SBC-456/E

Half-size 486 CPU Card with 10/100 Fast Ethernet/VGA/DOC, DOM, CFD, PC/104 & 4 COMs

FCC STATEMENT

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE. (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE RPEASONABLE PROTECTION AGAINTST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND , IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Acknowledgements

Packing list

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 Supporting CD-ROM

- 1 SBC-456/E CPU card

- 1 Hard disk drive (IDE) interface cable (40 pin)

- 1 Floppy disk drive interface cable (34 pin)

- 1 6-pin mini-DIN dual outlet adapter for keyboard and PS/2 mouse

- 1 Parallel port adapter (26 pins) and COM 2 adapter (for RS-232/ 422/485) kit

- PC/104 Module mounting supports

- 1 bag of screws and miscellaneous parts

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Notice

Dear Customer,

Thank you for purchasing the SBC-456/E board. The user manual is designed to help you to get the most out of the SBC-456/E, please read it thoroughly before you install and use the board. The product that you have purchased comes with two-year limited warranty, but EMAC cannot be responsible for misuse of the product. Therefore, we suggest you to read the manual before using the product.

To get the lastest version of the user manual, please visit our Web site at:

http://www.emacinc.com

Contents

General Information

This chapter provides background information for the SBC-456/E.

Sections include:

- Card specifications

- Board layout

Introduction

The SBC-456/E Ver.B is an all-in-one single board 486 computer with an **onboard SM-712 CRT/LCD controller, 10/100 Base-T Ethernet controller**, and **8MB EDO DRAM**. It packs all the functions of an industrial computer but still fits in a single, half-size card. This means the SBC-456/E Ver.B is absolutely your best solution for embedded applications.

The onboard PCI-bus, flat panel/CRT SVGA controller uses the SM-712 chipset with up to 2 MB of video memory. This chipset, used with the local PCI-bus, enables 32-bit graphic throughput at up to 33 MHz. It can support various LCD types, including TFT, DSTN, B/W, and EL due to it's excellent performance on display-intensive applications.

The onboard Ethernet Realtek RTL 8139C controller supports remote boot ROM functions.The SBC-456/E Ver.B supports the M-Systems DiskOnChip 2000 , DiskOnModule, and Compact FlashCard which are new generation of high performance storage units.

Another outstanding feature of the SBC-456/E Ver.B is the inclusion of a high speed, local bus IDE controller, which supports (through ATA PIO) mode 3 and mode 4 hard disks, enabling data transfer rates in excess of 11 MB/second. Up to four IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives, or other IDE devices. The built-in, enhanced IDE controller provides a 4-layer, 32-bit, posted write buffer and a 4-layer, 32-bit read-prefetch buffer to boost IDE performance.

Onboard features include three high speed RS-232 serial ports, and one RS-232/422/485 serial port with 16C550 UARTs, one bidirectional SPP/EPP/ECP parallel port and a floppy drive controller. In addition to the 486's 16 KB of onchip cache memory, the SBC-456/E Ver.B includes an extra 128 KB of L2 onboard cache memory.

If program execution is halted by a program bug or EMI, the board's

watchdog timer can automatically reset the CPU or generate an interrupt. This ensures reliability in unmanned or standalone systems.

All configuration display and Ethernet (SBC-456/E Ver. B) is done through software. A single Flash chip holds the system BIOS and the network boot ROM image. This minimizes the number of chips and eases configuration. You can change the display BIOS or install a boot ROM simply by programming the Flash chip.

The SBC-456/E Ver. B **supports 5 V EDO DRAM**. It also provides one 72-pin SIMM (Single In-line Memory Module) socket for its onboard system DRAM. The socket gives you the flexibility to configure your system from 4 MB to 64 MB of DRAM by using the most economical combination of SIMMs.

Features

- **Onboard AMD 486DX5-133 CPU (SQFP)**
- **SMI-712 LCD controller**
- **Built-in 2MB SGRAM memory**
- **10/100Base-T Ethernet**
- **DOC supported**
- **PC/104 expansion connector**
- **4 COMs**
- **CFD socket supported**
- **DOM Module Supported**

Specifications

General Functions

CPU: AMD 486DX5-133

CPU type: Onboard SQFP

Bus Interface: ISA bus

BIOS: AWARD 128KB FLASH BIOS

Chipset: ALi M1487/1489

I/O Chipset : Two ITE IT8661F, fully 16-bit I/O decoded

L2 Cache: Onboard 128KB L2 Cache,and could be upgraded to 512KB by factory

Memory: Onboard 4/8M(standard) EDO RAM (bank 0) and One 72-pin SIMM sockets support up to 128Mbytes Fast Page or EDO DRAM

Enhanced IDE: Supports two IDE devices and Bus Master mode with data transfer rate 16.7 MB/sec (One channel reserved for CFD)

FDD interface: Supports two floppy disk drives, 5.25" (360 KB and 1.2 MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)

Parallel port: One bi-directional parallel port which supports SPP, ECP, and EPP modes

Serial port: Three RS-232 and one RS-232/422/485 serial ports. Ports can be configured as COM1, COM2, COM3, COM4, or disabled individually. (16C550 equivalent)

KB/PS2 Mouse connector: 6-pin mini-DIN connector supports PC/AT keyboard and PS/2 mouse. Additional 5-pin header supports PC/AT keyboard for IPC applications

Real Time Clock Benchmark or equivalents, powered by lithium battery for data retention

Watchdog timer: Can generate a system reset, IRQ15, or NMI. Software selectable time-out interval (2 sec. ~128 min., 1 sec./step)

DMA: 7 DMA channels (8237 equivalent)

Interrupt: 15 interrupt levels (8259 equivalent)

Power management: I/O peripheral devices support power saving and doze/standby/suspend modes. APM 1.1 compliant

Flat Panel/CRT Interface

Chipset: SM-712
Display memory: 2MB
Display type: Supports non-interlaced CRT and LCD (TFT, DSTN, and MONO) displays. Can display both CRT and Flat Panel simultaneously
Resolution: Up to 1024x768 24 bit colors (CRT/LCD simultaneous Display)

Ethernet Interface

Chipset: Realtek 8139C 10/100Base-T Ethernet controller
Ethernet interface: Onboard 100Base-T RJ-45 connector. Optional Remote boot ROM function
SSD Interface: DOC /DOM/CFD

Expansion Interface

PC/104 connector: One 16-bit 104-pin connector onboard

Mechanical and Environmental

Power supply voltage: +5 V (4.75 V to 5.25 V), +3.3 V, -12 V
Operating temperature: 32 to 140ºF (0 to 60ºC)
Board size 7.3" (L) x 4.8" (W) (185 mm x 122 mm)

Board Layout
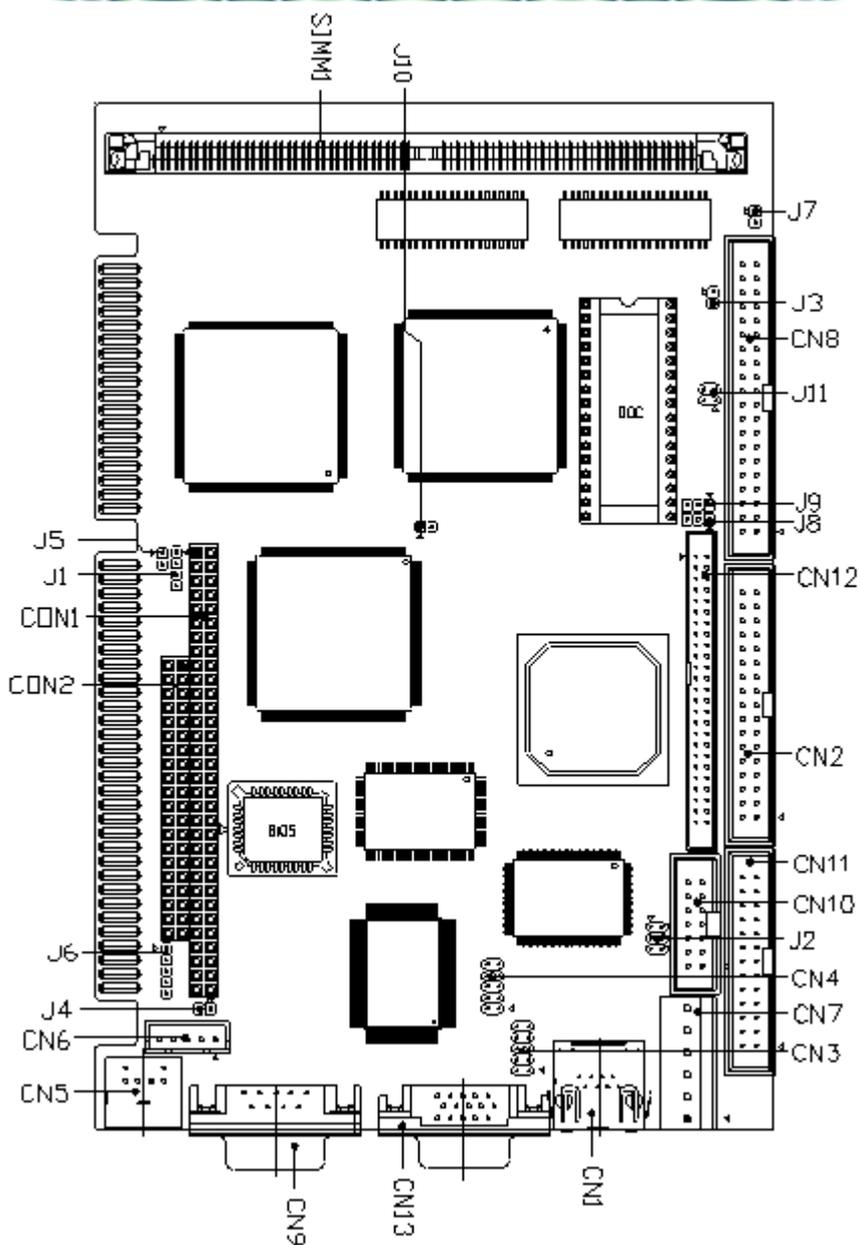
Mechanical Drawing
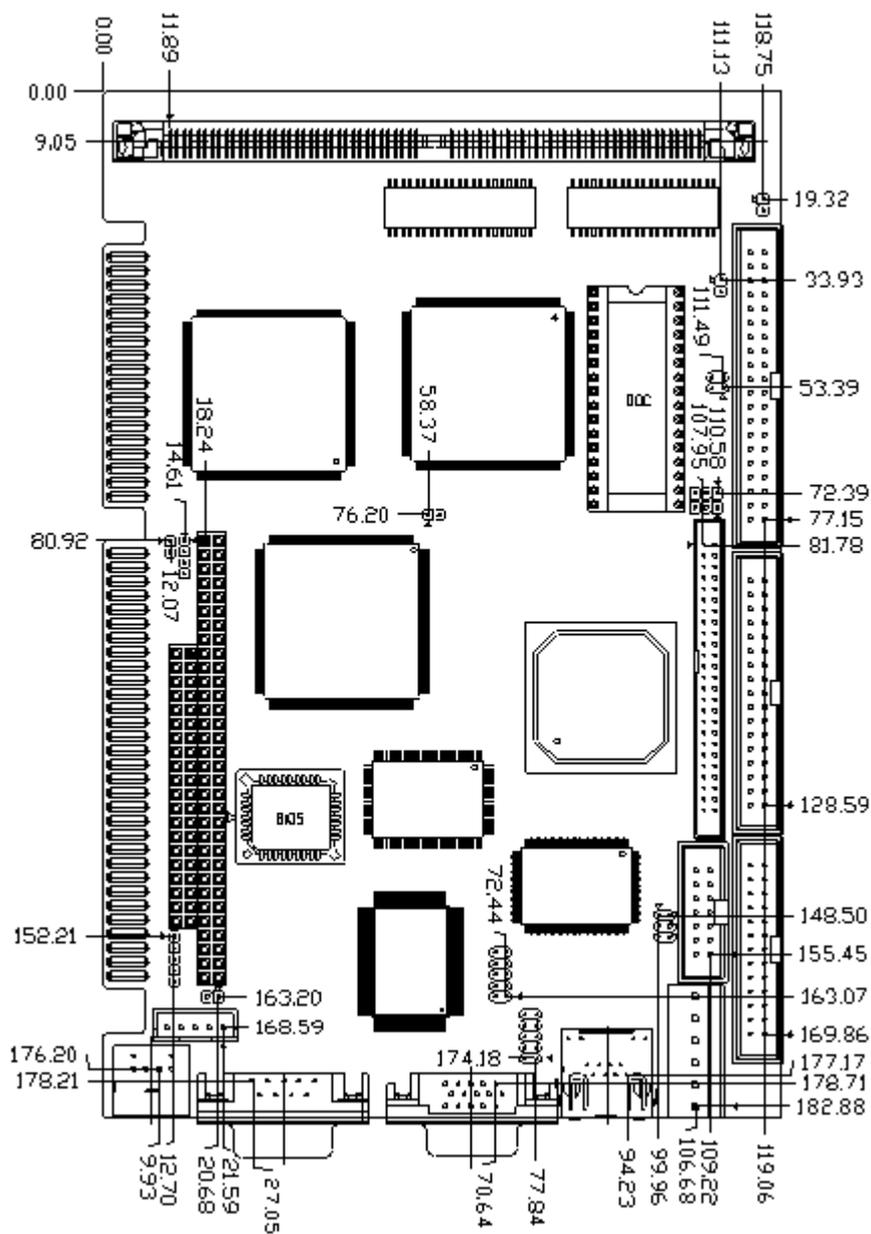
Installation

