

## **FCC Statement**

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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 UNDESIRE 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 REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED 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.

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CD-ROM2087657011

## **A Message to the Customer**

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### **EMAC Customer Services**

Each and every EMAC product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new EMAC equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name EMAC has come to be known.

Your satisfaction is our primary concern. Here is a guide to EMAC customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

### **Technical Support**

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your EMAC products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from EMAC engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

## **Product Warranty**

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This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by EMAC, or which have been subject to misuse, abuse, accident or improper installation. EMAC assumes no liability under the terms of this warranty as a consequence of such events.

Because of EMAC high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an EMAC product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, EMAC products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

## Packing List

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

1. SBC-657 Half-Size Single Board Computer Card
2. Quick Installation Guide
3. One Support CD Contains the followings:
  - User manual
  - Related Drivers
  - Latest BIOS
4. Cables

### Ordering Information

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PN	Type
1701010302	COM/Print Port cable kit
1701340702	FDD Cable
1701400453	IDE Cable 3.5" UDMA-100
1700060192	K/B & Mouse Cable
1709100201	USB Cable with two parts for port 1 and port 2
1709100201	USB Cable with two ports for port 3 and port 4 (optional)
1701100305	COM port with bracket for COM3 and COM4 (Optional)

---

## Notice

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Dear Customer,

Thank you for purchasing the SBC-657. This user manual is designed to help you to get the most out of the SBC-657, please read it thoroughly before you install and use the board. The product that you have purchased comes with an two-year limited warranty, but EMAC will not be responsible for misuse of the product. Therefore, we strongly urge you to first read the manual before using the product.

To receive the latest version of the user manual, please visit our Web site at:

**<http://www.emacinc.com>**

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# CHAPTER 1

## **General Information**

This chapter gives background information on the SBC-657

Sections include:

- Board Introduction
- Board Features
- Board Specifications

## 1.1 Introduction

---

This new Half-size CPU Card SBC-657 with onboard VIA Eden 667 or Ezra 800MHz (fan required), offers great value in an embedded computing platform for low power, low profile, fanless, mobile industrial applied computing applications based using the PCISA CPU card / Slot PC standard.

With its superior computing capacity using low power, embedded, x86-compliant architecture for industrial embedded computers, the SBC-657 enables flexible system designs, including low profile and silent fanless devices (667MHz only). The VIA Eden Platform is designed for optimal heat dissipation and power consumption, allowing quiet-running fanless device designs and saving on energy costs and battery life. With this ultimate feature onboard SBC-657 saves energy in mobile designs.

Features onboard included: Integrated 4X 2D/3D Graphic Controller, a 10/100Base-T Fast Ethernet port, and 18/36-bit LCD Panel support. Its design is based on the half-size CPU card form factor and supports ISA bus, PC/104 expansion. Other on-board features include 4 COMs / 1 Parallel / 4 USBs / 1 IrDA Port. The SSD solution supports CompactFlash cards. Power management can be flexible with its ATX or AT power support.

This product uses a VIA Twister-T chip VT8606 with Integrated 2D/3D/ Video Accelerator. The VGA/LCD interface has a frame buffer of up to 32 MB using system memory. It can display both CRT and Flat Panel (TFT) simultaneously. The SBC-657 supports single 10/100Mbps Ethernet connections through RJ-45 connectors. The SBC-657 can be the best fanless solution if Eden 667MHz CPU is chosen. This is perfect for target market segments such as modern gateway devices, VPNs, firewalls, or machine controllers, especially for \*Always on\* devices.

## 1.2 Features

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- Onboard VIA Ezra(800MHz)/Eden(667MHz) EPGA mobile CPU
- Integrated AGP 4X 2D/3D Graphics Accelerator
- Supports CRT and 18/36-bit TFT Panels
- 36 bit Dual channel LVDS interface onboard
- Type II Compact Flash storage devices supported
- Single 10/100Base-T Fast Ethernet
- Supports UDMA100
- AT/ATX Power management

## 1.3 Specifications

---

❖ <b>CPU</b>	VIA C3 Ezra (800MHz)/ Eden(667MHz) mobile EPGA CPU (with system bus frequencies of 133MHz)
❖ <b>BIOS</b>	Award 256KB Flash BIOS
❖ <b>Chipset</b>	VIA VT8606/VT82C686B
❖ <b>Memory</b>	Onboard one 144-pin SODIMM socket supports up to 512MB SDRAM
❖ <b>Enhanced IDE</b>	Supports up to two IDE devices. BIOS auto-detect Supports PIO mode 5 and Bus Master. Supports Ultra DMA100 mode with data transfer rate up to 100MB/sec.
❖ <b>FDD interface</b>	Supports up to two floppy disk drives, 5.25 inch (360KB and 1.2 MB) and/or 3.5inch (720KB, 1.44MB and 2.88MB)
❖ <b>Parallel Port</b>	Can be configured to LPT1, LPT2, LPT3 or disabled. Supports SPP, ECP, EPP.
❖ <b>Serial Port</b>	Winbond 83977EF, three RS-232 serial ports and one RS-232/422/485 serial ports. Ports can be configured as COM1, COM2, COM3, COM4, or disabled indi- vidually. (16C550 equivalent)

- ❖ **IrDA port** Supports one IrDA Tx/Rx header
- ❖ **KB/Mouse connector** One 6-pin mini DIN connector supports PS/2 Keyboard and PS/2 mouse.
- ❖ **USB connectors** Two 5 x 2 header onboard support four USB ports
- ❖ **Battery** Lithium battery for data retention
- ❖ **Watchdog Timer** Can generate a system reset. Software selectable time-out interval (1 sec.~255 sec, 1 sec/step, 1 min~255 min, 1min/step.)
- ❖ **DMA** 7 DMA channels (8237 equivalent)
- ❖ **Interrupt** 15 interrupt levels (8259 equivalent)
- ❖ **Power management** Supports ATX or AT power supply. Support power saving and doze/standby/suspend modes.

### **Flat Panel/CRT Interface**

- ❖ **Chipset** VIA VT8606 integrated Graphic Accelerator
- ❖ **Display memory** Shared memory up to 32MB
- ❖ **Display Type** Supports non-interlaced CRT and up to 36-bit Dual channel TFT LCD. Can display both CRT and flat panel(TFT) simultaneously
- ❖ **Resolution** Up to 1280 x 1024 @24bpp colors

### **Ethernet Interface**

- ❖ **Chipset** RTL 8139C PCI-bus Ethernet controller
- ❖ **Interface** Onboard one 10/100Base-T RJ-45 connectors

### **Expansion Interface**

- ❖ **PC/104 Connector** One 16-bit 104-pin connector onboard
- ❖ **SDD Interface** One type II Compact Flash Socket
- ❖ **PCISA**

### **Mechanical and Environmental**

- ❖ **Power Supply voltage** AT or ATX type
- ❖ **Operating temperature** 32 to 140 degrees F (0 to 60 degrees C)
- ❖ **Board Size** 7.3(L) x 4.8(W) (185mm x 122mm)
- ❖ **Weight** 0.66 lb. (0.3Kg)

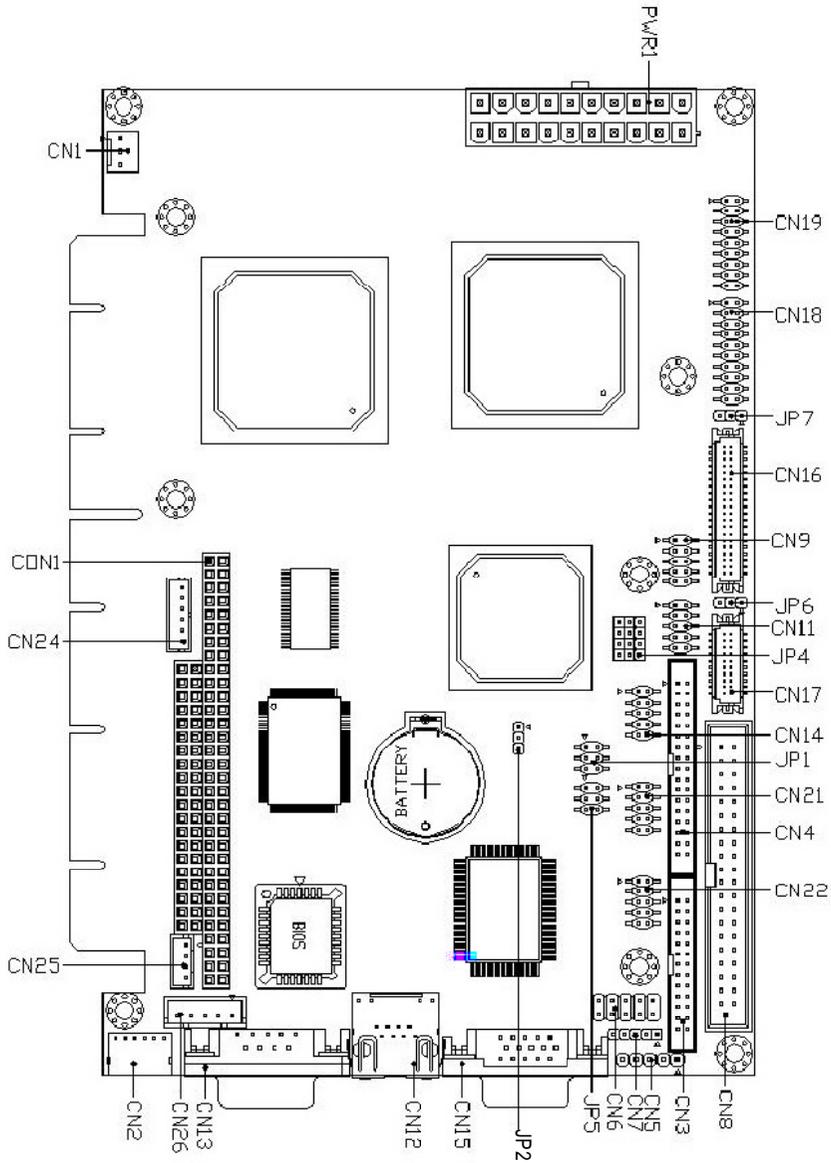
# 2

## **Installation**

This chapter describes how to set up the main board hardware, including instructions on setting jumpers and connecting peripherals, switches, and indicators. Be sure to read all the safety precautions before you begin the installation procedure.

