SBC8354

Pentium All-in-One
Embedded Board Series

User's Manual

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ESD Precautions

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.

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Chapter 1
Introduction

The **SBC8354VEA** is a Pentium-based embedded board with audio interface. Designed with the space-limited applications in mind, the **SBC8354** is practically the finest embedded 586 board in existence. Using a standardized format conforming to the size of a 5.25" HDD, **SBC8354** can adapt a wide variety of Pentium 586 microprocessors by simply configuring its onboard jumpers. To simplify system integration, it packs embedded provisions such as super I/Os, digital I/Os, XVGA, LCD, Ethernet, solid state disk, all on a single board. Unique embedded features such as 4 serial ports (3 x RS-232, 1 x RS-232/422/485) with +5V/12V power capability and digital I/Os for UPS and simple automation control are exclusive design features that allow adoption of a extensive array of PC peripherals.

The industrial-grade construction of the **SBC8354** allows your system to endure the continuous operation in hostile environments where stability and reliability are basic requirements. Its built-in watchdog timer, a special industrial feature not commonly seen on other motherboards, enhances system dependability of the SBC8354.

Designed for the professional embedded developers, the Pentium embedded board **SBC8354** is virtually the ultimate one-step solution for embedded system applications.

1.1 Specifications

- **CPU:** Intel Pentium P54C/P55C, AMD K5/K6/K6-2, Cyrix 6x86, IDT C6
- **System Chipset:** SiS 5582
- **BIOS:** AMI BIOS
- **Standard I/O:**
  - 4 x serial ports; 3x RS-232, 1x RS-232/422/485 with +5/12V power output capability in Pin 1 and Pin 9 (see page 9), selectable via jumper setting
    - 1 x parallel port, SPP/EPP/ECP
    - 2 x IDE Interface
    - 1 x FDD Interface
    - 1 x Keyboard Interface
    - 1 x PS/2 Mouse Interface
- **System Memory:** 2 x 72-pin SIMM socket upgradeable to 128MB
- **L2 Cache:** Onboard 512KB
- **Real Time Clock:** Dallas 12887A or its equivalent with built-in battery lasting 10 years
- **Watchdog Timer:**
  - Generates a system reset or Non-Maskable Interrupt
  - Software programmable timer

- **Ethernet:**
  - PCI Plug & Play Ethernet Controller
  - 10 Base-T/100 Base-T Interface Auto Switch
- **Digital I/O:** 4-channel input, 4-channel output
- **VGA/Flat Panel Controller:**
  - PCI interface controller with integrated 2MB SDRAM
  - VGA chipset: C&T 69000 supporting CRT/LCD displays
  - Supports up to 1280 x 1024 256-color resolution on non-interlaced CRT monitors, and 1024 x 768 16 bit-color on LCD panel monitors
- **Audio Interface:**
  - ESS 1869 Plug & Play audio controller
  - Supports Line-In, Audio-Out, and Mic-In
- **IrDA Interface:**
  - Supports IrDA version 1.0 SIR protocol
  - Supports Sharp ASK-IR protocol
- **USB Interface:** 2 USB ports
- **DiskOnChip®:** supports DiskOnChip®
- **Expansion Slots:** ISA/PCI and PC/104 expansion capability
- **Dimensions:** 146 x 203 mm

NOTE: *Specifications are subject to change without notice.*

1.2 Utilities Supported

- Ethernet Utility
- Flat panel/CRT Drivers
- Audio Drivers

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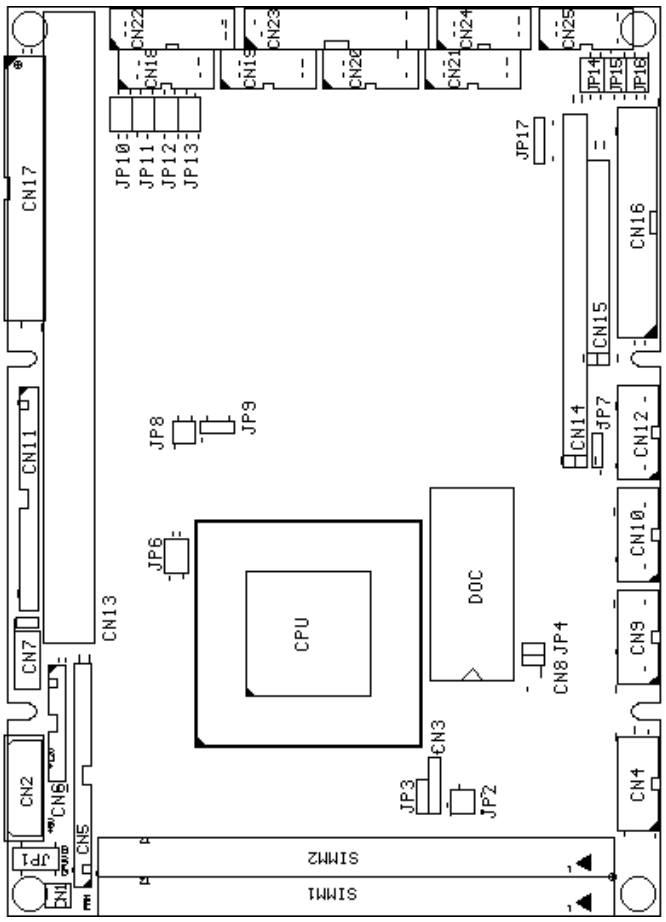
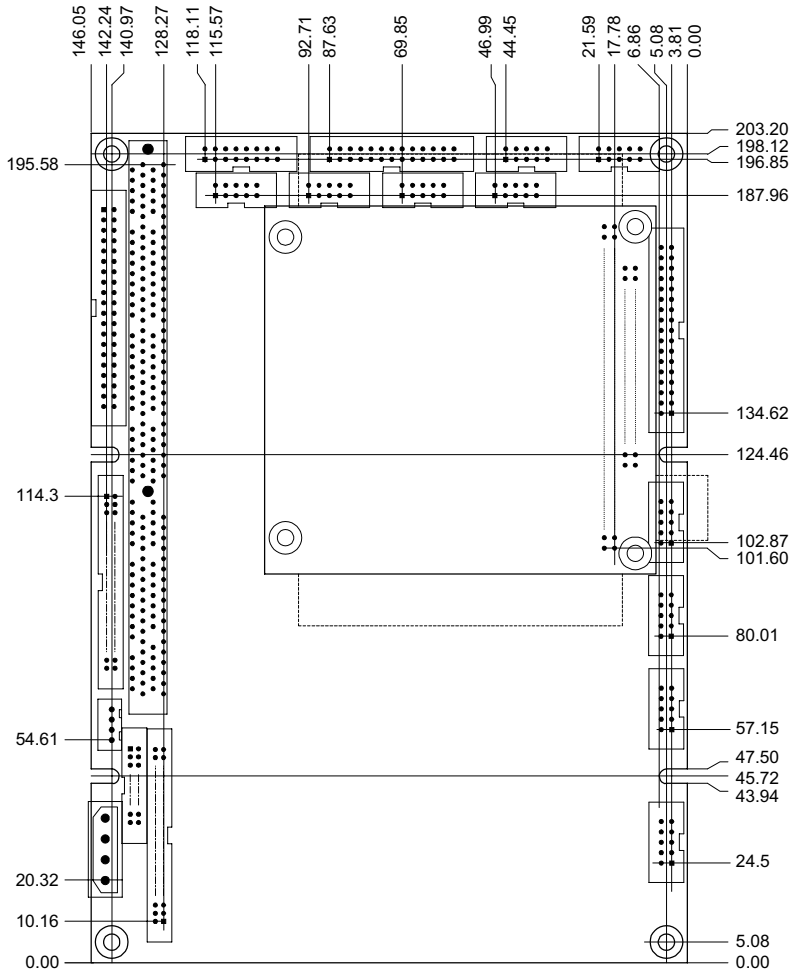
Chapter 2
Jumpers and Connectors

2.1 Board Layout and Fixing Holes

The figure below shows the location of all jumpers and connectors on the **SBC8354**.



SBC8354 Series Board Layout



SBC8354 Series Fixing Hole Placements

2.2 Jumper Settings

Making the proper jumper settings configures the **SBC8354** to match the needs of your application. The following table shows the correct jumper settings for the onboard devices.

Jumper	Default Setting	Jumper Setting
JP1	CPU Voltage Level : 2.9V	Short 1-2, 7-8
JP2	DiskOnChip® Memory Segment : DC000 – DFFFF	All Open
JP3	CPU VCC3 Select : 3.3V	Short 2-3
JP4	CMOS Clear Jumper : Normal	Open
JP6	CPU Bus/Core Ratio: 3.0	Short 3-4
JP7	Watchdog Trigger Mode Setting : NMI	Short 1-2
JP8	CPU Bus Clock : 66.6MHz	Short 3-4
JP9	Flat Panel Power Selection (V_{DDM} of CN11 and CN6) : 3.3V	Short 2-3
JP10	COM4 Mode Select : RS-232	Short 3-5, 4-6
JP11	COM3 Mode : Pin 1=DCD	Short 3-5
JP12	COM4 Mode Select : RS-232	Short 3-5, 4-6
JP13	COM4 Mode Select : RS-232	Short 1-2
JP14	COM2 Mode : Pin 1=DCD	Short 3-5
JP15	COM4 Mode : Pin 1=DCD	Short 3-5
JP16	COM1 Mode : Pin 1=DCD	Short 3-5

IMPORTANT: *The above default settings are set for Intel MMX-200 MHz CPU use. Please refer to the following subsections when installing other types of microprocessors.*

2.2.1 CPU Settings: JP1, JP3, JP6, JP8

When installing a new CPU, the related jumpers including CPU voltage (**JP1**), CPU type (**JP3**), CPU Clock Ration (**JP6**) and CPU Bus Clock (**JP8**) may need to be adjusted.

CPU Model		JP6	JP8	JP1	JP3
Intel P54C	P-133	Short 1-2	Short 3-4	Short 1-2, 3-4, 5-6, 7-8	Short 1-2
	P-166	Short 1-2, 3-4	Short 3-4	Short 1-2, 3-4, 5-6, 7-8	Short 1-2
	P-200	Short 3-4	Short 3-4	Short 1-2, 3-4, 5-6, 7-8	Short 1-2
Intel P55CMMX	P-166	Short 1-2, 3-4	Short 3-4	Short 1-2, 7-8	Short 2-3
	P-200	Short 3-4	Short 3-4	Short 1-2, 7-8	Short 2-3
	P-233	Open	Short 3-4	Short 1-2, 7-8	Short 2-3
AMD	K6-166	Short 1-2, 3-4	Short 3-4	Short 1-2, 7-8	Short 2-3
	K6-200	Short 3-4	Short 3-4	Short 1-2, 7-8	Short 2-3
	K6-233	Open	Short 3-4	Short 1-2, 3-4	Short 2-3
	K6-266	Short 1-2, 5-6	Short 3-4	Short 5-6	Short 2-3
	K6-300	Short 1-2, 3-4, 5-6	Short 3-4	Short 5-6	Short 2-3
	K6-2-300	Short 1-2, 3-4, 5-6	Short 3-4	Short 5-6	Short 2-3
	K6-2-333	Short 3-4, 5-6	Short 3-4	Short 5-6	Short 2-3
	K6-2-366	Short 5-6	Short 3-4	Short 5-6	Short 2-3
	K6-2-400	Short 1-2	Short 3-4	Short 5-6	Short 2-3
Idt	MX200	Short 3-4	Short 3-4	Short 1-2, 3-4, 5-6, 7-8	Short 1-2
Cyrix	6x86MX-166	Short 1-2, 3-4	Short 1-2	Short 1-2	Short 2-3
	6x86MX-200	Short 1-2, 3-4	Short 3-4	Short 1-2	Short 2-3
	6x86MX-233	Short 3-4	Short 3-4	Short 1-2	Short 2-3
	6x86MX-266	Open	Short 3-4	Short 1-2	Short 2-3

2.2.1.1 CPU Jumper Settings Reference

With the rapid development and short life cycle of microprocessors in the market, the preceding section only provides the jumper settings of currently available CPU types and makes. For upcoming CPU types, please refer to the following tables when configuring the jumpers onboard the **SBC8354**.

CPU Voltage Level: JP1

Options	Setting
2.0	All Open
2.1	Short 7-8
2.2	Short 5-6
2.3	Short 5-6, 7-8
2.4	Short 3-4
2.5	Short 3-4, 7-8
2.6	Short 3-4, 5-6
2.7	Short 3-4, 5-6, 7-8

Options	Setting
2.8	Short 1-2
2.9	Short 1-2, 7-8 (default)
3.0	Short 1-2, 5-6
3.1	Short 1-2, 5-6, 7-8
3.2	Short 1-2, 3-4
3.3	Short 1-2, 3-4, 7-8
3.4	Short 1-2, 3-4, 5-6
3.5	Short 1-2, 3-4, 5-6, 7-8

CPU VCC3 Select: JP3

Options	Setting
Single Voltage	Short 1-2
Dual Voltage 3.3V	Short 2-3 (default)

CPU Bus/Core Ratio: JP6

Options	Setting
x 1.5/3.5	Open
x 2/x 6	Short 1-2
x 2.5	Short 1-2, 3-4
x 3	Short 3-4 (default)

Options	Setting
x 4	Short 1-2, 5-6
x 4.5	Short 1-2, 3-4, 5-6
x 5	Short 3-4, 5-6
x 5.5	Short 5-6

CPU Bus Clock: JP8

Options	Setting
50MHz	Short 1-2, 3-4
55MHz	All Open
60MHz	Short 1-2
66.6MHz	Short 3-4 (default)

2.2.2 DiskOnChip® Memory Segment: JP2

Options	Settings
D0000 – D3FFF	Short 1-2, 3-4
D4000 – D7FFF	Short 3-4
D8000 – DBFFF	Short 1-2
DC000 – DFFFF	All Open (default)

2.2.3 COM1~COM4 Mode: JP11, JP14, JP15, JP16

COM1	JP16
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 9=12V	Short 2-4
Pin 9=RI	Short 4-6

COM2	JP14
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 9=12V	Short 2-4
Pin 9=RI	Short 4-6

COM3	JP11
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 9=12V	Short 2-4
Pin 9=RI	Short 4-6

COM4	JP15
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 9=12V	Short 2-4
Pin 9=RI	Short 4-6

: Default settings

2.2.4 COM4 Mode Select: JP10, JP12, JP13

COM4	JP10	JP12	JP13
RS-232 (default)	3-5, 4-6	3-5, 4-6	1-2
RS-422	1-3, 2-4	1-3, 2-4	3-4
RS-485	1-3, 2-4	1-3, 2-4	5-6

2.2.5 Flat Panel Power Selection (V_{DDM} of CN11 and CN6): JP9

VDDM	Settings
5V	Short 1-2
3.3V	Short 2-3 (default)

SBC8354 supports +3.3V or +5V flat panel displays. When using such type of flat panels, configure jumper **JP9** to the appropriate voltage of the flat panel.

2.2.6 Watchdog Trigger Mode Setting: JP7

The watchdog timer is an indispensable feature of the **SBC8354**. It has a sensitive error detection function and a report function. When the CPU processing comes to a halt, the watchdog either generates a NMI or resets the CPU.

Options	Settings
NMI	Short 1-2 (default)
RESET	Short 2-3
Disabled	Open (default)

2.2.7 CMOS Clear Jumper: JP4

Options	Settings
Clear CMOS	Short 1-2
Normal	Open (default)

2.3 Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered by your system may be a result from loose or improper connections. Ensure that all connectors are in place and firmly attached. The following table lists the function of each connector on the **SBC8354**. Their corresponding pin assignments are described in Chapter 3.

Connectors	Label	Connectors	Label
CPU Fan Connector	CN1	PC/104 16-bit Connector	CN15
Power Connector 1	CN2	FDD Connector	CN16
KeyLock/Power LED	CN3	IDE Channel 2	CN17
Audio Connector	CN4	COM1	CN18
IDE Channel 1	CN5	COM2	CN19
Power Connector 2	CN7	COM3	CN20
Flat Panel Connector	CN11, CN6	COM4	CN21
Reset Connector	CN8	VGA Connector	CN22
IrDA Connector	CN9	Printer Port Connector	CN23
USB Connector	CN10	Digital I/O Connector	CN24
KB and PS/2 Mouse	CN12	Ethernet Connector	CN25
EISA Connector	CN13	HDD Active LED	JP5
PC/104 8-bit Connector	CN14	Net LED Link LED: 1-2 Tx/Rx: 3-4	JP17

Chapter 3
Hardware Description

3.1 Microprocessors

The **SBC8354** supports Intel Pentium, AMD K5/K6/K6-2, and Cyrix 6x86 microprocessors. Systems based on these CPUs can be operated under UNIX, OS/2, Windows NT, Windows 95 and MS-DOS environments. The system performance depends on the microprocessor installed onboard. When installing a new CPU, the jumpers including CPU type, CPU clock, CPU voltage and PCI bus clock may need to be adjusted according to the specifications of the microprocessor. Make sure all settings are correct for the installed microprocessor to prevent any damage to it.

3.2 BIOS

System BIOS used on the **SBC8354** is AMI Plug and Play BIOS. The **SBC8354** contains a single Winbond 29EE020 Flash EPROM and supports power-on modification of the system BIOS. Refer to Chapter 7 for a detailed description of the AMI BIOS software utility program.

3.3 System Memory

The two onboard 72-pin SIMM sockets, capable of supporting 256Kx36, 512Kx36, 1Mx36, 2Mx36, 4Mx36 and 8Mx36 SIMM modules, provide users with up to 128MB of system memory. The DRAM controller supports auto-insert error debug, auto-detect DRAM size and bank.

The **SBC8354** also supports non-parity SIMM DRAM. In CMOS BIOS, the "memory-parity-check item" must be set to *Disabled.*

3.4 I/O Port Address Map

The Pentium CPU communicates via I/O ports. It has a total of 1KB port addresses available for assignment to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-03F	Interrupt controller #1
040-05F	Timer
060-06F	Keyboard controller
070-07F	Real time clock, NMI
080-09F	DMA page register
0A0-0BF	Interrupt controller #2
0C0-0DF	DMA controller #2
0F0	Clear math coprocessor busy signal
0F1	Reset math coprocessor
0F8-0FF	Math processor
120	Disable watchdog timer operation (read)
121	Enable watchdog timer operation (read)
122	Watchdog
123	Digital I/O
1F0-1F8	Fixed disk controller
200-207	Game port
250-25F	Winbond I/O #2
278-27F	Parallel port #2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel port #1
380-38F	SDLC #2
3A0-3AF	SDLC #1
3B0-3BF	MDA video card (including LPT1)
3C0-3CF	EGA card
3D0-3DF	CGA card

Continued . . . . .

Address	Devices
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port #1 (COM1)
3E8-3EF	Serial port #3 (COM3)
2F8-2FF	Serial port #2 (COM2)
2E8-2EF	Serial port #4 (COM4)
3FF	Winbond I/O #1

3.5 Interrupt Controller

The **SBC8354** is a 100% PC compatible control board. It consists of 16 ISA interrupt request lines. Four out of the sixteen can either be ISA or PCI. The mapping list of the 16 interrupt request lines is shown on the following table.

NMI	Parity check error
IRQ0	System timer output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	Audio
IRQ6	Floppy disk controller
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	Ethernet
IRQ10	Serial port #3
IRQ11	Serial port #4
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE Channel

3.6 IDE Interface Connector

The built-in 2 channel PCI bus enhanced IDE controller supports 4 IDE drives, master/slave mode and post write transaction mechanisms with 64-byte buffer, and master data transaction. **CN5** is a 44-pin primary IDE interface connector for standard 2.5" IDE device. **CN17** is a 40-pin secondary IDE interface connector for standard 3.5" IDE device.

CN5: IDE Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 16
19	GND	20	No connector	21	No connector
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	No connector	29	No connector	30	GND-Default
31	Interrupt	32	No connector	33	SA1
34	No connector	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND	41	Vcc	42	Vcc
43	GND	44	No connector		

CN17: 40-pin IDE Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1

Continued . . . . .

Pin	Description	Pin	Description	Pin	Description
16	Data 14	17	Data 0	18	Data 16
19	GND	20	No connector	21	No connector
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	No connector	29	No connector	30	GND-Default
31	Interrupt	32	No connector	33	SA1
34	No connector	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND				

3.7 Display Interface

3.7.1 Flat Panel/CRT Interface Controller

The built-in C&T 69000 is a high-performance flat panel/super VGA display controller with onboard 2M bytes VGA RAM. It is capable of driving a wide array of flat panel and CRT displays. It can also support CRT at a maximum resolution of up to 1280x1024 with 256 colors, 640x480 with 16M colors, and panel resolutions of 1024x768, and 1280x1024. The C&T 69000 also supports monochrome panels up to 64 gray scales. It displays up to 226,981 different colors on passive STN flat panels and up to 16M colors on 24-bit active matrix flat panels.

3.7.2 Features

- Fully compatible with IBM™ VGA
- Flat panel and CRT monitor can be displayed simultaneously
- Onboard 2M bytes VGA RAM
- Supports panel resolution up to 1280x1024
- Supports non-interlaced CRT monitors with resolutions up to 1280x1024 256 colors
- Direct interface to Color and Monochrome Dual Drive and Single Drive panels
- SMARTMAP™ intelligent color to gray scale conversion enhances text legibility

- Integrated programmable linear address feature accelerates GUI performance
- Hardware Windows acceleration
- Built-in 44 pins general purpose connector for flat panel display, and an extended 20-pin for 36 bit XVGA flat panel

3.7.3 VGA/Flat Panel Connectors

The **SBC8354** has three connectors that support CRT VGA and flat panel displays, individually or simultaneously. **CN22** is a 16-pin pin header connector commonly used for the CRT VGA display. **CN11** (44-pin) and **CN6** (20-pin) are dual-in-line headers for flat panel connection. Configuration of the VGA interface is done via the software utility and no jumper setting is required. The following two tables are the pin assignments for the CRT/VGA connector and the flat panel connector.

CN22: CRT/VGA Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
1	Red	2	GND	3	Green
4	N/A	5	Blue	6	GND
7	N/A	8	N/A	9	GND
10	N/A	11	GND	12	Horizontal Sync
13	N/A	14	Vertical Sync	15	N/A
16	No connector				

CN11: Flat Panel Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
1	-12V	2	+12VM	3	GND
4	GND	5	VDDM	6	VDDM
7	ENAVEE	8	GND	9	P0
10	P1	11	P2	12	P3
13	P4	14	P5	15	P6
16	P7	17	P8	18	P9
19	P10	20	P11	21	P12

Continued . . . . .

Pin	Description	Pin	Description	Pin	Description
22	P13	23	P14	24	P15
25	P16	26	P17	27	P18
28	P19	29	P20	30	P21
31	P22	32	P23	33	GND
34	GND	35	SHFCLK	36	FLM
37	M	38	LP	39	GND
40	ENABKL	41	GND	42	-SHFCLK
43	VDDM	44	VDDM		

CN6: Flat Panel Connector for XVGA

Pin	Description	Pin	Description	Pin	Description
1	GND	2	GND	3	P24
4	P25	5	P26	6	P27
7	P28	8	P29	9	GND
10	GND	11	P30	12	P31
13	P32	14	P33	15	P34
16	P35	17	VDDM	18	VDDM
19	+12VM	20	+12VM		

3.7.4 Flat Panel Connector Pin Description

Name	Description
P0~P35	Flat panel data output
ENABKL	Activity Indicator and Enable Backlight outputs
SHFCLK	Shift clock. Pixel clock for flat panel data
M	M signal for panel AC drive control
LP	Latch pulse. Flat panel equivalent of HSYNC
FLM	First line marker. Flat panel equivalent of VSYNC
+12VM	+12V power controlled by chipset
ENAVEE	Power sequencing controls for panel LCD bias volt
VDDM	3.3V or 5V selected by JP9

3.8 Floppy Disk Controller

The **SBC8354** provides a 34-pin header type connector, **CN16**, for support of up to two floppy drives. The floppy drives could be any one of the following types: 5.25" 360KB/1.2MB and 3.5" 720KB/1.44MB/2.88MB.

CN16: Floppy Disk Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
1	GND	2	Reduce write current	3	GND
4	No connector	5	GND	6	No connector
7	GND	8	Index#	9	GND
10	Motor enable A#	11	GND	12	Drive select B#
13	GND	14	Drive select A#	15	GND
16	Motor enable B#	17	GND	18	Direction#
19	GND	20	STEP#	21	GND
22	Write data#	23	GND	24	Write gate#
25	GND	26	Track 0 #	27	GND
28	Write protect#	29	GND	30	Read data#
31	GND	32	Side 1 select#	33	GND
34	Disk change#				

3.9 Parallel Port Interface

The onboard **PRN** of **SBC8354** is a multi-mode parallel port supporting:

- **Standard mode:** IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port
- **Enhanced mode:** Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)
- **High speed mode:** Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

The address selection of the onboard parallel port, in LPT1 (3BCH), LPT2 (378H), LPT3 (278H) or disabled, is configured within the BIOS CMOS setup utility.

CN23: Parallel port Connector Pin Assignment

Pin	Description	Pin	Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialize#
4	Data 2	17	Printer Select In#
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	No connector

3.10 Serial Port Interface

The **SBC8354** has four onboard serial ports, **COM1**, **COM2** and **COM3** are RS-232 and **COM4** is RS-232/422/485, jumper selectable. All four ports feature +5V/12V power capability on pin 1 and pin 8, depending on the jumper setting.

3.10.1 Serial Ports IRQ Selection

COM1, **COM2**, **COM3** and **COM4** have their own corresponding one 10-pin connector. IRQ for **COM1** and **COM2** are selected on IRQ4 or IRQ3. Both ports can be enabled or disabled via BIOS setting. The IRQ for **COM3** and **COM4** is selected on 10 or 11 by BIOS setting.

3.10.2 Serial Ports +5V and +12V Power Selection

The four COM ports have +5V/+12V power capability on pin 1 and pin 8, depending on the jumper setting. (See Section 2.2) The RS-232 pin assignments are listed on the next page.

Pin	Description	Pin	Description
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)		

The RS-422/485 pin assignments for **COM4** are listed on the following table.

Pin #	Signal Name	
	R2-422	RS-485
1	TX-	DATA-
2	No connector	No connector
3	TX+	DATA+
4	No connector	No connector
5	RX+	No connector
6	No connector	No connector
7	RX-	No connector
8	No connector	No connector
9	GND	GND
10	No connector	No connector

3.11 Digital I/Os

The **SBC8354** is equipped with a 4-channel digital I/O connector **CN24** that meets a system's customary automation control needs. The digital I/O can be configured to control the cash drawer, or to sense the warning signal of an Uninterrupted Power System (UPS), or to perform the store security control. The digital I/O is controlled via software programming.

CN24: Digital I/O Connector

Pin	Signal	Pin	Signal
1	DIO Out 0	2	DIO Out 1
3	DIO Out 2	4	DIO Out 3
5	GND	6	DIO In 0
7	DIO In 1	8	DIO In 2
9	DIO In 3	10	GND

3.11.1 Digital I/O Software Programming

The Digital I/O on the **SBC8354** is not an isolated type.

Output	Address	Bit
Out-0	123	0
Out-1	123	1
Out-2	123	2
Out-3	123	3

Example program;

Out 123h, 03h	Out-0, Out-1	Turn On
	Out-2, Out-3	Turn Off
Out 123h, 0Ah	Out-0, Out-2	Turn Off
	Out-1, Out-3	Turn On

Example program;

If INPUT 123 is
(1011), then INPUT-2 is "0"
If INPUT 123 is (1100), then INPUT-0 &1 are "0"
** The INPUT signal has to be TTL signal

3.12 Real Time Clock and CMOS RAM

The **SBC8354** contains a MC146818 compatible Real Time Clock (RTC) and 128 bytes of CMOS RAM in the Dallas DS12887A, or its equivalent. The CMOS RAM stores the system configuration information entered via the SETUP program. A battery, with power lasting 10 years, keeps the stored information on the RTC and CMOS RAM active when system power is turned off.

3.13 Keyboard and PS/2 Mouse Connector

The **SBC8354** provides a keyboard and PS/2 mouse interface via a 10-pin connector. The pin assignment of this keyboard/ mouse connector is shown below.

CN12: Keyboard and PS/2 Mouse Connector Pin Assignment

Pin	Description	Pin	Description
1	Keyboard Vcc	6	Mouse Vcc
2	Keyboard Data	7	Mouse data
3	Keyboard CLK	8	Mouse CLK
4	GND	9	GND
5	Vcc	10	+12V

3.14 USB Connector

The Universal Serial Bus (USB) connector on the **SBC8354** is used when installing peripherals supporting the USB interface. **CN10** is the 10-pin USB connector on the **SBC8354**.

CN10: USB Connector

Pin	Description	Pin	Description
1	VCC	6	UV1+
2	VCC	7	GND
3	UV0-	8	GND
4	UV1-	9	GND
5	UV0+	10	GND

3.15 Ethernet Connectors

The RJ-45 connector is applied for Ethernet operations. To connect the **SBC8354** to a 10-Base-T or 100-Base-T hub, just plug one end of the cable into the **CN25** and connect the other end (phone jack) of the cable to a 10/100-Base-T hub.

CN25: 10/100-Base-T Interface

Pin	Description	Pin	Description
1	Tx+ (Data transmission positive)	2	Tx- (Data reception negative)
3	Rx+(Data reception positive)	4	RJ-1 (for 100-Base-T only)
5	RJ-1 (for 100-Base-T only)	6	Rx- (Data reception negative)
7	RJ-2 (for 100-Base-T only)	8	RJ-2 (for 100-Base-T only)
9	No connector	10	GND

3.16 CPU Fan Connector

CN1 is a CPU fan connector. Pentium microprocessors require a fan for heat dispensing. The fan connector on the **SBC8354** provides power to the fan. Its pin assignment is as follows:

Pin	Description
1	+12V
2	GND

3.17 PC/104 Connectors

The PC/104 is an industrial standard. It is a compact form factor with dimensions of 3.6" x 3.8" and is fully compatible with the ISA Bus. The PC/104 interface is able to adapt the off-the-shelf PC/104 modules, such as sound module, fax modem module and multi-I/O module...etc.

CN14: PC/104 Bus Pin Assignment

Pin#	Pin Name	Pin#	Pin Name	Pin#	Pin Name	Pin#	Pin Name
1	IOCHCHK*	2	0V	3	SD7	4	RESETDRV
5	SD6	6	+5V	7	SD5	8	IRQ9
9	SD4	10	-5V	11	SD3	12	DRQ2
13	SD2	14	-12V	15	SD1	16	ENDXFR*
17	SD0	18	+12V	19	IOCHRDY	20	(KEY)
21	AEN	22	SMEMW*	23	SA19	24	SMEMR*
25	SA18	26	IOW*	27	SA17	28	IOR *
29	SA16	30	DACK3*	31	SA15	32	DRQ3
33	SA14	34	DACK1*	35	SA13	36	DRQ1
37	SA12	38	REFRESH*	39	SA11	40	SYSCLK
41	SA10	42	IRQ7	43	SA9	44	IRQ6
45	SA8	46	IRQ5	47	SA7	48	IRQ4
49	SA6	50	IRQ3	51	SA5	52	DACK2*
53	SA4	54	TC	55	SA3	56	SALE
57	SA2	58	+5V	59	SA1	60	OSC
61	SA0	62	0V	63	0V	64	0V

CN15: PC/104 Bus Pin Assignments

Pin#	Pin Name	Pin#	Pin Name	Pin#	Pin Name	Pin#	Pin Name
1	0V	2	0V	3	MEMCS16*	4	SBHE*
5	IOCS16*	6	LA23	7	IRQ10	8	LA22
9	IRQ11	10	LA21	11	IRQ12	12	LA20
13	IRQ15	14	LA19	15	IRQ14	16	LA18
17	DACK0*	18	LA17	19	DRQ0	20	MEMR*
21	DACK5*	22	MEMW*	23	DRQ5	24	SD8
25	DACK6*	26	SD9	27	DRQ6	28	SD10
29	DACK7*	30	SD11	31	DRQ7	32	SD12
33	+5V	34	SD13	35	MASTER*	36	SD14
37	0V	38	SD15	39	0V	40	(KEY)

3.18 PCI/ISA Slot Connector

The **SBC8354** provides a free ISA/PCI slot for ISA and PCI device expansion.

CN13: PCI/ISA Slot Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
A1	-IOCHK	A2	SD7	A3	SD6
A4	SD5	A5	SD4	A6	SD3
A7	SD2	A8	SD1	A9	SD0
A10	IOCHRDY	A11	AEN	A12	SA19
A13	SA18	A14	SA17	A15	SA16
A16	SA15	A17	SA14	A18	SA13
A19	SA12	A20	SA11	A21	SA10
A22	SA9	A23	SA8	A24	SA7
A25	SA6	A26	SA5	A27	SA4
A28	SA3	A29	SA2	A30	SA1
A31	SA0	B1	GND	B2	RESETDRV
B3	+5V	B4	IRQ9	B5	-5V

Continued . . . . .

Pin	Description	Pin	Description	Pin	Description

B6	DREQ2	B7	-12V	B8	-0WS
B9	+12V	B10	GND	B11	-SMEMW
B12	-SMEMR	B13	-IOW	B14	-IOR
B15	-DACK3	B16	DREQ3	B17	-DACK1
B18	DREQ1	B19	-REFRESH	B20	SYSCLK
B21	IRQ7	B22	IRQ6	B23	IRQ5
B24	IRQ4	B25	IRQ3	B26	-DACK2
B27	TC	B28	BALE	B29	+5V
B30	OSC	B31	GND	C1	-SBHE
C2	LA23	C3	LA22	C4	LA21
C5	LA20	C6	LA19	C7	LA18
C8	LA17	C9	-MEMR	C10	-MEMW
C11	SD8	C12	SD9	C13	SD10
C14	SD11	C15	SD12	C16	SD13
C17	SD14	C18	SD15	D1	-MEMCS16
D2	-IOCS16	D3	IRQ10	D4	IRQ11
D5	IRQ12	D6	IRQ15	D7	IRQ14
D8	-DACK0	D9	DREQ0	D10	-DACK5
D11	DRQ5	D12	-DACK6	D13	DREQ6
D14	-DACK7	D15	DREQ7	D16	+5V
D17	-MASTER	D18	GND	E1	GND
E2	GND	E3	-PIRQA	E4	-PIRQC
E5	+5V	E6	KEY	E7	+5V
E8	-PCIRST	E9	-PGNT0	E10	-PREQ0
E11	GND	E12	PCLK0	E13	GND
E14	AD30	E15	No connector	E16	KEY
E17	No connector	E18	AD28	E19	AD26
E20	AD24	E21	AD22	E22	AD20
E23	AD18	E24	No connector	E25	KEY
E26	No connector	E27	AD16	E28	-FRAME
E29	-CBE2	E30	-TRDY	E31	-STOP
F1	GND	F2	GND	F3	-PIRQB

Continued . . . . .

Pin	Description	Pin	Description	Pin	Description

F4	-PIRQD	F5	+5V	F6	KEY
F7	+5V	F8	PCLK1	F9	GND
F10	-PGNT1	F11	GND	F12	-PREQ1
F13	AD31	F14	AD29	F15	No connector
F16	KEY	F17	No connector	F18	AD27
F19	AD25	F20	-CBE3	F21	AD23
F22	AD21	F23	AD19	F23	No connector
F25	KEY	F26	No connector	F27	AD17
F28	-IRDY	F29	-DEVSEL	F30	-PLOCK
F31	-PERR	G1	No connector	G2	No connector
G3	-CBE1	G4	PAR	G5	GND
G6	KEY	G7	GND	G8	AD13
G9	AD11	G10	AD9	G11	-CBE0
G12	AD6	G13	AD4	G14	AD2
G15	KEY	G16	+5V	G17	+5V
G18	GND	G19	GND	H1	-SERR
H2	AD15	H3	AD14	H4	AD12
H5	GND	H6	KEY	H7	GND
H8	AD10	H9	AD8	H10	AD7
H11	AD5	H12	AD3	H13	AD1
H14	AD0	H15	KEY	H16	+5V
H17	+5V	H18	GND	H19	GND

3.19 Pin Assignments of Other Connectors

JP5: HDD Active LED

Pin	Description
1	Vcc
2	Signal

CN9: IrDA Connector

Pin	Signal	Pin	Signal
1	Vcc	2	Vcc
3	No connector	4	No connector
5	No connector	6	IRRX
7	No connector	8	GND
9	GND	10	IRTX

CN4: Audio Connector

Pin	Signal	Pin	Signal
1	MIC-IN	2	GND
3	Line In L	4	GND
5	Line In R	6	GND
7	Audio Out L	8	GND
9	Audio Out R	10	GND

CN3: KeyLock and Power LED

Pin	Description
1	Vcc
2	No connector
3	GND
4	KeyLock
5	GND

CN2: Power Connector

Pin	Description
1	+5V
2	GND
3	GND
4	+12V

CN7: Power Connector

Pin	Description
1	-5V
2	GND
3	GND
4	-12V

Chapter 4
Ethernet

4.1 Introduction

The **SBC8354** is equipped with a high performance Plug and Play Ethernet interface which is fully compliant with the IEEE 802.3 standard, and consisting of a RJ-45 connector (CN25).

4.2 Features

- 10Mb/s and 100Mb/s operations
- Supports 10Mb/s and 100Mb/s N-Way auto negotiation
- Full duplex capability
- Full compliance with PCI Revision 2.1
- PCI Bus Master data transfers

4.3 Drivers Supported

Bundled with popular software drivers, the **SBC8354** Ethernet interface allows great flexibility to work with all major networking operating systems including Novell NetWare v2.x, v3.x, v4.x, Microsoft LAN Manager, Win3.1, Win NT, Win95/98, IBM LAN Server, SCO UNIX or other ODI, NDIS and Packet drive compliant operating systems.

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Chapter 5
Display Drivers

The LCD/VGA chipset used on the **SBC8354** is C&T69000 which can drive a wide range of monochrome and color flat panels including Single-Drive (SS) and Dual-Panel, Dual Drive (DD) passive STN and active matrix TFT / MIM LCD, EL, and Plasma panels. The 69000 supports an additional 256Kx16 DRAM providing a 32-bit video memory bus and additional display memory to support resolution up to 1280x1024 in 256 colors, 800x600 in 256 colors, and 640x480 in 16M colors. The 69000 accelerator can support up to 64 gray scales on monochrome panels, up to 226, 981 colors on passive STN LCDs, and up to 16M colors on 24-bit active matrix LCDs. It also offers a variety of programmable features to optimize display quality, including tall font stretching, fast vertical centering and programmable vertical stretching in graphics for handling modes with less than 480 lines.

The 69000 is fully compatible with the VGA graphics standard at the register, gate, and BIOS levels. AXIOMTEK supplies fully VGA-compatible BIOS, end-user utilities and drivers for common application programs (e.g., Microsoft Windows™ , OS/2, WordPerfect, Lotus, etc.). CHIPS' drivers for Windows include a Big Cursor setting and fast panning / scrolling capabilities.

Before you begin the driver software installation, be sure to make backup copies of the *Display Driver Diskettes*.

Make sure you know the version of the application for which you are installing drivers. Your *Display Driver Diskettes* contain drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

5.1 Windows 3.1x

These drivers are designed to work with Microsoft Windows Version 3.1x. You may install these drivers either through Windows or in DOS.

5.1.1 Driver Installation - DOS Setup

Step 1: Install Windows as you normally do for a VGA display. Run Windows to make sure it is working correctly. Then exit from Windows.

Step 2: Place the Windows 3.1x *Display Driver Diskette* in drive A. Type **A: <ENTER>** to make it be the default drive. Type **SETUP <ENTER>** to run the driver SETUP program. Press any key to get to the application list. Using the arrow keys, select ***Windows Version 3.1*** and press the **<ENTER>** key. Press the **<ENTER>** key to select ***All Resolutions***, then press **<END>** to begin the installation. At this point, you will be asked for the path to your Windows System directory (default C:\WINDOWS). When the installation is complete, press any key to continue. Press **<ESC>** followed by **Y** to exit to DOS.

Step 3: Change to the directory where you installed Windows (usually C:\WINDOWS).

Step 4: Type **SETUP <ENTER>** to run the Windows Setup program. It will show the current Windows configuration. Use the "up" arrow key to move to the *Display* line and press **<ENTER>**. A list of display drivers will be shown. Use the arrow keys to select one of the drivers starting with an asterisk (*) and press **<ENTER>**.

Step 5: Follow the directions on the screen to complete the setup. In most cases, you may press **<ENTER>** to accept the suggested option. When Setup is done, it will return to DOS. Type **WIN <ENTER>** to start Windows with the new display driver.

5.1.2 Changing Display Drivers from DOS

To change display drivers from DOS, change to the Windows directory and run Setup, repeating steps 4 and 5 from the previous section. Besides the special display drivers marked by an asterisk (*), you should be able to use the following standard drivers:

VGA	640x480, 16 colors
Super VGA	800x600, 16 colors

5.1.3 Changing Display Drivers from Windows

To change display drivers from Windows, select the *Windows Setup* icon from the Main window. You will be shown the current setup configuration. Select *Change System Settings* from the Option menu. Click on the arrow at the end of the *Display* line. A list of display drivers will be shown. Click on the driver you want to select. Then, click on the *OK* button. Follow the directions to complete the setup.

5.1.4 Changing Color Schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. You can correct this by choosing the same color scheme or a new color scheme. First, select the *Control Panel* from the *Main* window. Select the *Color* icon. You will be shown the current color scheme. Choose a new color scheme and click the *OK* button.

5.2 Windows NT 3.5x

These drivers are designed to work with Microsoft Windows NT 3.5x

5.2.1 Driver Installation

Step 1 : Install Windows NT as you normally would do for a VGA display. Run Windows NT Control Panel from the Main Group. Choose the **Display** *option*. In the Display Settings dialog box, click on *Change Display Type*. Click on *Change* from the Adapter Type in the Display Type dialog box. Click on *Other* in the Select Device dialog box.

Step 2: Place the *Windows NT Display Driver Diskette* in drive A. Press **<ENTER>** and the name of the driver, *Chips and Technologies Video Controller* will appear highlighted in the Models list box. Click on ***INSTALL*** to install the selected driver. Once the installation is complete, the system must be shut down and restarted.

Step 3: Upon restart, at the **Invalid Display Selection** message, click on *OK* and select the desired display settings from the Display Settings dialog box. The system must be shut down and restarted for the new settings to take effect.

5.3 OS/2

These drivers are designed to function with the OS/2 Version 3.0 ONLY

5.3.1 Driver Installation

Before installation of this display driver, the system display should be set to VGA mode. VGA is the default video mode enabled when OS/2 is installed.

If the current system primary display is not VGA, or if a previous version of this driver is being used, the system should first be returned to VGA mode. To restore VGA mode, use Selective Install and select VGA for Primary Display.

To install this driver, do the following steps:

Step 1: Open an OS/2 full screen or windowed session.

Step 2: Place the CHIPS 65550 Display Driver Diskette in drive A.

Type **A: <ENTER>** to make this the default drive.

Type **INSTALL A: C: <ENTER>**

Where A: is the floppy disk drive and C: is the hard disk partition containing \OS2

Once the Install Program is completed, do a system shutdown and reboot.

A log of the information output during the install can be found in <root>:\OS2\INSTALL\CTINSTL.LOG

Step 3: After the system has rebooted, open the System Setup folder and run Selective Install to install the new device driver and configure the video system.

Follow the instructions on the screen to set up the OS/2 display drivers in your system. First, select Primary Display from the System Configuration Window. From the list of Primary Display Adapter Types, select Chips and Technologies 65550 and then select *OK*.

After the program installation is completed, the display driver will be initialized for 640x480x256 Color. Shutdown and then reboot the system for the installed changes to take effect.

To switch to a different video resolution or color depth, do the following:

Change Video Resolution

Step 4: To change the screen resolution or color depth:

Open the System Setup folder, then open System. From the list of available screen resolutions, select a new resolution. Point to the title-bar icon and double click. See Changing Screen Resolution in OS/2 User's Guide for more information.

NOTE: *Always use the INSTALL.CMD for the first installation of the video device drivers. Thereafter, perform Step 4 above when changing video resolutions.*

5.3.2 WIN-OS/2

Please note the following limitations regarding WIN-OS/2.

1. The WIN-OS/2 full screen session should be set to Enhanced Capability. The default setting is Standard Mode. If this setting is not changed, Windows will not run correctly.
2. WIN-OS/2 should be started by selecting the WIN-OS/2 Full Screen Icon in the Command Prompts folder, or with the WIN command in a DOS Full Screen or OS/2 Full Screen session.
3. Do not start WIN-OS/2 in a DOS or OS/2 Window. The system does not support the enhanced video mode being used in a window, and therefore will not run.
4. When running a full screen WIN-OS/2 session, do not use ALT-HOME to switch to Windows DOS session.

5.3.3 Driver Diskette Copy

For proper installation of OS/2 drivers, all diskette copies must be properly labeled "CTDISP 1".

To copy the OS/2 Display Driver Diskette, follow these instructions:

Step 1: Copy all files on the OS/2 Display Driver Diskette as you normally would onto another diskette.

Step 2: Place the diskette copy in drive A. At the C:\ prompt, type LABEL A: CTDISP 1 to properly label your diskette.

NOTE: *If you encounter problems when loading Full Screen OS/2 or WIN-OS/2, check if you are using lmouse.drv driver in the WINDOWS/SYSTEM subdirectory. If so, then you must edit the CHIPS550.DSP file and modify the following line:*

BOOT OS2MOUSE.DRV MOUSE.DRV
to
BOOT OS2MOUSE.DRV LMOUSE.DRV

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Chapter 6
Audio Device

6.1 Introduction

The audio device onboard the **SBC8354VEA** incorporates the ESS1869 audio chipset. ESS1869 is a 16 Bit ISA Bus Plug and Play device that supports MIC In, Line In, and 2 watts of Audio Out. Connector **CN4** onboard **SBC8354VEA** serves as the interface between the audio device and the **SBC8354VEA**-based system. Refer to Section 3.19 for the pin assignments of **CN4**.

6.2 Supported Drivers

The audio driver bundled with the **SBC8354VEA** supports several OS platforms. There are 4 operating systems currently supported by the **SBC8354VEA** audio driver. Audio drivers provided include Windows NT 4.0, Win3.1, Win95, and OS/2.

6.3 Plug and Play Notes

Both Win95 and Win98 operating systems support Plug and Play components and peripherals. In relation to the Audio Device onboard **SBC8354VEA**, these platforms automatically detect any installed audio device then allocate the resources to the audio device. With the 16 interrupt request lines fully occupied (see Section 3.5), we recommend you to set the Audio Device at IRQ5. Doings so will avoid conflicts with other installed devices, and eliminate harsh sound reproduction on your audio device.

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Chapter 7
AMI BIOS Utility

Chapter 7 describes how to set up BIOS configuration along with the Watchdog utility and software programs.

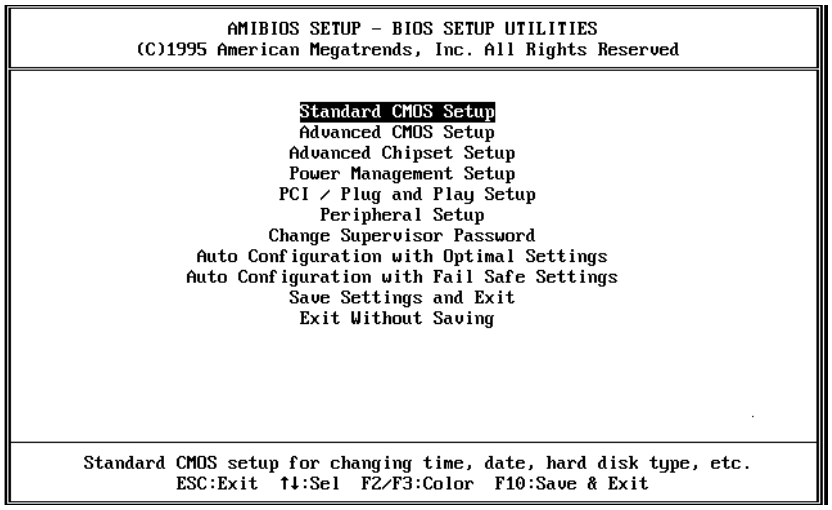
7.1 AMI BIOS Setup

7.1.1 Starting AMI BIOS Setup

Upon POST execution, the following message appears on the screen:

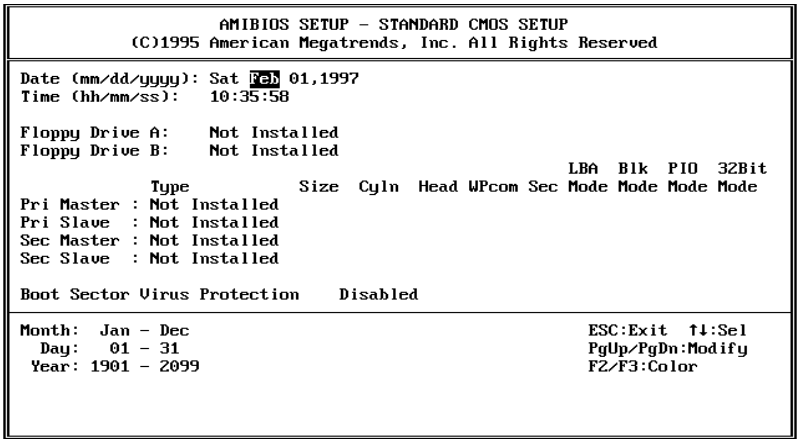
Hit <DEL> if you want to run SETUP

Press the <Del> key to run AMI BIOS Setup.



7.2 Standard CMOS Setup

Upon entering this BIOS Setup option, the following screen will appear:



- **Date, Day and Time Configuration**

  Select the Standard option. Select the Date and Time icon. The current values for each category are displayed. Enter new values through the keyboard.

- **Floppy Drive A:, Floppy Drive B:**

  Move the cursor to these fields via ↑ and ↓ and select the floppy type. The settings are 360KB 5.25 inch, 1.2 MB 5.25 inch, 720KB 3.5 inch, 1.44 MB 3.5 inch, or 2.88 MB 3.5 inch.

- **Pri Master, Pri Slave**

  Select one of these hard disk drive icons to configure the drive named in the option. A scrollable screen that lists all valid disk drive types is displayed. Select the correct type and press <Enter>. The AMIBIOS is able to detect the IDE drive parameters automatically and report them on this screen. To enable this auto-detect function, just select the drive type *Auto*.

  The **SBC8354** provides 2 IDE channels. This channel can support either mater/slave drive.

7.2.1 Entering Drive Parameters

You can also enter the hard disk drive parameters. The drive parameters are:

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
Write Pre-compensation	The size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write pre-compensation circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number where write pre-compensation begins.
Landing Zone	This number is the cylinder location where the heads will normally park when the system is shut down.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drive may have even more sectors per track.
Capacity	The formatted capacity of the drive is (Number of heads) x (Number of cylinders) x (Number of sectors per track) x (512 bytes per sector)

7.3 Advanced CMOS Setup

This section lists the most commonly used items in Advanced CMOS Setup. If you have any questions or unable to find answers in this manual, please contact authorized technicians.

- **System Keyboard**

  This option does not specify if a keyboard is attached to the computer. Instead it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboards. The available settings are *Absent* and *Present.*

- **Primary Display**

  Select this icon to configure the type of monitor attached to the computer. The settings are *Monochrome, Color 40x25, Color 80x25, VGA/PGA/EGA,* or *Not Installed.*

- **Parity Check**

  This option enables or disables NMI. If the watchdog function selects NMI trigger, this option must be enabled.

- **Wait for <F1> If Any Error**

  AMI BIOS POST runs system diagnostic tests that can generate a message followed by:

  Press <F1> to continue

  If this option is enabled, AMI BIOS waits for the user to press <F1> before continuing. If this option is disabled, AMI BIOS continues the boot process without waiting for <F1> to be pressed. The options available are *Enabled* and *Disabled*.

- **Floppy Drive Seek**

  When this option is enabled, AMI BIOS performs a Seek command on floppy drive A: before booting the system. The settings are *Enabled* and *Disabled*.

- **Floppy Drive Swap**

  This option enables or disables the floppy swap function. The available options are *Enable* and *Disable*.

- **BootUp Sequence**

  This option sets the boot sequence of installed drives (either floppy drive A: or hard disk drive C: or CDROM) that AMI BIOS attempts to boot from after POST completes. The settings are *C:, A:*, *CDROM* or *A:*, *C:*, *CDROM* or *CDROM*, *A:*, *C:.*

- **System Boot Up CPU Speed**

  This option sets the speed of the CPU at system boot time. The options are *High* and *Low*.

- **External Cache**

  If the onboard cache memory is enabled there are only two settings available, *Write Thru* or *Write Back*; otherwise it is set to *Disabled*.

7.4 Advanced Chipset Setup

- **Memory Parity Check**

  This option enables or disables parity error checking for system RAM. The settings are *Enabled* (all system RAM parity is checked) and *Disabled*.

7.5 Peripheral Setup

- **Onboard FDC**

  This option enables the use of the built-in floppy drive controller. Available settings are *Auto*, *Enabled* and *Disabled*.

- **OnBoard Serial Port 1**

  IRQ4 is used for the first serial port (COM1). This option selects the onboard serial port 1 Address set. The settings are *Auto*, *Disabled*, *3F8h IRQ4*, and *3E8h IRQ4*.

- **OnBoard Serial Port 2**

  IRQ3 is used for the second serial port (COM2). This option selects the onboard serial port 2 Address set. The settings are *Auto*, *Disabled*, *2F8h IRQ3* and *2E8h IRQ3.*

- **OnBoard Serial Port 3**

  This option selects the onboard serial port 3 Address set. The settings are *Auto*, *Disabled*, *3F8h IRQ10*, *2F8h IRQ12*, *3E8h IRQ10*, and *2E8h IRQ12.*

- **OnBoard Serial Port 4**

  This option selects the onboard serial port 4 Address set. The settings are *Auto*, *Disabled*, *3F8h IRQ9*, *2F8h IRQ11*, *3E8h IRQ9*, and *2E8h IRQ11.*

- **OnBoard Parallel Port**

  This option selects onboard parallel port Address set. The settings are *Auto*, *3BCh*, *378h*, *278h* and *Disabled*.

- **Parallel Port Mode**

  This option specifies the parallel port Mode. The settings are *Normal*, *Di-Dir*, *EPP* and *ECP.*

Appendix A
Watchdog Timer

Using the Watchdog Timer

The **SBC8354** features a system protective device, watchdog timer, which can generate a CPU reset when the system comes to a halt or failure. This function ensures the system's reliability during unattended operation. The system failure may be caused by thunder, power glitch, radio interference, software bug or whatever reason.

To activate the watchdog timer, some program code similar to the following code has to be written to the system running loops:

```
:
  Loop:
       read (0x121)              ; enable and trigger WDT
          :                      ; interval time between triggers
       if (END) GOTO END         ; must be smaller than time-out
          GOTO Loop; period
  END:
       read (0x120)              ; disable WDT
          :
```

Setting the Watchdog Time-out

User can setup the watchdog time-out via the BIOS Function Call.

```
Call:   AX = 7101 H
        BX = Time-out Value (0001~FFFF, 1=0.5 sec)
        INT = 15H
Return
        AL = 0                    = successful
        Other                     = Fail
```

How to Use the Watchdog Function

The user can read I/O Port 121H to enable Watchdog or disable it by reading I/O Port 120H.

Reset Watchdog - Read I/O Port 121H
Time_A - Read I/O Port 121H
Time_B - Read I/O Port 121H
Disable Watchdog - Read I/O Port 120H
** Time_B_Time_A < Time_Out Setting **

In system Run_Time, you still have to read I/O Port 121H to reset the Watchdog timer.

If the system fails, the TSR should be stopped and Watchdog reset action will be activated.

Appendix B

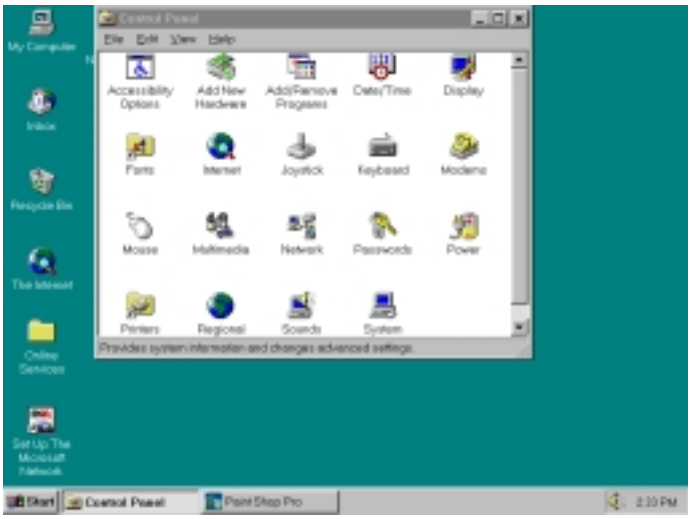
AUDIO/NET Driver Installation under Win95/98

This appendix describes in detail the important steps when installing the **SBC8354VEA** audio and network drivers under Win95.

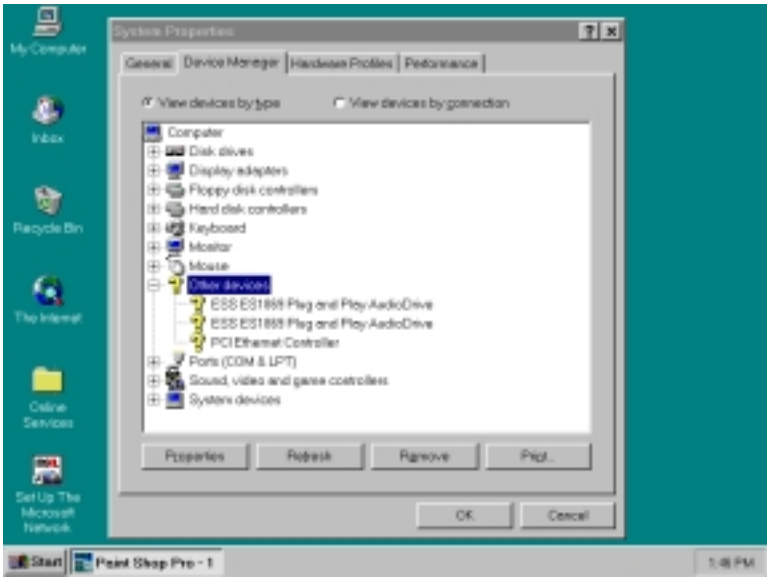
IMPORTANT: *During Win95 installation, do not attempt to install your Sound Card & Network Adapter hardware outright; doing so will install the older versions of the device drivers within the Win95/98 setup program.*

After completing the Win95/98 installation, user must do the following actions upon first-time entry into Win95/98:

1. Launch the Control Panel window
   - Select the **Start** button at the bottom left corner of the screen then click on **Settings**.
   - Choose **Control Panel** from the list and the following window appears on your display.

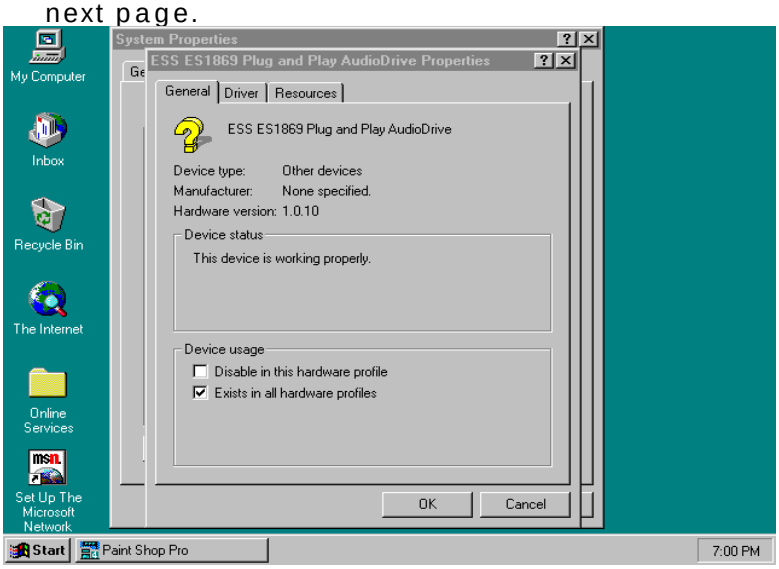


2. Access the System Properties window
   - Double-click on the **System** icon and then choose **Device Manager** from the menu.
   - A new window will pop-up with the **Other Devices** represented by a **"?"** mark. Click this **"?"** mark and 3 devices marked with **"?"** appears on its subset device list. Two out of 3 devices specify the *ESS ES1869 Plug and Play AudioDrive*; the other device specifies the *PCI Ethernet Controller*. Refer to the following illustration for a more accurate description.



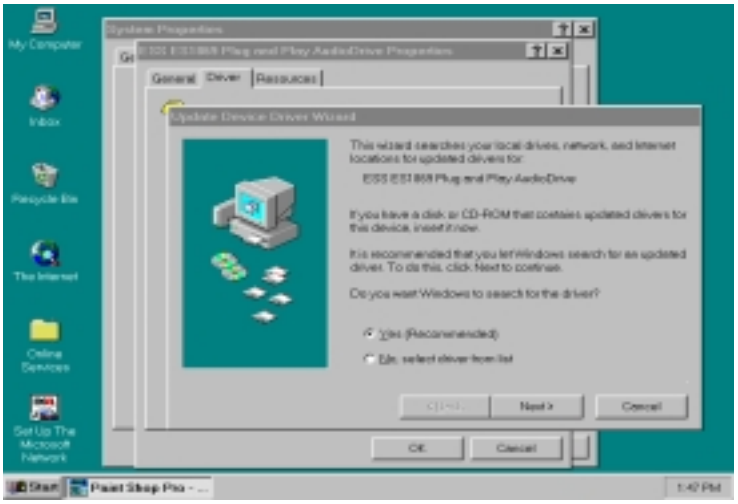
3. Enter the ESS ES1869 Plug and Play AudioDrive Properties window
   - Insert the ESS1869 Driver for Win95/98 diskette into your Drive A:.
   - Move the cursor to the **first** *ESS ES1869 Plug and Play AudioDrive*, double-click your left mouse button and the **ESS ES1869 Plug and Play AudioDrive Properties** window pops up as illustrated on the

next page.



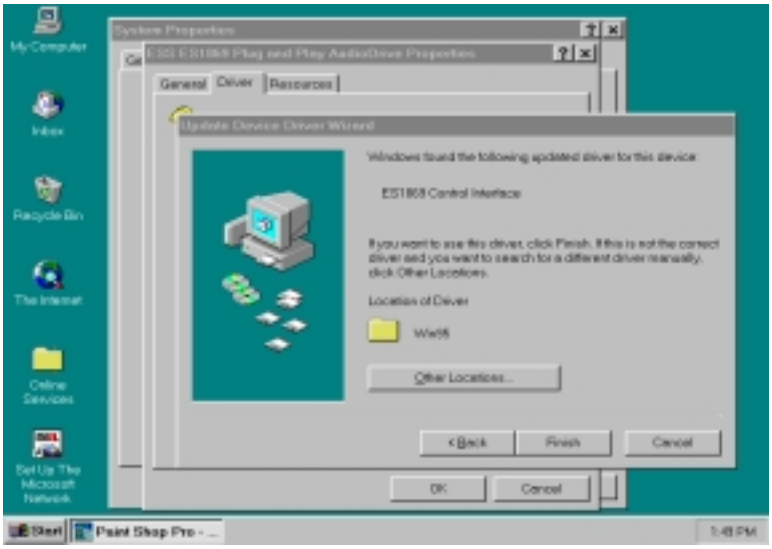
4. Detect and specify the .INF audio device driver path

- Click on **Driver** from the menu bar and a new screen appears with the **Update Driver...** button.
- Click on this **Update Driver...** button and the **Update Device Driver Wizard** window below appears.



- Choose **Yes (Recommended)** then click on the **Next>** button to proceed. The system then searches for the .INF audio driver file starting from A: drive.

5. Completing the installation
   - Once the driver file in Drive A: is detected, the **Update Device Driver Wizard** window will list the detected driver. Refer to the screen below.
   - Click on the **Finish** button to complete the installation of the **first** *ESS ES1869 Plug and Play AudioDrive*.



After installation, your display will return back to the **ES1869 Plug and Play AudioDrive Properties** window. Click on the **Close** button to get back to the **System Properties** window.

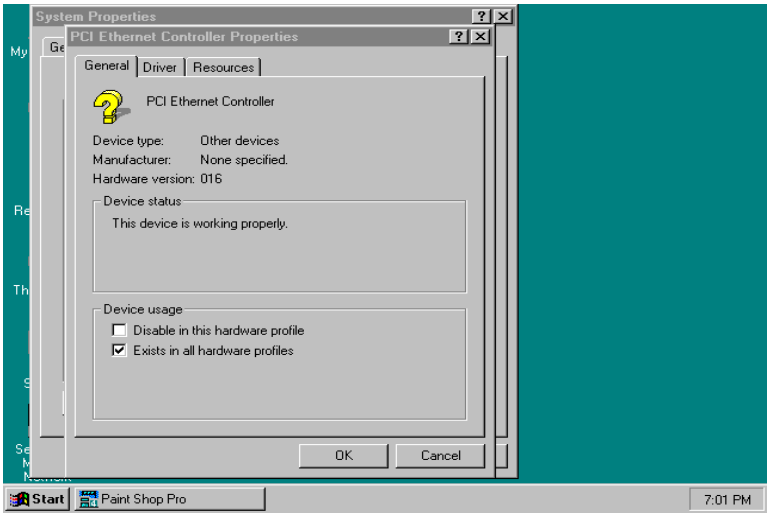
6. Update the ***second*** ESS ES1869 Plug and Play AudioDrive
   - Follow the same procedure described on Steps 3 through 6. Use the same ESS1869 Driver for Win95/98 diskette.

After installing both *ESS ES1869 Plug and Play AudioDrive*, a **speaker icon** appears on the lower right corner of the screen.

This implies the successful installation and normal operation of your Sound Card under Win95/98.

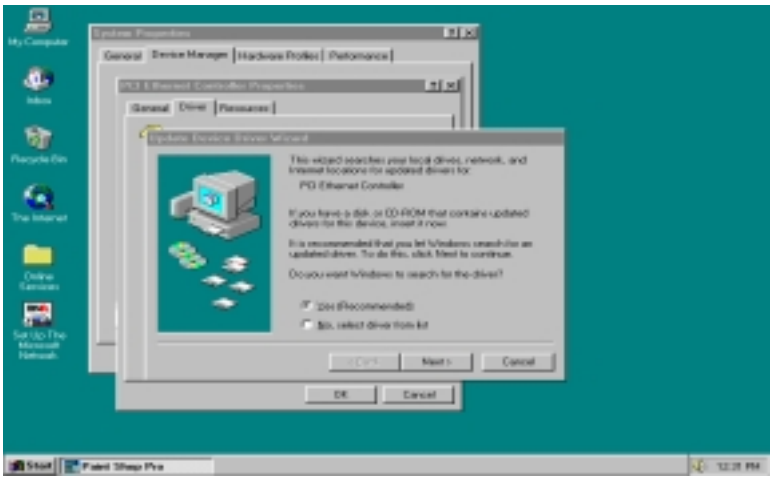
7. Enter the PCI Ethernet Controller Properties window

   - Return back to the **Device Manager** window shown in Step 2.
   - Insert the RTL8139 Net Device Driver for Win95/98 diskette into Drive A:.
   - Move the cursor to the *PCI Ethernet Controller* then double-click your left mouse button. The screen then displays the **PCI Ethernet Controller Properties** window.



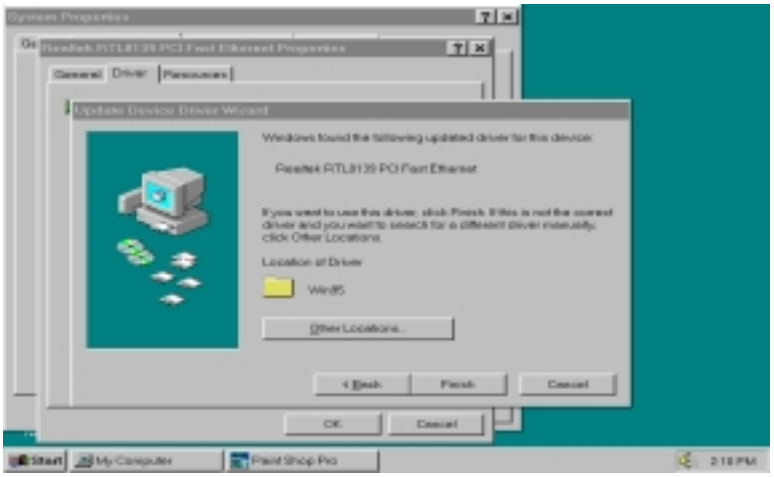
8. Detect and specify the .INF network device driver path

   - Click on **Driver** from the menu bar and a new screen appears with the **Update Driver...** button.
   - Click on this **Update Driver...** button and the **Update Device Driver Wizard** window appears as shown on the next page.



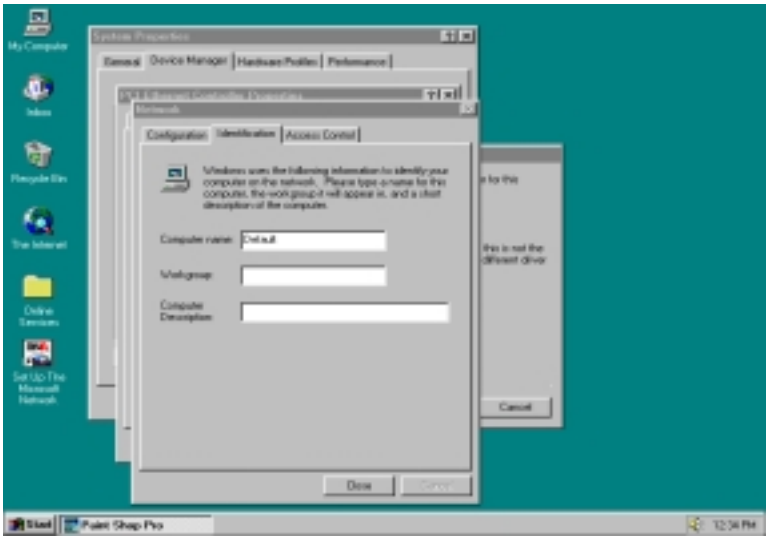
- Choose **Yes (Recommended)** then click on the **Next>** button to proceed. The system then searches for the .INF network driver file starting from A: drive.

9. Capping the installation
   - Once the network device driver in Drive A: is detected, the **Update Device Driver Wizard** window will list the detected driver.
   - Click on the **Finish** button to complete the installation of the *PCI Ethernet Controller*.


Update Device Driver Wizard
Realtek RTL8139 PCI Fast Ethernet
Other Locations...
Finish
Cancel
OK
Cancel
Start
My Computer
Paint Shop Pro

10. Provide Network Information

- Right after completing the network adapter installation, the system displays the **Network** window requiring you to fill up your computer's name, the workgroup it will appear in, and a short description of it. Refer to the following screen.
- After filling up the items, press the **Close** button to exit.



11. Reboot the system

- Your system will now ask you whether you'd like to reset the computer. This signifies the successful installation of your RTL8139 NET Device Driver into Win95/98. Click on the **Yes** button.

NOTE: *We highly recommend that you reset the system in order for the new network driver to take effect.*

This page does not contain any information.