

SBC8440

**3.5" Form Factor
SBC with CRT/LCD
and Fast Ethernet**

User's Manual

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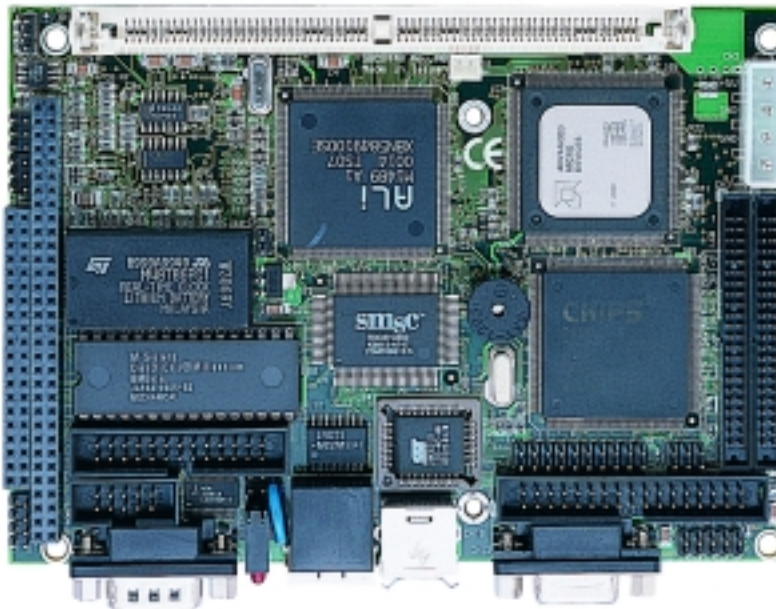
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Chapter 1

Introduction

1.1 General Description



Designed with the space-limited applications in mind, the SBC8440 is virtually the existing embedded 486 SBC at its finest. Major onboard features include CHIPS 65550 VGA GUI Accelerator controller, networking controller, one Flash Disk socket, two serial RS-232 ports (one for RS232, one for RS232/422/485), enhanced bi-directional parallel port, PCI enhanced IDE hard disk drive interface, floppy disk controller, and watchdog timer. The industrial-grade construction of SBC8440 ensures continuous, reliable operation in harsh industrial environments.

Its video portion features the ability to control most EL, mono/color DSTN and TFT flat panel display as well as standard VGA. Equipped with 1MB of EDO DRAM. The CHIPS 65550 can display in 640x480 resolution on commonly used flat panels and true color displays on CRTs.

You can also use SBC8440 to transform any system into a 32-bit 486 compatible computer. Its highly compact form and numerous features make it an ideal cost & performance solution for high-end commercial and industrial applications where high CPU speed and low mean-time-to-repair are critical.

1.2 Specifications

- **CPU:** PQFP AMD Am486DX5-133W16BHC CPU onboard
- **Bus Clock:** 33MHz
- **System Chipset:** ALi 1487/1489 core logic controller
- **BIOS:**
 - Award BIOS with DMI, Plug-and-Play & Y2K compliant in 1Mbit Flash ROM
 - SmartView VGA BIOS function
 - Integrated Ethernet Novell Boot ROM function
- **System Memory:**
 - 1 x 72-pin SIMM socket upgradeable to 64MB FPM/EDO
- **Onboard Display:**
 - C&T 65550 PCI supporting CDT/LCD displays with 1MB EDO RAM
 - Resolution: Non-interlaced CRT monitor up to 1024x768 @ 256 colors, LCD panel monitor up to 1024x768 @ 256 colors
- **Ethernet:** Realtek 8139C PCI PnP 10/100Base-T Ethernet
- **Onboard IDE:**
 - PIO Mode 0-4, DMA Mode 0-1 and one channel up to 2 devices (44-pin box header)
 - Enhanced IDE ATAPI/16.6, LS-120 & ZIP bootable

- **Onboard Multi I/O:**
 - One floppy port (box header) supporting up to 2 drives (LS-120 bootable)
 - One SPP/EPP/ECP parallel port (box header) supporting LS-120
 - Two 16550 UARTs compatible serial ports with COM1 as RS-232 (D-type) and COM2 (box header); jumper selectable as RS232/422/485
 - One IrDA (pin header) for wireless communication
- **PS/2 Keyboard/Mouse:** PS/2 type (mini-DIN connector)
- **Real Time Clock (RTC):** Dallas/ST 12887 or the latest components
- **Watchdog Timer:**
 - System reset or NMI (Non-maskable Interrupt) software programmable timer interval and jumper selectable
 - 64 levels, 0.5~8/5~80/50~800/100~1600 seconds
- **Onboard SSD:** Supports M-Systems DiskOnChip®
- **Expansion Capability:** One 16-bit PC/104 connector
- **Other Features:**
 - Workable under +5V electrical voltage
 - Internal power connectors for +5V, GND, GND, and +12V; and power connector for -5V, GND, GND, -12V.

