

## **SBC-659 Rev. B**

Intel® Tualatin, Pentium® III

Half-size CPU Card

With Intel 815E chipset,

Dual LAN, Audio, Dual

COMs, LCD & 4 USB.

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## Packing List

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

- 1 SBC-659 Half- size Single Board Computer Card
- 1 Quick Installation Guide
- 1 Support CD contains the followings:
  - ✓ User's Manual (this manual in PDF file)
  - ✓ Ethernet driver and utilities
  - ✓ VGA driver and utilities
  - ✓ Audio driver and utilities
- 1 Floppy disk drive interface cable (34-pin, pitch 2.0mm)
- 1 IDE hard disk drive cable (40-pin, pitch 2.54mm)
- 1 parallel port (26-25-pin, pitch 2.0mm) and serial port (10-9 pin, pitch 2.0mm) adapter kit.
- 1 bag of screws and miscellaneous parts

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

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Chapter

1

**General  
Information**

## 1.1 Introduction

---

If your requirements for a single board computer consist of a half-sized footprint, dual Ethernet, pure PCI interface and Intel quality logic chipset, then SBC-659 is the solution. This half-sized single board computer is ideal for Internet data access server.

The dual Ethernet socket ensures consistent high server throughput and transparent backup connections in corporate servers. Two RJ-45 connectors controlled by two separate chipsets, Intel 815E and Intel 82559GD both offering 10/100Base Ethernet interface.

The processors used on this single board computer may vary, however to acquire the full potential of this embedded computer we suggest Intel Celeron or Pentium III offering 300~766MHz (With system bus frequencies of 66 MHz), 450-850 MHz (With system bus frequencies of 100MHz), or 533-1.4 GHz (With system bus frequencies of 133MHz). But the board cannot support 0.25u CPU. The logic chipset onboard is entirely Intel, controlling the LCD, LAN and audio functions.

This half-sized board features our first built in audio interface, supporting microphone in, line in/out, speaker out and CD in capabilities. Codec job tasking are performed by ALC 200 chip. The VGA has a display memory size of 4MB, supporting non-interlaced CRT and up to 18/36-bit LCD through DVI/DVO module.

On the solder side we offer a 144-pin SODIMM socket providing a maximum of 256MB of memory. A compact flash connector is provided

onboard. For expansion modules a PCI-104 connector is integrated into this half-sized card.

SBC-659 supports one IDE device, dual floppy disk, four USB ports onboard, two RS-232 serial ports and of which one can be configured as RS-232/422/485. The single bi-directional parallel ports can support SPP, ECP and EPP modes. The standard ATX power connector enables this half sized SBC to be operated without a backplane if necessary.

## 1.2 Features

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- Supports Intel Celeron /Pentium III FC-370 CPUs, but 0.25u CPU is the exception
- High Speed AGP 2X for VGA function onboard (Intel 815E built in)
- Two 10/100 Base-T Fast Ethernet (Intel 815 E built in and Intel 82559GD)
- Supports H/W status monitoring
- Integrated AC-97 2.1 SoundBlaster compatible PCI 3D Audio
- Onboard Intel 815E controller supports 18/36-bit TFT panel
- Supports Compact Flash Memory
- Supports PCI-104 modules
- Four USB ports onboard
- Two COM ports onboard
- DVI interface onboard
- Pure PCI interface, supports ISA through backplane

## 1.3 Specifications

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### System

- CPU: Tualatin, PIII, Celeron, and compatible CPUs, but can't support 0.25u CPU (With system bus frequencies of 66/100/133MHz)
- CPU socket: 370 pins Socket
- BIOS: Award 2 MB Flash BIOS
- Chipset: Intel 815E
- I/O chipset: ITE IT8712F.
- Memory: Onboard one 144 pins SODIMM socket supports up to 256Mbytes SDRAM (PC-100/133 SDRAM supported).
- Enhanced IDE: One IDE channel. Support Ultra DMA/ 100 mode with data transfer rate of 100MB/sec.
- FDD interface: Supports two floppy disk drives, 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB).
- Parallel port: One bi-directional parallel ports. Supports SPP, ECP, and EPP modes.
- Serial port: Two RS-232 serial ports can be configured as COM1, COM2, COM3,

COM4, or disabled individually and of which one and be configured as RS-232/422/485 (COM2). (16C550 equivalent).

- IRDA interface: Supports SIR and CIR
- KB/Mouse connector: 6-pin mini-DIN connector supports PC/AT keyboard and PS/2 mouse and wake on KBD function.
- USB connectors: 10-pin onboard connector supports four USB ports.
- Battery: Lithium battery for data retention
- Watchdog timer: Can generate a system reset, IRQ15, or NMI. Software selectable time-out interval (1 sec. ~ 255 min., 1 sec./step)
- DMA: 7 DMA channels (8237 equivalent)
- Interrupt: 15 interrupt levels (8259 equivalent)
- Power management: Supports ATX power supply. I/O peripheral support power saving and doze/standby/suspend modes. APM 1.2 compliant.

## Mechanical and environmental

- Power supply voltage: +5V, -5V, +12V, -12V, +3.3V
- Operating temperature: 32 to 140o F (0 to 60o C)

- Board size: 7.3"(L) x 4.8"(W) (185mm x 122mm)
- Weight: 1.2 lb. (0.3 Kg)

## Chapter

# 2

## Quick Installation Guide

**Notice:**

*The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.*



## 2.1 Safety Precautions

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**Warning!**

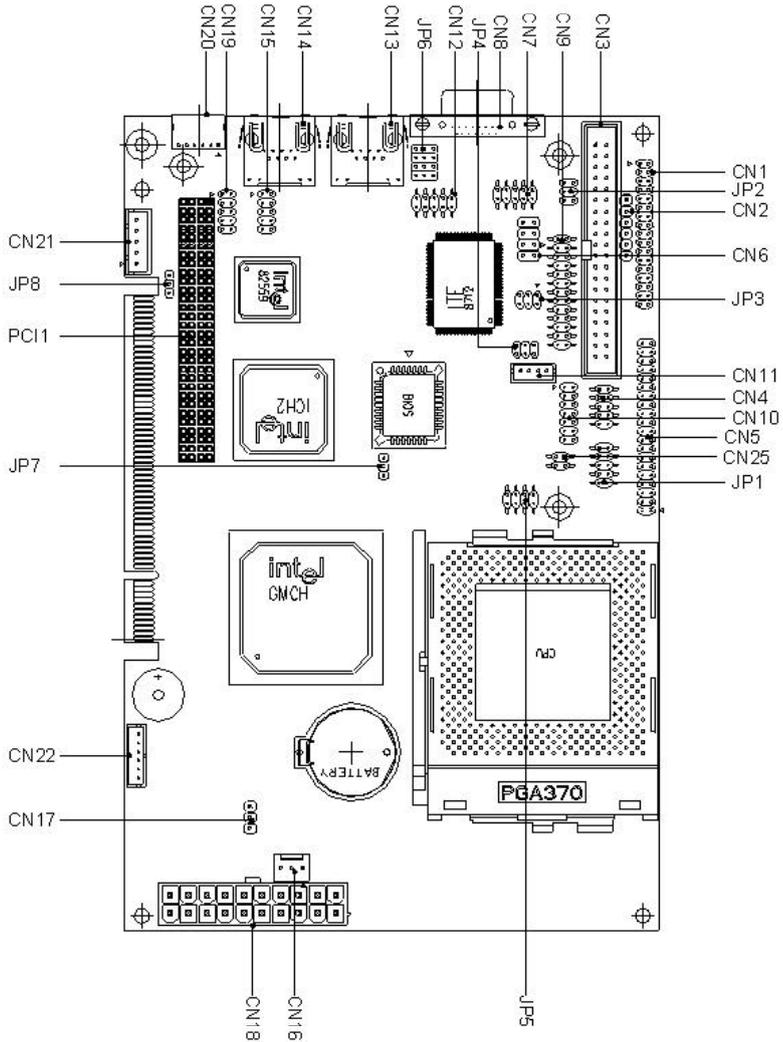
*Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

