

SBC8159

**Pentium All-in-One
PCI/ISA CPU Card Series**

User's Manual

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ESD Precautions

Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Unpacking

After unpacking the CPU card, check and see if the following items are included and in good condition. If any of the items is missing or damaged, notify your dealer immediately.

Product Name	Function	Package
SBC8159VE	SBC8159 Pentium all-in-one CPU card with onboard VGA and Ethernet	<ul style="list-style-type: none"> ● SBC8159VE Pentium All-in-One PCI/ISA CPU card with onboard VGA and Ethernet x 1 ● VGA Utility Diskettes x 4 ● LAN Utility Diskettes x 2 ● 3.55" IDE HDD cable x 2 ● 3.5" FDD cable x1 ● Printer extension cable with bracket x1 ● PS/2 Mouse/USB/COM1 extension cables with bracket x 1 ● COM2/Printer extension cables with bracket x 1 ● User's Manual x 1 ● Warranty Card x 1
SBC8159V	SBC8159 Pentium all-in-one CPU card with onboard VGA	<ul style="list-style-type: none"> ● SBC8159V Pentium All-in-One PCI/ISA CPU card with onboard VGA x 1 ● VGA Utility Diskettes x 4 ● 3.55" IDE HDD cable x 2 ● 3.5" FDD cable x1 ● Printer extension cable with bracket x1 ● PS/2 Mouse/USB/COM1 extension cables with bracket x 1 ● COM2/Printer extension cables with bracket x 1 ● User's Manual x 1 ● Warranty Card x 1

Make sure that all of the items listed above are present.

What To Do If There Is A Problem

If there are damaged or missing parts, contact your supplier and/or dealer immediately. Do not attempt to apply power to the board if there is damage to any of its components.

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Chapter 1

Introduction

1.1 General Description



The SBC8159 Series is an industrial grade Pentium CPU card incorporating the SiS 5598 Core Logic chipset, and the Winbond 83877F I/O chipset. These chips ensure the CPU card's compatibility with ISA bus passive backplanes. The 6-layer structure of SBC8159VE (with the VIA 100/10M Ethernet controller) not only reduces signal noise but also meets all green functions with its built-in power management feature. These advanced technologies along with the PCI Local Bus architecture brings outstanding performance to Windows-based applications.

Designed for the professional embedded developers, the Pentium all-in-one SBC8159 Series is virtually your ultimate one-step solution to various applications.

1.2 Special Features

1.2.1 Infrared Data Association

IrDA is a standard developed for transmitting data via infrared light waves. Increasingly, computers and other devices come with IrDA ports. This enables you to transfer data from one device to another without any cables.

Connector provisions on the SBC8159 Series supports this optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that supports this feature. Please refer to Chapter 2 and the Appendix for the IrDA connector and its respective pin assignments.

1.2.2 Universal Serial Bus

USB is a new external bus standard that supports data transfer rates of 12 Mbps (12 million bits per second). A single USB port can be used to connect up to 127 peripheral devices, such as mice, modems, and keyboards. USB also supports Plug-and-Play installation and hot plugging.

USB has recently become more widespread. It is expected to eventually completely replace serial and parallel ports. Onboard the SBC8159 Series CPU card sits two USB ports available for USB device(s) connection. Chapter 2 and the Appendix on this manual list the designated USB connector(s) and their respective pin assignments.

1.2.3 Ultra DMA/33

The duo combination of the SBC8159 Series architecture along with the SiS 5598 Core Logic chipset greatly enhances IDE transfer rate with the deployment of Bus Master Ultra DMA/33. Improving IDE data transfer rate up to 33MB/sec, Ultra DMA/33 too delivers flexibility and convenience to existing ATA-2 IDE specifications. This compatibility feature of Ultra DMA/33 eliminates the upgrade considerations of current hard drives and cables.

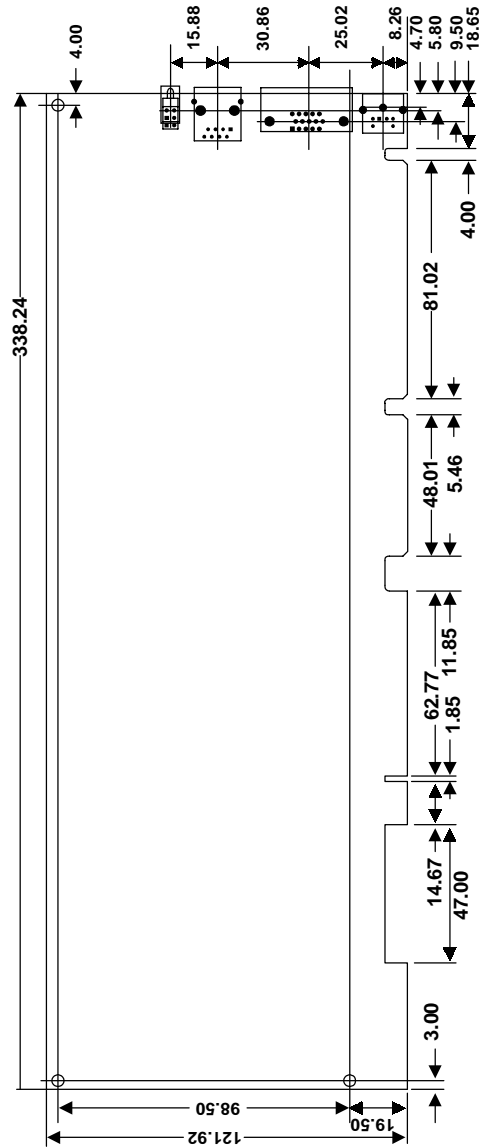
1.3 Specifications

- **CPU:**
 - Intel Pentium P54C 90/100/120/133/150/166/200 MHz
 - Intel Pentium P55C 166/200/233 MHz
 - AMD K5 PR100/133/166 MHz, K6 166/200/233/266/300 MHz, K6-2 266/300/333/366/400 MHz
 - Cyrix/IBM 6x86/6x86L/6x86(MX) P166+/PR200/PR233/PR266/PR300, MII PR300
 - IDT C6 180/200/225/240 MHz, WinChip 2-3D 200/225/240/266 MHz
- **Chipset:**
 - System chipset: SiS 5598 Core Logic chipset
 - I/O chipset: Winbond W83877F
 - Ethernet: VIA 86C100A+ DAVICOM DM9101
- **System Memory:** 4 x 72-pin SIMM sockets supporting up to 256MB; EDO/FPM memory compatible
- **L2 Cache:** Onboard 512KB
- **Standard I/O:**
 - 2 x serial port
 - 1 x parallel port
 - 2 x HDD interface
 - 1 x FDD interface
 - 2 x Keyboard interface
 - 1 x PS/2 Mouse interface
- **Onboard VGA:**
 - SiS 5598
 - Supports up to 1280 x 1024 resolution
- **Ethernet:** Onboard VIA VT86C100A chip with boot ROM function, 10/100 Base-T Interface via RJ-45 connector
- **Watchdog Timer:** Generates a system reset
16-level software programmable time interval from 0.5 to 1000 seconds, configured via CMOS Setup

- **DiskOnChip®:**
 - Onboard socket for flash memory disk support from 2MB up to 72MB
- **BIOS:** Award PnP Flash BIOS
- **Real-time Clock:** ST MA8T86PC1 (DS12B887 compatible)
- **Dimensions:** 338 (L) x 122 (W) mm

1.4 Board Dimensions

Units: in mm

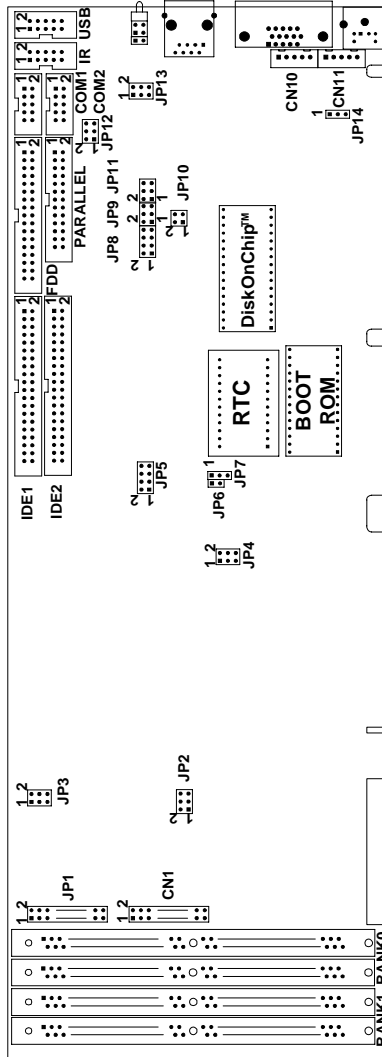


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Chapter 2

Jumpers and Connectors

2.1 Board Layout



2.2 Jumper Settings

The SBC8159 Series is configured to match the needs of your application by proper jumper settings. The following tables show the correct jumper settings for the onboard devices.

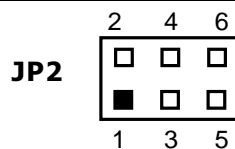
Jumper	Function
JP2	CPU Clock Ratio Selection
JP3	CPU V_{io} (V_{cc3}) Selection
JP4	CPU Bus Clock Selection
JP5	CPU Vcore Selection
JP2, JP3, JP4, JP5	CPU Settings
JP1	Onboard VGA Settings
JP10	DiskOnChip [®] Memory Segment
JP6	Clear CMOS Jumper
JP7	WatchDog Function
JP8, JP9, JP11	RS232/422/485 (COM2) Selection
JP12, JP13	COM1, COM2 Mode
JP1, JP14	PS/2 Mouse Enable/Disable Selection

2.2.1 CPU Settings

When a new CPU is to be installed, the related jumpers including CPU type, CPU Bus Clock, CPU Voltage, PCI Bus Clock, etc. may need to be adjusted.

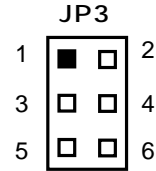
2.2.1.1 CPU Clock Ratio Selection: JP2

Options	Settings	Options	Settings
X1.5	Open	x3.5	Open
x2, x6	Short 1-2 (default)	x4	Short 1-2, 5-6
X2.5	Short 1-2, 3-4	x4.5	Short 1-2, 3-4, 5-6
x3	Short 3-4	x5	Short 3-4, 5-6
		x5.5	Short 5-6



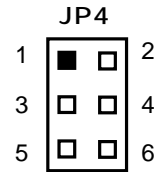
2.2.1.2 CPU V_{io} (V_{cc3}) Selection: JP3

Options	Settings
Single Voltage CPU: Intel P54C, Cyrix 6x86, AMD K5, IDT C6, WinChip-2	JP3: Short 1-3, 2-4
Dual Voltage CPU: Intel P55C (MMX), Cyrix 6x86L, 6x86MX/MXII, AMD K6, K6-2	JP3: Short 3-5, 4-6 (default)



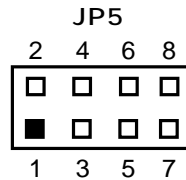
2.2.1.3 CPU Bus Clock Selection: JP4

Options	Settings
60MHz	Short 1-3, 4-6
66MHz	Short 1-3, 2-4 (default)
75MHz	Short 2-4, 3-5



2.2.1.4 CPU V_{core} Selection: JP5

Options	Settings	Options	Settings
2.0	All Open	2.8	Short 7-8
2.1	Short 1-2	2.9	Short 1-2, 7-8
2.2	Short 3-4	3.0	Short 3-4, 7-8
2.3	Short 1-2, 3-4	3.1	Short 1-2, 3-4, 7-8
2.4	Short 5-6	3.2	Short 5-6, 7-8
2.5	Short 1-2, 5-6	3.3	Short 1-2, 5-6, 7-8
2.6	Short 3-4, 5-6	3.4	Short 3-4, 5-6, 7-8
2.7	Short 1-2, 3-4, 5-6	3.5	Short 1-2, 3-4, 5-6, 7-8



2.2.1.5 CPU Settings: JP2, JP3, JP4, JP5

When installing a new CPU, the related jumpers including CPU Voltage (**JP5**), CPU Type (**JP3**), CPU Clock Ratio (**JP2**), and CPU Bus Clock (**JP4**) may need to be adjusted.