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

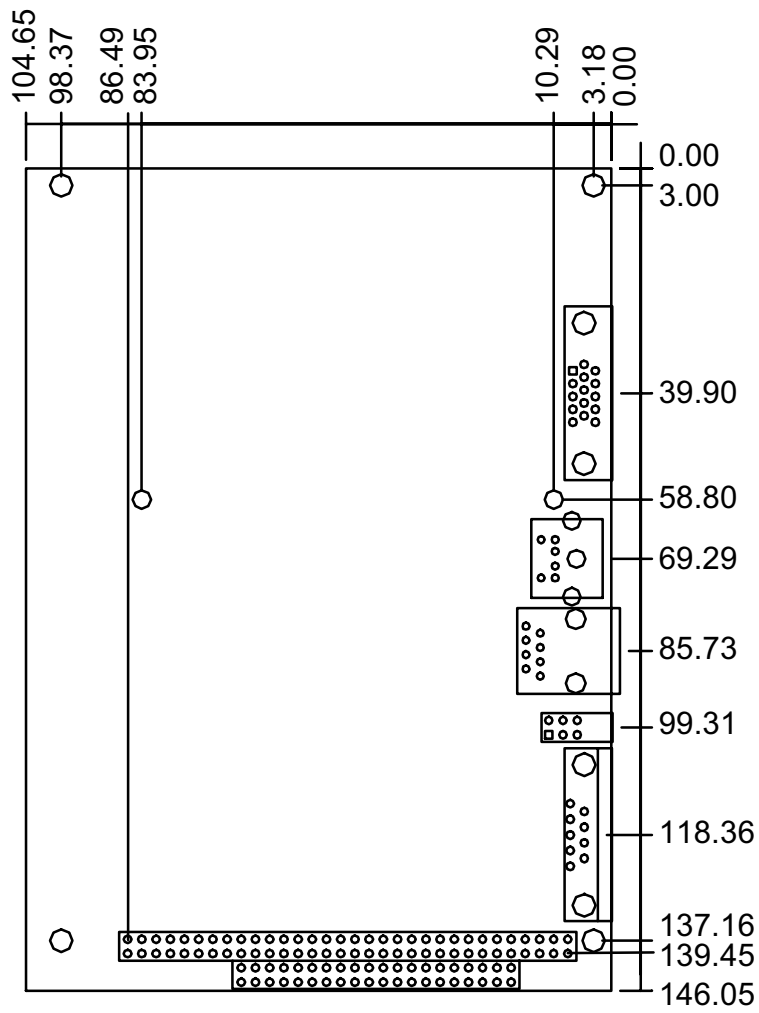
1.3 Utilities Supported

- Ethernet Utility
- Flat panel/CRT Drivers

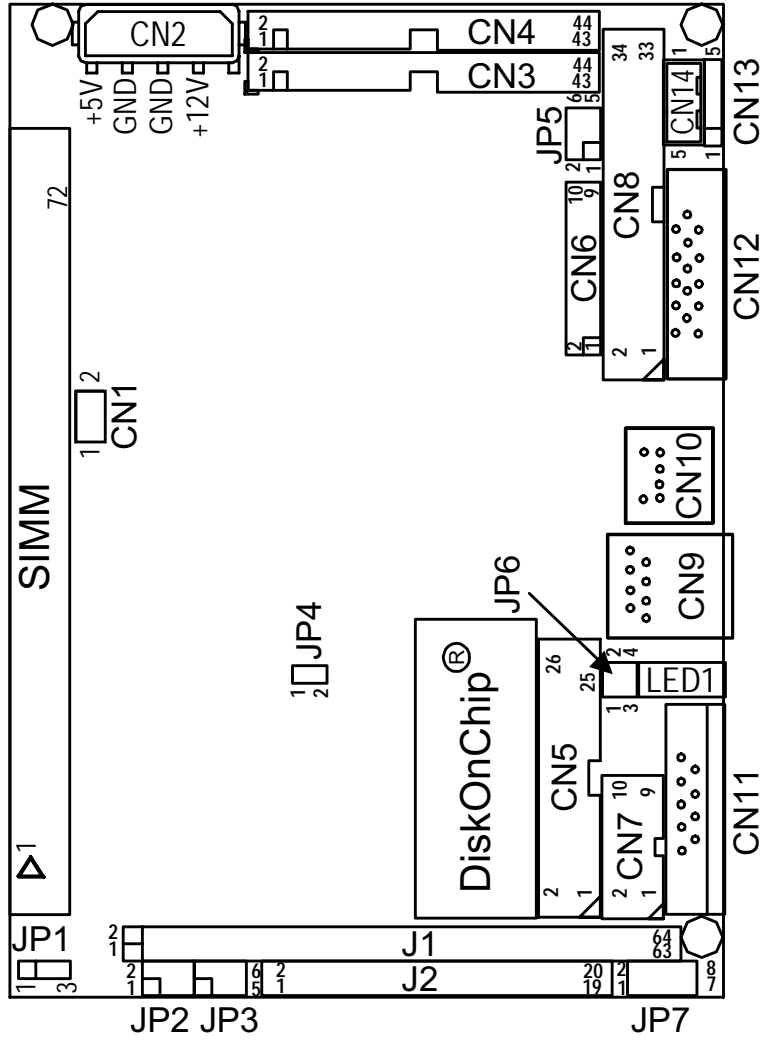
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Chapter 2 Installation

2.1 Board Dimension and Fixing Holes



2.2 Placement



2.3 Jumper Settings

The SBC8440 is configured to match the needs of your application by proper jumper settings. The following tables show the correct jumper settings for the onboard devices.

Jumper	Default Setting	Jumper Setting
JP1	Watchdog Trigger Disabled	Open
JP2	COM2 RS232/422/485 Settings: RS-232	Short 3-5, 4-6
JP3	COM2 RS232/422/485 Settings: RS-232	Short 3-5, 4-6
JP4	Clear CMOS Jumper: Normal	Open
JP5	Flat Panel Voltage Selection: Flat Panel Signal Level at 3.3V	Short 2-4
JP5	Flat Panel Voltage Selection: VDDM of CN3 at 5V	Short 3-5
JP6	DiskOnChip® Memory Segment D0000-D3FFF	Short 1-2, 3-4
JP7	COM2 RS232/422/485 Settings: RS-232	Short 1-2

2.3.1 Watchdog Function Setting: JP1

The watchdog timer is an indispensable feature of the SBC8440. It has a sensitive error detection function and a report function. When the CPU processing comes to a halt, the watchdog can generate a NMI or reset the CPU.

Watchdog Function	Settings
Activate NMI when Watchdog triggered	Short 1-2
Reset system when Watchdog triggered	Short 2-3
Disabled	Open (default)

2.3.2 Serial Ports Settings: JP2, JP3, JP7

The SBC8440 provides 2 onboard serial ports, 1 x RS-232 and 1 x RS-232/422/485. The corresponding jumper settings are shown on the following table.

If COM2 is to be set to RS-422/485, the following jumpers have to be set correctly.

COM2 RS-232/422/485 Setting: JP7, JP2, JP3

Options	Settings		
	JP7	JP2	JP3
RS-232 (default)	Short 1-2	Short 3-5, 4-6	Short 3-5, 4-6
RS-422	Short 3-4	Short 1-3, 2-4	Short 1-3, 2-4
RS-485	Short 5-6, 7-8	Short 1-3, 2-4	Short 1-3, 2-4

2.3.3 CMOS Clear Jumper: JP4

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

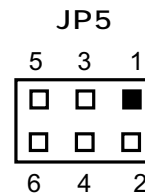
2.3.4 Flat Panel Voltage Selection: JP5

SBC8440 supports +3.3V or +5V flat panel, with voltage selection completed by setting **JP5**.

JP5: Flat panel signal Level

Flat Panel Signal Level	JP5
3.3 V (default)	Short 2-4
5 V	Short 4-6

V _{DDM} of CN3	JP5
3.3 V	Short 1-3
5 V (default)	Short 3-5



2.3.5 DiskOnChip® Memory Segment: JP6

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

2.4 Connectors

The onboard connectors link the SBC8440 to external devices such as hard disk, floppy disk or printer. The following table lists the function of each connector on the SBC8440. Corresponding pin assignments are described in Chapter 3.

Connector	Description
CN1	CPU FAN Connector
CN2	Power Connector 1
CN3	Flat Panel Connector
CN4	IDE Connector
CN5	Parallel Port
CN6	Front Panel Bezel Connector
CN7	COM2
CN8	FDC Connector
CN9	Ethernet Connector
CN10	K/B and PS/2 Connector
CN11	COM1
CN12	CRT Connector
CN13	IrDA Connector
CN14	Power Connector 2

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Chapter 3

Hardware Description

3.1 Safety Precaution

Disconnect the power cord from the SBC8440 before your installation. Do not make any connections while the power is on because the sudden surge of power could ruin any sensitive components. Most electronic components are sensitive to the static electric charge. Therefore, before touching the SBC8440 control board, always ground yourself to keep from any static charge. Use a grounding wrist strap and place all electronic components in any static-shielded devices.

3.2 CPU

The SBC8440 supports an onboard AMD486DX5-133 (Am5x86-P75) CPU. Systems based on these CPUs can be operated under UNIX, OS/2, Windows NT, Windows 95 and MS-DOS environments. Moreover, the installed CPU determines system's performance.

3.3 BIOS

The system BIOS used in SBC8440 is Award Plug and Play BIOS. The SBC8440 contains a single 1MB Flash EPROM and supports power-on modification of the system BIOS.

3.4 System Memory

SBC8440 has one onboard 72-pin SIMM sockets, able to support 256Kx36, 512Kx36, 1Mx36, 2Mx36, 4Mx36 and 8Mx36 SIMM modules, providing the user with up to 64MB system memory. The DRAM controller supports auto-insert error debug, auto-detect DRAM size and bank.

The SBC8440 also supports non-parity SIMM DRAM. In CMOS BIOS, the "memory-parity-check item" must be set to *Disabled*.

