SBC-780

Pentium III Socket 370
Full-Size CPU Card
With LCD, Ethernet, Audio,
PCI-104 & CompactFlash™

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Packing List

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

- 1   SBC-780 Full-Size CPU Card

- 1   Quick Installation Guide

- 1   CD-ROM for manual (in PDF format), BIOS, and drivers

- 1   HDD Cable (ATA 66/100)

- 1   FDD Cable

- 1   Audio and COM Port Cable with bracket

- 1   LPT and COM Port Cable with bracket

- 1   Y-Cable (Keyboard and Mouse)

- 1   USB Cable with bracket

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

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Chapter 1 General Information

Chapter 2 Quick Installation Guide

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1.1 Introduction

The all-in-one SBC-780 single board computer series is designed for embedded applications where full features and performance are major concerns. The various CPU options support Intel Pentium III, Celeron (up to Tualatin 1.4GHz) and VIA C3 processors (up to 1.1GHz), SBC-780 series brings with its significant gains in performance. SBC-780 series is powered by with the VIA Twister-T system chipset.

An integrated AGP 4X 2D/3D graphics accelerator is also provided. With Dual channel LVDS interface, the SBC-780 series supports TFT-DSTN LCD displays and CRT monitor simultaneously. It also provides up to 1600x1200 resolution for CRT and 1024x768 resolution for LCD with UMA 32MB display memory.

Excellent connectivity is provided by embedded 10/100Mbps Fast Ethernet connection. Two DIMM slots for a total of 1GB RAM memory ensures that users have more than enough memory to handle leading applications. Moreover, one CompactFlash^{TM} Type II slot is supported as external storage. The SBC-780 series is fully functional, offering comprehensive I/O support, including 4 USB ports for connecting the latest peripherals. The SBC-780 series is equipped with the range of legacy ports, including a parallel port, an IrDA port, and an AC-97 2.1/SoundBlaster compatible audio.

1.2 Features

- Supports VIA C3 up to 1.1GHz & Intel CPU up to 1.4GHz (66/100/133MHz FSB)

- Integrated AGP 4X 2D/3D Graphics Accelerator share memory up to 32MB

- Supports CRT and 36-bit TTL/LVDS TFT/DSTN panels

- Integrated AC-97 2.1 / SoundBlaster – compatible legacy audio

- Supports Compact Flash Type II Storage

- Supports Dual 10/100Base-T Fast Ethernet (Single LAN option provided)

- Supports Ultra ATA-100 with data transfer rate up to 100 MB/Sec

- 2COMS / 1 Parallel / 4 USB / 1 IrDA Port

- PICMG 2.0 expansion interface and PCI-104

- Watchdog Timer

1.3 Specifications

System

- CPU   Socket 370, support VIA C3 up to
  1.1GHz & Intel Pentium III ∕ Celeron
  (Coppermine ∕ Tualatin) 66∕100∕133MHz
  FSB, supports up to 1.4GHz

- System Memory   168pin 3.3V SDRAM DIMM Socket x 2,
  total up to 1024MB PC133

- Chipset   VIA VT8606
  VIA VT82C686B

- IO Chipset   VIA VT82C686B

- BIOS   Award Plug & Play ISA BIOS – 2Mb

- Ethernet: Realtek 8139D, 10∕100Mbps x 2, use
  External RJ-45 Connector

- SSD   Supports CompactFlash™ Type II Slot
  (shared with secondary IDE, bootable)

- Watchdog timer   1~255sec, 64 level and can be set with
  software

- Expansion Interface: PICMG 2.0, PCI-104 interface

- Battery   3V Lithium battery

- DMA   7 DMA channels (8237 equivalent)

- Interrupt   15 interrupt levels (8259 equivalent)

- H/W status   Power supply voltages, fan speed,
  monitoring   and temperature monitoring

- Power supply voltage +5V (4.75V to 5.25V), +12V (11.4V to 12.6V), -5V (-4.75V to -5.25V), -12V (-11.4V to –12.6V), ATX/AT
- Size / Weight 13.3" (L) x 4.8" (W) (338mm x 122mm) 1.2lb (0.5kg)
- Operating temperature 32℉ to 140℉ (0℃ to 60℃)

I/O

- Enhanced IDE Interface   ATA-100 x 2 channel (support 4 ATAPI devices)
- FDD Interface   Standard FDD port x 1 (supports up to 2 floppy devices)
- Serial Ports   COM1: RS-232 COM2: RS-232/RS-422/RS-485
- Parallel Port   supports SPP/EPP/ECP mode
- Keyboard / PS2 Mouse connector   Mini-DIN for PS/2 K/B and mouse connector x 1 Internal keyboard pin header x 1 Internal mouse pin header x 1
- IrDA   One IrDA Tx/Rx header
- Audio   Realtek ALC201 AC97 multi-channel codec
- USB   Two 5x2 pin headers (support 4 USB 1.1 ports)

Display

- Chip   VIA VT8606
- Memory Size   Shared memory up to 32MB
- Resolution   Up to 1600x1200@16bpp colors for CRT

  Up to 1024x768@24bpp colors for LCD

- LCD Interface   18/36-bit TFT/DSTN LCD
- LVDS Interface   single/dual channel LVDS LCD panels
- CRT and LCD can display simultaneously

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.

OZONE SAFE

RECYCLABLE

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Chapter 2 Quick Installation Guide