CPU Model	JP2	JP3	JP4	JP5
Intel P54C	P-133	Short 1-2	Short 1-3, 2-4	Short 1-2, 3-4, 5-6, 7-8
	P-166	Short 1-2, 3-4	Short 1-3, 2-4	Short 1-2, 3-4, 5-6, 7-8
	P-200	Short 3-4	Short 1-3, 2-4	Short 1-2, 3-4, 5-6, 7-8
Intel P55CMMX	P-166	Short 1-2, 3-4	Short 3-5, 4-6	Short 1-3, 2-4
	P-200	Short 3-4	Short 3-5, 4-6	Short 1-3, 2-4
	P-233	Open	Short 3-5, 4-6	Short 1-3, 2-4
AMD	K6-166	Short 1-2, 3-4	Short 3-5, 4-6	Short 1-3, 2-4
	K6-200	Short 3-4	Short 3-5, 4-6	Short 1-3, 2-4
	K6-233	Open	Short 3-5, 4-6	Short 1-3, 2-4
	K6-266 K6-2-266	Short 1-2, 5-6	Short 3-5, 4-6	Short 1-3, 2-4
	K6-300 K6-2-300	Short 1-2, 3-4, 5-6	Short 3-5, 4-6	Short 1-3, 2-4
	K6-2-333	Short 3-4, 5-6	Short 3-5, 4-6	Short 1-3, 2-4
	K6-2-366	Short 5-6	Short 3-5, 4-6	Short 1-3, 2-4
	K6-2-400	Short 1-2	Short 3-5, 4-6	Short 1-3, 2-4
Cyrix	6x86MX- PR166	Short 1-2	Short 3-5, 4-6	Short 1-3, 2-4
	6x86MX- PR200	Short 1-2, 3-4	Short 3-5, 4-6	Short 1-3, 2-4
	6x86MX- PR233	Short 3-4	Short 3-5, 4-6	Short 1-3, 2-4
	6x86MX- PR266	Open	Short 3-5, 4-6	Short 1-3, 2-4
	MII-300GP	Open	Short 3-5, 4-6	Short 1-3, 2-4
Idt	C6-180	Short 3-4	Short 1-3, 2-4	Short 1-3, 4-6
	C6/W2-200	Short 3-4	Short 1-3, 2-4	Short 1-3, 2-4
	C6/W2-225	Short 3-4	Short 1-3, 2-4	Short 2-4, 3-5
	C6/W2-240	Short 1-2, 5-6	Short 1-3, 2-4	Short 1-3, 4-6
	C6/W2-266	Short 1-2, 5-6	Short 1-3, 2-4	Short 1-3, 2-4

2.2.2 Onboard VGA Settings: JP1

Options		Settings	JP1	
VGA	Enable	Short 3-5 (default)	1	<input type="checkbox"/>
	Disable	Short 1-3	3	<input type="checkbox"/>
VGA ID Selection	AD30	Short 7-9 (for future version of chip)	5	<input type="checkbox"/>
	AD31	Short 9-11 (default)	7	<input type="checkbox"/>
VGA IRQ8	Enable	Short 13-15 (default)	9	<input type="checkbox"/>
	Disable	Short 15-17	11	<input type="checkbox"/>
VGA MCLK	Enable	Short 8-10 (default)	13	<input type="checkbox"/>
	Disable	Short 10-12	15	<input type="checkbox"/>

NOTE: Pins 14, 16, and 18 of JP1 configures the setting of the PS/2 mouse. Please refer to Section 2.2.8 for the corresponding PS/2 settings of JP1.

2.2.3 DiskOnChip® Memory Segment: JP10

Options	Settings	JP10	
D0000 - D3FFF	Short 1-2, 3-4	1	<input type="checkbox"/>
D4000 - D7FFF	Short 1-2	3	<input type="checkbox"/>
D8000 - DBFFF	Short 3-4		<input type="checkbox"/>
DC000 - DFFFF	Open		<input type="checkbox"/>

2.2.4 Clear CMOS Jumper: JP6

Options	Settings	JP6	
Clear CMOS	Short 1-2	1	<input type="checkbox"/>
Normal Operation (default)	Open	2	<input type="checkbox"/>

2.2.5 WatchDog Function: JP7

Options	Settings	JP7	
NMI	Short 1-2	1	<input type="checkbox"/>
Restart	Short 2-3	2	<input type="checkbox"/>
		3	<input type="checkbox"/>

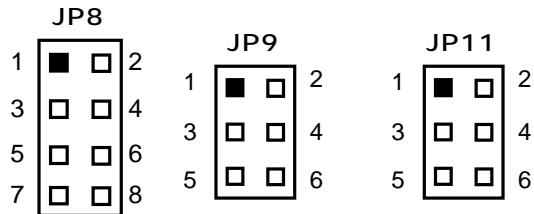
2.2.6 RS232/422/485 (COM2) Selection: JP8, JP9, JP11

JP8, JP9, JP11: RS-232/422/485 Selection

COM1 is fixed for RS-232 function only.

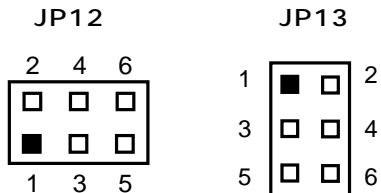
COM2 is selectable for RS-422, 485 function.

COM2 Function	Jumper Settings		
	JP8	JP9	JP11
RS-232	Short 1-2	Short 3-5, 4-6	Short 3-5, 4-6 (default)
RS-422	Short 3-4	Short 1-3, 2-4	Short 1-3, 2-4
RS-485	Short 5-6, 7-8	Short 1-3, 2-4	Short 1-3, 2-4



2.2.7 COM1, COM2 Mode: JP12, JP13

COM1	JP13	COM2	JP12
Pin 1 = 5V	Short 1-3	Pin 1 = 5V	Short 1-3
Pin 1 = DCD	Short 3-5 (default)	Pin 1 = DCD	Short 3-5 (default)
Pin 8 = 12V	Short 2-4	Pin 8 = 12V	Short 2-4
Pin 8 = RI	Short 4-6	Pin 8 = RI	Short 4-6



2.2.8 PS/2 Mouse Enable/Disable Selection: JP1, JP14

Options	Settings	
	JP1	JP14
Enabled	Short 14-16 (default)	Short 2-3 (default)
Disabled	Short 16-18	Short 1-2

The diagram shows two jumper headers. JP1 is a 20-pin header with pins numbered 1 to 20. Pins 14, 15, and 16 are shorted together. JP14 is a 3-pin header with pins numbered 1, 2, and 3. Pins 2 and 3 are shorted together.

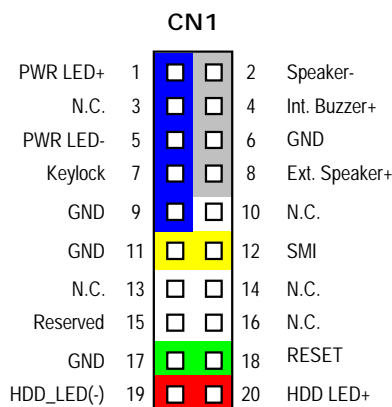
2.3 Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered with your system may be caused by loose or improper connections. Ensure that all connectors are in place and firmly attached. The following tables list the function of each connector on the SBC8159 Series CPU card. Their corresponding pin assignments will be described in Chapter 3.

Connectors	Label	Connectors	Label
General Output	CN1	Internal Keyboard	CN10
IDE1 Connector	CN4	External PS/2 Mouse	CN11
IDE2 Connector	CN5	IrDA Connector	CN12
FDD Connector	CN6	RJ-45 LAN Connector	CN15
LPT Connector	CN7	VGA Connector	CN16
COM1 Connector	CN8	Keyboard DIN	CN17
COM2 Connector	CN9	USB Connector	CN18

2.3.1 Improvised Connectors

2.3.1.1 General Output Connector



Power LED/KeyLock Switch

This 5-pin connector, designated at **Pins 1, 3, 5, 7 and 9 of CN1**, connects the system power LED indicator and keyboard lock to their respective switches on the case. The Power LED lights up when the system is powered ON and blinks when it is in Sleep mode. KeyLock switch enables the keyboard locking function of the SBC8159 Series.

Speaker Connector

Pins 2, 4, 6, and 8 of CN1 is a 4-pin connector that connects to the case-mounted speaker unit. When using the internal buzzer for the system, **short** pins **2** and **4** of **CN1**. For external speaker connection, plug the **Speaker- line** into pin **2** and the **Speaker+ line** into pin **4**.

SMI Switch

This switch enables the connection between the SBC8159 Series-based system and the installed hardware. Aside from the SMI Switch featured in the previous section, **Pins 11 & 12 of CN1** also support the SMI switch function. Refer to Sections 5.8 for a detailed description of its function.

Reset Switch

Pins 17 & 18 of CN1 connect to the case-mounted reset switch and allow rebooting of your computer instead of turning OFF the power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply.

HDD LED

This connector extends to the hard drive activity LED on the control panel. This LED will flash when the HDD is being accessed. **Pins 19 & 20 of CN1** connect the hard disk drive and the front panel HDD LED.

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Chapter 3

Installation

This chapter describes the hardware installation procedures on the SBC8159 Series all-in-one Pentium CPU cards.

The following is a list of typical peripherals required to build a minimum system:

- Power supply and passive backplane (optional)
- IBM™ PC/AT keyboard
- Display monitor
- Floppy or hard disk with MS-DOS or Flash Disk emulator

3.1 System Memory

SBC8159 Series has 4 onboard 72-pin SIMM sockets, able to support 512Kx36, 1Mx36, 2Mx36, 4Mx36, 8Mx36, and 16Mx36 SIMM modules, providing the user with up to 256MB system memory. It also supports non-parity SIMM DRAM. When using SIMM DRAM, disable the "memory-parity-check item" on your BIOS utility program. The DRAM controller supports auto-insert error debug, auto-detect DRAM size.

3.1.1 System Memory Installation

You can install from 4MB up to 64MB memory onboard using 2/4/8/16/32/64 MB 72-pin FPM/EDO SIMM modules.