**Caution!**

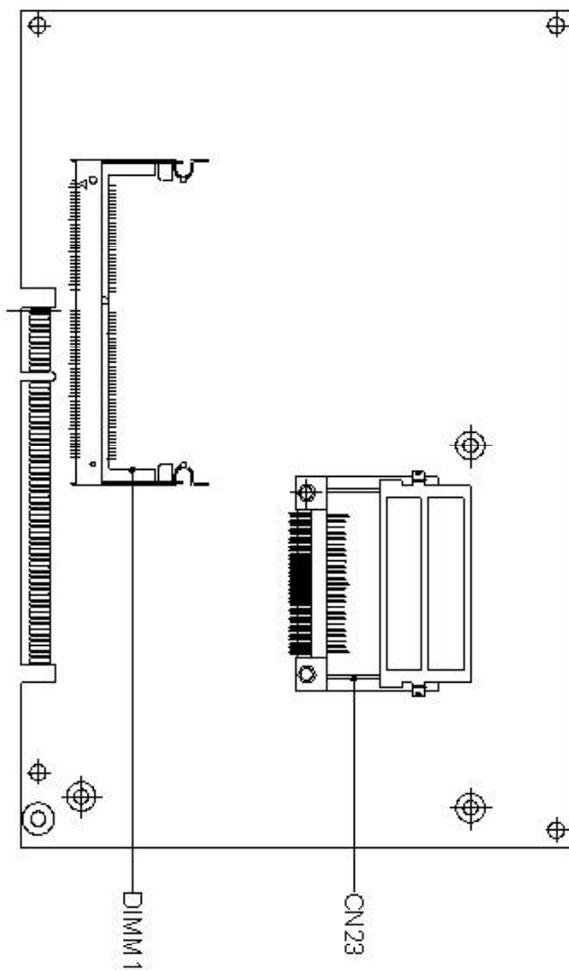
*Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

## 2.2 Location of Connectors and Jumpers

### Component Side

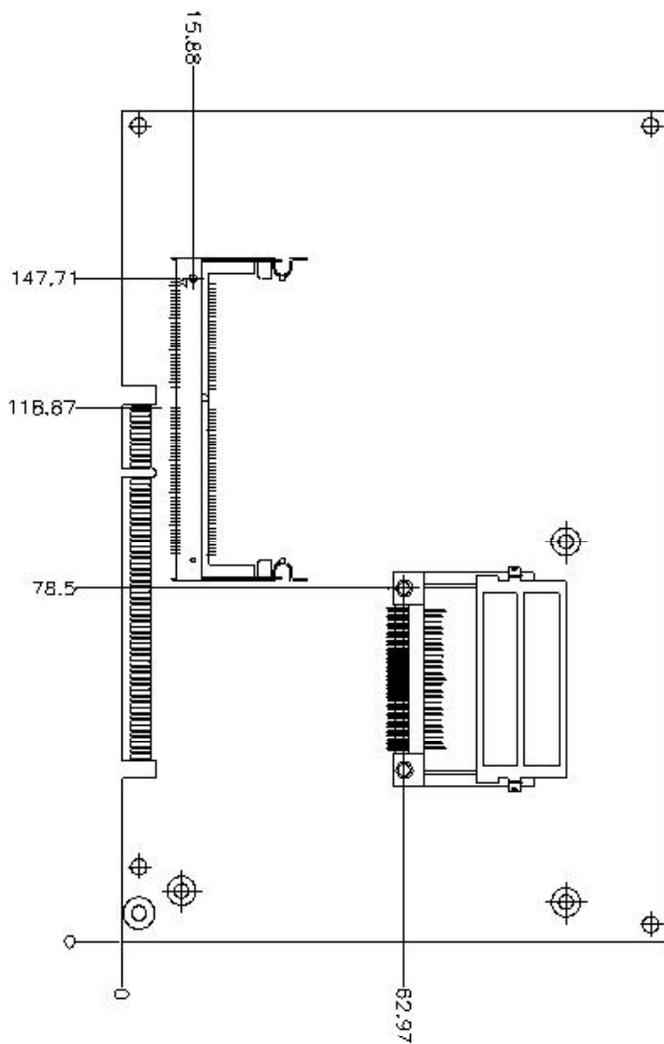


## Solder Side





## Solder Side



## 2.4 List of Jumpers

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The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

### Jumpers

Label	Function
DIMM 1	SO-DIMM
JP1 (1-2)	Front Panel (Power On)
JP1 (3-4)	Front Panel (IDE Driver LED)
JP1 (5-6)	Front Panel (External Speaker)
JP1 (7-8)	Front Panel (Case Open)
JP1 (9-10)	Front Panel (Reset)
JP2	COM2 Ring / +5V / +12V Select
JP3	COM2 RS-232 / 422 485 Select
JP4	Audio Out Select
JP5 (1-2, 3-4)	FSB Auto Select
JP5 (5-6, 7-8)	FSB Manual Select
JP6	COM2 RS-232 / 422 / 485 Select
JP7	Clear CMOS
JP8	PCI-104 Voltage Select

## 2.5 List of Connectors

---

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

### Connectors

Label	Function
CN1	Floppy Drive Connector
CN2	IrDA Connector
CN3	IDE Hard Drive Connector
CN4	Digital I/O Connector
CN5	Digital Visual Interface Connector
CN6	External LAN LED Indicator Connector
CN7	COM1 RS-232 Serial Port Connector
CN8	VGA Display Connector
CN9	Parallel Port Connector
CN10	Audio Connector
CN11	Audio Out Connector (1 Watt)
CN12	COM2 RS-232 / 422 / 485 Serial Port Connector
CN13	100 Base-Tx Ethernet Connector
CN14	100 Base-Tx Ethernet Connector
CN15	USB 1-2 Connector
CN16	CPU Fan Power Connector
CN17	North Bridge Fan Power Connector
CN18	ATX Power Connector
CN19	USB 3-4 Connector
CN20	Keyboard and PS/2 Mouse Connector
CN21	Internal Keyboard Connector
CN22	External Power On Connector

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CN23	Compact Flash Connector
CN24	Wake On Lan Connector
CN25	Watchdog Timer Connector

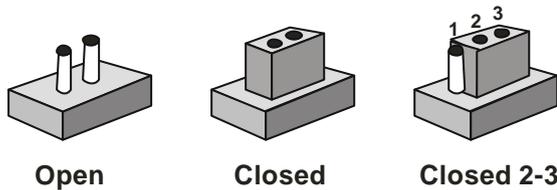
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## 2.6 Setting Jumpers

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You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of 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 you connect the pins with the clip.

To “open” a jumper you 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.



