SBC Series

Single Board Computer
Half-size PICMG 1.3
with LAN, Audio, SATA

SEH-9450-LAS

User's Manual

CONTEC CO.,LTD.

Check Your Package

Thank you for purchasing the CONTEC product.

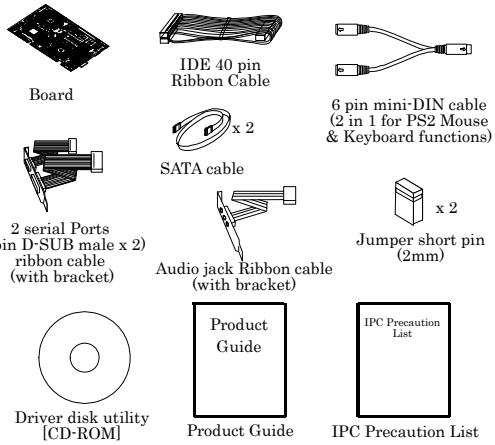
The product consists of the items listed below.

Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer.

Product Configuration List

- Industrial PICMG CPU Board (SEH-9450−LAS) …1
- Product Guide …1
- IPC Precaution List …1
- Driver disk utilities * 1 (CD-ROM) …1
- IDE 40 pin Ribbon Cable …1
- SATA Cable …2
- 2 serial Ports (9 pin D-SUB male x 2) ribbon cable (with bracket) …1
- Audio jack cable (with bracket) …1
- 6 pin mini-DIN cable (2 in 1 for PS2 Mouse & Keyboard functions) …1
- Jumper short pin (2.00 mm) …2

* 1 The CD-ROM contains the driver software and User's Manual (this Manual)



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Caution about Battery

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the local ordinances or regulations.

Table of Contents

1. Introduction

About the SBC

This product is a half-size sized single-board computer that supports PICMG1.3.
It uses Intel (R) 945GME Chipset. The supported CPU is Intel (R) Core Duo / Core 2 Duo processor.
For the memory, up to 4 GB (total capacity : 3.1GB) of DDR2 SDRAM can be mounted.

The all-in-one design features a wide variety of interfaces including Analog RGB, LVDS, SDVO, USB2.0 x 4, SATA x 2, 1000BASE-T/100BASE-TX, audio, IDE, serial and PS/2 Keyboard/Mouse.

When used in combination with the optional PICMG1.3-compatible Backplane BEH-0611, you can use the PCI Express / PCI bus expansion board on it.

The built-in CF card slot (Type I/II) enables boot-up from a CF card.
When to connecting external devices or building the system, please read this manual carefully.

Features

- Half-size single-board computer supporting PICMG1.3

This PICMG1.3-compatible half-size model, when used in combination with a PICMG1.3 backplane, allows you to build a system configuration that uses the PCI Express / PCI bus expansion board.

- Adoption of 945GME Chipset to allow the mounting of Intel Core Duo / Core 2 Duo processor

The use of Intel (R) 945GME + GMCH, ICH7M-DH, FWH Chipset allows you to incorporate M-socket-compatible Intel (R) Core Duo / Core 2 Duo processor（FSB 533/566MHz） CPU.

- Max. 4 GB (total capacity : 3.1GB) of DDR2 SDRAM

For the memory, up to 4 GB (total capacity : 3.1GB) of DDR2 SDRAM(400/533/667MHz) can be mounted.

- The all-in-one design features a wide variety of interfaces.

This product comes with interfaces such as Analog RGB, LVDS, SDVO, USB2.0 x 4, SATA x 2, 1000BASE-T/100BASE-TX, audio, IDE, serial and PS/2 interfaces.

- Equipped with a CF card slot (Type I/II), enabling boot-up from a CF card.

Equipped with a CF card slot (Type I/II), enabling boot-up from a CF card. It can also be used through IDE compatibility (True IDE) with ATA/ATA-4.

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.

Web Site

Japanese	http://www.contec.co.jp/
English	http://www.contec.com/
Chinese	http://www.contec.com.cn/

Latest product information

CONTEC provides up-to-date information on products.

CONTEC also provides product manuals and various technical documents in the PDF.

Free download

You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information
Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One Year Warranty

CONTEC Product is warranted by CONTEC CO., Ltd. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from our Sales Administration Department before returning any product.

* No product will be accepted by CONTEC group without an RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

⚠ CAUTION

- Do not modify the product. CONTEC will bear no responsibility for problems, etc., resulting from modifying this product.
- Do not strike or bend the board.
  Otherwise, the board may malfunction, overheat, cause a failure or breakage.
- Do not touch the board's metal plated terminals (edge connector) with your hands.
  Otherwise, the board may malfunction, overheat, or cause a failure. If the terminals are touched by someone's hands, clean the terminals with industrial alcohol.
- There are switches and jumpers on the board that need to be set in advance. Be sure to check these before installing to the expansion slot.
- Only set the switches and jumpers on the board to the specified settings.
  Otherwise, the board may malfunction, overheat, or cause a failure.

⚠ CAUTION

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacture's instructions.

Environments

Use this product in the following environment. If used in an unauthorized environment, the board may overeat, malfunction, or cause a failure.

Operating temperature

0 - 60°C

Operating humidity

10 - 90%RH (No condensation)

Corrosive gases

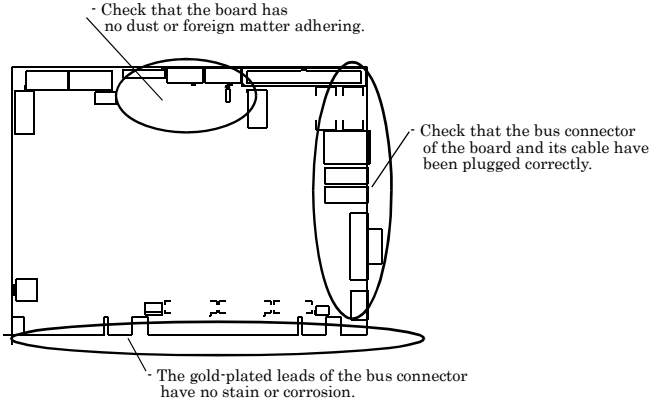
None

Floating dust particles

Not to be excessive

Inspection

Inspect the product periodically as follows to use it safely.



Storage

When storing this product, keep it in its original packing form.

(1) Put the board in the storage bag.

(2) Wrap it in the packing material, and then put it in the box.

(3) Store the package at room temperature at a place free from direct sunlight, moisture, shock, vibration magnetism, and static electricity.

Disposal

When disposing of the product, follow the disposal procedures stipulated under the relevant laws and municipal ordinances.

2. System Reference

Specification

Table 2.1. Functional Specifications ***< 1 / 2 >***

Type	Specifications
Supported CPU	Intel(R) Core Duo / Core 2 Duo (FSB 533 / 667 MHz)
Cache	Built in CPU
Processor socket	Socket M
Memory (Option)	Up to MAX 4G, DDR2 400 / 533 / 667, 200 pin SO-DIMM Socket X 2 *1
Chipset	Intel(R) 945GME+ ICH7M-DH
BIOS	Phoenix AwardBIOS, PnP support
VGA	Built in Intel 945GME, One Analog RGB D-Sub 15pin connector. One LVDS (18bit) I/F: (One box-header 30-pins and one box-header 20-pins connectors) One SDVO I/F (box-header 30-pins connector) *2
Keyboard / Mouse connector	One PS/2 keyboard/Mouse connector (Bundled the 2 in 1 cable)
Serial I/F	One box-header 10-pin connector (RS-232C) One box-header 10-pin connector (RS-232C/422/485) Baud rate: 115,200 - 50 bps (programmable)
Parallel I/F	None
On board expansion bus	Mini PCI bus
LAN Port	1000BASE-T/100BASE-TX, Intel 82573E controller, One RJ-45 connector. *3 Wake On LAN support
IDE I/F	One EIDE ports, up to two IDE devices One box-header 40-pin connector, support Ultra DMA 33/66/100 *4 The CF card slot and it shares with a Slave port.
SATA I/F	Two Serial ATA 1.0 compliant ports
FDD I/F	None
Compact Flash Slot *5	Type I/II x 1, IDE Slave Master port connection, Support booting *6
SSD Socket	None
USB Port	4ch USB2.0 compliant ports, one box-header 10-pin connector that support 2ch, Two USB type A connectors support 2ch.
RAID	RAID0, RAID1
Audio	AC97 CODEC., One pin-header 10-pin connector for speaker-out, line-in, microphone-in.

*1 Max. available memory capacity is 3.1GB. (ECC is not support.)

*2 PCI-E X16 SDVO PORT can't use at same time.

*3 1000 BASE-T is supported with the Windows 2000 and Windows XP.

*4 IDE port cannot support by UltraDMA66/100 mode at the time of CF card use.

*5 This CF card slot do not have the hot-swap function. The card cannot remove from slot and attach to slot at the time of a power supply ON.

The card may be damaged if a power supply is turned off at the time of card access.

*6 IDE Slave port can support one drive at the time of CF card use.

Table 2.1. Functional Specifications ***< 2 / 2 >***

Type	Specifications
Watchdog Timer	Software programmable 255 levels (1 - 255sec). When time up: Reset
General-purpose I/F	None
Hardware Monitor	Monitoring of the temperature of CPU and board, power supply voltage, and fan speed
RTC	The coin type Lithium battery specification is shown in table Specification: CR2450 Voltage: 3V Capacity: 620mAh Weigh: 6.3g * Backup time: Over 7 years at 25ºC. * Real Time Clock accourate: ±3 minutes/month at 25ºC.
Power Management	Power management setup via BIOS Modem Ring On/Wake One LAN Supports PC98/PC99 ACPI Power management
Bus specification/Size (mm)	SHB Express™ (PICMG 1.3) 167.64 / (L) x 126.50 (H)
DC Power Requirements	+12VDC±5% +5VSB (Stand by) ±5% (only when using the ATX power supply)
Power supply specifications (Max.)	Power Consumption (Intel Core™2 Duo T7200 2.06GHz/667 MHz): +12VDC±5%, 3.0A +5VSB±5%, 0.5A
Operating temperature/ Operating Humidity	0 - 60°C *7 10 - 90%RH (No condensation)
Storage temperature	-20 - 80°C
Floating dust particles	Not to be excessive
Corrosive gases	None
Weight	480g
Operating System Support	Windows XP Professional Windows XP Home Edition Windows 2000 Professional

*7 Depends on the specification of CPU and heat sink.

Power Management Features

- Support both ACPI (Advanced Configuration and Power Interface) and legacy (APM) power management.
- ACPI v2.0 compliant
- APM v1.2 compliant
- PCI bus clock run, Power Management Enable (PME) control, all with hardware automatic wake-up
- Multiple suspends power plane controls and suspends status indicators
- Normal, doze, sleep, suspend and conserve modes
- Global and local device power control

Power Requirements

Your system requires a clean, steady power source for reliable performance of the high frequency CPU on the product, the quality of the power supply is even more important. For the best performance makes sure your power supply provides a range of 11.4 volts minimum to 12.6 volts maximum DC power source.

Power Consumption

For typical configurations, the CPU card is designed to operate with at least a 250W power supply. A higher-wattage power supply should be used for heavily-loaded configurations.
The power supply must meet the following requirements:

- Rise time for power supply: 2 ms - 20 ms
- Minimum delay for reset to Power Good: 100ms
- Minimum Power down warning: 1 ms

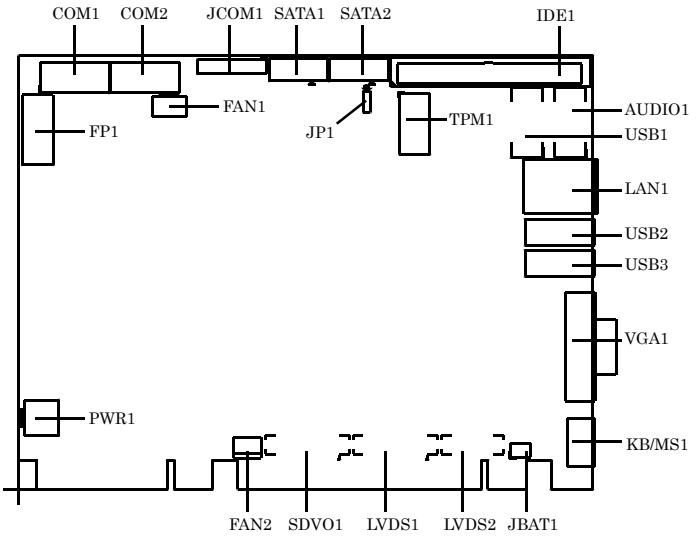
The following table lists the power supply's tolerances for DC voltages:

Table 2.2. DC voltage tolerance

DC Voltage	Acceptable Tolerance
+ 5VSB (Stand by)	±5%
+ 12V	±5%

Connector & Jumper Location

Top side



Bottom side

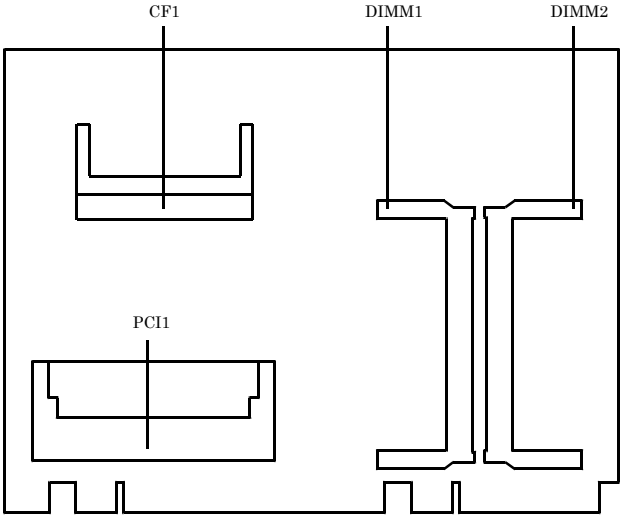


Figure 2.1. Connector & Jumper Location

Table 2.3. SBC Connectors

Item	Content
AUDIO1	Audio Connector
CF1	Compact Flash Slot
COM1	Serial 1 Port Connector
COM2	Serial 2 Port Connector
DIMM1, DIMM2	DIMM Memory Socket
FAN1	CPU FAN Connector
FAN2	System FAN Connector
FP1	Front Panel Connector
IDE1	Primary IDE Connector
JBAT1	CMOS / ROM Clear
JP1	CF Setting
KB/MS1	PS/2 Keyboard / Mouse Connector
LAN1	10/100/Giga LAN Connector
LVDS1, LVDS2	LVDS Connectors
PCI1	Mini PCI Slot
PWR1	Power Connector
SATA1, SATA2	Serial ATA Connectors
SDVO1	Serial Digital Video Output connector
USB1, USB2, USB3	USB Port Connectors
VGA1	15 pin D-Sub Connecto

Block Diagram

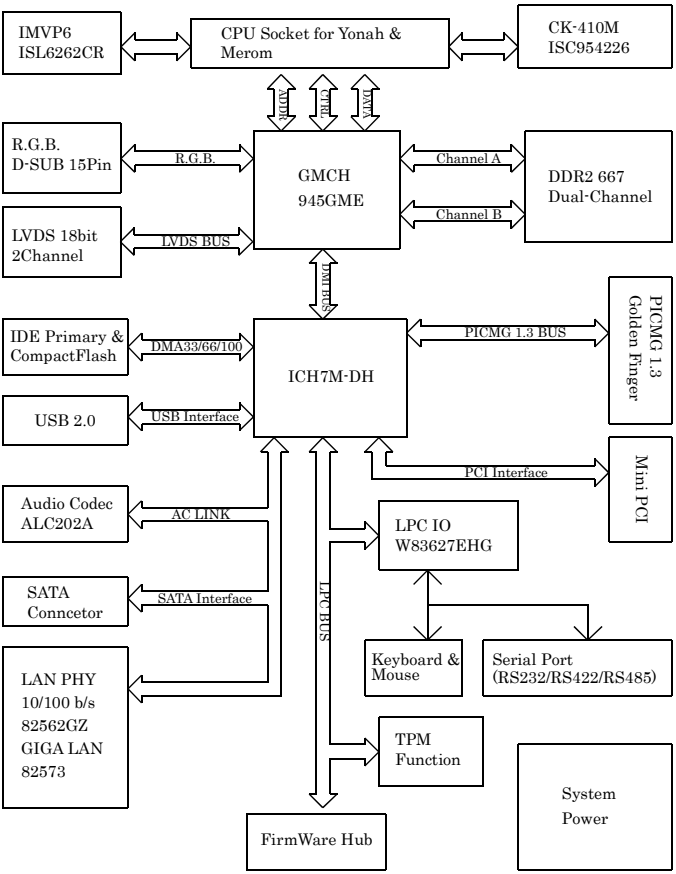


Figure 2.2. Block Diagram

3. Hardware Installations

This chapter provides information on how to use the jumpers and connectors on the product in order to set up a workable system.

Installation procedure

(1) Confirm the power supply is off.

(2) Install the processor with correct orientation.

(3) Mount the Heat sink on the top of the processor. (The heat sink with a fan connects a fan cable to the fan connector on a board.)

(4) Insert the DDR2 SDRAM module with correct orientation.

(5) Confirm this product into to PICMG backplane.

(6) Insert all external cables. (Keyboard, Mouse, LAN, etc)

(7) Prepare a CRT monitor for CMOS setup.

(8) Turn on the power.

(9) Enter the BIOS setup mode by pressing 'DEL' key during boot up.

(10) Use the 'Load BIOS Optimal Defuals' feature.

(11) Configure the **Peripheral Setup** and the **Standard Setup** correctly.

⚠ CAUTION

The CMOS memory may be in an undefined state at power-on after a period of no battery backup.

CPU Installation:

This product supports a single Intel socket-M type Core Duo processor or Core 2 Duo processor. The processor's VID pins automatically program the voltage regulator on the CPU card to the required processor voltage. The host bus speed is automatically selected. The processor connects to the CPU card through the socket M.

The socket-M comes with a turn lock to secure the processor. Make sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket.

After you have installed the processor into the socket-M, check if the configuration setup for the CPU type and speed are correct. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

Refer to the description of optional heat sink fan appending for attachment of a heat sink fan.

Main Memory Installation: DIMM1, DIMM2

The product supports one single-side or double-sided DDR2-667 unregistered SO-DIMM, 200-pin sockets for a maximum total memory of 2GB.

This product supports the following memory features:

- 200-pin SO-DIMM with gold-plated contacts
- 400 / 533 / 667 Mhz DDR2 SDRam
- 1.8V memory only.
- Single or double-sided SO-DIMM in the following sizes:

NOTE : Install 4GB Memory Only recognize 3.1GB

Table 3.1. DDR2 SDRAM

SO-DIMM Capacity	Non-ECC configuration
256MB	32M x 16
512MB	32M x 16
512MB	64M x 8
1GB	64M x 8
1GB	128M x 8
2GB	128M x 8

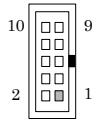
⚠ CAUTION

All memory components and SO-DIMM used with the SEH-9450-LAS CPU card must comply with the PC SDRAM Specification. These include: the PC SDRAM Specification (memory component specific), the PC Un-buffered DIMM Specification, and the PC Serial Presence Detect Specification.

Audio Connector: AUDIO1

This connector connects the Audio jack cable.

Table 3.2. Audio Connector

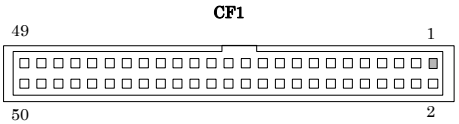


PIN No.	Function	PIN No.	Function
10	LINE-IN-L	9	LINE-IN-R
8	GND	7	GND
6	MICIN	5	NC
4	GND	3	GND
2	LINE-OUT-L	1	LINE-OUT-R

Compact Flash Slot: CF1

This product provides a Compact Flash interfaces. This interface is a very small removable mass storage device. It provides compatibility plus True IDE functionality compatible with ATA/ATA-4.

Table 3.3. Compact Flash Slot

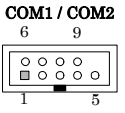


PIN No.	Function	PIN No.	Function
1	GND	2	D3
3	D4	4	D5
5	D6	6	D7
7	CS1#	8	GND
9	GND	10	GND
11	GND	12	GND
13	VCC	14	GND
15	GND	16	GND
17	GND	18	A2
19	A1	20	A0
21	D0	22	D1
23	D2	24	NC
25	GND	26	GND
27	D11	28	D12
29	D13	30	D14
31	D15	32	CS3#
33	GND	34	IOR#
35	IOW#	36	VCC
37	IRQ15	38	VCC
39	CSEL#	40	NC
41	SDRST#	42	IORDY
43	SDREQ	44	SDDACK#
45	CF_LED2#	46	SDIAG
47	D8	48	D9
49	D10	50	GND

Serial Port Connector: COM1 / COM2

Serial 1 (COM1), Serial 2 (COM2), are onboard serial ports of the product. The following table shows the pin assignments of these connectors.

Table 3.4. Serial Port Connector



PIN No.	RS-232C	RS-422	RS-485
1	DCD	TX-	TX-
2	RXD	TX+	TX+
3	TXD	RX+	RX+
4	DTR	RX-	RX-
5	GND	GND	GND
6	DSR	N.C.	N.C.
7	RTS	N.C.	N.C.
8	CTS	N.C.	N.C.
9	RI	N.C.	N.C.
10	N.C.	N.C.	N.C.

⚠ CAUTION

- For RS-485, TX+(pin 2) and RX+ (pin 3) must jumper together inside the D type connector.
- TX- (pin 1) and RX- (pin 4) is the same.

RS-422 / RS-485 specifications

- Transmission system: Asynchronous, half-/full-duplex serial transmission conforming to RS-422/RS-485
- Baud rate : 115,200 - 50bps (programmable)
- Signal extensible distance: 1.2km Max.

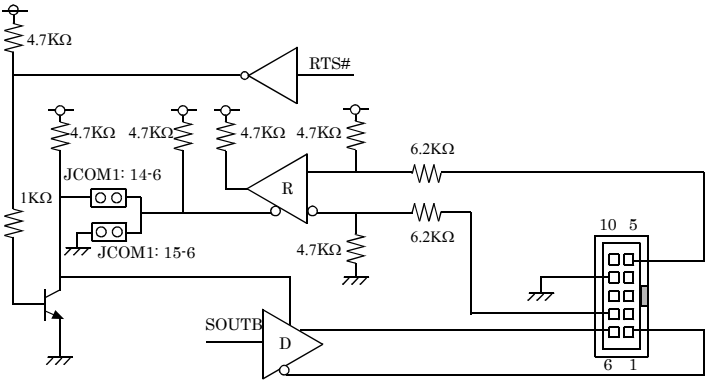


Figure 3.1. RS-422 / RS-485

CPU FAN Connector: FAN1

FAN1 is a 4-pins box-header for the CPU cooling fan power connector. The fan must be a 12V fan. Pin 3 is for Fan tachometer input. Pin is for PWM Fan output control. Pin 2 is for 12V voltage.

Table 3.5. CPU FAN Connector

PIN No.	Function
1	GND
2	POWER
3	FAN Sense
4	PWM FAN control

Housing: 5102-04 (molex)
Contact: 5104 (molex)

System FAN Connector: FAN2

FAN2 is a 3-pins box-header for the CPU cooling fan power connector. The fan must be a 12V fan. Pin 3 is for Fan speed sensor input. Pin 2 is for PWM regulating voltage output.

Table 3.6. System FAN Connector

PIN No.	Function
1	GND
2	+12V
3	FAN sense

Housing: 5102-03 (molex)
Contact: 5103 (molex)

Front Panel Connector: FP1

FP1 consist of header can be connected to a front panel power switch. The front panel connector includes headers for these I/O connections:

Power Switch (Power BT)

This header can be connected to a power push switch for ATX power supply.

Reset Switch (RESET)

This header can be connected to a reset push switch.

Power LED

This header can be connected to an LED that will light when the computer is powered on.

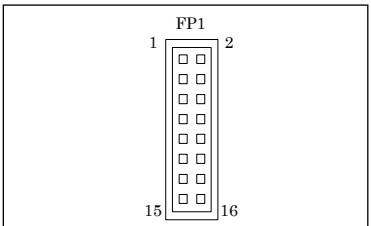
Hard drive activity LED (IDE ACT)

This header can be connected to an LED to provide a visual indicator that data is being read from or written to an IDE hard drive. For the LED to function properly, the IDE drive must be connected to the onboard IDE controller.

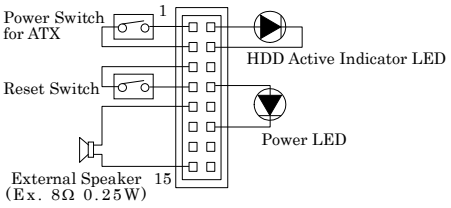
Speaker (BUZZER)

A speaker can be installed on the SEH-9450-LAS as a manufacturing option. The speaker is connected by a jumper on pins 9, 11, 13, 15 of the front panel connector.
The speaker (on-board or off-board) provides error beep code information during the POST in the event that the computer cannot use the video interface. The speaker is not connected to the audio subsystem and does not receive output from the audio subsystem.

Table 3.7. Front Panel Connector



Pin No.	Function	Pin No.	Function
1	Power BT	2	VCC
3	GND	4	IDE ACT
5	RESET	6	N.C.
7	GND	8	VCC
9	VCC	10	N.C.
11	N.C.	12	GND (for Power LED)
13	N.C.	14	N.C.
15	BUZZER	16	N.C.

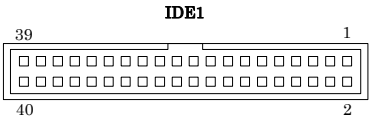


Speaker	9, 11, 13, 15	Power Button	1, 3
Reset Button	5, 7	HDD LED	2, 4
Power LED	8, 10, 12		

IDE port Connector: IDE1

This product provides a bus-mastering PCI IDE interface. This interface support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), and Ultra DMA/33/66/100 synchronous-DMA mode transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.
After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Please refer to your hard disk documentation for the jumper setting.

Table 3.8. Primary IDE Connector (IDE1)



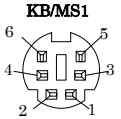
PIN No.	Function	PIN No.	Function
1	RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	DREQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	ALE
29	DACK	30	GND
31	IRQ	32	NC
33	A1	34	PDIAG
35	A0	36	A2
37	CS1	38	CS3
39	HD ACT	40	GND

Keyboard / Mouse Connector: KB/MS1

The CPU card provides a standard PS/2 keyboard/mouse connector for attaching a PS/2 keyboard/mouse. You will connect with an add-on cable for a PS/2 keyboard/mouse. You can select that plug a PS/2 mouse directly, PS/2 keyboard directly or both (use Y-cable) by jumper setting.

The PS2 Connector pin definition is shown below:

Table 3.9. Keyboard / Mouse Connector (KB/MS1)

KB/MS1	PIN No.	Function
	1	KB Data
	2	MS Data
	3	GND
	4	+5VSB
	5	KB Clock
	6	MS Clock

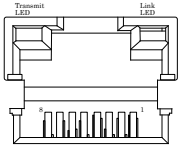
⚠ CAUTION

The mouse and keyboard can be plugged into either PS/2 connector. Power to should be turned off before a keyboard or mouse is connected or disconnected

Adapter connector for Giga LAN: LAN1

This connector is for the LAN adapter that has LED indicate for 10/100/1000 Base-TX RJ45 (1X1) with LEDs integrated magnetics connector. The follow table shows the pin assignments of this connector.

Table 3.10. GIGA LAN

LAN1	PIN No.	Function	
		100Base-TX	1000Base-T
	1	TX+	TRD+(0)
	2	TX-	TRD-(0)
	3	RX+	TRD+(1)
	4	NC	TRD+(2)
	5	NC	TRD-(2)
	6	RX-	TRD-(1)
	7	NC	TRD+(3)
	8	NC	TRD-(3)

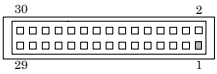
Right LED: Link LED
Link: Green, Active: Blink
Left LED: Transmit LED
10M: Off, 100M Gree, 1000M: Orange

LVDS LCD Connector: LVDS1 / LVDS2

LVDS1 and LVDS2 consist of 30-pin and 20-pin connectors that using the Hirose's DF13A-30DP-1.25V /DF13A-20DP-1.25V. The SEH-9450-LAS supports 2 channels (2 x 18-bit) of LVDS LCD panel display.

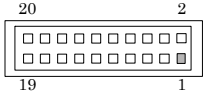
Table 3.11. LVDS Connector

LVDS1



PIN No.	Function	PIN No.	Function
2	TXL1+	1	TXL0+
4	TXL1-	3	TXL0-
6	GND	5	GND
8	N.C.	7	TXL2+
10	N.C.	9	TXL2-
12	GND-	11	GND
14	+3.3V	13	TXL_CLK+
16	+3.3V	15	TCL_CLK-
18	GND	17	GND
20	DCC_DATA	19	DCC_CLOCK
22	RST	21	LVDS_OUT
24	BKL_ADJ	23	LVDS_IN
26	+5V	25	BL_EN
28	+12V	27	GND
30	+12v	29	GND

LVDS2



PIN No.	Function	PIN No.	Function
2	TXU1+	1	TXU0+
4	TXU1-	3	TXU0-
6	GND	5	GND
8	N.C.	7	TXU2+
10	N.C.	9	TXU2-
12	GND	11	GND
14	+5V	13	TXU_CLOCK+
16	+5V	15	TXU_CLOCK-
18	+5V	17	GND
20	+12V	19	+12V

VDD: +3.3V LCD power out (1A Max.)

Mini PCI type III expansion socket: PCI1

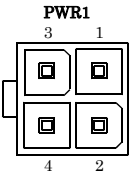
The Mini PCI specification defines an alternate implementation for small form factor PCI card.