1. Ensure that all power currents to the system are switched OFF.
2. Insert the first SIMM edge connector at a 45-degree angle into the socket of SIMM 1. The SIMM modules must be facing towards the CPU. Note that the SIMMs are latched and will only go in one direction.
3. Carefully push the SIMM towards the CPU until the locking tabs at the side snaps into place.
4. Check to make sure the SIMM is inserted securely.
5. Repeat Steps 2-4 for SIMM 2.

3.2 CPU Installation

1. Align pin one (white dot) on the CPU with pin one of the socket. Pin one of the CPU socket may either be marked on the board or indicated by an arrow sign on the base of the socket. Normally, its diagonal corner distinguishes pin one on the socket.
2. To complete the CPU installation, gently press the CPU into place.
3. Double-check the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.

3.3 Completing Installation

To complete the installation, the following steps should be followed:

1. Make sure the power is OFF.
2. Set the configuration jumpers according to the jumper setting on Chapter 2.
3. Install the SBC8159 Series CPU card into one of the slots on the passive backplane. You may allow the SBC8159 Series to stand alone as a single board computer.
4. Connect the I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply and etc. to the CPU board.

NOTE: *The color of pin one is usually red or blue, while others are gray.*

5. Turn ON the system power.

Chapter 4

Hardware Description

This chapter gives a detailed explanation of the hardware features onboard the SBC8159 Series all-in-one Pentium CPU cards.

4.1 CPU

The SBC8159 Series supports Intel Pentium, AMD K5/K6, and Cyrix 6x86 CPUs. Systems based on these CPUs can be operated under UNIX, OS/2, Windows NT, Windows 95 and MS-DOS environments. The system's performance depends on the installed CPU on the board. When installing a new CPU, the jumpers including CPU type, CPU Clock, CPU Voltage and PCI Bus Clock may need to be adjusted. Make sure all the settings are correct for the installed CPU to prevent any damage to the CPU.

4.2 BIOS

The system BIOS used in SBC8159 Series is Award Plug and Play BIOS. The SBC8159 Series contains a single 256KB Flash EPROM.

4.3 I/O Port Address Map

The CPU card communicates via I/O ports. It has a total of 1KB port addresses that can be assigned to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-03F	Interrupt controller #1
040-05F	Timer

Continued

Address	Devices
060-06F	Keyboard controller
070-07F	Real time clock, NMI
080-09F	DMA page register
0A0-0BF	Interrupt controller #2
0F0	Clear math coprocessor busy signal
0C0-0DF	DMA controller #2
0F1	Reset math coprocessor
0F8-0FF	Math processor
120	Disable watchdog timer operation (read)
121	Enable watchdog timer operation (read)
122	Watchdog
1F0-1F8	Fixed disk controller
200-207	Game port
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel port #1
380-38F	SDLC #2
3A0-3AF	SDLC #1
3B0-3BF	MDA video card (including LPT1)
3C0-3CF	EGA card
3D0-3DF	CGA card
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)
3F0	Winbond I/O

4.4 Interrupt Controller

The SBC8159 Series is a fully PC compatible control board. It consists of 16 ISA interrupt request lines and 4 of the 16 can be either ISA or PCI. The mapping list of the 16 interrupt request lines is shown below;

NMI	Parity check error
IRQ0	System timer output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	Reserved
IRQ6	Floppy disk controller
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	USB (onboard network)
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE Channel

4.5 IDE Interface Connector

The SBC8159 Series includes a 2-channel PCI bus enhanced IDE controller which can support master/slave mode and post write transaction mechanisms with 64-byte buffer, and master data transaction. This feature, connected via connectors **CN4** and **CN5**, allows the SBC8159 Series to handle 4 IDE drives. Refer to Appendix B for the respective pinout assignments of **CN4** and **CN5**.

4.6 VGA Interface Connector

CN13 onboard SBC8159 Series is a connector supporting CRT VGA panel displays. **CN13** is a standard 15-pin pin header connector commonly used for CRT VGA display. Configuration of the VGA interface is done via the software utility and no jumper setting is required. See Appendix B for the pin assignment of **CN13**.

4.7 Floppy Disk Controller

The SBC8159 Series provides a 34-pin header type connector, **CN6**, supporting up to two floppy drives. The floppy drives may be any one of the following types: 5.25" 360KB/1.2MB and 3.5" 720KB/1.44MB/2.88MB. The **CN6** pin assignment is listed in Appendix B.

4.8 Parallel Port Interface

The SBC8159 Series onboard **CN7** is a multi-mode parallel port able to support:

- Standard mode: IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port
- Enhanced mode: Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)
- High speed mode: Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

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

4.9 Serial Port Interface

The serial interface onboard SBC8159 Series consists of COM1 port supports RS-232 and COM2 provide RS-232/422/485 connectivity.

4.9.1 Serial Ports IRQ Selection

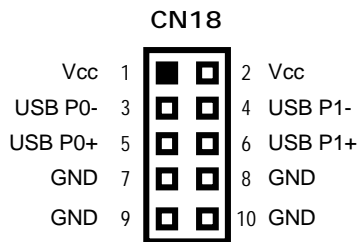
COM1 and COM2 on SBC8159 Series CPU card have two 10-pin connector, **CN8** and **CN9**, and a DB9-pin connector for COM1 (**CN15**). Interrupt Requests on COM1 and COM2 for all SBC8159 Series CPU cards are selected via IRQ4 and IRQ3 respectively. Additionally, both ports can be enabled or disabled via BIOS setting. The RS-232 pin assignments for COM1 and COM2 along with the RS-485 pin assignments for COM2 are in Appendix B.

4.10 Keyboard and PS/2 Mouse Connectors

The SBC8159 Series provides a keyboard (**CN10**) and PS/2 (**CN11**) mouse Interface with a 5-pin connector. **CN17** is a DIN connector for PS/2 keyboard connection. The pin assignments of the keyboard/mouse are shown in Appendix B.

4.11 USB Connector

The Universal Serial Bus (USB) connector on the SBC8159 Series is for installation of peripherals supporting the USB interface. **CN18** is the 10-pin USB connector on the SBC8159 Series.

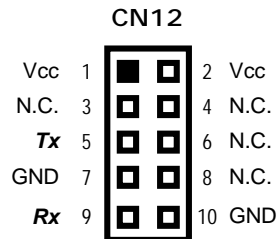


4.12 Ethernet Connector

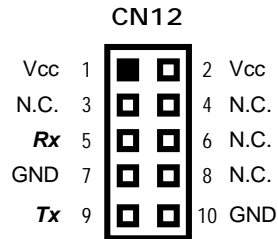
The RJ-45 connector is used for Ethernet. To connect the **SBC8159VE** to 10-Base-T or 100-Base-T hub, just plug one end of the cable into the **CN14** and connect the other end (phone jack) of the cable to a 10-Base-T hub.

4.13 IrDA Connector

CN12 is a 10-pin connector is used for an IrDA connector for wireless communication.



For Rev. A1 only



For Rev. A2 and later

You must also configure the setting on the “UART Mode Select” from the Integrated Peripherals menu your BIOS utility program to select whether UART2 is directed for use with COM2, IrDA, or other IrDA-compliant serial infrared port. Use the five pins of **CN17** and connect a ribbon cable from the module to the motherboard according to the pin definitions.

Chapter 5

Award BIOS Setup

The Award BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in a battery-backed RAM (CMOS RAM) that retains the Setup information each time the power is turned off.

5.1 Entering Setup

There are two ways to enter the Setup program. You may either turn on the computer and press immediately, or press the and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power On Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system and try again. This is possible by turning the system power to OFF then to ON, pressing the "RESET" button on the system case, or by simultaneously pressing <Ctrl>, <Alt>, and keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will be prompted with the following:

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

5.2 Control Keys

Up arrow	Moves cursor to the previous item
Down arrow	Moves cursor to the next item
Left arrow	Moves cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quits and deletes changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exits current page and returns to Main Menu
PgUp/"+" key	Increases the numeric value or makes changes
PgDn/"-" key	Decreases the numeric value or makes changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restores the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Loads the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Loads the Setup default , only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Saves all the CMOS changes, only for Main Menu

5.3 Getting Help

- **Main Menu**
The on-line description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu/Option Page Setup Menu**
Press <F1> to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <F1> or <Esc>.

5.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use the arrow keys to select the setup function you intend to configure then press <Enter> to accept or enter its sub-menu.

**ROM PCI/ISA BIOS (2A5IISZ9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.**

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date Hard Disk Type...	

- **Standard CMOS Setup**
This setup option includes all the items in a standard compatible BIOS.
- **BIOS Features Setup**
This setup page includes all the items of Award special enhanced features.
- **Chipset Features Setup**
This setup option includes all the items of chipset special features.
- **Power Management Setup**
This category determines the power consumption of the system after selecting its items. Default value is Disabled.
- **PnP/PCI Configuration**
This category specifies the assignment of all IRQs and DMAs.

- **Load BIOS Defaults**
BIOS defaults indicate the most appropriate values of the system parameter in which the system can operate at a minimum performance.
- **Load Setup Defaults**
Chipset defaults indicate the values required by the system for maximum performance.
- **Integrated Peripherals**
This page allows you to set up all the on board I/O controllers like IDE, SCSI, FDC, etc..
- **Supervisor / User Passwords**
Changes, sets or disables password of Supervisor or User. It allows you to restrict access to the system and Setup, or just to Setup.
- **IDE HDD Auto Detection**
Automatically configures hard disk parameters.
- **HDD Low Level Format**
Hard disk low level format utility.
- **Save & Exit Setup**
Saves CMOS value changes to CMOS and exits setup.
- **Exit Without Saving**
Abandons all CMOS value changes and exits setup.

5.5 Standard CMOS Setup Menu

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

**ROM PCI/ISA BIOS(2A5IISZ9)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.**

Date (mm:dd:yy) : Fri, Jul 18 1997								
Time (hh:mm:ss) : 00:00:00								
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDE	SECTOR	MODE
Primary Master:	Auto	0	0	0	0	0	0	-----
Primary Slave:	Auto	0	0	0	0	0	0	-----
Secondary Master:	Auto	0	0	0	0	0	0	-----
Secondary Slave:	Auto	0	0	0	0	0	0	-----
Drive A : 1.44M , 3.5 in						Base Memory : 640K		
Drive B : None						Extended Memory :14336K		
Video : EGA / VGA						Other Memory : 384K		
Halt On : All Errors						Total Memory :15360K		
ESC : Quit			↑ ↓ → ← : Select Item]			PU / PD / + / - : Modify		
F1 : Help			(Shift) F2 : Change Color					

- **Date**

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

day	The day of week, from Sun to Sat, determined by the BIOS, is read only
date	The date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
month	The month, Jan through Dec.
year	The year, depends on the year of BIOS

- **Time**

The time format is <hour> <minute> <second> accepting either function key or numerical key. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **Primary Master/Primary Slave/Secondary Master/Secondary Slave**

The categories identify the types of one channel that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type User is user-definable.

Press <PgUp>/<+> or <PgDn>/<-> to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information within this category. If your hard disk drive type does not match or is not listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, select "Type 1".

If the controller of HDD interface is SCSI, select "None".