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 application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

## 2.7 Front Panel (JP1)

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<b>JP1</b>	<b>Function</b>
1-2	GND / Power on Button
3-4	IDE LED- / IDE LED+
5-6	Speaker- / Speaker+
7-8	Case Open / GND
9-10	Reset Switch- / GND

## 2.8 Audio Out (JP4)

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<b>JP2</b>	<b>Function</b>
1-2, 3-4	Non- Amplifier (Default)
3-4, 5-6	Amplifier

## 2.9 COM2 Ring/+5V/+12V Selection (JP2)

---

<b>JP3</b>	<b>Function</b>
1-2	+12V
3-4	+5V
5-6	Ring

## 2.10 COM2 RS-232/422/485 Setting (JP3&JP6)

---

JP3	JP6	Function
1-2	1-2, 4-5, 7-8, 10-11	RS-232 (Default)
3-4	2-3, 5-6, 8-9, 11-12	RS-422
5-6	2-3, 5-6, 8-9, 11-12	RS-485

## 2.11 FSB Select (JP5)

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JP5	Function
1-2, 3-4	Auto Select (Default)
7-8	CPU/100MHz, SDRAM/100MHz
5-6	CPU/133MHz, SDRAM/133MHz
5-6, 7-8	CPU/66MHz, SDRAM/100MHz

## 2.12 Clear CMOS (JP7)

---

You can use JP7 to clear the CMOS data if necessary. To reset the CMOS data, place a jumper on JP7 (Clear CMOS) for just a few seconds, and then remove the jumper to the (Protect) position.

JP7	Function
1-2	Protect (Default)
2-3	Clear CMOS

### 2.13 PCI-104 Voltage Select (JP8)

---

You can use JP8 to set the voltage input/output at 5 volts or 3.3volts.

JP8	Function
1-2	5V
2-3	3.3V

### 2.14 Floppy Drive Connector (CN1)

---

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT
3	GND	4	N.C.
5	GND	6	N.C.
7	GND	8	INDEX
9	GND	10	MOTOR A
11	GND	12	DRIVE SELECT B
13	GND	14	DRIVE SELECT A
15	GND	16	MOTOR B
17	GND	18	DIRECTION
19	GND	20	STEP
21	GND	22	WRITE DATA
23	GND	24	WRITE GATE
25	GND	26	TRACK 0
27	GND	28	WRITE PROTECT
29	N.C.	30	READ DATA
31	GND	32	SIDE 1
33	N.C.	34	DISK CHANGE

## 2.15 IrDA Connector (CN2)

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The IrDA connector (CN2) can be configured to support wireless infrared modules. With this module and application software such as laplink or Win95, Direct Cable connection can transfer files between laptops, notebooks, PDA and printers. This connector supports HPSIR ( 115.2Kbps, 2 meters ), (ASK-IR ( 56Kbps ) and fast IR (4Mbps, 2 meters). Install infrared module onto IrDA connector and enabled infrared function from BIOS setup, make sure to have correct orientation when you plug onto IRDA connector (CN2).

Pin	Signal
1	+5V
2	CIRTX
3	IRRX
4	GND
5	IRTX
6	CIRRX

## 2.16 IDE Hard Drive Connector (CN3)

---

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15

19	SIGNAL GND	20	N.C.
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	GND
29	DACK	30	GND
31	IRQ 14	32	N.C.
33	ADDR 1	34	ATA66DETECT
35	ADDR 0	36	ADDR 2
37	CS#1	38	CS#3
39	IDEACTP	40	GND

## 2.17 Digital I/O Connector (CN4)

SBC-659 offers 4 bit TTL Input / Output digital I/O functions. Input 801H; GPI27 [bit1], GPI26[bit2], GPI25[bit3], GPI24[bit4] and Output 801H; GPO23[bit1], GPO22[bit2], GPO21[bit3], GPO20[bit4]. With the input and output consisting of the following:

Pin	Signal	Pin	Signal
1	IN1	2	IN2
3	IN3	4	IN4
5	OUT1	6	OUT2
7	OUT3	8	OUT4
9	+5V	10	GND

## 2.18 Digital Visual Interface Connector (CN5)

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Pin	Signal	Pin	Signal
A1	FTCLK 0	B1	FTD 0
A2	FTCLK 1	B2	FTD 1
A3	CRT-HSYNC	B3	FTD 2
A4	FTBLNK	B4	GND
A5	FTHSYNC	B5	FTD 3
A6	FTVSYNC	B6	FTD 4
A7	SL_STALL	B7	FTD 5
A8	GND	B8	CRT_VSYNC
A9	3VFTSCL	B9	FTD 6
A10	3VFTSDA	B10	FTD 7
A11	3VHTPLG	B11	FTD 8
A12	+5V	B12	VEE_OK
A13	PCIRST	B13	FTD 9
A14	+12V	B14	FTD 10
A15	FPVDDEN	B15	FTD 11
A16	GND	B16	+3.3V
A17	GPO22	B17	+3.3V
A18	SMBDATA	B18	GND
A19	SMBCLK	B19	+3.3V
A20	+5V	B20	FPBKLENR

## 2.19 External LAN LED Indicator Connector (CN6)

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Pin	Signal
1	Active
2	Link
3	Speed
4	VCC3
5	Active
6	Link
7	Speed
8	VCC3

## 2.20 VGA Connector (CN8)

---

The mainboard's PCI SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD, and active LCD displays. The board has two connectors to support these displays, one for standard CRT VGA monitors and one for flat panel displays.

### VGA display connector (CN8)

CN1 is a 15-pin, dual-in-line header used for conventional CRT displays. A simple one-to-one adapter can be used to match CN8 to a standard 15-pin D-SUB connector commonly used for VGA.

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	DDCSDA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	DDCSCL
8	GND	16	N.C.

## 2.21 Parallel port Connector (CN9)

---

Normally, the parallel port is used to connect the board to a printer. The SBC-659 includes an onboard parallel port, accessed through CN9, a 26-pin flat-cable connector. A traditional DB-25 connector cable is needed to install the printer to the board. The cable has a 26-pin connector on one end and a DB-25 pin connector on the other.

### Parallel port IRQ

The onboard parallel port is designated as LPT1 and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

Pin	Signal	Pin	Signal
1	STROBE	14	AFD
2	PTD 0	15	ERROR
3	PTD 1	16	INIT
4	PTD 2	17	SLIN
5	PTD 3	18	GND
6	PTD 4	19	GND
7	PTD 5	20	GND
8	PTD 6	21	GND
9	PTD 7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT	26	N.C.

## 2.22 Audio Connector (CN10)

On board SBC-659, there is a 14-pin header for audio capability. The pin definition is provided below.

Pin	Signal	Pin	Signal
1	MIC IN	2	MIC VCC
3	GND	4	CD GND
5	LINE IN L	6	CD IN L
7	LINE IN R	8	CD GND
9	GND	10	CD IN R
11	LINE OUT L	12	LINE OUT R
13	GND	14	GND

### 2.23 Audio Out Connector 1 Watt (CN11)

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Pin	Signal
1	OUT L+
2	OUT L-
3	OUT R+
4	OUT R-

### 2.24 COM1 & COM2 Serial Ports (CN7 & CN12)

---

On board offer two serial ports for serial devices connection. Pin definitions show as below.

#### COM1 RS-232 (CN7)

Pin	Signal	Pin	Signal
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	R1	10	N.C.

#### COM2 RS-232/422/485 (CN12)

Pin	Signal	Pin	Signal
1	DCD2 (422TXD-/485DATA-)	2	RXD2 (422RXD+)
3	TXD2 (422TXD+/485DATA+)	4	DTR2 (422RXD-)
5	GND	6	DSR2

7	RTS2	8	CTS2
9	R1/ +5v/ +12v	10	N.C.

## 2.25 100Base-Tx Ethernet Connector (CN13, 14)

Onboard supports one standard RJ-45 connector for Ethernet connection. The RJ-45 connector has two LED indicators. Both LED displays indicate the speed of information being processed, however the LAN speed does vary.

\* The on board Intel 82559XX fast Ethernet controller supports 10Mb/s and 100Mb/s N-way auto-negotiation operation.