Table 3.12. Mini PCI socket

Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name
1	TIP	2	RING	63	3.3V	64	FRAME#
Key		Key		65	CLKRUN#	66	TRDY#
3	8PMJ-3	4	8PMJ-1	67	SERR#	68	STOP#
5	8PMJ-6	6	8PMJ-2	69	GND	70	3.3V
7	8PMJ-7	8	8PMJ-4	71	PERR#	72	DEVSEL#
9	8PMJ-8	10	8PMJ-5	73	C/BE1	74	GND
11	LED1_GRNP	12	LED2_YELP	75	AD14	76	AD15
13	LED1_GRNN	14	LED2_YELN	77	GND	78	AD13
15	CHSGND	16	RESERVED	79	AD12	80	AD11
17	INTB#	18	5V	81	AD10	82	GND
19	3.3V	20	INTA#	83	GND	84	AD09
21	RESERVED	22	RESERVED	85	AD08	86	C/BE0
23	GND	24	3.3VAUX	87	AD07	88	3.3V
25	CLK	26	RST#	89	3.3V	90	AD06
27	GND	28	3.3V	91	AD05	92	AD04
29	REQ#	30	GNT#	93	RESERVED	94	AD02
31	3.3V	32	GND	95	AD03	96	AD00
33	AD31	34	PME#	97	5V	98	RESERVED
35	AD29	36	RESERVED	99	AD01	100	RESERVED
37	GND	38	AD30	101	GND	102	GND
39	AD27	40	3.3V	103	AC_SYNC	104	M66EN
41	AD25	42	AD28	105	AC_SDATA_IN	106	AC_SDATA_OUT
43	RESERVED	44	AD26	107	AC_BIT_CLK	108	AC_CODEC_ID0#
45	C/BE3	46	AD24	109	AC_CODEC_ID1#	110	AC_RESET#
47	GND	48	IDSEL	111	MOD_AUDIO_MON	112	RESERVED
49	GND	50	GND	113	AUDIO_GND	114	GND
51	AD21	52	AD22	115	SYS_AUDIO_OUT	116	SYS_AUDIO_IN
53	AD19	54	AD20	117	SYS_AUDIO_OUT_GND	118	SYS_AUDIO_IN GND
55	GND	56	PAR	119	AUDIO_GND	120	AUDIO_GND
57	AD17	58	AD18	121	RESERVED	122	MPCIACT#
59	C/BE2	60	AD16	123	VCC5VA	124	3.3VAUX
61	IRDY#	62	GND	8PMJ = 8 position modular jack connector pin, hereinafter referred to as RJ-45.			

Power supply Connector: PWR1

Table3.13. Power supply connector



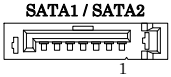
PIN No.	Function	PIN No.	Function
3	+12V	1	GND
4	+12V	2	GND

Suitable Housing: 39-01-2200 (Correpond)
Suitable: Contact: 5556 (correspond)
Maker: Molex

Serial ATA Connector: SATA1 / SATA2

Serial ATA is the revolutionary ATA interface that provides scalable performance for IDE device. With up to 150MB/s data transfer rate, Serial ATA is faster than current Parallel ATA and delivers superior input/output performance. In addition, the Serial ATA interface is furnished with RAID 0,1 function for extra performance enhancement and data protection.

Table 3.14. Serial ATA Connector

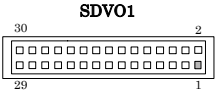


Pin no.	Function
1	GND
2	Serial ATA TX+
3	Serial ATA TX-
4	GND
5	Serial ATA RX-
6	Serial ATA RX+
7	GND

Serial Digital Video Output: SDVO1

The SDVO specification defines an alternate implementation for PCI express card. The pin assignments are as follows:

Table 3.15. SDVO1 Connector



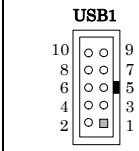
PIN No.	Function	PIN No.	Function
2	SDVOB_GREEN-	1	SDVOB_RED-
4	SDVOB_GREEN+	3	SDVOB_RED+
6	GND	5	GND
8	SDVOB_CLK-	7	SDVOB_BLUE-
10	SDVOB_CLK+	9	SDVOB_BLUE+
12	GND	11	GND
14	SDVOB_INT-	13	SDVO_DATA
16	SDVOB_INT+	15	SDVO_CLOCK
18	GND	17	GND
20	PCIRST-	19	RESERVED
22	GPIO21	21	RESERVED
24	NC	23	GND
26	+3.3V	25	+5V
28	LVDS_OUT	27	+5V
30	LVDS_IN	29	LVDS_RST

Note: PCIe X16 SDVO PORT Can't use at same time

USB Connector: USB1, USB2, USB3

This product have four USB (v2.0 compliant) ports. One box-header connector USB1. This box-header connector is for the optinal USB cable to provide two A Type connectors; and two USB A Type connectors.

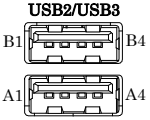
Table 3.16. USB Pin-header Connector



Pin No.	Function	Pin No.	Function
10	N. C.	9	N. C.
8	GND	7	GND
6	USB1+	5	USB0+
4	USB1-	3	USB0-
2	VCC1	1	VCC0

* Optional USB Cable: USB Connector Cable

Table 3.17. USB A type Connector



Pin No.	Function	Pin No.	Function
A1	USB2_VCC	B1	USB3_VCC
A2	USB2-	B2	USB3-
A3	USB2+	B3	USB3+
A4	USB2_GND	B4	USB3_GND

⚠ CAUTION

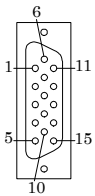
Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device or a low-speed USB device is attached to the cable. Use shielded cable that meets the requirements for full-speed devices

VGA Connector: VGA1

This is a VGA connector (D-Sub 15 pin). The pin assingnment is shown below.

Table 3.18. VGA Connector

VGA1



PIN No.	Function	PIN No.	Function
1	RED	9	N.C
2	GREEN	10	GND
3	BLUE	11	D-DATE
4	N.C	12	N.C
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	D-DCLK
8	GND		

4. Jumper Setting

Clear CMOS Content & BIOS setting cancel: JBAT1

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program. The RAM data contains the password information is powered by the onboard button cell battery. User can erase the CMOS memory content by short pin2 and pin3 of JBAT1 together.

Table 4.1. Clear CMOS Content

JBAT1	Function
	Normal Operation (Default)
	Clear CMOS Content

It is possible to start by invalidating the BIOS setting because pin 2 of JBAT1 and pin 4 are connected and the system is started. If the system doesn't start, please try this setting. Please set the setup screen again when the system starts.
Please connect pin 2 and pin 4 in the state of driving usually.

Table 4.2. Clear CMOS (in ROM) Content

JBAT1	Function
	Normal Operation (Default)
	ROM Clear

CF Master / Slave selector: JP1

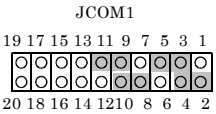
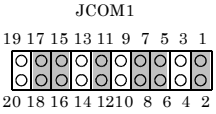
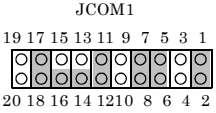
On board CF slot is connected to Secondary IDE. This jumper is select Master/Slave of CF memory card. Usually, please use it with a master setup.

Table 4.3. CF Master / Slave selector

JP1	Function
	Set to Master
	Set to Slave (Default)

RS-232/422/485 Selector: JCOM1

Table 4.4. RS-232/422/485 Selector

RS-232C (Default)	
RS-422	
RS-485	
1. For RS-485, TX+ (pin2) and RX+ (pin3) must jumper together inside the D type connector. 2. TX- (pin1) and RX- (pin 4) is the same.	

Transmit date control in half-duplex mode

In half-duplex mode, the transmission buffer must be controlled to prevent transmit data from causing a collision. The SEH-9450-LAS uses the RTS signal and bit 1 in the modem control register to control transmit data.

Modem control register

(Setting I/O address +4H) bit 1: 0 … RTS High (Disables transmission)
1 … RTS low (Enables transmission)

Setting the RS-422/RS-485 receiver disable control jumper

When the RS-422/RS-485 port is used, the RTS signal is used for driver enable control Connecting JCOM1 Pins 14 and 16 disables the receiver at the same time, preventing the port from receiving output data to an external device.

RS-422/485 setting

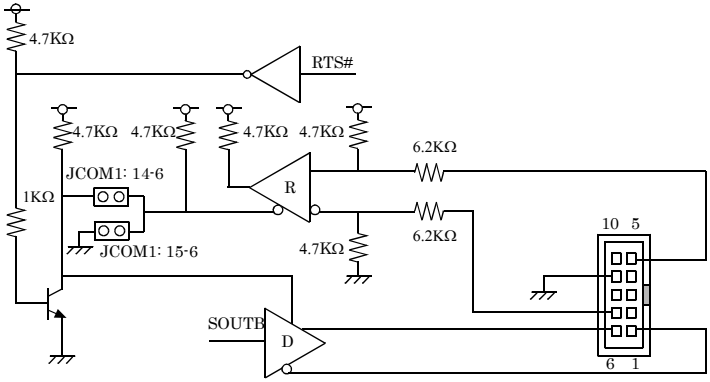


Figure 4.1. RS-422/485 Setting

I/O addresses and instructions

The table below lists I/O addresses for use as SERIAL2.

Table 4.5. I/O Addresses and instructions

I/O address	DLAB	Read/Write	Register	
02F8H	0	W	Transmitter holding Register	THR
		R	Receiver buffer Register	RBR
	1	W	Divisor latch Register (LSB)	DLL
02F9H	1	W	Divisor latch Register (MSB)	DLM
	0	W	Interrupt enable Register	IER
02FAH	X	R	Interrupt ID Register	IIR
02FBH	X	W	Line control Register	LCR
02FCH	X	W	Modem Control Register	MCR
02FDH	X	R	Line status Register	LSR
02FEH	X	R	Modem Status Register	MSR
02FFH	X	R/W	Scratch Register	SCR

5. CPU Board Resources

System address map

The GMCH memory map includes a number of programmable ranges. All of these ranges must be unique and non-overlapping. There are no hardware interlocks to prevent problems in the case of overlapping ranges. Accesses to overlapped ranges may produce indeterminate results.

Compatibility Area

Address	Description
0 - 640KB	DOS area
640 - 768KB	Video Buffer area
768 - 896KB	Expansion Area
896 - 960KB	Extended System BIOS Area
960 - 1MB	System BIOS Area

Memory Segment

Memory Segments	Comments
00000h - 9FFFFh	0 - 640K DOS Region
A0000h - BFFFFh	Video Buffer
B0000h - B7FFFh	Monochrome Adapter range
C0000h - CBFFFh	Video BIOS
CC000h - DFFFFh	Expansion Area
E0000h - EFFFFh	Extended System BIOS Area
F0000 - FFFFFh	System BIOS Area
100000h - 7FFFFFFFh	Extended Memory Area
00100000 to Top of Main Memory	Main DRAM Address Range
Top of Main Memory	Extended SMRAM Address Range
Top of Main Memory To 4GB	PCI Memory Address Range
FEC0000h - FECFFFFFh, FEE00000h - FEEFFFFFh	APIC configuration space
FFE0000h - FFFFFFFFh	High BIOS Area

PCI Routing Information

IDSEL	INT	Onboard Function
AD25	INT H	LAN Intel 82573E
AD26	INT G	SATA

6. Watch-Dog-Timer (WDT) Setting

Introduction

The watchdog timer serves as a safeguard against possible system lock-up in your industrial computer system. In most industrial environments, there are heavy equipment, generators, high-voltage power lines, or power drops that have adverse effects on your computer system. For instance, when a power drop occurs, it could cause the CPU to come to a halt state or enter into an infinite loop, resulting in a system lock-up.

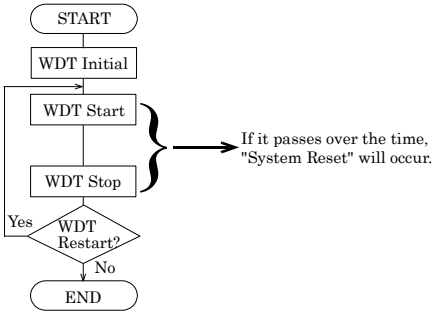
With the watchdog timer enabled, a RESET can be automatically generated unless the CPU periodically triggers the timer within the time-out interval. That is, while the system gets hung up, the running program can't trigger the timer periodically. The timer will generate a reset signal to reboot the system. This feature allows a running program to restart in an orderly way when a power glitch or any abnormal condition occurs.

The watchdog timer comes with 255-level time-out interval, 1 - 255 seconds per interval, which can be adjusted by software setting. There is a tolerance of 2 second for this time-out interval. For example, if the time-out interval has been set to 32 seconds, your program should trigger the watchdog timer before 28 seconds are escaped. Otherwise, after 28-32 seconds are escaped, the system will automatically reboot. To keep the system running normally, your program should trigger the watchdog timer every 28 seconds.

The I/O port is defined at address 2e/2fH. You can trigger/enable disable the timer by writing port2e/2fH.

Here is an example for flow chart and programming how to use the watch-dog-timer.

(1) Example flow chart



(2) Example programming

The following example is written in Intel8086 assembly language.

```
;===============
;<WDT Initial>
;===============
;----------------------------------
;Enter the extended function mode
;----------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL

;----------------------------------
;Set WDT function at pin89
;----------------------------------
MOV DX,2EH
MOV AL,2BH
OUT DX,AL
MOV DX,2FH
MOV AL,0DH
OUT DX,AL
;-------------------------------------------------
;Select logical device WDT(number 8)
;-------------------------------------------------
MOV DX,2EH
MOV AL,07H
OUT DX,AL
MOV DX,2FH
MOV AL,08H
OUT DX,AL
;-------------------------------------------------
;Activate logical device WDT(number 8)
;-------------------------------------------------
MOV DX,2EH
MOV AL,30H
OUT DX,AL
MOV DX,2FH
MOV AL,01H
OUT DX,AL
;----------------------------------
;Set timer unit : second
;----------------------------------
MOV DX,2EH
MOV AL,F5H
OUT DX,AL
MOV DX,2FH
MOV AL,00H
OUT DX,AL
;----------------------------------------
```

```
;Exit the extended function mode
;---------------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL

;================================
;<WDT START : counter set and a start >
;================================
;-----------------------------------------------
;Enter the extended function mode
;-----------------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
;-------------------------------------------------
;Select logical device WDT(number 8)
;-------------------------------------------------
MOV DX,2EH
MOV AL,07H
OUT DX,AL
MOV DX,2FH
MOV AL,08H
OUT DX,AL
;-------------------------------------------------------
;Set time of WDT and start to count down
;-------------------------------------------------------
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
;-----------------------------------------------------------------------
---------------
;The data of an example is 15 seconds.(01H=1sec.- FFH=255sec.)
MOV AL,0FH   ; 0FH = 15Sec.
;-----------------------------------------------------------------------
-----------------
OUT DX,AL
;----------------------------------
;Exit the extended function mode
;----------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
;==============
;<WDT STOP>
;==============
;----------------------------------
;Enter the extended function mode
;----------------------------------
```

```
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
;----------------------------------
;Select logical device WDT(number 8)
;----------------------------------
MOV DX,2EH
MOV AL,07H
OUT DX,AL
MOV DX,2FH
MOV AL,08H
OUT DX,AL
;----------------------------------
;Stop count down of WDT
;----------------------------------
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
;----------------------------------
;The data of 00H is stop WDT
MOV AL,00H
;----------------------------------
OUT DX,AL
;----------------------------------
;Exit the extended function mode
;----------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

⚠ CAUTION

The timer's intervals have a tolerance of ±2 seconds.

7. Hardware Monitor

Hardware Monitor

Hardware Monitor function is included in Hardware Monitor controller (Winbond W83627HF) on this product.

You can read Temperature, Voltage and Fan Sensor output of SBC.

Temperature

Two Thermistor are mounted on SBC as following. You can read Temperature of this position.

Voltage

You can read +3.3V, +5V, +1.05, +1.8V, +1.5V, 5VSB, Vcore of SBC.

VTT(1.05V) : CPU I/O voltage

Vcore : CPU core voltage

Speed Sensor

FAN Speed Sensor signal is input in FAN1 / FAN2 pin3 when you use FAN with speed sensor. You can read FAN speed.

⚠ CAUTION

You must use FAN with speed sensor if you would like to read FAN Speed.

8. BIOS Setup

Introduction

This chapter discusses Award's Setup program built into the FLASH ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The Award BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1 By pressing <Del> immediately after switching the system on, or

2 By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> 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 again be asked to.

Press F1 to continue, DEL to enter SETUP

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Table 8.1. Using Setup

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

A Final Note About Setup

The information in this chapter is subject to change without notice.

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 several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

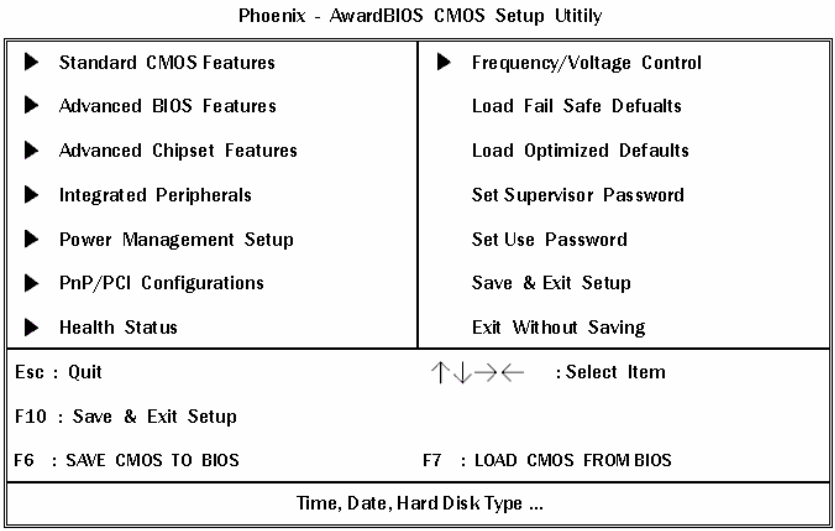


Figure 8.1. Main Manu

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features

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

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Setup

Use this menu to specify your settings for power management.

PnP / PCI Configuration

This entry appears if your system supports PnP / PCI.

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Supervisor / User Password

Use this menu to set User and Supervisor Passwords.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Save

Abandon all CMOS value changes and exit setup.

Standard CMOS Setup

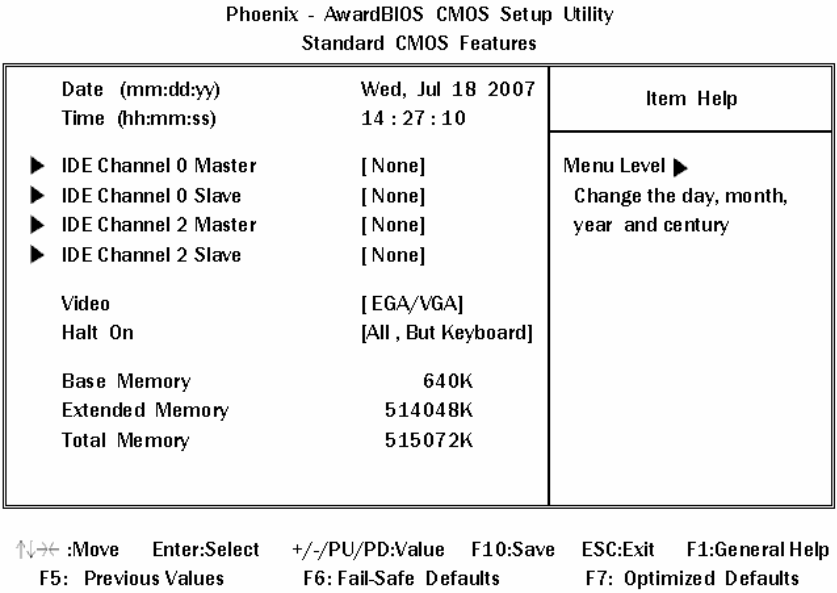


Figure 8.2. Standard CMOS Setup

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.

Main Menu Selections

This table shows the selections that you can make on the Main Menu

Table 8.2. Main Menu Selections

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 2 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 2 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.

Use the legend keys to navigate through this menu and exit to the main menu. Use Table 3 to configure the hard disk.

Table 8.3. IDE Adapters configurations

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0/2 Master/Slave	None Auto Manual	Selecting 'manual' lets you set the re-maining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Channel 0/2 Master/Slave' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Advanced BIOS Features Setup

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

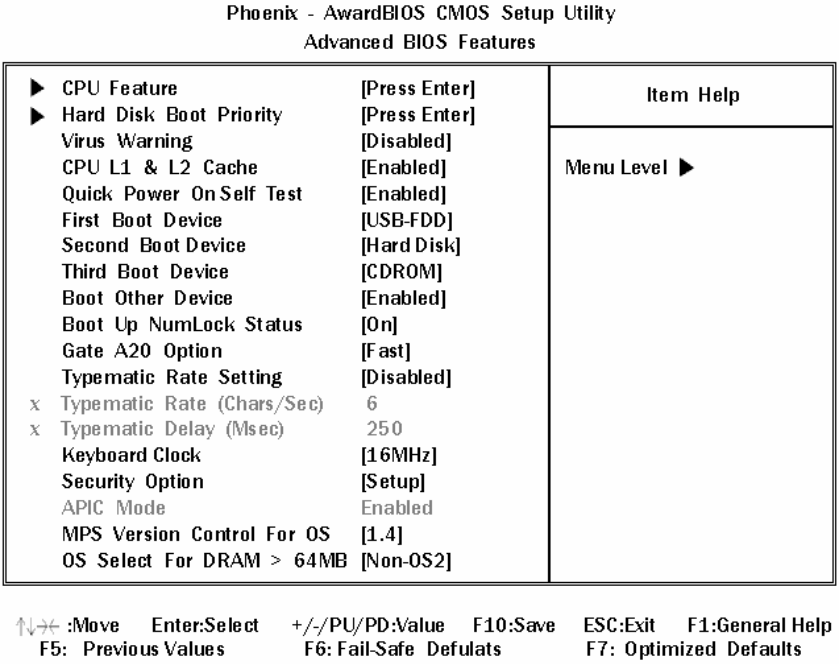


Figure 8.3. Advanced BIOS Features Setup

CPU Feature

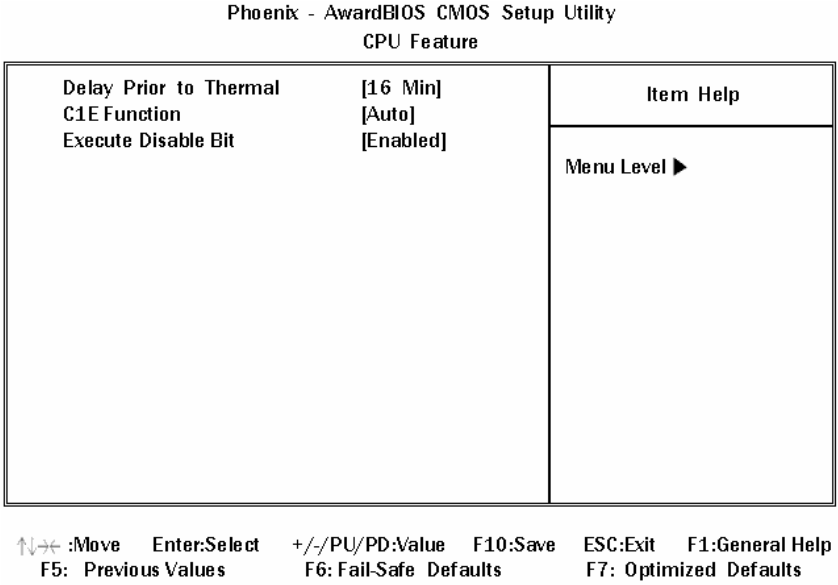
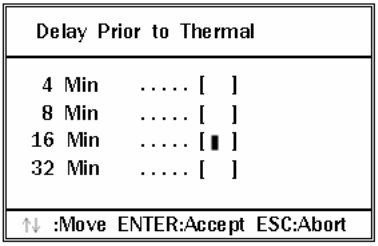
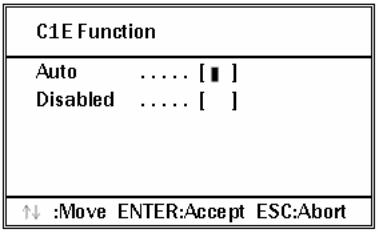