If the controller of HDD interface is CD-ROM, select "None".

CYLS.	number of cylinders	LANDZONE	landing zone
HEADS	number of heads	SECTORS	number of sectors
PRECOMP	write precom	MODE	HDD access mode

If there is no hard disk drive installed, select NONE and press <Enter>.

- **Drive A type/Drive B type**

The category identifies the types of floppy disk drive A or drive B installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5.25 inch PC-type standard drive; 360Kb capacity
1.2M, 5.25 in	5.25 inch AT-type high-density drive; 1.2MB capacity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb capacity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB capacity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB capacity

- **Video**

The category selects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in Setup. You have two ways to boot up the system:

1. When VGA as primary and monochrome as secondary, the selection for the video type is "VGA Mode".
2. When monochrome as primary and VGA as secondary, the selection of the video type is "Monochrome Mode".

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

- **Error halt**

The category determines whether the computer will stop if an error is detected during power up.

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

- **Memory**

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

- **Base Memory**

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

■ **Extended Memory**

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

■ **Other Memory**

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.

■ **Total Memory**

System total memory is the sum of basic memory, extended memory, and other memory.

5.6 BIOS Features Setup Menu

**ROM PCI/ISA BIOS (2A5IISZ9)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.**

Virus Warning	:Disabled	Video BIOS Shadow	:Enabled
CPU Internal Cache	:Enabled	C8000-CBFFF Shadow	:Disabled
External Cache	:Enabled	CC000-CFFFF Shadow	:Disabled
Quick Power On Self Test	:Enabled	D0000-D3FFF Shadow	:Disabled
Boot Sequence	:A,C,SCSI	D4000-D7FFF Shadow	:Disabled
Swap Floppy Drive	:Disabled	D8000-DBFFF Shadow	:Disabled
Boot Up Floppy Seek	:Enabled	DC000-DFFFF Shadow	:Disabled
Boot Up NumLock Status	:On		
Boot Up System Speed	:High		
Gate A20 Option	:Fast		
Typematic Rate Setting	:Disabled		
Typematic Rate(Chars/Sec)	:6	ESC : Quit	↑ ↓ → ← : Select Item
Typematic Delay (Msec)	:250	F1 : Help	PU/PD/+/- : Modify
Security Option	:Setup	F5 : Old Values	(Shift) F2 : Color
PCI/VGA Palette Snoop	:Disabled	F6 : Load BIOS Defaults	
OS Select for DRAM >64MB	:Non-OS2	F7 : Load Setup Defaults	

● **Virus Warning**

This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is "Disabled".

<p>! WARNING ! <i>Disk boot sector is to be modified</i> <i>Type "Y" to accept write or "N" to abort write</i> <i>Award Software, Inc.</i></p>

Enabled	Activates automatically when the system boots up causing a warning message to appear when there is an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when attempts to access the boot sector or hard disk partition table are made.

NOTE: *This function is only available with DOS and other operating systems that do not trap INT13.*

- **CPU Internal Cache/External Cache**
These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is "Enabled". CPUs with no built-in internal cache will not provide the "CPU Internal Cache" item on the menu.

Enabled	Enable cache
Disabled	Disable cache

- **Quick Power On Self Test**
This option speeds up Power On Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is "Enabled".

Enabled	Enable Quick POST
Disabled	Normal POST

- **Boot Sequence**
The original IBM PCs load the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, the BIOS now offers 11 different boot sequence options of three drives each. In addition to the traditional drives A and C, options include IDE hard drives D, E, and F; plus a SCSI hard drive and a CD-ROM drive. This category determines from which drive the computer searches first for the disk operating system (i.e., DOS). Default value is "A,C,SCSI".

A,C,SCSI	System searches for the operating system from the floppy disk drive. If it fails, it will search from the hard disk drive. If operating system is still not found, it'll seek from the SCSI device.
C,A,SCSI	System searches for the operating system from the hard disk drive first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
C,CDROM,A	System searches for the operating system from the hard disk drive first. If it fails, it will search from the IDE CDROM drive. If operating system is still not found, it'll seek from the floppy disk drive.
CDROM,C,A	System searches for the operating system from the IDE CDROM drive first. If it fails, it will search from the hard disk drive. If operating system is still not found, it'll seek from the floppy disk drive.
D,A,SCSI	System searches for the operating system from the second IDE HDD first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
E,A,SCSI	System searches for the operating system from the third IDE HDD first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
F,A,SCSI	System searches for the operating system from the fourth IDE HDD first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the SCSI device.
SCSI,A,C	System searches for the operating system from the SCSI device first. If it fails, it will search from the floppy disk drive. If operating system is still not found, it'll seek from the first IDE HDD.
SCSI,C,A	System searches for the operating system from the SCSI device first. If it fails, it will search from the first IDE HDD. If operating system is still not found, it'll seek from the floppy disk drive.
C only	System only searches for the operating system from the first IDE HDD.
LS/ZIP,C	System searches for the operating system from the 120MB LS floppy or the 100MB ZIP drive first. If it fails, it'll search from the first IDE HDD.

- **Boot Up Floppy Seek**

During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks, installed in the system. 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is "Enabled".

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the drive installed is 360K.

- **Boot Up NumLock Status**

This option enables and disables the numberlock function of the keypad. The default value is "On".

On	Keypad functions confine with numbers
Off	Keypad functions convert to special functions (i.e., left/right arrow keys)

- **Boot Up System Speed**

It selects the default system speed - the speed that the system will operate immediately after power up. The default value is "High".

High	Sets the speed to high
Low	Sets the speed to low

- **Gate A20 Option**

The default value is "Fast".

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**

This determines the typematic rate of the keyboard. The default value is "Disabled".

Enabled	Enable typematic rate and typematic delay programming
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items and the default is controlled by keyboard.

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

This option refers to the number of characters the keyboard can type per second. The default value is "6".

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**

This option sets the display time interval from the first to the second character when holding a key. The default value is "250".

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

- **Security Option**

This item allows you to limit access to the system and Setup, or just to Setup. The default value is "Setup".

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

NOTE: *To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything, just press <Enter> and it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **OS Select for DRAM >64**

This segment is specifically created for OS/2 when DRAM is larger than 64MB. If your operating system is OS/2 and DRAM used is larger the 64MB, you have to select "OS 2", otherwise (under non-OS2), default is NON-OS2. The default value is "Non-OS2".

- **Video BIOS Shadow**

Video shadowing increases the video speed by copying the video BIOS into RAM. However, it is still optional depending on the chipset design. The default value of this option is "Enabled".

Enabled	Video BIOS shadowing is enabled
Disabled	Video BIOS shadowing is disabled

- **C8000 - CBFFF Shadow/DC000 - DFFFF Shadow**

These options determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit. The default value for all is "Disabled".

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

- NOTE:
1. For C8000-DFFFF option-ROM on PCI BIOS – BIOS automatically enables the shadow RAM. User does not have to select the item.
 2. IDE second channel control:
Enable: enables secondary IDE port and BIOS will assign IRQ15 for this port.
Disable: disables secondary IDE port and IRQ15 is available for other device(s). The item is optional only for PCI BIOS.
 3. Some sound cards have an onboard CD-ROM controller that uses IDE Secondary Port. To avoid PCI IDE conflict, disable the IDE secondary channel control so that the CD-ROM may work.

5.7 Chipset Features Setup Menu

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

**ROM PCI/ISA BIOS (2A5IISZ9)
CHIPSET FEATURES SETUP
AWARD SOFTWARE INC.**

Auto Configuration	: Disabled	CPU to PCI Post Write	: Disable
L2 Cache Update Mode	: WT	CPU to PCI Burst Mem. WR	: Disabled
L2 (WB) Tag Bit Length	: 7bits	ISA Bus Clock Frequency	: PCICLK/4
SRAM Back-to-Back	: Enabled	System BIOS Cacheable	: Disabled
NA# Enable	: Disabled	Video BIOS Cacheable	: Disabled
Starting Point of Paging	: 4T	Memory Hole at 15M-16M	: Disabled
Refresh Cycle Time (us)	: 62.4	VGA Shared Memory Size	: 1.5MB
RAS Pulse Width Refresh	: 4T	VGA Memory Clock (MHz)	: 69
RAS Precharge Time	: 4T	Linear Mode SRAM Support	: Enabled
RAS to CAS Delay	: 4T		
CAS# Pulse Width (FP)	: 2T		
CAS# Pulse Width (EDO)	: 2T		
RAMW# Assertion Timing	: 3T		
CAS Precharge Time (EDO)	: 1T		
CAS Precharge Time (FP)	: 1T	ESC	: Quit ↑ ↓ → ← : Select Item
SDRAM WR Retire Rate	: X-2-2-2	F1	: Help PU/PD/+/- : Modify
SDRAM Wait State Control	: 1WS	F5	: Old Values (Shift) F2 : Color
Enhanced Memory Write	: Disabled	F6	: Load BIOS Defaults
Read Prefetch memory RD	: Enabled	F7	: Load Setup Defaults

- **Auto Configuration**

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

NOTE: *When this item is enabled, the pre-defined items will become SHOW-ONLY.*

- **L2 Cache Update Mode**
L2 update mode determines how the CPU writes data to its external cache. Write-Through updates memory with data held in the cache whenever the CPU issues a write cycle. Write-Back updates memory only under certain conditions, such as read requests to the memory whose contents are currently in the cache. The CPU operates with fewer interruptions, increasing its efficiency, in Write-Back mode. The available choices are *WT* and *WB*.
- **L2 (WB)Tag Bit Length**
Not all SRAM supports 8 tag bits. The system board designer should select the installed cache SRAM. If this field is set to 8 tag bits and the system reports cache memory errors, try setting the field to 7 bits. The available choices are *7 bits* and *8 bits*.
- **SRAM Back-to-Back**
This item allows you to enable/disable SRAM Back-to-Back. A single burst cycle timing is 3-1-1-1. SRAM Back to Back is for 2 consecutive cycles timing: 3-1-1-1-1-1-1-1-1. The available choices are *Enabled* and *Disabled*.
- **NA# Enable**
It controls both DRAM and cache timing. If NA# not enable, there would not be any consecutive cycle sent by CPU. The available choices are *Enabled* and *Disabled*.
- **Starting Point of Paging**
This item allows you to select the "starting Point of Paging" function. The available choices are *1T*, *2T*, *4T*, and *8T*.
- **Refresh Cycle Time (us)**
DRAM needs data refresh otherwise the data will be lost. The normal refresh time is 15.6us. However the progress of DRAM technology makes the DRAM be able to suffer longer refresh time, 15.6 x 1, or 15.6 x 2, or 15.6 x 3. The available choices are *15.6*, *62.4*, *124.8*, *187.2*.
- **RAS Pulse Width Refresh**
Select the number of CPU clock cycles for RAS DRAM refresh. Fewer clock cycles give faster performance, and more cycles give more stable performance. The available choices are *4T*, *5T*, *6T*, and *7T*.