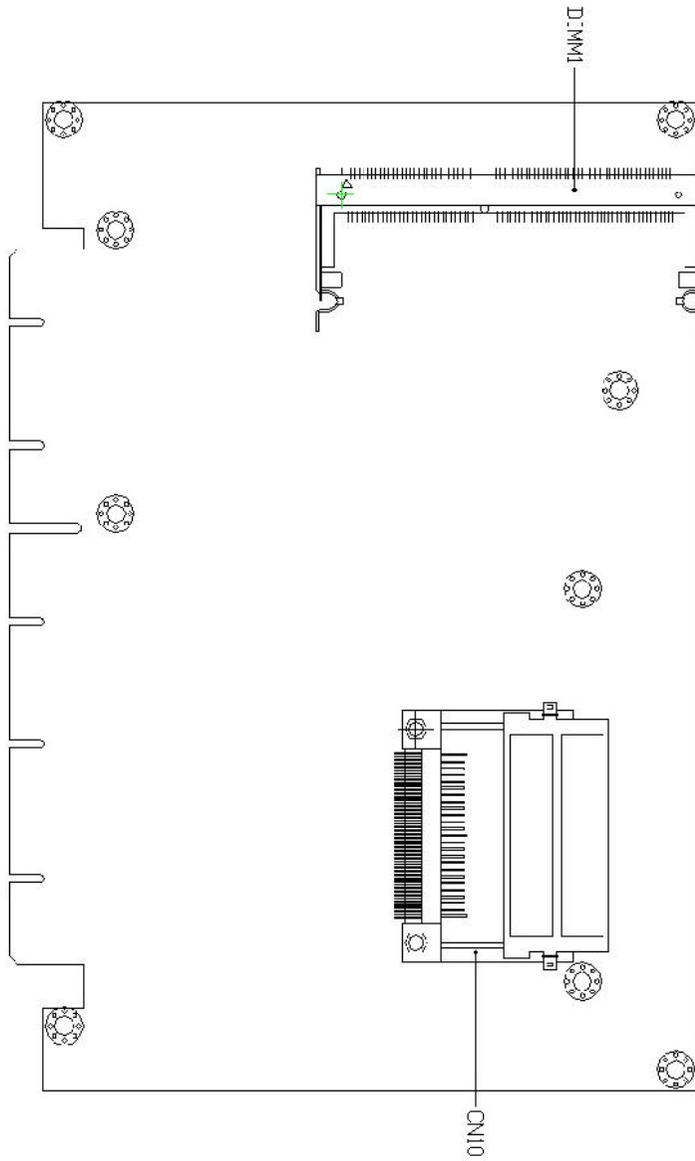
# SBC-657

## Locating Jumpers & Connectors



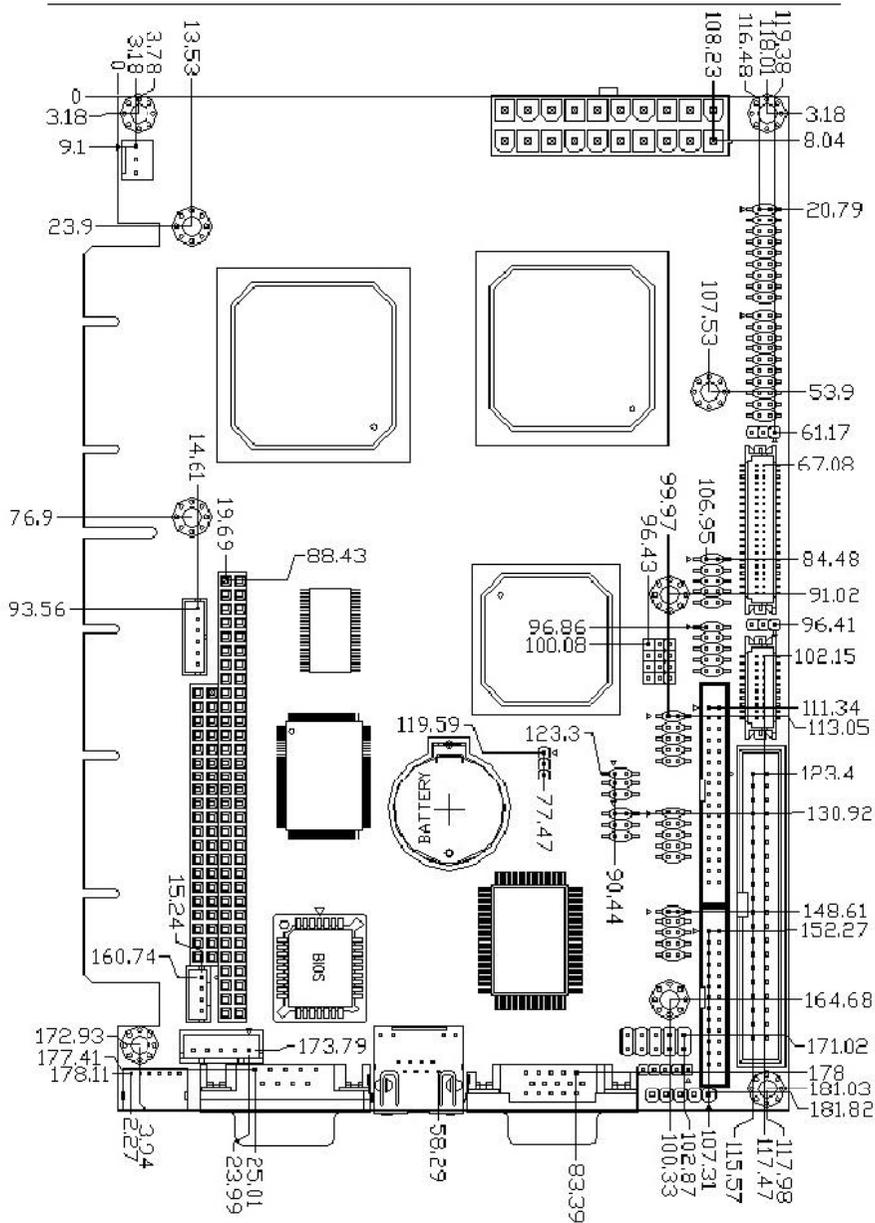
## Locating Jumpers & Connectors (Soldering Side)

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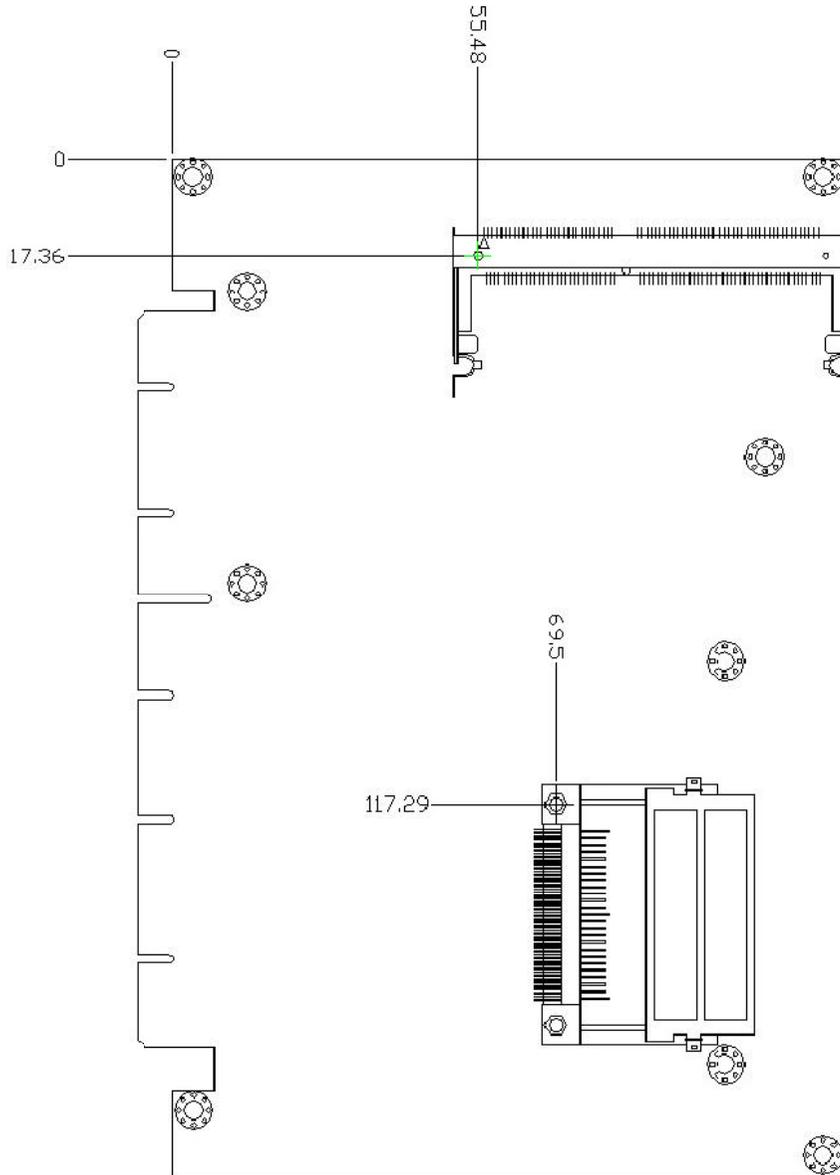


# SBC-657

## Mechanical Drawing



## Mechanical Drawing (Soldering Side)



## Jumpers and Connectors

---

Connectors on the board are used to connect 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 application.

The function of each jumper and connector are listed below:

### Jumpers

---

Label	Function
JP1	COM2 Ring signal select
JP2	Clear CMOS
JP4	RS-232/422/485 setting
JP5	RS-232/422/485 select
JP6	LCD shift clock setting
JP7	LCD voltage setting

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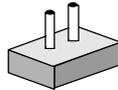
## Connectors

Label	Function
PWR1	Power Connector (ATX & AT Power)
CN1	FAN connector
CN2	Keyboard and Mouse connector
CN3	Printer port connector
CN4	Floppy connector
CN5	IR connector
CN6	Front panel connector
CN7	Option EXT PME
CN8	IDE connector
CN9	First USB connector
CN10	CompactFlash Socket
CN11	Second USB connector
CN12	LAN connector
CN13	COM1 connector
CN14	COM2 connector
CN15	VGA connector
CN16&CN17	LCD connector
CN18	Channel 1 LVDS LCD connector
CN19	Channel 2 LVDS LCD connector
CN21	COM3 connector
CN22	COM4 connector
CN23	PISA Connector
CN24	Backplane ATX Power Connector
CN25	Internal Mouse Connector
CN26	Internal Keyboard Connector
CON1	PC104 Connector

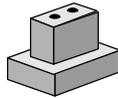
## Setting Jumpers

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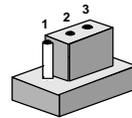
Configure your card to meet the needs of your applications by setting jumper which is the simplest electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, connect the pins with the clip. To "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 representative before you make any changes.

### Pin position

---

1 □ ○ 2

3 ○ ○ 4

5 ○ ○ 6

7 ○ ○ 8

## COM2 Ring signal select (JP1)

Ring *	5V	12V
1  2	1 ○ ○ 2	1 ○ ○ 2
3 ○ ○ 4	3  4	3 ○ ○ 4
5 ○ ○ 6	5 ○ ○ 6	5  6

\*default

## Clear CMOS (JP2)

JP2 is used when CMOS data needs to be reset. To reset , cap 2-3 closed for few seconds, then move the jumper back to 1-2 closed.

Normal*	Clear
1 	1 ○
2 	2 
3 ○	3 

\*default

## RS-232/422/485 Setting (JP4)

RS-232*	RS-422/RS485
1  ○ 3	1 ○  3
4  ○ 6	4 ○  6
7  ○ 9	7 ○  9
10  ○ 12	10 ○  12

\*default

# SBC-657

## RS-232/422/485 Setting (JP5)

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

## LCD Shift Clock Select (JP6)

SHFCLK*	ASHFCLK
1  2	1 ○
2  3	2  3
3 ○	3  4

\*default

## LCD Voltage Setting (JP7)

5V	3.3V*
1  2	1 ○
2  3	2  3
3 ○	3  4

\*default

## Power Connectors (AT&ATX Power)

---

The ATX power supply uses 20-pin connector and the AT power supply uses 6-pin connector as shown in the table. Please work according to the pin assignments and ensure they are plugged in the right direction.

### ATX Power Connector Pin Assignments (PW1)

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PWRONX
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWROK	18	-5V
9	+5VSB	19	+5V
10	+12V	20	+5V

### AT Power Connector Pin Assignments (PWR1)

Pin	Signal	Pin	Signal
1	NC	7	GND
2	VCC	8	GND
3	+12V	9	-5V
4	-12V	10	VCC
5	GND	11	VCC
6	GND	12	VCC

## FAN Connector (CN1)

---

### FAN Connector (CN1)

Pin	Signal
1	GND
2	FAN VCC
3	CPU FAN

## Keyboard and Mouse Connector (CN2)

---

The mainboard BIOS Advanced setup menu allows you to select "Present" or "Absent" under the "System Keyboard" section, allows no-keyboard operation in embedded system applications without the system halting under POST (power-on-self-test).

### Keyboard and Mouse Connector (CN2)

Pin	Signal
1	MCK
2	KCK
3	KBVCC
4	GND
5	KDT
6	MDT

## Parallel Port Connector (CN3)

Printer port connector			
Pin	Signal	Pin	Signal
1	STB#	2	AUTOFD#
3	PTD0	4	ERROR#
5	PTD1	6	PINIT#
7	PTD2	8	SLCTIN#
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

## Floppy Drive Connector (CN4)

---

With support of different types of floppy, you can simply adopt any of the combinations of 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB, and 2.88 MB) drives onto the mainboard.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. 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).

Wire number 1 on the cable is normally red or blue, and the other wires are usually gray.

### Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN4. Make sure that the red or blue wire corresponds to pin 1 on the 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 A: drive. The set in the middle connects to B: drive.
3. If you are connecting a 5.25" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

If you are connecting a 3.5" floppy drive, you may have trouble determining which pin is pin number 1. Look for a number printed on the circuit board indicating pin number 1. Also, the connector on the floppy drive connector may have a slot. When the slot is up, pin number 1 should be on the right. Check the documentation that came with the drive for more information.

If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

## Floppy Drive Connector (CN4)

### Floppy Drive Connector (CN4)

Pin	Signal	Pin	Signal
1	GND	2	DRV DEN 0
3	GND	4	NC
5	GND	6	DRV DEN 1
7	GND	8	INDEX#
9	GND	10	MTR#0
11	GND	12	DS#1
13	GND	14	DS#0
15	GND	16	MTR#1
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRAK#0
27	GND	28	WRTPRT#
29	GND	30	RDATA#
31	GND	32	HDSEL#
33	GND	34	DSKCHG#

## IR connector (CN5)

The IR connector (CN5) can be configured to support wireless infrared module, with this module and application software such as laplink or Win95/98 Direct Cable connection, user can transfer files to or from laptops, notebooks, PDA, and printers. This connector supports HPSIR (115.2Kbps, 2 meters), ASK-IR (56Kbps) and Fast .

Install infrared module onto IrDA connector and enable infrared function from BIOS setup. And make sure to have correct orientation when you plug onto IR connector (CN5).

### IR Connector (CN5)

Pin	Signal
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

## Front Panel Connector (CN6)

### Front Panel Connector (CN6)

Pin	Signal	Pin	Signal
1	GND	2	PWRBTN#
3	HDDLED#	4	VCC
5	BEEPR	6	VCC
7	GND	8	VCC
9	GND	10	RSTIN#

## Option EXT PME (CN7)

### EXT (CN7)

Pin	Signal
1	VCC
2	GND
3	PME#
4	SMBDATA
5	SMBCLK

## **IDE Hard Drive Connector (CN8)**

---

You can attach up to two Enhanced Integrated Device Electronics hard disk drives to CN8. The IDE controller of SBC-657 uses a PCI local bus interface. This advanced interface supports faster data transfer.

### **Connecting the hard drive**

Connecting to ATA66/100 drives requires a 80 pins wire conductor IDE cable and an adaptor to connect to the slim hard drive.

Wire number 1 on the cable is normally red or blue, and the other wires are usually gray.

1. Connect one end of the cable to CN8. Make sure that the red wire corresponds to pin 1 on the connector
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 drives. (see your hard drive's documentation for the location of the connector).

Connect a second drive as described above.

For ATA66/100, if you install two drives, the black end of the cable connect to Master drive and the grey end connect to the Slave drive.

## IDE hard drive Connector (CN8)

### IDE Hard Drive Connector (CN8)

Pin	Signal	Pin	Signal
1	IDERST#	2	GND
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD9	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	GND	20	NC
21	PDREQ	22	GND
23	PDDIOW#	24	GND
25	PDDIOR#	26	GND
27	PDDRDY	28	PDCSEL
29	PD_DACK#	30	GND
31	IRQ14	32	NC
33	PDDA1	34	PD_80P
35	PDDA0	36	PDDA2
37	PDDCS#1	38	PDDCS#3
39	HDDLED#	40	GND

## First USB Connector (CN9)

### First USB Connector

Pin	Signal	Pin	Signal
1	UVCC0	2	GND
3	USB#0	4	GND
5	USB#0	6	USB#1
7	GND	8	USB#1
9	GND	10	UVCC1

## Compact Flash Connector (CN10)

---

### Compact Flash Connector (CN10)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	GND	33	GND
9	GND	34	SDIOR#
10	GND	35	SDIOW#
11	GND	36	VCC
12	GND	37	IRQ15
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	N/C
16	GND	41	IDERST#
17	GND	42	SDRDY
18	SDA2	43	NC
19	SDA1	44	VCC
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/A	49	SDD10
25	GND	50	GND

## Second USB Connector (CN11)

---

SBC-657 provides four USB (Universal Serial Bus) interface, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification Rev. 1.1, and can be disabled in the system BIOS setup.

### Second USB Connector (CN11)

Pin	Signal	Pin	Signal
1	UVCC2	2	GND
3	USBD#2	4	GND
5	USBD2	6	USBD3
7	GND	8	USBD#3
9	GND	10	UVCC3

## 100Base-T Ethernet Connector (CN12)

---

This 100Base-T Ethernet connector is a standard RJ-45 connector. The onboard RTL8139C fast Ethernet controller supports 10Mbps or 100 Mbps N-way auto-negotiation operation.

### Lan Connector (CN12)

Pin	Signal	Pin	Signal
1	TX+	13	LVCC3
2	TX-	14	SLED
3	RX+	15	LVCC3
4	NC	16	ALED
5	NC	12	GND
6	RX-	11	GND
7	NC	10	NC
8	NC	9	NC

## Serial port / COM 1 (CN13)

---

SBC-657 offers four serial ports, three RS-232 and one RS-232/422/485, which allow you to connect them to serial devices (mouse, printers, etc.).

### Com 1 (CN13)

Pin	Signal
1	NDCD1
6	NDSR1
2	NRXD1
7	NRTS1
3	NTXD1
8	NCTS1
4	NDTR1
9	NRI1
5	GND

## Serial Port / COM 2 (CN14)

---

SBC-657 offers four serial ports, three RS-232 and one RS-232/422/485, which allow you to connect them to serial devices (mouse, printers, etc.).

### COM 2 (CN14)

PIN	Signal	PIN	Signal
1	CM2-1	2	CM2-2
3	CM2-3	4	CM2-4
5	GND	6	NDSR2
7	NRTS2	8	NCTS2
9	NRI2	10	NC

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## VGA Connector (CN15)

### VGA Connector (CN15)

Pin	Signal	Pin	Signal
1	RED	9	VGAVCC
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	SDA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	SCL
8	GND		

## LCD Connector (CN16)

### LCD Connector (CN16)

Pin	Signal	Pin	Signal
1	VDDS5	2	VDDS5
3	GND	4	GND
5	VDDS3	6	VDDS3
7	ENABKL	8	GND
9	NC	10	NC
11	B0	12	B1
13	B2	14	B3
15	B4	16	B5
17	NC	18	NC
19	G0	20	G1
21	G2	22	G3
23	G4	24	G5
25	NC	26	NC
27	R0	28	R1
29	R2	30	R3
31	R4	32	R5
33	GND	34	GND
35	VSHCLK	36	FLM
37	DE	38	LP
39	NC	40	ENAVEE

## LCD Connector (CN17)

LCD Connector (CN17)			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	B10	4	B11
5	B12	6	B13
7	B14	8	B15
9	G10	10	G11
11	G12	12	G13
13	G14	14	G15
15	R10	16	R11
17	R12	18	R13
19	R14	20	R15

## Channel 1 LVDS LCD Connector (CN18)

Channel 1 LVDS LCD Connector (CN18)			
Pin	Signal	Pin	Signal
1	TX1OUT1	2	TX1OUT#1
3	GND	4	GND
5	TX1CLK	6	TX1CLK#
7	GND	8	PPVCC
9	PPVCC	10	PPVCC
11	TX1OUT2	12	TX1OUT#2
13	GND	14	GND
15	TX1OUT0	16	TX1OUT#0
17	NC	18	NC
19	ENVDD	20	NC

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## Channel 2 LVDS LCD Connector (CN19)

### Channel 2 LVDS LCD Connector (CN19)

Pin	Signal	Pin	Signal
1	TX2OUT1	2	TX2OUT#1
3	GND	4	GND
5	TX2CLK	6	TX2CLK#
7	GND	8	PPVCC
9	PPVCC	10	PPVCC
11	TX2OUT2	12	TX2OUT#2
13	GND	14	GND
15	TX2OUT0	16	TX2OUT#0
17	NC	18	NC

## COM 3 Connector (CN21)

### COM 3 Connector (CN21)

Pin	Signal	Pin	Signal
1	NDCD3	2	NRXD3
3	NTXD3	4	NDTR3
5	GND	6	NDSR3
7	NRTS3	8	NCTS3
9	NRI3	10	NC

## COM 4 Connector (CN22)

### COM 4 Connector (CN22)

Pin	Signal	Pin	Signal
1	NDCD4	2	NRXD4
3	NTXD4	4	NDTR4
5	GND	6	NDSR4
7	NRTS4	8	NCTS4
9	NRI4	10	N/C

## PISA Connector (CN23)

## **Backplane ATX Power Connector (CN24)**

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### **Backplane ATX Power connector (CN24)**

---

<b>Pin</b>	<b>Signal</b>
------------	---------------

---

1	N/C
---	-----

---

2	GND
---	-----

---

3	N/C
---	-----

---

4	GND
---	-----

---

5	PS ON
---	-------

---

6	VCCSB
---	-------

---

## **Internal Mouse Connector (CN25)**

---

### **Internal Mouse Connector (CN25)**

---

<b>Pin</b>	<b>Signal</b>
------------	---------------

---

1	MCK
---	-----

---

2	MDT
---	-----

---

3	GND
---	-----

---

4	VCC
---	-----

---

## **Internal Keyboard Connector (CN26)**

---

### **Internal Keyboard Connector (CN26)**

---

<b>Pin</b>	<b>Signal</b>
------------	---------------

---

1	KCK
---	-----

---

2	KDT
---	-----

---

3	NC
---	----

---

4	GND
---	-----

---

5	KBVCC
---	-------

---

## **CON1 PC/104 Connector**

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# CHAPTER 3

## **Award BIOS Setup**

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

## 3. 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 CMOS SRAM so that it retains the Setup information when the power is turned off.

### 3.1 Entering Setup

- **To Enter Setup Before Boot Press  
<Del>**

Power ON the computer and press <Del> immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Del> key.

If the message disappears before you respond and you still wish to enter Setup, then please power off/on the board or reset the system by shorting pin9-10 on CN6.

## 3.2 Control Keys

---

These keys help you navigate in Award BIOS:

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	Main Menu: Quit and not save changes into CMOS RAM Status Page Setup Menu and Option Page Setup Menu: Exit current page and return to Main Menu
PgUP/+	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	Item Help
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

## 3.3 Getting Help

---

### 3.3.1 Main Menu

Figure 3.1 shows the Main Setup Menu screen.

### 3.3.2 Status Page Setup /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 Esc or the F1 key again.

### In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer is no longer able to boot, the **Award BIOS** supports an override CMOS settings that helps you to reset the system back to default configuration. (Please refer to P.15 for JP2 - Clear CMOS setting.)

### The Best Advice

The best advice is to alter only settings that you thoroughly understand. In particular, **DO NOT** change settings in Advanced Chipset Features unless you understand what you are doing. The Chipset defaults have been carefully chosen by Award Software or your system manufacturer for the best performance and reliability. Even a seemingly small change to the Chipset setup may cause the system to become unstable.

**The displayed configuration charts in this chapter show you all the default settings of SBC-657.**

## 3.4 The Main Setup Menu

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 3.1) will appear on the screen. The Main Menu allows you to select setup items and press <Enter> to accept or enter the sub-menu.



Figure 3.1: The Main Setup Menu

### Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

### Advanced BIOS Features

Use this menu enables you to set all the enhanced features available on your system.

### Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

### Integrated Peripherals

The menu enables you to specify all onboard peripherals settings. (Primary slave, secondary slave, keyboard, mouse etc.)

### **Power Management Setup**

Use this menu to specify your settings for power management.

### **PnP/PCI Configuration**

This setup page includes all the configurations of PCI & PNP ISA resources.

### **PC Health Status**

### **Frequency/Voltage Control**

Use this menu to specify your settings for frequency/ voltage control.

### **Load Fail-Safe Defaults**

Use this menu to load the BIOS default values for the minimal/ stable performance for your system to operate.

### **Load Optimized Defaults**

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations.

### **Set Supervisor Password**

Use this menu to set Supervisor Passwords.

### **Set User Password**

User this menu to set User Passwords.

### **Save and Exit Setup**

Save CMOS value changes to CMOS and exit setup.

### **Exit Without Saving**

Abandon all CMOS value changes and exit setup.

## 3.5 Standard CMOS Setup Menu

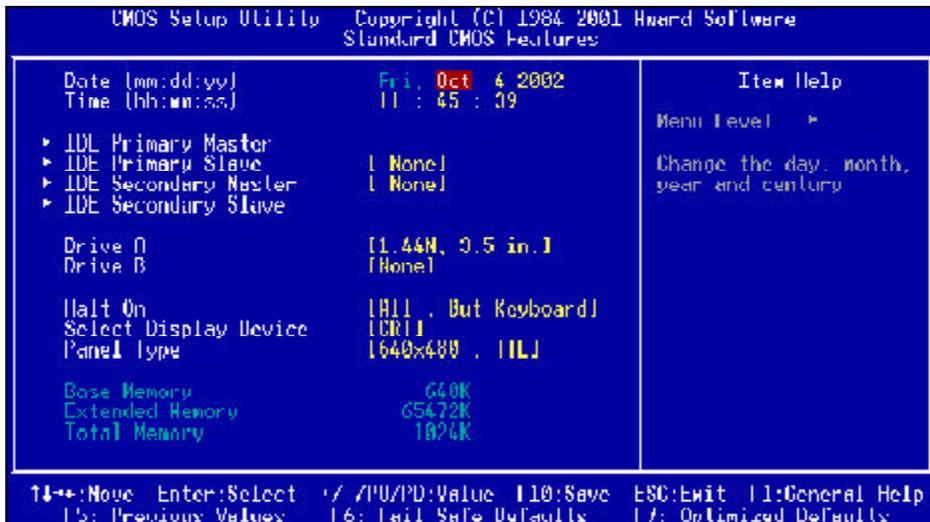


Figure 3.2 Standard CMOS Setup Menu

This standard setup menu allows users to configure system components such as the date, time, hard disk drive, floppy drive, display, and memory. Online help for each field can be accessed by pressing F1. Use the arrows to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

### 3.5.1 Date and Time Configuration

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

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

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

### 3.5.2 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 about other hard drive types, such as SCSI drives.

User Arrow key to select the menu of the page meanwhile you can also get Item Help at right hand side of the screen. To Enter Hard Drive setting page press <Enter> to the next page

***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

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

1. **NONE:** No drive type to be selected
2. **Manual:** This will allow you to manually set the drive type you are using in your system. (See Below)

**Mode:** Types of ACCESS: Auto, Large, CHS or LBA

**Auto:** The BIOS automatically determines the optimal mode.

**CHS:** This allows the user to enter their own hardware values

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

**LBA : (Logical Block Addressing)** During drive access, 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 specifications**

Here is a brief explanation of drive specifications:

**Type:** The BIOS contains a table of predefined 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 predefined 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

### 3.5.3 Drive A / Drive B type

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

### 3.5.4 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.

**The choices: All,But Keyboard; All, But Diskette; All, But Disk/Key; All Errors; No Errors.**

### 3.5.5 Select Display Device

SBC-657 can be used with various visual display peripherals. It can also display the both CRT and Flat Panel(TFT or DSTN) simultaneously. This function allows the end user to select the type of visual display peripheral they are incorporating with the SBC-657 single board computer.

**The choices: LCD, CRT, LCD+CRT**

### 3.5.6 Panel Type

SBC-657 can be used with various display panels. Please select the type of panel you are incorporating with our single board computer. Consult your panel manual for detail information.

**The choices: 640x480 TTL, 800x600 TTL, 1024x768 TTL, 800x600 1ch LVDS, 1024x768 1ch LVDS, 1024 x 768 2ch LVDS**

## 3.6 Advanced BIOS Features

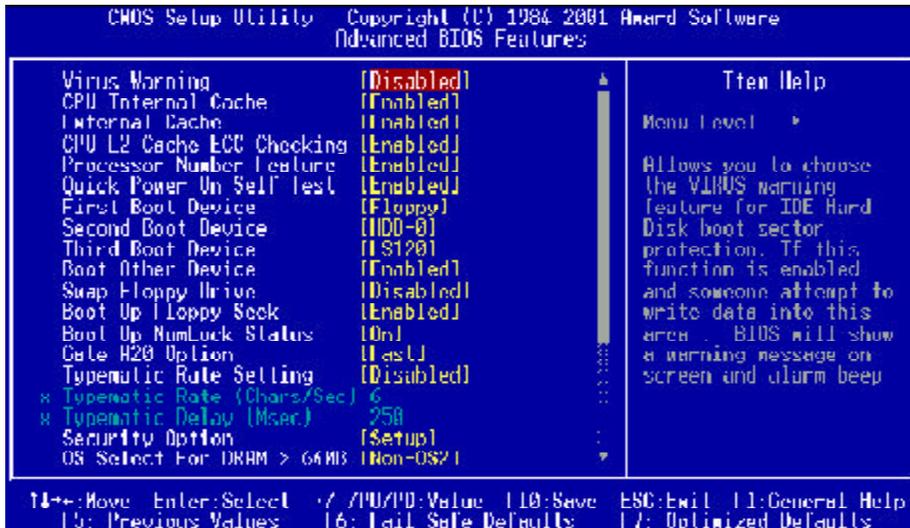


Figure 3.3 Advanced BIOS Features

### 3.6.1 Virus Warning

This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system, in the mean time, you can run anti-virus program to locate the problem.

**Enable:** Activate automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table

**Disable:** **Default.** No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

### **3.6.2 CPU Internal Cache/External Cache**

Cache memory is additional memory that is much faster than conventional DRAM (system 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(Default), Disabled.**

### **3.6.3 CPU L2 Cache ECC Checking**

When you select Enabled, memory checking is enable when the external cache contains ECC SRAMs.

**The choices:Enabled(Default), Disabled.**

### **3.6.4 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.

**The choices: Enabled(Default), Disabled.**

### **3.6.5 First/Second/Third Boot Device**

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

**The choices:**

**First Boot Device: Disable, Floppy(Default), LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2, ZIP100**

**Second Boot Device: Same as above. Default value - HDD0**

**Third Boot Device: Same as above. Default value - LS120**

### **3.6.6 Boot Other Device**

If your boot device is not included in the following choices Floppy, LS120, HDD0, HDD1, HDD2, SCSI, CDROM, you may set **First/Second/Third Boot devices to Disable** and **enable the BOOT Other Device function**. The system will automatically boot the other device.

**The choices: Enabled (Default), Disabled.**

### **3.6.7 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: Enabled, Disabled(Default).**

### **3.6.8 Boot Up Floppy Seek**

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 720K, 1.2M and 1.44M are all 80 tracks.

**The choices: Enabled(Default), Disabled.**

### **3.6.9 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(Default), Off.**

### **3.6.10 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 improves system speed, particularly with OS/2 and Windows.

**The choices: Fast(Default), Normal.**

### **3.6.11 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: Enabled, Disabled(Default)**

#### **■ Typematic Rate**

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**

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.

### **3.6.12 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(Default), Sysytem.**

### **3.6.13 OS Select For DRAM>64MB**

Select the operating system that is running with greater than 64MB or RAM on the system.

**The choices: Non-OS2(Default), OS2**

### **3.6.14 Repeat No FDD For WIN 95**

**The Choices: Yes(Default), No**

### 3.6.15 Video BIOS Shadow

Software that resides in a read only memory (ROM) chip on a device is called firmware. The Award BIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals such as, for example, 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 are C0000-C7FFF. 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.

**The choices: Enabled(Default), Disabled.**

These categories determine whether optional ROM will be copied to RAM by 16K byte.

- ◆ **C8000-CBFFF Shadow: Disabled**
- ◆ **CC000-CFFFF Shadow: Disabled**
- ◆ **D0000-D3FFF Shadow: Disabled**
- ◆ **D8000-DBFFF Shadow: Disabled**
- ◆ **DC000-DFFFF Shadow: Disabled**

### 3.6.16 Small Logo (EPA) Show

**The choices: Enabled, Disabled**

## 3.7 Advanced Chipset Features

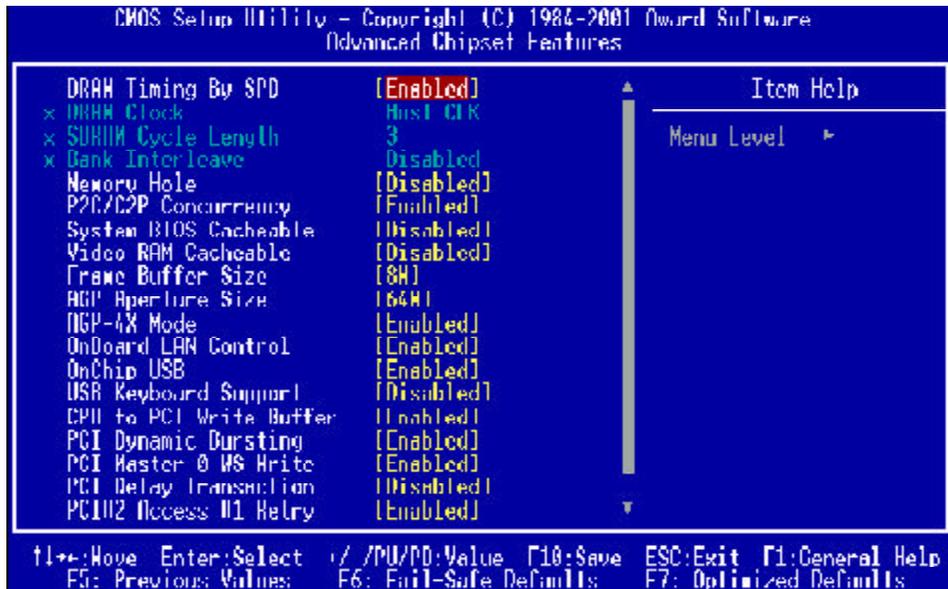


Figure 3.4 Advanced Chipset Features

### 3.7.1 DRAM Timing By SPD

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs.

**The choices:** Enabled(Default), Disabled.

### 3.7.2 DRAM Clock

This item allows you to control the DRAM speed.

**The choice:** Host Clock, HCLK-33M, HCLK+33M

### 3.7.3 SDRAM Cycle Length

This field sets the CAS latency timing.

**The choices:** 3, 2

### **3.7.4 Bank Interleave**

**The choices: 2 Bank, 4 Bank, Disabled.**

### **3.7.5 Memory Hole**

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory.

**The choices: 15M-16 M, Disabled(Default)**

### **3.7.6 P2C/C2P Concurrency**

This item allows yo to enable/disable the PCI to CPU, CPU to PCI concurrency.

**The choices: Enabled(Default), Disabled**

### **3.7.7 System BIOS Cacheable**

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

**The choices: Enabled, Disabled(Default)**

### **3.7.8 Video RAM Cacheable**

**The choices: Enabled, Disabled(Default)**

### **3.7.9 Frame Buffer Size**

**The choices: 2M, 4M, 8M(Default), 16M, 32M.**

### **3.7.10 AGP Aperture Size**

Select the size of Accelerated Graphics Port (AGP) aperture.

The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

**The choices: 4M, 8M, 16M, 32M, 64M(Default), 128M.**

### **3.7.11 AGP-4X Mode**

Enable 4X mode will enhance your system performance.

**The choices: Enabled(Default), Disabled.**

### **3.7.12 OnBoard LAN Control**

**The choices: Enabled(Default), Disabled.**

### **3.7.13 OnChip USB**

Select enabled if you wish to use onboard USB feature.

**The choices: Enabled(Default), Disabled.**

### **3.7.14 USB Keyboard Support**

Select enabled if you wish to connect a USB keyboard.

**The choices: Enabled, Disabled(Default)**

### **3.7.15 CPU to PCI Write Buffer**

When this field is enabled, writes from the CPU to the PCI bus are buffered, to compensate for the speed differences between the CPU and PCI bus. When, disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another write cycle.

**The choices: Enabled(Default), Disabled.**

### **3.7.16 PCI Dynamic Bursting**

When enabled, every write transaction goes to the write buffer. Burstable transactions then burst on the PCI bus and nonburstable transactions do not.

**The choices: Enabled(Default), Disabled.**

### **3.7.17 PCI Master 0 WS Write**

When enabled, writes to the PCI bus are executed with zero wait states

**The choices: Enabled(Default), Disabled.**

### **3.7.18 PCI Delay Transaction**

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select enabled to support

compliance with PCI specification version 2.1.

**The choices: Enabled, Disabled(Default)**

### **3.7.19 PCI #2 Access #1 Retry**

When disabled, PCI#2 will be connected until access finishes (default). When enabled, PCI#2 will be disconnected if max retries are attempted without success.

**The choices: Enabled(Default), Disabled.**

### **3.7.20 AGP Master 1 WS Write**

System will run single wait state delay before write data from buffer, if user set to disable system will run twice wait states so system can stable.

**The choices: Enabled, Disabled(Default)**

### **3.7.21 AGP Master 1 WS Read**

System will run single wait state delay before read data from buffer, if user set to disable system will run twice wait states so system can stable.

**The choices: Enabled, Disabled(Default)**

## 3.8 Integrated Peripherals

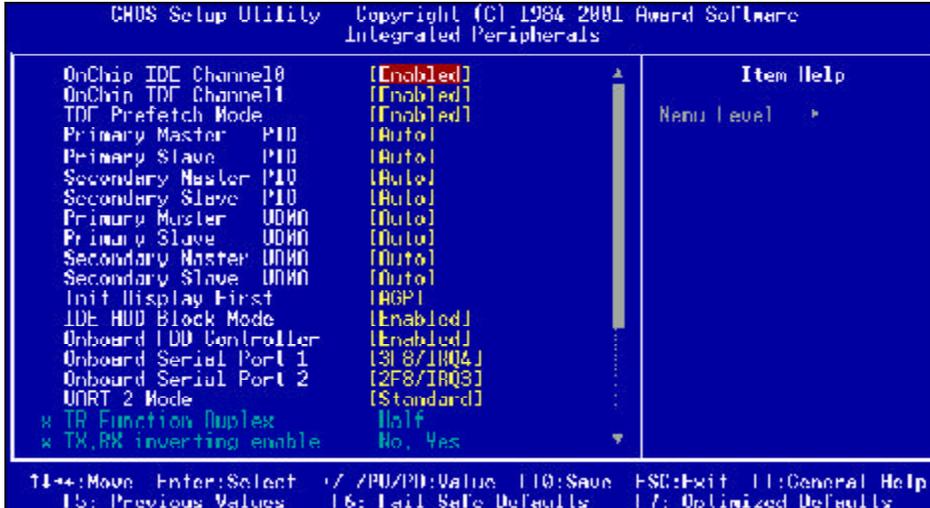


Figure: 3.5 Integrated Peripherals

### 3.8.1 On-Chip IDE Channel 0

The system chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary and/or secondary IDE interface.

Select Disabled to deactivate this interface, if you install a primary and/or secondary add-in IDE interface.

**The choices: Enabled(Default), Disabled.**

### 3.8.2 On-Chip IDE Channel 1

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the secondary IDE interface. Select Disabled to deactivate this interface.

**The choices: Enabled(Default), Disabled.**

### **3.8.3 IDE Prefetch Mode**

The onboard IDE drive interfaces supports IDE prefetching, for faster drive accesses. If you install a primary and or secondary add in IDE interface, set this field to Disabled if the interface does not support prefetching.

**The choices: Enabled(Default), Disabled.**

### **3.8.4 Primary/Secondary Master/Slave PIO**

The four IDE PIO (Programmable Input/Output) fields let you set a PIO mode (0-1) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

**The choices: Auto(Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.**

### **3.8.5 Primary/Secondary Master/Slave UDMA**

Ultra DMA 66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your IDE Cable both support Ultra DMA 33/66 **select Auto** to enable BIOS support.

**The choices: Auto(Default), Disable**

### **3.8.6 Init Display First**

This item allows you to activate PCI or onboard VGA device first.

**The choices: PCI Slot, AGP(Default)**

### **3.8.7 IDE HDD Block Mode**

Select Enabled only if your hard drives support block mode.

**The choices: Enabled(Default), Disabled**

### **3.8.8 Onboard FDD Controller**

This item allows you to enable/disable onboard floppy disk controller.

**The choices: Enabled(Default), Disabled**

### **3.8.9 Onboard Serial Port 1**

Normally, the main board I/O chips will occupy a certain portion of memory space. For each I/O device the computer provides an I/O address. The more devices attached the more address needed to organize the memory storage areas. If all the I/O devices were run through the same address, your devices would come to a near halt. By providing the end user with four serial ports this allows devices to run more efficiently if needed. Also the corresponding interrupt needs to be selected.

**The choices: 3F8/IRQ4(Default), 3E8/IRQ4, 2F8/IRQ3, 2E8/IRQ3, Disabled**

### **3.8.10 Onboard Serial Port 2**

**The choices: 3F8/IRQ4, 3E8/IRQ4, 2F8/IRQ3(Default), 2E8/IRQ3, Disabled**

### **3.8.11 UART 2 Mode**

**The choices: Standard(Default), HPSIR, ASKIR**

**HPSIR** IrDA-compliant serial infrared port

**ASK IR** Amplitude shift keyed infrared port

### **3.8.12 IR Function Duplex**

Select the value required by the IR device connected to the IR port. Full duplex mode permits simultaneous two direction transmission. Half duplex mode permits transmission in one direction only at a time.

**The choices: Half, Full**

### **3.8.13 TX, RX inverting enable**

Consult your IR peripheral documentation to select the correct setting .

**The choices:** Yes, No; Yes, Yes; No, No; No, Yes

### **3.8.14 Onboard Parallel Port**

Select a logical LPT port address and corresponding interrupt for the physical parallel port

**The Choice:** 378/IRQ7, 278/IRQ5, 3BC/IRQ7(Default), Disabled

### **3.8.15 Onboard Parallel Mode**

Two bidirectional parallel ports.

**The choices:** Normal(Default), EPP, ECP, ECP/EPP .

### **3.8.16 ECP Mode Use DMA**

Select a DMA channel for the port.

**The choices:** 3(Default), 1

### **3.8.17 Parallel Port EPP Type**

Select EPP port type 1.7 or 1.9.

**The choices:** EPP1.9(Default), EPP1.7

### **3.8.18 Onboard Serial Port 3**

**The choices:** Disabled(Default), 3F8, 2F8, 3E8, 2E8

### **3.8.19 Serial Port 3 Use IRQ**

**The choices:** IRQ10, IRQ11, IRQ4, IRQ3

### **3.8.20 Onboard Serial Port 4**

**The choices:** Disabled(Default), 3F8, 2F8, 3E8, 2E8

### **3.8.21 Serial Port 4 Use IRQ**

**The choices:** IRQ10, IRQ11, IRQ4, IRQ3

## 3.9 Power Management Setup

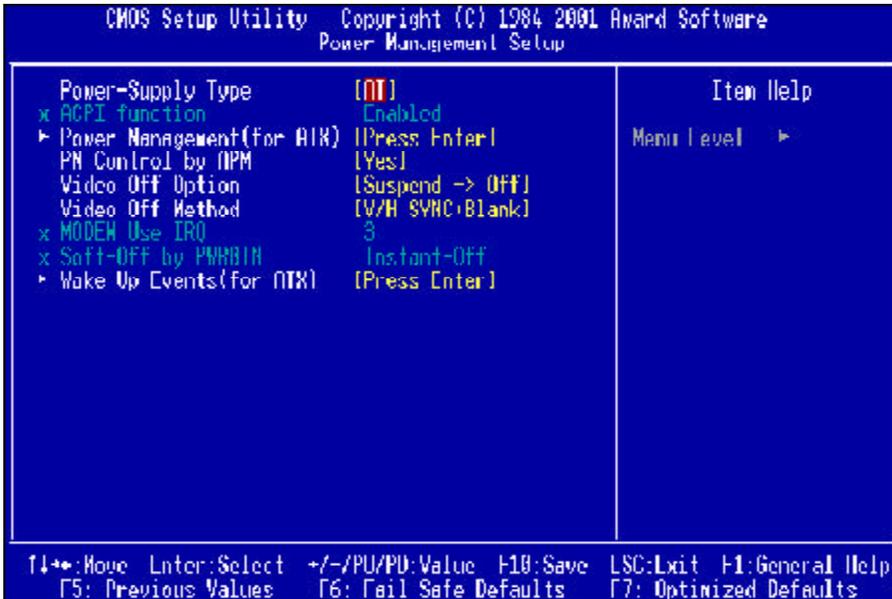


Figure 3.6 Power Management Setup

- **3.9.1 Power-Supply Type**  
There are two power supply type to choose from AT to ATX.  
**The choices: AT(Default), ATX**
- **3.9.2 ACPI function**  
**The choices: Disabled, Enabled**

### **3.9.3 Power Management(for ATX)**

This category allows you to select the type ( or degree ) of power saving and is directly related to the following modes:

#### **1. HDD Power Down**

The choices: 1-15 mins, Disable

#### **2. Doze Mode**

The choices: 1min, 2min, 4min, 6min, 8min, 10min, 20min, 30min, 40min, 1hr, Disable

#### **3. Suspend Mode**

The choices: 1min, 2min, 4min, 6min, 8min, 10min, 20min, 30min, 40min, 1hr, Disable

### **SETUP TIPS**

#### **Maximum Saving**

1. HDD - 1~15 minutes or Disable
2. Doze Mode - 1 Minute
3. Suspend Mode - 1 Minute

#### **Minimum Saving**

1. HDD - 1~15 minutes or Disable
2. Doze Mode - 1 Hour
3. Suspend Mode - 1 Hour

#### **User Define**

1. HDD - 1~15 minutes or Disable
2. Doze Mode - 1 min, 2 min, 4 min, 6 min, 8 min, 10 min, 20 min, 30 min, 40 min, 1 hour.
3. Suspend Mode - 1 min, 2 min, 4 min, 6 min, 8 min, 10 min, 20 min, 30 min, 40 min, 1 hour.

### 3.9.4 PM Control by APM

If advanced power management is installed on your system, selecting Yes gives better power savings.

**The choices: Yes(Default), No**

### 3.9.5 Video Off Option

Select the power saving modes during which the monitor goes blank.

**The Choices:**

**Always on** Monitor remains on during power saving modes.

**Suspend--Off (Default)** Monitor blanked when system enters suspension mode.

**All Modes--Off** Monitor blanked when system enters any power saving mode.

### 3.9.6 Video Off Method

This determines the manner in which the monitor is blanked.

**The Choices:**

**V/H SYNC + Blank(Default)**

This Selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer

**Blanck Screen**

This option only writes blanks to the video buffer

**DPMS**

Initial display power management signaling

### 3.9.7 MODEM Use IRQ

**The Choices: 3 (Default), 4, 5, 7, 9, 10, 11, NA**

### 3.9.8 Soft-Off by PWRBTN

**The Choices: Instant-Off(Default), Delay 4 Sec**

### **3.9.9 Wake Up Events (for ATX)**

#### **Sub-Menu:**

**\* VGA:**

**The choices: OFF(Default), On**

**\* LPT & COM:**

**The Choices LPT/COM(Default), NONE, LPT, COM**

**\* HDD & FDD:**

**The Choices: ON(Default), OFF**

**\* Modem Ring Resume:**

**The Choices: Disabled(Default), Enabled**

**\* RTC Alarm Resume:**

Set to 'On' to wake the system up from suspend mode as defined in Resume Time

**The Choices: Disabled(Default), Enabled**

**\* Date (of Month):**

Specify date when the system should wake up from Suspend mode.

**The Choices: 0-31**

**\* Resume Time (hh:mm:ss)**

Press <TAB> to enter the next field.

**The Choices: 24hr:60mins:60secs**

**\* Primary INTR:**

**The Choices: ON(Default), OFF**

### **3.9.10 IRQS Activity Monitoring**

#### **Sub-Menu:**

**IRQ3 (COM2)/IRQ4(COM1)/IRQ5(LPT2)/  
IRQ6(Floppy Disk)/IRQ7(LPT1): Enabled**

**IRQ8(RTC Alarm)/IRQ9(IRQ2 Redir)/  
IRQ10(Reserved)/IRQ11(Reserved): Disabled**

**IRQ12(PS/2 Mouse)/IRQ13(Coprocessor)/  
IRQ14(Hard Disk): Enabled**

**IRQ15(Reserved): Disabled**

## 3.10 PnP/PCI Configurations

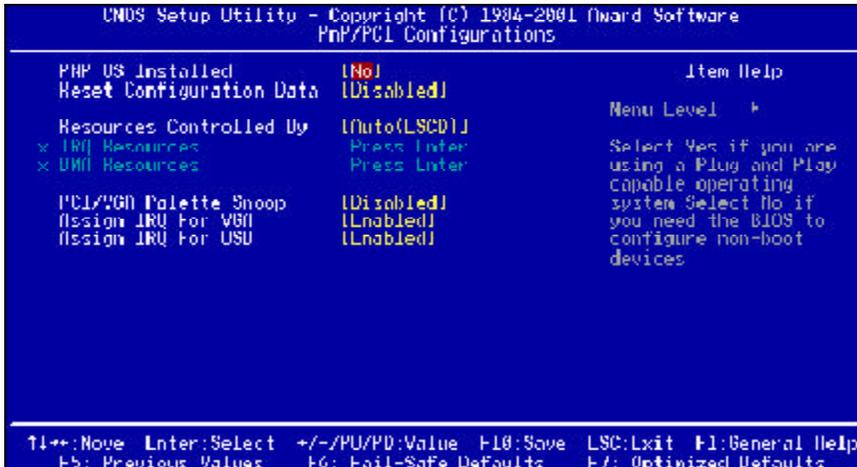


Figure 3.10 PnP/PCI Configurations

### 3.10.1 PNP OS Installed

Select Yes if you are using a plug and play capable operating system. Select No if you need the BIOS to configure non-boot devices.

**The choices: No, Yes.**

### 3.10.2 Reset Configuration Data

Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

**The choices: Enabled, Disabled**

### 3.10.3 Resources Controlled By

BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you cannot select IRQ, DMA and memory base address fields, since BIOS automatically assigns them.

**The choices: Auto (ESCD) (Default), Manual.**

### **3.10.4 IRQ Resources**

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

#### **Sub-Menu:**

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to **The choices: PCI/ISA PnP, Legacy ISA**

### **3.10.5 DMA Resources**

When resources are controlled manually, assign each DMA channel a type, depending on the type of device using the DMA channel.

#### **Sub-Menu:**

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

DMA-0/DMA-1/DMA-3/DMA-5/DMA-6/DMA-7 assigned to:  
**The choices: PCI/ISA PnP, Legacy ISA**

### **3.10.6 PCI/VGA Palette Snoop**

Leave this field at Disabled.

**The choices: Enabled, Disabled(Default)**

### **3.10.7 Assign IRQ for VGA**

**The choices: Enabled(Default), Disabled.**

### **3.10.8 Assign IRQ for USB**

**The choices: Enabled(Default), Disabled**

## 3.11 PC Health Status



The screenshot shows the BIOS PC Health Status screen. The title bar reads 'CMOS Setup Utility - Copyright (C) 1984-2001 Award Software' and 'PC Health Status'. The main content is a table of system health metrics:

Item	Value	Item Help
Current CPU Temp.	32°C / 87°F	Item Help Menu Level ▶
Current CPU/FAN Speed	35°C / 95°F	
Vcore	2.01 V	
2.5V	2.54 V	
3.3V	3.26 V	
5V	4.98 V	
12V	12.00 V	

Figure 3.11 PC Health Status

### 3.11.1 PC Health Status

Your system does not allow you to alter any of the setting in this menu. The system engineer has already designated the correct setting for SBC-657.

## 3.12 Frequency/Voltage Control



The screenshot shows the BIOS Frequency/Voltage Control screen. The title bar reads 'CMOS Setup Utility - Copyright (C) 1984-2001 Award Software' and 'Frequency/Voltage Control'. The main content is a table of system control settings:

Item	Value	Item Help
Auto Detect DIMM/PCI Clk	[Disabled]	Item Help Menu Level ▶
Spread Spectrum Modulated	[Disabled]	

Figure 3.12 Frequency/Voltage Control

### 3.12.1 Auto Detect DIMM/PCI CLK

This item allows you to enable/disable auto detect DIMM/PCI clock.

**The choices: Enabled(Default), Disabled**

### 3.12.2 Spread Spectrum Modulated

This allows you to enable/disable the spread spectrum modulate. When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme pulse spikes to flat curves thus reducing EMI.

**The choices: . 25%, . 50%, Disabled(Default)**

### 3.13 Load Fail-Safe Defaults

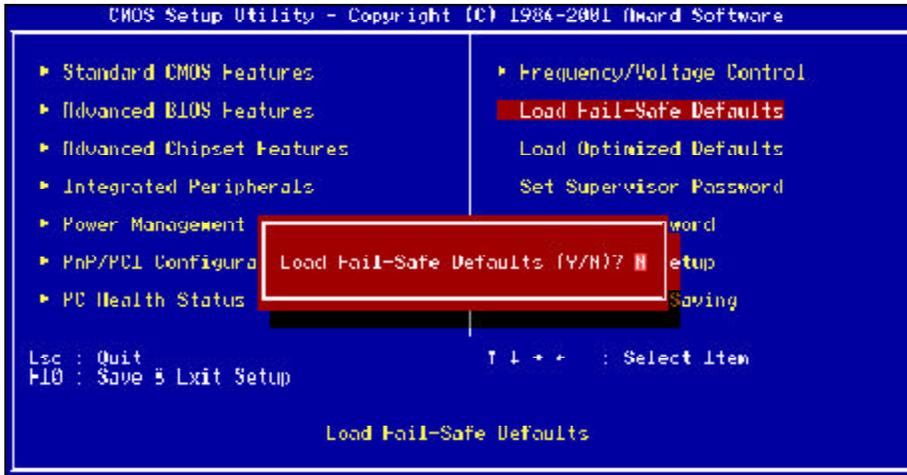


Figure 3.13 Load Fail-Safe Defaults

#### 3.13.1 Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Default (Y/N)?

Pressing "Y" loads the BIOS default values for the most stable, minimal performance system operations.

## 3.14 Load Optimized Default

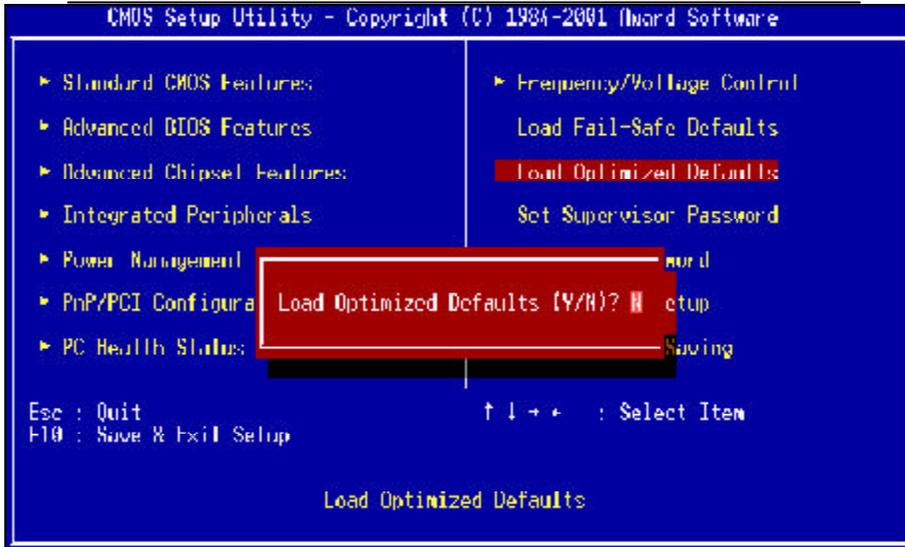


Figure 3.14 Load Optimized Default

### 3.14.1 Load Optimized Default

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)?

Pressing "Y" loads the default values that are factory settings for optimal performance system operations.

### 3.15 Set Supervisor Password



Figure 3.15 Set Supervisor Password

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.

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 whenever 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.*

## 3.16 Set User Password

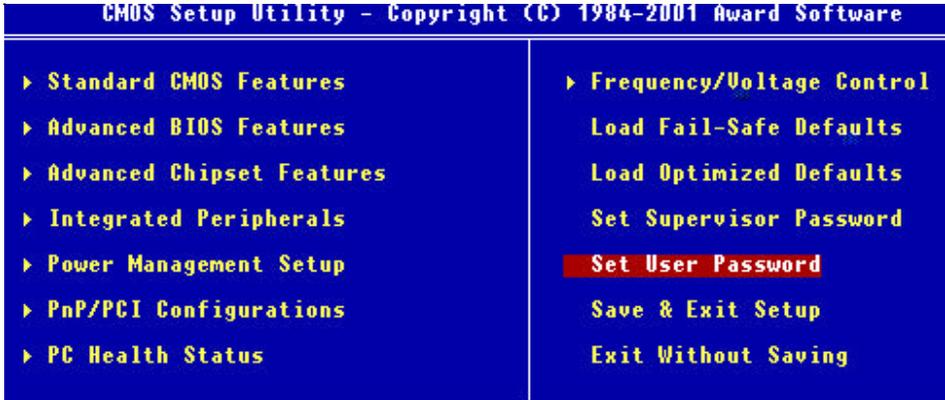


Figure 3.16 Set User Password

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 whenever you enter Setup.

**Setup** Enter a password whenever you enter Setup.

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



# CHAPTER 4

## **Driver Installation**

This SBC-657 is equipped with an Audio, VGA and Dual LAN interfaces. This chapter provides instructions for installing the software drivers on these peripherals.

## 4.1 Drivers Installation 1

---

The SBC-657 comes with a CD which contains most of the drivers and utilities for your needs. There are several installation ways depending on the driver package under different Operating System application. **We recommend that the system driver installation procedure be performed first.**

If you utilize Windows NT series OS, you are strongly recommended to download the latest version Windows NT Service Pack from Microsoft website and install it before installing any driver.

### **Installation :**

**Applicable for Windows 9x/ME/2000/XP/NT 4.0**

1. Insert the **SBC-657 CD** into the CD ROM Drive.
2. From the CD ROM, select the desired component **Driver** folder, select the desired **Operation System folder** to double click on the **Setup.exe** icon. A driver installation screen will appear.  
*(Notice: take VGA driver installation under Windows 98 for example, choose the corresponding folder depending on your OS)*
3. A driver installation screen will appear, please follow the on-screen instructions to install the driver in sequence. and click on the **Next** button.  
*(Notice: In some cases the system will ask you to insert Windows 98 CD and key in its path. Then click on the **OK** button to key in path.)*
4. Click on the **Finish** button to finish installation process. And allows the system to reboot.

## 4.2 Drivers Installation 2

---

### Installation

#### Applicable for Windows 9x/ME/2000

1. Insert the **SBC-657 CD** into the CD ROM Drive.
  2. Click on **Start** button, select the **Settings**, then click on the **Control Panel** icon.
  3. Double click on the **Add/Remove Hardware** icon and **Add New Hardware Wizard** will appear. Click on the **Next** button.
  4. Select **Search for the best driver for your device (Recommended)** and click on the **Next** button.
  5. Select **Specify a location**, click on **Have Disk** button then key in the CD-ROM path and specify component drivers and OS folders. Then click on the **Next** button.
  6. The Wizard shows that Windows driver file search for the device: (For example, Ethernet devices, the list appear **Realtek RTL8139/810X Family PCI Fast Ethernet NIC**).
- Click on the **Next** button.
7. The system will ask you to insert Windows 98 CD. Click on the **OK** button to insert CD and key in path.
  8. Click on the **OK** button.
  9. Click on the **Finish** button to finish installation process. And allows the system to reboot.

## 4.3 Drivers Installation 3

---

### Installation :

#### Applicable for Windows NT 4.0

1. Insert the **SBC-657 CD** into the CD ROM Drive.
2. Start system with Windows NT 4.0 installed.  
**IMPORTANT:** When the "Please select the operating system to start..." message is displayed, select "Windows NT Workstation Version 4.00 [VGA mode]".
3. From **Start**, select the **Settings group**, then click on the **Control Panel** icon.
4. In the **Control Panel**, select the desired device and click on the icon.
5. Follow the step-by-step instruction and click on **OK** button.
6. Click on the **Have Disk...** button.
7. Key in CD-ROM path and specify component drivers, then click on the **OK** button.
8. From the list of displayed devices, select your desired device.
9. If a message appears stating the driver is already installed on the system, and asks if you want to use the current or new drivers, be sure to select the **New** button.
12. If prompted for the driver disk a second time, click on the **Continue** button.  
*(Notice: In some cases the system will ask you to insert Windows NT CD. Follow its instructions to complete the setup procedures.)*
13. When the message **The drivers were successfully installed** is displayed, remove the display driver disk, then click on the **OK** button.
14. Reboot the system.

# APPENDIX A

## **Programming the Watchdog Timer**

SBC-657 is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a stand-still for whatever reason. This feature ensures system reliability in industrial stand-alone and unmanned environments.

## Programming the watchdog timer

---

An on-board watchdog timer reduces the chance of disruptions which CPLD (compact programmable logical device) interference can cause. This is a valuable protective device for standalone or unmanned applications. When the watchdog timer activates(CPU processing has come to a halt), it can reset the system, or generate an interrupt on IRQ10, IRQ11, IRQ15, and NMI. This can be set via I/O Port 444, the functions as following:

0 :	RESET
1 :	NMI
2 :	IRQ10
3 :	IRQ11
4 :	IRQ15

If you decide to program the watchdog timer, you must write data to I/O port 443 (hex). The output data is a value timer. You can write from 00 (hex) to FF (hex) for input second data, and the related timer is 10 seconds to 255 seconds.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should write I/O port 80 (hex) a Hex value.

The following procedure is a sample program for the watchdog timer:

- Type C:\DOS\Debug <ENTER>
- To start watchdog timer and set function "Reset" type;
  - o 444 0 <Enter>; out 444h data 0
- To input Watchdog timers time-out interval of 5 seconds type;
  - o 443 05 <Enter>; out 443h data 05
- To disable the watchdog timer type;
  - i 80 <Enter>

The time interval data of the watchdog timer is shown in binary code (8 bits).

Sample 2 : 5 seconds

0	0	0	0	0	1	0	1
---	---	---	---	---	---	---	---