### 100Base-Tx Ethernet connector (CN14)

Pin	Signal	Pin	Signal
1	TX1+	9	N.C.
2	TX1-	10	N.C.
3	RX1+	11	GND
4	N.C.	12	GND
5	N.C.	13	ACTIVE LED
6	RX1-	14	LINK LED
7	N.C.	15	+3.3V
8	N.C.	16	SPEED LED`

### 100Base-Tx Ethernet connector (CN13)

Pin	Signal	Pin	Signal
1	TX+	9	N.C.
2	TX-	10	N.C.
3	RX+	11	GND
4	N.C.	12	GND
5	N.C.	13	ACTIVE LED

6	RX-	14	LINK LED
7	N.C.	15	+3.3V
8	N.C.	16	SPEED LED`

## 2.26 USB Connector (CN15, CN19)

The SBC-659 provides four USB (Universal Serial Bus) interfaces, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interfaces comply with USB specification Rev. 1.0, and can be disabled in the system BIOS setup.

### USB 0-1 connector (CN15)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD0-	4	GND
5	USBD0+	6	USBD1+
7	GND	8	USBD1-
9	GND	10	+5V

### USB 2-3 connector (CN19)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD2-	4	GND
5	USBD2+	6	USBD3+
7	GND	8	USBD3-
9	GND	10	+5V

## 2.27 CPU Fan Power Connector (CN16)

---

Plug in the fan cable to the 3-pin fan connector onboard. The fan connector is marked CN16.

Pin	Signal
1	GND
2	+12V
3	Fan speed sensor

## 2.28 Power Connector (CN18)

---

### ATX power connector (CN18)

The ATX power supply uses 20-pin connector shown below. Make sure you plug in the right direction.

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

### 2.29 PS/2 Keyboard and Mouse Connector (CN20)

---

On board SBC-659, there is a standard 6-pin header for PS/2 keyboard and mouse connector. The pin definition is provided below.

Pin	Signal	Pin	Signal
1	MS CLOCK	2	KB CLOCK
3	+5V	4	GND
5	KB DATA	6	MS DATA
7	N.C.	8	N.C.

### 2.30 Internal Keyboard Connector (CN21)

---

On board SBC-659, there is a 5-pin header for internal keyboard connection. The pin definition is provided below.

Pin	Signal
1	CLK
2	DATA
3	N.C.
4	GND
5	+5V

### 2.31 External Power On Connector (CN22)

---

On board SBC-659, there is a 6-pin header for external power on function. The pin definition is provided below.

Pin	Signal
1	N.C.
2	GND
3	N.C.
4	GND

---

 5 PS-ON
 

---

 6 5VSB
 

---

### 2.32 Compact Flash Connector (CN23)

---

Pin	Signal	Pin	Signal
1	GND	26	GND
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
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	DATA 8
23	DATA2	48	DATA 9
24	N.C.	49	DATA10
25	GND	50	GND

---

### 2.33 Wake On Lan Connector (CN24)

---

---

Pin	Signal	Pin	Signal
1	+5V		
2	GND		
3	WOL		
4	SMBDATA		
5	SMBCLK		

---

### 2.34 Watchdog Timer Connector (CN25)

---

---

Pin	Signal
1	+5V
2	+3.3V
3	WDRST
4	GND

---

Chapter

3

**Award  
BIOS Setup**

### 3.1 System test and initialization

---

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

#### **System configuration verification**

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The SBC-659 REV. B CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

## 3.2 Award BIOS Setup

---

Awards 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 RAM so that it retains the Setup information when the power is turned off.

### **Entering setup**

Power on the computer and press <Del> immediately. This will allow you to enter Setup.

### **Standard CMOS Features**

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

### **Advanced BIOS Features**

Use this menu to set the advanced features available on your system.

### **Advanced Chipset Features**

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

### **Integrated Peripherals**

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

### **Power Management Setup**

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

### **PnP/PCI Configurations**

This entry appears if your system supports PnP/PCI.

### **PC Health Status**

This menu allows you to set the shutdown temperature for your system.

### **Frequency/Voltage Control**

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

### **Load Optimized Defaults**

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

### **Set Supervisor/User Password**

Use this menu to set Supervisor/User Passwords.

### **Save and Exit Setup**

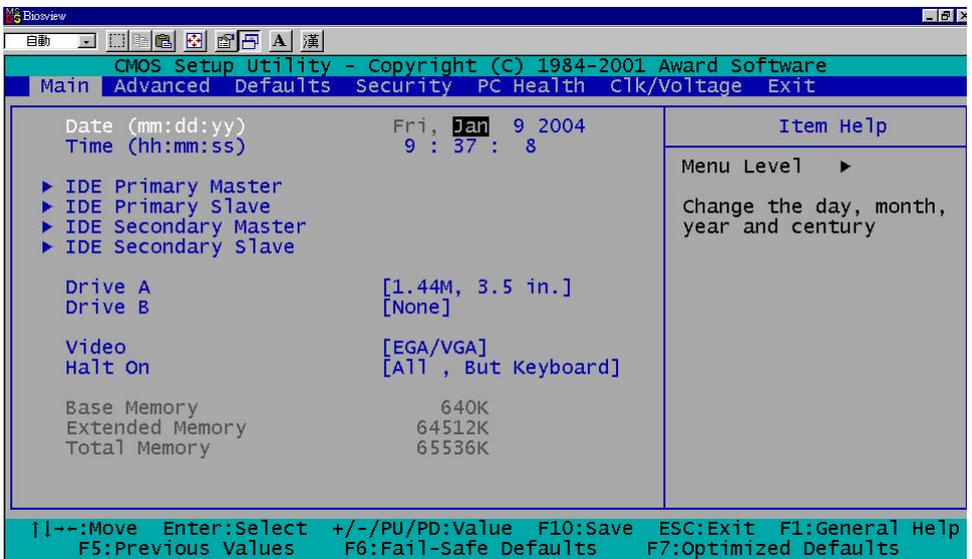
Save CMOS value changes to CMOS and exit setup.

### **Exit Without Saving**

Abandon all CMOS value changes and exit setup.

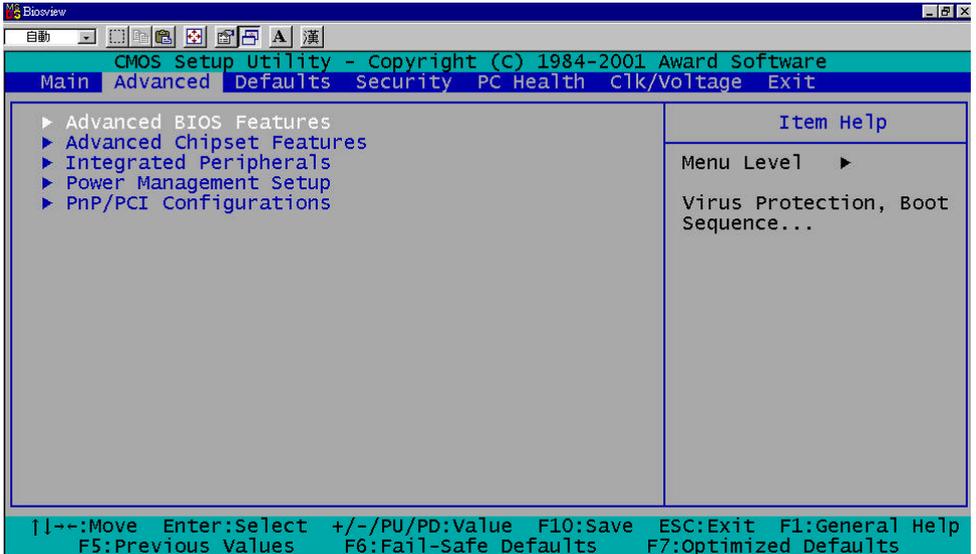
### 3.3 Standard CMOS Features

When you choose the Standard CMOS Features option from the INITIAL SETUP SCREEN menu, the screen shown below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the right box of the Menu screen.



