
OnBoard FDC	Auto	Available Options: ▶ Disabled Primary Secondary Both  ESC:Exit    ↑↓:Sel PgUp/PgDn: Modify F1:Help    F2/F3:Color
OnBoard Serial Port 1	3F8/COM1	
OnBoard Serial Port 2	2F8/COM2	
Serial Port2 Mode	Normal	
Duplex Mode	N/A	
OnBoard Parallel Port	378	
Parallel Port Mode	ECP	
EPP Version	N/A	
Parallel Port DMA Channel	3	
Parallel Port IRQ	7	
OnBoard IDE	Both	
OnBoard AC'97 Audio	Enabled	
OnBoard Legacy Audio	Enabled	
Sound Blaster	Enabled	
SB I/O Base Address	220h-22fh	
SB IRQ Select	5	
SB DMA Select	1	
MPU-401	Disabled	
MPU-401 I/O Address	330h-333h	

## 4.10 Hardware Monitor Setup

<b>AMIBIOS SETUP – HARDWARE MONITOR SETUP</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b>	
<b>*** System Hardware Monitor ***</b>	
<b>Chassis Intrusion</b>	<b>Disabled</b>
TSENS1 Temperature TSENS2 Temperature CPU Fan Speed Chassis Fan Speed Vcore + 2.500V + 3.300V + 5.000V +12.000V	Available Options: ▶ Disabled Enabled Reset  ESC:Exit      ↑↓:Sel PgUp/PgDn: Modify F1:Help      F2/F3:Color

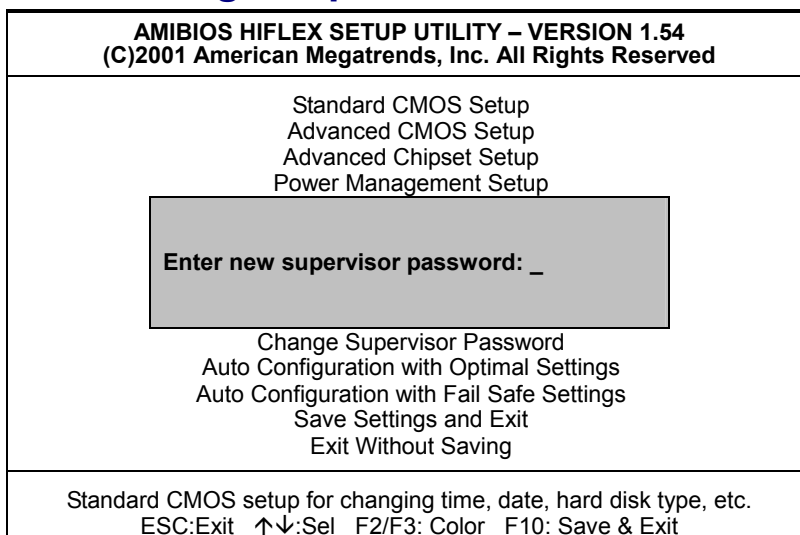
## 4.11 Auto-Detect Hard Disks

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

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

<b>AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.54</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b>
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup PCI / Plug and Play Setup Peripheral Setup Hardware Monitor Setup Auto-Detect Hard Disks Change User Password Change Supervisor Password Auto Configuration with Optimal Settings Auto Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

## 4.12 Change Supervisor/User Password



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

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

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

### ENTER PASSWORD:

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

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

### PASSWORD DISABLED.

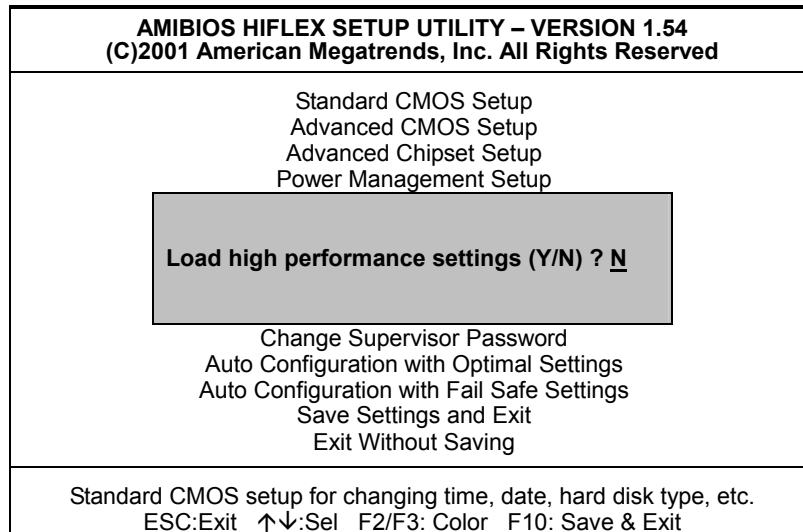
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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

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

## 4.13 Auto Configuration with Optimal Settings

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



## 4.14 Optimal Configuration with Fail Safe Settings

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

<b>AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.54 (C)2001 American Megatrends, Inc. All Rights Reserved</b>
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup
<b>Load failsafe settings (Y/N) ? <u>N</u></b>
Change Supervisor Password Auto Configuration with Optimal Settings Auto Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

## 4.15 Save Settings and Exit

Pressing <Enter> on this item asks for confirmation:

<b>AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.54</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b>
Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup
<b>Save current settings and exit (Y/N) ? <u>Y</u></b>
Change Supervisor Password Auto Configuration with Optimal Settings Auto Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving
Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save & Exit

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

## 4.16 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

**Quit without saving (Y/N)?**

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

<p><b>AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.54</b> <b>(C)2001 American Megatrends, Inc. All Rights Reserved</b></p>
<p>Standard CMOS Setup Advanced CMOS Setup Advanced Chipset Setup Power Management Setup</p> <p><b>Quit without saving (Y/N) ? <u>N</u></b></p> <p>Change Supervisor Password Auto Configuration with Optimal Settings Auto Configuration with Fail Safe Settings Save Settings and Exit Exit Without Saving</p>
<p>Standard CMOS setup for changing time, date, hard disk type, etc. ESC:Exit ↑↓:Sel F2/F3: Color F10: Save &amp; Exit</p>
<p>Abandon all Data &amp; Exit Setup</p>



# Chapter 4-1

---

## Award BIOS Setup

The HS-6050 uses Award PCI/ISA BIOS for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options that could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

### 4.1 Starting Setup

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

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

1. By pressing <Del> immediately after switching the system on
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**

## 4.2 Using Setup

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

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

### 4.2.1 Getting Help

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

### 4.3 Main Menu

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

**CMOS Setup Utility – Copyright © 1984-2001 Award Software**

▶ Standard CMOS Features	▶ Frequency/Voltage Control
▶ Advanced BIOS Features	Load Fail-Safe Defaults
▶ Advanced Chipset Features	Load Optimized Defaults
▶ Integrated Peripherals	Set Supervisor Password
▶ Power Management Setup	Set User Password
▶ PnP/PCI Configurations	Save & Exit Setup
▶ PC Health Status	Exit Without Saving
Esc : Quit                      F9 : Menu in BIOS                      ↑↓→← : Select Item	
F10 : Save & Exit Setup	

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

## 4.4 Standard CMOS Features

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

### CMOS Setup Utility – Copyright © 1984-2001 Award Software Standard CMOS Features

Date (mm:dd:yy)	Wed, Jul 11 2001	Item Help
Time (hh:mm:ss)	10 : 32 :57	Menu Level ▶
▶ IDE Primary Master	[None]	Change the day, month, year and century
▶ IDE Primary Slave	[None]	
▶ IDE Secondary Master	[None]	
▶ IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5in.]	
Drive B	[None]	
Video	[EGA/VGA]	
Halt On	[All, But Keyboard]	
Base Memory	640K	
Extended Memory	65472K	
Total Memory	1024K	
↑↓→←: Select Item    + / - /PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults		

## 4.5 Advanced BIOS Features

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

### CMOS Setup Utility – Copyright ©1984-2001 Award Software Advanced BIOS Features

Virus Warning	Disabled	Item Help
CPU Internal Cache	Enabled	Menu Level ▶
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	
Processor Number Feature	Enabled	Change the day, month, year and century
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CD-ROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up Num Lock Status	On	
Gate A20 Option	Normal	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Report on FDD for WIN95	NO	
Video BIOS Shadow	Enabled	
C8000-CBFFF Shadow	Disabled	
CC000-CFFFF Shadow	Disabled	
D0000-D7FFF Shadow	Disabled	
D8000-DBFFF Shadow	Disabled	
DC000-DFFFF Shadow	Disabled	
Small Logo (EPA) Show	Enabled	
↑↓→←: Select Item    + / - /PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults		

## 4.6 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 the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

### CMOS Setup Utility – Copyright ©1984-2001 Award Software Advanced Chipset Features

DRAM Clock	Host Clock	Item Help
DRAM Timing by SPD	Enabled	Menu Level ►
SDRAM Cycle Length	3	
Bank Interleave	Disabled	
Memory Hole at 15M-16M	Disabled	Change the day, month, year and century
P2C/C2P Concurrency	Enabled	
Fast R-W Turn Around	Enabled	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Enabled	
Video RAM Cacheable	Enabled	
Frame Buffer Size	8M	
AGP Aperture Size	64M	
On Chip USB	Enabled	
USB Keyboard Support	Disabled	
On Chip Sound	Auto	
CPU to PCI Write Buffer	Enabled	
PCI Dynamic Bursting	Enabled	
PCI Master 0 WS Write	Enabled	
PCI Delay Transaction	Enabled	
PCI#2 Access#1 Retry	Disabled	
AGP Master 1WS Write	Disabled	
Memory Parity/ECC Check	Disabled	
↑↓→←: Select Item    + / - /PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults		