This chapter explains setup procedures for the SBC-456/E Ver. B hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

Jumpers and Connectors

Connectors on the board link themselves to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your applications. The table below lists the function of each jumper and connector:

Jumpers and Connectors

Label	Function
J1	Buzzer or external speaker
J2	COM2 RS-232/422/485 select
J3	DOM voltage select
J4	Clear CMOS
J5	Fan power
J6	Keyboard lock
J8	LCD voltage select
J9	LCD shift clock select
J11	DOC address setting
J7	HDD LED connector
J10	Reset connector
CN1	LAN connector
CN2	FDD connector
CN3	COM3 connector
CN4	COM4 connector
CN5	Keyboard & PS/2 Mouse connector
CN6	Internal keyboard connector
CN7	Power connector(P8)
CN8	HDD connector
CN9	COM1 connector
CN10	COM2 connector
CN11	Parallel connector
CN12	LCD connector
CN13	VGA connector
CN14	Compact Flash Disk connector
CON1,2	PC104 connector
U30	DOC socket

Locating Jumpers and Connectors

SIMM1 J10

J7

J3

CN8

J11

J9
J8

J5
J1

CON1

CON2

CN12

CN2

BIOS

CN11
CN10
J2
CN4
CN7
CN3

J6

J4
CN6

CN5

CN9 CN13 CN1
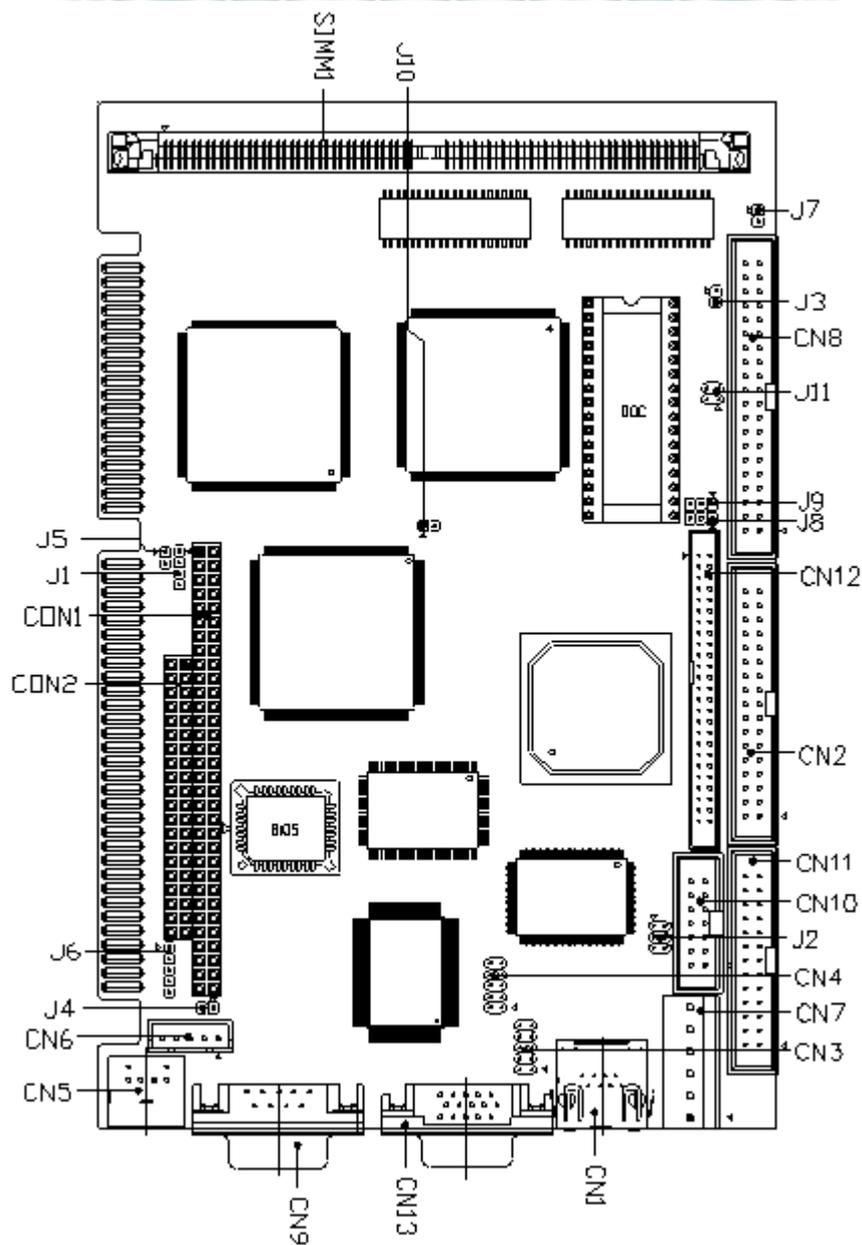
Setting Jumpers

Configure your card to meet the needs of your applications by
setting jumper which is the simplest electric switch. It consists of
two metal pins and a small metal clip (often protected by a plastic
cover) that slides over the pins to connect them. To close a jumper,
connect the pins with the clip. To "open" a jumper, please remove
the clip. Sometimes a jumper will have three pins, labeled 1, 2, and
3. In this case you would connect either pins 1 and 2 or 2 and 3.
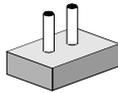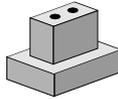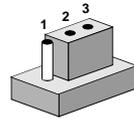
Open	Closed	Closed 2-3

The jumper settings are schematically depicted in this manual as
follows:

Open	Closed	Closed 2-3

A pair of needle-nose pliers may be helpful when working with
jumpers.

If you have any doubts about the best hardware configuration for
your applications, contact your local distributor or sales represen-
tative before you make any changes.

Safety Precautions

Warning! Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on because sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the PC chassis.

Caution! Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. And place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

Installing DRAM (SIMM)

The SBC-456/E Ver. B CPU card provides one 72-pin SIMM (Single In-line Memory Module) socket and supports between 4MB and 64MB.

Installing SIMM

Note: The module can only fit into a socket one way.

1. Insert the memory module into the socket at a moderate angle.

2. Push the module toward the vertical posts at both ends of the socket until the module is upright and the retaining clips at both ends of the module click into place. When positioned correctly, the pins on top of the vertical posts should correspond to the circular holes on the ends of the module.

Removing SIMM

If you need to remove a SIMM, follow the procedures below:

1. Supporting the SIMM with a finger, use a pen or a similarly shaped object and press one retaining clip straight down.

2. Repeat for the other side. When released, the retaining clips will push the SIMM up and out of its upright position.

3. Carefully pull the SIMM out of the socket with your fingers.

Buzzer or External Speaker (J1)

The CPU card has its own buzzer. You can disable the internal buzzer and connect an external speaker to EXT SPK. Enabling the external speaker automatically disables the internal buzzer.

Buzzer or External Speaker (J1)

*Buzzer	External Speaker

1 2 3 4
■ ○ ●━●

* default

1 2 3 4
■ ●━○ ○   OR

+   -
◁

1 2 3 4
■ ○ ○ □

+   ◁   -
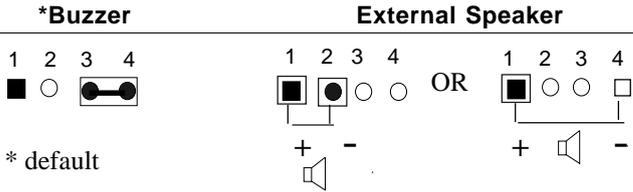
Pin	Function
1	Vcc
2	Speaker output
3	Buzzer in
4	Speaker output

COM2 RS-232/422/485 Select (J2)

The SBC-456/E Ver.B offers two serial ports. The follwing chart shows the available options:

COM2 RS-232/422/485 select (J2)

*RS-232	RS-422	RS-485
1 ■━● 2	1 □ ○ 2	1 □ ○ 2
3 ○ ○ 4	3 ●━● 4	3 ○ ○ 4
5 ○ ○ 6	5 ○ ○ 6	5 ●━● 6
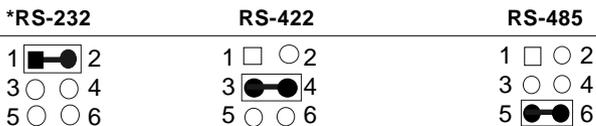
* default

DOM Voltage Select (J3)

DOM Voltage Select (J3)

*Default	DOM Used
○ ○	●━●

Clear CMOS (J4)

You can connect an external switch to clear the CMOS. This switch closes J4 and turns on the power, at which time the CMOS setup will be cleaned.

Clear CMOS (J4)

*Protect (default)	Clear CMOS
○ ○	●━●

Fan Power (J5)

You can connect a fan to the CPU. SBC456/E Ver.B offers +5V to drive a fan for CPU.

Fan Power (J5)

Pin	Function
1	Vcc
2	GND

Keyboard Lock (J6)

Keyboard Lock (J6)

Pin	Signal	Pin	Signal
1	Vcc	4	KBLOCK
2	N/C	5	GND
3	GND		

➤ LCD Voltage Select (J8)

J8	*3.3V	5V
	1 ○ 2 ● 3 ●	1 ● 2 ● 3 ○
	*default	

➤ LCD Shift Clock Select (J9)

You can select the LCD control signals by setting J9. The following chart shows the available options.

LCD Shift Clock Select (J9)	
*SHF CLK	ASHF CLK
1 ■ 2 ● 3 ○	1 □ 2 ● 3 ●

* default

DiskOnChip Socket (U30)

The DiskOnChip 2000 family of products provides a single chip solid-state flash disk in a standard 32-pin DIP package. The DiskOnChip 2000 is a solid-state disk with no moving parts, resulting in a significant reduction in power consumption and an increase in reliability. If your operating system is Win9X (except Win2K), you can install it according to the process on the next page.