- **RAS Precharge Time**
Defines the length of time for Row Address Strobe is allowed to precharge. The available choices are *2T*, *3T*, *4T*, and *5T*.
- **RAS to CAS Delay**
This sets the relative delay between the row and column address strobes. The available choices are *2T*, *3T*, *4T*, and *5T*.
- **CAS # Pulse Width (FP)**
Determines the number of CPU clock cycles allocated for the CAS to accumulate its charge before Fast Page mode DRAM is allowed to precharge. If insufficient time is allowed, refresh may be incomplete and data lost. The available choices are *2T* and *1T*.
- **CAS # Pulse Width (EDO)**
Determines number of CPU clock cycles the CAS signal pulses during EDO DRAM reads and writes, when memory is not interleaved. The available choices are *2T* and *1T*.
- **RAMW# Assertion Timing**
This item allows you to select the RAMW# assertion timing. RAMW# is internal DRAM control signal of chipset. The available choices are *Normal* and *Faster*.
- **CAS Precharge Time (EDO)**
This item allows you to select CAS precharge time for EDO RAM. The available choices are *1T*, *1T/2T*, and *2T*.
- **CAS Precharge Time (FP)**
This item allows you to select CAS precharge time for FP RAM. The available choices are *1T*, *1T/2T*, and *2T*.
- **SDRAM WR Retire Rate**
Chipset has a post write buffer. The buffer will store the data of all CPU write cycle first, and then forward the data to DRAM. "retire rate" is the speed of buffer to DRAM. The available choices are *X-1-1-1* and *X-2-2-2*.
- **SDRAM Wait State Control**
This item allows you to select SDRAM wait state control function during Precharge command. The available choices are *1WS* and *0WS*.
- **Enhanced Memory Write**
This time allows you to enable/disable the enhanced memory write. The available choices are *Enabled* and *Disabled*.

- **Read Prefetch Memory RD**
Chipset has a prefetch buffer. It will prefetch the DRAM data of next address in buffer. Then when next necessary hits this address, CPU can get the data from this buffer instead of DRAM. It will shorten this cycle time. The available choices are *Enabled* and *Disabled*.
- **CPU to PCI Post Write**
Select enabled to use a fast buffer for posting writes to memory. Using a fast buffer releases the CPU before completion of a write cycle to DRAM. The available choices are *3T*, *4T*, and *Disabled*.
- **CPU to PCI Burst Mem. WR**
Select enabled permits PCI burst memory write cycles, for faster performance. When disabled, performance is slightly slower, but more reliable. The available choices are *Enabled* and *Disabled*.
- **ISA Bus Clock Frequency**
Set the speed of the ISA bus here. Two settings are tied to the speed of the PCI bus. If the PCI bus operates at 33 MHz, a setting of *PCICLK/4* would yield an ISA bus speed of approximately 8 MHz, the standard speed of the ISA bus. While most devices operate at higher ISA bus speeds, try a slower bus speed if your ISA device does not function properly at a high bus speed. The available choices are *7.159MHz*, *PCICLK/3*, and *PCICLK/4*.
- **System BIOS Cacheable**
Select Enabled allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Enabled	BIOS access cached
Disabled	BIOS access not cached

- **Video BIOS Cacheable**
Select Enabled allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Enabled	Video BIOS access cached
Disabled	Video BIOS access not cached

- **Memory Hole At 15M-16M**

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved it can not be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Enabled	Memory hole supported
Disabled	Memory hole not supported

- **VGA Shared Memory Size**

This item allows you to select the VGA Shared Memory Size. The available choices are *0.5MB*, *1MB*, *1.5MB*, and *2MB*.

- **VGA Memory Clock (MHz)**

This item allows you to select the VGA Memory Clock (MHz). The available choices range from *40~70 MHz*.

- **Linear Mode SRAM Support**

Set this field to Enabled only if the system contains a Cyrix CPU and linear mode SRAM. The available choices are *Enabled* and *Disabled*.

5.8 Power Management Setup

The Power Management Setup screen appears like this:

**ROM PCI/ISA BIOS (2A5IISZ9)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.**

Power Management	: Disable	IRQ3 (COM 2)	: Enabled
PM Control by APM	: No	IRQ4 (COM 1)	: Enabled
Video Off Method	: Susp, Stby -> Off	IRQ5 (LPT 2)	: Enabled
Video Off After	: V/H SYNC+Blank	IRQ6 (Floppy Disk)	: Enabled
Modem Use IRQ	: Break	IRQ7 (LPT 1)	: Enabled
Doze Mode	: 7	IRQ8 (RTC Alarm)	: Enabled
Standby Mode	: 7	IRQ9 (IRQ2 Redir)	: Enabled
Suspend Mode	: 10	IRQ10 (Reserved)	: Enabled
** PM Timers **		IRQ11 (Reserved)	: Enabled
HDD Off After	: 14 Min	IRQ12 (PS/2 Mouse)	: Enabled
Doze Mode	: Disable	IRQ13 (Coprocessor)	: Enabled
Standby Mode	: Disable	IRQ14 (Hard Disk)	: Enabled
Suspend Mode	: Disable	IRQ15 (Reserved)	: Enabled
** PM Events **		ESC: Quit ↑↓→←: Select Item	
COM Ports Activity	: Disabled	F1 : Help PU/PD/+/- : Modify	
LPT Ports Activity	: Disabled	F5 : Old Values (Shift)F2 : Color	
HDD Ports Activity	: Disabled	F6 : Load BIOS Defaults	
VGA Activity	: Disabled	F7 : Load Setup Defaults	

- **Power Management**

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

1. Doze Mode
2. Standby Mode
3. Suspend Mode
4. HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings.

Max. Power Saving	Maximum power management -- ONLY AVAILABLE FOR SL CPUs . Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Continued

Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Disable (default)	No power management. Disables all four modes

- **PM Control by APM**

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If Advance Power Management (APM) is installed on your system, selecting Yes gives better power savings. If the Max. Power Saving is not enabled, this will be preset to *No*.

NOTE: *If APM is not installed, this option has no effect.*

- **Video Off Option**

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

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

- **Video Off Method**

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

NOTE: *Green monitors detect the V/H SYNC signals to turn off its electron gun*

- **Switch Function**
This item allows you to select the switch function type. The available choices are *Deturbo*, *Break*, *Break/Wake*, and *Disabled*.
- **Doze Speed (div by)**
Sets the CPU's speed during Doze mode. The speed is reduced to a fraction of the CPU's normal speed. The divisors range from 1 to 8. The available choices also range from *1-8*.
- **Stdby Speed (div by)**
Sets the CPU's speed during Doze mode. The speed is reduced to a fraction of the CPU's normal speed. The divisors range from 1 to 8-0. The available choices also range from *1-8*.
- **MODEM Use IRQ**
This determines the IRQ in which the MODEM can use. The available choices are *3*, *4*, *5*, *7*, *9*, *10*, *11*, and *NA*.

5.8.1 PM Timers

The following four modes are Green PC power saving functions which are only user configurable when *User Defined Power Management* has been selected. See above for available selections.

- **HDD Off After**
By default, this item is Disabled, meaning that no matter the mode the rest of the system, the hard drive will remain ready. Otherwise, you have a range of choices from 1 to 15 minutes or Suspend. This means that you can elect to have your hard disk drive be turned off after a selected number of minutes or when the rest of the system goes into a Suspend mode.
- **Doze Mode**
When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.
- **Standby Mode**
When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

- **Suspend Mode**

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

5.8.2 Power Down Activities

Power Down Activities events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything that occurs to a device configured as *On*, even when the system is in a power down mode.

- **COM Ports Activity**

When set to *On* (default), any event occurring at a COM (serial) port will awaken a system which has been powered down.

- **LPT Ports Activity**

When set to *On* (default), any event occurring at a LPT (printer) port will awaken a system which has been powered down.

- **HDD Ports Activity**

When set to *On* (default), any event occurring at a hard or floppy drive port will awaken a powered down system.

- **VGA Activity**

When set to *On* (default), any event occurring at VGA will awaken a system which has been powered down.

The following is a list of IRQ's, Interrupt ReQuests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. As stated above, the choices are *On* and *Off*.

When set to *On*, activity will neither prevent the system from going into a power management mode nor awaken it.

- | | | |
|----------------------|---------------------|-----------------------|
| ■ IRQ3 (COM 2) | ■ IRQ8 (RTC Alarm) | ■ IRQ12 (P/S 2 Mouse) |
| ■ IRQ4 (COM 1) | ■ IRQ9 (IRQ2 Redir) | ■ IRQ13 (Coprocessor) |
| ■ IRQ5 (LPT 2) | ■ IRQ10 (Reserved) | ■ IRQ14 (Hard Disk) |
| ■ IRQ6 (Floppy Disk) | ■ IRQ11 (Reserved) | ■ IRQ15 (Reserved) |
| ■ IRQ7 (LPT 1) | | |

5.9 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

**ROM PCI/ISA BIOS (2A5IISZ9)
PNP/PCI CONFIGURATION SETUP
AWARD SOFTWARE, INC.**

Resources Controlled By	: Manual	PCI IRQ Activated By	: Edge
Reset Configuration Data	: Disabled	PCI IDE 2 nd Channel	: Disabled
IRQ-3 assigned to	: PCI/ISA PnP	PCI IDE IRQ Mao To	: PCI-AUTO
IRQ-4 assigned to	: PCI/ISA PnP	Primary IDE INT#	: C
IRQ-5 assigned to	: PCI/ISA PnP	Secondary IDE INT#	: A
IRQ-7 assigned to	: PCI/ISA PnP		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP		
DMA-3 assigned to	: PCI/ISA PnP	ESC: Quit	↑↓→←: Select Item
DMA-5 assigned to	: PCI/ISA PnP	F1 : Help	PU / PD / + / - : Modify
DMA-6 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift)F2 : Color
DMA-7 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

- Resource controlled by**
 The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows[®]95. The available choices are *Auto* and *Manual*.

- **Reset Configuration Data**

Normally, you leave this field 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 operating system can not boot. The available choices are *Enabled* and *Disabled*.
- **IRQ3/4/5/7/9/10/11/12/14/15**

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

 1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
 2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

The available choices are *Legacy ISA* and *PCI/ISA PnP*.
- **DMA0/1/3/5/6/7 assigned to**

When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

 1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
 2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

The available choices are *Legacy ISA* and *PCI/ISA PnP*.
- **PCI IRQ Activated by**

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system's manufacturer. The available choices are *Level* and *Edge*.

- **PCI IDE 2ND Channel**

The IDE standard supports two channels (interfaces) with two devices on each channel. Enable the second channel if your system has two PCI IDE connectors in use, either on the system board or on expansion boards. Disable the second channel if a second IDE connector is not present or not in use. The available choices are *Enabled* and *Disabled*.

- **PCI IDE IRQ Map to**

This allows you to configure your system to the type of IDE disk controller in use. By default, Setup assumes that your controller is an ISA (Industry Standard Architecture) device rather than a PCI controller. The more apparent difference is the type of slot being used.

If you have equipped your system with a PCI controller, changing this allows you to specify which slot has the controller and which PCI interrupt (A, B,C or D) is associated with the connected hard drives. Remember that this setting refers to the hard disk drive itself, rather than individual partitions. Since each IDE controller supports two separate hard drives, you can select the INT# for each. Again, you will note that the primary has a lower interrupt than the secondary as described in "*Slot x Using INT#ⁿ*" above.