2.1 Safety Precautions

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

Locating connectors and jumpers (component side)
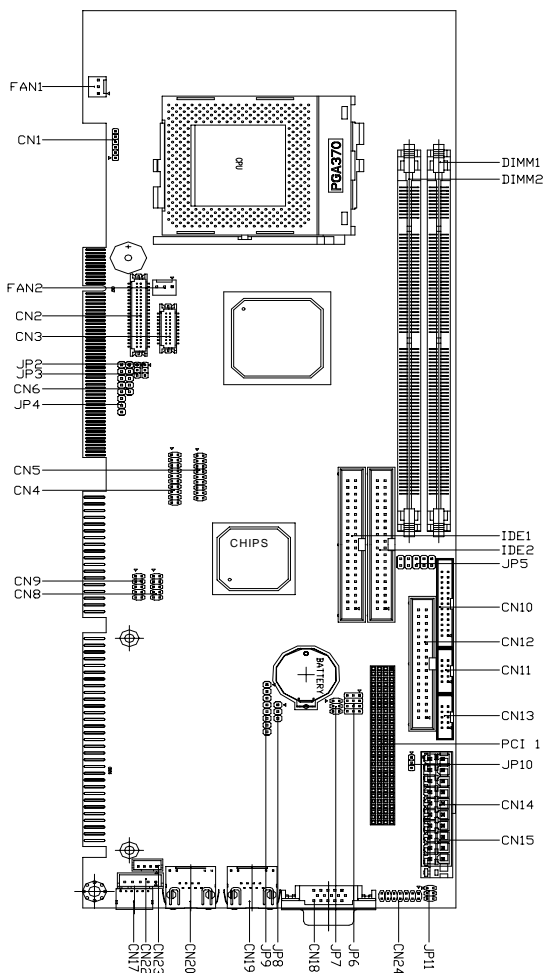
Locating connector (solder side)

CN21
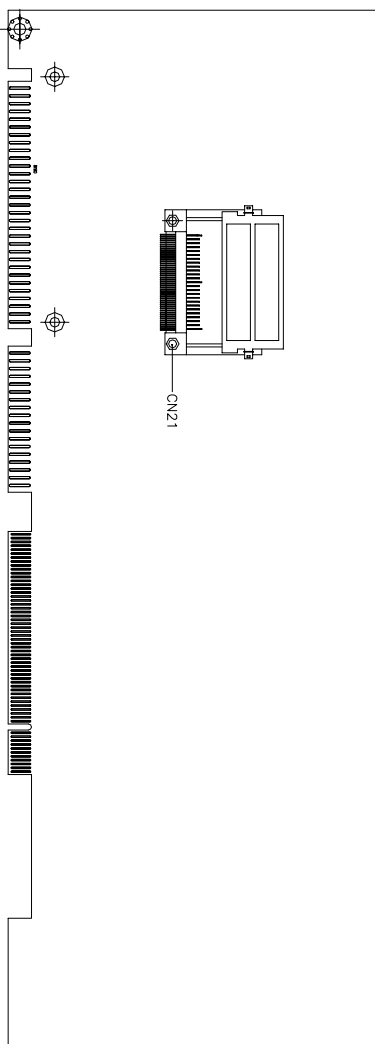
2.3 Mechanical Drawing

Mechanical drawing (component side)
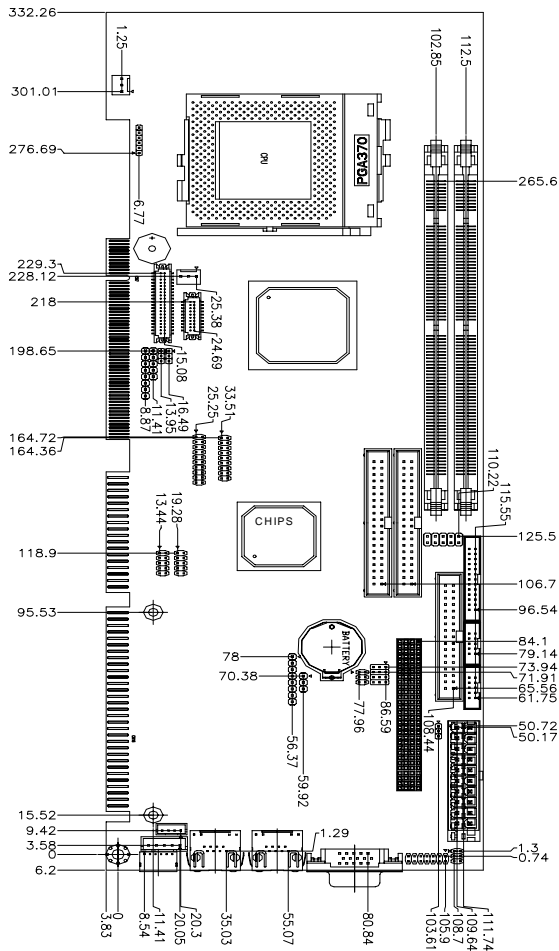
Mechanical Drawing (solder side)
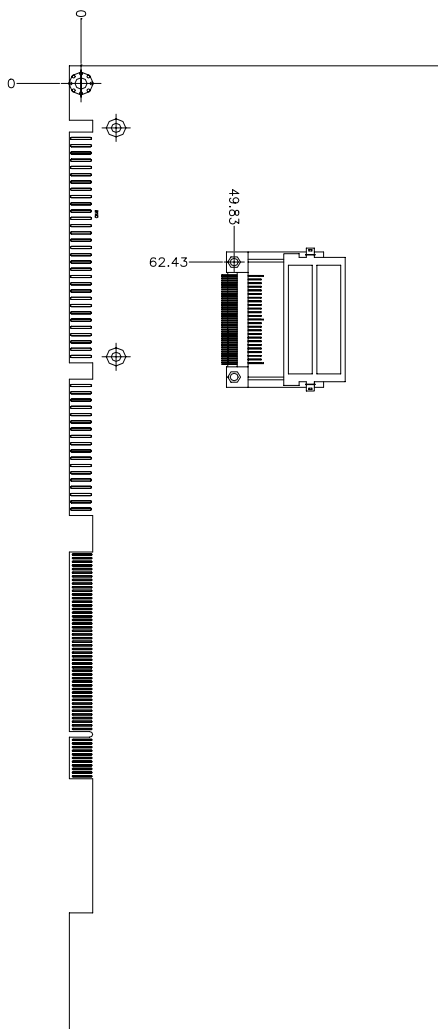
2.4 List of Jumpers

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 jumpers of the board:

Jumpers

Label	Function
JP2	LCD Voltage Selection
JP3	TTL-LCD Clock Selection
JP6	COM2 RS-232/422/485 Selection
JP7	COM2 RS-232/422/485 Selection
JP8	Clear CMOS
JP10	PCI-104 I/O Voltage Selection
JP11	COM2 Ring/+5V/+12V Selection

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 of the connectors of the board:

Connectors

Label	Function
CN1	Optional ATX Power Connector
CN2	TTL_LCD Connector
CN3	TTL_LCD Connector
CN4	Channel 1 LVDS Connector
CN5	Channel 2 LVDS Connector
CN6	SIR Connector
CN8	USB1/2 Connector
CN9	USB3/4 Connector
CN10	LPT Port Connector
CN11	COM2 RS-232/422/485 Serial Port Connector
CN12	Floppy Connector
CN13	COM1 RS-232 Serial Port Connector
CN14 /15	POWER Connector
CN17	PS2 Keyboard/Mouse Connector
CN18	VGA Display Connector
CN19	10/100Base-T RJ-45 Ethernet Connector / LAN 1
CN20	10/100Base-T RJ-45 Ethernet Connector / LAN 2
CN21	CompactFlash™ Disk Connector
CN22	Internal Keyboard Connector
CN23	Internal Mouse Connector
CN24	Audio Input/Output Connector

Full-Size SBC	SBC-780

DIMM1	DIMM Slot
DIMM2	DIMM Slot
FAN1	CPU Fan Connector
FAN2	System Fan Connector
IDE1	Primary IDE Hard Drive Connector
IDE2	Secondary IDE Hard Drive Connector
PCI1	PCI-104 Connector
JP5	Front Panel Connector

2.6 Setting Jumpers

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.
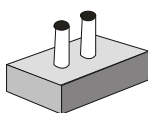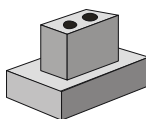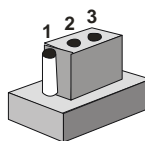
Open   **Closed**   **Closed 2-3**

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

If you have any doubt 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 LCD Voltage Selection (JP2)

JP2	Function
1-2	+5V
2-3	+3.3V (Default)

2.8 TFT_LCD Clock Selection (JP3)

JP3	Function
1-2	CLK (Default)
2-3	Reverse CLK

2.9 COM2 RS-232/422/485 Selection (JP6&JP7)

JP7	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

2.10 Clear CMOS (JP8)

Warning:
To avoid damaging the computer, always turn off the power supply before setting " Clear CMOS." Before turning on the power supply, set the jumper back to "Protected"

JP8	Function
1-2	Protected (Default)
2-3	Clear CMOS

2.11 PCI-104 I/O Voltage Selection (JP10)

JP10	Function
1-2	+5V (Default)
2-3	+3.3V

2.12 COM2 Ring/+5V/+12V Selection (JP11)

JP11	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.13 Optional ATX Power Connector (CN1)

Pin	Signal
1	N.C
2	GND
3	N.C
4	GND
5	PS-ON
6	+5VSB

2.14 TTL_LCD Connector (CN2)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	GND	4	GND
5	+3.3V	6	+3.3V
7	ENBKL	8	GND
9	N.C	10	N.C
11	B00	12	B01
13	B02	14	B03
15	B04	16	B05
17	N.C	18	N.C
19	G00	20	G01
21	G02	22	G03
23	G04	24	G05
25	N.C	26	N.C
27	R00	28	R01

29	R02	30	R03
31	R04	32	R05
33	GND	34	GND
35	DOT_CLOCK	36	VSYNC
37	DE	38	HSYNC
39	N.C	40	ENAVEE

2.15 TTL_LCD Connector (CN3)

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

2.16 Channel 1 LVDS Connector (CN4)

Pin	Signal	Pin	Signal
1	LVDS_TX1OUT1+	2	LVDS_TX1OUT1-
3	GND	4	GND
5	LVDS_TX1CLK+	6	LVDS_TX1CLK-
7	GND	8	PPVCC
9	PPVCC	10	PPVCC
11	LVDS_TX1OUT2+	12	LVDS_TX1OUT2-
13	GND	14	GND
15	LVDS_TX1OUT0+	16	LVDS_TX1OUT0-
17	N.C	18	N.C
19	ENVDD	20	N.C

2.17 Channel 2 LVDS Connector (CN5)

Pin	Signal	Pin	Signal
1	LVDS_TX2OUT1+	2	LVDS_TX2OUT1-
3	GND	4	GND
5	LVDS_TX2CLK+	6	LVDS_TX2CLK-
7	GND	8	PPVCC
9	PPVCC	10	PPVCC
11	LVDS_TX2OUT2+	12	LVDS_TX2OUT2-
13	GND	14	GND
15	LVDS_TX2OUT0+	16	LVDS_TX2OUT0-
17	N.C	18	N.C

2.18 SIR Connector (CN6)

Pin	Signal
1	+5V
2	NA
3	CIRRX
4	GND
5	CIRTX

2.19 USB Connectors (CN8/CN9)

USB1 Connector (CN8)

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

USB2 Connector (CN9)

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

2.20 LPT Port Connector(CN10)

Pin	Signal	Pin	Signal
1	#STROBE	2	#AFD
3	DATA0	4	#ERROR
5	DATA1	6	#INIT
7	DATA2	8	#SLIN
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	#ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	N.C

2.21 COM2 RS-232/422/485 Serial Port Connector(CN11)

Pin	Signal	Pin	Signal
1	DCD (422TXD-/485DATA-)	2	RXD(422RXD+)
3	TXD(422TXD+/485DATA+)	4	DTR(422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI/+12V	10	N.C

2.22 Floppy Connector(CN12)

Pin	Signal	Pin	Signal
1	GND	2	#REDWC
3	GND	4	N.C
5	GND	6	#DS1
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	#DIR
19	GND	20	#STEP
21	GND	22	#WRITE DATA
23	GND	24	#WRITE GATE
25	GND	26	#TRACK0
27	GND	28	#WRITE PROTECT
29	GND	30	#READ DATA
31	GND	32	#SIDE1
33	GND	34	#DISK CHANGE

2.23 COM1 RS-232 Serial Port Connector (CN13)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C

2.24 Power Connector (CN14 / CN15)

CN14

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

CN15 * optional function

Pin	Signal
1	N.C
2	+5V
3	+12V
4	-12V
5	GND
6	GND
7	GND
8	GND
9	-5V
10	+5V
11	+5V
12	+5V

2.25 PS2 Keyboard/Mouse Connector (CN17)

Pin	Signal
1	KB_DATA
2	MS-DATA
3	GND
4	+5VSB
5	KB_CLK
6	MS_CLK
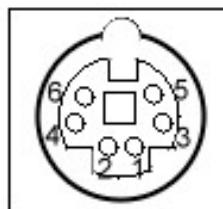
2.26 VGA Display Connector (CN18)

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	N.C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N.C	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK	16	GND
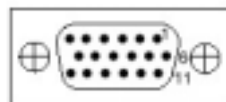
2.27 10/100Base-T RJ-45 Ethernet Connectors (CN19 / CN20)

Pin	Signal	Pin	Signal
1	TX+	2	TX-
3	RX+	4	N/C
5	N/C	6	RX-
7	N/C	8	N/C
9	N/C	10	N/C
11	Ground	12	Ground
13	ACT_LED	14	LINK_LED
15	+3.3 V	16	SPEED_LED
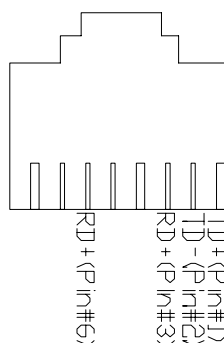
2.28 CompactFlash™ Disk Connector (CN21)

Pin	Signal	Pin	Signal
1	Ground	26	Ground
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	Ground	33	Ground
9	Ground	34	SDIOR#
10	Ground	35	SDIOW#
11	Ground	36	+5V
12	Ground	37	IRQ15
13	+5V	38	+5V
14	Ground	39	CSEL#
15	Ground	40	N.C
16	Ground	41	SEC_IDERST#
17	Ground	42	SIORDY
18	SDA2	43	N.C
19	SDA1	44	+5V
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N.C	49	SDD10
25	Ground	50	Ground

2.29 Internal Keyboard Connector (CN22)

Pin	Signal
1	Keyboard Clock
2	Keyboard Data
3	NC
4	Ground
5	+5VSB

2.30 Internal Mouse Connector (CN23)

Pin	Signal
1	Mouse Clock
2	Mouse Data
3	Ground
4	+5VSB

2.31 Audio Input/Output Connector (CN24)

Pin	Signal	Pin	Signal
1	MIC_in	2	MIC_VCC
3	Audio Ground	4	CD_GND
5	LINE_in L	6	CD_L
7	LINE_in R	8	CD_GND
9	Audio Ground	10	CD_R
11	LINE_out L	12	LINE_out R
13	Audio Ground	14	Audio Ground

2.32 Fan Connectors (FAN1&FAN2)

Pin	Signal
1	GND
2	+12V
3	Speed Sense

2.33 Primary/Secondary Hard Drive Connector (IDE1&IDE2)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	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	32	N.C
33	ADDR1	34	UDMA DETECT
35	ADDR0	36	ADDR2
37	CS#1	38	CS#3
39	LED	40	GND

2.34 Front Panel Connector (JP5)

Pin	Signal		
1	Power On Button(-)	2	Power On Button(+)
2	IDE LED(-)	4	IDE LED(+)
5	External Buzzer(-)	6	External Buzzer(+)
7	Power LED(-)	8	Power LED(+)
9	Reset Switch(-)	10	Reset Switch(+)

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.

When you should encounter fatal errors, please contact your distributor or sales representative.

System configuration verification

These routines check the current system configuration the values stored in the CMOS memory of the board. 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:

You are starting your system for the first time

You have changed the hardware attached to your system

The CMOS memory has lost power and the configuration information has been erased.

The SBC-780 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 CMOS 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 memory so that it retains the Setup information when the power is turned off.

Some items in the BIOS are programmed to auto detect your system. The presence or the values of these items vary with the corresponding hardware specification of your system.

● **Entering setup**

Power on the computer and press <Del> immediately. This will allow you to enter Setup. The top menu offers users various functions to configure the system. The default page after entering the BIOS setup is [Main – Standard CMOS setup].

● **Major Setup Features:**

  ✧ **Main – Standard CMOS Features**

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

● **Advanced Features Setup**

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

  ✧ **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 of the chipset registers and optimize your system performance.

✧   **Integrated Peripherals**

Use this menu to specify your settings for integrated peripherals. (IDE, LAN, Serial Port, Parallel Port, IR, Audio)

✧   **Power Management Setup**

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

✧   **PnP/PCI Configurations**

This entry appears if your system supports PnP/PCI.

● **Default – 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.

● **Security Password**

Use this menu to set password

● **PC Health Setup**

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

Exit Setup

- **Clk/Voltage Setup**

    Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

- **Exit**

    ◇ **Save & Exit Setup**

        Save CMOS value changes to CMOS and exit setup.

    ◇ **Exit Without Saving**

        Abandon all CMOS value changes and exit setup.

3.2.1   Main Setup

● **Standard CMOS setup**

Select [Main] for STANDARD CMOS SETUP option from the top 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.

✧ **Date and Time Configuration**

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

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

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

● **IDE Primary/Secondary Master/Slave**

  ✧ **IDE HDD Auto-Detection**

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

  NOTE: It is recommended to select "AUTO" for all drives.

  The BIOS can automatically detect the specifications and optimal operating mode of almost all IDE hard drives. When you select AUTO for a hard drive, the BIOS will detect its specifications

  ✧ **IDE Primary/Secondary Master/Slave**

  If you do not want to select "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 as below)

  ✧ **Drive A**

  ✧ **Drive B**

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

  ■   None   No diskette drive installed

  ■   360K, 5.25 in   5-1/4 inch PC-type standard drive; 360 kilobyte capacity

  ■   1.2M, 5.25 in   5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity

  ■   720K, 3.5 in   3-1/2 inch double-sided drive; 720 kilobyte capacity

  ■   1.44M, 3.5 in   3-1/2 inch double-sided drive; 1.44 mega byte capacity

  ■   2.88M, 3.5 in   3-1/2 inch double-sided drive; 2.88 mega byte capacity

● **Video**

This function setting allows you to select the video type.

The choices: EGA/VGA, CGA 40, CGA 80, MONO

● **Halt On**

During the power-on-self-test (POST), the computer will stop if the BIOS detects a hardware error. You can tell 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.

● **Select Display Device**

This field selects the type of display device installed in your computer.

The choices: Auto, CRT, LCD, CRT+LCD

● **Base Memory**

Typically 640 KB. Also called conventional memory. The DOS operating system and conventional applications use this area.

● **Extended Memory**

Above the 1-MB boundary. Early IBM personal computers could not use memory above 1 MB, but current PCs and their software can use extended memory.

● **Total Memory**

The fields show the total installed random access memory (RAM).

3.2.2 Advanced Features Setup

By choosing the [Advanced BIOS Feature] option from the initial setup menu, the screen below is displayed.
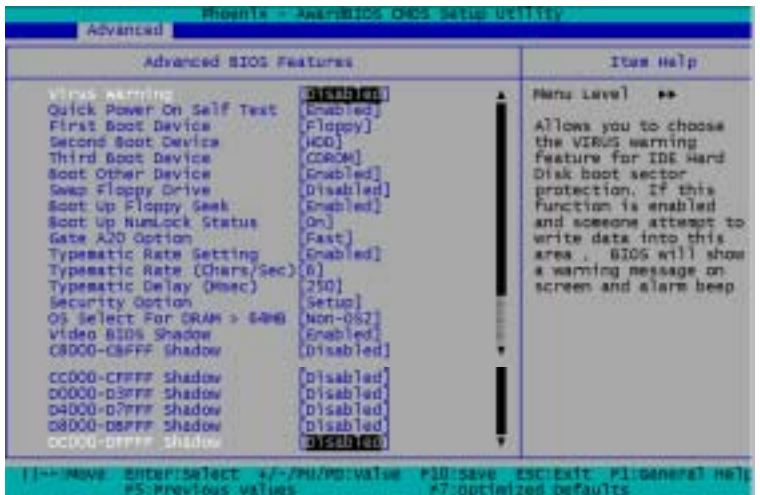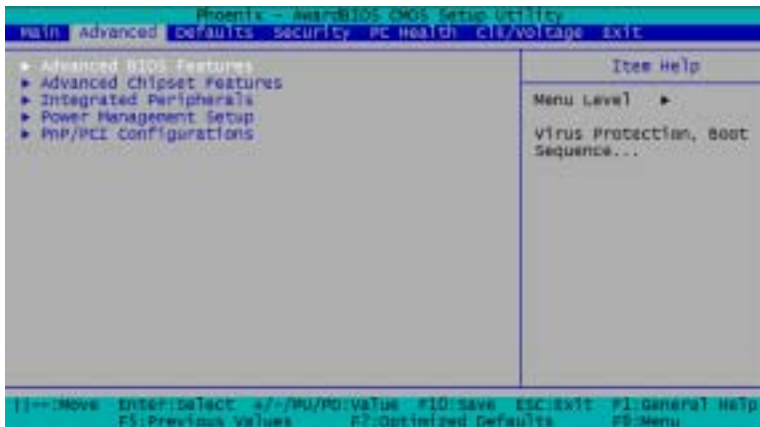
✧ **Virus Warning**

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

> *NOTE*: *Many disk diagnostic programs that access the boot*
> *sector table can trigger the virus-warning message. If you*
> *plan to run such a program, we recommend that you first*
> *disable the virus warning. Before installing Microsoft*
> *Windows, please disable this function.*

The choices: Enabled, Disabled.

✧ **Quick Power On Self Test**

Select Enabled to reduce the amount of time required to run the power-on-self-test (POST) while system booting.

The choices: Enabled, Disabled.

✧ **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: Floppy, LS120, HDD, SCSI, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, ISA-FDD, Disabled.

 ✧ **Boot Other Device**

If your boot device, such as SCSI/RAID, is not included in the following choices "Floppy, LS120, HDD, SCSI, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, ISA-FDD", you may set First/Second/Third Boot devices to "Disabled" and enable the BOOT Other Device function. The system will automatically boot the other device.

The choices: Enabled, Disabled.

 ✧ **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 vice-versa.

The choices: Enabled, Disabled.

 ✧ **Boot Up Floppy Seek**

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

The choices: Enabled, Disabled.

 ✧ **Boot Up NumLock Status**

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

The choices: On, Off.

 ✧ **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, Normal.

 ✧ **Typematic Rate Setting**

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choices: Enabled, Disabled.

 ✧ **Typematic Rate (Chars/Sec)**

When the typematic rate setting is enabled, you can select a typematic rate, at which character repeats when you hold down a key.

The choices: 6, 8, 10, 12, 15, 20, 24, 30.

 ✧ **Typematic Delay (Msec)**

When the typematic rate setting is enabled, you can select a typematic delay, at which before keystrokes begin to repeat.

The choices: 250, 500, 750, 1000

◇ **Security Option**

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

The choices: Setup, System.

◇ **OS Select For DRAM > 64MB**

The choices: Non-OS2, OS2

◇ **Video BIOS Shadow**

The choices: Enabled, Disabled

◇ **C8000-CBFFF/CC000-CFFFF/D0000-D3FFF/D4000-D7FFF/D8000-DBFFF/DC000-DFFFF Shadow**

The choices: Enabled, Disabled

● **Advanced Chipset features setup**

By choosing the [Advanced Chipset Features Setup] option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

◇ **DRAM Timing By SPD**

This function stores information about Memory Module setting. Therefore, it can auto detect the best frequency that the memory module should use.

The Choices: Disabled, Enabled

◇ **Memory Hole**

Enable this function to allow ISA ROM to map to 15-16M and support Legacy ISA devices. If you don't utilize legacy ISA devices in your system, you are recommended to disable this function to enhance graphic performance.

The choices: Disabled, 15M – 16M

◇ **Frame Buffer Size**

Set the size of memory for graphic display.

The choices: 2M, 4M, 8M, 16M, 32M

✧ **AGP Aperture Size**

Aperture size will ensure that all writes posted in the global write buffer to the graphics aperture are retired to DRAM before initiating any CPU-PCI cycle. This can be used to ensure synchronization between the CPU and AGP master.

The choices: 128M, 64M, 32M, 16M, 8M, 4M

✧ **Panel Type**

The choices: 640x480 TFT

800x600 TFT

1024x768 TFT 36bit

1024x768 TFT 18bit

1024x768 LVDS 1 Channel

1024x768 LVDS 2 Channel

800x600 LVDS

✧ **Boot Device Select**

The choices: Auto, Both

✧ **OnChip USB**

The choices: Enabled, Disabled.

✧ **USB Keyboard Support**

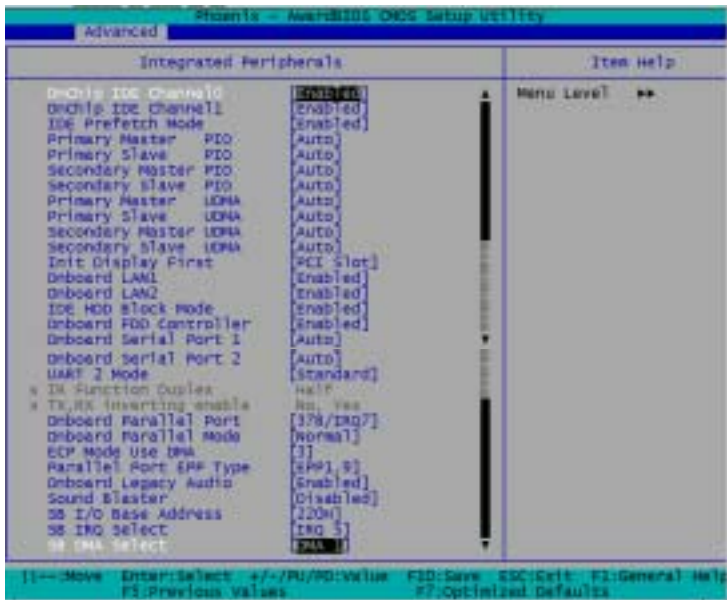The choices: Enabled, Disabled.

✧ **USB Mouse Support**

The choices: Disabled, Enabled

✧ **OnChip Sound**

The choices: Auto, Disabled

● Integrated Peripherals

By choosing the [Integrated Peripherals] option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

✧ OnChip IDE Channel0 ∕ OnChip IDE Channel1

The integrated peripheral controller contains an IDE interface supporting two IDE channels.

The choices: Enabled, Disabled

✧ IDE Prefetch Mode

The onboard IDE drive interfaces support IDE prefetching for faster drive access.

The choices: Enabled, Disabled

✧ **Primary/Secondary Master/Slave PIO**

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

The choices: Auto, Mode 0, Mode 1, Mode 2, Mode 3,

Mode 4

✧ **Primary/Secondary Master/Slave UDMA**

Ultra DMA33/66/100 implementation is only working when your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and IDE cable both support Ultra DMA 33/66/100 select Auto to enable BIOS support.

The choices: Auto, Disabled

✧ **Init Display First**

You can select AGP or PCI slot to initialize it as the primary display before initializing any other display device on the system.

The choices: PCI Slot, AGP

✧ **Onboard LAN1/LAN2**

The default setting for this is "Enabled". If you do not utilize onboard LAN function, just configure it as "Disabled" without any efforts on jumper setting.

The choices: Enabled, Disabled

✧ **IDE HDD Block Mode**

Block mode is also called "block transfer", "multiple commands", or "multiple sector read/write". If your IDE hard drive supports block mode, please select "Enabled" for automatic detection of the optimal number of block read/write per sector the drive supports.

The choices: Enabled, Disabled

✧ **Onboard Serial Port 1/ Port 2**

Normally, the board's I/O chips will occupy a certain portion of memory space. For each I/O device, the computer provides and I/O address. The more devices attached the more address needed to organize the memory storage areas. If all the I/O devices are fun running through the same address, your devices would come to a near halt. Also, the corresponding interrupt needs to be selected.

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

2E8/IRQ3, Auto

✧ **UART 2 Mode**

If you do not disable Onboard Serial Port 2, you will have to select an operating mode for the second serial port.

The choices: Standard, HPSIR, ASKIR

If you select HRSIR or ASKIT, you have to set the following tow functions.

✧ **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: Full, Half

✦ **Tx, Rx inverting enable**

Please consult with your IR peripheral documentation to select the correct setting of the TxD and RxD signals.

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

✦ **Onboard Parallel Port**

Two bi-directional parallel ports.

The choices: Disabled, 3BC/IRQ7, 378/IRQ7, 278/IRQ5

✦ **Onboard Parallel Mode**

Two bi-directional parallel ports.

The choices: Normal, EPP, ECP, ECP/EPP

✦ **ECP Mode Use DMA**

Select a DMA channel for the port.

The choices: 1, 3

✦ **Parallel Port EPP Type**

You can use this feature to choose which version of EPP to sue. For better performance, use EPP 1.9. But if you are facing connection issues, try to set it to EPP 1.7.

The choices: EPP1.9, EPP1.7

✦ **Onboard Legacy Audio**

Enable to utilize onboard legacy audio function

The choices: Disabled, Enabled

✧ **Sound Blaster**

Enable to utilize Sound Blaster function.

The choices: Disabled, Enabled

✧ **SB I/O Base Address**

Select a base I/O address for the Sound Blaster interface.

The choices: 220H, 240H, 260H, 280H

✧ **SB IRQ Select**

Select Interrupt for the Sound Blaster interface.
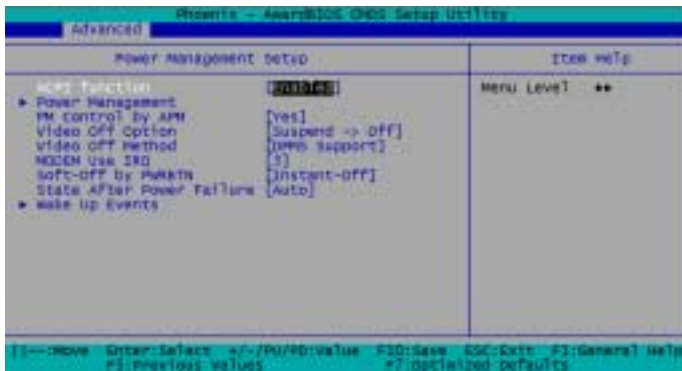
The choices: IRQ 5, IRQ 7, IRQ 9, IRQ 10

✧ **SB DMA Select**

Select DMA mode for the Sound Blaster interface.

The choices: DMA 0, DMA 1, DMA 2, DMA 3

● **Power Management Setup**

By choosing the [Power Management Setup] option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

◇ **ACPI Function**

This item allows you to enable/disable the Advanced Configuration and Power Interface (ACPI). **The option will automatically set "disabled" when AT power is applied.**

The choices: Enabled, Disabled

◇ **Power Management**

Select Max Saving mode or Min Saving mode or define desired Doze Mode, Suspend Mode, HDD Power Down functions by User Define.

This category allows you to select the type (or degree) of

power saving and is directly related to the following modes:

1. User Define

2. Min Saving

3. Max Saving

Min. Power Saving	Minimum power management. HDD Power Down =15 minutes. Doze Mode = 1 hour Suspend Mode = 1 hour
Max.Power Saving	Maximum power management-- **ONLY AVAILABLE FOR SL CPU'S.** HDD Power Down = 1 Doze Mode = 1 Min Suspend Mode = 1 Min
User Defined	Allow you to set each mode individually. When not disabled, each of the tinges is from 1 min. to 1 hour except for HDD Power Down, which ranges from 1 min. to 15 min. and disable.

✧ **PM Control by APM**
The choices: No, Yes

✧ **Video off Option**
The choices: Always On, Suspend Off, All Modes Off

✧ **Video off Method**
The choices: Blank Screen, V/H SYNC+Blank, DPMS Support

✧ **MODEM Use IRQ**
The choices: NA, 3, 4, 5, 7, 9, 10, 11

✧ **Soft-Off by PWRBTN**

The choices: Delay 4 Sec, Instant-off

✧ **State After Power Failure**

This field lets you determine the state that your PC returns to after a power failure. If set to off, the PC will not boot after a power failure. If set to on, the PC will restart after a power failure. If set to auto, the PC will restart to the former status. **This option will not be available when AT power is applied.**

The choices: Auto, On, Off

Wake Up Events
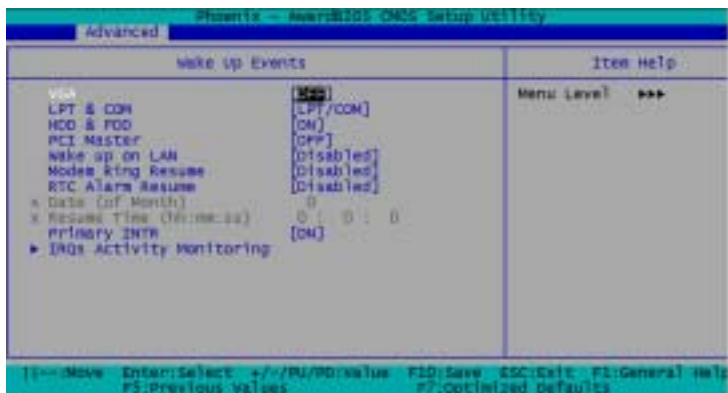
✧ **VGA**

The choices: Off, On

✧ **LPT & COM**

The choices: NONE, LPT, COM, LPT/COM

✧ **HDD & FDD**

 The choices: OFF, ON

✧ **PCI Master**

 The choices: OFF, ON

✧ **Wake up on LAN**
 The option will not be available when AT power is applied.

 The Choices: Enabled, Disabled

✧ **Modem Ring Resume**
 The option will not be available when AT power is applied.

 The choices: Enabled, Disabled

✧ **RTC Alarm Resume**
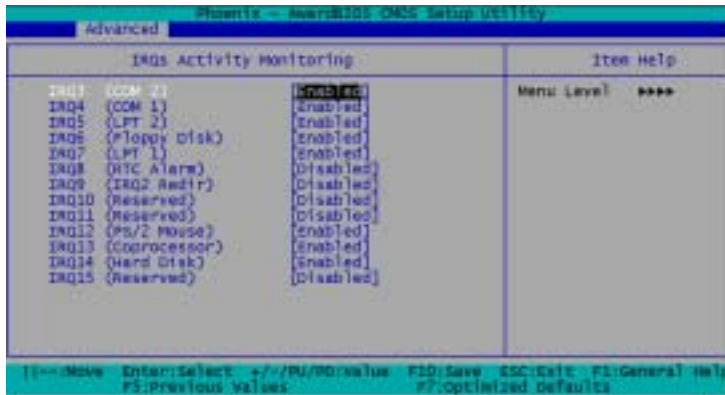 **The option will not be available when AT power is applied.**

 The Choices: Enabled, Disabled

✧ **Date (of Month)**

✧ **Resume Time (hh:mm:ss)**

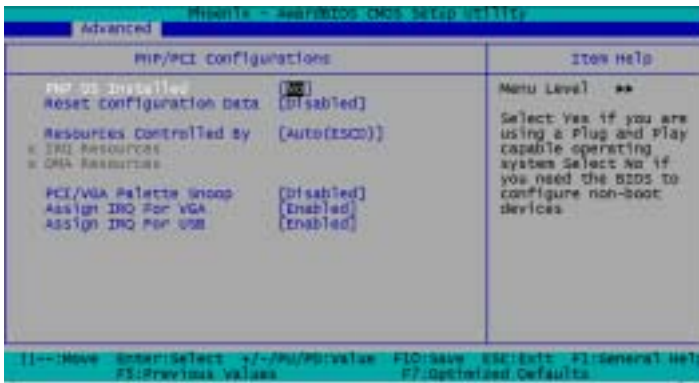✧ **Primay INTR**

 The Choices: OFF, ON

IRQ Activity Monitoring

The choices: Enabled, Disabled

● **PnP/PCI Configuration**

By choosing the PnP/PCI Configuration option from the INITIAL SETUP SCREEN menu, the screen below is displayed.

✧ **PNP OS Installed**

Select Yes if the system operating environment is Plug and Play aware, for example Windows 9x, Windows 2000, and Windows XP. Hardware resource will be distributed by OS.

Select No if you need the BIOS to configure non-boot devices.

The choices: No, Yes.

✧ **Reset Configuration Data**

Normally, you leave this field disabled. Select enabled to reset Extended System Configuration Data (ESCD) when serious conflict is caused by add-on device or system reconfiguration.

The choices: Enabled, Disabled

✧ **Resources Controlled By**

The Award Plug and Play BIOS has the capacity to automatically configure all the boot and Plug and Play devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

The choices: Auto (ESCD), Manual.