3.5 I/O Port Address Map

The 486 CPU communicates via I/O ports. It has a total of 1KB port addresses able to be assigned 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 co-processor busy signal
0F1	Reset math co-processor
0F8-0FF	Math processor
10C-10E	RAM/ROM disk program port address
120-121	Watch-dog timer operation
1F0-1F8	Fixed disk controller
300-31F	Prototype card
360-36F	Reserved

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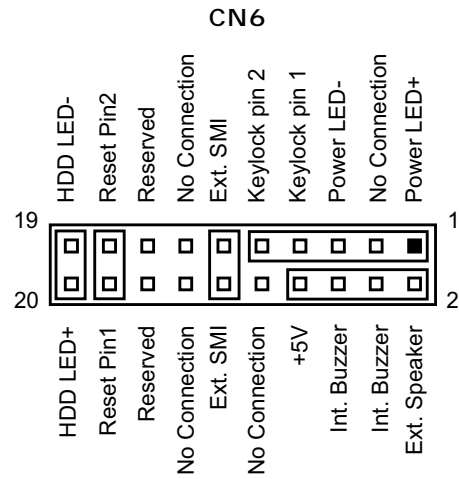
Address	Devices
378-37F	Parallel port #1
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port #1(COM1)
2F8-2FF	Serial port #2(COM2)
398	Onboard I/O (SMC37C669) Configuration Register

3.6 Interrupt Controller

The SBC8440 is a fully PC compatible control board. It consists of 16 ISA interrupt request lines and 4 of the 16 can be either ISA or PCI. The mapping list of the 16 interrupt request lines is shown below;

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	Selectable for Parallel port
IRQ6	Floppy disk controller
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 mouse
IRQ13	Math co-processor
IRQ14	Primary IDE channel
IRQ15	Reserved

3.7 Front Panel Bezel Connector



CN6: Front Panel Bezel Connector Pin Assignment

Pin	Description	Pin	Description
1	Power LED+	2	Ext. Speaker
3	No connector	4	Int. Buzzer
5	Power LED-	6	Int. Buzzer
7	Keylock pin 1	8	+5V
9	Keylock pin 2	10	No connector
11	No connector	12	No connector
13	No connector	14	No connector
15	Reserved	16	Reserved
17	Reset Pin2	18	Reset Pin1
19	HDD LED-	20	HDD LED+

NOTE: *You may only install the speaker (pins 2 & 8), or short pins 4 & 6 (internal buzzer) at one given time.*

3.8 IDE Interface Connector

The SBC8440 builds in 1 channel, able to support 2 IDE drives, PCI bus enhanced IDE controller which can support master/slave mode and post write transaction mechanisms with 64-byte buffer, and master data transaction.

CN4: IDE Connector Pin Assignment

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	+5V	42	+5V
43	GND	44	No connector

3.9 Display Interface

3.9.1 Flat Panel/CRT Interface Controller

The SBC8440 builds in C&T65550, a high-performance flat panel/super VGA display controller with onboard 1M byte. It is capable to drive CRT display and a wide array of flat panel displays. It can support CRT to the maximum resolution up to 1024x768 with 256 colors, 640x480 with 16M colors, and to support panel resolution of 1024x768. It can support monochrome panels up to 64 gray scales. It can also display up to 226, 981 different colors on passive DSTN flat panels and up to 16M colors on 24-bit active matrix flat panels.

3.9.2 Features

- Fully compatible with IBM™ VGA
- Flat panel and CRT monitor can be displayed simultaneously
- Onboard 1M byte VGA RAM
- Supports panel resolution up to 1024x768
- Supports non-interlaced CRT monitors with resolutions up to 1024x768 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

3.9.3 VGA/Flat Panel Connectors

The SBC8440 has two connectors to support the CRT VGA and flat panel displays, respectively or simultaneously. **CN12** is a standard 15-pin connector commonly used for the CRT VGA display, and **CN3** is a 44-pin, dual-in-line header for flat panel connection. Configuration of the VGA interface is done via the software utility and no jumper setting is required. The following two tables are the pin assignments for the CRT/VGA connector and the flat panel connector, respectively.

CN12: CRT/VGA Connector Pin Assignment

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

CN3: Flat Panel Connector Pin Assignment

Pin	Description	Pin	Description
1	-12V	2	+12V
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

Continued

Pin	Description	Pin	Description
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

3.9.4 Flat Panel Connector Pin Description

Name	Description
PO~P23	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
+12V	+12V power from PC power supply
ENAVEE	Power sequencing controls for panel LCD bias volt
-SHFCLK	the inverter signal of SHFCLK
VDDM	3.3V or 5V selected by JP6

3.10 Floppy Disk Controller

The SBC8440 provides a 34-pin header type connector, **CN8** for supporting 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.

CN8: Floppy Disk Connector Pin Assignment

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 #

3.11 Parallel Port Interface

The onboard PRT of SBC8440 is a multi-mode parallel port able to support:

- **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 select of the onboard parallel port in LPT1 (378H), LPT2 (278H), LPT3 (3BCH) or disabled is done by BIOS CMOS setup.

CN5: Parallel Port Connector Pin Assignment

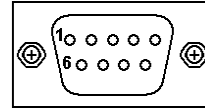
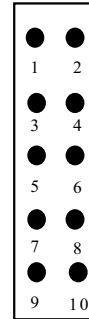
Pin	Description	Pin	Description
1	Strobe #	14	Auto Form Feed #
2	Data 0	15	Error #
3	Data 1	16	Initialize #
4	Data 2	17	Printer Select In #
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	Acknowledge #	23	GND
11	Busy	24	GND
12	Paper Empty #	25	GND
13	Printer Select	26	No connector

3.12 Serial Port Interface

The SBC8440 has two onboard serial ports, with COM1 as RS-232 and COM2 as RS-232/422/485, both selected via jumper setting. Both ports have +5V/12V power on both pins 1 and 8 or pin 9 (CN12 at SBC8440V), depending on jumper selection.

The RS-232's pin assignments are listed below;

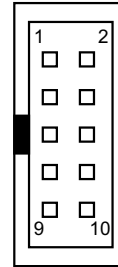
CN11	CN7	Description
1	1	Data Carrier Detect (DCD)
6	2	Data Set Ready (DSR)
2	3	Receive Data (RXD)
7	4	Request to Send (RTS)
3	5	Transmit Data (TXD)
8	6	Clear to Send (CTS)
4	7	Data Terminal Ready (DTR)
9	8	Ring Indicator (RI)
5	9	Ground (GND)
X	10	GND



NOTE: *The COM1 and COM2 ports of SBC8440VE are pin header type connectors whereas for SBC8440, COM1 is a DB-9 connector and COM2 is a pin header.*

The RS-422/485 pin assignment for COM2 is listed as follows;

CN7 Pin	RS-422	RS-485
1	TXD-	DATA-
2	x	x
3	TXD+	DATA+
4	x	x
5	RXD+	x
6	x	x
7	RXD-	x
8	x	x
9	GND	GND
10	x	x

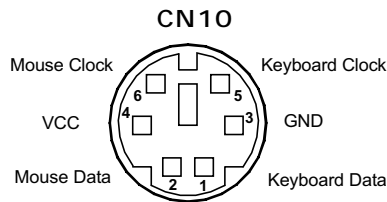


3.13 Real Time Clock and CMOS RAM

The SBC8440 contains an MC146818 compatible Real Time Clock (RTC) and 128 byte of CMOS RAM in the DALLAS DS12887, or its equivalent. The CMOS RAM stores the system configuration information entered via the SETUP program. The RTC and the CMOS RAM are kept active by a battery when the system power is turned off, and the battery power can last for ten years.

3.14 Keyboard and PS/2 Mouse Connector

CN10 is a DIN connector for PS/2 keyboard connection.

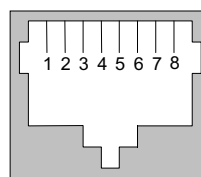


3.15 Ethernet Connector

The RJ-45 connector (**CN9**) is used for Ethernet. To connect the SBC8440VE to a hub, just plug one end of the cable into the **CN9** and connect the other end of the cable to a hub.

CN9: RJ-45 Connector Pin Assignment

Pin	Signal
1	Tx+ (Data transmission positive)
2	Tx- (Data transmission negative)
3	Rx+ (Data reception positive)
6	Rx- (Data reception negative)
other	Not use



RJ-45

3.16 CPU Fan Connector

CN1 is a CPU fan connector. All 486 and 5x86 CPUs require a fan for heat dispensing. A fan connector is thus designed on the SBC8440 to provide the fan power. Its pin assignment is as follows;

Pin	Description
1	+5V
2	GND

3.17 IrDA Connector

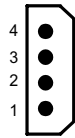
CN13 is a 10-pin IrDA connector for wireless communication.

CN13

+5V	□	1
N.C.	□	2
IRRX	□	3
GND	□	4
IRTX	□	5

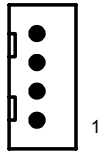
3.18 Power Input Connectors

CN2 is the +5V/+12V power input connector of the SBC8440. The SBC8440 needs +5V for normal operation.



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

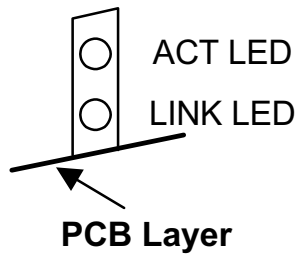
CN14, on the other hand, is the -5V and -12V power input connector of SBC8440. The corresponding pin assignment is listed on the table below.



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

3.19 LAN LED

The LAN LED consists of two light emitting diodes that indicate the Ethernet connectivity and operation. The following diagram illustrates the corresponding assignments of the LEDs.



3.20 PC/104 Connectors

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

J1: PC/104 Bus Pin Assignment

PIN No.	PIN Name	PIN No.	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

Continued

PIN No.	PIN Name
49	SA6
51	SA5
53	SA4
55	SA3
57	SA2
59	SA1
61	SA0
63	0V

PIN No.	PIN Name
50	IRQ3
52	DACK2 *
54	TC
56	SALE
58	+5V
60	OSC
62	0V
64	0V

J2: PC/104 Bus Pin Assignments

PIN No.	PIN Name
1	0V
3	MEMCS16 *
5	IOCS16 *
7	IRQ10
9	IRQ11
11	IRQ12
13	IRQ15
15	IRQ14
17	DACK0 *
19	DRQ0
21	DACK5 *
23	DRQ5
25	DACK6 *
27	DRQ6
29	DACK7 *
31	DRQ7
33	+5V
35	MASTER *
37	0V
39	0V

PIN No.	PIN Name
2	0V
4	SBHE *
6	LA23
8	LA22
10	LA21
12	LA20
14	LA19
16	LA18
18	LA17
20	MEMR *
22	MEMW *
24	SD8
26	SD9
28	SD10
30	SD11
32	SD12
34	SD13
36	SD14
38	SD15
40	(KEY)

Chapter 4

Display Drivers

The LCD/VGA chipset used on the SBC8440 is C&T65550 which can drive a wide range of monochrome and color flat panels including Single-Drive (SS) and Dual-Panel, Dual Drive (DD) passive DSTN and active matrix TFT / MIM LCD, EL, and Plasma panels. The 65550 supports an additional 256Kx16 DRAM providing a 32-bit video memory bus and additional display memory to support resolution up to 1024x768 in 256 colors, 800x600 in 256 colors, and 640x480 in 16M colors. The 65550 accelerator can support up to 64 gray scales on monochrome panels, up to 226, 981 colors on passive DSTN 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 65550 is fully compatible with the VGA graphics standard at the register, gate, and BIOS levels. The manufacturer 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

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.

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.

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

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.

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

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

Driver Installation

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

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

- Step 1.* Open an OS/2 full screen or windowed session.
- Step 2.* Place the CHIPS 65550 Display Driver Diskette in drive A.
- Type A: <ENTER> to make this the default drive.
- Type INSTALL A: C: <ENTER>
- Where A: is the floppy disk drive and C: is the hard disk partition containing \OS2.
- Once the Install Program is completed, do a system shutdown and reboot.

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

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

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

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

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

Change Video Resolution

- Step 4.* To change the screen resolution or color depth:
- Open the System Setup folder, then open System. From the list of available screen resolutions, select a new resolution. Point to the title-bar icon and double click. See Changing Screen Resolution in OS/2 User's Guide for more information.

NOTE: *Always use the INSTALL.COMD for the FIRST installation of the video device drivers. Thereafter, to change video resolutions, do Step 4 above.*

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.

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 problem with loading Full Screen OS/2 or WIN-OS/2, check if you are using lmouse.drv driver in the WINDOWS\SYSTEM sub-directory. If yes, then you must edit the CHIPS550.DSP file and modify the following line:*

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

4.4 VGA Software Utilities

4.4.1 DOS Utility

These utility programs are designed to work with MS-DOS.

MODETEST

MODETEST is a DOS based diagnostic tool to set and display information for each video mode. To execute the MODETEST utility program, type the following command:

MODETEST

All the VGA modes will be sequentially displayed by pressing <ENTER>. To display a specific mode, type the following optional field after the command, where "xx" defines the desired VGA mode:

MODETEST [-m xx]

Press any key (except <Esc>) to display the next screen. This will cycle through each video mode and display the following information:

Mode number

Resolution (in characters if text mode; in pixels if graphics mode)

Number of available colors

Vertical scanning frequency

Horizontal scanning frequency

Dot Clock (pixel) frequency

This utility will also display a set of color bars to show the range of colors and put a border of changing colors around the screen.

To execute the HELP file, type the following command:

MODETEST -?

Press <Esc> at any time to exit the program and return to DOS.

4.4.2 Windows 95 Utility

These utility programs are designed to work with Microsoft Windows 95.

CHIPSDSP.DLL

CHIPSDSP.DLL is located on the CHIPS Windows 95 driver disk. This file is a Windows 95 based utility for selecting display type and refresh rate. It is a Display Properties Refresh window that is automatically installed when installing CHIPS Windows 95 display drivers. The Display icon is in the Control Panel group. To invoke the Display icon, simply click on the Start button, go to Settings, and click on Control Panel and then double click on the Display icon. Click on the property sheet with the heading Refresh.

How to use the utility

DISPLAY DEVICE allows you to select the display type from the following:

- CRT only <ALT C>
- LCD (Flat Panel) only <ALT L>
- Both CRT and LCD (Flat Panel) <ALT B>

REFRESH RATE allows you to select the refresh rate from the following:

- Interlaced
- 56 Hz
- 60 Hz
- 70 Hz
- 72 Hz
- 75 Hz
- 85 Hz

- NOTE:
- 1. The refresh rates that are supported by the selected monitor are the only refresh rates that will show and be selectable.*
 - 2. Not all CHIPS products may support the above Refresh Rates.*

WINDOWS DEFAULT allows you to return to the default refresh rate setting for the selected monitor in Windows 95.

CHIPSDSP.RTF

The visible text strings for CHIPSDSP.HLP (Help file) are stored in the CHIPSDSP.RTF file. The OEM may modify or translate the text strings to other languages by editing the CHIPSDSP.RTF file using Microsoft Word for Windows Version 7.0. After the text strings are modified, open CHIPSDSP.HPJ from Microsoft Help Workshop in Microsoft Visual C++ 4.0. The file must be recompiled by selecting "*Save and Compile*".

After recompiling, the CHIPSDSP.HLP will display the edited text strings in the language of your choice.

To distribute the modified CHIPSDSP.HLP file with Windows 95 Disk 1, please note the following:

Copy CHIPSDSP.HLP onto Disk 4 to overwrite the existing file.

CHIPSDSP.RC

The visible text strings for CHIPSDSP Applet are stored in the CHIPSDSP.RC file. The OEM may modify or translate the text strings to other languages by using the Microsoft Visual C++ Developer Studio version 4.0 to edit the CHIPSDSP.RC file.

Once the text strings are modified, the Resource Compiler located in the Microsoft Visual C++ 2.0 must recompile the file. To recompile the resources, execute the RES.BAT (included on Disk 3).

NOTE: *Edit the path in the RES.BAT file to point to the location where Microsoft Visual C++ exists.*

Please ignore the warning messages RC2182: duplicate dialog control ID 9999.

After recompiling the resources, the CHIPSDSP.DLL will display the edited text strings in the language of your choice.

To distribute the modified CHIPSDSP.DLL file with Windows 95 Disk 1, please note the following:

Copy CHIPSDSP.DLL onto Disk 4 to overwrite the existing file.

4.4.3 Windows 3.1 Utility

These utility programs are designed to work with Microsoft Windows Version 3.1.

CHIPSCPL.CPL

CHIPSCPL.CPL is a Windows based utility to select resolutions and color depth. It is a Control Panel Applet with its own icon that is automatically installed when installing CHIPS Windows 3.1 linear drivers. The Control Panel icon is in the Main Windows group. To invoke the control panel applet, simply click on the icon. The driver resolution and color depth take effect only after Windows is rebooted with the new driver.

How to use the utility

SCREEN SIZE <ALT S> allows you to select from the following resolutions:

- 640x 480
- 800x 600
- 1024x768
- 1280x1024

By selecting the resolution first, it will determine the allowable selections for color depth.

COLOR <ALT O> allows you to select the number of colors from the following:

- 16 (4 bits per pixel)
- 256 (8 bpp)
- 32K (15 bpp)
- 64K (16 bpp)
- 16M (24 bpp)

By selecting the color depth first, it will determine the allowable selections for resolution.

DPI <ALT P> allows you to select a large or small font.

DISPLAY <ALT D> allows you to select the display type from the following:

- CRT only
- LCD (Flat Panel) only
- Both CRT and LCD (Flat Panel)

MONITOR SELECTION <ALT M> allows you to select from the list of monitors.

REFRESH <ALT R> allows you to select the refresh rate from the following:

- Interlaced
- 56 Hz
- 60 Hz
- 70 Hz
- 72 Hz
- 75 Hz

The refresh rates supported by the selected monitor are the only available refresh rates that can be selected.

CURSOR-ANIMATION <ALT A> allows you to select an animated cursor instead of the hourglass wait cursor.

BIG CURSOR <ALT G> allows you to select a big cursor for better visibility on the Flat Panel.

VERSION <ALT V> displays version information about the current driver.

HELP <ALT H> displays help information on how to use the Display Driver Control Panel.

FONT SIZE <ALT F> (*Japanese Windows only*) allows you to select the font size from the following:

- 12
- 16
- 20
- 24

NOTE: *The CHIPSCPL will prompt for Windows 3.1 and /or Chip's driver disk(s) if required files are missing.*

4.4.4 Setup Programs

The following setup programs were developed for the installation of CHIPS Display Drivers through Windows or DOS. The driver files have been compressed with the Microsoft Corporation ("MS") COMPRESS.EXE utility. Please note that we do not support driver installation through the MS Windows Setup due to the limitations of their COMPRESS.EXE and EXPAND.EXE utilities.

The setup programs contain video chip detection and video memory detection at the time of installation. These programs will automatically detect the CHIPS VGA controller and the amount of video memory present in the system, then read the appropriate script file, and then install the appropriate drivers. For example, when setup identifies the VGA controller and 512KB video memory, the setup program will read the script files identified by the characters "5K", and then install only the drivers that function with 512KB of video memory.

English Environment

WINSETUP.EXE

WINSETUP.EXE is a setup program that allows the user to install driver files through Windows. This setup program will expand driver files, and then install the drivers in the appropriate sub-directories. To install the drivers, go to the Run command from the File menu in the Program Manager, and type A:\WINSETUP.

W*.INF

The W*.INF files are the script files for installation of the display drivers using WINSETUP.EXE. These files are located in the root directory of Disk 3 and are required to be in the same directory as WINSETUP.EXE.

The W*.INF files may be edited by the OEM to tailor the WINSETUP.EXE program to install specific drivers. You may use any ASCII text editor to modify these files. For example, if the OEM does not want to install the 24bpp driver, W*.INF must be modified as follows:

1. Enter the W*.INF file into an ASCII text editor.
2. Go to the [Files] section of the W*.INF file.
3. Delete the line that contains the name of the file for the 24bpp driver.
4. Save the file and exit the text editor.

The W*.INF files may also be edited to install the drivers to another destination sub-directory. The default destination sub-directory is \WINDOWS\SYSTEM. To change the destination sub-directory, replace "SYSTEM" in the [Files] section of W*.INF with the destination sub-directory of your choice.

NOTE: *Modifying other fields in the W*.INF file may cause WINSETUP.EXE to not function properly.*

SETUP.EXE

SETUP.EXE is a setup program that allows the user to install driver files in DOS. This setup program will expand driver files, and then install the drivers in the appropriate sub-directories. To install the drivers, type "SETUP" at the DOS prompt.

S*.SCP

The S*.SCP files are the script files for installation of the display drivers using SETUP.EXE. These files are located in the root directory of Disk 3 and are required to be in the same directory as SETUP.EXE.

The S*.SCP files may be edited by the OEM to tailor the SETUP.EXE program to install specific drivers. You may use any ASCII text editor to modify these files. For example, if the OEM does not want to install the 24bpp driver, S*.SCP must be modified as follows:

1. Enter the S*.SCP file into an ASCII text editor.
2. Go to the [MENU2 ENTRY Definition] section of the S*.SCP file.
3. Delete the line that contains the name of the file for the 24bpp driver.
4. Save the file and exit the text editor.

The S*.SCP file may also be edited to install the drivers to another destination sub-directory. The default destination sub-directory is \WINDOWS\SYSTEM. To change the destination sub-directory, replace "SYSTEM" in the [MENU2 ENTRY Definition] section of S*.SCP with the destination sub-directory of your choice.

NOTE: *Modifying other fields in the S*.SCP file may cause SETUP.EXE to not function properly.*

OEM*.INF

These files contain information regarding display driver resolution and color depth needed by Windows.

The OEM*.INF files may be edited by the OEM to tailor the setup programs for Windows to display specific drivers, resolutions and colors. These files may be modified by using any ASCII text editor, or example, if the OEM does not want to install the 24bpp driver, resolution and color depth, OEM*.INF must be modified as follows:

1. Enter the OEM*.INF file into an ASCII text editor.
2. Go to the [display] section of the OEM*.INF file.
3. Delete the line that contains the name of the file for the 24bpp driver, resolution and color depth.
4. Save the file and exit the text editor.

NOTE: *Modifying other fields in the OEM*.INF file may cause Windows to not function properly.*

Japanese Environment

This contains display drivers for Japanese Windows only.

SETUP.EXE

SETUP.EXE is a setup program that allows the user to install Windows 3.1/J driver files through Japanese DOS/V. This setup program will expand driver files, and then install the drivers in the appropriate sub-directories. To install the drivers, type SETUP at the DOS/V prompt.

S*.SCP

The S*.SCP files are the script files for installation of the display drivers using SETUP.EXE. These files are located in the root directory of Disk 3, and are required to be in the same directory as SETUP.EXE

The S*.SCP files may be edited by the OEM to tailor the SETUP.EXE program to install specific drivers. You may use any ASCII text editor to modify these files. For example, if the OEM does not want to install the 24bpp driver, S*.SCP must be modified as follows:

1. Enter the S*.SCP file into an ASCII text editor.
2. Go to the [MENU2 ENTRY Definition] section of the S*.SCP file.
3. Delete the line that contains the name of the file for the 24bpp driver.
4. Save the file the exit the text editor.

The S*.SCP file may also be edited to install the drivers to another destination sub-directory. The default destination sub-directory is \WINDOWS\SYSTEM. To change the destination sub-directory, replace "SYSTEM" in the [MENU2 ENTRY Definition] section of S*.SCP with the destination sub-directory of your choice.

NOTE: *Modifying other fields in the S*SCP file may cause SETUP.EXE to not function properly.*

Chapter 5

Ethernet Introduction

5.1 Introduction

The SBC8440VE 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 SBC8440VE 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, IBM LAN Server, SCO UNIX or other ODI, NDIS and Packet drive compliant operating systems.

This page does not contain any information.

Chapter 6

Award BIOS Utility

This chapter describes the different settings available in the Award BIOS that comes with the SBC8440VE CPU card. Also contained here are instructions on how to set up the BIOS configuration.

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM (CMOS RAM) that enables the system to retain the Setup information when power is turned OFF.

6.1 Entering Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn ON the computer, the Award BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup at this stage, press key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys when the following message briefly appears at the bottom of the screen during the POST (Power On Self Test).

**TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC>
OR KEY**

You can also restart by turning the system OFF and back ON again. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

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

6.2 Control Keys

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp / "+" key	Increase the numeric value or make changes
PgDn / "-" key	Decrease the numeric value or make 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	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

6.3 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>.

6.4 Main Menu

Once you enter 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 arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

**ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.**

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

The section listed along the footer of the Main Menu screen displays the control keys for this menu. Another section located at the bottom of the Main Menu, just below the control keys, displays information on the currently highlighted item in the list.

NOTE: *If you find that your computer cannot boot after making and saving system changes with Setup, the Award BIOS, via its built-in override feature, resets your system to the CMOS default settings.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

- **Standard CMOS Setup**
This setup page 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 page includes all the items of chipset special features.
- **Power Management Setup**
This category determines how much power consumption for system after selecting below items. Default value is Disable.
- **PCI Configuration Setup**
This category specifies the setup of PCI related devices and onboard I/O's.
- **Load BIOS Defaults**
BIOS defaults indicates the most appropriate value of the system parameter which the system would be in minimum performance.
- **Load Setup Defaults**
Chipset defaults indicates the values required by the system for the maximum performance.
- **Password Setting**
Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.
- **IDE HDD Auto Detection**
Automatically configure hard disk parameters.
- **Save & Exit Setup**
Save CMOS value changes to CMOS and exit setup.
- **Exit Without Saving**
Abandon all CMOS value changes and exit setup.

6.5 Standard CMOS Setup

Standard CMOS Setup allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the CPU card is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, or when the onboard battery fails, or if the configuration stored in the CMOS memory is lost or damaged.

The Standard CMOS Setup Menu is divided into 7 categories. Each category includes one or more than one setup items. Use the arrow keys to highlight the item and then the <PgUp> or <PgDn> keys to select the value you want in each item.

Standard CMOS Setup Menu (Support Enhanced IDE)

**ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.**

Date (mm:dd:yy) : Wed, Mar 4 1998		Time (hh:mm:ss) : 00 : 00 : 00	
HARD DISKS	TYPE	SIZE	CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master	Auto	0 0	0 0 0 0 0 Auto
Primary Slave	None	0 0	0 0 0 0 0 Auto
Drive A	: 1.44M, 3.5in	Base Memory : 640K Extended Memory : 15360K Other Memory : 384K Total Memory : 16384K	
Drive B	: None		
Video	: EGA / VGA		
Halt On	: All Errors		
ESC : Quit		↑↓→← : Select	Item PU / PD / + / - : Modify
F1 : Help		(Shift) F2 : Change Color	

At the bottom of the menu are the control keys on this menu. If you need any help on each item field, pressing the <F1> key displays the relevant information that may help you. The memory display at the lower right-hand side is read-only. It will adjust automatically according to the memory changed. The

following pages describe each item of this menu.

- **Date**

The date format is:

Day	The day of week, from Sun to Sat, determined by the BIOS, is read only
Month	The month, Jan (1) through Dec (12)
Date	The date, from 1 to 31 (or the maximum allowed in the month), date input may be keyed from the numerical / function key
Year	The year, depending on the BIOS

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

- **Time**

The time format is:

Hour	From 00 to 23
Minute	From 00 to 59
Second	From 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

- **Primary HDDs / Primary Slave**

The categories identify the types of one channel that have been installed in the computer. There are 45 predefined types and 4 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 for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information must 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, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None".

If the controller of HDD interface is CD-ROM, the selection shall be "None".

If a hard disk has not been installed select NONE and press <Enter>.

NOTE: *The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in these fields. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.*

CYLS	number of cylinders
HEAD	number of read/write heads
PRECOMP	write precompensation
LANDZ	landing zone
SECTORS	number of sectors
MODE (for IDE HDD only):	Auto Normal (HD < 528MB) Large (for MS-DOS only) LBA (HD > 528MB and supports Logical Block Addressing)

● **Drive A / Drive B**

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

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**

This field 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:

- When VGA as primary and monochrome as secondary, the selection of the video type is "VGA Mode".

- When monochrome as primary and VGA as secondary, the selection of the video type is "Monochrome mode".

You can choose the following video display cards:

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	For Hercules or MDS adapters, includes high resolution monochrome adapters

- **Halt On**

This field determines whether the system will halt if an error is detected during power up.

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

- **Memory**

The category is displayed only, and is determined by POST 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 CPU card, or 640K for systems with 640K or more memory installed on the CPU card.

- **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.

6.6 BIOS Features Setup

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

**ROM / PCI ISA BIOS
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.**

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CFFFF Shadow	: Disabled
External Cache	: Enabled	D0000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D8000-DFFFF Shadow	: Disabled
Boot Sequence	: C,CDROM,A		
Swap Floppy Drive	: Disabled		
Boot Up Floppy Drive	: Enabled		
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI /VGA Palette Snoop	: Disabled		
OS Select For DRAM>64MB	: Non-OS2		
		ESC : Quit	↑↓→← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

- **Virus Warning**

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt to write to the boot sector is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

NOTE: *Many disk diagnostic programs, which attempt to access the boot sector table, can cause the virus warning. If you will run such a program, disable the Virus Warning feature.*

! 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 available only for DOS and other OSes that do not trap INT13.*

- **CPU Internal Cache / External Cache**

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are **Enabled**.

Enabled	Enable cache
Disabled	Disable cache

NOTE: *If your CPU does not have an Internal Cache, then "CPU Internal Cache" will not be shown on the screen.*

- **Quick Power On Self Test**

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned ON. If it is set to *Enabled*, BIOS will skip some items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

- **Boot Sequence**

This field determines the drive that the system searches first for an operating system. The default value is *C, CDROM, A*. The options are :

C, CDROM, A	System will first search for hard disk drive then CDROM, floppy disk drive.
A, C, CDROM	System will first search for floppy disk drive then hard disk drive, CDROM

- **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**

When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 720K, 1.2M and 1.44M all have 80 tracks. By default, this field is set to *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 type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

- **Boot Up NumLock Status**

This allows you to activate the NumLock function after you power up the system. By default, the system boots up with **NumLock ON**.

On	Keypad is number keys
Off	Keypad is arrow keys

- **Boot Up System Speed**

It selects the default system speed - the speed that the system will run at immediately after power up.

High	Set the speed to high
Low	Set the speed to low

- **Gate A20 Option**

This you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB. The default setting 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**

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to **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 this 2 items and the default is controlled by keyboard.

- **Typematic Rate (Chars/Sec)**

When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. By default, this item is set to **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)**

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to **250msec**.

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

- **Security Option**

This field allows you to limit access to the System and Setup. The default value is **Setup**. When you select **System**, the system prompts for the User Password every time you boot up. When you select **Setup**, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

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

NOTE: *To disable security, select PASSWORD SETTING at Main Menu and then you'll be asked to enter password. Don't type anything and just press <Enter> to disable security. Once 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 this field is enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.
- **OS Select for DRAM >64MB**
This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is **Non-OS/2**.
- **Video BIOS Shadow**
This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

- **C8000 - CFFFF Shadow/D8000 - DFFFF Shadow**
Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether optional ROM will be copied to RAM or not.
These categories determine whether optional ROM will be copied to RAM by 16K byte or 32Kbyte per/unit, the size of which depends on the chipset.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

- NOTE:
1. For C8000-DFFFF option-ROM on PCI BIOS, BIOS will automatically enable the shadow RAM. User does not have to select the item.
 2. IDE second channel control:
Enable : enables secondary IDE port and BIOS, and assigns IRQ15 for this port.
Disable: disables secondary IDE port and IRQ15 for availability to other device. The item is optional only for PCI BIOS.

Some sound cards have onboard CD-ROM controller that uses IDE Secondary Port. To avoid PCI IDE conflict, disable the IDE secondary channel control for the CD-ROM to work.

6.7 Chipset Features Setup

This Setup menu controls the configuration of the CPU card chipset.

**ROM PCI/ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE INC.**

Auto Configuration	: Enabled	Onboard FDC Controller	: Enabled
AT-BUS Clock	: CLK/4	Onboard UART1	: Auto
DRAM Read Timing	: Normal	Onboard UART2	: Auto
DRAM Write Timing	: Normal	Onboard UART2 Mode	: Standard
SRAM Read Timing	3-2-2-2	Onboard Parallel Port	: 378/IRQ7
SRAM WriteTiming	0 Wait	Parallel Port Mode	: Normal
Hidden Refresh	: Disabled		
ISA I/O Recovery	: Enabled		
Fast-Back-to-Back	: Enabled		
On-Chip Local Bus IDE	: Enabled		
IDE Buffer for DOS & Win	: Enabled		
IDE HDD Block Mode	: Enabled	ESC : Quit	↑↓→← : Select Item
IDE Primary Master PIO	: Auto	F1 : Help	PU/PD/+/- : Modify
IDE Primary Slave PIO	: Auto	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

- Auto Configuration**
 This predefines values for DRAM, cache timing according to CPU type and system clock. When enabled, the predefined items will become read-only.
- ISA I/O Recovery Time**
 This option specifies the length of the delay (in sysclks) inserted between consecutive 16-bit and 8-bit I/O operations. The default setting is *Enabled*.
- IDE HDD Block Mode**

Enabled	Enable IDE HDD Block Mode. The BIOS will detect the block size of the HDD and send block command automatically.
Disabled	Disable IDE HDD Block Mode

6.8 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.

**ROM PCI/ISA BIOS
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.**

Power Management	: Disabled	IRQ5 (LPT2)	: ON
PM Control by APM	: Yes	IRQ6 (Floppy Disk)	: ON
Video Off Option	: Susp,Stby→Off	IRQ7 (LPT1)	: ON
Video Off Method	: DPMS Support	IRQ8 (RTC Alarm)	: OFF
MODEM Use IRQ	: 3	IRQ9 (IRQ2 Redir)	: ON
		IRQ10 (Reserved)	: OFF
	"PM Timers"	IRQ11 (Reserved)	: OFF
HDD Off After	: Disabled	IRQ12 (PS/2 Mouse)	: ON
Doze Mode	: Disabled	IRQ13 (Coprocessor)	: OFF
Standby Mode	: Disabled	IRQ14 (Hard Disk)	: ON
Suspend Mode	: Disabled	IRQ15 (Reserved)	: OFF
	"PM Events"		
VGA	: OFF		
FDD (3FXh)	: ON		
LPT & COM	: LPT/COM		
HDD (1FXh)	: ON		
NMI	: OFF		
IRQ3 (COM2)	: ON		
IRQ4 (COM1)	: ON		
		ESC : Quit	↑ ↓ → ← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

- **Power Management**

This category determines how much power consumption for system after selecting below items. Default value is Disable. The following pages tell you the options of each item & describe the meanings of each option.

Item	Options	Descriptions
A. Power Management	<i>Disable</i>	Global Power Management disabled
	<i>User Define</i>	Users can configure their own power management
	<i>Min Saving</i>	Pre-defined timer values are used such that all timers are in their MAX values
	<i>Max Saving</i>	Pre-defined timer values are used such that all timers are in their MIN values
B. PM Control by APM	<i>No</i>	System BIOS will ignore APM when power managing the system
	<i>Yes</i>	System BIOS will wait for APM's prompt before it enters any PM mode (i.e., DOZE, STANDBY or SUSPEND). NOTE: <i>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!</i>
NOTE: <i>If APM is not installed, this option has no effect.</i>		
C. Video Off Option	<i>Always On</i>	System BIOS will never turn OFF the screen.
	<i>Suspend->Off</i>	Screen OFF when system is in SUSPEND mode
	<i>Susp, Stby->Off</i>	Screen OFF when system is in STANDBY or SUSPEND mode
	<i>All Modes->Off</i>	Screen OFF when system is in DOZE, STANDBY or SUSPEND mode
NOTE: <i>The M/B markers are recommended to fix this item to (2) or (3) & hide it by using MODBIN Utility.</i>		

Continued

Item	Options	Descriptions
D. Video Off Method	<i>Blank Screen</i>	The system BIOS will only blank OFF the screen when disabling video
	<i>DPMS Supported</i>	This function is enabled only for VGA cards supporting DPMS
NOTE: <i>Green monitors detect the V/H SYNC signals to turn OFF its electron gun.</i>		
E. Modem Use IRQ	3	The BIOS sets the "Modem Use IRQ" number at IRQ3. You can manually choose the IRQ number.
F. HDD Power Down (*) Remark 2	Disable	HDD's motor will not turn OFF.
	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 Mins.	Defines the continuous HDD idle time before the HDD enters power saving mode (motor OFF)
	When Suspend	BIOS will turn the HDD's motor OFF when system is in SUSPEND mode.
NOTE: – 2nd & 3rd options above can be selected at the same time. – When HDD is in power saving mode, any access to the HDD will wake up the HDD.		
G. Doze Mode	Disable	System will never enter DOZE mode.
	10, 20, 30, 40 Secs., 1, 3, 5, 10, 15, 20, 30, 40 Mins., 1, 2, 3 Hrs.	Defines the continuous idle time before the system enters DOZE mode If any item defined in (J) is enabled & active, DOZE timer will be reloaded.
NOTE: <i>Normally, DOZE mode puts the system into low speed or 8MHz, screen may be OFF depending on (E).</i>		

Continued

Item	Options	Descriptions
H. Standby Mode (*) Remark 1	Disable	System will never enter STANDBY mode.
	10, 20, 30, 40 Secs., 1, 3, 5, 10, 15, 20, 30, 40 Mins., 1 Hr	Defines the continuous idle time before the system enters STANDBY mode. If any item defined in (J) is enabled & active, STANDBY timer will be reloaded.
NOTE: Normally, STANDBY mode puts the system into low speed or 8MHz, screen may be OFF depending on (E).		
I. Suspend Mode (*) Remark 1	Disable	System will never enter SUSPEND mode
	10, 20, 30, 40 Secs., 1, 3, 5, 10, 15, 20, 30, 40 Mins., 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
NOTE: Normally, SUSPEND mode puts the system into low speed or 8MHz, clock is stopped, screen may be OFF depending on (E).		
J. PM Events VGA FDD (3FXh) LPT & COM HDD (1FXh) NMI IRQ3 (COM 2) IRQ4 (COM 1) IRQ5 (LPT 2) IRQ6 (Floppy Disk) IRQ7 (LPT 1) IRQ8 (RTC Alarm) IRQ9 (IRQ2 Redir) IRQ10 (Reserved) IRQ11 (Reserved) IRQ12 (PS/2 Mouse) IRQ13 (Coprocessor) IRQ14 (Hard Disk) IRQ15 (Reserved)	OFF	The specified event activity will not affect the PM timers.
	On	The specified event activity causes the PM Timers to be reloaded (i.e., the Power Management Unit (PMU) monitors the specified activities as PM events).

- Remark 1: *All items marked with (*) in this menu are loaded with predefined values long as the item "Power Management" is not configured as "User Defined".
These items are: "System Doze", "System Standby", and "System Suspend".*
- # Remark 2: *Although the item "HDD Power Down" is not controlled by the item "Power Management" (in terms of timer value), the HDD(s) will not power down if the global power management is disabled!*

6.9 PCI Configuration Setup

This Item applies to a PISA bus 486 All-in-One board only

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value. You can manually configure the PCI Device's IRQ. The following pages tell you the options of each item & describe the meanings of each option.

**ROM PCI/ISA BIOS
PCI CONFIGURATION SETUP
AWARD SOFTWARE INC.**

PNP BIOS Auto-Config	: Disabled	CPU to PCI Write Buffer	: Enabled
Slot 1 Using INT#	: AUTO	CPU to PCI Byte Merge	: Enabled
Slot 2 Using INT#	: AUTO	PCI to DRAM Buffer	: Enabled
Slot 3 Using INT#	: AUTO		
Slot 4 Using INT#	: AUTO		
1st Available IRQ	: 10		
2nd Available IRQ	: 11		
3rd Available IRQ	: 12		
4th Available IRQ	: 9		
PCI IRQ Activated By	: Level		
PCI IDE 2nd Channel	: Enabled		
PCI IDE IRQ Map To	: PCI-AUTO		
Primary IDE INT#	: A		
		ESC : Quit	↑↓→←: Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

The following tell you the options of each item & describe each option.