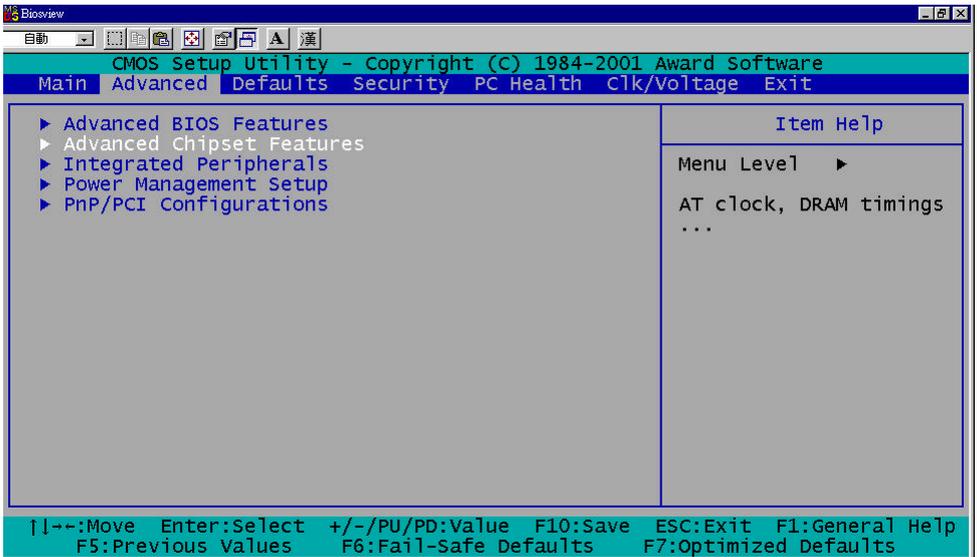
### 3.4 Advanced BIOS Features

By choosing the Advanced BIOS Features option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 REV. B



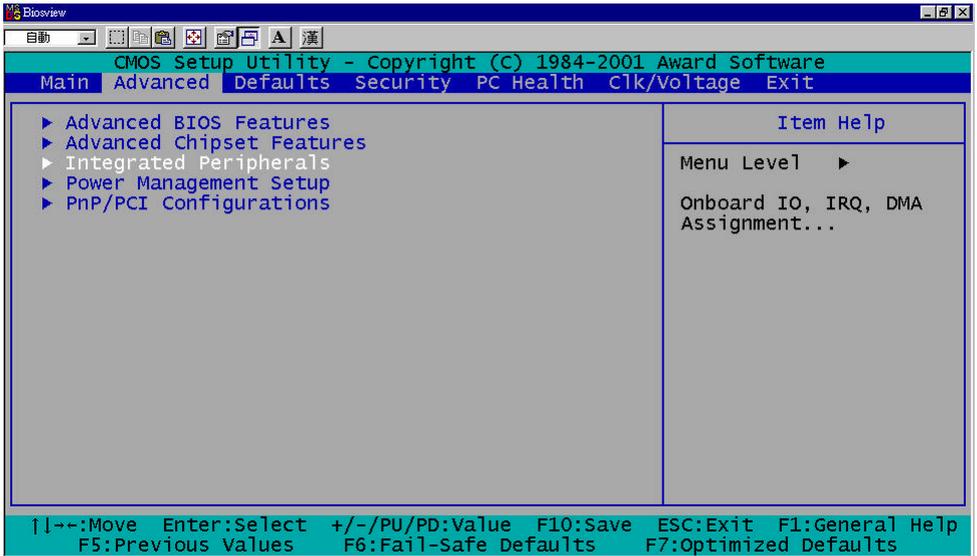
### 3.5 Advanced Chipset Features

By choosing the Advanced Chipset Features option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 REV. B.



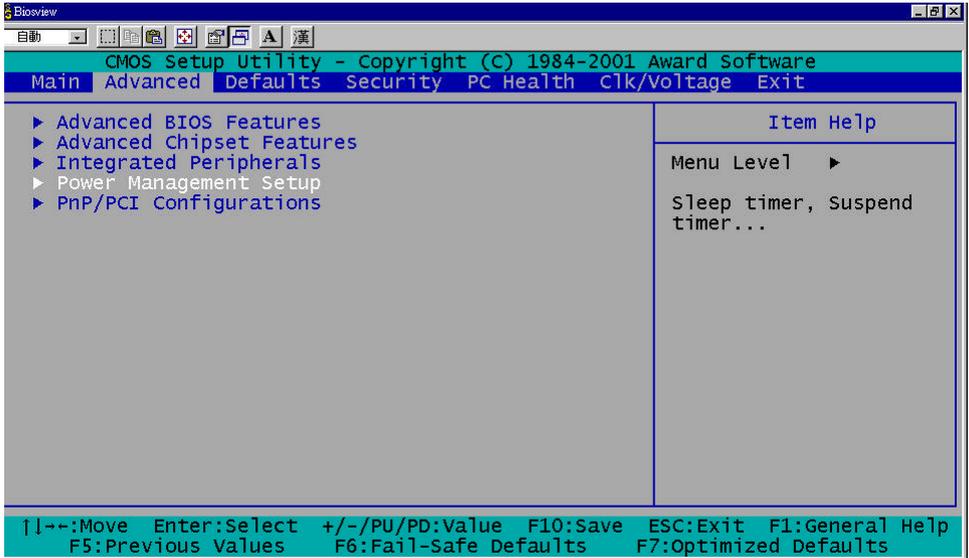
### 3.6 Integrated Peripherals

By choosing the Integrated Peripherals from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 REV. B.



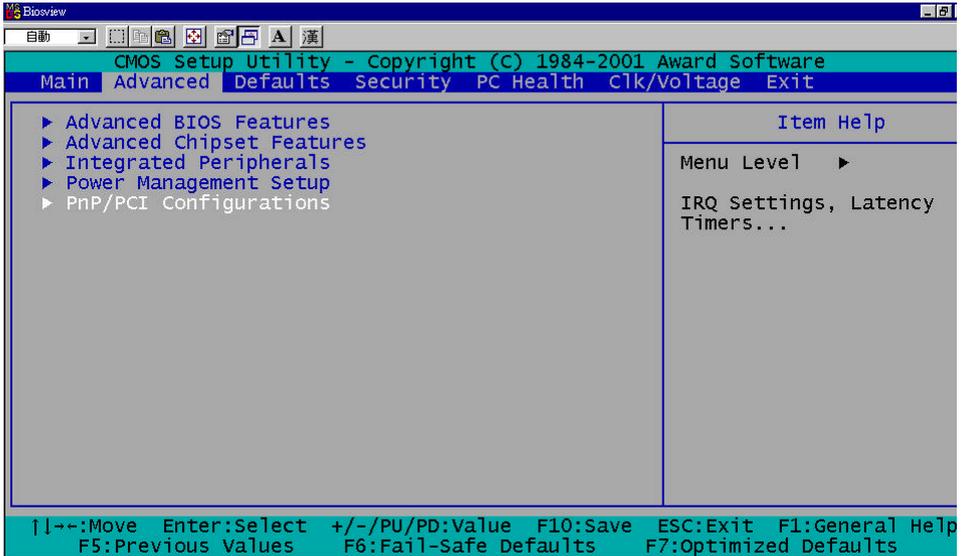
### 3.7 Power management Setup

By choosing the Power Management Setup from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 Rev. B.