The DiskOnChip 2000 family of products is available in capacities ranging from 2MB up to 1GB, unformatted. In order to manage the disk, the DiskOnChip 2000 includes the TrueFFS, M-Systems' Flash File System proprietary software. The DiskOnChip 2000 package is pin-to-pin compatible with standard 32-pin EPROM devices.

pin Name	Description	Pin Number	Direction	Note
A0-A12	Address bus	4-12,23,25-27	Inputs	
A13-A16	Address bus	2,3,28,29	Inputs	1
D0-D7	Data bus	13-15,17-21	I/O	
CE/	Chip Enable	22	Input	
OE/	Output Enable	24	Input	
WE/	Write Enable	31	Input	
NC	Not connected	1.30		2
VCC	Power	32		
GND	Ground	16		
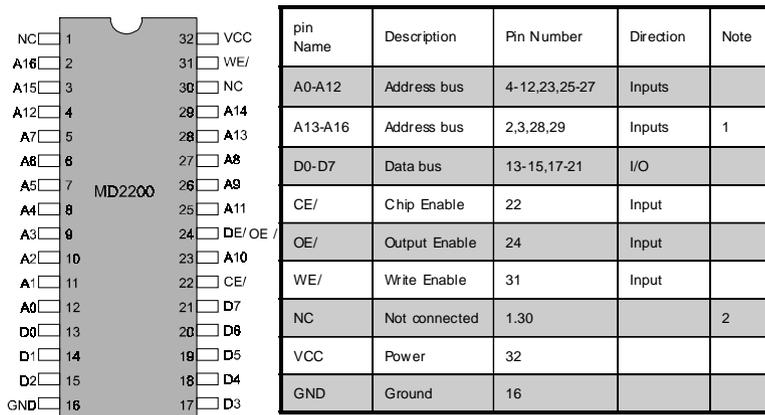
Figure1-MD2200 Pin-out

Note 1: Pins A13 through A16 are not used by the MD2200. They are kept for socket backward compatibility with ED 1100 (DiskOnChip 1000)

Note 2: Pins 1 and 30 are not used by MD2200

DiskOnChip (DOC) 2000 Installation

When the DOC is installed correctly, a DOC will work like an HDD or an FDD. To install the DOC on the mainboard, follow the instructions below:

1. Plug the DOC into the socket. Make sure pin 1 of the DOC is aligned with pin 1 of the socket.

2. Push the DOC into the socket until it is firmly seated in the socket.

Caution: the DOC may be damaged if it is installed incorrectly.

3. Set the jumper for the memory address of the DOC.

Note:

The memory shadow function sometimes will create conflicts with the memory window. You should disable the memory shadow from the BIOS SETUP if the DOC cannot be accessed.

Configure DOC as a boot device

To configure a DOC as a boot drive, you should copy the operating system files onto the DOC. The following procedure is an example of the initialization process.

1. Install a DOC into your system.

2. Insert a bootable floppy disk in drive A: and boot the system.

3. At the DOS prompt, type **SYS C:** to transfer the DOS system files to the DOC (assuming the DiskOnChip is installed as drive C:). Reboot the system.

4. Go to the BIOS Setup Utility by hitting the <DEL> key. Set the type of Primary Master or C: Drive as *Not Installed*.

5. Remove the floppy disk from the drive A: and leave the BIOS Setup Utility. The system should boot from the DOC.

DOC Address Setting (J11)

The DiskOnChip 2000 occupies a 8 Kbyte window in the upper memory address (the range is shown as below). You should ensure this dose not conflict with any other device's memory address. J11 can control the memory address of Flash disk.

DiskOnChip 2000 Address Setting	
Memory Address (HEX)	**J11**
DISABLE	3 ● ● 1 4 ● ● 2
DC00	3 ○ ● 1 4 ○ ● 2
D800*	3 ● ○ 1 4 ● ○ 2
D400	3 ○ ○ 1 4 ○ ○ 2
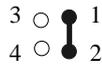
* default setting

These addresses might conflict with the ROM BIOS of other peripheral boards. Please select appropriate memory address to avoid memory conflict.

HDD LED (J7)

You can use an LED to indicate when the HDD is active. Pin1 supplies the LED power, and Pin2 is the ground.

HDD LED (J7)

Pin	Function
1	HD-LED+
2	HD-LED-

Reset Connector (J10)

You can connect an external switch to easily reset your computer. This switch restarts your computer as if you had turned off the power, then turned it back on.

Reset Connector (J10)

Pin	Function
1	GND
2	RST-IN

LAN Connector (CN1)

This 100Base-T Ethernet connector is a standard RJ-45 connector.

The onboard Realtek RTL8139C fast Ethernet controller supports 10Mb/s and 100 Mb/s N-way auto-negotiation operation. Ethernet is the most popular type of local area network, which sends its communications through radio frequency signals carried by a coaxial cable.
Ethernet uses a bus or star topology and supports data transfer rates of 10 Mbps. A newer version of Ethernet, called *100Base-T* (or *Fast Ethernet),* supports data transfer rates of 100 Mbps.

LAN Connector (CN1)

Pin	Signal	Pin	Signal
1	Tx+	2	Tx-
3	Rx+	4	NC
5	NC	6	Rx-
7	NC	8	NC

Floppy Drive Connector (CN2)

You can attach up to two floppy drives to the SBC-456/E Ver. B's on-board controller and use any combination of 5 1/4" (360 KB and 1.2 MB) and/or 3 1/2" (720 KB, 1.44 MB, and 2.88 MB) drives.

The SBC-456/E Ver. B CPU card comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. There are two sets of floppy disk drive connectors, one in the middle, and one on the other end. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit board connector (usually used for 5.25" drives).

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into the CN2 connector.

2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: floppy and the other set in the middle connects to the B: floppy.

Pin assignments
The following table lists the pin assignments for the CN2 connector:

Floppy Drive Connector (CN2)

Pin	Signal	Pin	Signal
1~33 (odd)	GND	2	High density
4, 6	Unused	8	Index
10	Motor enable A	12	Driver select B
14	Driver select A	16	Motor enable B
18	Direction	20	Step pulse
22	Write data	24	Write enable
26	Track 0	28	Write protect
30	Read data	32	Select head
34	Disk change		

Serial Port COM1 (CN9), COM2 (CN10),COM3 (CN3), and COM4 (CN4) Connectors

The SBC-456/E Ver.B offers three RS-232 serial ports to connect serial devices. Using the BIOS Peripheral Setup program, you can select the address for each port or disable it. See the following table for the pin assignment.

COM1 RS-232 Connector (CN9)	
Pin	Signal
1	DCD1
2	RX1
3	TX1
4	DTR1
5	GND
6	DSR1
7	RTS1
8	CTS1
9	RI1

COM2 RS-232/422/485 (CN10)			
Pin	Signal	Pin	Signal
1	DCD2	2	DSR2
3	RXD2	4	RTS2
5	TXD2	6	CTS2
7	DTR2	8	RI2
9	GND	10	N/C
11	485TXD+	12	485TXD-
13	422RXD-	14	422RXD-

COM3 RS-232 Connector (CN3)

Pin	Signal	Pin	Signal
1	DCD3	6	DSR3
2	RX3	7	RTS3
3	TX3	8	CTS3
4	DTR3	9	RI3
5	GND	10	NC

COM4 RS-232 Connector (CN4)

Pin	Signal	Pin	Signal
1	DCD4	6	DSR4
2	RX4	7	RTS4
3	TX4	8	CTS4
4	DTR4	9	RI4
5	GND	10	NC

Keyboard and PS/2 Mouse Connectors (CN5, CN6)

The SBC-456/E Ver.B board provides two keyboard and PS/2 mouse connectors. A 5-pin connector (CN6) supports passive backplane applications. A second 6-pin mini-DIN keyboard and PS/2 mouse connector (CN5) on the card mounting bracket supports single board computer applications.
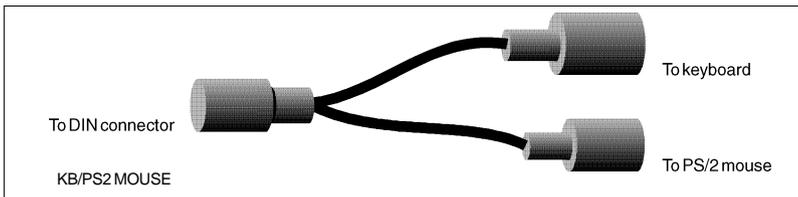
Keyboard & PS/2 Mouse Connector (CN5)

Pin	Function
1	K.B. data
2	PS/2 data
3	GND
4	Vcc
5	K.B.clock
6	PS/2 clock

Keyboard Connector (CN6)

Pin	Function
1	K.B. clock
2	K.B. data
3	N.C.
4	GND
5	Vcc

Power Connector (CN7)

In single board computer (non-passive backplane) applications, you will need to connect the power directly to the SBC-456/E Ver.B board using CN7. This connector is fully compatible with the standard PC PS/2 power supply connector, P8. See the following table for its pin assignments:

Power Connector (CN7)

Pin	Signal
1	N.C.
2	+5 V_{DC}
3	+12 V_{DC}
4	-12 V_{DC}
5	GND
6	GND

IDE Hard Drive Connector (CN8)

You can attach two Enhanced Integrated Device Electronics hard disk drives to the SBC-456/E Ver. B's internal controller. The card comes with a 40-pin flat piggyback cable which has three identical 40-pin flat-cable connectors.

Connecting the hard drive

Wire number 1 on the cable is red, and the other wires are gray.

1. Connect one end of the cable to the IDE connector and make sure that the red wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).

2. Plug the other end of the cable to the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

Unlike floppy drives, you can make the connections with any of the connectors on the cable. If you install two drives, you will need to set one as the master and the other as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

Pin assignment

The following table lists the pin numbers and their respective signals:

IDE Connector (CN8)			
Pin	Signal	Pin	Signal
1	Reset	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	DOM voltage
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	BALE
29	N.C.	30	GND
31	IRQ 14	32	-I/O CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND

Parallel (Printer) Connector (CN11)

Normally, the parallel port is used to connect the card to a printer. The SBC-456/E Ver.B includes an onboard parallel port, accessed through the CN11 connector, a 26-pin flat-cable connector. The CPU card comes with an adapter cable, which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket.

Installing the retaining bracket

The retaining bracket installs at an empty slot in your system's chassis. It provides an external port that gives your parallel peripheral access to the card's parallel port connector.

1. Find an empty slot in your chassis.

2. Unscrew the plate that covers the end of the slot.

3. Screw in the bracket in place of the plate.

4. Next, attach the flat-cable connector to the CN11 connector. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that Wire 1 connects to Pin 1 of the CN11 connector. Pin 1 is on the right side of the CN11 connector.

Pin assignments

Parallel (printer) Connector (CN11)			
Pin	Signal	Pin	Signal
1	Strobe	2	Data 0
3	Data 1	4	Data 2
5	Data 3	6	Data 4
7	Data 5	8	Data 6
9	Data 7	10	-Acknowledge
11	Busy	12	Paper empty
13	+Select	14	-Auto feed
15	-Error	16	-Init printer
17	-Select input	18~25	GND

Display Connectors (CN13, CN12)

The SBC-456/E CPU card's VGA connector (CN13) with PCI bus supports monochrome display as well as high resolution color displays. The card also features an LCD connector (CN12), which allows you to connect various flat panel displays. The following table lists their pin assignments:

VGA Connector (CN13)	
Pin	**Signal**
1	Red
2	Green
3	Blue
4	Not used
5	GND
6	Red return (GND)
7	Green return (GND)
8	Blue return (GND)
9	NC
10	Sync return (GND)
11	NC
12	SDAT
13	Horizontal sync
14	Vertical sync
15	SCLK

LCD Connector (CN12)

Pin	Signal	Pin	Signal
1	+12 V$_{DC}$	2	+12 V$_{DC}$
3	GND	4	GND
5	LCDV (5 V or 3.3V)	6	LCDV (5 V or 3.3V)
7	EN VEE	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	P24	34	P25
35	SHFCLK	36	FLM (V SYS)
37	M(DE)	38	LP (H SYS)
39	GND	40	FPEN
41	P26	42	P27
43	P28	44	P29
45	P30	46	P31
47	P32	48	P33
49	P34	50	P35

Please check the next page to get the more detailed information of pin assignment.