Item	Options	Descriptions
A. Slot 1 Using INT# Slot 2 Using INT# Slot 3 Using INT# Slot 4 Using INT#	AUTO A B C D	A,B,C,D : These options are reserved for "Dirty" cards from which the system BIOS cannot tell which INT it's using!
<p>NOTE: – Choose "AUTO" for all devices unless you know exactly which card is a dirty device & which INTs does that card uses!</p> <p>– Choose only "AUTO" for Multi-Func PCI devices because options A, B, C, D will force the BIOS to assign IRQs for function 0 only!</p>		
B. 1st Available IRQ 2nd Available IRQ 3rd Available IRQ 4th Available IRQ	3 4 5 7 9 10 11 12 14 15 NA	The system BIOS will assign these 4 available IRQs to the found PCI devices.
C. PCI IRQ Activated by	Edge Level	To tell the chipset the IRQ signals input is level or edge trigger
D. PCI IDE 2nd Channel	Enable Disable	Enable/disable 2nd channel of PCI/IDE card. It includes I/O port (170H-177H) and IRQ 15 assignment

Item	Options	Descriptions
E. PCI IDE IRQ Map To	PCI-AUTO PCI-SLOT1 PCI-SLOT2 PCI-SLOT3 PCI-SLOT4 ISA	<u>PCI-AUTO:</u> The BIOS will scan for PCI IDE devices & determine the location of the PCI IDE device. (See item below.)
		<u>PCI-SLOT1</u> <u>PCI-SLOT2</u> <u>PCI-SLOT3</u> <u>PCI-SLOT4</u> – assigns IRQ 14 for primary IDE INT# IRQ 15 for secondary IDE INT# for the specified slot
		<u>ISA:</u> – The BIOS will not assign any IRQs even if PCI IDE card is found! Because some IDE cards connect the IRQ 14 & 15 directly from ISA slot thru a cord. (This cord is called Legacy Header)
F. Primary IDE INT# Secondary IDE INT#	A B	To tell which INT3 does the PCI IDE card is using for its interrupts

6.10 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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT	DETECTION
PNP/PCI CONFIGURATION	LOAD BIOS Defaults (Y/N)? N
LOAD BIOS DEFAULTS	SAVING
LOAD SETUP DEFAULTS	
ESC : Quit	↑↓→← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Load BIOS Defaults except Standard CMOS Setup	

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

6.11 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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT	DETECTION
PNP/PCI CONFIGURATION	LOAD SETUP DEFAULTS (Y/N)? N
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Load BIOS Defaults except Standard CMOS Setup	

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

6.12 Password Setting

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

ENTER PASSWORD:

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

To disable 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.

If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

6.13 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 that is 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
Drive C :User(516MB)	1120	16	65535	1119	59	NORMAL
Drive D :None (203MB)	684	16	65535	685	38	-----

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

2. HDD Modes

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

■ NORMAL mode

A generic access mode wherein 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)
<hr/>		
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.

6.14 Save & Exit Setup

This option allows you to determine whether to accept the modifications or not. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT	DETECTION
PNP/PCI CONFIGURATION	SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Save Data to CMOS & Exit Setup	

6.15 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.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT	DETECTION
PNP/PCI CONFIGURATION	SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Abandon all Data & Exit Setup	

6.16 BIOS Reference - POST Codes

NOTE: *ISA POST codes are typically output to port address 80h.*

POST (hex)	Description
01-02	Reserved
C0	Turn OFF OEM specific cache, shadow...
03	<ol style="list-style-type: none"> 1. Initialize EISA registers (EISA BIOS only) 2. Initialize all the standard devices with default values Standard devices includes: <ul style="list-style-type: none"> -DMA controller (8237) -Programmable Interrupt Controller (8259) -Programmable Interval Timer (8254) -RTC chip
04	Reserved
05	<ol style="list-style-type: none"> 1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
C1	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	<ol style="list-style-type: none"> 1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 2. OEM specific cache initialization (if needed)
0A	<ol style="list-style-type: none"> 1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-120 with Dummy(Spurious) Interrupt Handler 2. Issue CPUID instruction to identify CPU type 3. Early Power Management initialization (OEM specific)

Continued

POST (hex)	Description
0B	<ol style="list-style-type: none"> 1. Verify the RTC time is valid or not 2. Detect bad battery 3. Read CMOS data into BIOS stack area 4. PnP initializations including (PnP BIOS only) <ul style="list-style-type: none"> -Assign CSN to PnP ISA card -Create resource map from ESCD 5. Assign IO & Memory for PCI devices (PCI BIOS only)
0C	Initialization of the BIOS Data Area (40 : 0N – 40:FF)
0D	<ol style="list-style-type: none"> 1. Program some of the Chipset value according to Setup. (Early Setup Value Program) 2. Measure CPU speed for display & decide the system clock speed 3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep
0E	<ol style="list-style-type: none"> 1. Initialize the APIC (Multi-Processor BIOS only) 2. Test video RAM (If Monochrome display device found) 3. Show messages including: <ul style="list-style-type: none"> -Award Logo, Copyright string, BIOS Date code & Part No. -OEM specific sign on messages -Energy Star Logo (Green BIOS ONLY) -CPU brand, type & speed -Test system BIOS checksum(Non-Compress Version only)
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved

Continued

POST (hex)	Description
1E	If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)
1F-29	Reserved
30	Detect Base Memory & Extended Memory Size
31	1. Test Base Memory from 256K to 640K 2. Test Extended Memory from 1M to the top of memory
32	1. Display the Award Plug & Play BIOS Extension message (PnP BIOS only) 2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port... according to setup value
33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse
3E	Try to turn ON Level 2 cache Note: Some chipset may need to turn ON the L2 cache in this stage. But usually, the cache is turn ON later in POST 61h
3F-40	Reserved
BF	1. Program the rest of the Chipset value according to Setup. (Later Setup Value Program) 2. If auto-configuration is enabled, programmed the chipset with pre- defined values in the MODBINable Auto-Table
41	Initialize floppy disk drive controller
42	Initialize Hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports
44	Reserved
45	Initialize math coprocessor.
46-4D	Reserved
4E	If there is any error detected (such as video, kb...), show all the error messages on the screen & wait for user to press <F1> key

Continued

POST (hex)	Description
4F	<ol style="list-style-type: none"> 1. If password is needed, ask for password 2. Clear the Energy Star Logo (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS
51	Reserved
52	<ol style="list-style-type: none"> 1. Initialize all ISA ROMs 2. Later PCI initializations (PCI BIOS only) <ul style="list-style-type: none"> -assign IRQ to PCI devices -initialize all PCI ROMs 3. PnP Initializations (PnP BIOS only) <ul style="list-style-type: none"> -assign IO, Memory, IRQ & DMA to PnP ISA devices -initialize all PnP ISA ROMs 4. Program shadows RAM according to Setup settings 5. Program parity according to Setup setting 6. Power Management Initialization <ul style="list-style-type: none"> -Enable/Disable global PM -APM interface initialization
53	<ol style="list-style-type: none"> 1. If it is NOT a PnP BIOS, initialize serial & parallel ports 2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value
60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting
61	<ol style="list-style-type: none"> 1. Try to turn ON Level 2 cache Note: if L2 cache is already turned ON in POST 3D, this part will be skipped 2. Set the boot up speed according to Setup setting 3. Last chance for Chipset initialization 4. Last chance for Power Management initialization (Green BIOS only) 5. Show the system configuration table
62	<ol style="list-style-type: none"> 1. Setup daylight saving according to Setup value 2. Program the NumLock, typematic rate & typematic speed according to Setup setting

Continued

POST (hex)	Description
63	<ol style="list-style-type: none">1. If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only)2. Clear memory that have been used3. Boot system via INT 19H
FF	System Booting. This means that the BIOS already pass the control right to the operating system

Unexpected Errors

POST (hex)	Description
B0	If interrupt occurs in protected mode.
B1	Unclaimed NMI occurs

Appendix A

Watchdog Timer

Using the Watchdog Function

The SBC8440 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 **JP3** of SBC8440. Follow the steps below to enable and program the watchdog function of SBC8440.

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.