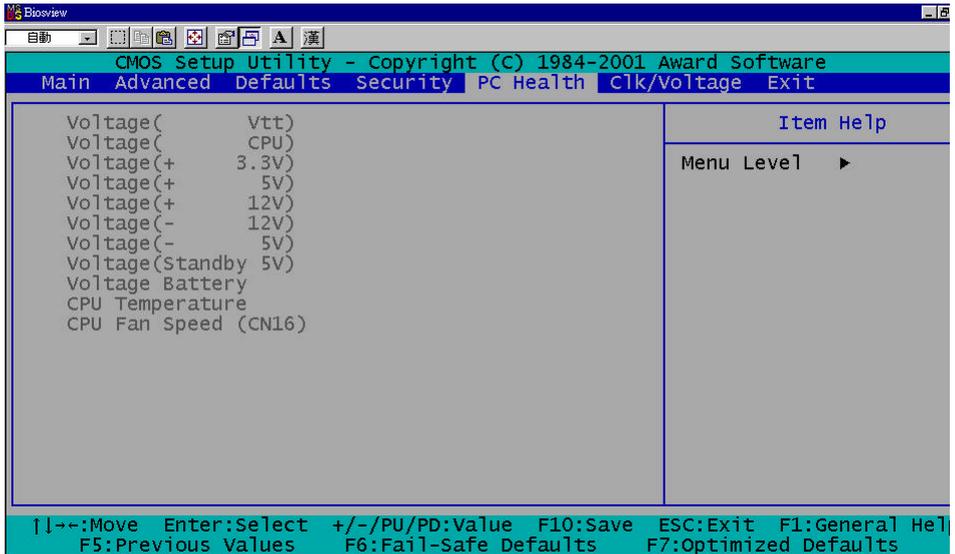
### 3.8 PnP/PCI configuration

By choosing the PnP/PCI configurations from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 REV. B.



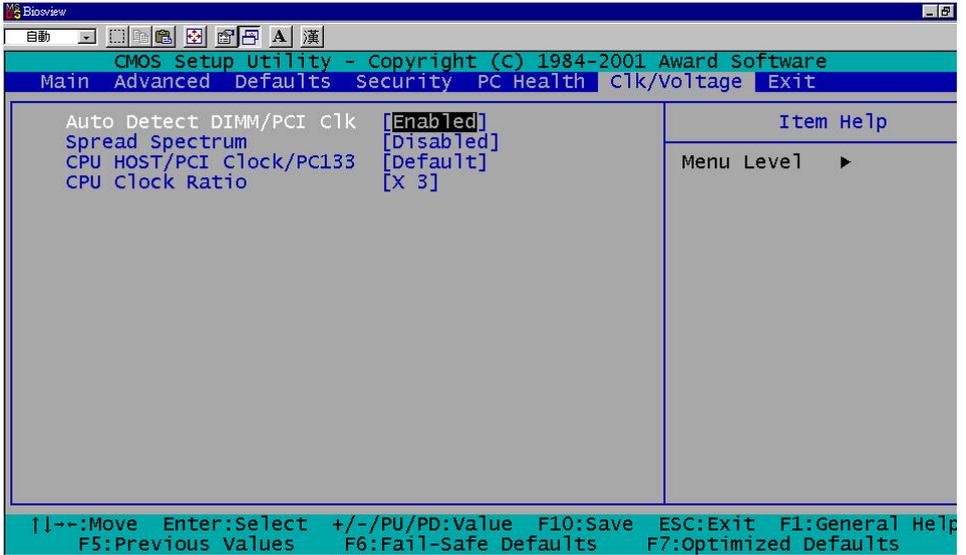
### 3.9 PC Health Status

By choosing the PC Health Status from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 REV. B.



### 3.10 Frequency/Voltage control

By choosing the Frequency/Voltage Control from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the SBC-659 REV. B.

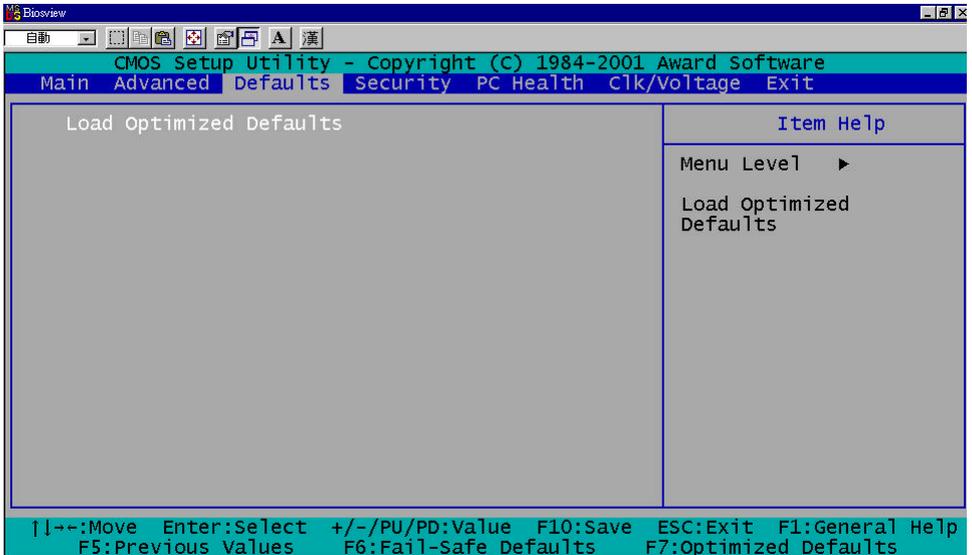


### 3.11 Load Optimized Defaults

---

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

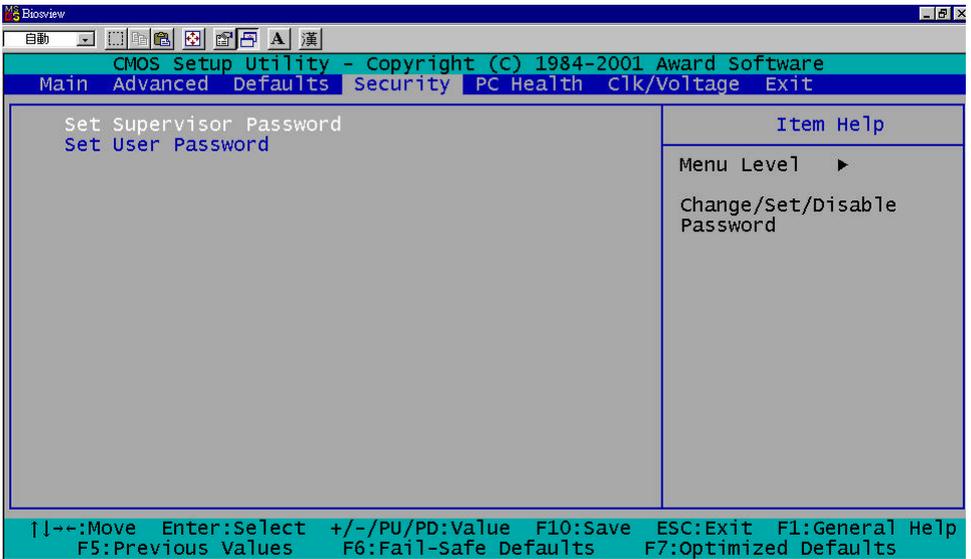
Load Optimized Defaults (Y/N)?



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

### 3.12 Set Supervisor/User Password

You can set either SUPERVISOR or USER PASSWORD, or both of them. The difference between the two is that the supervisor password allows unrestricted access to enter and change the options of the setup menus, while the user password only allows entry to the program, but not modify options.



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.