Selecting "*PCI Auto*" allows the system to automatically determine how your IDE disk system is configured.

5.10 Integrated Peripherals

ROM PCI/ISA BIOS (2A5IISZ9)
 INTEGRATED PERIPHERALS
 AWARD SOFTWARE, INC.

Internal PCI/IDE	: Both	WatchDog Time-out Setting	: 0.5 sec
IDE Primary Master PIO	: Auto	PS/2 mouse Function	: Disabled
IDE Primary Slave PIO	: Auto	USB Controller	: Disabled
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
IDE Burst Mode	: Disabled		
IDE Data Port Post Write	: Disabled		
IDE HDD Block Mode	: Disabled		
Onboard FDD Controller	: Enabled		
Onboard Serial Port 1	: 3E8/IRQ4		
Onboard Serial Port 2	: 2E8/IRQ3		
UART 2 Mode	: HPSIR		
IR Function Duplex	: Full		
RxD, TxD Active	: Hi, Hi		
Onboard Parallel Port	: 38C/IRQ7	ESC: Quit	↑↓→←: Select Item
Onboard Parallel Mode	: ECP/EPP	F1: Help	PU / PD / + / - : Modify
ECP Mode Use DMA	: 1	F5: Old Values	(Shift)F2 : Color
Parallel Port EPP Type	: EPP1.9	F6: Load BIOS Defaults	
		F7: Load Setup Defaults	

- **Internal PCI / IDE**

This chipset contains an internal PCI IDE interface with support for two IDE channels. The available choices are *Primary*, *Secondary*, and *Both*.

5.10.1 IDE PIO

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers (primary and secondary) so you have to ability to install up to four separate hard disks.

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete tasks by themselves. This is simpler and more efficient (and faster).

Your system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When *Auto* is selected, the BIOS will select the best available mode. This is true for the next four setup items:

1. IDE Primary Master PIO
2. IDE Primary Slave PIO
3. IDE Secondary Master PIO
4. IDE Secondary Slave PIO

● **IDE Data Port Post Write**

PCI speed is faster than the speed of physical hard disk or CD-ROM. To use a buffer to store the PCI data first then forwards the data to hard disk. The available choices are *Enabled* and *Disabled*.

● **IDE HDD Block Mode**

The 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.

Enabled	Secondary HDD controller used
Disabled	Secondary HDD controller not used

● **Onboard FDD Controller**

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature. The available choices are *Enabled* and *Disabled*.

● **Onboard Serial Port 1/Port 2**

This item allows you to determine access onboard serial port 1/port 2 controller with which I/O address. The available choices are *3F8/IRQ4*, *238/IRQ3*, *3E8/IRQ4*, *2F8/IRQ3*, *Disabled*, and *Auto*.

● **UART 2 Mode**

This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The available choices are *Standard*, *ASKIR*, and *HPSIR*.

- **IR Function Duplex**
This item allows you to select the IR function when you select the UART 2 Mode is ASKIR. The available choices are *Half* and *Full*.
- **RxD, TxD Active**
This item allows you to determine the active of RxD, TxD. The available choices are *"Hi, Hi"*, *"Lo, Lo"*, *"Lo, Hi"*, and *"Hi, Lo"*.
- **Onboard Parallel Port**
This item allows you to determine access onboard parallel port controller with which I/O address. The available choices are *378H/IRQ7*, *278H/IRQ5*, *3BCH/IRQ7*, and *Disabled*.
- **Onboard Parallel Mode**
Select an operating mode for the onboard parallel (printer) port. Normal EPP (Extended Parallel Port) ECP (Extended Capabilities Port) CEP+EPP PC AT parallel port Bidirectional port Fast, buffered port Fast, buffered, bidirectional port.
Select Normal unless you are certain your hardware and software both support EPP or ECP mode.
The available choices are *SPP*, *ECP/EPP*, *ECP*, and *EPP/SPP*.
- **ECP Mode Use DMA**
Select a DMA channel for the parallel port for use during ECP mode.
The available choices are *3* and *1*.
- **Parallel Port EPP Type**
This item allows you to determine the IR transfer mode of onboard I/O chip. The available choices are *EPP1.9* and *EPP1.7*.
- **WatchDog Time-Out Setting**
The default value is *"0.5 Sec"*.
- **PS/2 mouse function**
This item allows you to determine to enable the hardware PS/2 mouse function or not. The available choices are *Enabled* and *Disabled*.
- **USB Controller**
Select Enabled if your system contains a USB controller and you have a USB keyboard. The default value is *"Disabled"*.

5.11 Supervisor/User Password Setting

You can set either supervisor or user password, or both of them. The differences between are:

1. **supervisor password:** can enter and change the options of the setup menus.
2. **user password:** just can enter but do not have the right to change the options of the setup menus.

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

ENTER PASSWORD:

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

To disable password, just press <Enter> when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password is enabled, you have to type it every time you enter Setup. This prevents any unauthorized person from changing your system configuration.

Additionally when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during boot up and entry into Setup. If set as "Setup", prompting will only occur prior to entering Setup.

5.12 IDE HDD Auto Detection

The Enhance IDE feature is included in all Award BIOS. The following is a brief description of this feature.

1. Setup Changes

<I> Auto-detection

BIOS setup will display all possible modes supported by the HDD including NORMAL, LBA & LARGE.

If HDD does not support LBA modes, no 'LBA' option will be shown.

Users can select a mode appropriate for them.

ROM/PCI/ISA BOPS (2XXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master :								
Select Primary Master Option (N = Skip) : N								
OPTION	SIZE	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS	MODE	
1 (Y)	516	1120	16	65535	1119	59	NORMAL	
2	516	524	32	0	1119	63	LBA	
3	516	560	32	65535	1119	59	LARGE	

<II> Standard CMOS Setup

	CYLS	Heads	Precomp	Landzone	Sector	Mode
Primary Master :User(516MB)	1120	16	65535	1119	59	NORMAL
Primary Slave :None (203MB)	684	16	65535	685	38	-----
Secondary Master :	None	0	0	0	0	0 0
Secondary Slave :	None	0	0	0	0	0 0

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

2. HDD Modes

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

■ NORMAL mode

Generic access mode wherein neither BIOS nor IDE controller will make any transformations during accessing.

The maximum number of cylinders, head & sectors for NORMAL mode are 1024, 16 & 63.

no. Cylinder	(1024)
x no. Head	(16)
x no. Sector	(63)
x no. per sector	(512)
<hr/>	
528 Megabytes	

If user sets his HDD to NORMAL mode, the maximum accessible HDD size will be 528MB even though its physical size may be greater than that!

■ LBA (Logical Block Addressing) mode

A new HDD accessing method to overcome the 528MB bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD.

During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder number into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4GB which is obtained by the following formula:

no. Cylinder	(1024)
x no. Head	(255)
x no. Sector	(63)
x bytes per sector	(512)
<hr/>	
814 Gigabytes	

■ **LARGE mode**

Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user does not want LBA).

The Award BIOS provides another alternative to support these kinds of HDD!

Example of LARGE mode:

<u>CYLS</u>	<u>HEADS</u>	<u>SECTOR</u>	<u>MODE</u>
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT13h in order to access the right HDD address!

Maximum HDD size:

	no. Cylinder	(1024)
x	no. Head	(32)
x	no. Sector	(63)
	x bytes per sector	(512)

1 Gigabytes

3. Remarks

To support LBA or LARGE mode of HDDs, there must be some software involved. All these software are located in the Award HDD Service Routine (INT 13h). It may fail to access a HDD with LBA (LARGE) mode selected if you are running under a Operating System that replaces the whole INT 13h.

5.13 Hard Disk Low Level Format Utility

This Award Low-Level-Format Utility is designed as a tool to save your time formatting your hard disk. The utility automatically looks for the necessary information of the drive you selected. This utility also searches for bad tracks and lists them for your reference.

Shown below is the Main Menu after you enter into the Award Low-Level-Format Utility.

Hard Disk Low Level Format Utility				BAD TRACKS TABLE NO. CYLS HEAD			
SELECT DRIVE BAD TRACK LIST PREFORMAT							
Current select drive is : C							
DRIVE: C CYLINDER : 0 HEAD: 0							
	Size	CYLS	Head	Precomp	Landz	Sector	Mode
Primary Master:	0	0	0	0	0	0	AUTO
Primary Slave:	0	0	0	0	0	0	AUTO
Up/Down - Select item		Enter - Accept		ESC-Exit/Abort			
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- **Control Keys**
Use the Up and Down arrow keys to move around the selections displayed on the upper screen. Press <Enter> to accept the selection. Press <Esc> to abort the selection or exit the utility.
- **Select Drive**
Select from installed hard disk drive C or D. Listed at the bottom of the screen is the drive automatically detected by the utility.
- **Bad Track List**
 - **Auto scan bad track**
The utility will automatically scan bad tracks and list the bad tracks on the window at the right side of the screen.
 - **Add bad track**
Directly type in the information of the known bad tracks on the window at the right side of the screen.

- **Modify bad track**
Modify the information of the added bad tracks in the window at the right side of the screen.
- **Delete bad track**
Delete the added bad tracks on the window at the right side of the screen.
- **Clear bad track table**
Clear the whole bad track list on the window at the right side of the screen.
- **Preformat**
 - **Interleave**
Select the interleave number of the hard disk drive you wish to perform low level format. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for utility automatic detection.
 - **Auto scan bad track**
This allows the utility to scan first then format by each track.
 - **Start**
Press <Y> to start low level format.

5.14 Power-On Boot

After you have made all the changes to CMOS values and the system cannot boot with the CMOS values selected in Setup, restart the system by turning it OFF then ON or press the "RESET" button on the system case. You may also restart by simultaneously pressing the <Ctrl>, <Alt>, and <Delete> keys. Upon restarting the system, immediately press <Insert> to load the BIOS default CMOS values for boot up.

Chapter 6

Ethernet Introduction

6.1 Introduction

The **SBC8159VE** is equipped with a high performance Plug and Play Ethernet interface that is fully compliant with the IEEE 802.3 10-Base-T and 10-Base-5 standards. It consists of a RJ-45 connector (**CN15**). With the different media support capability, your workstations can be configured for multiple topologies.

6.2 Features

The Ethernet features of the **SBC8159VE** are summarized as follows:

1. Complies with IEEE 802.3 10-Base T and 10-Base-5 standards.
2. Fully compatible with the Microsoft ISA Plug and Play specifications
3. Full smart functions including auto-scan, auto-setup and auto-diagnostic
4. A LED pin head is reserved for a diagnostic LED to indicate network link status. Fully compatible with Novell NE2000. Setup/Diagnostic utility
5. Supports software drivers for IPX, NDIS, ODI, SCO UNIX, Windows NT, and Win 95.
6. Supports Plug and Play function (PnP) and Jumperless Configuration.

6.3 Drivers Support

Bundled with popular software drivers, the **SBC8159VE** Ethernet interface allows great flexibility to work with all major networking operating systems including Novell NetWare v2.x, v3.x, v4.x, Microsoft LAN Manager, Win3.1, Win NT, Win95, IBM LAN Server, SCO UNIX or other ODI, NDIS and Packet drive compliant operating systems. There are two Ethernet driver diskettes that came with the SBC8159VE. The diskettes contain several text files (.txt) referring to the proper installation instructions of the driver. Refer to the contents of the text files before installing any drivers. The following table lists the location of the text files of various network drivers.

Subdirectory	Text File
Linux	Linux.txt
Pcnfs	Pcnfs.txt
Pktdrv	Packet.txt
Sco3	Fetsco3.txt
Sco5	Fetsco5.txt
Wfw31	wfw31.txt
Wfw311	wfw311.txt
Win95	win95.txt
Win98	win98.txt
Winnt35	winnt35.txt
Winnt351	winnt351.txt
Winnt40	winnt40.txt
Lansvr40.dos	lsdos.txt
Lansvr40.os2	lso2.txt
Lantasti	lantasti.txt
Mslanman.dos/Drivers/Ethernet/Fetnd	lmdos.txt
Mslanman.os2/Drivers/Ethernet/Fetnd	lmos2.txt
Netware/Client32.dos	Cnt32dos.txt
Netware/Client32.w95	Cnt32w95.txt
Netware/Dosodi	dosodi.txt
Netware/Srvodi.311	Nw311.txt
Netware/Srvodi.312	nw312.txt
Netware/Srvodi.4x	nw4x.txt

Chapter 7

Display Drivers

The LCD/VGA chipset used on the SBC8159 Series is SiS5598 which can drive a wide range of monochrome and color flat panels including Single-Drive (SS) and Dual-Panel, Dual Drive (DD) passive STN and active matrix TFT / MIM LCD, EL, and Plasma panels. The 65550 supports an additional 256Kx16 DRAM providing a 32-bit video memory bus and additional display memory to support resolution up to 1024x768 in 256 colors, 800x600 in 256 colors, and 640x480 in 16M colors. The 65550 accelerator can support up to 64 gray scales on monochrome panels, up to 226, 981 colors on passive STN LCDs, and up to 16M colors on 24-bit active matrix LCDs. It also offers a variety of programmable features to optimize display quality, including tall font stretching, fast vertical centering and programmable vertical stretching in graphics for handling modes with less than 480 lines.

The SiS5598 is fully compatible with the VGA graphics standard at the register, gate, and BIOS levels. AXIOM supplies fully VGA-compatible BIOS, end-user utilities and drivers for common application programs (e.g., Microsoft Windows™, OS/2, WordPerfect, Lotus, etc.). CHIPS' drivers for Windows include a Big Cursor setting and fast panning / scrolling capabilities.

There are four driver diskettes that came with the SBC8159 Series. The first diskette contains a README file (.txt) referring to the proper installation instructions of the display drivers. The README file contains the following information:

- SiS 5597/5598 VGA Drivers Diskette Contents
- System Requirements
- SiS 5597/5598 VGA Driver Setup & Usage Procedures for SVGAUTL.EXE DOS Utility

- SiS 5597/5598 VGA Driver Setup & Usage Procedures for AutoDesk ADI 4.2 -Protected Mode
 - AutoCAD R11
 - AutoCAD R12
 - AutoShade R2.0
 - 3D Studio Version 3.0
- SiS 5597/5598 VGA Driver Setup & Usage Procedures for Microsoft NT 3.5x
- SiS 5597/5598 VGA Driver Setup & Usage Procedures for Microsoft NT 4.0
- SiS 5597/5598 VGA Driver Setup & Usage Procedures for Microsoft Windows 95 & Windows 98
- SiS 5597/5598 VGA Driver Setup & Usage Procedures for IBM OS/2 Warp 3.0 (Double Byte Character)
- SiS 5597/5598 VGA Driver Setup & Usage Procedures for IBM OS/2 Warp 3.0 (Single Byte Character)

It is important to read carefully the contents of the README file before installing the display driver. The following table lists the location of the text files of various network drivers.

A p p e n d i x A

Watchdog Timer

Using the Watchdog Function

Follow these steps when using the watchdog function onboard the SBC8159 Series CPU card.

1. To enable the watchdog function, read I/O port 121H (e.g., "I 121") under "debug" of MS-DOS environment. To disable the function, place I/O port 120H under "debug" of MS-DOS environment.

Reset Watchdog -Read I/O Port 121H

Disable Watchdog - Read I/O Port 120H

In system Run_Time, you still have to read I/O Port 121H to reset the Watchdog timer.

If the system fails, the TSR should be stopped for the Watchdog Reset to be activated.

2. Set the corresponding Watchdog option in the Integrated Peripherals menu of the CMOS Setup utility. The available Time-out Trigger options are 0.5, 1, 5, 10, 20, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500 and 1000 sec(s).

This page does not contain any information.

Appendix B

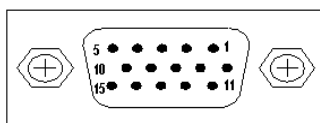
Connector Pin Assignments

40-pin IDE Interface Connector: CN4 and CN5

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 16
19	GND	20	N.C.	21	DREQ
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	GND	29	DACK	30	GND
31	Interrupt	32	N.C.	33	SA1
34	N.C.	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	N.C.				

CRT/VGA Connector: CN16, CN13 (for SBC8159VE)

Pin	Description	Pin	Description	Pin	Description
1	Red	2	Green	3	Blue
4	No connector	5	GND	6	GND
7	GND	8	GND	9	No connector
10	GND	11	No connector	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC Clock



Standard 15-pin pin header connector for CRT VGA display

Floppy Disk Connector: CN6

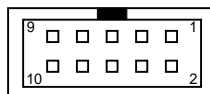
Pin	Description	Pin	Description	Pin	Description
1	GND	2	Reduce write current	3	GND
4	N.C.	5	GND	6	N.C.
7	GND	8	Index#	9	GND
10	Motor enable A#	11	GND	12	Drive select B#
13	GND	14	Drive select A#	15	GND
16	Motor enable B#	17	GND	18	Direction#
19	GND	20	STEP#	21	GND
22	Write data#	23	GND	24	Write gate#
25	GND	26	Track 0 #	27	GND
28	Write protect#	29	GND	30	Read data#
31	GND	32	Side 1 select#	33	GND
34	Disk change#				

Parallel Port Connector: CN7

Pin	Description	Pin	Description
1	Strobe#	2	Auto Form Feed#
3	Data 0	4	Error#
5	Data 1	6	Initialize#
7	Data 2	8	Printer Select In#
9	Data 3	10	GND
11	Data 4	12	GND
13	Data 5	14	GND
15	Data 6	16	GND
17	Data 7	18	GND
19	Acknowledge#	20	GND
21	Busy	22	GND
23	Paper Empty#	24	GND
25	Printer Select	26	

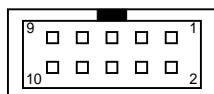
RS-232 pin assignments for CN8 (COM1)

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



CN8

RS-485 pin assignments for CN9 (COM2)



CN9

Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	DSR	N.C.	N.C.
3	RX	TX+	DATA+
4	RTS	N.C.	N.C.
5	TX	RX+	N.C.
6	CTS	N.C.	N.C.
7	DTR	RX-	N.C.
8	RI	N.C.	N.C.
9	GND	GND	GND
10	N.C.	N.C.	N.C.

Internal Keyboard Connector: CN10

Pin	Description
1	Keyboard CLK
2	Keyboard Data
3	N.C.
4	GND
5	KB Vcc

PS/2 Mouse Connector: CN11

Pin	Description
1	Mouse CLK
2	Mouse Data
3	N.C.
4	GND
5	Mouse Vcc

USB Connector: CN18

Pin	Description	Pin	Description
1	USB Vcc	2	USB Vcc
3	USB P0-	4	USB P1-
5	USB P0+	6	USB P1+
7	GND	8	GND
9	GND	10	GND

Ethernet Connector: CN15

Pin	Description	Pin	Description
1	Tx+ (Data transmission positive)	2	Tx- (Data reception negative)
3	Rx+(Data reception positive)	4	N.C.
5	N.C.	6	Rx- (Data reception negative)
7	N.C.	8	N.C.

PICMG Slot Connector

Signal	Pin	Pin	Signal
GND	B01	A01	IOCHCHK#
RESETDRV	B02	A02	SD7
+5V	B03	A03	SD6
IRQ9	B04	A04	SD5
-5V	B05	A05	SD4
DRQ2	B06	A06	SD3
-12V	B07	A07	SD2
ENDXFR#	B08	A08	SD1
+12V	B09	A09	SD0
SMEMW#	B11	A11	AEN
SMEMR#	B12	A12	SA19
GND	B10	A10	IOCHRDY
IOW#	B13	A13	SA18
IOR#	B14	A14	SA17
DACK3#	B15	A15	SA16
DRQ3	B16	A16	SA15
DACK1#	B17	A17	SA14
DRQ1	B18	A18	SA13
REFRSH#	B19	A19	SA12
SYSCLK	B20	A20	SA11
IRQ7	B21	A21	SA10
IRQ6	B22	A22	SA9
IRQ5	B23	A23	SA8
IRQ4	B24	A24	SA7
IRQ3	B25	A25	SA6
DACK2#	B26	A26	SA5
TC	B27	A27	SA4
BALE	B28	A28	SA3
+5V	B29	A29	SA2
OSC	B30	A30	SA1

Continued

Signal	Pin	Pin	Signal
GND	B31	A31	SA0
Connector Key			
Connector Key			
Connector Key			
MEMCS16#	D01	C01	SBHE#
IOCS16#	D02	C02	LA23
IRQ10	D03	C03	LA22
IRQ11	D04	C04	LA21
IRQ12	D05	C05	LA20
IRQ15	D06	C06	LA19
IRQ14	D07	C07	LA18
DACK0#	D08	C08	LA17
DRQ0	D09	C09	MEMR#
DACK5#	D10	C10	MEMW#
DRQ5	D11	C11	SD8
DACK6#	D12	C12	SD9
DRQ6	D13	C13	SD10
DACK7#	D14	C14	SD11
DRQ7	D15	C15	SD12
+5V	D16	C16	SD13
MASTER#	D17	C17	SD14
GND	D18	C18	SD15
-12V	F01	E01	TRST#
TCK	F02	E02	+12V
GND	F03	E03	TMS
TDO	F04	E04	TDI
+5V	F05	E05	+5V
+5V	F06	E06	INTA#
INTB#	F07	E07	INTC#
INTD#	F08	E08	+5v

Continued

Signal	Pin	Pin	Signal
REQ3#	F09	E09	CLKC
REQ1#	F10	E10	+5V (I/O)
GNT3#	F11	E11	CLKD
GND	F12	E12	GND
GND	F13	E13	GND
CLKA	F14	E14	GNT1#
GND	F15	E15	RST#
CLKB	F16	E16	+5V (I/O)
GND	F17	E17	GNT0#
REQ0#	F18	E18	GND
+5V (I/O)	F19	E19	REQ2#
AD31	F20	E20	AD30
AD29	F21	E21	+3.3V
GND	F22	E22	AD28
AD27	F23	E23	SD26
AD25	F24	E24	GND
+3.3V	F25	E25	AD24
C/BE3#	F26	E26	GNT2#
AD23	F27	E27	+3.3V
GND	F28	E28	AD22
AD21	F29	E29	AD20
AD19	F30	E30	GND
+3.3V	F31	E31	AD18
AD17	F32	E32	AD16
C/BE2#	F33	E33	+3.3V
GND	F34	E34	FRAME#
IRDY#	F35	E35	GND
+3.3V	F36	E36	TRDY#
DEVSEL#	F37	E37	GND
GND	F38	E38	STOP#

