SBC8360

Socket370 All-in-One Petit Board Series with CRT/LCD and Ethernet

User's Manual

Disclaimers

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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.

Trademarks Acknowledgments

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Chapter 1
Introduction

The **SBC8360VEA** is a Celeron/Pentium III -based Petit board with Ethernet and audio interface. Designed with the space-limited applications in mind, the **SBC8360** is practically the finest embedded Socket370 in existence. Using a standardized format conforming to the size of a 5.25" HDD, **SBC8360** can adapt a wide variety of Celeron and Pentium III 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 **SBC8360** allows your system to endure the continuous operation in hostile environments where stability and reliability are basic requirements. System dependability of **SBC8360** is enhanced by its built-in watchdog timer, a special industrial feature not commonly seen on other motherboards.

Designed for the professional embedded developers, the Pentium embedded board **SBC8360** is virtually the ultimate one-step solution for embedded system applications.

1.1 Specifications

- **CPU**
  - Intel Celeron
  - Intel Pentium III
- **System Chipset:** Intel 440BX Core Logic Controller
- **Processor Socket:** ZIF Socket370
- **Bus Clock:** 66/100 MHz
- **BIOS**
  - Award BIOS, Y2K compliant
  - 2Mbit Flash ROM, DMI, Plug and Play
- **System Memory**
  - One 168-pin DIMM
  - Maximum SDRAM of up to 256MB (buffered)/128MB (unbuffered)
- **L2 Cache:** Integrated in CPU
- **Onboard IDE**
  - 2 channels up to 4 devices (IDE1 x 44-pin, IDE2 x 40-pin)
  - PIO Mode 0-4, DMA Mode 0-2 and Ultra DMA/33
  - LS-120 & ZIP Bootable
- **Onboard Multi-I/O**
  - One floppy port (box header) supporting up to two devices (LS-120 & ZIP Bootable)
  - One SPP/EPP/ECP parallel port (box header), LS-120 supported

  - Four 16550 UARTs compatible serial ports with +5V/+12V power output in pin 1 or pin 9 via jumper setting (TTL level reserved in COM2):
    - 3 x RS-232 (box header)
    - 1x RS-232/422/485 box header and selectable via jumper setting
    - 1 x IrDA (box header) for wireless communcation

- **Real Time Clock:** Dallas /ST12887 or latest product
- **Watchdog Timer**
  - System reset or Non-Maskable Interrupt software programmable Time interval and jumper selectable
  - 64 levels, 0.5~8 / 5~80 / 50~800 / 100~1600 seconds
- **Ethernet**
  - Realtek 8139 PCI Bus 10/100M Base-T
  - Wake-On-LAN (via ATX power)
  - RJ-45 interface (box header) equipped
- **Digital I/O:** 4-channel TTL/DTL compatible input and output
- **USB Interface:** 2 USB ports with fuse protection and complies with USB Spec. Rev. 1.1A
- **Power Management:** ACPI (Advanced Configuration and Power Interface)
- **Hardware Monitoring**
  - Winbond W83781D
  - Monitoring for CPU/system temperatures, system voltage, and chassis/fan speeds
- **Onboard Display**
  - AGP interface controller with integrated 2MB SDRAM
  - VGA chipset: C&T 69000 AGP-1x 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
- **DiskOnChip®:** supports M-Systems DiskOnChip®
- **Expansion Slots:**
  - One 16 Bit PC/104 connector
  - One EISA slot for PCI/ISA expansion

- **Onboard Audio**
  - ESS Solo-1 1938 32-bit PCI 2.1 AudioDrive controller
  - High quality ESFM™ Music Synthesizer
  - Dynamic range (SNR) over 80dB
  - Integraed Spatializer® 3D audio effects processor
  - 32-bit Sound Blaster™ and Sound Blaster™ Pro compatible
  - 16-bit stereo ADC and DAC
  - PC97/PC98 and WHQL specifications
  - Full-duplex operation for simultaneous record and playback
  - Internal MIC-in, Line-in, Speaker/Line-out interface reserved
- **Other Features**
  - Win 95/98/2000 Software-off
- **Form Factor:** Current 5.25" form factor
- **Dimensions:** 203.20 x 146.05 mm^2

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

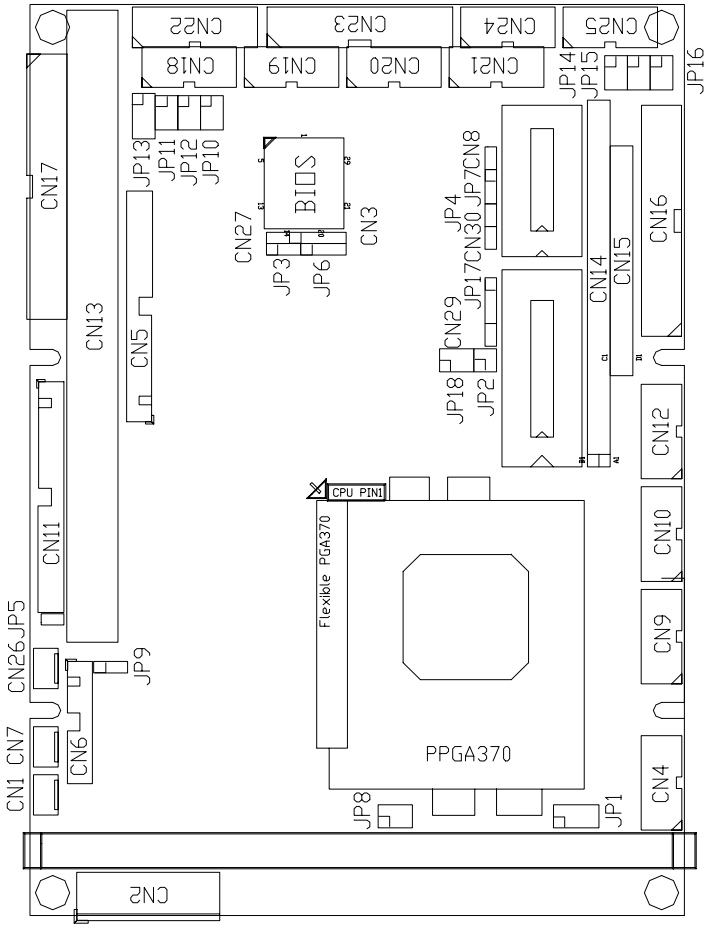
1.2 Utilities Supported

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

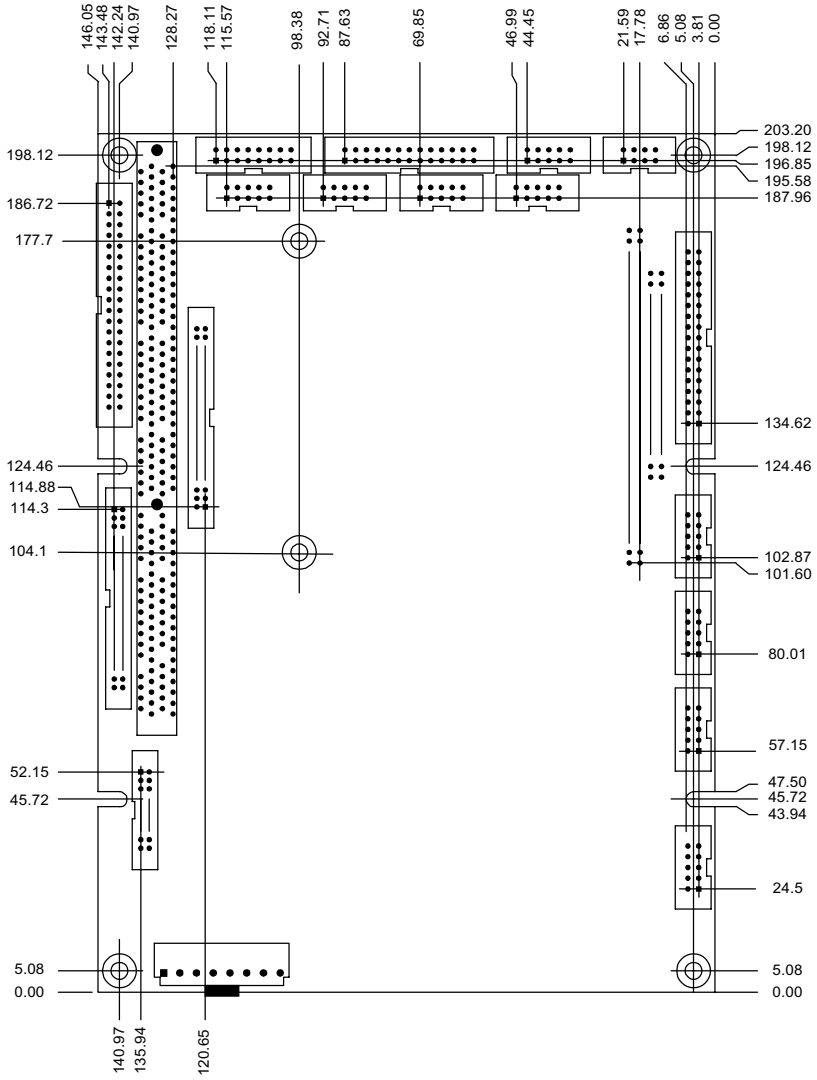
Chapter 2
Jumpers and Connectors

2.1 Board Layout and Fixing Holes

The figure below shows the location of all jumpers and connectors on the **SBC8360**.