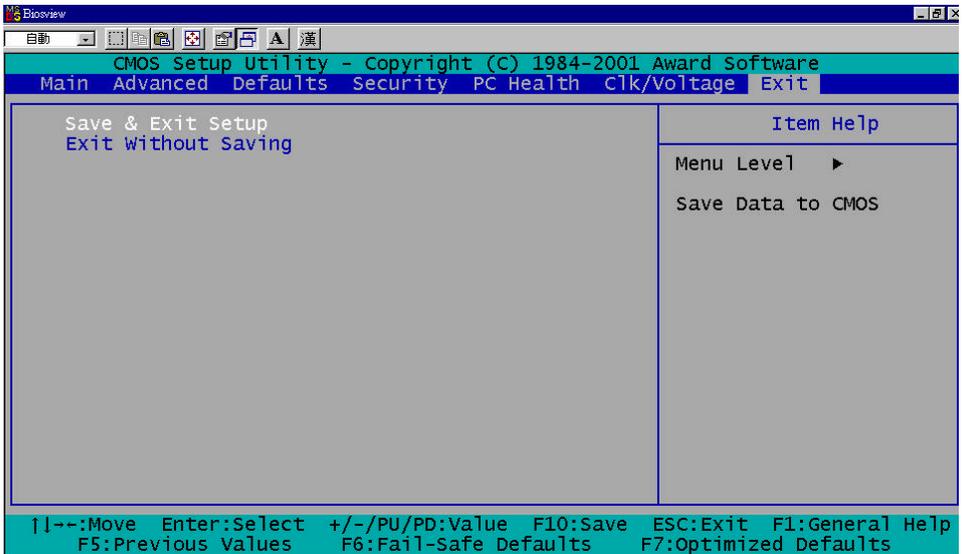
**Setup** Enter a password whenever you enter Setup.

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

### 3.13 Save & Exit Setup

---

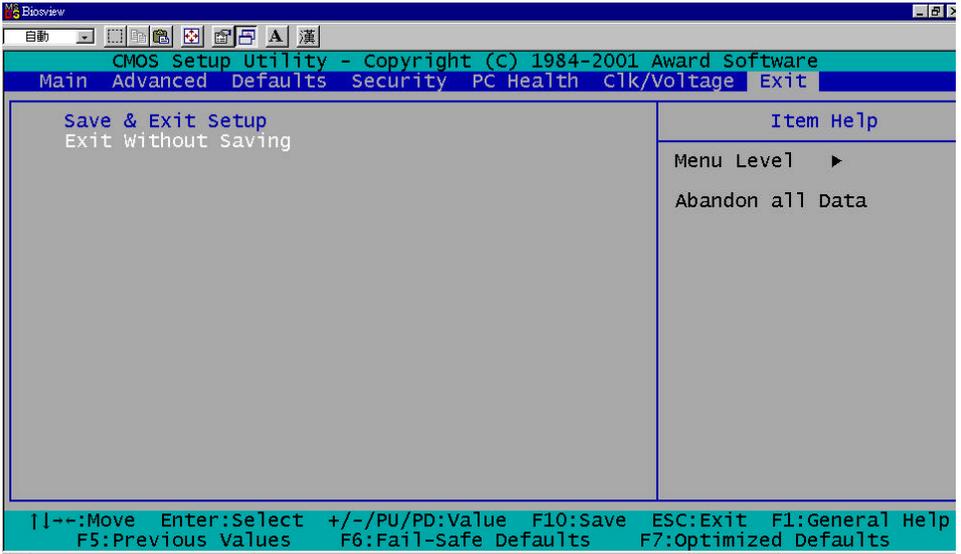
If you select this option and press <Enter>, the values entered in the setup utilities will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn on your system and compare this to what it finds as it checks the system. This record is required for the system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



### 3.14 Exit without saving

---

Selecting this option and pressing <Enter> allows you to exit the Setup program without recording any new value or changing old one.



Chapter

4

**Driver  
Installation**

The SBC-659 REV. B comes with a CD-ROM that contains most of drivers and utilities of your needs.

There are several installation ways depending on the driver package under different Operating System application.

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.

***Please follow the sequence below to install the drivers:***

Step 1 – Install Intel INF Update for Windows 98-XP

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

For installation procedures of each driver, you may refer to section 4.1-4.3.

## 4.1 Installation 1:

---

### **Applicable for Windows 2000/98/ME/NT 4.0**

1. Insert the SBC-659 REV. B CD-ROM into the CD-ROM Drive.
2. From the CD-ROM, select the desired component Driver folder, and then 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 onscreen 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 ROM 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 allow the system to reboot.

## 4.2 Installation 2:

---

### Applicable for Windows 2000/ 98/ME

1. Insert the **SBC-659 REV. B CD-ROM** into the CD-ROM Drive.
2. Click on **Start** button, select the **Settings**, and 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. Click on the **Next** button.
7. The system will ask you to insert Windows 98 CD ROM. Click on the **OK** button to insert CD-ROM and key in path.
8. Click on the **OK** button.
9. Click on the **Finish** button to finish installation process. And allow the system to reboot.

### 4.3 Installation 3:

---

#### Applicable for Windows NT 4.0

1. Insert the **SBC-659 REV. B CD ROM** 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** and 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.
10. If prompted for the driver diskette a second time, click on the **Continue** button.  
*(Notice: In some cases the system will ask you to insert Windows NT CD ROM. Follow its instructions to complete the setup procedures.)*
11. When the message "**The drivers were successfully installed**" is displayed, click on the **OK** button.
12. Reboot the system.

Appendix

A

# CompactFlash® Cover Installation Guide

## A.1 How to install the CompactFlash cover

---

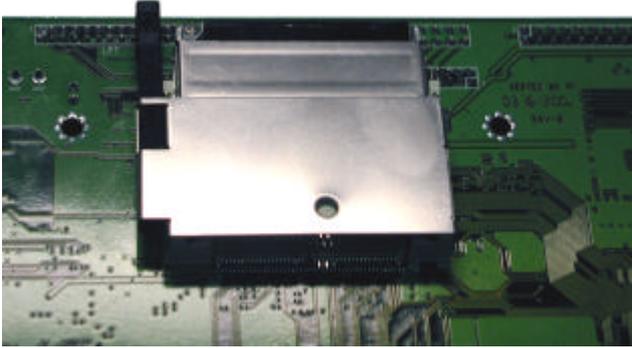
SBC-659 Rev. B is given a CompactFlash Card cover with the product. The purpose for the CompactFlash Card cover is to prevent users from dropping the CompactFlash Card under the condition of the delivery and system operation.

Please follow the steps below to install the CompactFlash Card cover. The instructions are simply for your reference which mean you may install the CompactFlash Card cover in the way you prefer.