## 4.7 Integrated Peripherals

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

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

### CMOS Setup Utility—Copyright ©1984-2001 Award Software Integrated Peripherals

On chip IDE Channel 0	Auto	Item Help
On chip IDE Channel 1	Auto	Menu Level ▶
IDE Prefetch Mode	Enabled	
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	Change the day, month, year and century
IDE Second Master PIO	Auto	
IDE Second Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Second Master UDMA	Auto	
IDE Second Slave UDMA	Auto	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard FDC Controller	Enabled	
Onboard Serial Port1	3F8/IRQ4	
Onboard Serial Port2	2F8/IRQ3	
UART Mode Select	Normal	
UART2 Duplex Mode	Half	
RXD, TXD Active	Hi, Lo	
IR Transmission delay	Enabled	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
ECP Mode Use DMA	3	
EPP Mode Select	EPP1.7	
Onboard Legacy Audio	Enabled	
Sound blaster	Enabled	
S/B I/O Base Address	220H	
S/B IRQ Select	IRQ5	
S/B DMA Select	DMA1	
MPU-401	Disabled	
MPU-401 I/O Address	330H-333H	
↑↓→←: Select Item    +/-/PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults		

## 4.8 Power Management Setup

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

**CMOS Setup Utility – Copyright ©1984-2001 Award Software**  
**Power Management Setup**

ACPI function	Disabled	Item Help
Power Management	User Define	Menu Level ▶
Doze Mode	User Define	
Standby Mode	Disabled	
Suspend Mode	Disabled	Change the day, month, year and century
HDD Power Down	Disabled	
ACPI Suspend Type	S1	
PM Control by APM	Yes	
Video Off Option	Suspend → Off	
Modem use IRQ	3	
Soft-off by PWRBTN	Delay 4Sec	
Wake Up Event		
VGA	VGA	
LPT & COM	LPT/COM	
HDD & FDD	On	
PCI Master	Off	
Modem Ring Resume	Disabled	
RTC Alarm Resume	Disabled	
Date (of Month)	0	
Resume Time	0	
IRQ Active		
Primary INTR	Enabled	
IRQ3 (COM2)	Enabled	
IRQ4 (COM1)	Enabled	
IRQ5 (LPT2)	Enabled	
IRQ6 (Floppy)	Enabled	
IRQ7 (LPT1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Reserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Disabled	
IRQ13 (Coprocessor)	Disabled	
IRQ14 (Hard Disk)	Disabled	
IRQ15 (Reserved)	Disabled	
↑↓→←: Select Item    +/-/PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults		



## 4.9 PnP/PCI Configurations

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

### CMOS Setup Utility – Copyright ©1984-2001 Award Software PnP/PCI Configurations

PNP OS Installed	No	Item Help	
Reset Configuration Date	Disabled	Menu Level ▶	
Resources controlled By	Auto (ESCD)		
IRQ Resources			
IRQ3 Assign	PCI/ISA PNP	Change the day, month, year and century	
IRQ4 Assign	PCI/ISA PNP		
IRQ5 Assign	PCI/ISA PNP		
IRQ6 Assign	PCI/ISA PNP		
IRQ7 Assign	PCI/ISA PNP		
IRQ8 Assign	PCI/ISA PNP		
IRQ9 Assign	PCI/ISA PNP		
IRQ10 Assign	PCI/ISA PNP		
IRQ11 Assign	PCI/ISA PNP		
IRQ12 Assign	PCI/ISA PNP		
IRQ13 Assign	PCI/ISA PNP		
IRQ14 Assign	PCI/ISA PNP		
IRQ15 Assign	PCI/ISA PNP		
DMA Resources			
DMA0	PCI/ISA PNP		
DMA1	PCI/ISA PNP		
DMA2	PCI/ISA PNP		
DMA3	PCI/ISA PNP		
DMA4	PCI/ISA PNP		
DMA5	PCI/ISA PNP		
DMA6	PCI/ISA PNP		
DMA7	PCI/ISA PNP		
PCI/VGA Palette Snoop	Disabled		
Assign IRQ for VGA	Enabled		
Assign IRQ for USB	Enabled		
↑↓→←: Select Item    +/-/PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults			

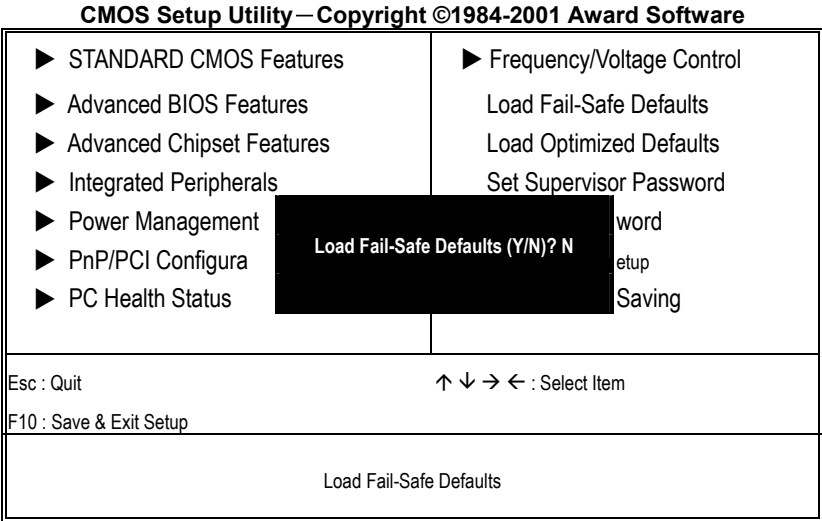
# 4.10 PC Health Status

CMOS Setup Utility— Copyright ©1984-2001 Award Software  
PC Health Status

Current CPU Temp Current System Temp Current CPUFAN1 Speed Current CPUFAN2 Speed  Vcore +3.3V +5V +12V -12V  Shutdown Temperature	Item Help Menu Level ▶  Change the day, month, year and century
↑↓→←: Select Item    + / - /PU/PD: Value    F10: Save    ESC: Quit    F1: General Help F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults	

## 4.11 Load Fail-Safe Defaults

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







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

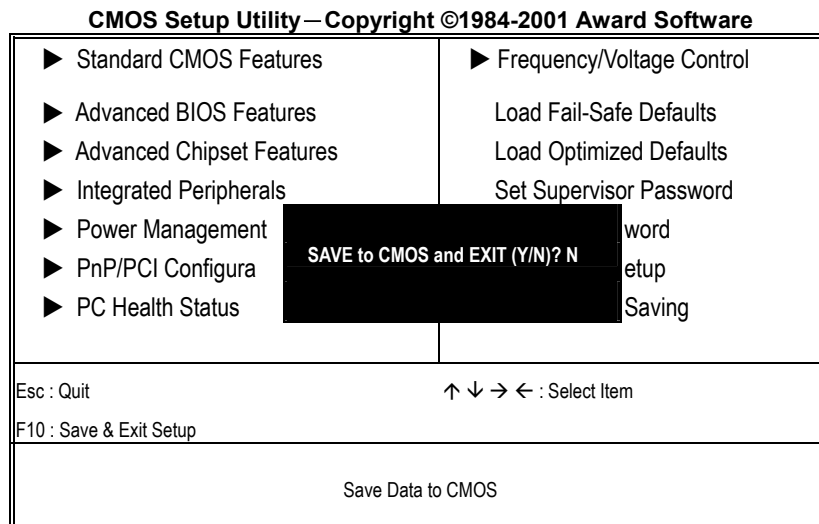
Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

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

## 4.14 Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

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





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# Chapter 5

## Software Utilities

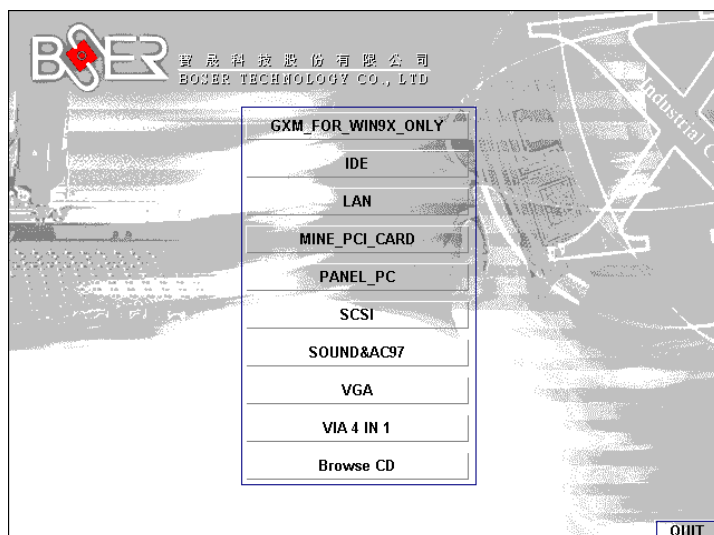
This chapter contains the detailed information of IDE, VGA, Audio and LAN driver installation procedures.

### 5.1 IDE and Audio Driver Installation

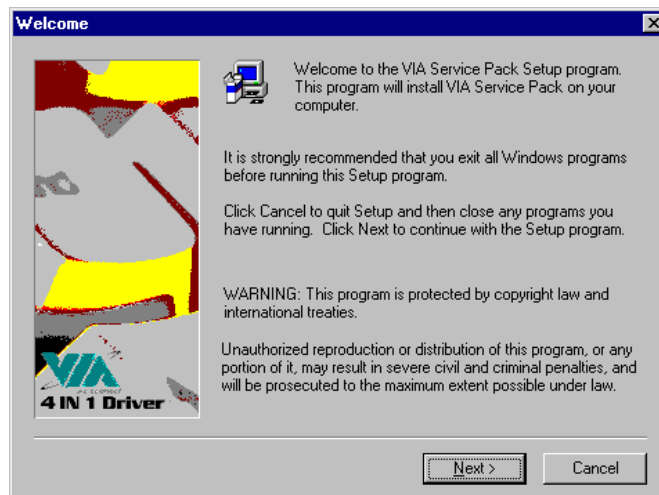
The utility disk that came with the delivery package contains an auto-run program that invokes the installation programs for the IDE, VGA and Audio drivers. The following describes the installation procedures of each driver.

#### 5.1.1 VIA VT82C686B AGP Bus Driver Installation

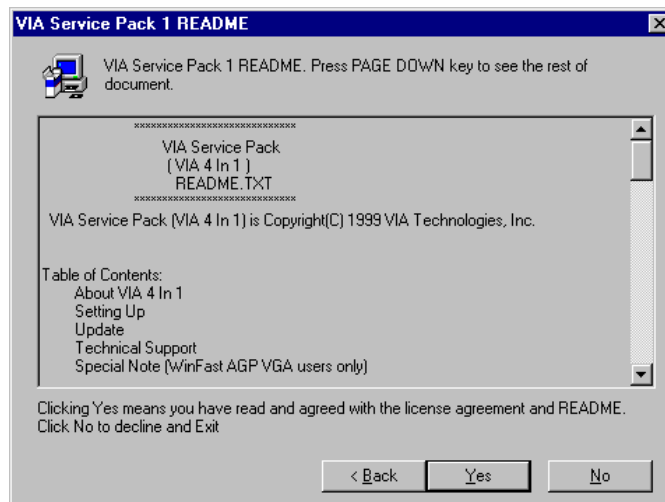
1. Insert Utility CD Disk to your CD ROM. The main menu will pop up as shown below.



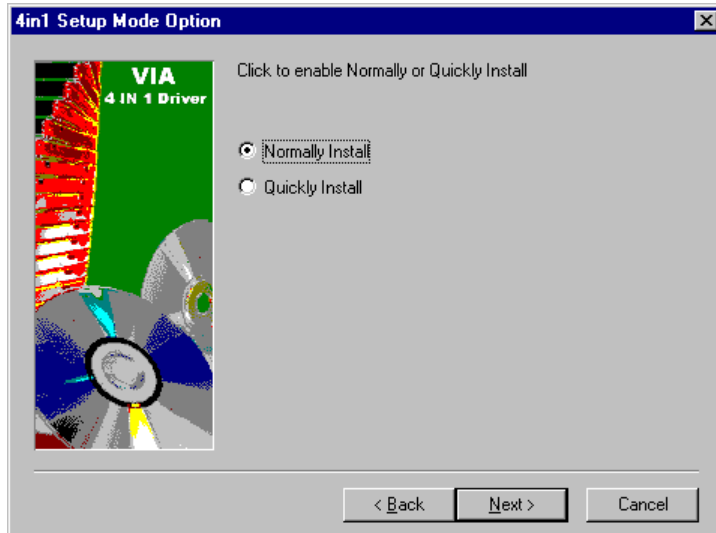
2. Press "VIA 4 IN 1" and to go Setup.
3. Once the Welcome screen appears on the screen, make sure to close any applications running and then click on the Next button.



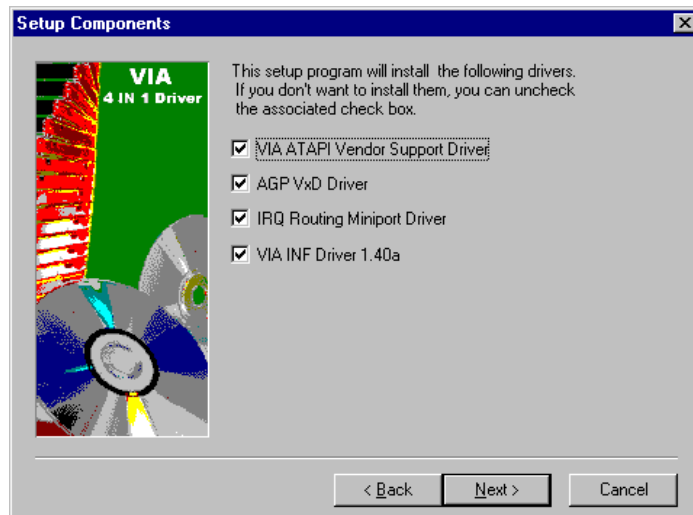
4. When the Readme window pops on the screen, you may read the whole document including the license agreement or just press Yes to skip through and continue installation.



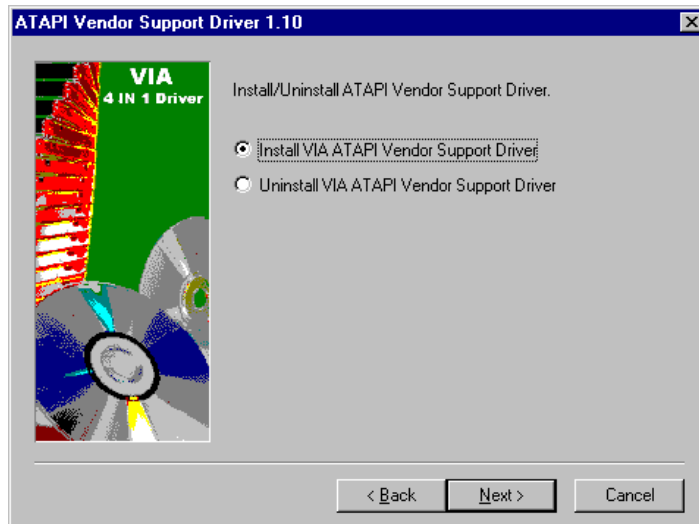
5. The 4 in 1 Setup dialog is now displayed. Select on Normally Install and then click on Next.



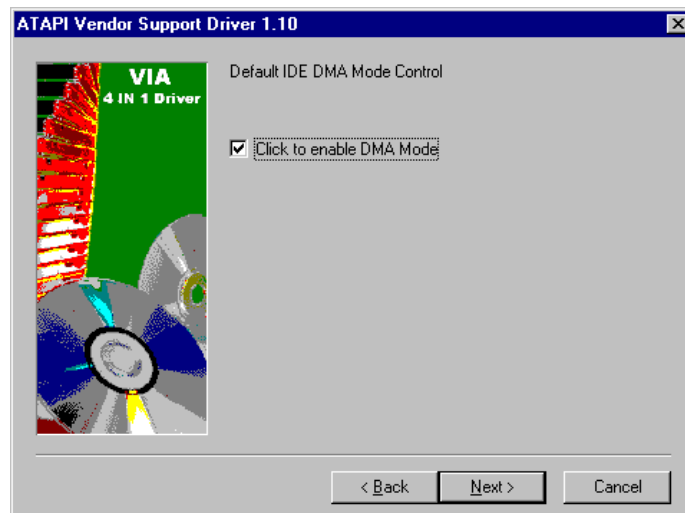
6. The next window lists all components detected in your system and asks you to select the ones requiring drivers. Tick on all items then proceed by clicking on the Next button below the screen.



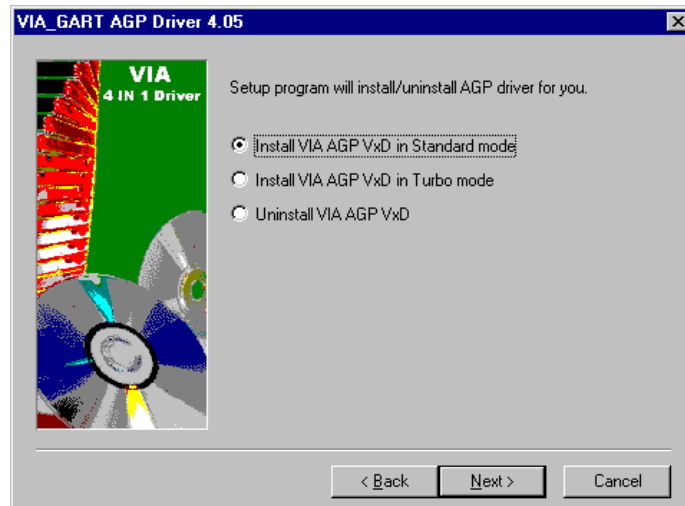
7. The program starts to install the ATAPI driver when you click the Next button on the screen below.



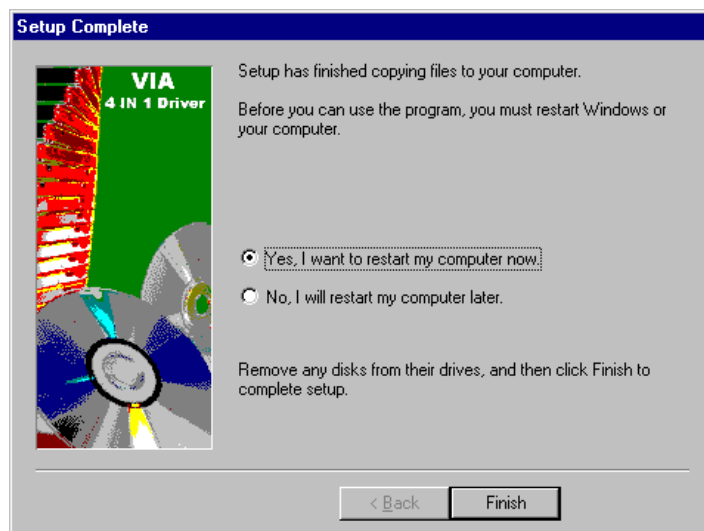
8. When the ATAPI driver is completely installed. The utility then displays your DMA mode status and allows you to enable it. Tick on the box and press on the Next button to continue.



9. The following screen then gives you the choice of installing the AGP driver in standard or turbo mode. Select on the Standard Mode and then click on Next to proceed.



10. Installation of the AGP driver is now complete. Once the screen below appears, select on restarting your computer to activate all drivers/settings completed.

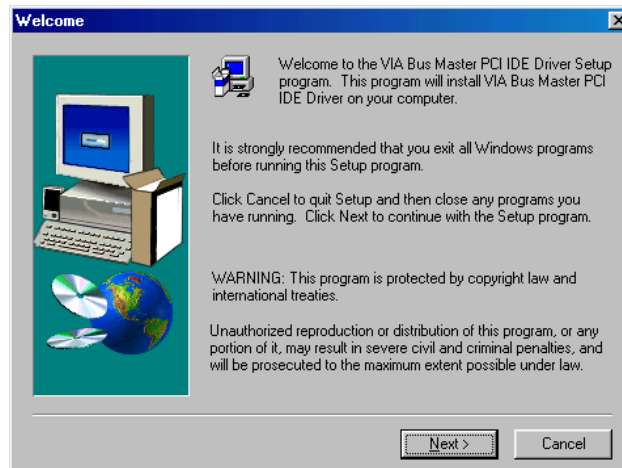


### 5.1.2 VIA IDE Tool Installation

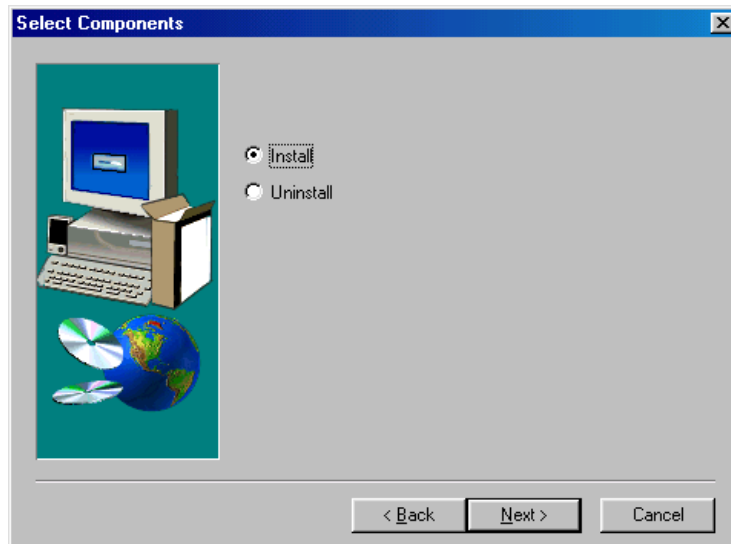
1. With the Utility CD Disk still in your CD ROM drive, open the File Manager and then select the CD-ROM drive. As soon as the system reads the disk, the following screen will appear on your display. Click on VIA\_IDE from the main menu to start installing the VIA ID Tool.



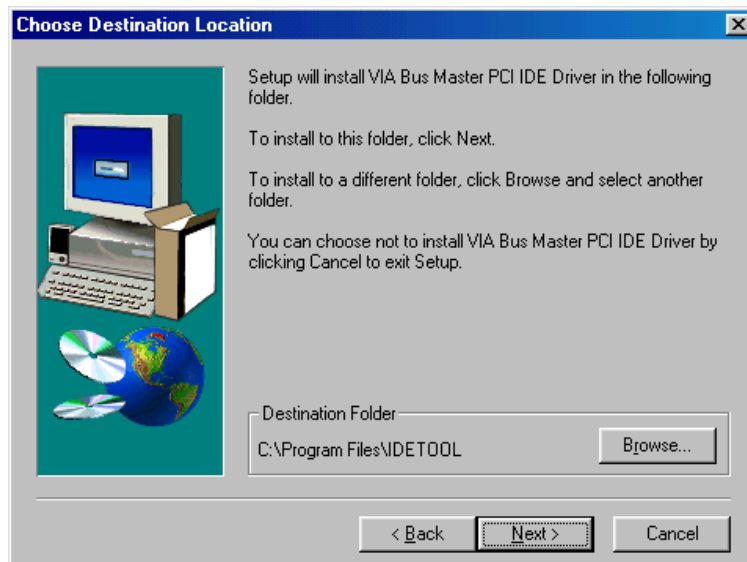
2. Once the Welcome screen appears on the screen, make sure to close applications that are running and then click the Next button.



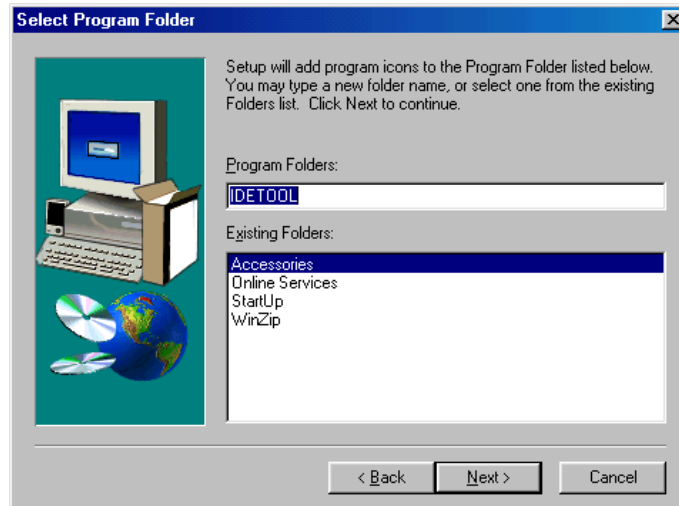
3. The Select Components dialog box is now displayed. Select on Install and then click on Next.



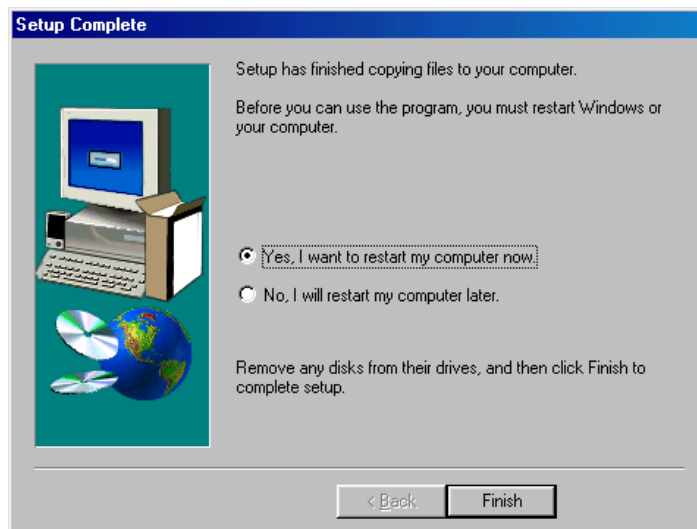
4. Choose the folder to where the program will install the driver. Select the default folder (C:\Program Files\IDETOOL) and then click on Next to proceed.



5. The program will now create an icon for the IDETOOL. Simply press Next to continue with the installation.

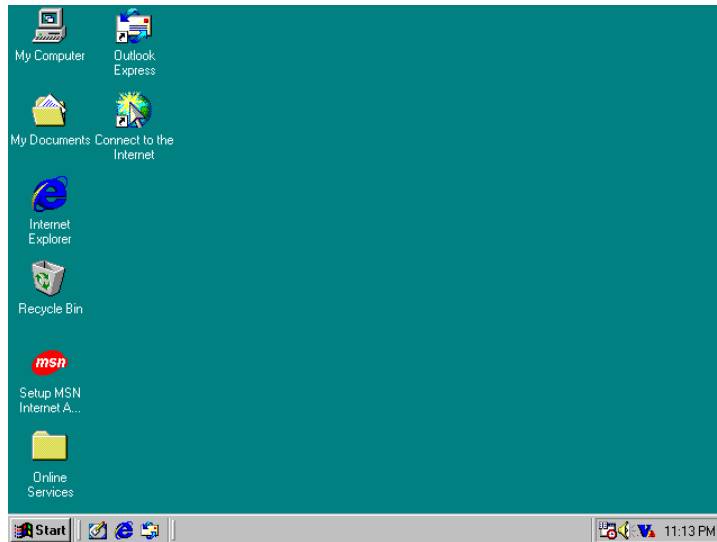


6. The program now installs and transfers the files to your system. After it finishes, you will be prompted to restart your system. We recommend you to reboot your computer to allow the new settings to take effect. Click on the Finish button to reboot.

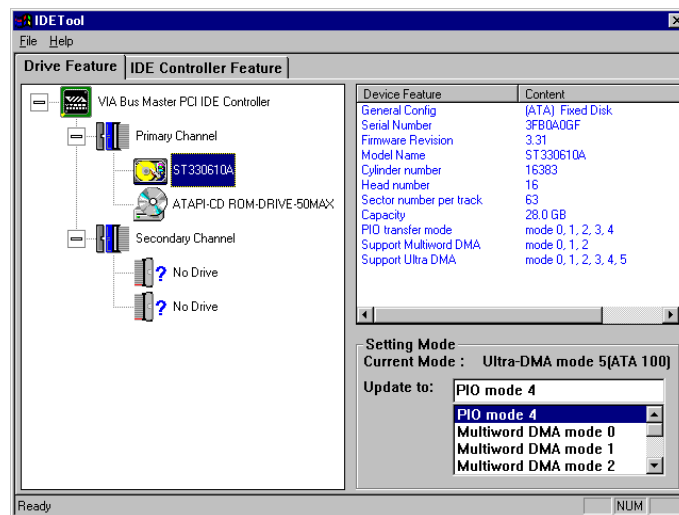




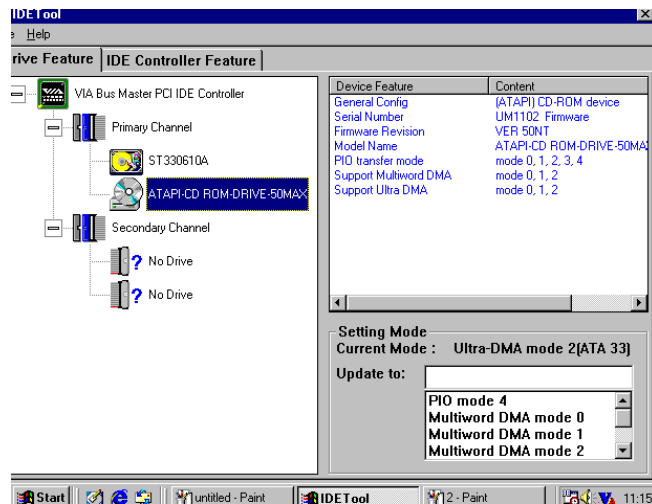
- Once the system enters the main Windows screen, it will display a new icon along the right hand task bar. This icon represents the IDE Tool quick launch program.



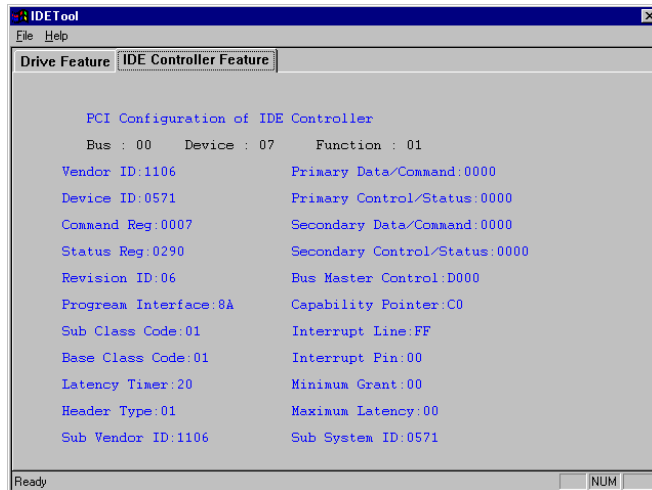
- Double-clicking on this new task bar icon will launch the IDE Tool's Drive Feature dialog box, as shown below.



- The Drive Feature dialog box has 2 columns of information. The left column lets you to view the hardware installed on your system. When you select any hardware, the right column displays the device's information and specifications. You may also update the settings of your devices from the right column.



- Once you select the IDE Controller Feature from the IDE Tool dialog box, a list of read-only information related to the system's IDE controller is shown.

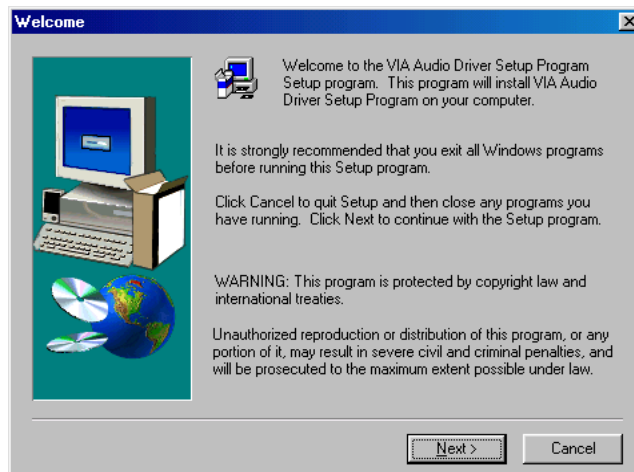


### 5.1.3 Audio Driver Installation

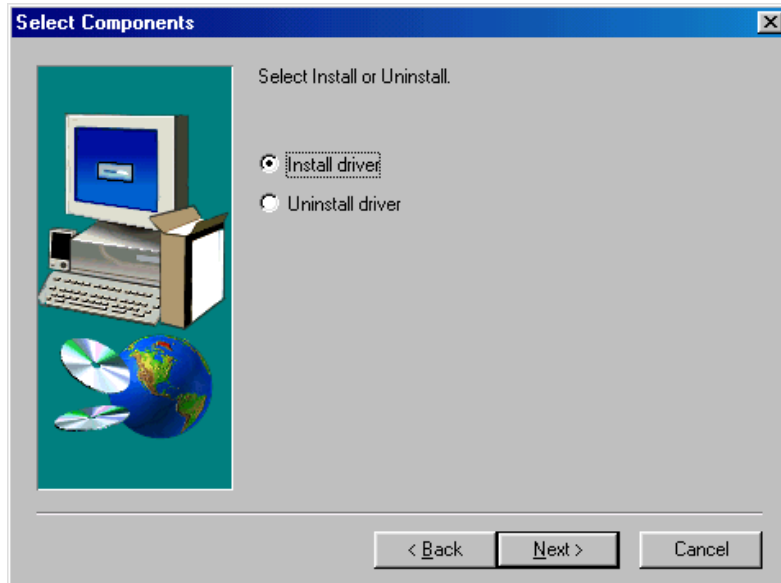
1. With the Utility CD Disk still in your CD ROM drive, open the File Manager and then select the CD-ROM drive. As soon as the system reads the disk, the VGA Menu screen below will appear on your display. Click on VIA\_AC97 from the main menu.



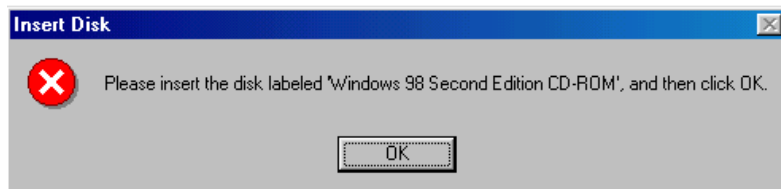
2. Once the Welcome screen appears on the screen, make sure to close applications that are running and then click the Next button.



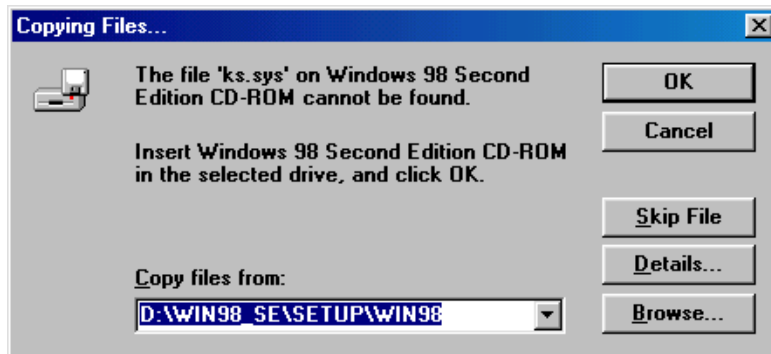
3. The Select Components dialog box is now displayed. Select on Install driver and then click on Next.



4. The program will now require the Windows installation disk for proper hardware installation. Insert the CD and then click on Next.



5. When the display below appears on your screen, Setup is already installing and copying the related files onto your hard drive. Click on the Next button to proceed.



6. After the audio driver installation finishes, select the Finish button to complete the installation process.

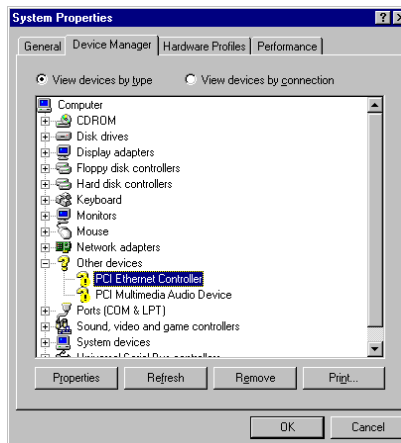


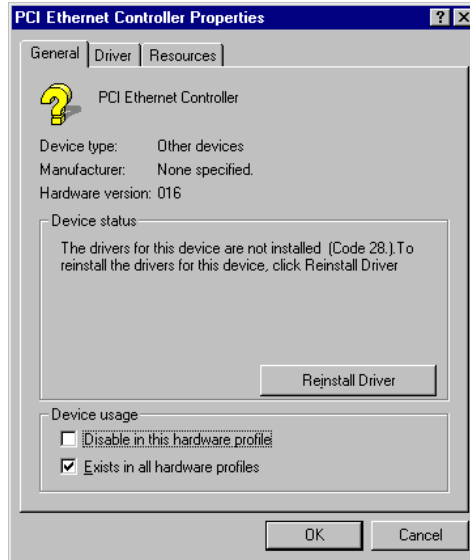
## 5.2 LAN Driver Installation for WIN95 & WIN98

1. With the Utility CD Disk still in your CD ROM drive, right click on My Computer icon from the Windows menu. Select on System Properties and then proceed to the Device Manager from the main menu.

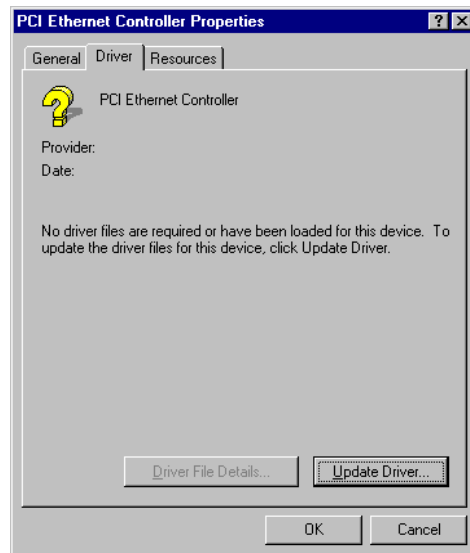


2. Select on Other Devices from the list of devices then double-click on PCI Ethernet Controller.





3. The PCI Ethernet Controller Properties screen then appears, allowing you to re-install the driver. Select Driver from the main menu to proceed.



4. The window then displays the current status of your LAN driver. Press on Update Driver button to continue.
5. The program will then launch the Update Device Driver Wizard window that will install your device driver. Click on the Next button to proceed to the next step.



6. When the succeeding window asks you what you wish Windows to do, tick on the "Search for a better driver...." Click on the Next button to proceed.

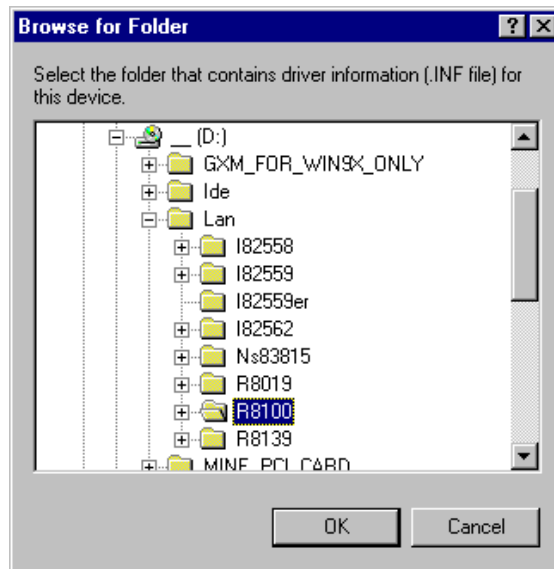




7. The Update Device Driver Wizard will then ask you to specify, by ticking, the path of the new driver. Tick on the open boxes where you require the program to search for the device driver then click on the Browse button to manually specify the path.



8. Press on the OK button as soon as you have located the path of your driver.



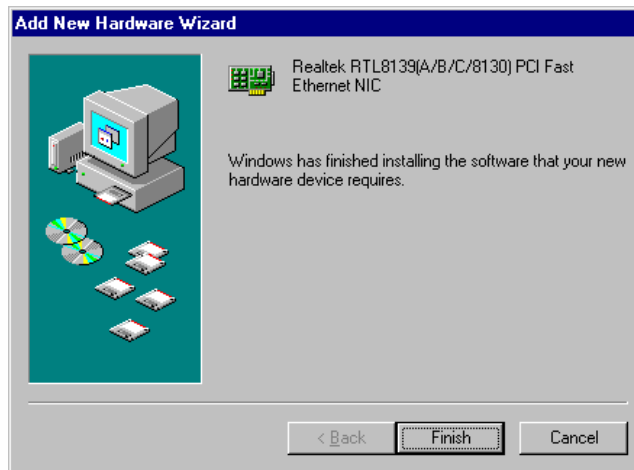
9. Once the program returns to the Add New Hardware Wizard screen, your specified location will appear. Press on the Next button to continue.



10. Once the program detects the device driver (\*.inf) file from your specified location, it will automatically copy the files into your hard drive.
11. When copying of driver files finishes, the program will then ask you to insert your Windows.



12. The program then copies the necessary files from your Windows installation disk to complete the driver setup process. Once the driver is completely installed, the following message appears on your display. Click on the Finish button to proceed.

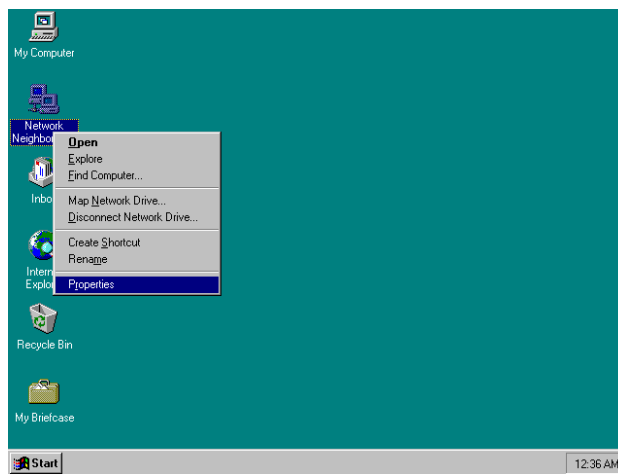


13. Restart your computer to make the new system settings take effect. Click on the Yes button when the screen below appears and your LAN Driver for Win95 and Win98 are now completely installed.

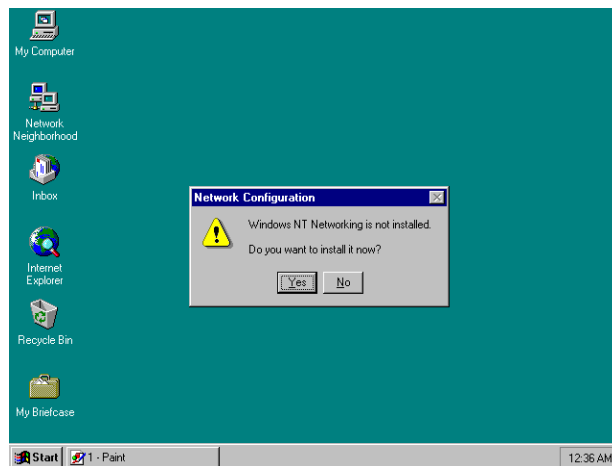


## 5.3 LAN Driver Installation for WIN NT4.0

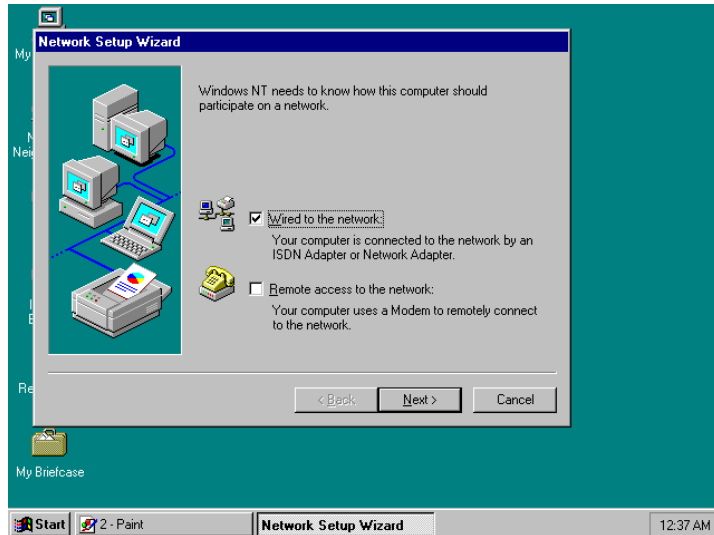
1. With the Utility CD Disk still in your CD ROM drive, right click on Network Neighborhood icon from the Windows menu. Select on Properties.



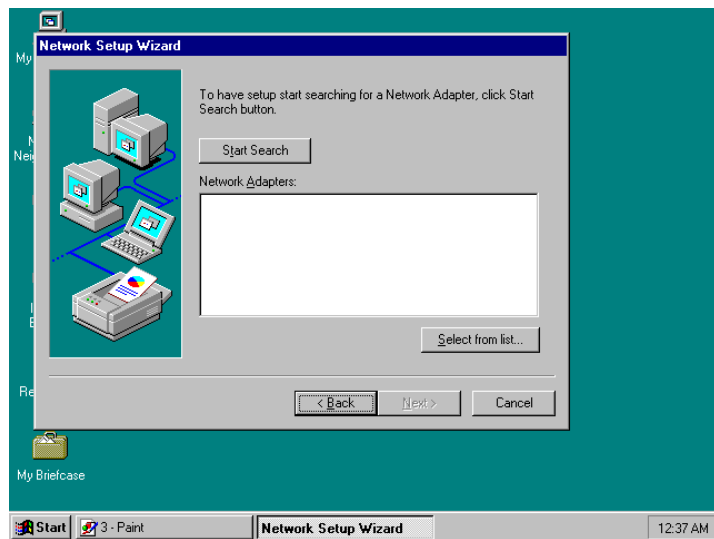
2. The system automatically detects the absence of Windows NT Networking. Click on the Yes button to start installation.



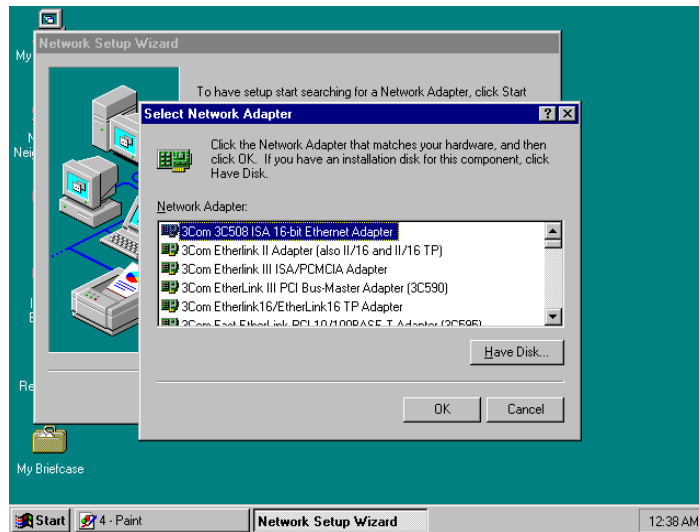
3. Tick on the "Wired to Network" once the following screen appears. Click on the Next to proceed.



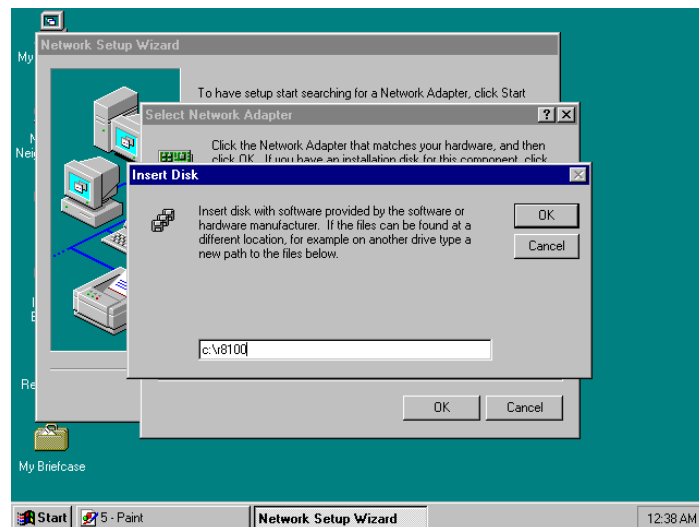
4. Click on the Start Search button for the program to locate the Network Adapter.



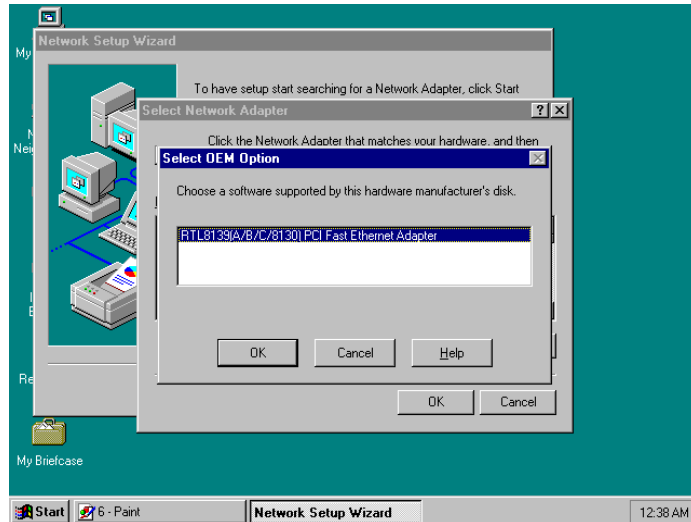
- Once setup finishes the search, it will list a number of adapters for you to choose from. Press on the Have Disk button to assign the driver path location.



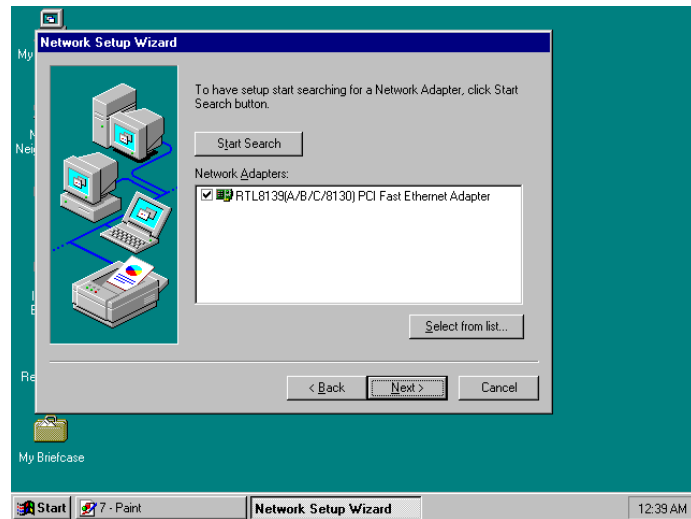
- Setup now asks you for the location of the driver. When you have entered the new driver path, press on the OK button to continue.



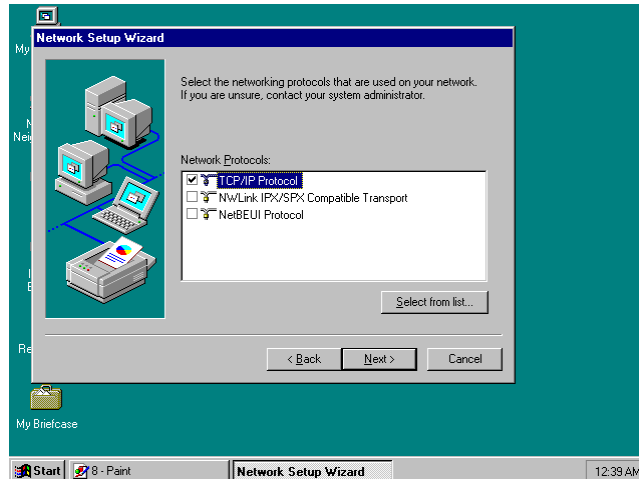
- When Setup finds the information it needs about the new driver, it will display the device it found on the following screen. Press on the OK button to accept and proceed.



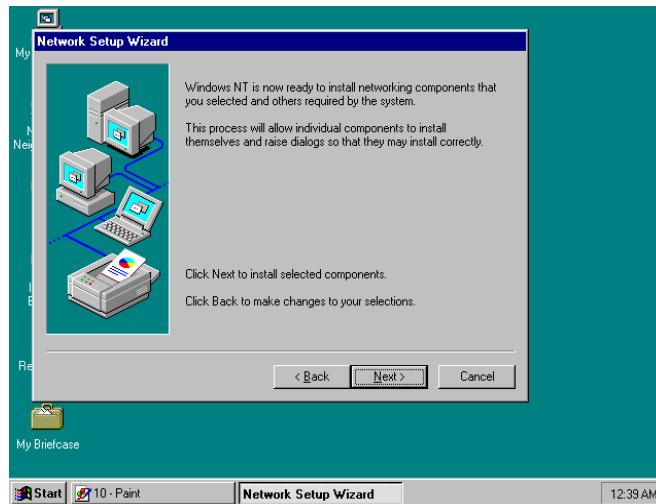
- Setup then returns to Network Setup Wizard screen and displays your new Network Adapter. Click on Next to continue.



9. The Network Setup Wizard then allows you to set the Network Protocols on your network. Select the appropriate protocol and then click on Next to continue.

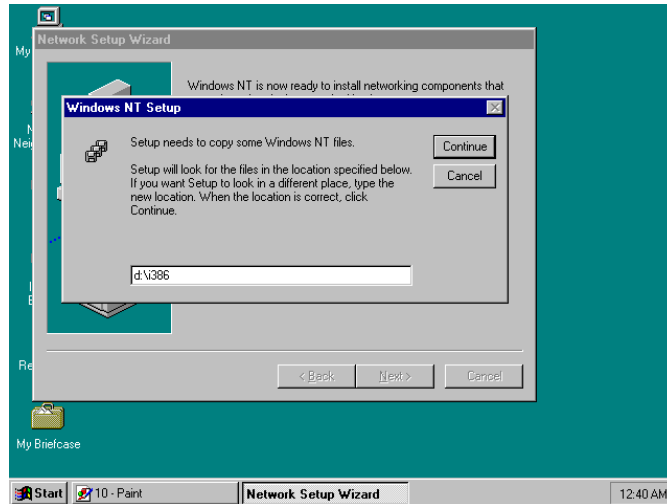


10. Before Setup starts installing the components found and the settings you made, it will give you the option to proceed or go back for changes from the following screen. Click on the Next button once you are sure of your devices.

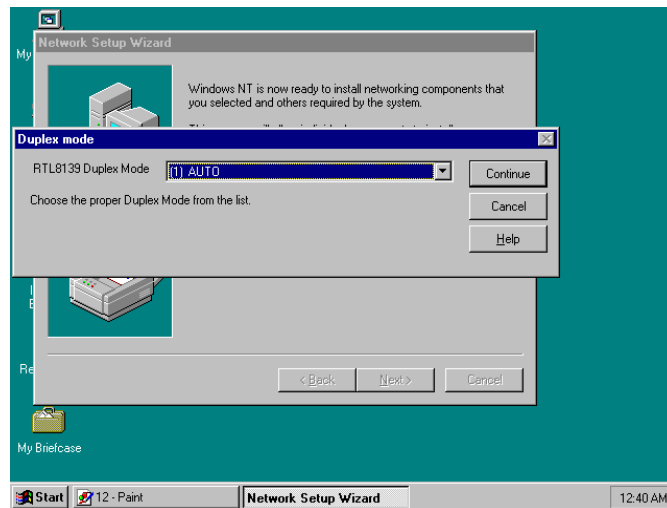




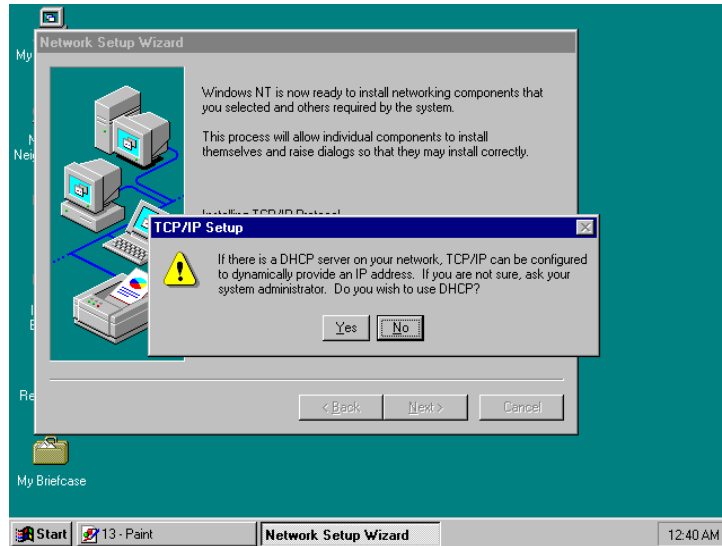
11. Windows NT Setup will then need to copy files necessary to update the system information. Specify the path then press Continue.