Lynx-EM+ Pin	Color DSTN			Color TFT				
	16-bit	*24-bit*	*9-bit*	*12-bit*	*18-bit*	*24-bit*	*12-bitx2*	*18-bitx2*
P0	LD0	LD0	B0	B0	B0	B0	BA0	BA0
P1	LD1	LD1	B1	B1	B1	B1	BA1	BA1
P2	LD2	LD2	B2	B2	B2	B2	BA2	BA2
P3	LD3	LD3		B3	B3	B3	BA3	BA3
P4	LD4	LD4			B4	B4	BB0	BB0
P5	LD5	LD5			B5	B5	BB1	BB1
P6	LD6	LD6				B6	BB2	BB2
P7	LD7	LD7				B7	BB3	BB3
P8		LD8	G0	G0	G0	G0	GA0	GA0
P9		LD9	G1	G1	G1	G1	GA1	GA1
P10		LD10	G2	G2	G2	G2	GA2	GA2
P11		LD11		G3	G3	G3	GA3	GA3
P12	UD0	UD0			G4	G4	GB0	GB0
P13	UD1	UD1			G5	G5	GB1	GB1
P14	UD2	UD2				G6	GB2	GB2
P15	UD3	UD3				G7	GB3	GB3
P16	UD4	UD4	R0	R0	R0	R0	RA0[1]	RA0
P17	UD5	UD5	R1	R1	R1	R1	RA1	RA1
P18	UD6	UD6	R2	R2	R2	R2	RA2	RA2
P19	UD7	UD7		R3	R3	R3	RA3	RA3
P20		UD8			R4	R4	RB0	RB0
P21		UD9			R5	R5	RB1	RB1
P22		UD10				R6	RB2	RB2
P23		UD11				R7	RB3	RB3
P24								BA4
P25								BA5
P26								BB4
P27								BB5
P28								GA4
P29								GA5
P30								GB4
P31								GB5
P32								RA4
P33								RA5
P34								RB4
P35								RB5

Note1:RA0 denotes first pixel of R0 for 2 pixels/clk interface. RB0 denotes second pixel of R0 for 2 pixels/clk interface.

Compact Flash Disk Connector (CN14)

Pin	Signal	Pin	Signal
Compact Flash Disk Connector (CN14)			
Pin	Signal	Pin	Signal
1	GND	26	GND
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	CS#1	32	CS#3
8	GND	33	GND
9	GND	34	IO READ
10	GND	35	IO WRITE
11	GND	36	+5V
12	GND	37	IRQ15
13	+5V	38	+5V
14	GND	39	CSEL
15	GND	40	N.C.
16	GND	41	IDE RESET
17	GND	42	IO READY
18	ADDR2	43	N.C.
19	ADDR1	44	+5V
20	ADDR0	45	DASP
21	DATA0	46	DIAG
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	HDIO16J	49	DATA10
25	GND	50	GND

BIOS Setup

This chapter describes how to configure the BIOS for the system.

General Information

BIOS Setup configures system information that is stored in CMOS RAM.

Starting BIOS Setup

As POST executes, the following appears;

```
  Hit <DEL> if you want to run SETUP
```

Press <DEL> to run AWARDBIOS setup.

BIOS Main Menu

The BIOS setup screen appears as follows:

```
                  ROM PCI/ISA BIOS (2A4KDAKC)
                      CMOS SETUP UTILITY
                    AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

    BIOS FEATURES SETUP             PASSWORD SETTING

    CHIPSET FEATURES SETUP          IDE HDD AUTO DETECTION

    POWER MANAGEMENT SETUP          HDD LOW LEVEL FORMAT

    PCI CONFIGURATION SETUP         SAVE & EXIT SETUP

    LOAD BIOS DEFAULTS              EXIT WITHOUT SAVING

    LOAD SETUP DEFAULTS

  Esc : Quit                     ↑ ↓ → ←  : Select Item
  F10 : Save & Exit Setup        (Shift)F2 : Change Color
```

Setup Keys

These keys helps you navigate in Setup:

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

Standard CMOS Setup

This standard setup menu allows users to configure system components such as the date, time, hard disk drive, floppy drive, display, and memory.

```
                     ROM PCI/ISA BIOS (2A4KDAKC)
                         CMOS SETUP UTILITY
                        AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP             PASSWORD SETTING

   CHIPSET FEATURES SETUP          IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP          HDD LOW LEVEL FORMAT

   PCI CONFIGURATION SETUP         SAVE & EXIT SETUP

   LOAD BIOS DEFAULTS              EXIT WITHOUT SAVING

   LOAD SETUP DEFAULTS

Esc : Quit                        ↑ ↓ → ←    : Select Item
F10 : Save & Exit Setup           (Shift)F2 : Change Color
```

```
                     ROM PCI/ISA BIOS (2A4KDAKC)
                        STANDARD CMOS SETUP
                        AWARD SOFTWARE, INC.

   Date (mm:dd:yy) : Fri, Jun  7 2002
   Time (hh:mm:ss) : 15 : 48 : 24

   HARD DISKS          TYPE   SIZE   CYLS HEAD PRECOMP LANDZ SECTOR  MODE

   Primary Master   :    0      0      0    0     0      0      0    AUTO
   Primary Slave    :    0      0      0    0     0      0      0    AUTO
   Secondary Master :   47      0      0    0     0      0      0    AUTO
   Secondary Slave  :   47      0      0    0     0      0      0    AUTO

   Drive A : 1.44M, 3.5 in.
   Drive B : None

   Panel Type : 640x480  TFT
   Halt On : All,But Keyboard

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

Date and Time Configuration

The BIOS determines the day of the week from the other date information. This field is for information only.

Press the left or right arrow key to move to the desired field (date, month, year). And press the PgUp/- or PgDn/+ key to increment the setting, or type the desired value into the field.

The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the left or right arrow key to move to the desired field. And press the PgUp/- or PgDn/+ key to increment the setting, or type the desired value into the field.

HARD DISKS

The BIOS supports up to four IDE drives. This section does not show information about other IDE devices, such as a CD-ROM drive, or other hard drive types, such as SCSI drives.

NOTE: We recommend that you select type AUTO for all drives.

The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select type AUTO for a hard drive, the BIOS detects its specifications during POST, every time the system boots.

If you do not want to select drive type AUTO, other methods of selecting the drive type are available:

1. Match the specifications of your installed IDE hard drive(s) with the preprogrammed values for drive types 1 through 45.

2. Select USER and key values into each drive parameter field.

3. Use the IDE HDD AUTO DECTECTION function in Setup.

The following is a brief explanation of drive specifications on next page:

Type: The BIOS contains a table of pre-defined drive types. Each defined drive type has a specified number of cylinders, number of heads, write precompensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.

- **Size**: Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.

- **Cyls**: Number of cylinders

- **Head**: Number of heads

- **Precomp**: Write precompensation cylinder

- **Landz**: Landing zone

- **Sector**: Number of sectors

- **Mode**: Auto, Chs, Large, or LBA

  - **Auto**: The BIOS automatically determines the optimal mode.
  - **Chs**: Maximum number of cylinders, heads, and sectors supported are 1024, 16, and 63.

  - **Large**: For drives that do not support LBA and have more than 1024 cylinders.

  - **LBA** (Logical Block Addressing): During drive accesses, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater than 1024 cylinders.

Drive A
Drive B

Select the correct specifications for the diskette drive(s) installed in the computer.

None	No diskette drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 mega byte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 mega byte capacity

Panel Type

In the Panel selection item, you can use Page/Up/Down key to select requried LCD BIOS. There are eight various. LCD BIOS available in this BIOS selection table:

1	**640x480 TFT**
2	**640x480 DSTN**
3	**800x600 TFT**
4	**800x600 DSTN**
5	**1024x768 TFT**
6	**1024x768 DSTN**

Halt On

During the power-on-self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

• **No errors**: POST does not stop for any error.

• **All errors**: The BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.

• **All, But Keyboard**: POST does not stop for a keyboard error, but stops for all other errors

• **All, But Diskette**: POST does not stop for diskette drive errors, but stops for all other errors.

• **All, But Disk/Key**: POST does not stop for a keyboard or disk error, but stops for all other errors.

BIOS Features Setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

```
                    ROM PCI/ISA BIOS (2A4KDAKC)
                         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   : Disabled    D8000-DFFFF Shadow  : Disabled
Boot Sequence              : A,C
Swap Floppy Drive          : Disabled
Boot Up Floppy Seek        : Enabled
Boot Up NumLock Status     : On
Boot Up System Speed       : High
Gate A20 Option            : Fast
Memory Parity Check        : Enabled
Typematic Rate Setting     : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec)     : 250
Security Option            : Setup
PS/2 mouse function control: Enabled     ESC : Quit         ↑↓→← : Select Item
PCI/VGA Palette Snoop      : Disabled    F1  : Help         PU/PD/+/- : Modify
OS Select For DRAM > 64MB  : Non-OS2     F5  : Old Values  (Shift)F2 : Color
Report No FDD For WIN 95   : Yes         F6  : Load BIOS  Defaults
                                         F7  : Load Setup Defaults
```

The displayed configuration is based on the manufacturer's SETUP DEFAULTS settings.

Virus Warning

When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: *Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.*

The choices:Disabled or Enabled.

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.

The External Cache field may not appear if your system does not have external cache memory.

The choices: Enabled or Disabled.

Quick Power On Self Test

Select Enabled to reduce the amount of time required to run the power-on-self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work.

The choices:Disabled or Enabled.

Boot Sequence

The original IBM PCs loaded 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 many boot sequence options.

The choices:A,C / C, A / C, CDROM, A / CDROM,C,A / C only.

Swap Floppy Drive

This field is effective only in systems with two floppy drives. Selecting enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B.

The choices:Disabled or Enabled.

Boot Up Floppy Seek

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to Disabled to save time.

The choices: Enabled or Disabled.

Boot Up NumLock Status

Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

The choices: On or Off.

Boot Up System Speed

Usually the options are "High" and "Low", where "High" is the normal system speed, and is the default setting. "Low" is for debugging only.

The choices: High or Low.

Gate A20 Option

Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to "Fast" can improve system speed, particularly with OS/2 and Windows.

The choices: Fast or Normal.

Memory Parity Check

Parity is a measure of the consistency of your system's RAM and memory chips. At boot, the BIOS will both size and test all memory. When a parity error is detected, the BIOS will display a message describing the problem as well as the problem's location, if possible. The boot process will then terminate and you will not be able to continue until the bad chip or SIMM is located and replaced.

Disabling the Memory Parity Check allows the system to by-pass the test and allows your system to boot. You then have a choice of continuing to operate your system or attempt to solve the problem.

The choices: Enabled or Disabled.

Typematic Rate Setting

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

Typematic Rate (Chars/Sec)

When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.

Security Option

If you have set a password, select whether the password is required every time the system boots, or only when you enter "Setup".

The choices: Setup or System.

PS/2 Mouse Function Control

This reserves IRQ 12 for a PS/2 mouse if one is found at boot. Normally, the server doesn't have neither mouse nor keyboard. Leaving this on 'Enabled' won't harm. 'Disabled' is safer (IRQs might otherwise be reassigned if someone connects a mouse during tests with a local console).

The choices: Enabled or Disabled.

PCI/VGA Palette Snoop

This item is useful for a few nonstandard VGA graphics boards. Please leave this field at Disabled.

The choices: Disabled or Enabled .

OS Select For DRAM>64M

Select the operating system that is running with greater than 64MB or RAM on the system.
The choices: Non-OS2/OS2

Report No FDD For WIN 95

Report no FDD for Win 95 or not.
The choices: Yes or No

Shadow

Software that resides in a read-only memory (ROM) chip on a device is called firmware. The AwardBIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals, such as a SCSI adaptor.

Shadowing copies firmware from ROM into system RAM, where the CPU can read it through the 16-bit or 32-bit DRAM bus. Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves the performance of the system BIOS and similar ROM firmware for expansion peripherals, but it also reduces the amount of high memory (640 KB to 1 MB) available for loading device drivers, etc.

Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option.

Video BIOS shadows into memory area C8000-DFFFF. The remaining areas shown on the BIOS Features Setup screen may be occupied by other expansion card firmware. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

Chipset Features Setup

By choosing the CHIPSET FEATURES SETUP option from the
INITIAL SETUP SCREEN menu, the screen below is displayed.