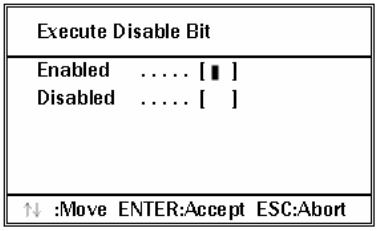


Figure 8.4. CPU Feature Setup

Press <Enter> to configure the settings relevant to CPU Feature.

Table 8.4. CPU Features Selections

Description	Choice
Delay Prior to Thermal Select the interval to setup the delay timer for CPU Thermal-Throuttling	
C1E Function CPU C1E Function Select.	

Description	Choice
Execute Disable Bit When disabled, forces the XD feature flag to always return 0.	

Hard Disk Boot Priority

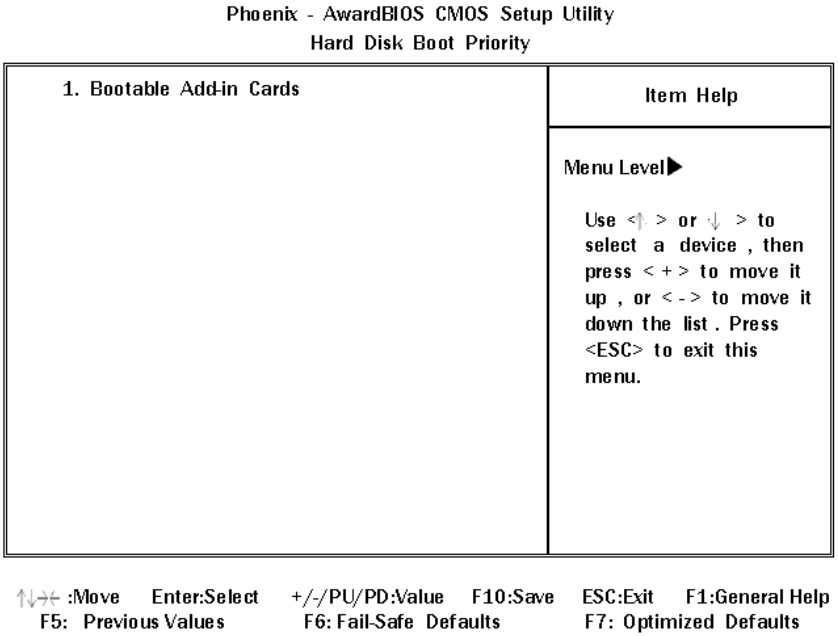


Figure 8.5. Hard Disk Boot Priority Setup

With the field, there is the option to choose, aside from the hard disks connected, “Bootable add-in Cards” which refers to other external device.

Virus Warning

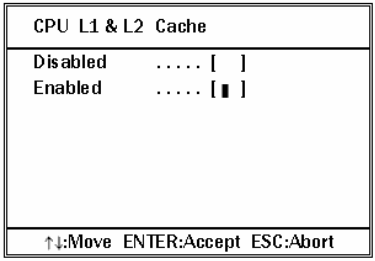
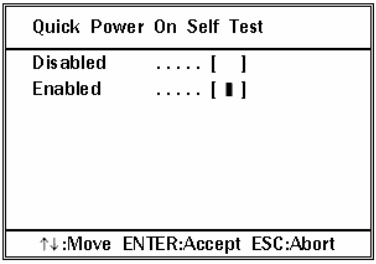
When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

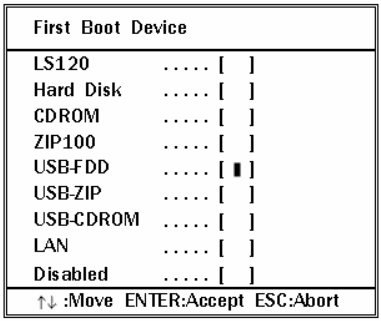
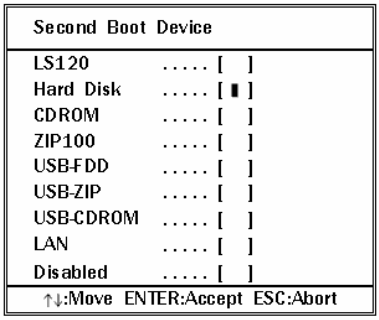
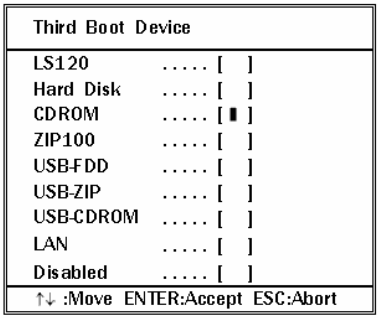
⚠ CAUTION

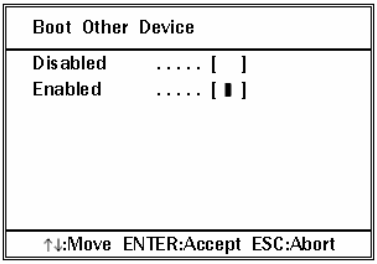
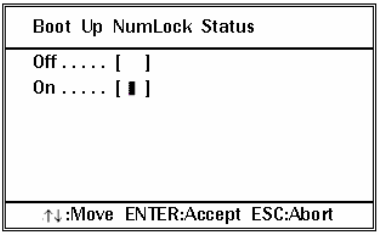
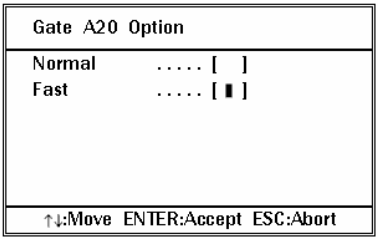
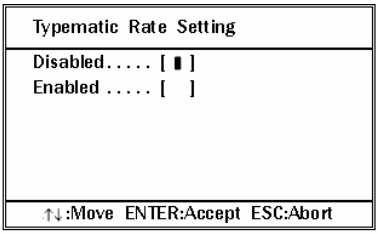
Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

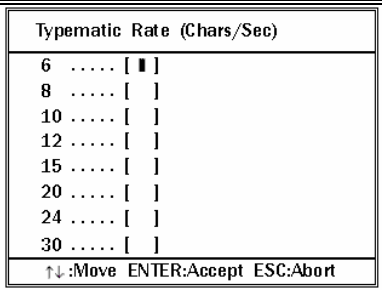
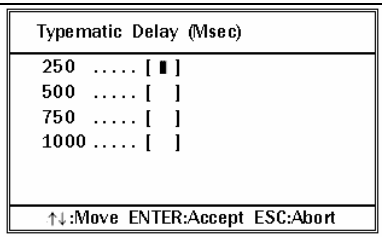
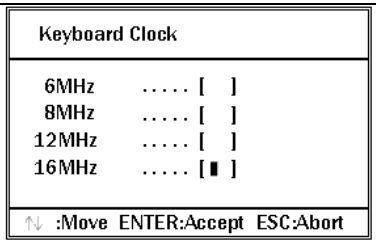
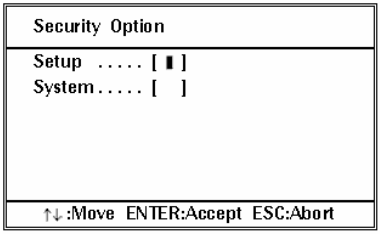
Enabled	Activates automatically when the system boots up causing a warning message to appear when any-thing attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

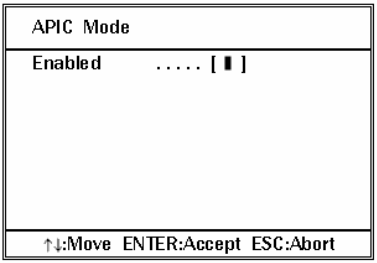
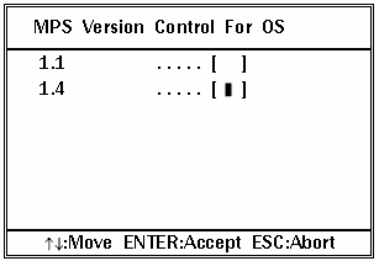
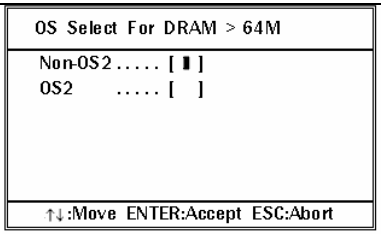
Table 8.5. Advance BIOS Feature Selections

Description	Choice
CPU L1 & L2 Cache Cache memory is additional memory that is faster than conventional DRAM. These allow you to enable (speed up memory access) or disable the cache function.	
Quick Power On Self Test Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work	

Description	Choice
First Boot Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	
Second Boot Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	
Third Boot Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	

Description	Choice
Boot Other Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	
Boot Up NumLock Status Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.	
Gate A20 option Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows	
Typematic Rate Setting When Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When Enabled, you can select a typematic rate and typematic delay.	

Description	Choice
Typematic Rate (Chars/Sec) When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second.	
Typematic Delay (Msec) When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.	
Keyboard Clock Select the keyboard clock.	
Security Option Select whether the password is required every time the system boots or only when you enter setup. If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup. System: The system will not boot and access to Setup will be denied if the correct password is not 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 and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.	

Description	Choice
APIC Mode APIC stands for Advanced Programmable Interrupt Controller. Note : This item is show only	
MPS Version Control For OS Use the Multiprocessor Specification (MPS) for OS option to specify the MPS version to be used. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability.	
OS Select For DRAM > 64M Select the operating system that is running with greater than 64MB of RAM on the system.	

Advanced Chipset Features Setup

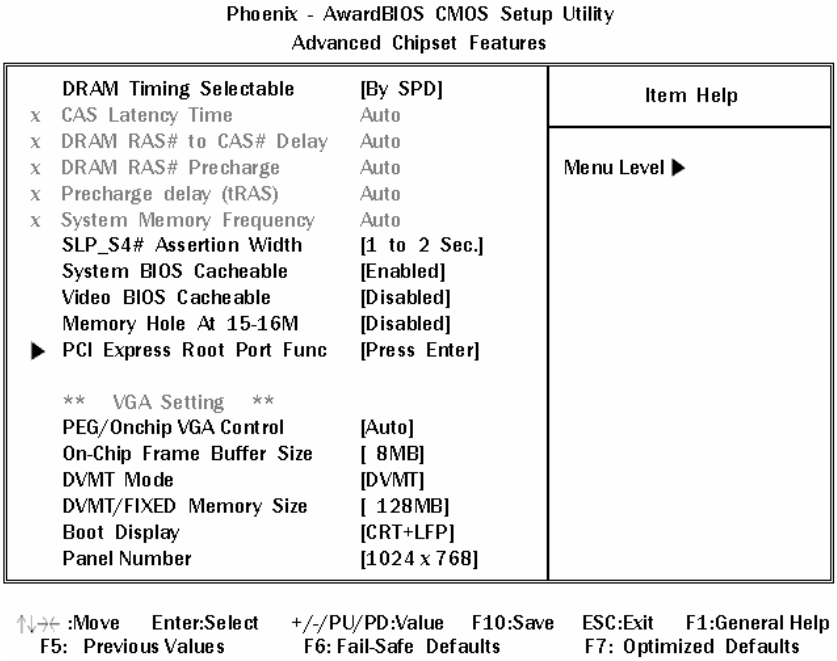
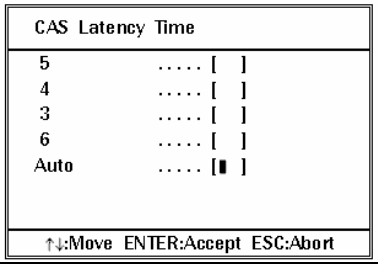
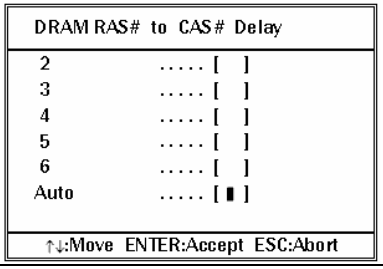
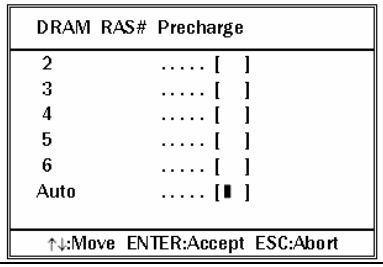
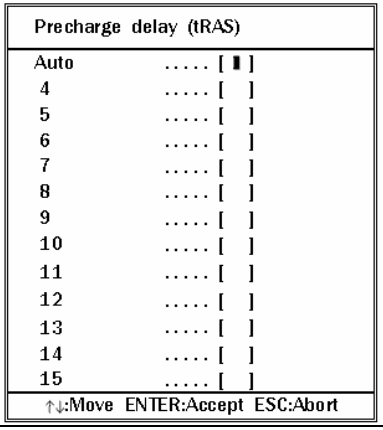


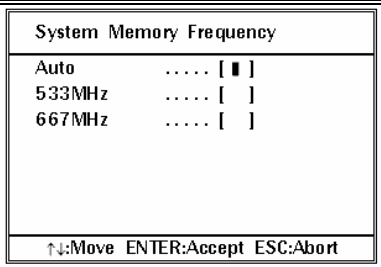
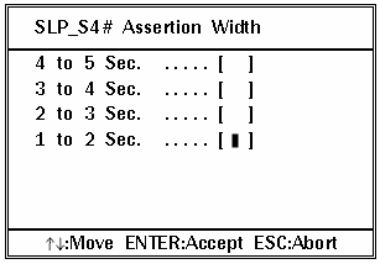
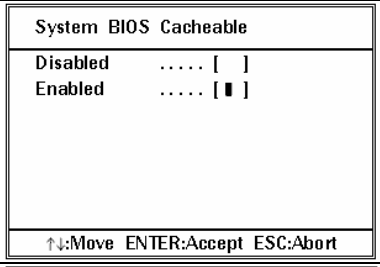
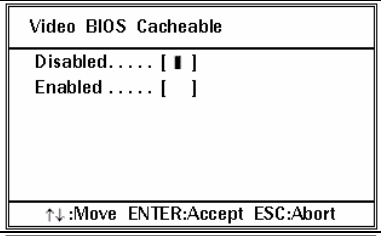
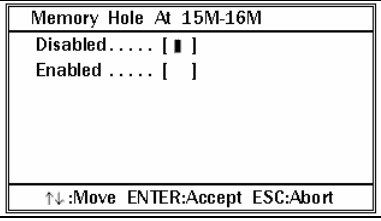
Figure 8.6. Advanced Chipset Features Setup

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.

Table 8.6. Advance Chipset Feature Selections

Description	Choice
DRAM Timing Selectable The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unlees you install new memory that has a different performance rating than the original DRAMs.	DRAM Timing Selectable Manual ..... [ ] By SPD ..... [▮] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
CAS Latency Time When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this fild from the default value specified by the system designer. You can select CAS latency time in HCLK of 3/4/5/6 or Auto. The system board designer should set the values in this field, depends on the DRAM installed specifications of the installed DRAM or the installed CPU.	
DRAM RAS# to CAS# delay This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.	
DRAM RAS# Precharge The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.	
Precharge delay (tRAS) This item controls the number of DRAM clocks to activate the precharge delay. The default setting for the DRAM Cycle time tRAS is Auto.	

Description	Choice
System Memory Frequency This item sets the main memory frequency. When you use an external graphics card, you can adjust this to enable the best performance for your system.	
SLP_S4# Assertion Width Allows you to set the SLP_S4# assertion width. The default setting is 1 to 2 Sec.	
System BIOS Cacheable Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.	
Video BIOS Cacheable Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.	
Memory Hole At 15M-16M In order to improve performance, certain space in memory can be reserved for ISA card. This memory must be mapped into the memory space below 16MB.	

PCI Express Root Port Function

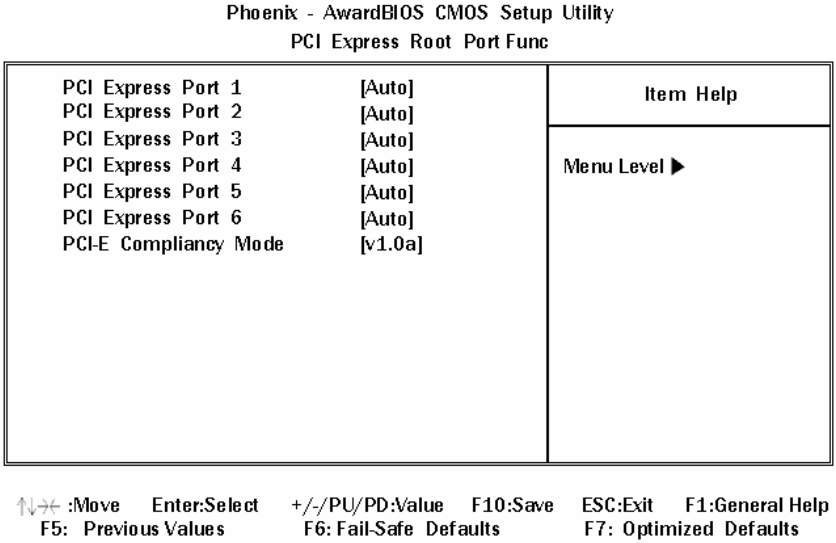
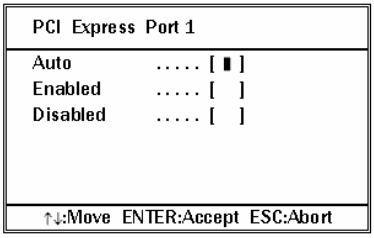
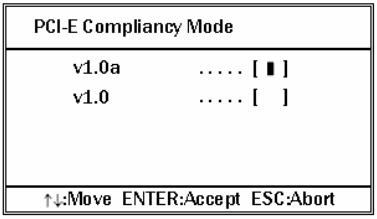


Figure 8.7. PCI Express Root Port Function

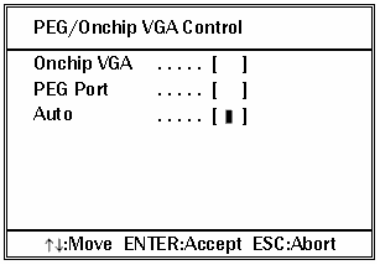
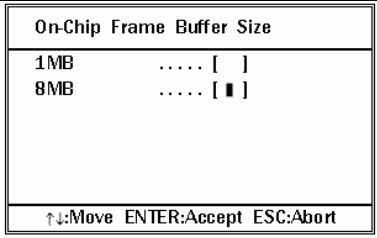
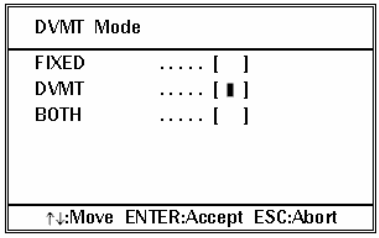
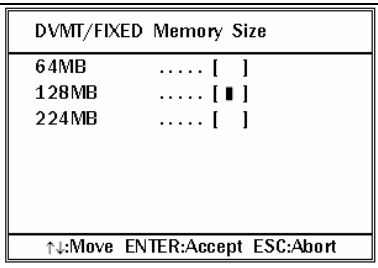
Table 8.7. PCI Express Root Port Function Selections

Description	Choice
PCI Express Port 1/2/3/4/5/6 This item allows you to enable or disable or Auto configure the PCI Express Port 1/2/3/4/5/6.	
PCI-E Compliancy Mode This item allows you to set PCI Express compliancy mode.	

VGA setting

The field under the On-Chip VGA Setting and their defaults settigs are:

Table 8.8. VGA Setting Selections

Description	Choice
PEG/On Chip VGA Control Select VGA Control by PCI Express Graphic, On-chip or Auto.	
On-Chip Frame Buffer Size When Enabled, a fixed VGA frame buffer from A000h to BFFFh and a CPU-to-PCI write buffer are implemented.	
DVMT Mode Allows you to set the Dynamic Video Memory Technology (DVMT) mode.	
DVMT/FIXED Memory Size Allows you to set the Dynamic Video Memory Technolosy (DVMT) memory sieze.	

Description	Choice
Boot Display This item allows you to select the boot display device. Note : When installing SDVO, then it will display CRT+ EFP item.	Boot Display CRT ..... [ ] CRT+LFP ..... [ ] CRT+EFP ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort
Panel Number These fields allow you to select the LCD Panel type.	Panel Number 800 x 600 ..... [ ] 1024 x 768 ..... [ ] 1280 x1024 ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

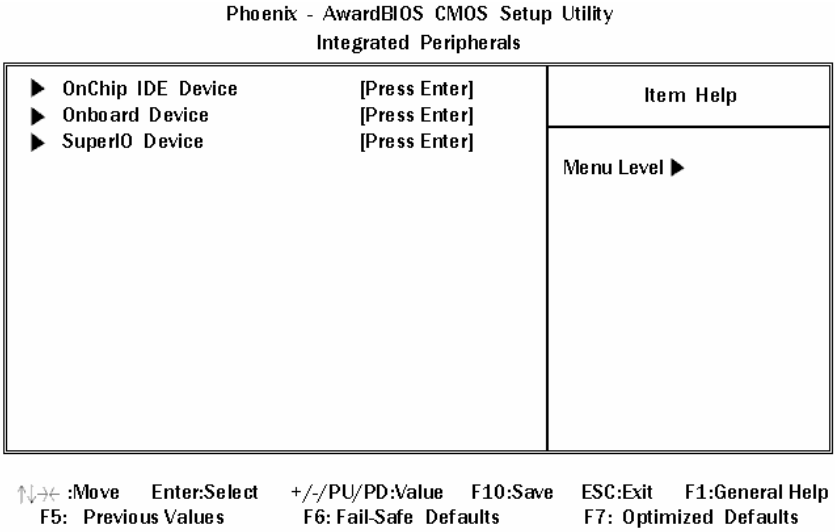


Figure 8.8. Integrated Peripherals

OnChip IDE Device

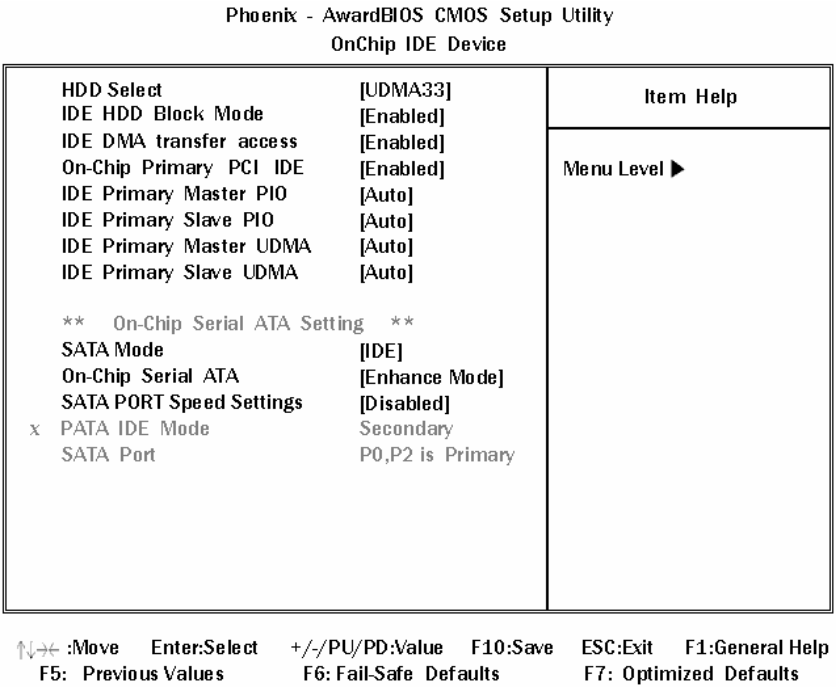
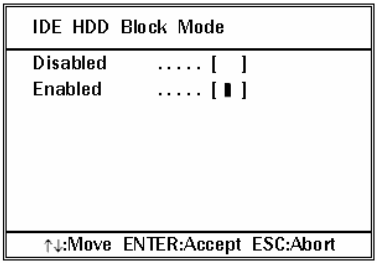
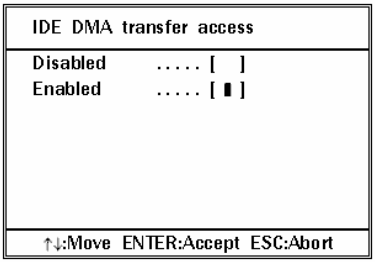
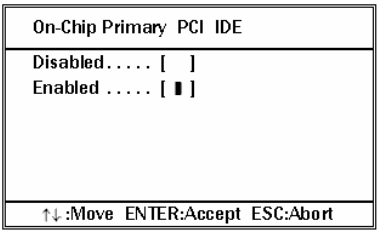
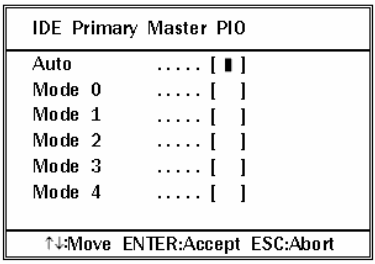
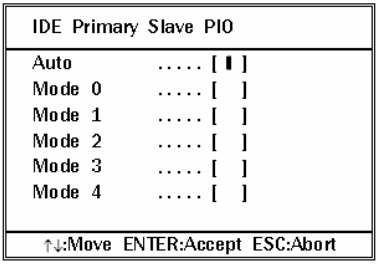
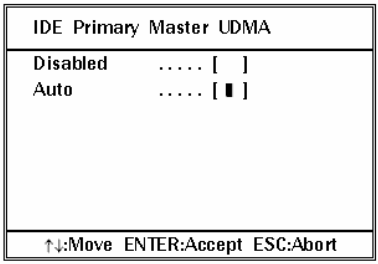
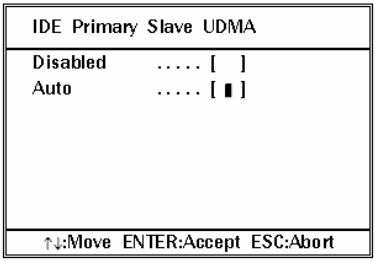


Figure 8.9. OnChip IDE Device

Table 8.9. On Chip IDE Device Selections

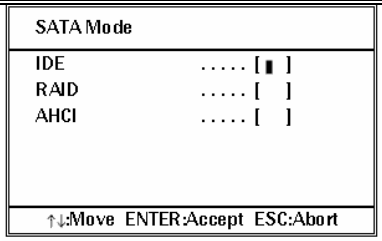
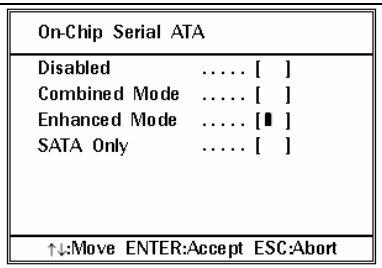
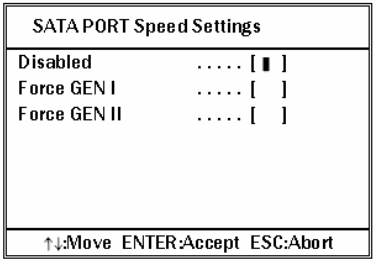
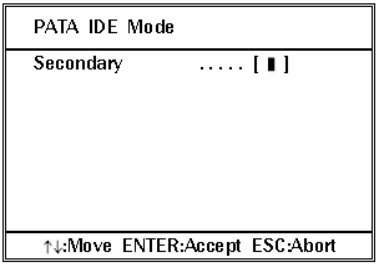
Description	Choice
HDD Select You can choose your hard disk type to Auto Select or UDMA 33.	HDD Select Auto Select . . . . . [ ] UDMA33 . . . . . [ ] ↑↓:Move ENTER:Accept ESC:Abort

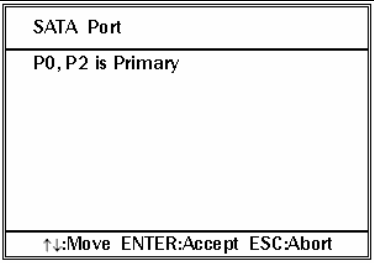
Description	Choice
IDE HDD Block mode Block mode is also called block transfer, multiple commands, or multiple sectors read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.	
IDE DMA transfer access This item allow you to enable or disable the IDE DMA transfer access.	
On-Chip Primary PCI IDE The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.	

Description	Choice
IDE Primary Master / Slave PIO The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.	 
IDE Primary Master/Slave UDMA UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.	 

On Chip Serial ATA Setting

Table 8.10. On Chip Serial ATA setting Selections

Description	Choice
SATA Mode Allow you setting the SATA hard disk mode to IDE, RAID or AHCI mode.	
On-Chip Serial ATA Disabled: Disabled SATA Controller. Combined Mode: PATA and SATA are combined. Maximum of 4 IDE devices can use 2 for SATA 2 for PATA. Enhanced Mode: Enable both SATA and PATA. Maximum of 4 IDE devices are supported. SATA Only: SATA is operating in legacy mode.	
SATA PORT Speed Settings Disable the SATA Port Speed setting or force to GEN I / GEN II.	
PATA IDE Mode The fix setting of the PATA IDE Mode is secondary.	

Description	Choice
SATA Port Sets the Serial ATA channel to primary only. Note:The item is show only	

Onboard Device

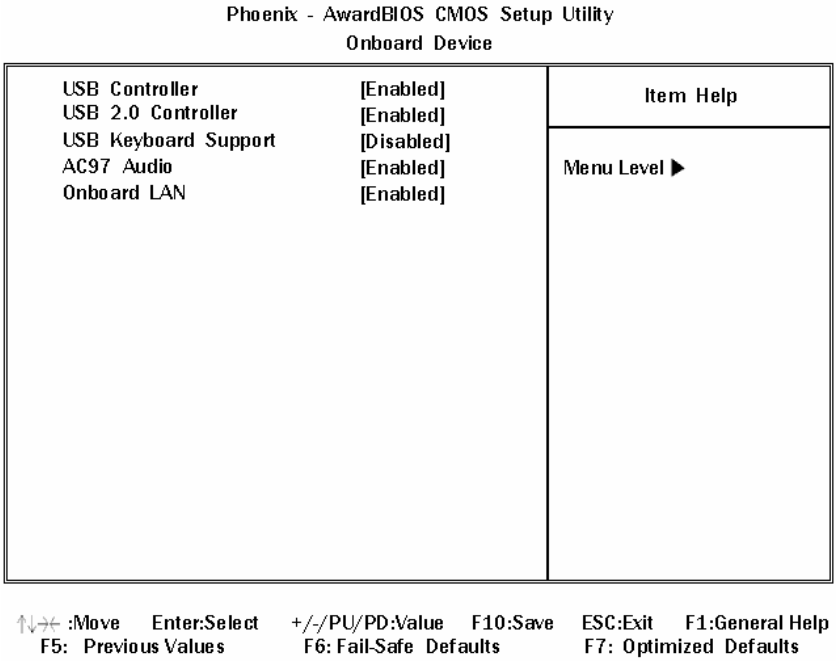
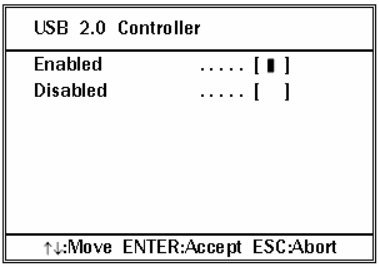
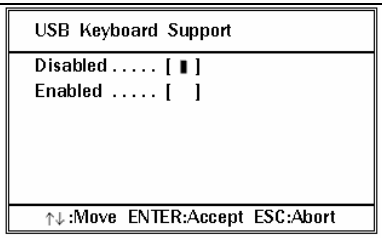
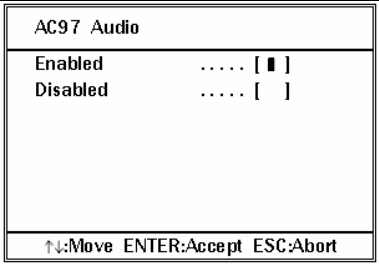
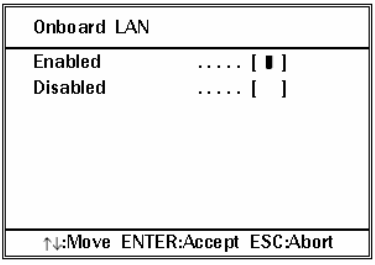


Figure 8.10. Onboard Device

Table 8.11. On board device Selections

Description	Choice
USB Controller Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.	USB Controller Enabled . . . . . [▮] Disabled . . . . . [ ] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
USB 2.0 Controller You can disable this function if you are not using onboard USB 2.0 feature.	
USB Keyboard Support Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.	
AC97 Audio Select Enabled to use the audio capabilities of your system. Most of the following fields do not appear when this field is Disabled.	
Onboard LAN Select Enabled to active the onboard 10/100/1000 LAN controller, select Disabled to turn-off the onboard 10/100/1000 LAN controller when you do not want to use this function.	

Super IO Device

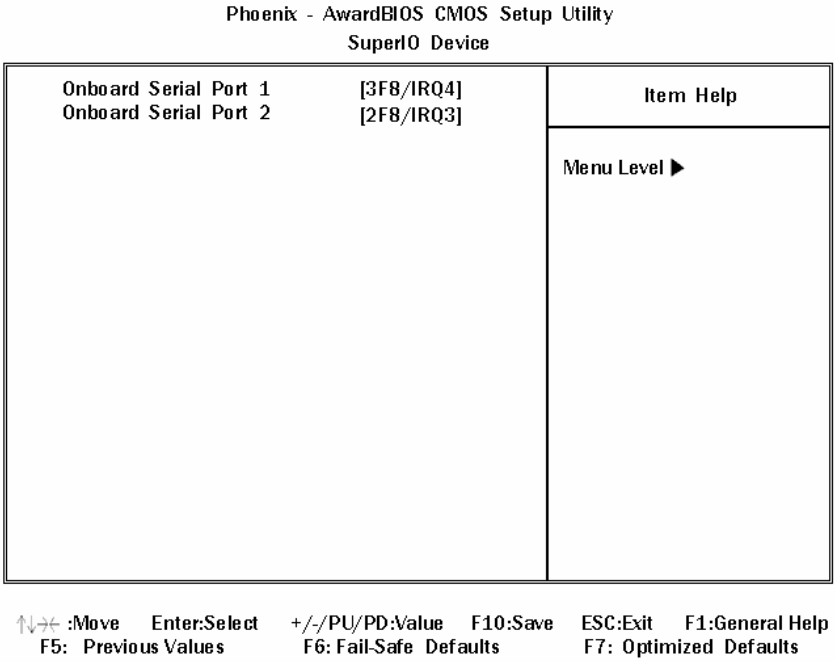


Figure 8.11. SuperIO Device

Table 8.12. Super I/O device Selections

Description	Choice
Onboard Serial Port 1 Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.	Onboard Serial Port 1 Disabled ..... [ ] 3F8/IRQ4..... [ ] 2F8/IRQ3..... [ ] 3E8/IRQ4..... [ ] 2E8/IRQ3..... [ ] Auto ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort
Onboard Serial Port 2 Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.	Onboard Serial Port 2 Disabled ..... [ ] 3F8/IRQ4..... [ ] 2F8/IRQ3..... [ ] 3E8/IRQ4..... [ ] 2E8/IRQ3..... [ ] Auto ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

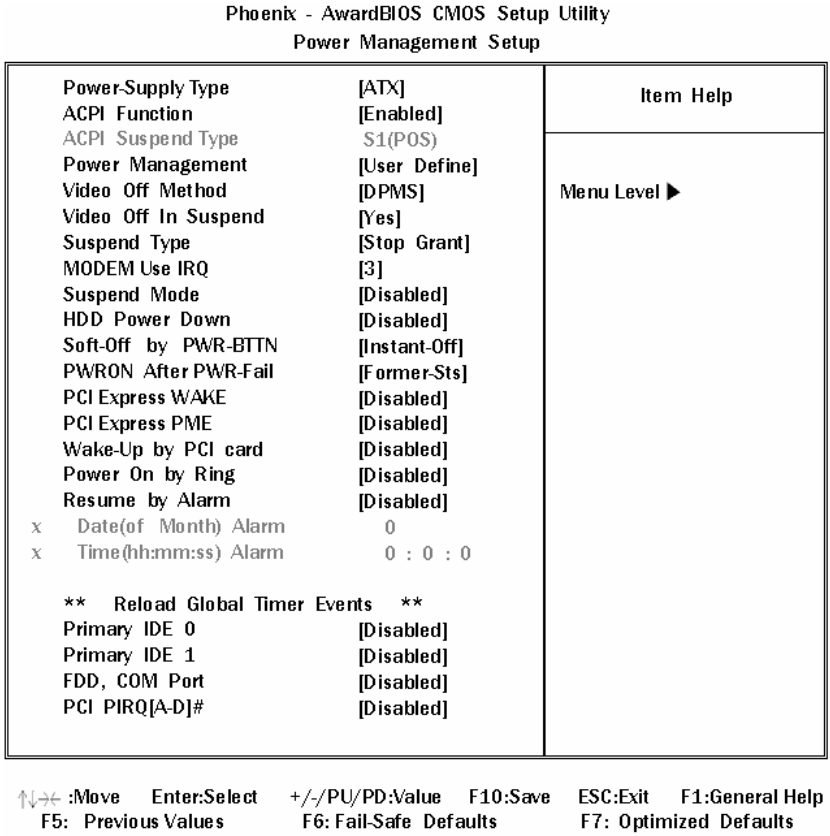
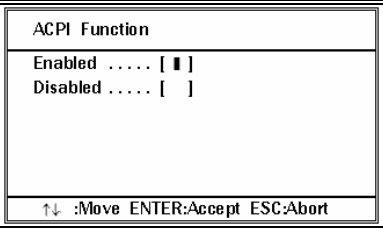


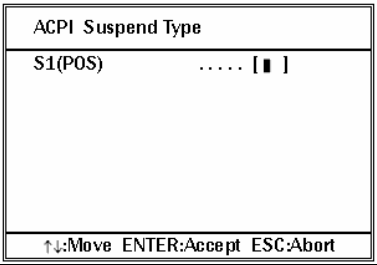
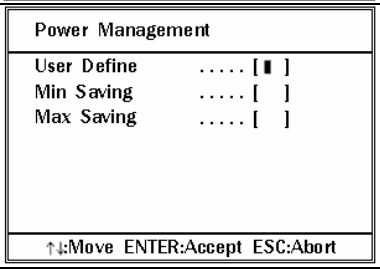
Figure 8.12. Power Management Setup

Table 8.13. Power Management setup Selections

Description	Choice
Power Supply Type This item sets the power supply type that you used.	Power-Supply Type AT . . . . . [ ] ATX . . . . . [▮] :Move ENTER:Accept ESC:Abort

Description	Choice
ACPI Function When set to 'Enabled', turns on the ACPI Function. The default setting is 'Enabled'.	

Note: ACPI (Advanced Configuration and Power Interface) is a power management specification that makes hardware status information available to the operating system ACPI enables a computer to turn its peripherals on and off for improved power management. It also allows the computer to be turned on and off by external devices, so that mouse or keyboard activity wakes up the computer.

ACPI Suspend Type The fix setting of the ACPI Suspend mode is S1(POS).	
Power management This setting controls the System Doze Mode, Standby Mode, and Suspend Mode Timer features.	

This category allows you to select the type (or degree) of power saving and is directly related to the following mode HDD Power Down

User Define:

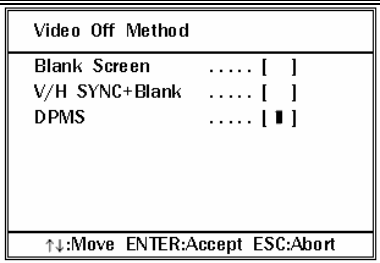
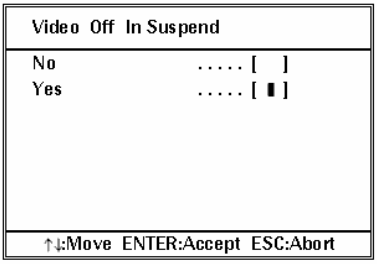
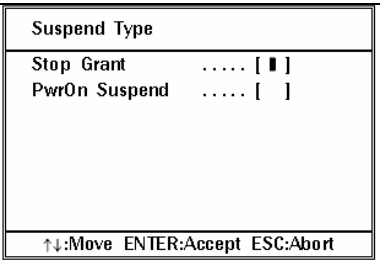
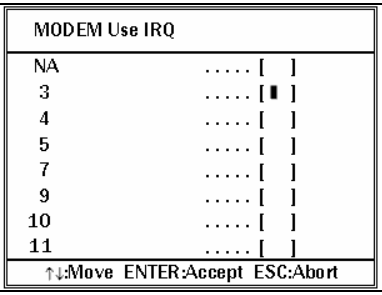
Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

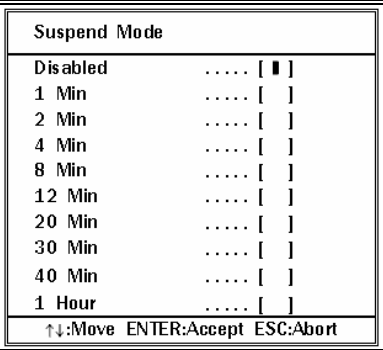