SBC8360 Board Layout



SBC8360 Fixing Hole Placements

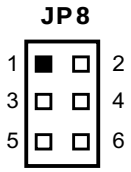
2.2 Jumper Settings

The **SBC8360** is configured to match the needs of your application with the proper jumper settings. The table below is a summary of all the jumpers and their corresponding functions onboard the **SBC8360**. The following tables show the correct jumper settings for the onboard devices.

Jumper	Default Setting	Jumper Setting
JP1	Reserved	Open
JP2	DiskOnChip® Memory Segment Setting: D0000 - D1FFF	Short 1-2, 3-4
JP3	Keyboard Wakeup Function Setting: Disabled	Short 1-2
JP4	CMOS Clear Setting: Normal	Open
JP7	Watchdog Timer Mode Setting: NMI	Short 1-2
JP8	CPU Bus Clock Settings: 66MHz	Short 1-2, 3-4
JP9	Flat Panel Power Selection: 5V	Short 1-2
JP10	COM4 Settings: RS-232	Short 3-5, 4-6
JP11	COM3 Mode: Pin 1=DCD, Pin 8=RI	Short 3-5, 4-6
JP12	COM4 Settings: RS-232	Short 3-5, 4-6
JP13	COM4 Settings: RS-232	Short 1-2
JP14	COM2 Mode: Pin 1=DCD, Pin 8=RI	Short 3-5, 4-6
JP15	COM4 Mode: Pin 1=DCD, Pin 8=RI	Short 3-5, 4-6
JP16	COM1 Mode: Pin 1=DCD, Pin 8=RI	Short 3-5, 4-6
JP18	Audio Line Out/Speaker Out Setting: Line Out	Short 1-3, 2-4

2.2.1 CPU Bus Clock: JP8

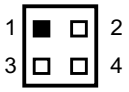
Options	Setting
66MHz	Short 1-2, 3-4 (default)
100MHz	Short 3-4



2.2.2 DiskOnChip® Memory Segment: JP2

Options	Settings
D0000 – D1FFF	Short 1-2, 3-4 (default)
D2000 – D3FFF	Short 1-2
D4000 – D5FFF	Short 3-4
D6000 – D7FFF	All Open

JP2



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 8=12V	Short 2-4
*Pin 8=RI	Short 4-6

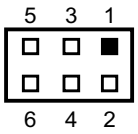
COM2	JP14
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 8=12V	Short 2-4
*Pin 8=RI	Short 4-6

COM3	JP11
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 8=12V	Short 2-4
*Pin 8=RI	Short 4-6

COM4	JP15
Pin 1=5V	Short 1-3
*Pin 1=DCD	Short 3-5
Pin 8=12V	Short 2-4
*Pin 8=RI	Short 4-6

: Default settings

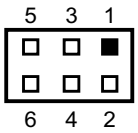
JP11 / 14 / 15 / 16



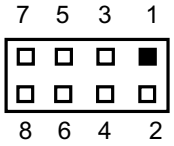
2.2.4 COM4 Mode Select: JP10, JP12, JP13

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, 7-8

JP10 / 12

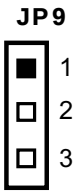


JP13



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

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

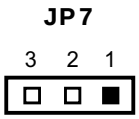


SBC8360 supports +3.3V or +5V flat panel displays. When using such type of flat panels, configure jumper **JP9** to the appropriate voltage of the flat panel.

2.2.6 Watchdog Trigger Mode Setting: JP7

The watchdog timer is an indispensable feature of the **SBC8360**. 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

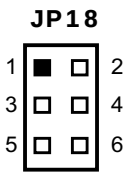


2.2.7 CMOS Clear Jumper: JP4

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

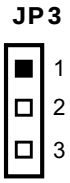
2.2.8 Audio Line Out/Speaker Out Jumper: JP18

Options	Settings
Line Out	Short 1-3, 2-4 (default)
Speaker Out	Short 3-5, 4-6



2.2.9 Keyboard Wakeup Function Setting: JP3

Options	Settings
Disabled	Short 1-2 (default)
Enabled	Short 2-3



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 **SBC8360**. Their corresponding pin assignments are described in Chapter 3.

Connectors	Label	Connectors	Label
CPU and System Fan Connector	CN1, CN7, CN26	COM1	CN18
Power Connector 1	CN2	COM2	CN19
KeyLock/Power LED	CN3	COM3	CN20
Audio Connector	CN4	COM4	CN21
IDE Channel 1	CN5	VGA Connector	CN22
Flat Panel Connector	CN6, CN11	Printer Port Connector	CN23
Reset Connector	CN8	Digital I/O Connector	CN24
IrDA Connector	CN9	Ethernet Connector	CN25
USB Connector	CN10	Power Button Connector	CN27
KB and PS/2 Mouse	CN12	Reserved	CN29
EISA Connector	CN13	Temperature Sensor Connector	CN30
PC/104 8-bit Connector	CN14	HDD Active LED	JP5
PC/104 16-bit Connector	CN15	Internal Speaker Connector	JP6
FDD Connector	CN16	Net LED Link LED: 1-2 Tx/Rx: 3-4	JP17
IDE Channel 2	CN17	DiskOnChip Connector	U13

Chapter 3
Hardware Description

3.1 Microprocessors

The **SBC8360** supports Intel Celeron and Pentium III CPUs. Systems based on these CPUs can be operated under UNIX, OS/2, Windows NT/2000, Windows 95/98 and MS-DOS environments. The system performance depends on the microprocessor installed onboard. When installing a new CPU, the jumpers including CPU type, CPU Bus Clock, and CPU Voltage may need to be adjusted. Make sure all settings are correct for the installed microprocessor to prevent any damage to the CPU.

3.2 CPU Bus Clock

The **SBC8360** supports CPU Bus speeds for 66 and 100 MHz. The CPU Bus Clock is generated by a clock generator and can be changed by setting jumper **JP8**.

3.3 BIOS

System BIOS used on the **SBC8360** is Award Plug and Play BIOS. The **SBC8360** contains a single 2Mbit Flash EPROM.

3.4 System Memory

The **SBC8360** inductrial CPU card supports one 168-pin DIMM (Dual In-Line Memory Module) socket for a maximum memory of 256MB buffer SDRAMs. The memory modul can come in sizes of 16MB, 32MB, 64MB, 128MB and 256MB.

NOTE: *Use SDRAM modules with PC100 or PC133 specifications when running 100MHz CPU bus speed. With 66MHz CPU, SDRAM modules with PC66, PC100 or PC133 specifications can be used. You have to install the Intel Celeron processor before installing the memory modules.*

3.5 I/O Port Address Map

The Intel 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)
3F0-3FF	Winbond I/O #1

3.6 Interrupt Controller

The **SBC8360** 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

3.7 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 15
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 15
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				

3.8 Display Interface

3.8.1 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.

3.8.2 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

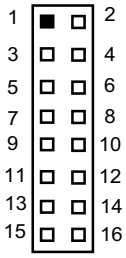
- SMARTMAP™ intelligent color to gray scale conversion enhances text legibility
- Integrated programmable linear address feature accelerates GUI performance
- Hardware Windows acceleration
- Built-in 44 pins general purpose connector for flat panel display, and an extended 20-pin for 36 bit XVGA flat panel

3.8.3 VGA/Flat Panel Connectors

The **SBC8360** 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 tables are the pin assignments for the CRT/VGA connector and the flat panel connectors.

CN22: CRT/VGA Connector Pin Assignment

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



CN11: Flat Panel Connector Pin Assignment

Pin	Signal	Pin	Signal	Pin	Signal
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
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		

3.8.4 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

3.9 Floppy Disk Controller

The **SBC8360** 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#				

3.10 Parallel Port Interface

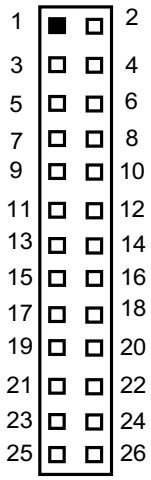
The onboard **PRN** of **SBC8360** is a multi-mode parallel port supporting:

- **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), and 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



3.11 Serial Port Interface

The **SBC8360** 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.

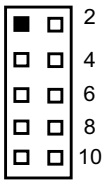
3.11.1 Serial Ports IRQ Selection

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.

3.11.2 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 following table.

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)	10	No connector



The RS-422/485 pin assignments for **COM4** are listed below.

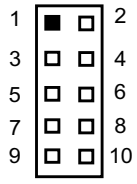
Pin #	Signal Name	
	R2-422	RS-485
1	TX-	DATA-
2	No connector	No connector
3	TX+	DATA+
4	No connector	No connector
5	RX+	No connector
6	No connector	No connector
7	RX-	No connector
8	No connector	No connector
9	GND	GND
10	No connector	No connector

3.12 Digital I/Os

The **SBC8360** 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



3.12.1 Digital I/O Software Programming

The Digital I/O on the **SBC8360** 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

3.13 Real Time Clock and CMOS RAM

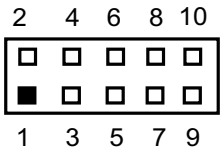
The **SBC8360** contains a MC146818 compatible Real Time Clock (RTC) and 128 bytes of CMOS RAM in the Dallas DS12887A, or its equivalent. The CMOS RAM stores the system configuration information entered via the SETUP program. A battery, with power lasting 10 years, keeps the stored information on the RTC and CMOS RAM active when system power is turned off.

3.14 Keyboard and PS/2 Mouse Connector

The **SBC8360** 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

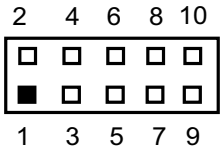


3.15 USB Connector

The Universal Serial Bus (USB) connector on **SBC8360** is used when installing peripherals supporting the USB interface. **CN10** is the 10-pin USB connector on the **SBC8360**.