```
                    ROM PCI/ISA BIOS (2A4KDAKC)
                       CHIPSET FEATURES SETUP
                        AWARD SOFTWARE, INC.

 Auto Configuration      : Enabled

 AT-BUS Clock            : 7.19MHz
 DRAM Read Timing        : Slow
 DRAM Write Timing       : Fast
 SRAM Read Timing        : 2-1-1-1
 SRAM Write Timing       : 0 Wait

 Hidden Refresh          : Disabled
 Memory Hole (15M -16M)  : Disabled
 ISA I/O Recovery        : Enabled
 Fast-Back-to-Back       : Enabled

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

Auto Configuration

Auto Configuration selects predetermined optimal values of
chipset parameters. When "Disabled", chipset parameters revert to
setup information stored in CMOS. Many fields in this screen are
not available when Auto Configuration is "Enabled".

The choices: Enabled or Disable.

Hidden Refresh

When "Disabled", DRAM is refreshed by IBM AT methodology,
using a CPU cycles for each refresh. When hidden refresh is
"Enabled", the DRAM controller seeks the most opportune
moment for a refresh, regardless of CPU cycles, with least disrup-
tion of system activity and least performance penalty. Hidden
refresh is faster and more efficient, and it also allows the CPU to
maintain the status of the DRAM even if the system goes into a
power management "suspend" mode.

The choices: Disabled or Enabled.

Memory Hole (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 choices: Disabled or Enabled.

ISA/IO Recovery

The CPU and local bus are much faster than industry standard architecture (ISA) input/output (I/O) bus. Select "Enabled" to allow additional time for I/O devices to respond to the system. Otherwise, data could be lost. If all your I/O devices are capable of fast I/O, selecting "Disabled" can speed up processing.

The choices: Enabled or Disabled.

Fast-Back-to-Back

When Enabled, consecutive write cycles targeted to the same slave become fast back-to-back on the PCI bus.

The choices: Enabled or Disabled.

Power Management Setup

By choosing the POWER MANAGEMENT option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

```
                    ROM PCI/ISA BIOS (2A4KDAKC)
                       POWER MANAGEMENT SETUP
                       AWARD SOFTWARE, INC.

Power Management   : User Define    IRQ5  (LPT 2)      : ON
PM Control by APM  : Yes            IRQ6  (Floppy Disk): ON
Video Off Option   : Susp,Stby -> Off   IRQ7  (LPT 1)     : ON
Video Off Method   : Blank Screen   IRQ8  (RTC Alarm)  : OFF
MODEM Use IRQ      : 3              IRQ9  (IRQ2 Redir) : ON
                                    IRQ10 (Reserved)   : OFF
      ** PM Timers **               IRQ11 (Reserved)   : OFF
HDD Power Down     : Disable        IRQ12 (PS/2 Mouse) : ON
Doze Mode          : Disable        IRQ13 (Coprocessor): OFF
Standby Mode       : Disable        IRQ14 (Hard Disk)  : ON
Suspend Mode       : Disable        IRQ15 (Reserved)   : OFF

      ** PM Events **
VGA                : OFF
FDD   (3FXh)       : ON
LPT & COM          : LPT/COM        ESC : Quit          ↑↓←→ : Select Item
HDD   (1FXh)       : ON             F1  : Help          PU/PD/+/- : Modify
NMI                : OFF            F5  : Old Values    (Shift)F2 : Color
IRQ3  (COM 2)      : ON             F6  : Load BIOS  Defaults
IRQ4  (COM 1)      : ON             F7  : Load Setup Defaults
```

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:
1. Doze Mode
2. Standby Mode
3. Suspend Mode

Max Saving (Maximum power savings. Only Available for SL CPU)
1. Doze Mode--10 Sec
2. Standby Mode--10 Sec
3. Suspend Mode--10 Sec

Min Saving (Minimum power savings)
1. Doze Mode--1 Hour
2. Standby Mode--1 Hour
3. Suspend Mode--1 Hour

User Define

You can set the Doze Mode, Standby Mode, and Suspend Mode individaully.

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

The choices: Yes or No.

Vedio Off Option

Selects the power-saving mode during the monitor goes blank:

Always On	Monitor remains on during power-saving modes.
Suspend ->Off	Monitor blanked when system enters Suspend mode.
Susp, Stby -> Off	Monitor blanked when system enters either Suspend or Standby mode.
All Modes -> Off	Monitor blanked when system enters any power saving mode.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC + Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer
Blank Screen	This option only writes blanks to the video buffer
DPMS	Initial display power management signaling

MODEM Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.
The choices: 3,4,5,7,9,10,11,or NA.

HDD Power Down

After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active.
The choices: 1~15 min.

Doze, Standby, Suspend Mode

Please check the Power Management item in Page 49.

PM Events

You may disable activity monitoring of some common I/O events and interrupt requests so they do not wake up the system. The default wake-up event is keyboard activity. When On (or named, in the case of LPT & COM), any activity from one of the listed system peripheral devices or IRQs wakes up the system.

A power-management (PM) event awakens the system from, or resets activity timers for Suspend mode. You can disable monitoring of common interrupt requests so they do not generate PM events.

PCI Configurations

```
            ROM PCI/ISA BIOS (2A4KDAKC)
                PCI CONFIGURATION SETUP
                  AWARD SOFTWARE, INC.

PnP BIOS Auto-Config: Enabled     CPU to PCI Write Buffer : Enabled
                                  CPU to PCI Byte Merge   : Enabled
Slot 1 Using INT#    : AUTO       PCI to DRAM Buffer      : Enabled
Slot 2 Using INT#    : AUTO
Slot 3 Using INT#    : AUTO
Slot 4 Using INT#    : AUTO




PCI IRQ Actived By   : Level
PCI IDE 2nd Channel  : Enabled
PCI IDE IRQ Map To   : PCI-AUTO
 Primary   IDE INT#  : A
 Secondary IDE INT#  : B          ESC : Quit         ↑↓→← : Select Item
                                  F1  : Help       PU/PD/+/- : Modify
                                  F5  : Old Values  (Shift)F2 : Color
                                  F6  : Load BIOS  Defaults
                                  F7  : Load Setup Defaults
```

PnP BIOS Auto-Config

The Award Plug and Play BIOS can automatically configure Plug and Play-compatible devices. If you select "Enabled", the Available IRQ fields disappear, because the BIOS automatically handles their configuration.
The choices: Enabled or Disabled..

Slot 1/2/3/4 Using INT#

Some PCI devices use interrupts to signal that they need to use the PCI bus. Other devices, most graphics adapters, do not need interrupt service at all. Each PCI slot can activate up to four interrupts, INT# A, INT# B, INT# C and INT# D. By default, a PCI slot is allowed INT# A. Assigning INT# B has no meaning unless the device in the slot requires two interrupt services rather than just one. Likewise, using INT# C can only mean the device requires three interrupts; and using INT# D, four interrupts. Selecting the default, AUTO, allows the PCI controller to automatically allocate the interrupts.
The choices: Auto, A, B,C or D.

1st/2nd/3rd/4th Available IRQ

If you select "Disabled" in the PnP BIOS Auto-Config item, the Available IRQ fields will appear.
And when an installed PCI device requires interrupt service, you may manually select an unused interrupt line for PCI IRQs. NA indicates the interrupt is assigned to an ISA bus device and is not available to any PCI slot.
The choices: 5,9,10,11,12,14,15, or NA..

PCI IRQ Actived By

Leave the IRQ trigger set at Level unless the PCI device assigned to the interrupt specifies Edge-triggered interrupts.
The choices: Level or Edge.

PCI IDE 2nd Channel

Since your chipset supports a second IDE channel, you can use this selection to enable or disable the second channel. The second channel may connect to a CD-ROM.
The choices: Enabled or Disabled.

PCI IDE IRQ MAP To

This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts. If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface(s) installed in your system (PCI or ISA). Standard ISA interrupts for IDE channels are IRQ14 for primary and IRQ15 for secondary.
The choices: PCI-Auto, ISA, PCI-SLOT1, PCI-SLOT2, PCI-

SLOT3, PCI-SLOT4.

Primary/Secondary IDE INT#

If you select "ISA" in the "PCI IDE IRQ Map To" item, this field won't appear. By default, a PCI connection is assigned INT# A. Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. Because the PCI IDE interface in the chipset has two channels, it requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.
The choices: A, B,C or D.

CPU To PCI Write Buffer

When this item is enabled, the CPU can write up to four words of data to the PCI write buffer before the CPU must wait for the PCI bus cycles to finish. When "Disabled", the CPU must wait after each write cycle until the PCI bus signals that it is ready to receive more data.
*The choices: Enabled or Disabled.*

CPU To PCI Byte Merge

Byte merging permits merging of the data in consecutive CPU-to-PCI byte/word writes with the same word address, into the same posted write buffer location. The merged collection of bytes is then sent over the PCI Bus as a single dword.
The choices: Enabled or Disabled.

PCI To DRAM Buffer

Your system supports buffered writes from the PCI bus to DRAM for greater efficiency.
The choices: Enabled or Disabled.

Load BIOS Defaults/Load Setup Defaults

LOAD BIOS DEFAULTS loads the default system values directly from ROM. The BIOS DEFAULTS provides the most stable settings, though they do not provide optimal performance. LOAD SETUP DEFAULTS, on the other hand, provides for maximum system performance. If the stored record created by the setup utility becomes corrupted (and therefore unusable), BIOS defaults will load automatically when you turn the SBC-456/E Rev. B on.

```
          ROM PCI/ISA BIOS (2A4KDAKC)
             CMOS SETUP UTILITY
            AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP          INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP          PASSWORD SETTING

   CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

   PCI CONFIGURATION    ┌──────────────────────┐ ETUP
                        │ Load BIOS  Defaults (Y/N)? N │ SAVING
   LOAD BIOS DEFAULT    └──────────────────────┘

   LOAD SETUP DEFAULTS

Esc : Quit                   ↑ ↓ → ←  : Select Item
F10 : Save & Exit Setup      (Shift)F2 : Change Color
```

```
          ROM PCI/ISA BIOS (2A4KDAKC)
             CMOS SETUP UTILITY
            AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP          INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP          PASSWORD SETTING

   CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

   PCI CONFIGURATION    ┌──────────────────────┐ ETUP
                        │ Load SETUP Defaults (Y/N)? N │ SAVING
   LOAD BIOS DEFAULT    └──────────────────────┘

   LOAD SETUP DEFAULTS

Esc : Quit                   ↑ ↓ → ←  : Select Item
F10 : Save & Exit Setup      (Shift)F2 : Change Color
```

Integrated Peripherals

By choosing the INTEGRATD PERIPHERALS option from the initial SETUP SCREEN menu, the screen below is displayed.

```
            ROM PCI/ISA BIOS (2A4KDAKC)
               INTEGRATED PERIPHERALS
                AWARD SOFTWARE, INC.

On-Chip Local Bus IDE   : Enabled    Onboard Serial Port 4   : 2E8H
IDE Buffer for DOS & Win : Enabled   Serial Port 4 Use IRQ   : IRQ11
The 2nd channel IDE     : Enabled
IDE HDD Block Mode      : Enabled
IDE Primary Master PIO  : Auto
IDE Primary Slave  PIO  : Auto
IDE Secondary Master PIO : Auto
IDE Secondary Slave  PIO : Auto

Onboard FDC Controller  : Enabled
Onboard Serial Port 1   : 3F8/IRQ4
Onboard Serial Port 2   : 2F8/IRQ3
IR Address Select       : Disable

Onboard Parallel Port   : 378/IRQ7   ESC : Quit        ↑↓→← : Select Item
Parallel Port Mode      : SPP        F1  : Help       PU/PD/+/- : Modify
                                     F5  : Old Values  (Shift)F2 : Color
Onboard Serial Port 3   : 3E8H       F6  : Load BIOS  Defaults
Serial Port 3 Use IRQ   : IRQ10      F7  : Load Setup Defaults
```

On-Chip Local Bus IDE

The chipset contains an enhanced IDE interface with two IDE channels. Because each channel supports two IDE devices, the system supports a total of four IDE devices. If the board has one or two IDE connectors, this option should be Enabled. If you install an add-in IDE interface, please disable one or both on-chip IDE channels.
The choices: Enabled or Disabled.

IDE Buffer for DOS & Win

Select "Enabled" to increase throughput to and from IDE devices by using the on-chip read-ahead and posted-write IDE buffers. Note that use of the buffers may cause some slow IDE devices to be even slower. When in doubt, experiment with this setting for optimal performance and data integrity.
The choices: Enabled or Disabled.

The 2nd Channel IDE

This option enables the second channel IDE on the board.

The choices: Enabled or Disabled.

IDE HDD Block Mode

Block mode is also called "block transfer", "multiple commands", or "multiple sector read/write". If your IDE hard drive supports block mode (most new drives do), select "Enabled" for automatic detection of the optimal number of block read/writes per sector the drive can support.
The choices: Enabled or Disabled.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system will automatically determine the best mode for each device.
The choices: Auto, Mode0, Mode1, Mode2, Mode3, or Mode4.

Onboard FDC Controller

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

The choices: Enabled or Disabled.

Onboard Serial Port 1/2

Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.

The choices: 3F8/IRQ4,2F8/IRQ3,3E8/IRQ4,2E8/IRQ3,Disabled.

IR Address Select

If you disable this option, the next two items will disappear. This item is for you to specify the address for IR Port. But you have to "disable" this item for the IR function is deleted in this version.

IR Mode

If you disable the IR Address Select item, this feature will disappear from the screen. There are two different IR (Infra-Red) modes. Choose the one appropriate for the connection to the external device. Note that this feature requires an IR connector to be plugged into the IR header provided on the board.

IR IRQ Select

If you disable the IR Address Select item, this feature will disappear from the screen. Please choose a logical IRQ address for IR port.

Onboard Parallel Port

Select a logical LPT port address and corresponding interrupt for the physical parallel port.
The choices:378/IRQ7,278/IRQ5,Disabled,or 3BC/IRQ7.

Parallel Port Mode

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

ECP Mode Use DMA

If you choose "ECP" or "ECP+EPP" in the "Parallel Port Mode" , this item will appear. Please select a DMA channel for the port.
The choices:3 or 1.

Onboard Serial Port 3

This option enables serial port 3 on the board and specifies the base I/O port address for serial port 3.

The choices: *3F8H, 2F8H, 3E8H,2E8H, Disabled*.

Serial Port 3 Use IRQ

If you disable the Onboard Serial Port 3 item, this feature will disappear from the screen. Please choose a logical IRQ address for this port.
The choices:IRQ10, IRQ11, or IRQ5.

Onboard Serial Port 4

This option enables serial port 4 on the board and specifies the base I/O port address for serial port 4.

The choices: *2E8H, Disabled, 3F8H, 2F8H,3E8H*.

Serial Port 4 Use IRQ

If you disable the Onboard Serial Port 4 item, this feature will disappear from the screen. Please choose a logical IRQ address for this port.
The choices:IRQ10, IRQ11, or IRQ5.

Password Setting

```
                 ROM PCI/ISA BIOS (2A4KDAKC)
                      CMOS SETUP UTILITY
                   AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP             INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP             PASSWORD SETTING

   CHIPSET FEATURES SETUP          IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP          HDD LOW LEVEL FORMAT

   PCI CONFIGURATION SETUP         SAVE & EXIT SETUP

   LOAD BIOS DEFAULTS              EXIT WITHOUT SAVING

   LOAD SETUP DEFAULTS

 Esc : Quit                       ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup          (Shift)F2 : Change Color
```

When you select this function, a message appears at the center of the screen:

ENTER PASSWORD

Type the password, up to eight characters, and press Enter. Typing a password clears any previously entered password from CMOS memory.

Now the message changes:

CONFIRM PASSWORD

Again, type the password and press Enter.

To abort the process at any time, press Esc.

In the Security Option item in the BIOS Features Setup screen, select System or Setup:

System   Enter a password each time the system boots and when ever you enter Setup.

Setup   Enter a password when ever you enter Setup.

NOTE: To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.

IDE HDD Auto Detection

The IDE HDD AUTO DETECTION utility can automatically detect the IDE hard disk installed in your system. You can use it to self-detect and/or correct the hard disk type configuration. But you need to repeat the setup for each of the IDE combinations.

```
                 ROM PCI/ISA BIOS (2A4KDAKC)
                      CMOS SETUP UTILITY
                     AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP           INTEGRATED PERIPHERALS

    BIOS FEATURES SETUP           PASSWORD SETTING

    CHIPSET FEATURES SETUP        IDE HDD AUTO DETECTION

    POWER MANAGEMENT SETUP        HDD LOW LEVEL FORMAT

    PCI CONFIGURATION SETUP       SAVE & EXIT SETUP

    LOAD BIOS DEFAULTS            EXIT WITHOUT SAVING

    LOAD SETUP DEFAULTS

 Esc : Quit                    ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup       (Shift)F2 : Change Color
```

➡ HDD Low Level Format

This item lets you search for bad tracks and format a hard disk drive, but **this will destroy all data on the hard disk**. It is a useful tool for detecting and marking bad sectors on a IDE drive if the drive refuses to format under DOS first. Some hard disk drive manufacturers supply their own low-level formatting program.

```
                    ROM PCI/ISA BIOS (2A4KDAKC)
                        CMOS SETUP UTILITY
                        AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP            INTEGRATED PERIPHERALS

    BIOS FEATURES SETUP            PASSWORD SETTING

    CHIPSET FEATURES SETUP         IDE HDD AUTO DETECTION

    POWER MANAGEMENT SETUP         HDD LOW LEVEL FORMAT

    PCI CONFIGURATION SETUP        SAVE & EXIT SETUP

    LOAD BIOS DEFAULTS             EXIT WITHOUT SAVING

    LOAD SETUP DEFAULTS

    Esc : Quit                    ↑ ↓ → ←  : Select Item
    F10 : Save & Exit Setup       (Shift)F2 : Change Color
```

Save & Exit Setup

If you select this option and press <ENTER>, the values entered in the setup utility will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

```
              ROM PCI/ISA BIOS (2A4KDAKC)
                   CMOS SETUP UTILITY
                  AWARD SOFTWARE, INC.

  STANDARD CMOS SETUP          INTEGRATED PERIPHERALS

  BIOS FEATURES SETUP          PASSWORD SETTING

  CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

  POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

  PCI CONFIGURATION SETUP      SAVE & EXIT SETUP

  LOAD BIOS DEFAULTS           EXIT WITHOUT SAVING

  LOAD SETUP DEFAULTS

  Esc : Quit                  ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup     (Shift)F2 : Change Color
```

```
              ROM PCI/ISA BIOS (2A4KDAKC)
                   CMOS SETUP UTILITY
                  AWARD SOFTWARE, INC.

  STANDARD CMOS SETUP          INTEGRATED PERIPHERALS

  BIOS FEATURES SETUP          PASSWORD SETTING

  CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

  POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

  PCI CONFIGURATION            SAVE to CMOS and EXIT (Y/N)? N   ETUP

  LOAD BIOS DEFAULT                                            SAVING

  LOAD SETUP DEFAULTS

  Esc : Quit                  ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup     (Shift)F2 : Change Color
```

Exit without Saving

If you select this option and press <ENTER>, the values entered in the setup utility will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

```
            ROM PCI/ISA BIOS (2A4KDAKC)
                CMOS SETUP UTILITY
               AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP          INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP          PASSWORD SETTING

   CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

   PCI CONFIGURATION SETUP      SAVE & EXIT SETUP

   LOAD BIOS DEFAULTS           EXIT WITHOUT SAVING

   LOAD SETUP DEFAULTS

 Esc : Quit                  ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup     (Shift)F2 : Change Color
```

```
            ROM PCI/ISA BIOS (2A4KDAKC)
                CMOS SETUP UTILITY
               AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP          INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP          PASSWORD SETTING

   CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION

   POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT

   PCI CONFIGURATION        Quit Without Saving (Y/N)? N    ETUP

   LOAD BIOS DEFAULT                                        SAVING

   LOAD SETUP DEFAULTS

 Esc : Quit                  ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup     (Shift)F2 : Change Color
```

Drivers Installtion

This SBC-456/E Ver. B is equipped with a VGA and LAN interface. This chapter provides instructions for installing the software drivers on these peripherals.

Software Drivers

This chapter describes the operation and installation of the display drivers supplied on the *Supporting CD-ROM* shipped with your product.

The onboard VGA adapter is based on the Silicon Motion VGA Flat Panel /CRT controller and is fully IBM VGA compatible. This controller offers a large set of extended functions and higher resolutions. If you intend to use your VGA adapter in standard VGA modes only, you do not need to install any of these drivers. Since your VGA adapter is fully compatible, it does not require any special drivers to operate in standard modes.

The purpose of the enclosed software drivers is to take advantage of the extended features of the Silicon Motion VGA Flat Panel/CRT controller.

Hardware Configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, please follow these steps:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.

2. If a high-resolution mode is not supported in your system, try to adopt a lower-resolution mode. For example, 1024 x 768 mode will not work in some systems, but 800 x 600 mode is supported in most cases.

Necessary to Know

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver from the *Supporting CD-ROM*, you should:

• Know how to copy files from a CD-ROM to a directory on the hard disk

• Understand the MS-DOS directory structure

If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information *before* you install.

Before you begin

The *Supporting CD-ROM* contains different drivers for different Windows OS, please choose the specific driver according to your reversion of Windows OS .

Windows 98 IDE Driver Installation

If your system inform you of "unknown IDE device"in Winows98, please try the following steps to install the IDE driver.

1. Insert the **Windows 98 CD Diskette** into the CD ROM Drive.

2. Click on the **Start** button.

3. Select the **Settings** item.

4. Click on the **Control Panel** item.

5. Select the **Systems** icon to open the **System Properties** box.

6. Click on the **Device Manager** tab.

7. Select the **Other devices** item.

8. Select the **Unknown Device** item.
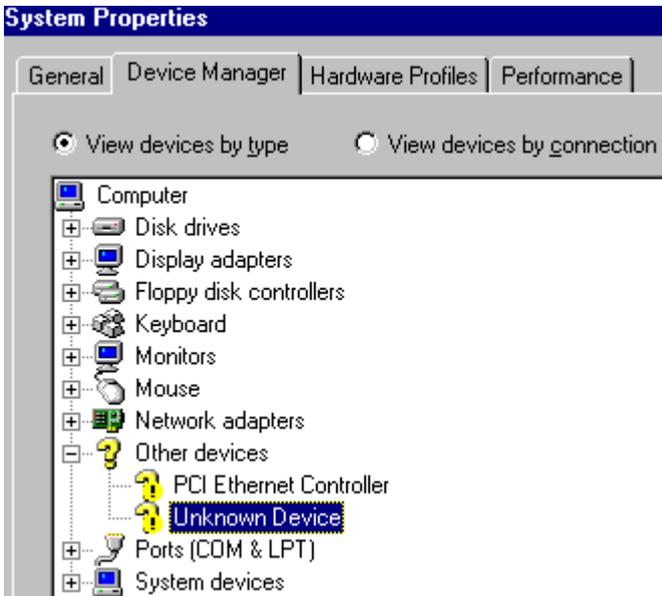
Another file will appear below this file, and then click the file,

9. Click on the **Driver** tab.

10. Click on the **Update Driver** button.

The **Update Device Driver Wizard** will appear,

11. Click on **Next**.

Update Device Driver Wizard

This wizard searches for updated drivers for:

   Unknown Device

A device driver is a software program that makes a hardware device work.

Upgrading to a newer version of a device driver may improve the performance of your hardware device or add functionality.

< <u>B</u>ack   [<u>N</u>ext >]   Cancel
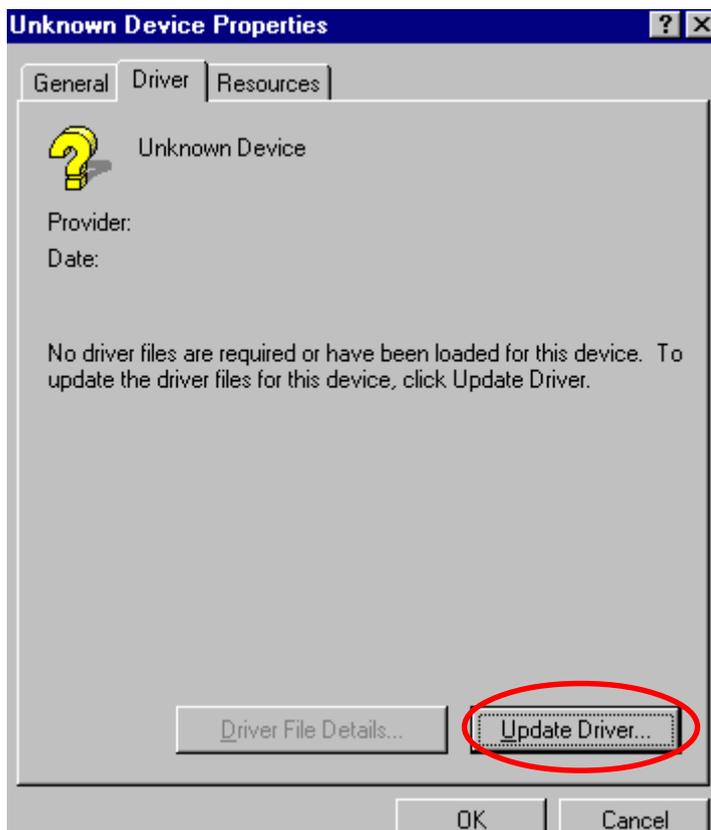
12. Select the second item.

13. Click on **Next**.

Update Device Driver Wizard

What do you want Windows to do?

○ Search for a better driver than the one your device is using now. (Recommended)

◉ Display a list of all the drivers in a specific location, so you can select the driver you want.

| < Back | Next > | Cancel |
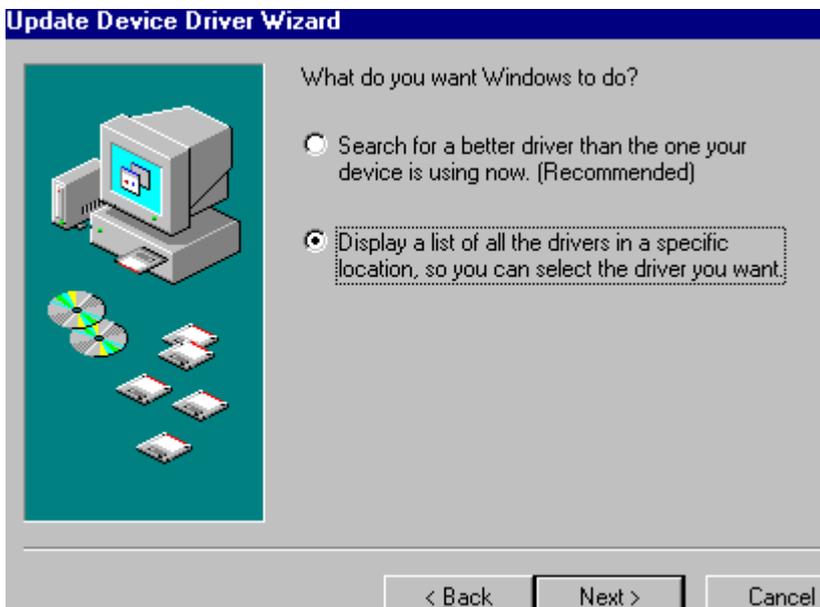
14. Select the **Hard disk controllers**.

15. Click on **Next**.

Update Device Driver Wizard

Select the type of device from the list below, then click Next.

Device Bay Controller
Disk drives
Display adapters
Floppy disk controllers
Global positioning devices
Hard disk controllers
Human Interface Devices
Imaging Device
Infrared devices
Keyboard
Memory Technology Drivers (MTDs)

< <u>B</u>ack   Next >   Cancel
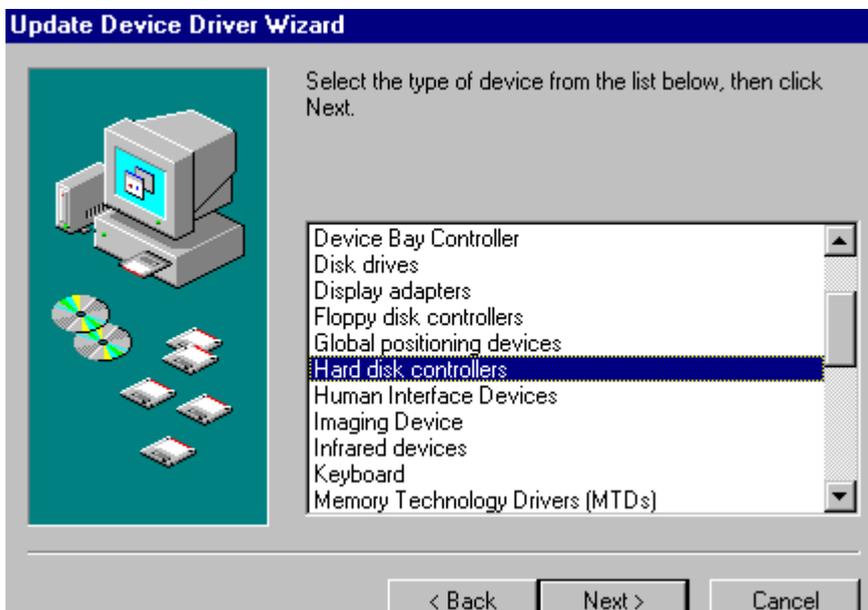
16. Select the **Acer Labs Inc**.

17. Select the **ALi PCI IDE Controller**.

18. Click on **Next**.

Update Device Driver Wizard

Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.

Manufacturers:

[Standard hard disk drivers]
Acer Labs Inc
ActionTec
AMD
Appian Technology
Calluna

Models:

ALi M5219 PCI Bus Master IDE Controller
ALi M5229 PCI Bus Master IDE Controller
ALi PCI IDE Controller

Have Disk...

< Back   Next >   Cancel

19. Click on the **Yes**.

Update Driver Warning

⚠ The driver that you have chosen was not written specifically for the selected hardware and may not work correctly. Installing this driver is not recommended. Are you sure you want to use this driver?

Yes   No

20. Click on **Next**.

Update Device Driver Wizard

Windows driver file search for the device:

ALi PCI IDE Controller

Windows is now ready to install the selected driver for this device. Click Back to select a different driver, or click Next to continue.

Location of driver:

C:\WINDOWS\INF\MSHDC.INF

< Back   Next >   Cancel

20. Click on **Finish** to reboot the system.

Update Device Driver Wizard

ALi PCI IDE Controller

Windows has finished installing the driver you selected for your hardware device.

< Back   Finish   Cancel

Installing VGA Driver

Installing Windows NT/98

Please put the provided CD into the CD-ROM drive and select **"my computer"**. Then click on the CD-ROM drive in the opened window, select **Driver/vga/Winnt** or **Driver/vga/Win98 (according to your Windows operating system)** , and double click on the **setup** icon. The file will open up and offer a **set up wizard**. Please follow the instructions and click on the corresponding buttons, the VGA features will self install. Shutdown afterwards to ensure proper installation.
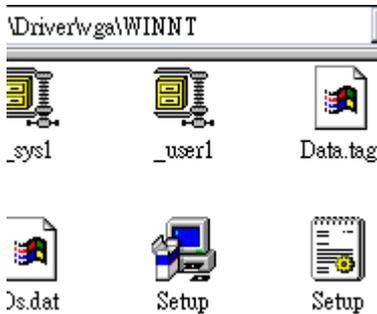
Installing Windows 95

1. Insert the **SBC-456/E CD Diskette** into the CD ROM Drive.

2. Click on the **Start** button.

3. Select the **Settings** item.

4. Click on the **Control Panel** item.

5. Select the **Systems** icon to open the **System Properties** box.

6. Click on the **Device Manager** tab.

7. Select the **Display adapters** item.

8. Select the **Standard PCI Graphics Adapter (VGA)** item.
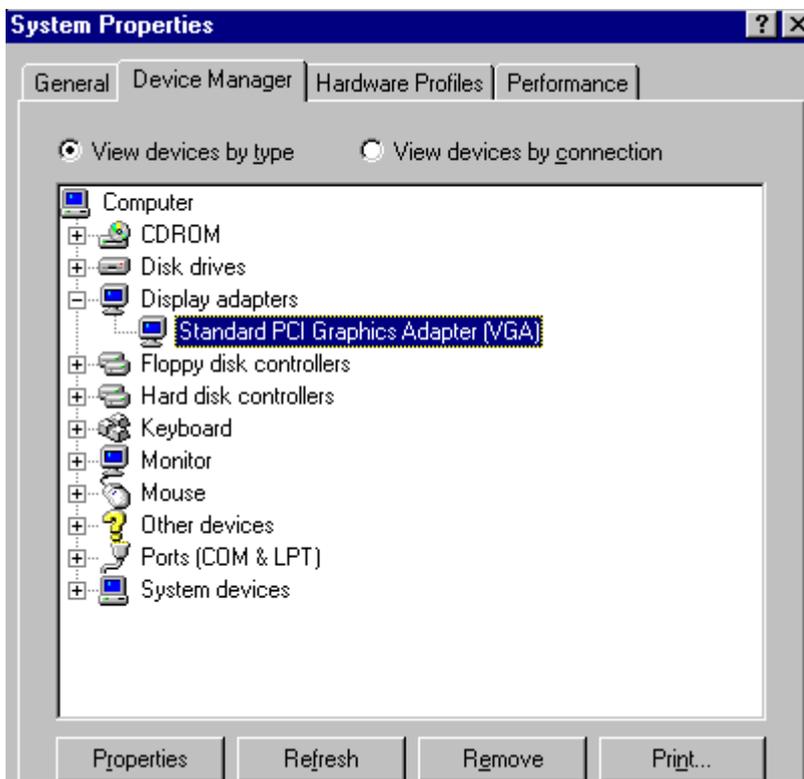
Another file will appear below this file, and then click the file,

  9. Click on the **Driver** tab.

 10. Click on the **Update Driver** button.

The **Update Device Driver Wizard** will appear,

 11. Click on **Next**.

12. Click on **Other Locations...**.....

13. Select "CD ROM drive"**/driver/vga/Win95,** and then click on **OK**.

14. Click on **Finish**.

Update Device Driver Wizard

Windows found the following updated driver for this device:

   Silicon Motion LynxEM+

If you want to use this driver, click Finish. If this is not the correct driver and you want to search for a different driver manually, click Other Locations.

Location of Driver

   Win95

Other Locations...

< Back   Finish   Cancel

Installation process will completely shutdown the computer and allow the system to reboot.

System Settings Change

To finish setting up your new hardware, you must restart your computer.

Do you want to restart your computer now?

Yes   No

Ethernet Driver Installation

1. Insert the **SBC-456/E CD Diskette** into the CD ROM Drive.

2. Click on the **Start** button.

3. Select the **Settings** item.

4. Click on the **Control Panel** item.

5. Select the **Systems** icon to open the **System Properties** box.

6. Click on the **Device Manager** tab.

7. Select the **Network adapters** item.
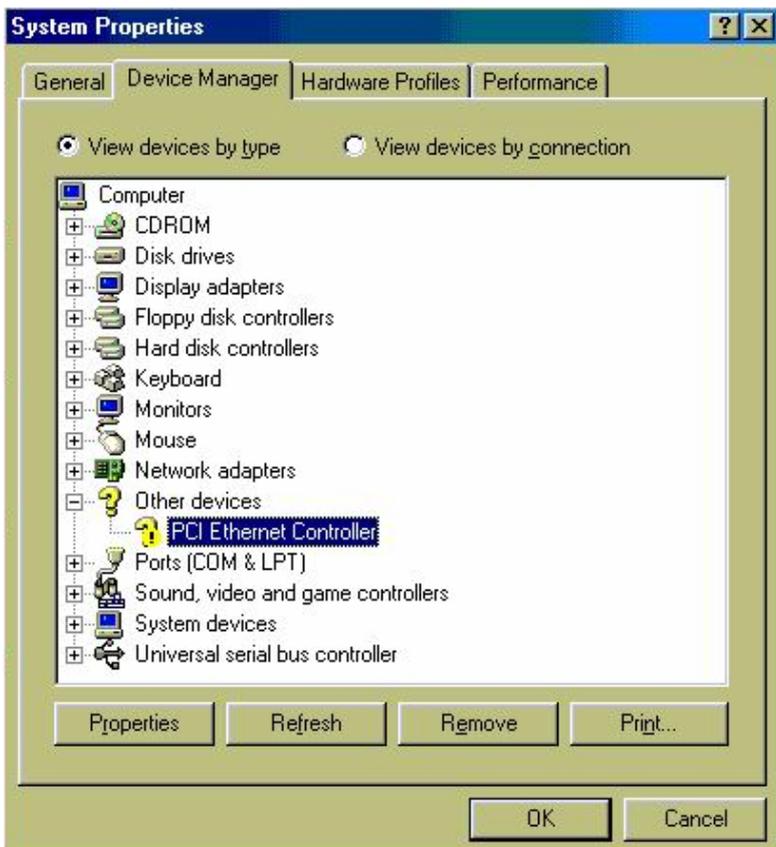
Another file will appear below this file, and then click the file,

8. Click on the **Driver** tab.

9. Click on the **Update Driver** button.

The **Update Device Driver Wizard** will appear,
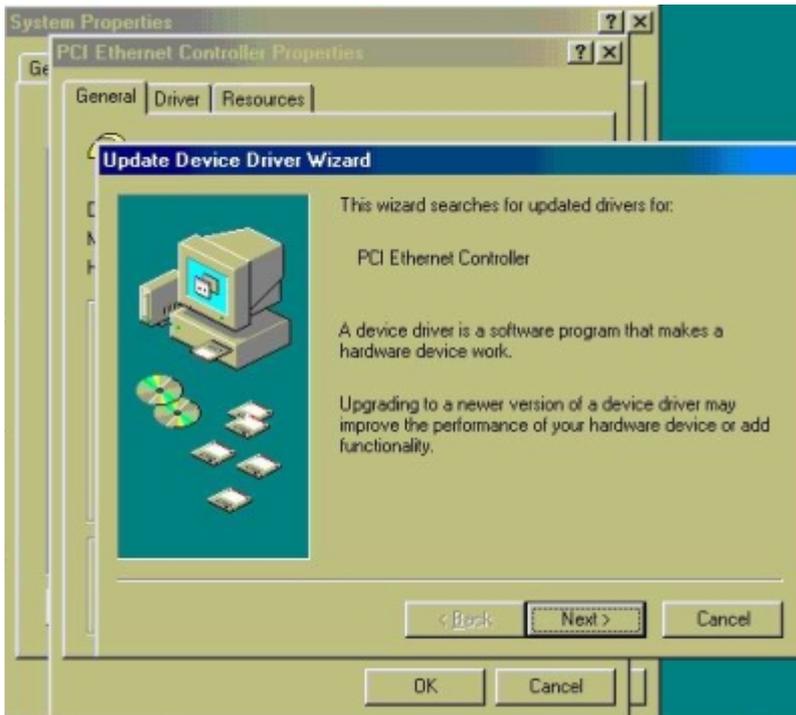
10. Click **on Next**.
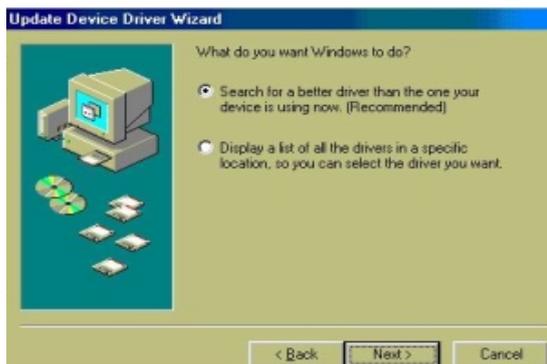
11. Select CD ROM drive, **D/Drivers/lan/Win98,** and then click **Next**.

Notice:We take the LAN installation under Windows 98 for example here, please choose the file according to your Windows OS.

12. Click on **Next**.

13. Click on **Finish**.

Installation process will completely shutdown the computer and allow the system to reboot.

A
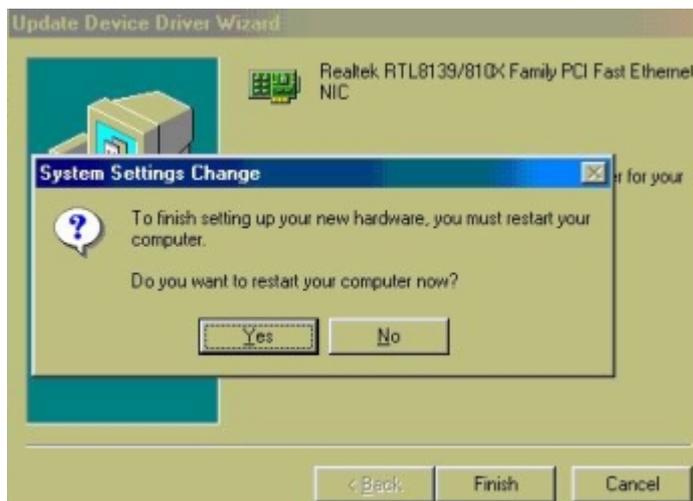
Watchdog Timer Demo Program

The following demo program illustrates the programming steps required to enable, set, and disable the watchdog timer.

Programming the Watchdog Timer

How to Program the Watchdog Timer

1. To set the time-out interval of watchdog timer:

   -- output the desired value to port **0x443**. Since the data is of 1 byte, the maximum value will be 255. In our design, 1 ~ 127 will denote 1sec ~ 127sec, though 129 ~ 255 will denote lmin ~ 127min. e.g.

   outportb(0x443, 30); // set interval to 30 seconds
   outportb(0x443, 0x85); // set interval to 5 minutes

2. To set the time-out event:

   -- output data to **prot 0x444,**

   • 0: reset system
   • 1, 2, 3: IRQ 10, 15, 11 respectively
   • 4: NMI
   e.g.
   outportb(0x444, 0); // set time-out event to reset-system

3. To disable watchdog timer:

   -- output any value to port 0x80, e.g.
   outportb(0x80, data); // disable watchdog timer

4. To ebable or refresh watchdog timer(the watchdog timer will return to its initial value, then count down):

   -- access the I/O port *0x443*, e.g.
   outportb(0x80, 0); // disable watchdog timer
   inportb(0x443); // refresh watchdog timer

   * Note: If you want to refresh the watchdog timer, you have to disable it first.

Demo Program

outportb(0x444, 0):   // set time-out event to reset-system

outportb(0x443x 10);   // set time-out interval to 10 seconds

iutportb(0x443);   // enable watchdog timer

customer_job();   // execute your job here, be sure your
                              job will finished within 10 seconds

outportb(0x80, 0);   // refresh watchdog timer, otherwise
                              the system will reset after time-out

outputb(0x443, 20);   // set time-out interval to 20 seconds

inportb(0x443);   // enable watchdog timer

another_job();   // another job finished in 20 seconds

outportb(0x80, 0)   // disable watchdog timer

...

...

Installing PC/104 Modules

This appendix provides instructions for installing PC/104 modules.

Installing PC/104 Modules

The PC/104 connector of SBC/E Rev.B gives you the flexibility to attach PC/104 expansion modules. These modules perform the functions of traditional plug-in expansion cards, but save space and valuable slots. Modules include:

- **PCM-3110B**   PCMCIA Module (one-slot)
- **PCM-3115B**   PCMCIA Module (two-slot)
- **PCM-3200**   PC/104 Sound Module
- **PCM-3420**   PC/104 Fast SCSI Module
- **PCM-3521**   Advanced Flat-Panel/CRT VGA Module
- **PCM-3522**   LCD Panel Adapter
- **PCM-3600**   PC/104 Fax/Modem Module
- **PCM-3610**   Isolated RS-232 and RS-422/485 Module
- **PCM-3640**   PC/104 4-port RS-232 Module
- **PCM-P50**   PC/104 Vehicle Power Supply
- **PCM-3660**   Ethernet Module
- **PCM-3718**   30 KHz A/D Module
- **PCM-3724**   48-channel DIO Module
- **PCM-3910**   Breadboard Module
- **PCM-3810**   Solid State Disk Module
- **PCM-3820**   High Density Flash Solid State Disk Module

Installing these modules on SBC-456/E Rev.B is a quick and easy job. The following steps show you how to mount the PC/104 modules.

Step1   Remove the SBC-456/E Rev. B from your system, and please pay attention to the safety instructions already mentioned above.

Step2   Make any jumper or link changes required to the CPU card now. Once the PC/104 module is mounted, you may have difficulty in accessing these.

Step3   Mount the PC/104 module onto the CPU card by pressing the module firmly and carefully onto the mounting connectors.

Step4   Secure the PC/104 module onto the CPU card using the four mounting spacers and srews.
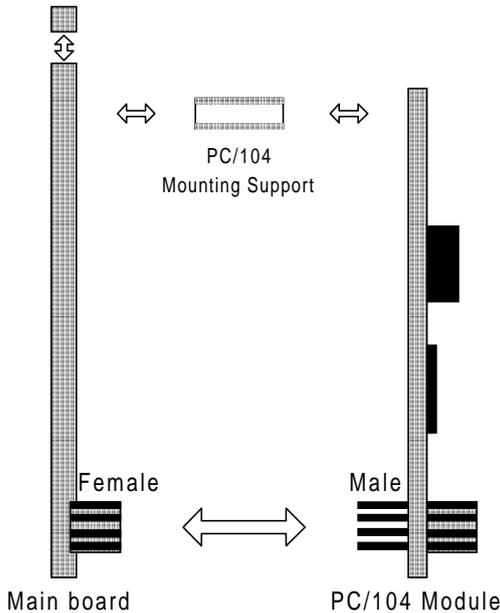
PC/104 Module Mounting Diagram
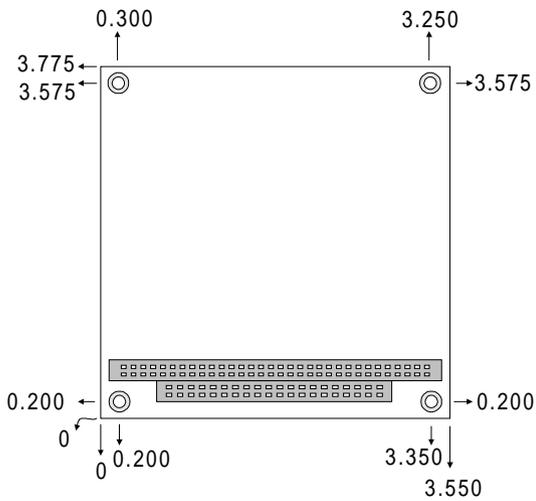
PC/104 module dimenstions (inches ±5%)