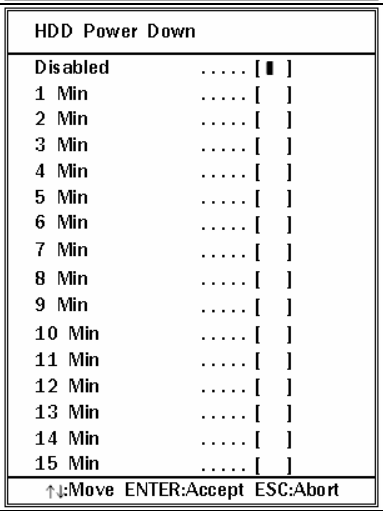
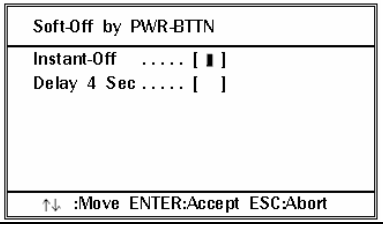
Min Saving:

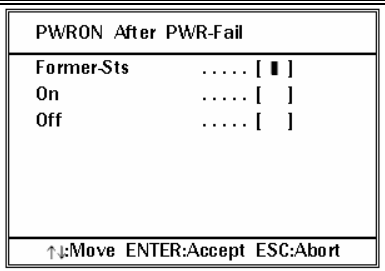
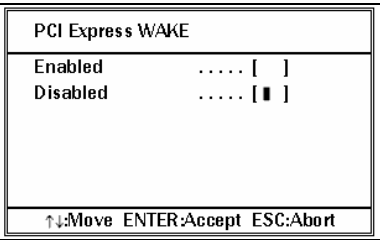
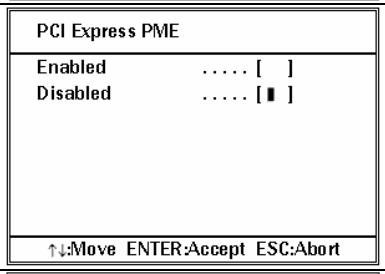
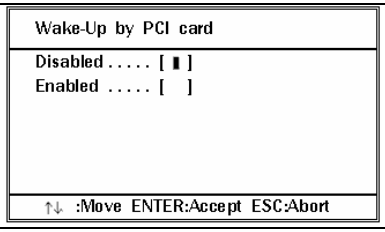
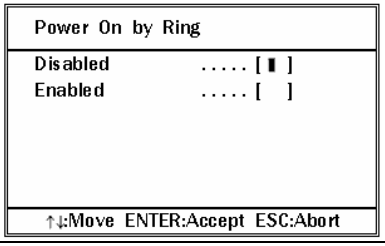
Minimum power management. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.

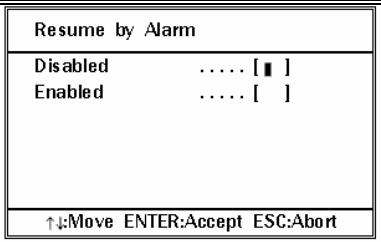
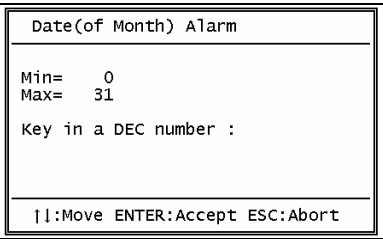
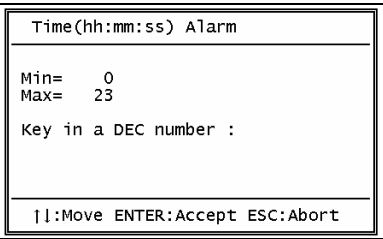
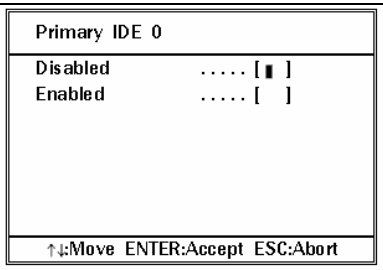
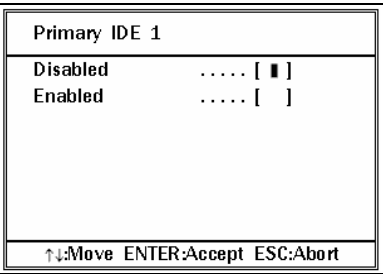
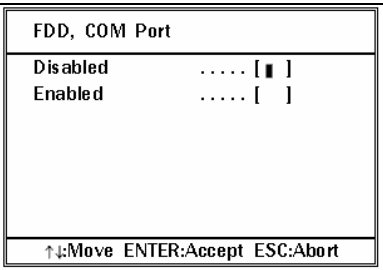
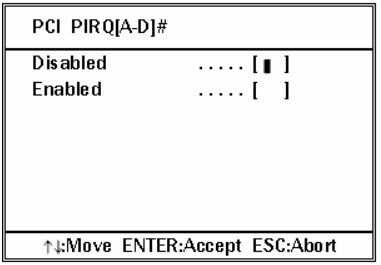
Max Saving:

Maximum power management – Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.

Description	Choice
Video Off Method This determines the manner in which the monitor is blanked.	
Blank Screen	This option only writes blanks to the video buffer.
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.
DPMS	Initial display power management signaling.
Video Off In Suspend This determines the manner in which the monitor is blanked.	
Suspend Type Enables you to select the Suspend type. Options are "Stop Grant" and "PwrOn Suspend".	
MODEM Use IRQ If you want an incoming call on a modem to automatically resume the system from a power-saving mode, use this item to specify the interrupt request line (IRQ) that is used by the modem. You might have to connect the fax/modem to a Keyboard computer Wake On Modem connector for this feature to work.	

Description	Choice
Suspend Mode The CPU clock will be stopped and the video signal will be suspended if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected.	
HDD Power Down When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.	
Soft-Off by PWR-BTTN When enabled, turning the system off with the on/off button places the system is a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or Resume by Ring activity.	

Description	Choice
Power after PWR-Fail Select a Power On status by the BIOS setup when power fail	
PCI Express WAKE By default, this field is disabled. If set Enable to enable On board lan "WOL" function	
PCI Express PME By default, this field is disabled. For Add on PCI-E Card PME	
Wake-Up by PCI card When Enabled, your can awakens the system from Suspend mode from LAN/ PCI card event.	
Power On by Ring When set to "Enabled," any activity on the Modem port will wake up the system from a power saving mode.	

Description	Choice
Resume by Alarm When Enabled, your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.	
	
Reload Global Timer Events: When Enabled, an event occurring on each listed device restarts the global timer for Standby mode.	
	
	

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.

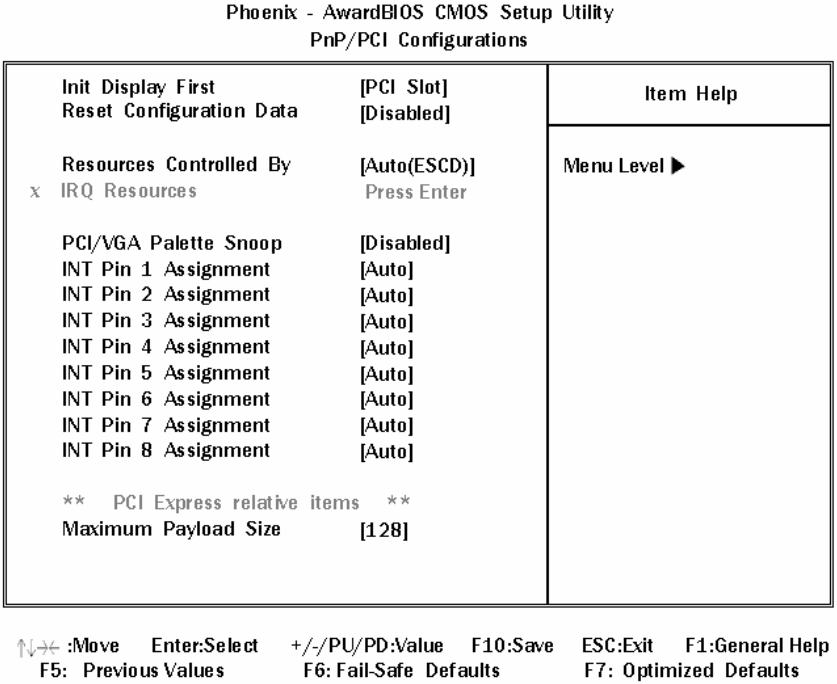
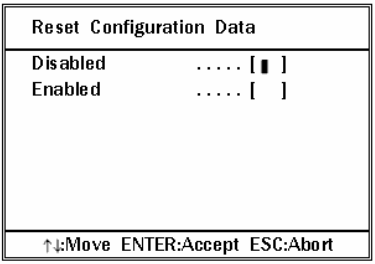
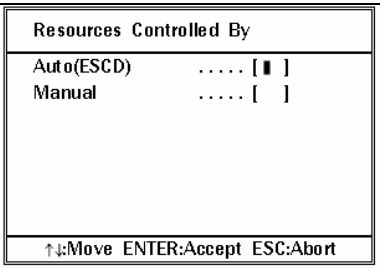


Figure 8.13. PnP/PCI Configuration Setup

Table 8.14. PCI PnP/PCI Configuration Setup Selections

Description	Choices
Init Display First Initialize the onboard video display before initializing any other display device on the system. Thus the onboard display becomes the primary display.	Init Display First PCI Slot ..... [▮] Onboard ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choices
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	
Resource Controlled by The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play – compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them	

IRQ n Resources

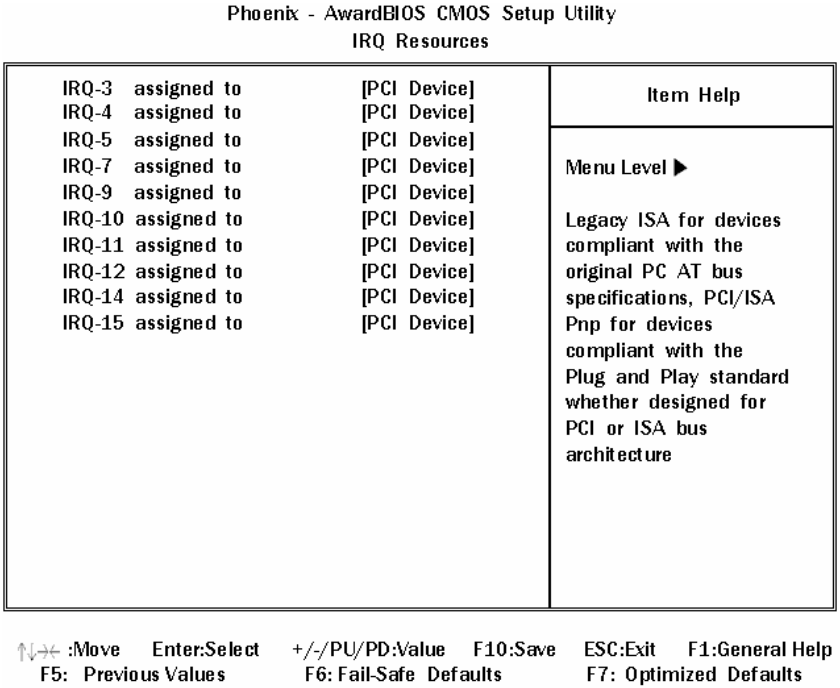


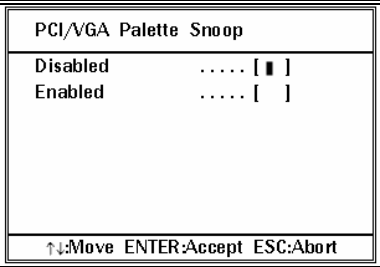
Figure 8.14. IRQ n Resources

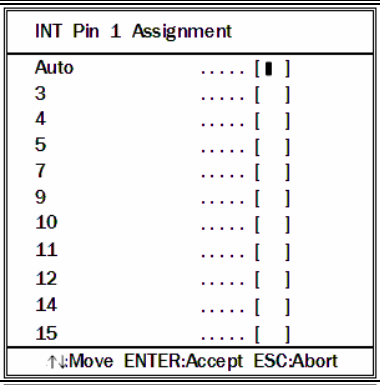
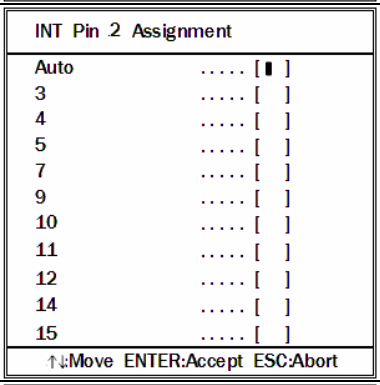
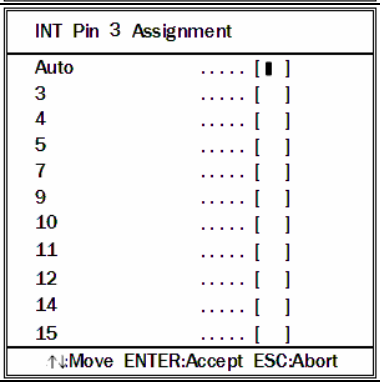
When resources are controlled manually, assign each system interrupt as on of the following type, depending on the type of device using the interrupt.

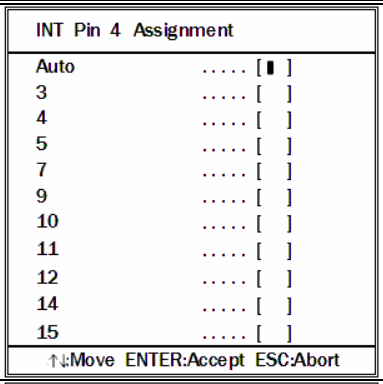
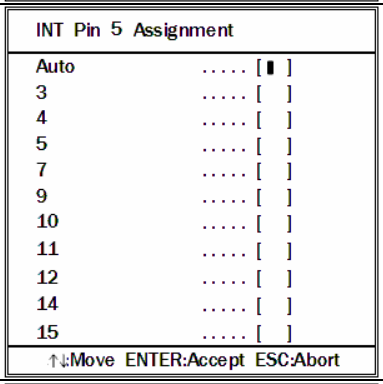
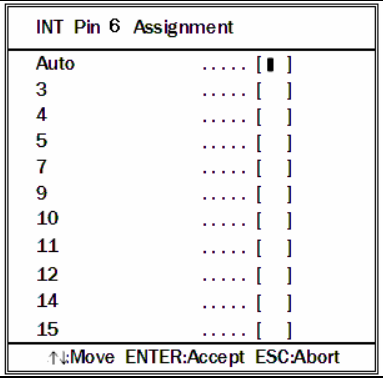
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ4 for serial port 1)

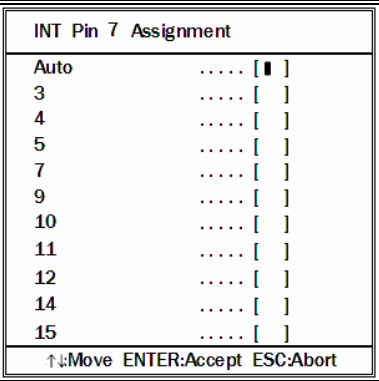
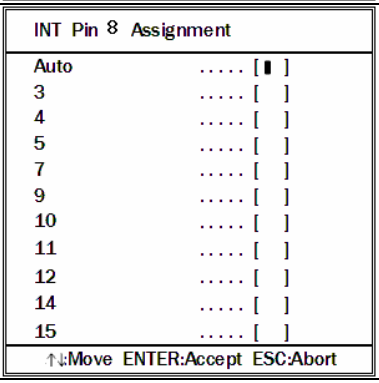
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

The Choice: Reserved and PCI device.

Description	Choices
PCI/VGA Palette Snoop This item is designed to overcome some problems that can be caused by some non-standard VGA cards. This board includes a built-in VGA system that does not require palette snooping so you must leave this item disabled. Leave this field at Disabled.	

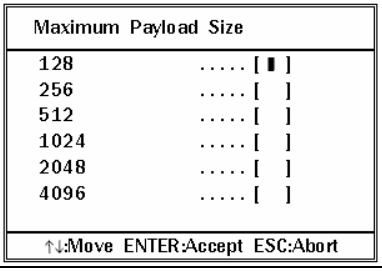
Description	Choices
INT Pin 1 Assignment Devices(s) using this INT: Display Controller - Bus 0 Dev 2 Func 0 USB 1.0/1.1 UHCI Controller - Bus 0 Dev 29 Func 3	
INT Pin 2 Assignment Devices(s) using this INT: Multimedia Device - Bus 0 Dev30 Func 2	
INT Pin 3 Assignment Devices(s) using this INT: USB 1.0/1.1 UHCI Contorller - Bus 0 Dev29 Func 2	

Description	Choices
INT Pin 4 Assignment Devices(s) using this INT: IDE Controller - Bus 0 Dev 31 Func 2 USB 1.0/1.1 UHCI Contorller - Bus 0 Dev 29 Func 1 SMBus Controller - Bus 0 Dev 31 Func 3	
INT Pin 5 Assignment Devices(s) using this INT: Network Controller - Bus 1 Dev 8 Func 0 Simple Communication Controller - Bus 0 Dev 30 Func 3	
INT Pin 6 Assignment Devices(s) using this INT: - Reserved	

Description	Choices
INT Pin 7 Assignment Devices(s) using this INT: - Reserved	
INT Pin 8 Assignment Devices(s) using this INT: USB 1.0/1.1 UHCI Controller - Bus 0 Dev 29 Func 0 USB 2.0 EHCI Controller - Bus 0 Dev 29 Func 7	

PCI Express relative items

Table 8.15. PCI Express Relative Items Selections

Description	Choices
Maximum Payload Size Set macimum TLP payload size for the PCI Express Devices. The unit is byte.	

PC Health Status

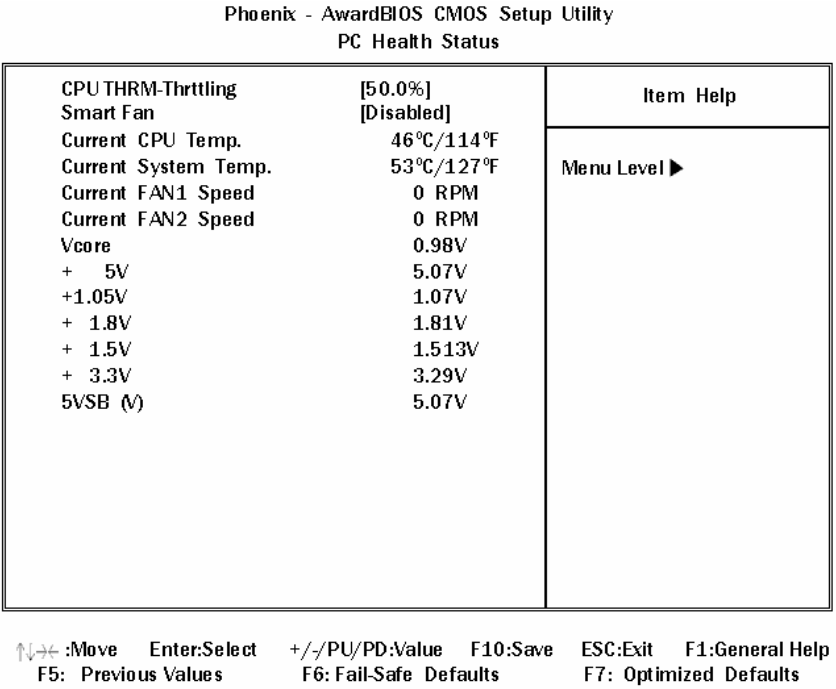
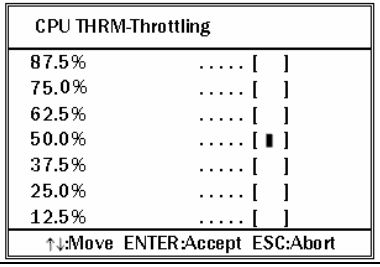
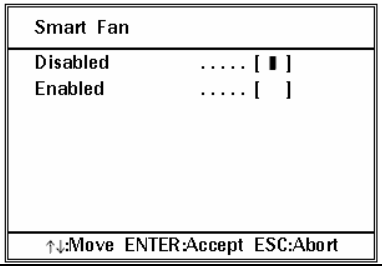


Figure 8.15. PC Health Status

The BIOS shows the PC health status in this window.

Table 8.16. PC Health Status Selections

Description	Choices
CPU THRM-Throttling This item sets the percentage of time that the CPU is idled if CPU throttling is initiated by excess heat.	
Smart Fan Disabled: Disable this function. Enabled: When this function is enabled, CPU fan will ran at different speed depending on CPU temperature. Users can adjust the fan speed with Easy Ture based on their requirements.	
Current FAN1 Speed	This field displays the current FAN1 speed, if your computer contains a monitoring system.
Current FAN2 Speed	This field displays the current FAN2 speed, if your computer contains a monitoring system.
Current CPU Temp.	This field displays the current CPU temperature, if your computer contains a monitoring system.
Current System Temp.	This field displays the current system temperature, if your computer contains a monitoring system.
Vcore / +5V / +1.05V / + 1.8V / +1.5V / +3.3V / 5VSB	These fields display the current voltage of input lines, if your computer contains a monitoring system.

Frequency/Voltage Control

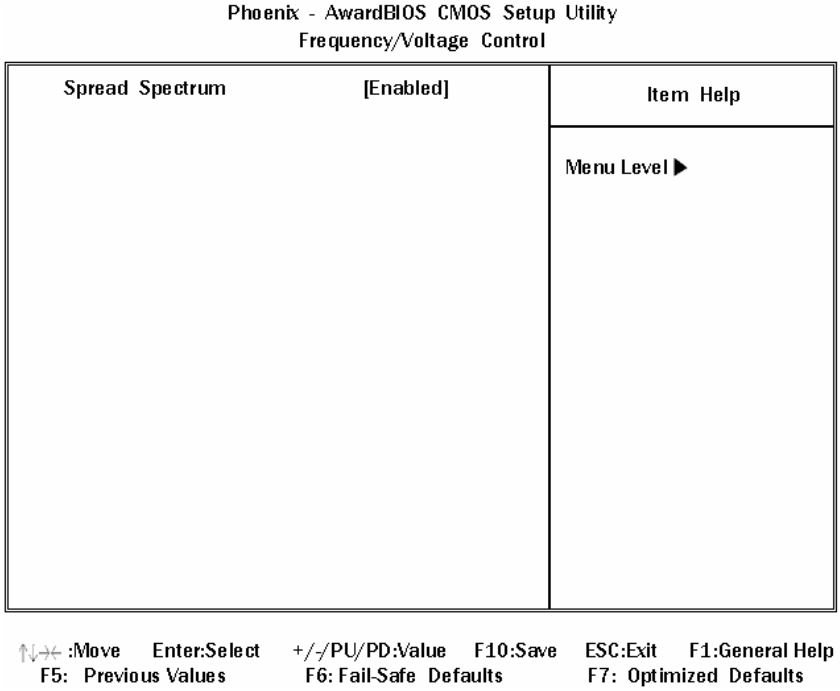


Figure 8.16. Frequency/Voltage Control

Table 8.17. Frequency/Voltage Control Selections

Description	Choices
Spread Spectrum When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.	Spread Spectrum Disabled . . . . . [ ] Enabled . . . . . [▮] ↑↓:Move ENTER:Accept ESC:Abort

Defaults Menu

Selecting “Defaults” from the main menu shows you two options which are described below

Load Fail-Safe Defaults

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

Load Fail-Safe Defaults (Y/N) ? N

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

Load Optimized Defaults

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

Load Optimized Defaults (Y/N) ? N

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

Supervisor /User Password Setting

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

SUPERVISOR PASSWORD: can enter and change the options of the setup menus.

USER PASSWORD: just can only enter but do not have the right to change the options of the setup menus. When you select this unction, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will 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 a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. 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 (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

Exit Selecting

Load Fail-Safe Defaults

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

POST Messages

During the Power On Self-Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.

If a message is displayed, it will be accompanied by:

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

POST Beep

Currently there are two kinds of beep codes in 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. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

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.

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 in-stalled firmly in the slot.

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 controller error or no controller 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.

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.

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, F1 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 con-tains a board.

> Note, When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

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.

Floppy disk(s) fail (80)

Unable to reset floppy subsystem.

Floppy disk(s) fail (40)

Floppy Type mismatch.

Hard disk(s) fail (80)

HDD reset failed.

Hard disk(s) fail (40)

HDD controller diagnostics failed.

Hard disk(s) fail (20)

HDD initialization error.

Hard disk(s) fail (10)

Unable to recalibrate fixed disk.

Hark disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out – Unlock the key

Unlock the key. BIOS detect the keyboard is locked. P17 of keyboard controller is pulled low.

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.

Manufacturing POST loop

System will repeat POST procedure infinitely while the P15 of keyboard controller is pull low. This is also used for M/B burn in test.

BIOS ROM checksum error – System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

BIOS reports the memory tests fail if the onboard memory is tested error.

POST Codes

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	Clear 8042 interface Initialize 8042 self-test
08h	Test special keyboard controller for Winbond 977 series Super I/O chips. Enable keyboard interface.
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional). Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel®) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved

POST (hex)	Description
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0~640K memory address. Initialize the APIC for Pentium class CPU. Program early chipset according to CMOS setup. Example: onboard IDE controller. Measure CPU speed. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multi-language Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved

POST (hex)	Description
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	Calculate total memory by testing the last double word of each 64K page. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	Program MTRR of M1 CPU Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. Initialize the APIC for P6 class CPU. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	Display PnP logo Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	Initialize Init_Onboard_Super_IO switch. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.

POST (hex)	Description
6Ch	Reserved
6Dh	Assign resources to all ISA PnP devices. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”.
6Eh	Reserved
6Fh	Initialize floppy controller Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	Call chipset power management hook. Recover the text fond used by EPA logo (not for full screen logo) If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	USB final Initialization NET PC: Build SYSID structure Switch screen back to text mode Set up ACPI table at top of memory. Invoke ISA adapter ROMs Assign IRQs to PCI devices Initialize APM Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code

POST (hex)	Description
94h	Enable L2 cache Program boot up speed Chipset final initialization. Power management final initialization Clear screen & display summary table Program K6 write allocation Program P6 class write combining
95h	Program daylight saving Update keyboard LED & typematic rate
96h	Build MP table Build & update ESCD Set CMOS century to 20h or 19h Load CMOS time into DOS timer tick Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

SEH-9450-LAS
User's Manual

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