Continued

Signal	Pin	Pin	Signal
LOCK#	F39	E39	+3.3V
PERR#	F40	E40	SDONE
+3.3V	F41	E41	SB0#
SERR#	F42	E42	GND
+3.3V	F43	E43	PAR
C/BE1#	F44	E44	AD15
AD14	F45	E45	+3.3V
GND	F46	E46	AD13
AD12	F47	E47	AD11
AD10	F48	E48	GND
GND	F49	E49	AD09
Connector Key			
Connector Key			
AD08	F52	E52	C/BE0#
AD07	F53	E53	+3.3V
+3.3V	F54	E54	AD06
AD05	F55	E55	AD04
AD03	F56	E56	GND
GND	F57	E57	AD02
AD01	F58	E58	AD00
+5V (I/O)	F59	E59	+5V (I/O)
ACK64#	F60	E60	REQ64#
+5V	F61	E61	+5V
+5V	F62	E62	+5V
Connector Key			
Connector Key			

Appendix C

Award BIOS Reference

POST Messages

During the Power On Self Test (POST), the BIOS automatically detects for errors and will either display a message on the screen requiring you to fix such problem or produce a beep code. Once a message is displayed, the following line will succeed it:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there is only one beep code in the Award BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED	CMOS battery is no longer functional. It should be replaced.
CMOS CHECKSUM ERROR	Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

Continued

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER	No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.
DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP	Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.
DISPLAY SWITCH IS SET INCORRECTLY	Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.
DISPLAY TYPE HAS CHANGED SINCE LAST BOOT	Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.
EISA Configuration Checksum Error PLEASE RUN EISA CONFIGURATION UTILITY	The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

Continued

EISA Configuration Is Not Complete PLEASE RUN EISA CONFIGURATION UTILITY	The slot configuration information stored in the EISA non-volatile memory is incomplete. NOTE: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.
ERROR ENCOUNTERED INITIALIZING HARD DRIVE	Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.
ERROR INITIALIZING HARD DISK CONTROLLER	Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.
FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT	Cannot find or initialize the floppy drive controller. make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.
Invalid EISA Configuration PLEASE RUN EISA CONFIGURATION UTILITY	The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory. NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Continued

KEYBOARD ERROR OR NO KEYBOARD PRESENT	Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.
Memory Address Error at ...	Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.
Memory Parity Error at ...	Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.
MEMORY SIZE HAS CHANGED SINCE LAST BOOT	Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.
Memory Verify Error at ...	Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.
OFFENDING ADDRESS NOT FOUND	This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

Continued

OFFENDING SEGMENT:	This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.
PRESS A KEY TO REBOOT	This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.
PRESS F1 TO DISABLE NMI, F2 TO REBOOT	When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.
RAM PARITY ERROR - CHECKING FOR SEGMENT ...	Indicates a parity error in Random Access Memory.
Should Be Empty But EISA Board Found PLEASE RUN EISA CONFIGURATION UTILITY	A valid board ID was found in a slot that was configured as having no board ID. NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.
Should Have EISA Board But Not Found PLEASE RUN EISA CONFIGURATION UTILITY	The board installed is not responding to the ID request, or no board ID has been found in the indicated slot. NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.
Slot Not Empty	Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board. NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Continued

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...	Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.
Wrong Board In Slot PLEASE RUN EISA CONFIGURATION UTILITY	The board ID does not match the ID stored in the EISA non-volatile memory. NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

POST Codes

NOTE: *EISA POST codes are typically output to port address 300h. ISA POST codes are output to port address 80h.*

POST (hex)	Description
C0	<ol style="list-style-type: none"> 1. Turn off OEM specific cache, shadow... 2. Initialize all the standard devices with default values standard devices includes: <ul style="list-style-type: none"> -DMA controller (8237) -Programmable Interrupt Controller (8259) -Programmable Interval Timer (8254) -RTC chip
C1	Auto-detection of onboard DRAM & Cache
C3	<ol style="list-style-type: none"> 1. Test system BIOS checksum 2. Test the first 256K DRAM 3. Expand the compressed codes into temporary DRAM area including the compressed System BIOS & Option ROMs
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS only)
04	Reserved
05	<ol style="list-style-type: none"> 1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved

Continued

POST (hex)	Description
07	Verifies CMOS' basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
09	<ol style="list-style-type: none"> 1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 2. OEM specific cache initialization (if needed)
0A	<ol style="list-style-type: none"> 1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers 2. Initialize INT no from 33-120 with Dummy(Spurious) Interrupt Handler 3. Issue CPUID instruction to identify CPU type 4. Early Power Management initialization (OEM specific)

● **This POST code is for boot block**

POST (hex)	Description
C0	<ol style="list-style-type: none"> 1. Turn off OEM specific cache, shadow. 2. Initialize all the standard devices with default values standard devices includes: -DMA controller (8237) -Programmable Interrupt Controller (8259) -Programmable Interval Timer (8254) -RTC chip
C1	Auto-detection of onboard DRAM & Cache
C3	Checking checksum of compressed code
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01	Clear base memory 0-640K
0C	Initial interrupt vector 00-1FH
0D	Initial ISA VGA
41H	Enable FDD and detect media type
FFH	Boot from FDD

● This page is for Non-Compressed Version only.

POST (hex)	Description
01-02	Reserved
C0	Turn off OEM specific cache, shadow...
03	<ol style="list-style-type: none">1. Initialize EISA registers (EISA BIOS only)2. Initialize all the standard devices with default values Standard devices includes:<ul style="list-style-type: none">-DMA controller (8237)-Programmable Interrupt Controller (8259)-Programmable Interval Timer (8254)-RTC chip
04	Reserved
05	<ol style="list-style-type: none">1. Keyboard Controller Self-Test2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS' basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
C1	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	<ol style="list-style-type: none">1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table2. OEM specific cache initialization (if needed)
0A	<ol style="list-style-type: none">1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-120 with Dummy(Spurious) Interrupt Handler2. Issue CPUID instruction to identify CPU type3. Early Power Management initialization (OEM specific)

● **The following POST Codes are for all of Compress Version & Non-Compress Version**

POST (hex)	Description
0B	<ol style="list-style-type: none"> 1. Verify if the RTC time is valid or not 2. Detect bad battery 3. Read CMOS data into BIOS stack area 4. PnP initializations including (PnP BIOS only) <ul style="list-style-type: none"> -Assign CSN to PnP ISA card -Create resource map from ESCD 5. Assign IO & Memory for PCI devices (PCI BIOS only)
0C	Initialization of the BIOS Data Area (40 : 00 – 40:FF)
0D	<ol style="list-style-type: none"> 1. Program some of the Chipset's value according to Setup. (Early Setup Value Program) 2. Measure CPU speed for display & decide the system clock speed 3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep which consists of one single long beep followed by two short beeps.
0E	<ol style="list-style-type: none"> 1. Initialize the APIC (Multi-Processor BIOS only) 2. Test video RAM (If Monochrome display device found) 3. Show messages including: <ul style="list-style-type: none"> - Award Logo, Copyright string, BIOS Date code & Part No. - OEM specific sign on messages - Energy Star Logo (Green BIOS ONLY) - CPU brand, type & speed - Test system BIOS checksum(Non-Compress Version only)
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality

Continued

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

Continued

POST (hex)	Description
4E	If there is any error detected (such as video, kb...), show all the error messages on the screen & wait for user to press <F1> key
4E	If there is any error detected (such as video, kb...), show all the error messages on the screen & wait for user to press <F1> key
4F	<ol style="list-style-type: none"> 1. If password is needed, ask for password 2. Clear the Energy Star Logo (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS
51	Reserved
52	<ol style="list-style-type: none"> 1. Initialize all ISA ROMs 2. Later PCI initializations (PCI BIOS only) <ul style="list-style-type: none"> -assign IRQ to PCI devices -initialize all PCI ROMs 3. PnP Initializations (PnP BIOS only) <ul style="list-style-type: none"> -assign IO, Memory, IRQ & DMA to PnP ISA devices -initialize all PnP ISA ROMs 4. Program shadows RAM according to Setup settings 5. Program parity according to Setup setting 6. Power Management Initialization <ul style="list-style-type: none"> -Enable/Disable global PM -APM interface initialization
53	<ol style="list-style-type: none"> 1. If it is NOT a PnP BIOS, initialize serial & parallel ports 2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value
60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting

BIOS Default Drive Table

This is a current list of the drive type table contained in Setup.

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
1	10	306	4	17	128	305	TEAC SD510, MMI 112, 5412
2	20	615	4	17	300	615	Seagate ST225, ST4026
3	30	615	6	17	300	615	
4	62	940	8	17	512	940	
5	46	940	6	17	512	940	
6	20	615	4	17	None	615	Seagate ST125, Tandon TM262
7	30	462	8	17	256	511	
8	30	733	5	17	None	733	Tandon TM 703
9	112	900	15	17	None	901	
10	20	820	3	17	None	820	
11	35	855	5	17	None	855	
12	49	855	7	17	None	855	
13	20	306	8	17	128	319	Disctron 526, MMI M125
14	42	733	7	17	None	733	
15		Reserved					
16	20	612	4	17	0	663	Microscience HH725, Syquest 3250, 3425
17	40	977	5	17	300	977	
18	56	977	7	17	None	977	
19	59	1024	7	17	512	1023	
20	30	733	5	17	300	732	
21	42	733	7	17	300	732	
22	30	306	5	17	300	733	Seagate ST4038
23	10	977	4	17	0	336	
24	40	1024	5	17	None	976	Seagate ST4051
25	76	1224	9	17	None	1023	Seagate ST4096

Continued

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
26	71	1224	7	17	None	1223	Maxtor 2085
27	111	1224	11	17	None	1223	Maxtor 2140, Priam S14
28	152	1024	15	17	None	1223	Maxtor 2190, Priam S19
29	68	1024	8	17	None	1023	Maxtor 1085, Micropolis 1325
30	93	918	11	17	None	1023	Maxtor 1105 1120, 4780
31	83	925	11	17	None	1023	Maxtor 1170
32	69	1024	9	17	None	926	CDC 9415
33	85	1024	10	17	None	1023	
34	102	1024	12	17	None	1023	
35	110	1024	13	17	None	1023	
36	119	1024	14	17	None	1023	
37	17	1024	2	17	None	1023	
38	136	1024	16	17	None	1023	
39	114	918	15	17	None	1023	Maxtor 1140, 4380
40	40	820	6	17	None	820	Seagate ST251
41	42	1024	5	17	None	1023	Seagate 4053 Miniscribe 3053/6053
42	65	1024	5	26	None	1023	Miniscribe 3053/6053 RLL
43	40	809	6	17	None	852	Miniscribe 3650
44	61	809	6	26	None	852	Miniscribe 3675 RLL
45	100	776	8	33	None	775	Conner CP3104
46	203	684	16	38	None	685	Conner CP3204
User							

This page does not contain any information.