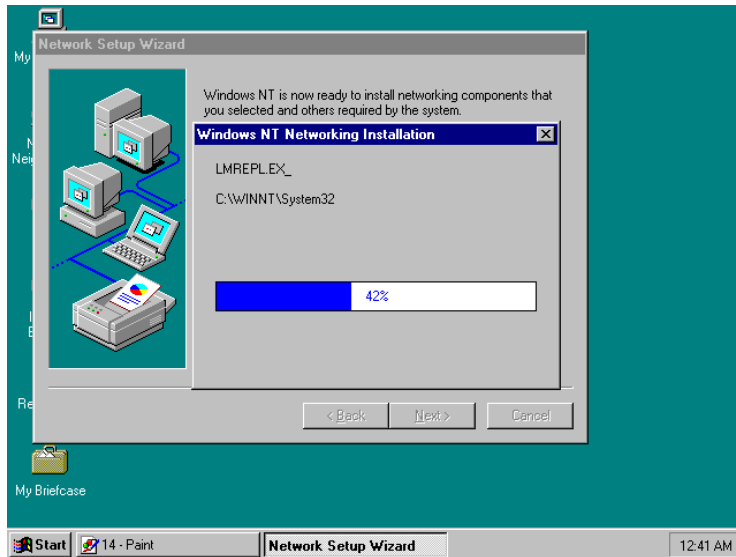
12. Once it finishes copying the files, Setup will now allow you to choose the Duplex Mode of your LAN controller. Press on the Continue button after making your selection.



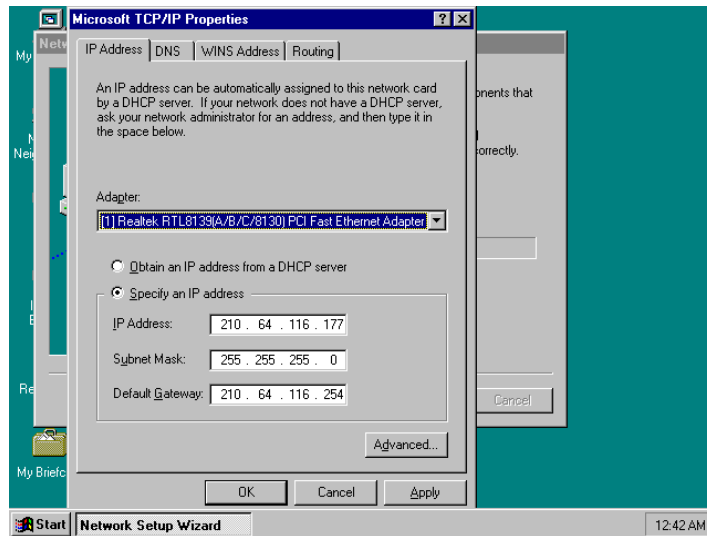
13. When Setup asks if you wish to change the TCP/IP settings of your system, select the appropriately. The default choice is No.



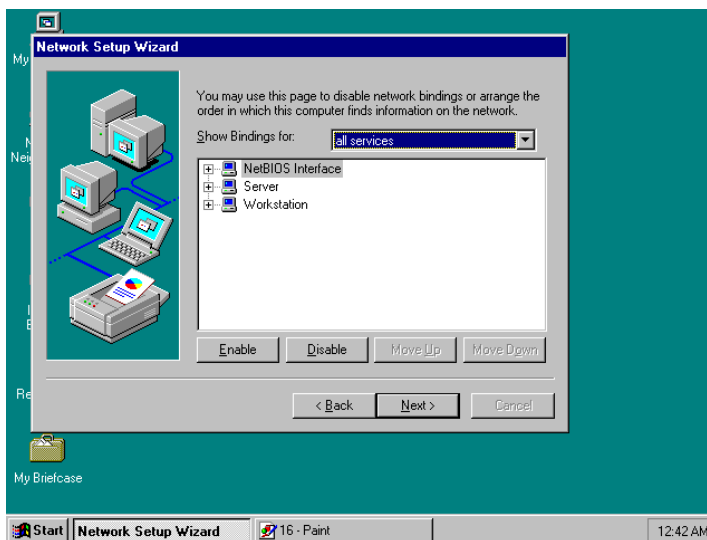
14. Setup then starts the Networking installation and copies the files.



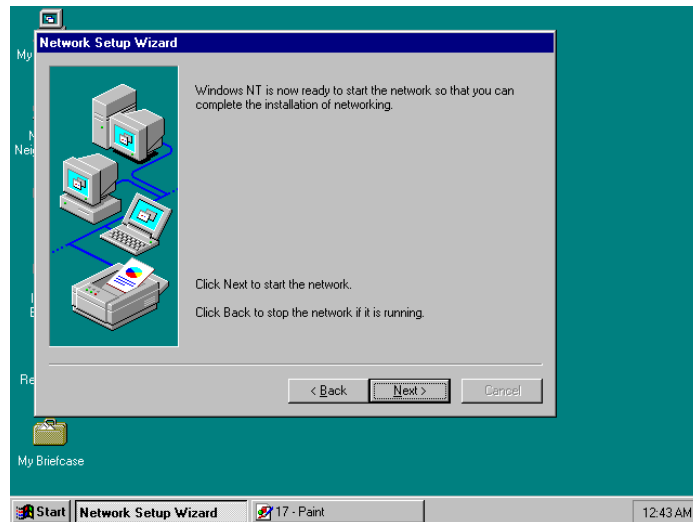
15. When Setup finishes copying, the TCP/IP properties of your system will then pop up on your screen like the one shown below. Make the necessary changes then click on OK to continue.



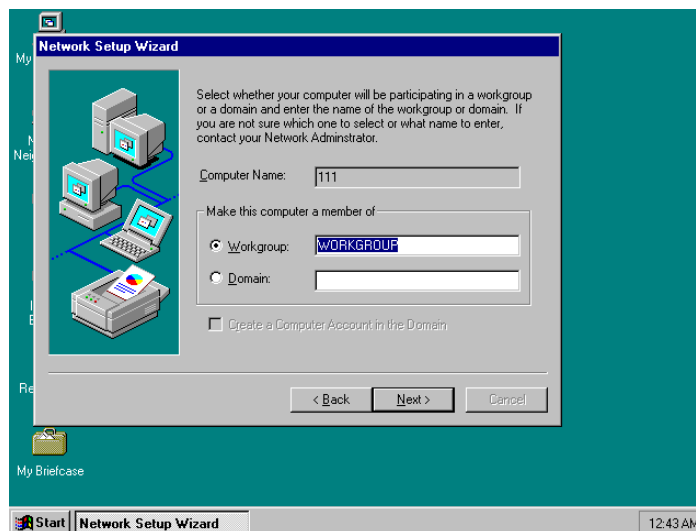
16. When the screen below appears, click on Next to continue.



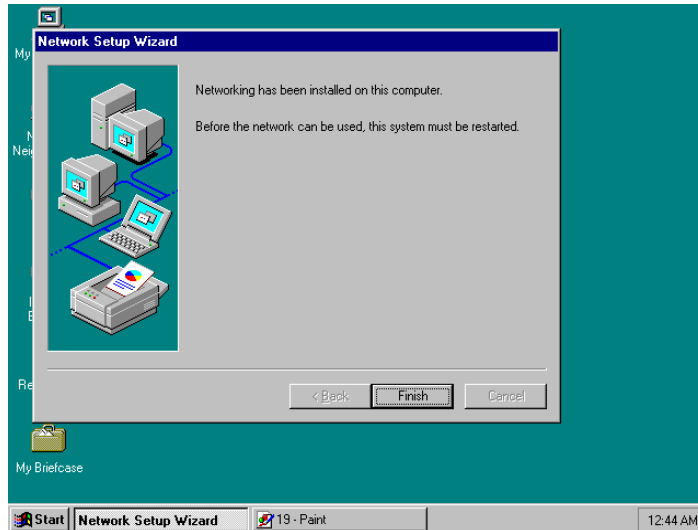
17. Setup then prompts you that it is ready to start the network. You may complete the installation thereafter. Click on Next to continue.



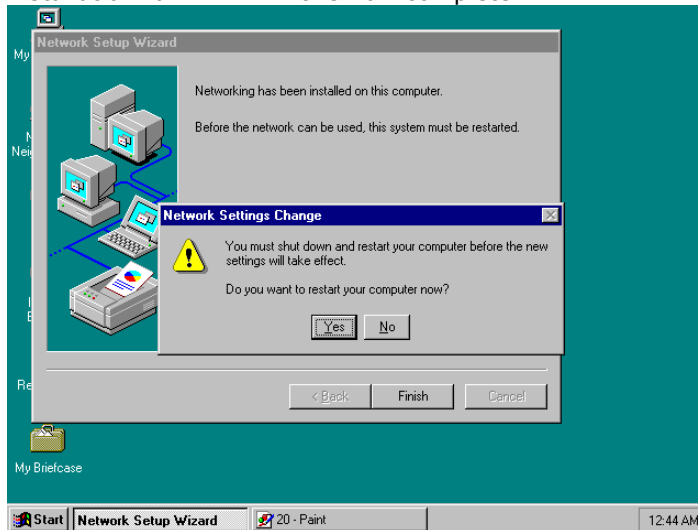
18. Assign the workgroup or domain setting of your computer. Click on Next to continue.



19. Restart your computer once the screen below appears. Click on Finish to continue.



20. Click on the Yes button to restart your computer. The LAN driver installation for WIN NT4.0 is now complete.



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