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

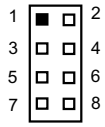


3.16 Ethernet Connectors

The RJ-45 connector is applied for Ethernet operations. To connect the **SBC8360** to a 10-Base-T or 100-Base-T hub, just plug one end of the cable into **CN25** and connect the other end (phone jack) of the cable to a 10/100-Base-T hub.

CN25: 10/100-Base-T Interface

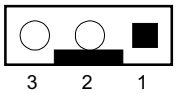
Pin	Description	Pin	Description
1	Tx+ (Data transmission positive)	2	Tx- (Data reception negative)
3	Rx+(Data reception positive)	4	RJ-1 (for 100-Base-T only)
5	RJ-1 (for 100-Base-T only)	6	Rx- (Data reception negative)
7	RJ-2 (for 100-Base-T only)	8	RJ-2 (for 100-Base-T only)
9	No connector	10	GND



3.17 CPU and System Fan Connectors

CN1, CN7, and **CN6** are CPU and system fan connectors. Pentium microprocessors require a fan for heat dispensing. The fan connector on **SBC8360** provides power to the fan. Its pin assignment is as follows:

Pin	Description
1	Sensor
2	+12V
3	GND



3.18 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 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)

3.19 PCI/ISA Slot Connector

The **SBC8360** 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

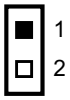
Continued . . . . .

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

3.20 Pin Assignments of Other Connectors

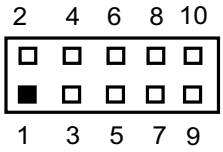
JP5: HDD Active LED

Pin	Description
1	Vcc
2	Signal



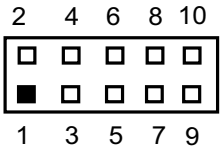
CN9: IrDA Connector

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



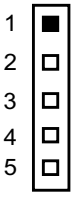
CN4: Audio Connector

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



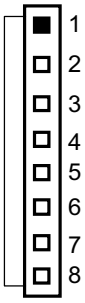
CN3: KeyLock and Power LED

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



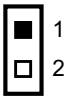
CN2: Power Connector

Pin	Description
1	+5V
2	GND
3	+12V
4	5VSB
5	Soft on/off
6	-12V
7	GND
8	+5V



CN27: Power Button Connector

Pin	Description
1	PW_BN+
2	PW_BN-

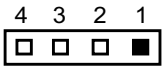


CN30: Temperature Sensor Connector

Pin	Description
1	Sensor
2	GND

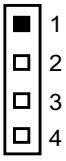
JP17: Net LED Connector

Pin	Description
1	Link LED+
2	Link LED-
3	Tx/Rx LED+
4	Tx/Rx LED-



JP6: Internal Speaker Connector

Pin	Description
1	Speaker Out
2	Speaker Out
3	Int. Buzzer
4	+5V



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Chapter 4
Display Drivers

The LCD/VGA chipset used on the **SBC8360** 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.

4.1 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.

4.1.1 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.

4.1.2 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

4.1.3 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.

4.1.4 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.

4.2 Windows NT 3.5x

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

4.2.1 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.

4.3 OS/2

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

4.3.1 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 69000 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.*

4.3.2 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.

4.3.3 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

This page does not contain any information.

Chapter 5
Ethernet

5.1 Introduction

The **SBC8360** 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).

5.2 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

5.3 Drivers Supported

Bundled with popular software drivers, the **SBC8360** 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.

This page does not contain any information.

Chapter 6
Audio Device

6.1 Introduction

The audio device onboard the **SBC8360VEA** incorporates the ESS Solo-1 1938 audio chipset. ESS Solo-1 is a 32 Bit PCI Bus Plug and Play device that supports MIC In, Line In, Line-out and 2 watts of Speaker-out. Connector **CN4** onboard the **SBC8360VEA** serve as the interface between the audio device and the **SBC8360VEA**-based system. Refer to Section 3.20 for the pin assignments of **CN4**.

6.2 Features

- PCI parallel bus interface, version 2.1
- Full native DOS games compatibility, via three technologies:
  - TDMA
  - DDMA
  - PC/PCI
- Dynamic range (SNR) over 80dB
- Integrated 3-D audio effects processor
- High-Quality music synthesizer

6.3 Drivers Supported

The audio driver bundled with the **SBC8360VEA** supports several OS platforms. There are 4 operating systems currently supported by the **SBC8355VEA** audio driver. Audio drivers provided include Windows NT 4.0, Win95, Win98, and Win98SE.

This page does not contain any information.

Chapter 7
Award BIOS Utility

The Award BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in a battery-backed RAM (CMOS RAM) that retains the Setup information each time the power is turned off.

7.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power On Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system and try again. This is possible by turning the system power to OFF then to ON, pressing the "RESET" button on the system case, or by simultaneously pressing <Ctrl>, <Alt>, and <Del> 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 be prompted with the following:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

7.2 Control Keys

Up arrow	Moves cursor to the previous item
Down arrow	Moves cursor to the next item
Left arrow	Moves cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quits and deletes changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exits current page and returns to Main Menu
PgUp/"+" key	Increases the numeric value or makes changes
PgDn/"–" key	Decreases the numeric value or makes changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restores the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Loads the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Loads the Setup default , only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Saves all the CMOS changes, only for Main Menu

7.3 Getting Help

- **Main Menu**
  The on-line description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu / Option Page Setup Menu**
  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 <F1> or <Esc>.

7.4 The 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 ten setup functions and two exit choices. Use the arrow keys to select the setup function you intend to configure then press <Enter> to accept or enter its sub-menu.

ROM PCI/ISA BIOS (2A59IA5E)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date Hard Disk Type...	

- **Standard CMOS Setup**
  This setup option includes all the items in a standard compatible BIOS.
- **BIOS Features Setup**
  This setup page includes all the items of Award special enhanced features.
- **Chipset Features Setup**
  This setup option includes all the items of chipset special features.
- **Power Management Setup**
  This category determines the power consumption of the system after selecting its items. Default value is Disabled.
- **PnP/PCI Configuration**
  This category specifies the assignment of all IRQs and DMAs.
- **Load BIOS Defaults**
  BIOS defaults indicate the most appropriate values of the system parameter in which the system can operate at a minimum performance.

- **Load Setup Defaults**
  Chipset defaults indicate the values required by the system for maximum performance.
- **Integrated Peripherals**
  This page allows you to set up all the on board I/O controllers like IDE, SCSI, FDC, etc..
- **Supervisor / User Passwords**
  Changes, sets or disables password of Supervisor or User. It allows you to restrict access to the system and Setup, or just to Setup.
- **IDE HDD Auto Detection**
  Automatically configures hard disk parameters.
- **Save & Exit Setup**
  Saves CMOS value changes to CMOS and exits setup.
- **Exit Without Saving**
  Abandons all CMOS value changes and exits setup.

7.5 Standard CMOS Setup Menu

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

ROM PCI/ISA BIOS (2A59IA5E)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Fri, Jul 18 1997
Time (hh:mm:ss) : 00:00:00

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDE	SECTOR	MODE
Primary Master:	Auto	0	0	0	0	0	0	------
Primary Slave:	Auto	0	0	0	0	0	0	------
Secondary Master:	Auto	0	0	0	0	0	0	------
Secondary Slave:	Auto	0	0	0	0	0	0	------

Drive A : 1.44M , 3.5 in
Drive B : None
Video : EGA / VGA
Halt On : All Errors

Base Memory : 640K
Extended Memory :14336K
Other Memory : 384K
Total Memory :15360K

ESC : Quit ↑ ↓ → ← : Select Item PU / PD / + / - : Modify
F1 : Help (Shift) F2 : Change Color

- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day of week, from Sun to Sat, determined by the BIOS, is read only
date	The date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
month	The month, Jan through Dec.
year	The year, depends on the year of BIOS

- **Time**
  The time format is <hour> <minute> <second> accepting either function key or numerical key. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **Primary Master / Primary Slave / Secondary Master / Secondary Slave**
  The categories identify the types of one channel that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type User is user-definable.
  Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information within this category. If your hard disk drive type does not match or is not listed, you can use Type User to define your own drive type manually.
  If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  If the controller of HDD interface is ESDI, select "Type 1".
  If the controller of HDD interface is SCSI, select "None".
  If the controller of HDD interface is CD-ROM, select "None".

CYLS.	number of cylinders	LANDZONE	landing zone
HEADS	number of heads	SECTORS	number of sectors
PRECOMP	write precom	MODE	HDD access mode

  If there is no hard disk drive installed, select NONE and press <Enter>.

- **Drive A type / Drive B type**
  The category identifies the types of floppy disk drive A or drive B installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5.25 inch PC-type standard drive; 360Kb capacity
1.2M, 5.25 in	5.25 inch AT-type high-density drive; 1.2MB capacity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb capacity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB capacity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB capacity

- **Video**
  The category selects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in Setup. You have two ways to boot up the system:

  1. When VGA as primary and monochrome as secondary, the selection for the video type is "VGA Mode".
  2. When monochrome as primary and VGA as secondary, the selection of the video type is "Monochrome Mode".

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

- **Error halt**
  The category determines whether the computer will stop if an error is detected during power up.

No errors	Whenever the BIOS detects a non-fatal error, the system will halt and you will be prompted.
All errors	The system boot will not stop for any error detected.
All, But Keyboard	System boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	System boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	System boot will not stop for a keyboard or disk error; it will stop for all other errors.

- **Memory**
  The category is display-only which is determined by POST (Power On Self Test) of the BIOS.
  - **Base Memory**
    The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.
  - **Extended Memory**
    The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.
  - **Other Memory**
    This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.
  - **Total Memory**
    System total memory is the sum of basic memory, extended memory, and other memory.

7.6 BIOS Features Setup Menu

ROM PCI/ISA BIOS (2A69KA5C)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Processor Number Feature	: Enabled	D4000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D8000-DBFFF Shadow	: Disabled
Boot Sequence	: C,A,SCSI	DC000-DFFFF Shadow	: Enabled
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Disabled		
Boot Up NumLock Status	: On		
Gate A20 Option	: Fast	LCD Type : (Type 6) 640x480 24 TFT	
Typematic Rate Setting	: Disabled	VGA Expansion(Full Screen): Disable	
Typematic Rate (Chars/Sec)	: 6	Display Type During POST: CRT Only	
Typematic Delay (Msec)	: 250	Display Type After POST: CRT Only	
Security Option	: Setup	ESC : Quit ↑ ↓ → ←: Select Item	
PCI/VGA Palette Snoop	: Disabled	F1 : Help PU/PD/+/- : Modify	
Assign IRQ for VGA	: Enabled	F5 : Old Values (Shift) F2 : Color	
OS Select for DRAM >64MB	: Non-OS2	F6 : Load BIOS Defaults	
Report No FDD for Win95	: Yes	F7 : Load Setup Defaults	

- **Virus Warning**
  This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is *"Disabled"*.

> ***! WARNING !***
> *Disk boot sector is to be modified*
> *Type "Y" to accept write or "N" to abort write*
> *Award Software, Inc.*

Enabled	Activates automatically when the system boots up causing a warning message to appear when there is an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when attempts to access the boot sector or hard disk partition table are made.

NOTE: *This function is only available with DOS and other operating systems that do not trap INT13.*

- **CPU Internal Cache / External Cache**
  These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is *"Enabled"*. CPUs with no built-in internal cache will not provide the "CPU Internal Cache" item on the menu.

Enabled	Enable cache
Disabled	Disable cache

- **CPU L2 Cache ECC Checking**
  When enabled, this allows ECC checking of the CPU's L2 cache. By default, this field is *Enabled*.

- **Quick Power On Self Test**
  This option speeds up Power On Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is *"Enabled"*.

Enabled	Enable Quick POST
Disabled	Normal POST

- **Boot Sequence**
  The original IBM PCs load the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, the BIOS now offers 11 different boot sequence options of three drives each. In addition to the traditional drives A and C, options include IDE hard drives D, E, and F; plus a SCSI hard drive and a CD-ROM drive. This category determines from which drive the computer searches first for the disk operating system (i.e., DOS). Default value is *"A,C,SCSI"*.

A,C,SCSI	System searches for the operating system from the floppy disk drive. If it fails, it will search from the hard disk drive. If operating system is still not found, it'll seek from the SCSI device.
C,A,SCSI	System searches for the operating system from the hard disk drive first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
C,CDROM,A	System searches for the operating system from the hard disk drive first. If it fails, it will search from the IDE CDROM drive. If operating system is still not found, it'll seek from the floppy disk drive.
CDROM,C,A	System searches for the operating system from the IDE CDROM drive first. If it fails, it will search from the hard disk drive. If operating system is still not found, it'll seek from the floppy disk drive.
D,A,SCSI	System searches for the operating system from the second IDE HDD first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.

E,A,SCSI	System searches for the operating system from the third IDE HDD first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
F,A,SCSI	System searches for the operating system from the fourth IDE HDD first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
SCSI,A,C	System searches for the operating system from the SCSI device first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the first IDE HDD.
SCSI,C,A	System searches for the operating system from the SCSI device first. If it fails, it will search from the first IDE HDD. If operating system is still not found, it'll seek from the floppy disk drive.
C only	System only searches for the operating system from the first IDE HDD.
LS/ZIP,C	System searches for the operating system from the 120MB LS floppy or the 100MB ZIP drive first. If it fails, it'll search from the first IDE HDD.

- **Swap Floppy Drive**
  This allows you to determine whether to enable Swap Floppy Drive or not. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled.*

- **Boot Up Floppy Seek**
  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks, installed in the system. 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is *"Enabled"*.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive types as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the drive installed is 360K.

- **Boot Up NumLock Status**
  This option enables and disables the numberlock function of the keypad. The default value is *"On"*.

On	Keypad functions confine with numbers
Off	Keypad functions convert to special functions (i.e., left/right arrow keys)

- **Gate A20 Option**
  The default value is *"Fast"*.

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**
  This determines the typematic rate of the keyboard. The default value is *"Disabled"*.

Enabled	Enable typematic rate and typematic delay programming
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items and the default is controlled by keyboard.

- **Typematic Rate (Chars/Sec)**
  This option refers to the number of characters the keyboard can type per second. The default value is *"6"*.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option sets the display time interval from the first to the second character when holding a key. The default value is *"250"*.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

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

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

- **PCI/VGA Palette Snoop**
  Some non-standard VGA display cards may not show colors properly. This field allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card. When disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

- **Assign IRQ for VGA**
  Enables or disables VGA's IRQ assignment. The options available are *Enabled* and *Disabled*.

- **OS Select for DRAM >64**
  This segment is specifically created for OS/2 when DRAM is larger than 64MB. If your operating system is OS/2 and DRAM used is larger the 64MB, you have to select "OS 2", otherwise (under non-OS2), default is NON-OS2. The default value is *"Non-OS2"*.

- **Report No FDD For Win 95**
  This option allows Windows 95 to share IRQ6 (assigned to a floppy disk drive) with other peripherals in case the drive is not existing. The default setting is *"No"*.

- **Video BIOS Shadow**
  Video shadowing increases the video speed by copying the video BIOS into RAM. However, it is still optional depending on the chipset design. The default value of this option is *"Enabled"*.

Enabled	Video BIOS shadowing is enabled
Disabled	Video BIOS shadowing is disabled

- **C8000 - CBFFF Shadow/DC000 - DFFFF Shadow**
  These options determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit. The default value for all is *"Disabled"*.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

NOTE:
1. *For C8000-DFFFF option-ROM on PCI BIOS – BIOS automatically enables the shadow RAM. User does not have to select the item.*
2. *IDE second channel control:*
   Enable: *enables secondary IDE port and BIOS will assign IRQ15 for this port.*
   Disable: *disables secondary IDE port and IRQ15 is available for other device(s). The item is optional only for PCI BIOS.*
3. *Some sound cards have an onboard CD-ROM controller that uses IDE Secondary Port. To avoid PCI IDE conflict, disable the IDE secondary channel control so that the CD-ROM may work.*

7.6.1 Onboard VGA Functions

The following options allow the overriding of the VGA BIOS settings integrated in the core chipset of **SBC8360**. Take note that the settings on the following will not take effect when a VGA peripheral card is connected to the system.

- **LCD Type**
  Although the system chipset already supports VGA and LCD alike, BIOS Features Setup still expands this feature further with the option to set any of the 15 LCD types. The available options are:
  - Type 1/13 1024 x 768 DSTN
  - Type 2 1280 x 1024 TFT
  - Type 3 640 x 480 DSTN
  - Type 4 800 x 600 DSTN
  - Type 5 640 x 480 (16bit) TFT
  - Type 6 640 x 480 (24bit) TFT
  - Type 7 1024 x 768 TFT
  - Type 8/9/10 800 x 600 TFT
  - Type 11/12 800 x 600 DSTN
  - Type 14 1280 x 1024 DSTN
  - Type 15 1024 x 600 DSTN
- **VGA Expansion (Full Screen)**
  This option allows you to enlarge application screens to full screen scale onto your display. However this option is not inversely compatible, rendering no change when applications screens have resolutions larger than the display resolution. The available options are Enabled and Disabled.

- **Display Type During / After POST**
  This item configures the viewing area for the POST sequence. When configured to the *incorrect display setting* or *Both*, it blankets the POST sequence from being viewed. If you select *Default*, this option is useless and follows the VGA BIOS settings. The available options are CRT Only, LCD Only, Both, and Default.

7.7 Chipset Features Setup Menu

Since the features in this section are related to the chipset on the CPU board and are completely optimized, you are not recommended to change the default settings in this setup table unless you are well oriented with the chipset features.

ROM PCI/ISA BIOS (2A69KA5C)
CHIPSET FEATURES SETUP
AWARD SOFTWARE INC.

SDRAM RAS-to-CAS Delay	: 3	CPU Warning Temperature	: Disabled
SDRAM RAS Precharge Time	: 3	Current System1 Temp.	:
SDRAM CAS latency Time	: Auto	Current System2 Temp.	:
SDRAM Precharge Control	: Disabled	Current CPU Temperature	:
DRAM Data Intgrity Mode	: Non-ECC	Current FAN1 Speed	:
System BIOS Cacheable	: Disabled	Current FAN2 Speed	:
Video BIOS Cacheable	: Disabled	Current FAN3 Speed	
Video RAM Cacheable	: Disabled	Vcore :	VTTP :
8 Bit I/O Recovery Time	: 1	Vcc3 :	+ 5 V :
16 Bit I/O Recovery Time	: 1	+ 12 V :	
Memory Hole at 15M-16M	: Disabled		
Passive Release	: Enabled		
Delayed Transaction	: Disabled		
AGP Aperture Size (MB)	: 64		

ESC	: Quit	↑ ↓ → ←	: Select Item
F1	: Help	PU/PD/+/-	: Modify
F5	: Old Values	(Shift)	F2 : Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

- **SDRAM RAS-to-CAS Delay**
  You can select RAS-to-CAS delay in HCLKs of 2 or 3. The board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

- **SDRAM RAS Precharge Time**
  When synchronous DRAM is installed, the number of clock cycles of RAS precharge time depends on the DRAM timing. Do not reset this field from the default value specified by the system designer. The available choices are *2* and *3*.

- **SDRAM CAS latency Time**
  You can select CAS latency time in HCLKs 2, 3, or Auto. The board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

- **DRAM Data Integrity Mode**
  This option sets the data itegrity mode of the DRAM installed in the system. The default setting is *"Non-ECC"*.

- **System BIOS Cacheable**
  Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default value is *"Disabled"*.

- **Video BIOS Cacheable**
  This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

- **Video RAM Cacheable**
  Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. The default value is *"Disabled"*.

- **8/16 Bit I/O Recovery Time**
  The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.
  These two fields let you add recovery time (in bus clock cycles) for 16/8 - bit I/O. The default values are *"1"* for 8 Bit I/O Recovery Time and *"1"* for 16 Bit I/O Recovery Time.

- **Memory Hole at 15M-16M**
  You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements. The default value is *"Disabled"*.

- **Passive Release**
  When enabled, CPU to PCI accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.
- **Delayed Transaction**
  The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1. The options available are *Enabled* and *Disabled*.
- **AGP Aperture Size (MB)**
  The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The options available are 4M, 8M, 16M, 32M, 64M, 128M and 256M.
- **Power Supply Type**
  This item allows you to identif the type of power supply installed on your system. The deafult valur is "*AT*".
- **CPU Warning Temperature**
  This option lets you set the CPU temperature limit where the system will produce a warning indicating CPU temperature has already exceeded. The default value is *"Disabled"*.
- **Current System1/System 2/CPU Temperature**
  These read-only fields reflect the functions of the hardware thermal sensor that monitors the chip blocks and system temperature to ensure the system is stable.
- **Current FAN1/FAN2/FAN3 Speed**
  These optional and read-only fields show he current speeds in RPM (revolution per minute) for the CPU fan and chassis fan as monitored by the hardware monitoring IC.
- **Vcore/VTTP/VCC3/+5V/+12V**
  These optional and read-only fields show the current voltages in the voltage regulators and power supply as monitored by the hardware monitoring IC.

7.8 Power Management Setup

The Power Management Setup screen appears like this:

ROM PCI/ISA BIOS (2A69KA5C)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

ACPI function	: Disabled	** Reload Global Timer Events **	
Power Management	: User Define	IRQ[3-7,9-15],NMI	: Disabled
PM Control by APM	: Yes	Primary IDE 0	: Disabled
Video Off Method	: V/H SYNC+Blank	Primary IDE 1	: Disabled
Video Off After	: Standby	Secondary IDE 0	: Disabled
Modem Use IRQ	: 3	Secondary IDE 1	: Disabled
Doze Mode	: Disabled	Floppy Disk	: Disabled
Standby Mode	: Disabled	Serial Port	: Enabled
Suspend Mode	: Disabled	Parallel Port	: Disabled
HDD Power Down	: Disabled		
Throttle Duty Cycle	: 62.5%		
PCI/VGA Act-Monitor	: Disabled		
Soft-Off by PWR-BTTN	: Instant-Off		
Wake Up on LAN	: Enabled		
IRQ 8 Break Suspend	: Disabled	ESC: Quit ↑↓→←: Select Item	
		F1 : Help PU / PD / + / - : Modify	
		F5 : Old Values (Shift)F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

- **ACPI function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The options available are Enabled, Disabled (default).

- **Power Management**
  This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. The table below describes each power management mode:

Max Saving	Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute in each mode.
User Define	Sets each mode individually. Select time-out periods in the PM Timers section, following.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).
Disabled	Default value

- **PM Control by APM**
  If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings. The default value is *"Yes"*.

No	System BIOS will ignore APM when power managing the system
Yes	System BIOS will wait for APM's prompt before it enters any PM mode (i.e., DOZE, STANDBY or SUSPEND). **Note:** If APM is installed or if there is a task running, even when the timer has timed out, the APM will not prompt the BIOS to put the system into any power saving mode!

NOTE: *If APM is not installed, this option has no effect.*

- **Video Off Method**
  Determines the manner in which the monitor is blanked.

V/H SYNC+Blank	Turns OFF vertical and horizontal synchronization ports and writes blanks to the video buffer
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
Blank Screen	System only writes blanks to the video buffer.

- **Video Off After**
  As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank off. The default value is *"Standby"*.

NA	System BIOS will never turn off the screen
Suspend	Screen off when system is in SUSPEND mode
Standby	Screen off when system is in STANDBY mode
Doze	Screen off when system is in DOZE mode

NOTE: *Green monitors detect the V/H SYNC signals to turn off its electron gun*

- **Modem Use IRQ**

3, 4, 5, 7, 9, 10, 11, NA	For external modem, 3 or 4 will be used for card type modem. It is up to card definition. Default is 3.

- **Doze Mode**
  After the selected period of system inactivity (1 minute to 1 hour), the CPU clock runs at slower speed while all other devices still operate at full speed.

The default value is *"Disabled"*.

Disabled	System will never enter doze mode
1/2/4/6/8/10/20/30/40 Min/1 Hr	Defines the continuous idle time before the system entering DOZE mode.

- **Standby Mode**
  After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed. The default value is *"Disabled"*.

Disabled	System will never enter STANDBY mode
1/2/4/6/8/10/20/30/40 Min/1 Hr	Defines the continuous idle time before the system entering STANDBY mode. If any item defined in (J) is enabled & active, STANDBY timer will be reloaded

- **Suspend Mode**
  After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	System will never enter SUSPEND mode
1/2/4/6/8/10/20/30/40 Min/1 Hr	Defines the continuous idle time before the system entering SUSPEND mode. If any item defined in (J) is enabled & active, SUSPEND timer will be reloaded

- **HDD Power Down**
  After the selected period of drive inactivity (1 to 15 minutes), the hard disk drive powers down while all other devices remain active. The default value is *"Disabled"*.

Disabled	HDD's motor will not power OFF.
1/2/3/4/5/6/7/8/9/10/ 11/12/13/14/15 Min	Defines the continuous HDD idle time before the HDD enters power saving mode (motor OFF)

- **Throttle Duty Cycle**
  When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs. The default value is *"62.5%"*.

- **PCI / VGA Act-Monitor**
  When Enabled, any video activity restarts the global timer for Standby mode. The default value is *"Disabled"*.

- **Soft-Off by PWR-BTTN**
  This only works with systems using an ATX power supply. It also allows tser to define the type of soft power OFF sequence the system will follow.

Instant-Off (default)	This option follows the conventional manner systems perform when power is turned OFF. Instant-Off is a soft power OFF sequence requiring only the switching of the power supply button to OFF.
Delay 4 Sec.	Upon turning OFF system from the power switch, this option will delay the complete system power OFF sequence by approximately 4 seconds. Within this delay period, system will temporarily enter into Suspend Mode enabling you to restart the system at once.

- **Wake Up on LAN**
  An inpit signal on the network awakens the system from a soft-off state.
- **IRQ 8 Break Suspend**
  You can turn on or off monitoring of IRQ8 (the Real Time Clock) so it does not awaken the system from Suspend mode. The default value is *"Disabled"*.
- **Reload Global Timer Events**
  When *Enabled*, an event occurring on each device listed below restarts the global time for Standby mode.
- **IRQ3 -7, 9-15, NMI** The default value is *"Disabled"*.
  Primary IDE 0 The default value is *"Disabled"*.
  Primary IDE 1 The default value is *"Disabled"*.
  Secondary IDE 0 The default value is *"Disabled"*.
  Secondary IDE 1 The default value is *"Disabled"*.
  Floppy Disk The default value is *"Disabled"*.
  Serial Port The default value is *"Enabled"*.
  Parallel Port The default value is *"Disabled"*.

7.9 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which 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.

ROM PCI/ISA BIOS (2A69KA5C)
PNP/PCI CONFIGURATION SETUP
AWARD SOFTWARE, INC.

PNP OS Installed	: No	Used MEM base addr	: N/A
Resources Controlled By	: Manual		
Reset Configuration Data	: Disabled	Assign IRQ For USB	: Enabled
IRQ-3	assigned to : Legacy ISA	Onboard Ethernet Bootrom	: Disabled
IRQ-4	assigned to : Legacy ISA		
IRQ-5	assigned to : PCI/ISA PnP		
IRQ-7	assigned to : Legacy ISA		
IRQ-9	assigned to : PCI/ISA PnP		
IRQ-10	assigned to : Legacy ISA		
IRQ-11	assigned to : Legacy ISA		
IRQ-12	assigned to : PCI/ISA PnP		
IRQ-14	assigned to : PCI/ISA PnP		
IRQ-15	assigned to : PCI/ISA PnP		
DMA-0	assigned to : PCI/ISA PnP		
DMA-1	assigned to : PCI/ISA PnP	ESC: Quit	↑↓→←: Select Item
DMA-3	assigned to : PCI/ISA PnP	F1 : Help	PU / PD / + / - : Modify
DMA-5	assigned to : PCI/ISA PnP	F5 : Old Values	(Shift)F2 : Color
DMA-6	assigned to : PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7	assigned to : PCI/ISA PnP	F7 : Load Setup Defaults	

- **PNP OS Installed**
  Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95). The default value is *"No"*.

- **Resources Controlled By**
  The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is *"Manual"*.

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

- **IRQ n Assigned to**
  When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default values for all IRQ n are *"PCI/ISA PnP"* for IRQ 5/9/12/14/15 and *"Legacy ISA"* for IRQ 3/4/7/10/11.

- **DMA n Assigned to**
  When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default values for all DMA n are *"PCI/ISA PnP"*.

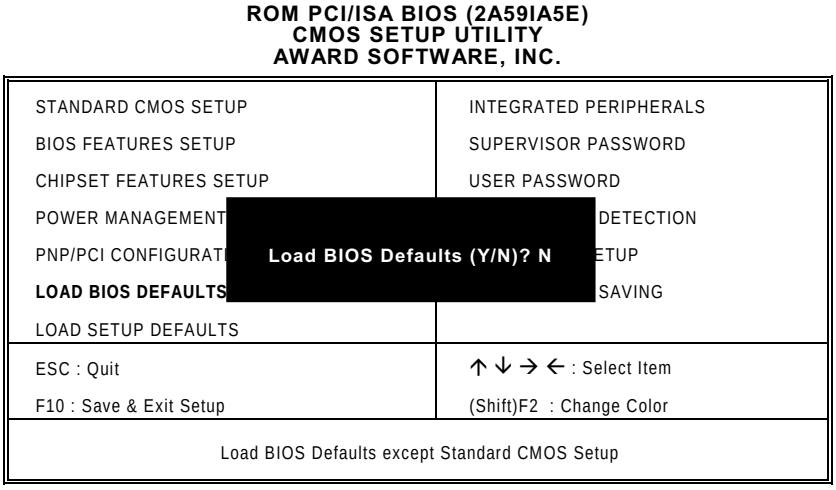
- **Used MEM base addr**
  Select a base address for the memory area used by any peripheral that requires high memory. The default setting is "*N/A"*.

- **Assign IRQ for USB**
  This item allows you to assign IRQ for the USB interface. The default value is *"Enabled"*.

- **OnBoard Ethernet BootROM**
  The BIOS of **SBC8360** includes Boot ROM for Novell. This item allows user to enable or disable such function.

7.10 Load BIOS Defaults

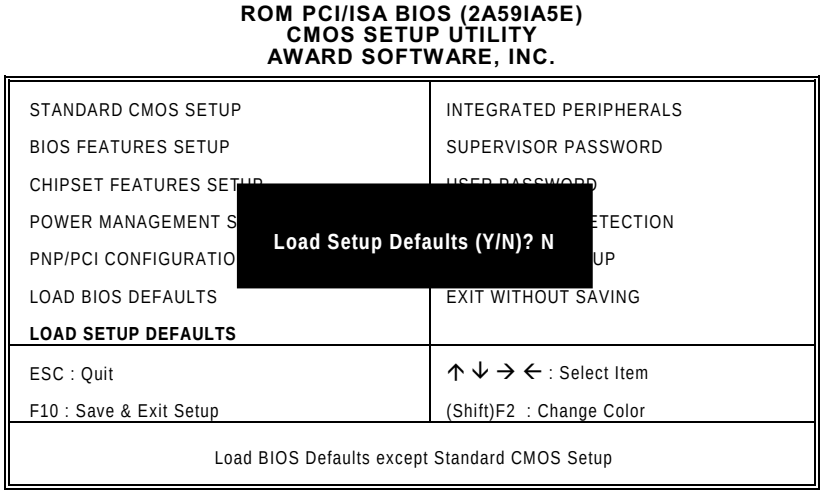
This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.



To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

7.11 Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.



To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

7.12 Integrated Peripherals

ROM PCI/ISA BIOS (2A69KA5C)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	Onboard Serial Port 2	: 2F8/IRQ3
IDE Primary Master PIO	: Auto	UART Mode Select	: Strandard
IDE Primary Slave PIO	: Auto	Onboard Parallel Port	: 378/IRQ7
IDE Secondary Master PIO	: Auto	Parallel Port Mode	: ECP+EPP
IDE Secondary Slave PIO	: Auto	ECP Mode Use DMA	: 3
IDE Primary Master UDMA	: Auto	EPP Mode Select	: EPP1.7
IDE Primary Slave UDMA	: Auto	Onboard Parallel Port 3	: 3E8/IRQ10
IDE Secondary Master UDMA	: Auto	Onboard Parallel Port 4	: 2E8H/IRQ11
IDE Secondary Slave UDMA	: Auto		
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
USB Keyboard Support	: Disabled		
Init Display First	: PCI/ISA		
		ESC: Quit	↑↓→←: Select Item
POWER ON Function	: Button Only	F1 : Help	PU / PD / + / - : Modify
Onboard FDC Controller	: Enabled	F5 : Old Values	(Shift)F2 : Color
Onboard Serial Port 1	: 3F8/IRQ4	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

The four items related to the WDT describe the set up of the Watchdog Timer (WDT), please refer to the Appendix for details.

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

- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The default value is *"Auto"*.

- **IDE Primary/Secondary Master/Slave UDMA**
  Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support. The default value is *"Auto"*.

- **On-Chip Primary/Secondary PCI IDE**
  The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately. The default value is *"Enabled"*.

  NOTE: *Choosing Disabled for these options will automatically remove the IDE Primary Master/Slave PIO and/or IDE Secondary Master/Slave PIO items on the menu.*

- **USB Keyboard Support**
  Select Enabled if your system contains a USB controller and you have a USB keyboard. The default value is *"Disabled"*.

- **Init Display First**
  This item allows you to decide to active whether PCI/ISA or Onboard first. The options available are *PCI/ISA*, and *Onboard.*

- **POWER ON Function**
  This option allows users to select the type of power ON sequence for the system to follow. The default value is *"Button-Only"*.

BUTTON-ONLY	Follows the conventional way of turning OFF system power (via power button).
Password	Upon selecting this option, the KB POWER ON Password line appears. Press <Enter> and you'll be prompted to enter and confirm a password of your choice. After setting the password, succeeding attempts to power ON the system will result to null. For system to activate, user must input the password via keyboard then press <Enter>.
Hot KEY	This option is very similar with that of Password. Hot-key combinations range from Ctrl-F1 to Ctrl-F12. User may define this combination from the Hot key Power ON option.
Mouse Left	This allows system to POWER ON by clicking the left mouse button. To enable, user must reboot and allow system to finish booting up otherwise the setting will not take effect.
Mouse Right	This allows system to POWER ON by clicking the right mouse button. To enable this setting, user must reboot and allow system to finish the boot up process otherwise the setting will not take effect.

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

- **Onboard Serial Port 1 / 2 / 3 / 4**
  Select an address and corresponding interrupt for the first and second serial ports. The default values are *"3F8/IRQ4"* for Onboard Serial Port 1, *"2F8/IRQ3"* for Onboard Serial Port 2, *"3E8H/IRQ10"* for Onboard Serial Port 3, and *"2E8H/IRQ11"* for Onboard Serial Port 4.

- **UART Mode Select**
  The second serial port offers these infrared interface modes:

  1. IrDA
  2. ASKIR IrDA-compliant serial infrared port
  3. Standard (default value)

  NOTE: *The UART Mode Select will not appear on the menu once you disable the setting of Onboard Serial Port 2.*

When UART Mode Select is set as ASKIR or IrDA, the options RxD, TxD Active and IR Transmittion delay will appear.

- **Onboard Parallel Port**
  Select a logical LPT port name and matching address for the physical parallel (printer) port. The default value is *"378/IRQ7"*.

  NOTE: *Choosing Disabled for this option will remove the Parallel Port Mode option on the menu.*

- **Parallel Port Mode**
  Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require one of the other modes offered in this field. The default value is *"ECP+EPP"*.

  NOTE: *Selecting EPP on this option will allow selection to the EPP Mode (EPP1.7, EPP1.9)*
  ECP mode selection will provide option for ECP Mode Use DMA.
  Choosing ECP+EPP modes will provide selections for both EPP Mode Select and ECP Mode Use DMA.

- **ECP Mode Use DMA**
  Select a DMA channel for the port.

- **EPP Mode Select**
  Select EPP port type 1.7 or 1.9.

7.13 Supervisor/User Password Setting

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

1. **supervisor password:** can enter and change the options of the setup menus.
2. **user password:** just can 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 with eight characters at most, and press <Enter>. The password typed will now 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 password, just press <Enter> when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password is enabled, you have to type it every time you enter Setup. This prevents any unauthorized person from changing your system configuration.

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

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during boot up and entry into Setup. If set as "Setup", prompting will only occur prior to entering Setup.

7.14 IDE HDD Auto Detection

The Enhance IDE feature is included in all Award BIOS. The following is a brief description of this feature.

1. Setup Changes

<I> Auto-detection

BIOS setup will display all possible modes supported by the HDD including NORMAL, LBA & LARGE.

If HDD does not support LBA modes, no 'LBA' option will be shown.

Users can select a mode appropriate for them.

ROM/PCI/ISA BOPS (2XXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE

Primary Master :

Select Primary Master Option (N = Skip) : N

OPTION	SIZE	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
1 (Y)	516	1120	16	65535	1119	59	NORMAL
2	516	524	32	0	1119	63	LBA
3	516	560	32	65535	1119	59	LARGE

<II> Standard CMOS Setup

	CYLS	Heads	Precomp	Landzone	Sector	Mode
Primary Master :User(516MB)	1120	16	65535	1119	59	NORMAL
Primary Slave :None (203MB)	684	16	65535	685	38	----------
Secondary Master :	None	0	0	0	0	0 0
Secondary Slave :	None	0	0	0	0	0 0

When HDD type is in 'user' type, the "MODE" option will be open for user to select HDD mode.

2. HDD Modes

The Award BIOS supports 3 HDD modes : NORMAL, LBA & LARGE

- NORMAL mode

  Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

  The maximum number of cylinders, head & sectors for NORMAL mode are 1024, 16 & 63.

	no. Cylinder	(1024)
x	no. Head	(16)
x	no. Sector	(63)
x	no. per sector	(512)
		528 Megabytes

If user sets his HDD to NORMAL mode, the maximum accessible HDD size will be 528MB even though its physical size may be greater than that!

- **LBA (Logical Block Addressing) mode**

  A new HDD accessing method to overcome the 528MB bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD.

  During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder number into its own physical address inside the HDD.

  The maximum HDD size supported by LBA mode is 8.4GB which is obtained by the following formula:

	no. Cylinder	(1024)
x	no. Head	(255)
x	no. Sector	(63)
x	bytes per sector	(512)
		814 Gigabytes

- **LARGE mode**

  Extended HDD access mode supported by Award Software.

  Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user does not want LBA). The Award BIOS provides another alternative to support these kinds of HDD!

  Example of LARGE mode:

CYLS	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

  BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT13h in order to access the right HDD address!

  Maximum HDD size:

	no. Cylinder	(1024)
x	no. Head	(32)
x	no. Sector	(63)
x	bytes per sector	(512)
	1 Gigabytes	

3. Remarks

To support LBA or LARGE mode of HDDs, there must be some software involved. All these software are located in the Award HDD Service Routine (INT 13h). It may fail to access a HDD with LBA (LARGE) mode selected if you are running under a Operating System that replaces the whole INT 13h.

7.15 Save & Exit Setup

This allows you to determine whether or not to accept the modifications. Typing "Y" quits the setup utility and saves all changes into the CMOS memory. Typing "N" brigs you back to Setup utility.

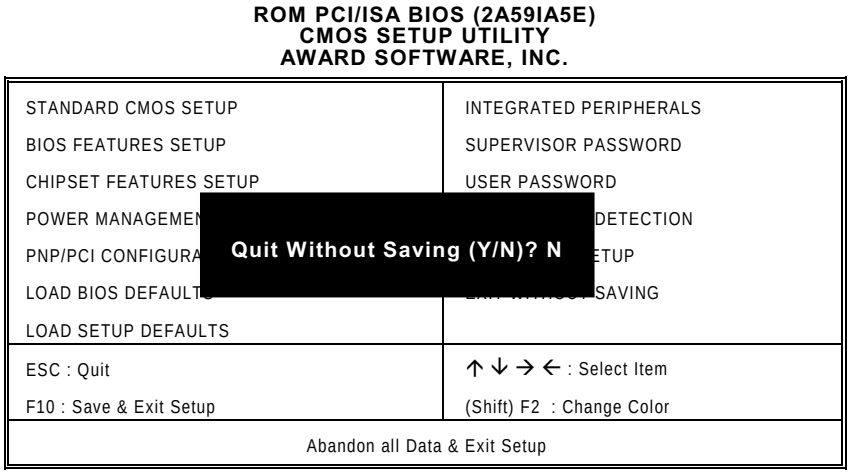
ROM PCI/ISA BIOS (2A59IA5E)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEM	DETECTION
PNP/PCI CONFIGU	TUP
LOAD BIOS DEFAU	SAVING
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Save Data to CMOS & Exit Setup	

Save to CMOS and Exit(y/N)? N

7.16 Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.



7.17 Power-On Boot

After you have made all the changes to CMOS values and the system cannot boot with the CMOS values selected in Setup, restart the system by turning it OFF then ON or press the "RESET" button on the system case. You may also restart by simultaneously pressing the <Ctrl>, <Alt>, and <Delete> keys. Upon restarting the system, immediately press <Insert> to load the BIOS default CMOS values for boot up.

This page does not contain any information.

Appendix A
Watchdog Timer

Using the Watchdog Function

The **SBC8360** CPU card uses version 2.0 of the watchdog timer. This onboard WDT generates either a system reset or non-maskable interrupt (NMI), depending on the settings made on jumper **JP7** of **SBC8360**. Follow the steps below to enable and program the watchdog function of **SBC8360**.

Start

↓

Un-Lock WDT	**:**	**OUT 120H 0AH ; enter WDT function** **OUT 120H 0BH ; enable WDT function**

↓

Set multiple (1~4)	**:**	**OUT 120 0NH ; N=1,2,3 or 4**

↓

Set base timer (0~F)	**:**	**OUT 121 0MH ; M=0,1,2,...F**

↓

WDT counting

↓

re-set timer	**:**	**OUT 121 0MH ; M=0,1,2,...F**

↓

IF No re-set timer	**:**	**WDT time-out, generate RESET or NMI**

↓

IF to disable WDT	**:**	**OUT 120 00H ; Can be disable at any time**

M	N			
	1	2	3	4
0	0.5 sec.	5 secs.	50 secs.	100 secs.
1	1 sec.	10 secs.	100 secs.	200 secs.
2	1.5 secs.	15 secs.	150 secs.	300 secs.
3	2 secs.	20 secs.	200 secs.	400 secs.
4	2.5 secs.	25 secs.	250 secs.	500 secs.
5	3 secs.	30 secs.	300 secs.	600 secs.
6	3.5 secs.	35 secs.	350 secs.	700 secs.
7	4 secs.	40 secs.	400 secs.	800 secs.
8	4.5 secs.	45 secs.	450 secs.	900 secs.
9	5 secs.	50 secs.	500 secs.	1000 secs.
A	5.5 secs.	55 secs.	550 secs.	1100 secs.
B	6 secs.	60 secs.	600 secs.	1200 secs.
C	6.5 secs.	65 secs.	650 secs.	1300 secs.
D	7 secs.	70 secs.	700 secs.	1400 secs.
E	7.5 secs.	75 secs.	750 secs.	1500 secs.
F	8 secs.	80 secs.	800 secs.	1600 secs.

Appendix B

AUDIO/NET Driver Installation under Win95/98

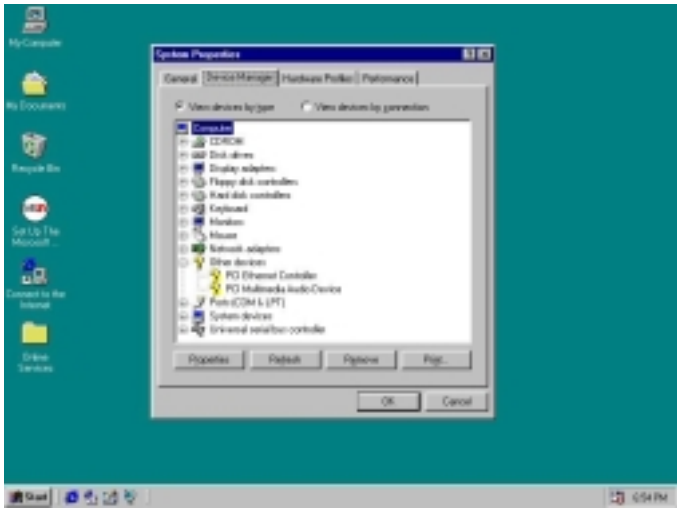
This appendix describes in detail the important steps when installing the **SBC8360VEA** audio and network drivers under Win98.

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.*

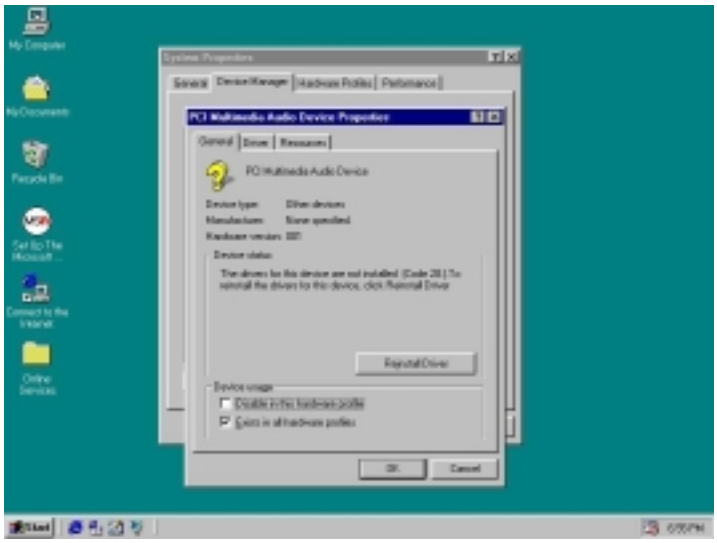
After completing the Win95/98 installation, user must do the following actions upon first-time entry into Win95/98:

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.

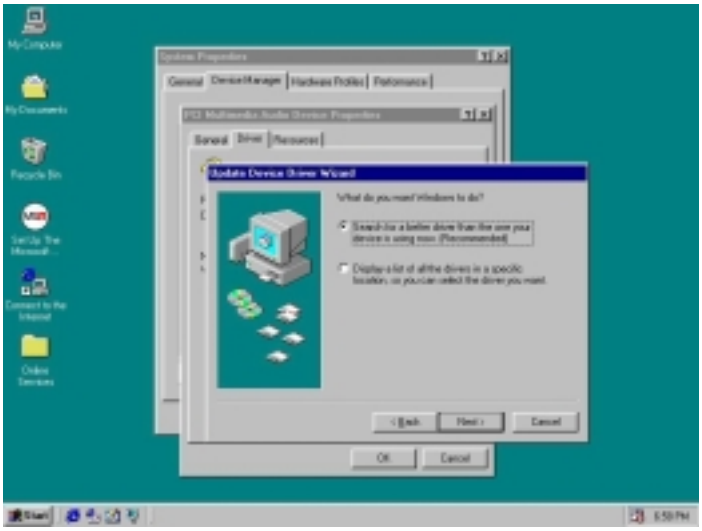
2. Access the System Properties window
   - Double-click on the **System** icon and then choose Device Manager from the menu.
   - A new window will pop-up with the **Other Devices** represented by a "?" mark. Click this "?" mark and 2 devices marked with "?" appears on its subset device list. One device specifies the *PCI Multimedia Audio*; and another device specifies the *PCI Ethernet Controller*. Refer to the following illustration for a more accurate description.



3. Enter the PCI Multimedia Audio Device Properties window
   - Insert the ESS1938S Driver for Win95/98 diskette into your Drive A:.
   - Move the cursor to the PCI Multimedia Audio Device, double-click your left mouse button and the PCI Multimedia Audio Device **Properties** window pops up as illustrated on the next page.

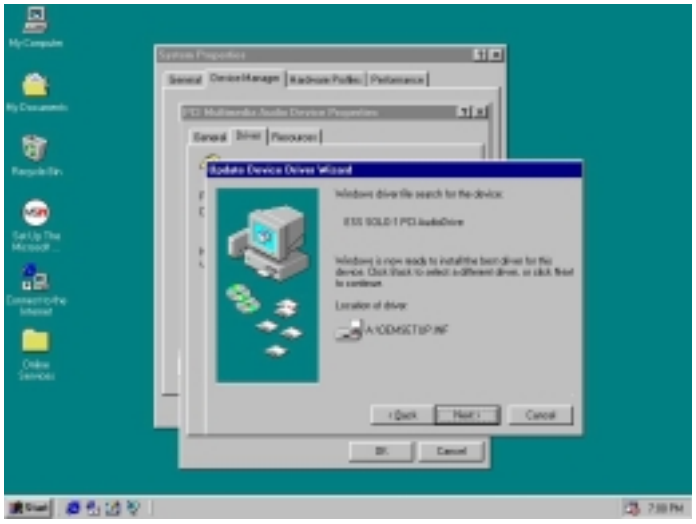


4. Detect and specify the .INF audio device driver path
   - Click on **Driver** from the menu bar and a new screen appears with the **Update Driver...** button.
   - Click on this **Update Driver...** button and the **Update Device Driver Wizard** window below appears.

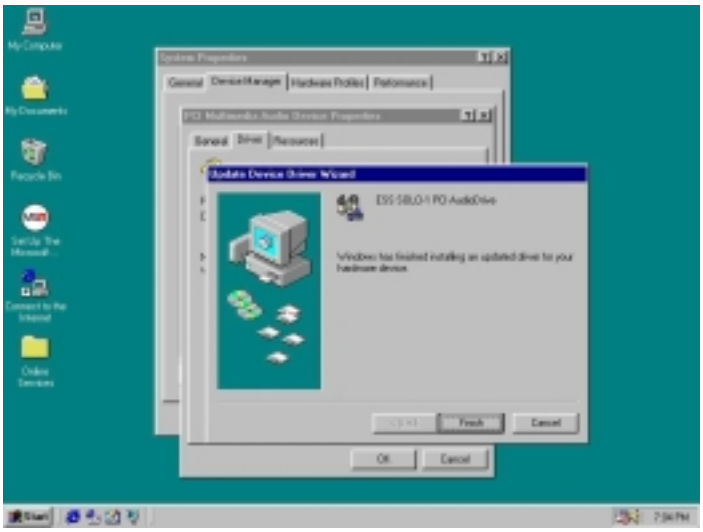


- Choose **Search for a better driver than the one your device is using now** then click on the **Next>** button to proceed. The system then searches for the .INF audio driver file starting from A: drive.

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 **Next** button to complete the installation of the *ESS Solo-1 PCI AudioDrive*.



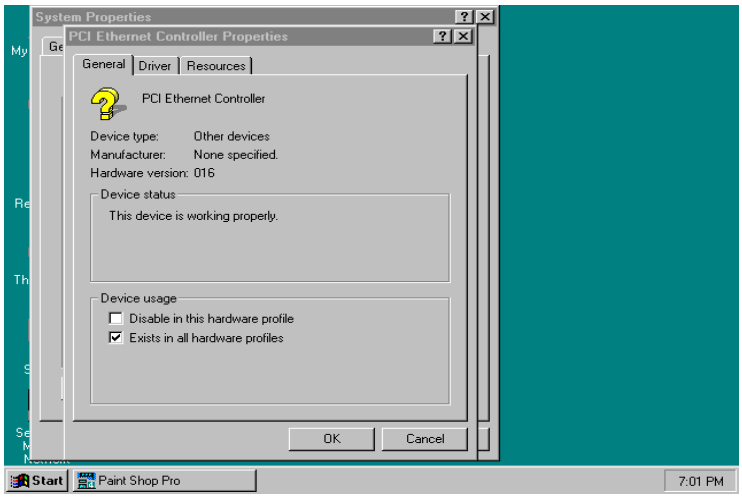
After installation, click on the Finish button then your display will return back to the **ESS Solo-1 PCI AudioDrive Properties** window. Click on the **Close** button to get back to the **System Properties** window.



After installing both *ESS Solo-1 PCI 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.

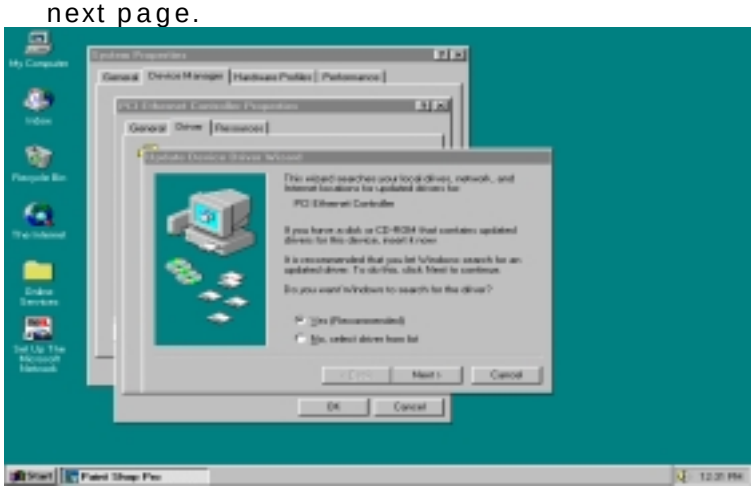
6. Enter the PCI Ethernet Controller Properties window

   - 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.



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

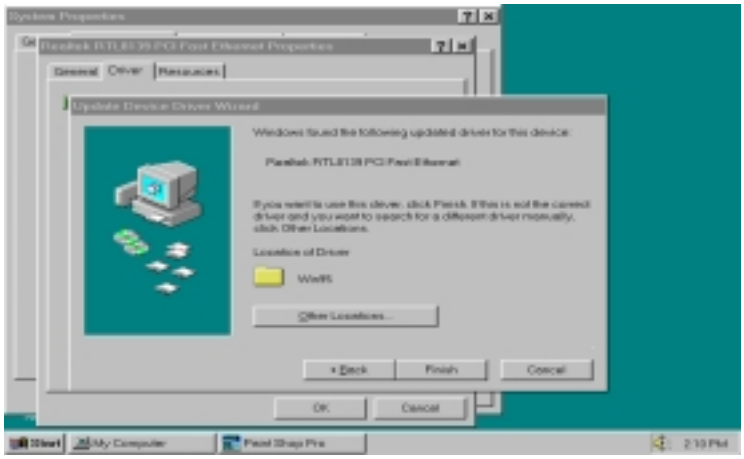
   - Click on **Driver** from the menu bar and a new screen appears with the **Update Driver...** button.
   - Click on this **Update Driver...** button and the **Update Device Driver Wizard** window appears as shown on the next page.



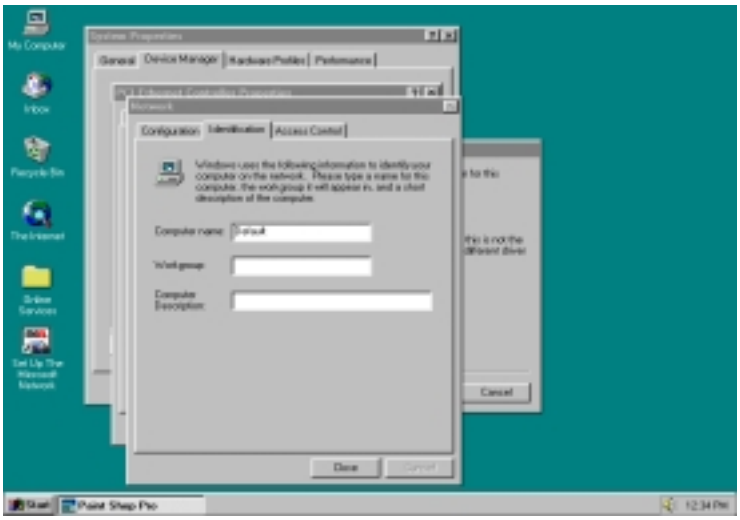
   - Choose **Yes (Recommended)** then click on the **Next>**

button to proceed. The system then searches for the .INF network driver file starting from A: drive.

8. 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*.



9. 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.



10. 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.*