✧ **IRQ Resources**

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt. There are two types for choice: Legacy ISA and PCI/ISA PnP.

Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1)

PCI/ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

✧ **DMA Resources**

When resources are controlled manually, assign each DMA channel a type, depending on the type of device using the DMA channel. There are two types for choice: **Legacy ISA and PCI/ISA PnP.**

Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific DMA channel

PCI/ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

✧ **PCI/VGA Palette Snoop**

Enabling this item informs the PCI VGA card to keep silent (and to prevent conflict) when palette register is updated (i.e., accepts data without responding any communication signals). This is useful only when two display cards use the same palette address and plugged in the PCI bus at the same time (such as MPEG or Video capture card). In such case, PCI VGA is silent while MPEG/Video capture card is set to function normally.

The Choices: Enabled, Disabled

✧ **Assign IRQ For VGA**

The Choices: Enabled, Disabled
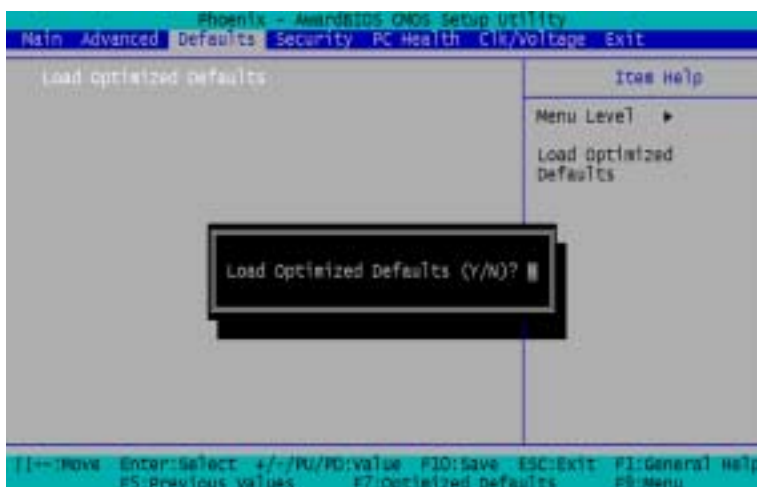
✧ **Assign IRQ For USB**

The Choices: Enabled, Disabled

3.2.3 Default Setup

● **Load Optimized Defaults**

Select [Defaults] to Load Optimized Defaults setting from the top menu, the screen shown below is displayed.

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

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.

3.2.4 Security Setup

●   **Set/Change password**

You can set the password to restrict unauthorized access to enter or change the options of the setup menus.

To abort the process at any time, press Esc.

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

3.2.5 PC Health Setup

By choosing the [PC Health] option from the top menu, the screen below is displayed.

● **CPU Warning Temperature**

The choices: Disabled, 50°C/122°F, 53°C/127°F, 56°C/133°F, 60°C/140°F, 63°C/145°F, 66°C/151°F, 70°C/158°F

● **Shutdown Temperature**

You can set the shutdown temperature. When the temperature of your system reaches the limitation, the system will shut down automatically to prevent damage caused by overheat. Please note this function may not work in some OS such as Win 2000/XP.

The choices: Disabled, 60 /140 , 65 /149 , 70 /158 , 75°C/167°F

● **Power on show status**

Enable this function to show hardware monitor listing after powering on the system.

The choices: Enabled, Disabled

● **CPU fan low speed warning**

Select the speed figure limits for the CPU speed. When CPU speed drop down to the limitation, the system would send out the warning signal.

The choices: Disabled, ↓3000 RPM, ↓4000 RPM, ↓5000 RPM

3.2.6 Clk/Voltage Setup

By choosing the [Clk/Voltage] option from the top menu, the screen below is displayed.

● **Auto Detect DIMM/PCI CLK**

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

The choices: Enabled, Disabled.

● **Spread Spectrum**

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. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

The choices: Disabled, -0.5%, +/-0.5%, +/-0.25%

3.2.7 Exit Setup

● **Save & Exit Setup**

If you select this option and press <Enter> from the top menu, 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 your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

● **Exit without saving**

Selecting this option and pressing <Enter> lets you exit the Setup program without recording any new values or changing old ones.

Chapter

4

Driver Installation

The SBC-780 comes with a CD-ROM which 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 2000 series OS, you are strongly recommended to download the latest version Service Pack from Microsoft website and install it before installing any driver.

Please follow the sequence below to install the drivers:

Step 1 – Install VIA 4-in-1 Driver

Step 2 – Install VGA Driver

Step 3 – Install Ethernet Driver

Step 4 – Install Audio Driver

Applicable for Windows 2000/98/ME/XP

1. Insert the supporting CD-ROM into drive.

2. Click on "***Start***" button and then click on "***Run***" button, find the installation wizard "***setup.exe***" in the following path:
    "cd-rom": \Driver\ Step 1 – Install VIA 4-in-1 Driver"

    For Step 2, look for the respective OS folders in the following path:
    "cd-rom":\ Driver\ Step 2 – Install VGA Driver. Under the selected OS folder, find the installation wizard "***Setup.exe***" button.

    Again Step 3 & 4, find the installation wizard "***Setup.exe***" button in the following path:
    "cd-rom": \Driver\ Step 3 – Install Ethernet Driver"
    "cd-rom": \Driver\ Step 4 – Install Audio Driver"

    Press the <Enter> key or click OK to begin the installation.
    *(Remarks: **"cd-rom"** means your CD-ROM drive letter)*

3. The setup will automatically detect your OS and complete the installation. Simply following the step-by-step instruction.

4. Shut down and restart your system.

Note: Since Windows NT is discontinued **in market,** we are unable to support Win NT series.

Appendix
A

Programming the
Watchdog Timer

Programming

An onboard watchdog timer reduces the chance of disruptions which CPLD (Compact Programmable Logical Device) interface can cause. This is an invaluable protective device for standalone or punmanned 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 NM1. This can be set via I/O Port 444, the function as following:

    0: RESET
    1: NM1
    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 form 01 (hex) to FF (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read a Hex value from I/O port 80 (hex).

The following procesude 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 watch timer type; i80 <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