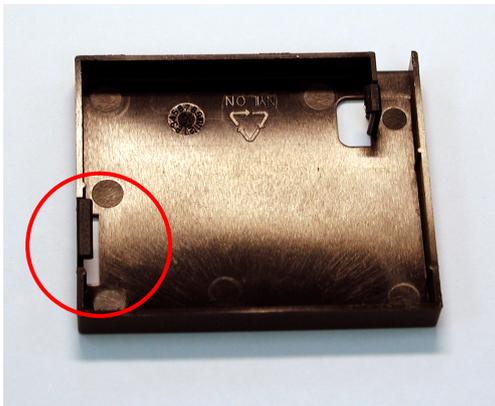
### Step 1: Plug in CompactFlash Card

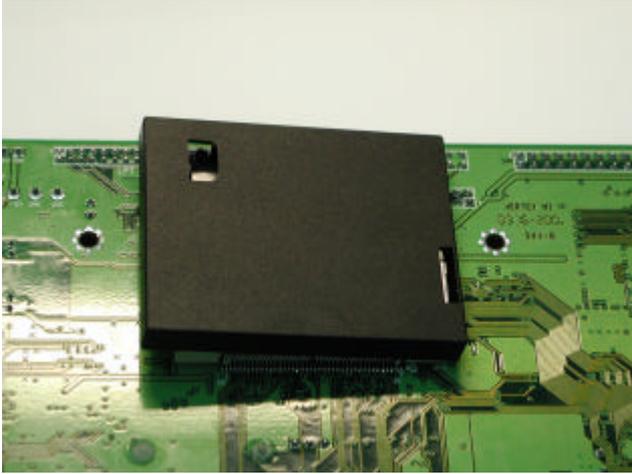


**Step 2: Push the CompactFlash Card forward until the end.**

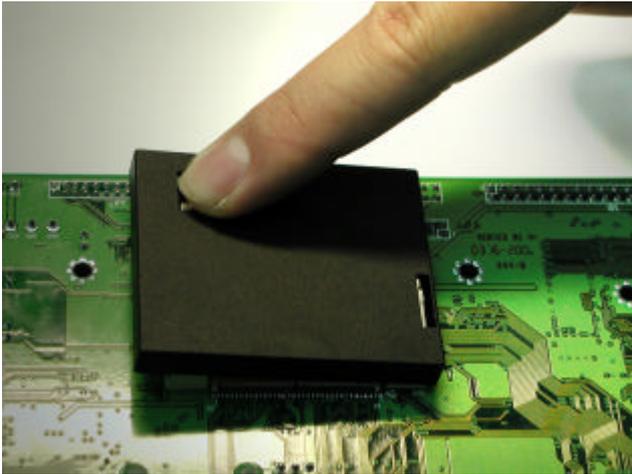


**Step 3: Put the cover on from the right to left and hook up the CompactFlash Card white base with the crook on the cover.**

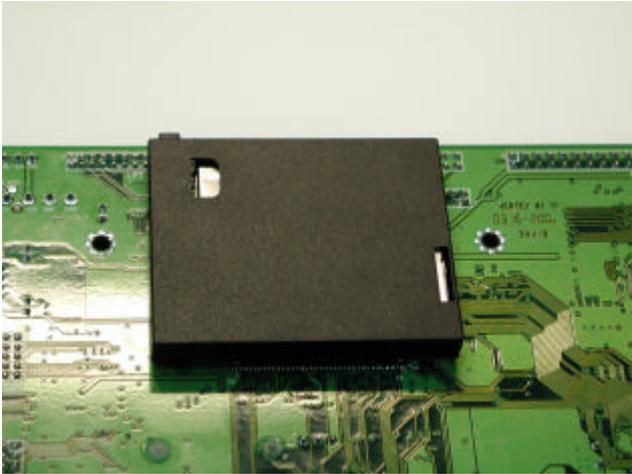




**Step 4: Press a little bit with the finger on the hole of the cover.**



**Step 5: Done**



## A.2 How to disassemble the CompactFlash cover

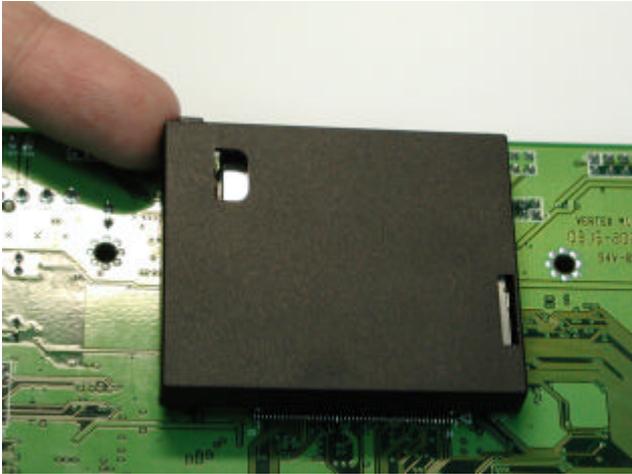
---

If you would like disassemble the CompactFlash Card, please follow the steps below. If you don't follow the regular steps to disassemble, the cover may suffer the permanent damage.

**Step 1: Pull the cover a little bit from the corner indicated.**



**Step 2: Pull the cover hard from the reverse corner indicated.**



In this way, the cover can be disassembled as easy as possible.

**Appendix**

**B**

**Programming the  
Watchdog Timer**

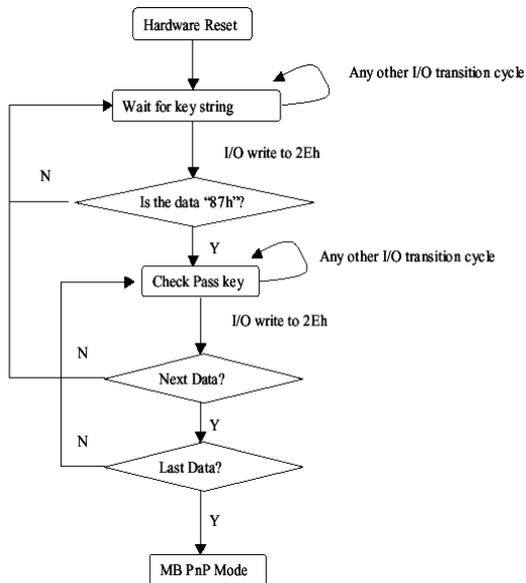
## B.1 Programming

SBC-659 Rev.B utilizes ITE 8712 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

### Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

### (1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2EH	2Fh

### (2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

### (3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

### WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

#### Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

**WatchDog Timer Control Register (Index=71h, Default=00h)**

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

**WatchDog Timer Configuration Register (Index=72h, Default=00h)**

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level <sup>Note</sup> for WDT

**WatchDog Timer Time-out Value Register (Index=73h, Default=00h)**

Bit	Description
7-0	WDT Time-out value 7-0

## B.2 IT8712 Watchdog Timer Initial Program

---

```
.MODEL SMALL
```

```
.CODE
```

Main:

```
CALL Enter_Configuration_mode
```

```
CALL Check_Chip
```

```
mov cl, 7
```

```
call Set_Logic_Device
```

```
;time setting
```

```
mov cl, 10 ; 10 Sec
```

```
dec al
```

Watch\_Dog\_Setting:

```
;Timer setting
```

```
mov al, cl
```

```
mov cl, 73h
```

```
call Superio_Set_Reg
```

```
;Clear by keyboard or mouse interrupt
```

```
mov al, 0f0h
```

```
mov cl, 71h
```

```
call Superio_Set_Reg
```

```
;unit is second.
```

```
mov al, 0C0H
```

```
mov cl, 72h
```

```
call Superio_Set_Reg
```

```
; game port enable
mov cl, 9
call Set_Logic_Device
```

```
Initial_OK:
CALL Exit_Configuration_mode
MOV AH,4Ch
INT 21h
```

```
Enter_Configuration_Mode PROC NEAR
MOV SI,WORD PTR CS:[Offset Cfg_Port]
```

```
MOV DX,02Eh
MOV CX,04h
Init_1:
MOV AL,BYTE PTR CS:[SI]
OUT DX,AL
INC SI
LOOP Init_1
RET
Enter_Configuration_Mode ENDP
```

```
Exit_Configuration_Mode PROC NEAR
MOV AX,0202h
CALL Write_Configuration_Data
```

RET

Exit\_Configuration\_Mode ENDP

Check\_Chip PROC NEAR

MOV AL,20h

CALL Read\_Configuration\_Data

CMP AL,87h

JNE Not\_Initial

MOV AL,21h

CALL Read\_Configuration\_Data

CMP AL,12h

JNE Not\_Initial

Need\_Initial:

STC

RET

Not\_Initial:

CLC

RET

Check\_Chip ENDP

Read\_Configuration\_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg\_Port+04h]

OUT DX,AL

```
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP
```

```
Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP
```

```
Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
```

```
Set_Logic_Device proc near
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp
```

```
;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
```

```
DW 02Eh,02Fh
```

## END Main

*Note: Interrupt level mapping*

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected