

EBC 360P series
Embedded Controller

User's Guide

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Table of Contents

How to Use This Guide

Chapter 1. Introduction

1.1 Specifications.....	1-3
1.2 What you have from the package.....	1-6

Chapter 2. Jumpers and Connectors

2.1 Jumpers.....	2-1
2.2 Connectors vs. Functions.....	2-3

Chapter 3. Capability Expanding

3.1 System Memory.....	3-1
3.2 Cache Memory.....	3-3
3.3 Mount-Change CPU.....	3-3

Chapter 4. EBC 360P Award BIOS Setup

4.1 Entering Setup.....	4-1
4.2 Control Keys.....	4-2
4.3 Getting Help.....	4-3
4.4 The Main Menu.....	4-4
4.5 Standard CMOS Setup Menu.....	4-7
4.6 BIOS Features Setup Menu.....	4-10
4.7 Chipset Features Setup Menu.....	4-16
4.8 Power Management Setup.....	4-20
4.9 PnP/PCI Configuration.....	4-24
4.10 Integrated Peripherals.....	4-26
4.11 Supervisor/User Password Setting.....	4-28
4.12 IDE HDD Auto Detection.....	4-28
4.13 Hard Disk Low Level Format Utility.....	4-32
4.14 Power-On Boot.....	4-34
4.15 BIOS Reference-POST Codes.....	4-40
4.16 BIOS Default Drive Table.....	4-46

Appendix 1 Watch Dog Timer

Appendix 2 Memory Mapping

How to use this guide

This manual is written to help you use EBC 360P series. The manual describes how to arrange various settings on the CPU board to meet your requirements. It's briefed as follows:

Chapter 1, "Introduction" gives an overview of the product's specifications. It also tells you what are included in the product package.

Chapter 2, "Switches and Connectors" describes the definitions and positions of Switches and Connectors that you may easily configure and set up per your requirement.

Chapter 3, "Capability Expanding" describes how to change or expand the CPU Board by changing the system memory, cache memory, and CPU to get more power out from the CPU board.

Chapter 4, "Award BIOS Setup" describes how to use the advanced PCI/Green BIOS to control almost every feature of the EBC 360P series, including the on board SCSI and watchdog timer.

The Appendix 1 describes how to set up the Watch Dog Timer (WDT) and gives an example to program the WDT.

The Appendix 2 describes the memory mapping for user's reference in add-on card or programming.

Chapter 1

Introduction

Welcome to the EBC 360P Advanced Embedded Controller. The EBC 360P is a brand new generation of advanced technologies. It's based upon Intel's notebook architecture and achieves the highest ever performance within a tiny footprint – 3 1/2" FDD size. With unique MMC2 architecture, the EBC 360P could support Intel Mobile Module (IMM), with Pentium II from 266 MHz to 333 MHz, and Pentium III from 500 MHz to 700+ MHz. It's almost 10 times faster than the Pentium Based Embedded Controller, with even smaller size! It's excellent to the system integrators or mobile/ruggedized equipments vendors who needs the ultra high computing power, yet with very limited space allowed.

The EBC 360P is the only one product in the world, which could support the fastest Pentium III CPU yet consume minimum power with minimum heat generated! The memory support could be 64 MB, 128 MB or 256 MB (Max.) SDRAM. The computing power is kept high and growing even higher when CPU and memory getting faster and larger.

The EBC 360P adopts the brand new C&T 69000 VGA/panel controller from Chip & Technologies with the embedded 2 MB SDRAM. This chip can support TFT panel up to 1280 x 1024,256 color, 75 Hz or support CRT up to 1600 x 1200, 256 color, 60Hz. This is good enough for any embedded display. The Intel 82559 Single Chip Ethernet controller is on board. The EBC 360P now could support either 10 Base T or 100 Base TX complied with the industry standard. (Intel's LAN solution is one of the major standards in the industry!)

All the standard PC features, such as two serial ports, one parallel port, high precision RTC, keyboard, mouse ports, and the USB are all standards on board. The SIO COM2 is also optional for RS422/485. The socket for Disk On Chip, which is the important feature for the Embedded Application, is also reserved. The single chip DOC memory size could be as large as 288 MB large enough for various applications.

The notebook type floppy connector and IDE connector are reserved. The watchdog timer is on board. The Flash ROM BIOS is also standard for easier BIOS update. The IDE supports mode 4 PIO, mode 2 DMA master and ultra DMA/33. The NEXCOM unique PCI/ZV port connector is also reserved for NEXCOM upgrade kits like the Ultra Wide SCSI, Ultra 2 SCSI, Ultra 2 SCSI with 2nd 100 Base TX or the highly admired multimedia kit with PCMCIA type II × 2 as well as the advanced PCI audio with these peripherals. The EBC 360P could be easily configured into a high performance embedded server, a high speed ISP server with its 2nd 100 Base TX, or simply a high performance multimedia-computing device.

Even the IrDA pins are reserved for any possible users' applications. Since the EBC 360P is a general purpose embedded controller, almost all I/O features are through the pins or headers on board for maximum flexibility. Various cables are provided for connecting with the standard I/O connectors, two on board connectors are reserved: the RJ45, and the mini DIN connector for keyboard as well as mouse.

1-1 Specifications

- **System Architecture**
 - Intel Mobile Module (IMM) based embedded controller
 - MMC2 controller dedicated to Pentium II/III CPU
 - All features on board (SSD, Ethernet, VGA, LCD Panel)
 - Micro board with standard 3.5" drive form factor
 - World's smallest Pentium III embedded controller
- **CPU Support**
 - Intel Mobile Module (IMM) MMC2 (400 pin) CPU support
 - Intel Pentium II/III 233MHz to 700 MHz
 - 256/512KB L2 Cache on module
 - Intel 440BX AGP set on module
- **Main Memory**
 - SDRAM support
 - 8MB to 256MB (Max.)
 - 144pin SO-DIMM socket ×1
- **BIOS**
 - Award System BIOS
 - Plug & Play support
 - Advanced Power Management support
 - 2M bits flash ROM

- **On Board VGA**

- C&T 69000 VGA controller
- TFT LCD/DSTN LCD/CRT control
- 2MB SDRAM on die
- Maximum Res. Color & Refresh Rate

Resolution	Colors	Refresh Rate (Hz)
1280×1024	256	60
1024×768	16bits (High color)	85, 75, 60
800×600	24bits (True color)	85, 75, 60

- Drivers support : Windows 95/98, Windows NT4.0
- 15 pin CRT connector ×1, Universal LCD Panel connector ×1

- **On Board LAN**

- Intel 82559 Single Ethernet controller
- 10 Base/100 Base TX support, full duplex
- Complies with PCI V2.1, IEEE802.3, IEEE 802.3U
- Drivers support: DOS/Windows, Netware, Windows 95/98, Windows NT4.0
- RJ45 CRT connector ×1

- **On Board I/O**

- Winbond 83977 Super I/O on board
- SIO ×2(RS232/422/485 ×1, jumper selectable), 10 pin connector ×2
- PIO ×1, Bi-directional, EPP/ECP support, 26 pin connector ×1
- Floppy disk controller : 3.5" 720K/1.2MB/1.44MB/2.88MB support, 26 pin connector ×1
- On chip enhanced IDE ×1 : PIO up to mode 4, DMA master up to mode 2, 44 pin connector ×1
- Keyboard, mouse controller : 6 pin mini DIN connector ×1 (both KBD & mouse, PS/2 mode)
- USB port ×1
- IrDA pin reserved

- On board buzzer × 1
- On board power connector : 4 pin additional power connector × 2
- 2 pin header for reset SW × 1
- 5 pin for keylock × 1
- **On Board RTC**
 - High precision real time clock/calendar with battery back up
- **On Board Solid State Disk Socket**
 - On board reserved socket for DOC of M-systems : 2MB~144MB, etc
- **Watchdog Timer**
 - 1,2,4...64 seconds time-out intervals
- **Integrated Connector for**
 - LAN ×1, USB ×1, KBD ×1, Mouse ×1, 20 pin connector with housing
- **PCI Expansion**
 - PCI/ZV port expansion connector reserved
- **Dimensions**
 - 145mm(L) × 102mm(W)
- **Power Requirements**
 - +5V : 6A (Max.)
 - +12V : 4A (Max.)
- **Environments**
 - Operating temperatures : 0°C to 60°C
 - Storage temperatures : -20°C to 80°C
 - Relative humidity : 10% to 90% (Non-condensing)
- **Certification**
 - CE approval
 - FCC Class A

1-2 What you'll have from the package

In addition to this manual, the EBC 356 package includes the following items:

- The EBC 360P embedded controller × 1
- SIO cable × 2
- Printer cable × 1
- IDE cable (for 40/44 pin) × 1
- FDC cable × 1
- PS2 keyboard/mouse adapter cable × 1
- VGA adapter cable × 1
- Power adapter cable x 1
- VGA driver diskette x1
- LAN driver diskette × 1

If any of these items is missing or damaged, please contact your vendor for what you need.

Chapter 2

Jumpers and Connectors

This chapter gives the definitions and shows where to locate the positions of switches and connectors.

2-1 Jumpers

Jumpers on the CPU board are used to select options for different functions used.

The Jumper is to accommodate the variations of the following table.
(see figure 2-1, 2-2 for Jumper positions)

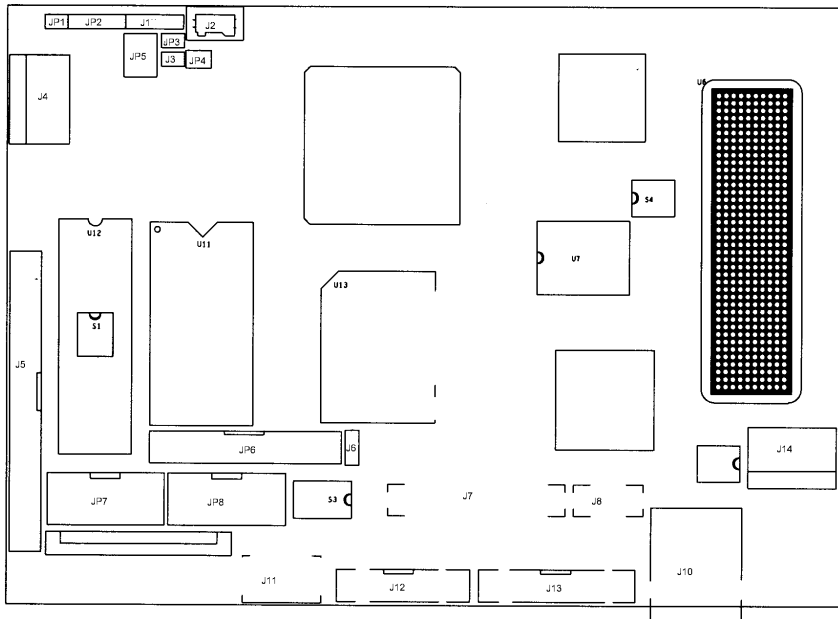


Figure 2-1 connector Positions (Front)

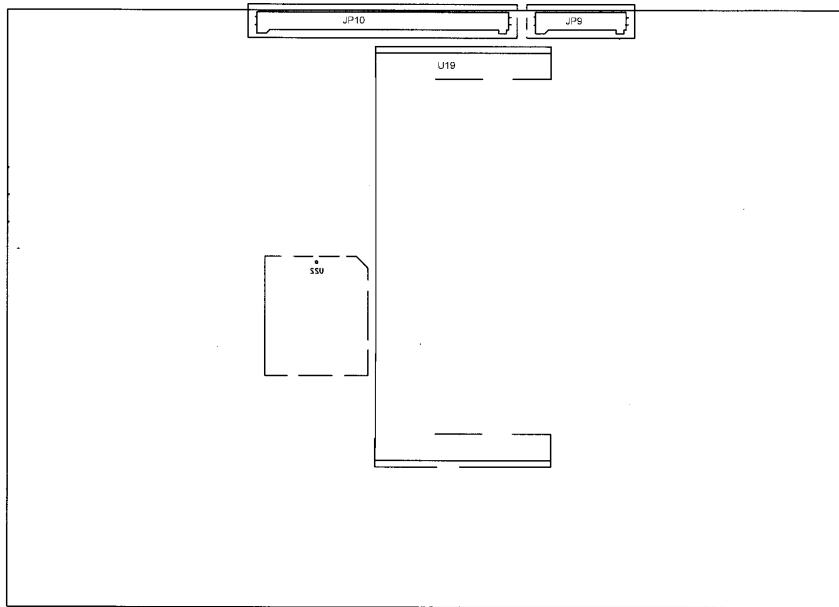


Figure 2-2 Connector Positions (Back)

Jumper Setting

M-SYSTEM DISK ON CHIP

	SW1.1	SW1.2	SW1.3	SW1.4
C0000	On	---	---	---
C8000	---	On	---	---
D0000	---	---	On	---
*D8000	---	---	---	On

COM2 RS232/RS422/RS485

	(SW3.1 SW3.2)	SW3.3	SW3.4	SW3.5	SW3.6
*RS232	On, On Or Off, Off	Off	Off	On	On
RS422	Off, On	On	On	Off	Off
RS485	On, Off	On	On	Off	Off

Panel Type

SW2.4	SW2.3	SW2.2	SW2.1	
On	On	On	On	1024x768 Dual Scan STN Color Panel
On	On	On	Off	1280x1024 TFT Color Panel
On	On	Off	On	1024x768 Dual Scan STN Color Panel:
On	On	Off	Off	1024x768 Dual Scan STN Color Panel
On	Off	On	On	640x480 Sharp TFT Color Panel
*On	Off	On	Off	640x480 18Bit TFT Color Panel
On	Off	Off	On	1024x760 TFT Color Panel
On	Off	Off	Off	800x600 TFT Color Panel
Off	On	On	On	800x600 TFT Color Panel
Off	On	On	Off	800x600 TFT Color Panel
Off	On	Off	On	800x600 Dual Scan STN Color Panel
Off	On	Off	Off	800x600 Dual Scan STN Color Panel
Off	Off	On	On	1024x768 TFT Color Panel
Off	Off	On	Off	1280x1024 Dual Scan STN Color Panel
Off	Off	Off	Off	1024x600 Dual Scan STN Color Panel
Off	Off	Off	Off	1024x600 TFT Color Panel

CPU Frequency Select

	SW4.1	SW4.2	SW4.3	SW4.4
*100MHZ	Off	Off	On	Off
66MHZ	Off	Off	Off	On

J6

1-2	For VDD 5V Panel
2-3	For VDD 3.3V Panel

Connector Position

Connector	Function	Remark
J1	IR Connector	
J2	GP I/O	
J3	HDD LED	
J4, J14	Power Connector	
J5	HDD Connector	
J7	Panel Connector for 24/18 bit	
J8	Panel Connector for 36 bit	
J9	FDD Connector	
J10	LAN Connector	
J11	KB/MS Connector	
J12	CRT Connector	
J13	LAN, LAN LED, USB0, KB/MS Connector	
JP1	Reset Switch	
JP2	Key Lock	
JP3	RTC CLS	
JP6	P I/O	
JP7	COM2	
JP8	COM1	
JP9	ZV PORT	In the back
JP10	PCI BUS Connector	In the back
U12	M-SYSTEM DOC	
U19	SO DIMM	In the back

Pin definitions of connectors**J1: IR CONNECTOR**

PIN No.	Description
1	5V
2	IRRXH
3	IRRX
4	GND
5	IRTX

J2: GPI/O CONNECTOR

PIN No.	Description	PIN No.	Description
1	GPO8	2	+5V
3	GPO28	4	GPI1
5	GPO29	6	GPI13
7	GPO30	8	GPI14
9	GND	10	GPI19

J3: HDD LED

PIN No.	Description
1	+ 330 ohm pull high5V
2	- HDD Active #

J4, J14: POWER CONNECTOR

PIN No.	Description
1	GND (Black)
2	GND (Black)
3	5V (Red)
4	5V (Red)

J5: NOTEBOOK TYPE IDE PRIMARY CONNECTOR

PIN No.	Description	PIN No.	Description
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	REQ#	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	READY	28	Pull down
29	DACK#	30	GND
31	IRQ14	32	NC
33	PDA1	34	NC
35	PDA0	36	PDA2
37	PCS1#	38	PCS3#
39	Active#	40	GND
41	5V	42	5V
43	GND	44	NC

J7: FLAT PANEL CONNECTOR FOR 24/18 BIT

PIN No.	Description	PIN No.	Description
1	ENABLK	2	BKL 5V
3	LP	4	DE
5	SHFCLK	6	FLM
7	P0	8	VDD
9	P2	10	P1
11	P4	12	P3
13	P6	14	P5
15	P8	16	P7
17	P10	18	P9
19	P12	20	VDD
21	P14	22	P11
23	GND	24	P13
25	P16	26	P15
27	P18	28	P17
29	P20	30	ENAVEE
31	P22	32	P19
33	GND	34	P21
35	P24	36	P23
37	P26	38	P25
39	PCLK	40	GND

J8: FLAT PANEL CONNECTOR FOR 36BIT

PIN No.	Description	PIN No.	Description
1	P28	2	P27
3	P30	4	P29
5	P32	6	P31
7	P34	8	P33
9	GND	10	P35

J9: FDD CONNECTOR

PIN No.	Description	PIN No.	Description
1	5V	2	Index #
3	5V	4	Driver Select A #
5	5V	6	Dskchg #
7	NC	8	NC

9	NC	10	Motor enable A#
11	NC	12	Direction #
13	RWC#	14	Step #
15	GND	16	Write Data #
17	GND	18	Write Gate #
19	GND	20	Track 0 #
21	GND	22	Write Protect #
23	GND	24	Read Data #
25	GND	26	Head Side Select #

J10: LAN CONNECTOR

PIN No.	Description
C1	TX+
C2	TX-
C3	RX+
C4	75 ohm GND
C5	75 ohm GND
C6	RX-
C7	75 ohm GND
C8	75 ohm GND

J11: KEY BOARD/MOUSE CONNECTOR

PIN No.	Description
1	KB/DATA
2	MS/DATA
3	GND
4	5V
5	KB/CLK
6	MS/CLK

J12: CRT MONITOR CONNECTOR

PIN No.	Description	PIN No.	Description
1	READ	2	GREEN
3	BULE	4	NC
5	GND	6	GND
7	GND	8	GND
9	5V	10	GND
11	NC	12	DDC DA
13	HSYNC	14	VSYNC
15	DDC CLK	16	NC

J13: LAN, LAN LED, USB0, KB/MS CONNECTOR

PIN No.	Description	PIN No.	Description
1	TERMPANE	2	BTX+
3	BRX+	4	BTX-
5	BRX-	6	LILED
7	ACTLED	8	KB_VCC
9	KBGND	10	SPEEDLED
11	USBGND	12	USBVCC
13	DOP	14	DON
15	KBGND	16	KB_VCC
17	LMCLK	18	LMDAT
19	LKCLK	20	LKDAT

J14: POWER CONNECTOR

PIN No.	Description
---------	-------------

1	GND (Black)
2	GND (Black)
3	12V (Yellow)
4	12V (Yellow)

JP2: KEYLOCK CONNECTOR

PIN No.	Description
1	+5V
2	NC-
3	GND
4	KEYLOCK
5	GND

JP3: RTC CLS

1-2	Short	Clear CMOS data
1-2	Open	Normal

JP6: PRINT PORT CONNECTOR

PIN No.	Description	PIN No.	Description
1	Strobe#	14	Auto From Feed
2	D0	15	Error#
3	D1	16	Initialize#
4	D2	17	Printer select IN#
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	Acknowledge#	23	GND
11	Busy	24	GND
12	Paper Empty	25	GND
13	Printer select	26	

JP7: COM2 RS232/RS422 OR 485

DCD/TXN	RD/TXP
TX/RXP	DTR/RXN
GND	DSR
RTS	CTS
RI	5V

JP7: COM2 RS422

TXN	TXP
RXP	RXN
GND	Not used
Not used	Not used
Not used	5V

JP7: COM2 RS485

TXN/RXN	TXP/RXP
Not used	Not used
GND	Not used
Not used	Not used
Not used	5V

JP8: COM1 RS232

DCD	BRD
TX	DTR
GND	DSR
RTS	CTS
RI	NC

JP9: ZV PORT CONNECTOR

PIN No.	Description	PIN No.	Description
1	VP0	2	VP1
3	VP2	4	VP3
5	VP4	6	VP5
7	VP6	8	VP7
9	VP8	10	VP9
11	VP10	12	VP11
13	VP12	14	VP13
15	VP14	16	VP15
17	ZVVREF	18	ZVHREF
19	ZVCLK	20	PCLK
21	+5V	22	GND
23	+5V	24	GND

JP10: PCI BUS CONNECTOR

PIN No.	Description	PIN No.	Description
1	V5_0	2	AD0
3	AD1	4	AD2
5	AD3	6	AD4
7	AD5	8	AD6
9	AD7	10	GND
11	V5_0	12	AD8
13	AD9	14	AD10
15	AD11	16	AD12
17	AD13	18	AD14
19	AD15	20	GND
21	V5_0	22	AD16
23	AD17	24	AD18
25	AD19	26	AD20
27	AD21	28	AD22
29	AD23	30	GND
31	V5_0	32	AD24
33	AD25	34	AD26
35	AD27	36	AD28
37	AD29	38	AD30
39	AD31	40	GND
41	V5_0	42	C/BE0
43	C/BE1	44	C/BE2
45	C/BE3	46	PAR
47	FRAME	48	TRDY
49	IRDY	50	GND
51	V5_0	52	STOP
53	DEVSEL	54	X
55	SERR	56	PREQ0
57	PGNT0	58	PREQ2
59	PGNT2	60	SERIRQ
61	PCICLK0	62	PCICLK1
63	PCIRST	64	PLOCK
65	PIRQ0	66	PIRQ1
67	PIRQ2	68	PIRQ3

Chapter 3

Capability Expanding

This chapter explains how you can expand capability of your CPU board in such aspects as system memory, cache memory, and CPU.

3-1 System Memory

Your system memory is provided by SO-DIMM (Dual In-line Memory Modules) on the back of the CPU board. There is only one SO-DIMM on board because of limited space. The table below shows possible SO-DIMM configurations for the memory bank and the figure helps you correctly install SO-DIMM modules. Both EDO and SDRAM are supported by EBC 360P.

SO-DIMM1	Total Memory
16MB	16MB
32MB	32MB
64MB	64MB
128MB	128MB
256MB	256MB

Installing SO-DIMM

To install SO-DIMM, you have to press SO-DIMM module gently but firmly into the SO-DIMM socket, with roughly 30-degree angle to the socket. Please note that the dented portion should coincide with the protruding spot of the socket. When the gold finger of the memory module is completely slid into the socket, push the memory module onto the clip of the socket. With two clicks, the memory module is firmly held by SO-DIMM socket. (See figure 3-1 & 3-2)

Figure 3-1

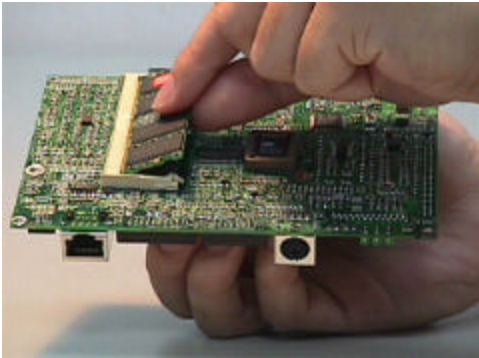
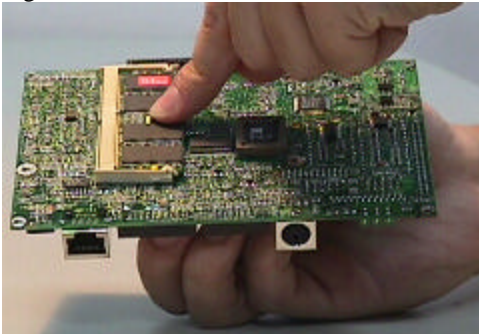


Figure 3-2



3-2 Cache Memory

Since the second level cache has been embedded onto Pentium II CPU module. You do not have to take care of either SRAM chips or SRAM modules. The cache size on the Pentium module is 512 KB standard. However, it's 256KB only (on die version) or standard 512 KB on the Pentium II module.

3-3 Mount-Change the CPU

The connector for the CPU module is called MMC2 (Mobile Module Connector 2). This connector is used to interface with Pentium IMM (Intel Mobile Module) or Pentium II IMM or Pentium III IMM.

The CPU modules should be fixed with three copper stand offs on the three mounting holes at the corners of the CPU modules. These stand offs should be on the bottom side of the CPU module.

To mount the CPU module, first move the IMM within the area of the mounting holes on the EBC 360P main board. Then carefully put the male portion of the MMC2 on the CPU module right on the female portion of the MMC2 on the main board. Press the CPU module evenly but firmly to the main board until the module is completely fitted into the MMC2 (See Figure 3-3). There are three mounting holes on the IMM modules. Just fix them with the stand offs and screws.

We also offer the optional heat sink with cooling FAN. If the heat sink kit is requested, it should be fixed to the CPU module first, then you could install the CPU module on to the EBC 360P.



Figure 3-3

Chapter 4

AWARD BIOS Setup

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

Entering Setup

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

TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC> OR KEY

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, <CTRL-ALT-ESC> OR TO ENTER SETUP

Control Keys

Up arrow ↑	Move to previous item
Down arrow ↓	Move to next item
Left arrow →	Move to the item in the left hand
Right arrow ←	Move to the item in the right hand
Esc 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
PgUp / "+" key	Increase the numeric value or make changes
PgDn / "-" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

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

The Main Menu

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select the items and press <Enter> to accept or enter the sub-menu.

ROM PCI/ISA BIOS (E360-000) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	INTEGRATED PERIPHERALS SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION SAVE & EXIT SETUP EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item (Shift)F2 : Change Color

Standard CMOS Setup

This setup page includes all the items in a standard compatible BIOS. See Page 4-7 to Page 4-9 for details.

BIOS Features Setup

This setup page includes all the items of Award special enhanced features. See Page 4-10 to Page 4-15 for details.

Chipset Features Setup

This setup page includes all the items of chipset special features. See Page 4-16 to 4-19 for details.

Power Management Setup

This category determines how much power consumption for system after selecting below items. Default value is Disable. See Page 4-20 to Page 4-23 for details.

PNP/PCI Configuration

This category specifies the assignment of all the IRQ's and DMA's. See Page 4-24 to Page 4-25 for details.

Load BIOS Defaults

BIOS defaults indicates the most appropriate value of the system parameter which the system would be in minimum performance. The OEM manufacturer may change the defaults through MODBIN before the binary image burn into the ROM.

Load Setup Defaults

Chipset defaults indicates the values required by the system for the maximum performance. The OEM manufacturer may change to defaults through MODBIN before the binary image burn into the ROM.

Integrated Peripherals

This category allows you to set up all the on board I/O controllers like IDE, SCSI, FDC, etc.,. See Page 4-26 to Page 4-27.

Supervisor/User Password

Change, set, or disable password of supervisor or user. It allows you to limit access to the system and Setup, or just to Setup. See Page 4-28 for details.

IDE HDD Auto Detection

Automatically configure hard disk parameters. See Page 4-29 to Page 4-31 for details.

HDD Low Level Format

Hard disk low level format utility.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

Standard CMOS Setup Menu

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

```

ROM PCI/ISA BIOS (E360-000)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Thu, Apr 20 2000
Time (hh:mm:ss) : 10 : 11 : 22

          CYLS.  HEADS  PRECOMP  LANDZONE  SECTORS  MODE
Drive C :   0 (  0Mb)   0    0    0    0    0    AUTO
Drive D :   0 (  0Mb)   0    0    0    0    0    AUTO

Drive A : 1.44M, 3.5 in.
Drive B : None
Floppy 3 Mode Support : Disabled

LCD&CRT : Auto

Halt On : All,But Keyboard

ESC : Quit          ↑ ↓ → ← : Select Item      PU/PD/+/- : Modify
F1  : Help          (Shift)F2 : Change Color

```

Date

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

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

Time

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

Primary Master/Primary Slave/Secondary Master/Secondary Slave

The categories identify the types of 2 channels that have been installed in the computer. There are 45 predefined types and 4 user definable types for enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type User is user-definable.

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

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

If the controller of HDD interface is ESDI, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None".

If the controller of HDD interface is CD-ROM, the selection shall be "None".

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

If a hard disk has not been installed select NONE and press <Enter>.

Drive A Type/Drive B Type

The category identifies the type of floppy disk drive A or drive B that has been installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Floppy 3 Mode Support:

The category determines whether the floppy 3 mode support is enabled or not.

LCD&CRT:

On board VGA select display type.

Type	Function
CRT	Boot from CRT only
LCD	Boot on LCD only
BOTH	Boot both LCD and CRT
AUTO	Boot on CRT or LCD

Error Halt On

The category determines whether the computer will stop or not if an error is detected during power up.

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

BIOS Features Setup Menu

ROM PCI/ISA BIOS (E552A-00) BIOS FEATURES SETUP AWARD SOFTWARE, INC.			
Virus Warning	: Enabled	Video BIOS Shadow	: Disabled
CPU Internal Cache	: Disabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Disabled	CC000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D0000-D3FFF Shadow	: Disabled
Boot From LAN First	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI	D8000-DBFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	DC000-DFFFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	Cyrix 6x86/MII CPUID	: Enabled
Boot Up NumLock Status	: Off		
Boot Up System Speed	: Low		
Gate A20 Option	: Normal		
Typeomatic Rate Setting	: Disabled		
Typeomatic Rate (Chars/Sec)	: 6		
Typeomatic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/UGA Palette Snoop	: Disabled	ESC : Quit	↑↓←→ : Select Item
OS Select For DRAM > 64MB	: Non-OS2	F1 : Help	PU/PD/+/- : Modify
HDD S.M.A.R.T. capability	: Disabled	F5 : Old Values (Shift)F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Virus Warning

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

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

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled (Default)	No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Note: This function is available only for DOS and other OSes that do not trap INT13.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enable. If your CPU without Internal Cache then this item "CPU Internal Cache" will not be show.

Enabled (Default)	Enable cache
Disabled	Disable cache

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled (Default)	Normal POST

Boot From LAN First

This category specifies whether System Boot through the LAN Boot ROM. If not, just disable it.

Enabled	Boot from LAN
Disabled (Default)	Not Boot from LAN

Boot Sequence

This category determines which drive computer searches first for the disk operating system (i.e., DOS). Default value is A,C, SCSI.

A, C, SCSI	Default
C, A, SCSI	
C, CDROM, A	
CDROM, C, A	
D, A, SCSI	
E, A, SCSI	
F, A, SCSI	
SCSI, A, C	
SCSI, C, A	

C only	
LS/ZIP, C	

Swap Floppy Drive

This item allows you to determine whether enable the swap floppy drive or not. The choice: Enabled/Disabled (Default).

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

Enabled (Default)	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

Boot Up NumLock Status

The default value is On.

On (Default)	Keypad is number keys
Off	Keypad is arrow keys

Boot Up System Speed

It selects the default system speed - the speed that the system will run at immediately after power up.

High (Default)	Set the speed to high
Low	Set the speed to low

Gate A20 Option

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

Typematic Rate Setting

This category determines the typematic rate.

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

Typematic Rate (Chars/Sec)

6 (Default)	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

Typematic Delay (Msec)

When holding a key, the time between the first and second character displayed.

250 (Default)	250 msec
500	500 msec
750	750 msec
1000	1000 msec

Security Option

This category allows you to limit access to the system and Setup, or just to 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 (Default)	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.

PCI/VGA Palette Snoop

Enable PCI controller support PCI/VGA palette snoop or not, if enabled, VGA cycle will transfer to ISA bus. If disabled (Default), VGA cycle only transfer to PCI bus.

OS Select for DRAM 64MB

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

Video BIOS Shadow

It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed.

Enabled (Default)	Video shadow is enabled
Disabled	Video shadow is disabled

C8000 - CFFFF Shadow/D0000 - DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit and the size depends on chipset.

Enabled	Optional shadow is enabled
Disabled (Default)	Optional shadow is disabled

Note:

1. For C8000-DFFFF option-ROM on PCI BIOS, BIOS will automatically enable the shadow RAM. User does not have to select the item.
2. IDE second channel control: Enable: enable secondary IDE port and BIOS will assign IRQ15 for this port.
Disable: disable secondary IDE port and IRQ15 is available for other device. The item is optional only for PCI BIOS.
3. Some of the sound cards have an onboard CD-ROM controller which uses IDE Secondary Port. In order to avoid PCI IDE conflict, the IDE secondary channel control has to select "disable" then CD-ROM can work.

Chipset Features Setup Menu

Since the features in this section are related to the chipset in the CPU board and all are optimized, you are not recommended to change the default settings in the setup table, unless you know very detailed about the chipset features.

ROM PCI/ISA BIOS (E360-000)	
BIOS FEATURES SETUP	
AWARD SOFTWARE, INC.	
Virus Warning	: Disabled
CPU Internal Cache	: Enabled
External Cache	: Enabled
CPU L2 Cache ECC Checking	: Enabled
Processor Number Feature	: Enabled
Quick Power On Self Test	: Disabled
Boot Sequence	: A,C,SCSI
Swap Floppy Drive	: Disabled
Boot Up NumLock Status	: Off
Gate A20 Option	: Fast
Typeomatic Rate Setting	: Enabled
Typeomatic Rate (Chars/Sec)	: 30
Typeomatic Delay (Msec)	: 250
Security Option	: Setup
PCI/UGA Palette Snoop	: Disabled
OS Select For DRAM > 64MB	: Non-OS2
Video BIOS Shadow	: Enabled
C8000-CBFFF Shadow	: Disabled
CC000-CFFFF Shadow	: Disabled
D0000-D3FFF Shadow	: Disabled
D4000-D7FFF Shadow	: Disabled
D8000-DBFFF Shadow	: Disabled
DC000-DFFFF Shadow	: Disabled
ESC : Quit ↑↓↓ : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

Auto Configuration

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

The Choice: Enabled (Default), Disabled.

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

DRAM Timing

The DRAM timing is controlled by the DRAM Timing Registers. The timings programmed into this register are dependent on the system design. Slower rates may be required in certain system designs to support loose layouts or slower memory.

60ns	DRAM Timing Type.
70ns (Default)	DRAM Timing Type.

DRAM Read Burst (EDO/FP)

This sets the timing for burst mode reads from two different DRAM(EDO/FPM). Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory.

x222/x333	Read DRAM (EDO/FPM) timings are 2-2-2/3-3-3
x333/x444 (Default)	Read DRAM (EDO/FPM) timings are 3-3-3/4-4-4
x444/x444	Read DRAM (EDO/FPM) timings are 4-4-4/4-4-4

DRAM Write Burst Timing

This sets the timing for burst mode writes from DRAM. Burst read and write requests are generated by the CPU in four separate parts. The first part provides the location within the DRAM where the read or write is to take place while the remaining three parts provide the actual data. The lower the timing numbers, the faster the system will address memory.

x222	Write DRAM timings are 2-2-2-2
x333 (Default)	Write DRAM timings are 3-3-3-3
x444	Write DRAM timings are 4-4-4-4

Fast EDO Lead Off

The item allows you to select the Fast EDO Lead Off or not to enhance the performance. The Choice: Enabled, Disabled (Default).

Refresh RAS# Assertion

This item allows you to select the type of DRAM refresh clock delay.

4Clks	The timing type.
5Clks (Default)	The timing type.

Fast RAS To CAS Delay

This field lets you insert a timing delay to get a faster performance between the Row Address Strobe (RAS) to Column Address Strobe (CAS) strobe signals, used when DRAM is written to, read from, or refreshed.

2	The timing delay
---	------------------

3 (Default)	The timing delay.
-------------	-------------------

DRAM Enhanced Paging

This item allows you to determine whether to keep the page open until a page/row miss or use additional information to keep the DRAM page open when host may be “right back”.

The Choice: Enabled (Default), Disabled.

Fast MA To RAS# Delay

This item allows you to select the DRAM Row Miss timing. Note: the timing adjustments are independent of DLT timing adjustment.

1	One clocks. (MA setup to RAS# assertion)
2	Two clocks (Default).

SDRAM (CAS Lat/RAS-to-CAS)

This item allows you to select the CAS# latency for all SDRAM cycles and RAS# to CAS# delay.

2/2	The timing type.
3/3 (Default)	The timing type.

SDRAM Speculative Read

This item is capable of allowing a DRAM read request to be generated slightly before the address has been fully decoded. This can reduce all read latencies. More simply, the CPU will issue a read request and included with this request is the place (address) in memory where the desired data is to be found. This request is received by the DRAM controller. When it is enabled, the controller will issue the read command slightly before it has finished determining the address.

The Choice: Enabled, Disabled (Default).

System BIOS Cacheable

Select Enabled allows caching of the system BIOS ROM at F000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Enabled	BIOS access cached
Disabled (Default)	BIOS access not cached

Video BIOS Cacheable

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

Enabled	Video BIOS access cached
Disabled (Default)	Video BIOS access not cached

8 Bit I/O Recovery Time

The recovery time is the length of time, measured in CPU clocks, which the system will delay after the completion of an input/output request. This delay takes place because the CPU is operating so much faster than the input/output bus that the CPU must be delayed to allow for the completion of the I/O. This item allows you to determine the recovery time allowed for 8 bit I/O. Choices are from NA, 1 (Default) to 8 CPU clocks.

16 Bit I/O Recovery Time

This item allows you to determine the recovery time allowed for 16 bit I/O. Choices are NA, 1,2 (Default), 3, 4 CPU clocks.

Memory Hole At 15M-16M.

In order to improve performance, certain space in memory can be reserved for ISA cards.. This memory must be mapped into the memory space below 16 MB.

Enabled	Memory hole supported.
Disabled (Default)	Memory hole not supported

Power Management Setup

The Power management setup will appear on your screen like this:

```
ROM PCI/ISA BIOS (E360-000)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.
```

<pre>ACPI function : Disabled Power Management : User Define PM Control by APM : Yes Video Off After : Standby MODEM Use IRQ : 3 Doze Mode : Disable Standby Mode : Disable Suspend Mode : Disable HDD Power Down : Disable Suspend Mode Option : PowerOn Suspend Throttle Duty Cycle : 62.5% PCI/VGA Act-Monitor : Disabled IRQ 8 Break Suspend : Disabled</pre>	<pre>** Reload Global Timer Events ** IRQ[3-7,9-15],NMI : Disabled Primary IDE 0 : Disabled Primary IDE 1 : Disabled Secondary IDE 0 : Disabled Secondary IDE 1 : Disabled Floppy Disk : Disabled Serial Port : Enabled Parallel Port : Disabled</pre>
<pre>ESC : Quit ↑↓↓+ : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults</pre>	

Power Management

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

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

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

Disabled	No power management. Disable all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving (Default)	Maximum power management -- ONLY AVAILABLE FOR SL CPU'S . Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.

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.
-------------	---

PM Control by APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock.

If the Max. Power Saving is not enabled, this will be preset to *No*.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank (Default)	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off After

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

N/A	Monitor will remain on during power saving modes.
Suspend	Monitor blanked when the systems enters the Suspend mode.
Standby	Monitor blanked when the system enters Standby mode.
Doze	Monitor blanked when the system enters any power saving mode.

MODEM Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

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

PM Timers

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

See above for available selections.

Doze Mode

When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

Standby Mode

When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

Standby Mode

1. Disable	System will never enter STANDBY mode
2. 1 Min 2 Min 4 Min 6 Min 8 Min 10 Min 20 Min 30 Min 40 Min 1 Hr	Defines the continuous idle time before the system entering STANDBY mode. If any item defined in (J) is enabled & active, STANDBY timer will be reloaded

Suspend Mode

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

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.

Throttle Duty Cycle

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.
The Choice: 12.5%, 25.0%, 37.5%, 50.0%, 62.5% (Default), 75.0%

PCI/VGA Active Monitor

When Enabled, any video activity restarts the global timer for Standby mode.
The Choice: Enabled (Default), Disabled.

PowerOn by Ring

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state..
The Choice: Enabled (Default), Disabled.

IRQ 8 Break Suspend

You can Enable or Disable monitoring of IRQ8 so it does not awaken the system from Suspend mode. The Choice: Enabled, Disabled (Default).

Reload Global Timer Events

When Enabled, an event occurring on each device listed below restarts the global time for Standby mode.

IRQ[3 -7, 9-15], NMI	Enabled (Default), Disabled
Primary IDE 0	Enabled, Disabled (Default)
Primary IDE 1	Enabled, Disabled (Default)
Secondary IDE 0	Enabled, Disabled (Default)
Secondary IDE 1	Enabled, Disabled (Default)
Floppy Disk	Enabled, Disabled (Default)
Serial Port	Enabled (Default), Disabled
Parallel Port	Enabled, Disabled (Default)

PnP/PCI Configuration

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

ROM PCI/ISA BIOS (E360-000) PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.

<pre> PNP OS Installed : Yes Resources Controlled By : Manual Reset Configuration Data : Disabled IRQ-3 assigned to : PCI/ISA PnP IRQ-4 assigned to : PCI/ISA PnP IRQ-5 assigned to : PCI/ISA PnP IRQ-7 assigned to : PCI/ISA PnP IRQ-9 assigned to : PCI/ISA PnP IRQ-10 assigned to : PCI/ISA PnP IRQ-11 assigned to : PCI/ISA PnP IRQ-12 assigned to : PCI/ISA PnP IRQ-14 assigned to : PCI/ISA PnP IRQ-15 assigned to : PCI/ISA PnP DMA-0 assigned to : PCI/ISA PnP DMA-1 assigned to : PCI/ISA PnP DMA-3 assigned to : PCI/ISA PnP DMA-5 assigned to : PCI/ISA PnP DMA-6 assigned to : PCI/ISA PnP DMA-7 assigned to : PCI/ISA PnP </pre>	<pre> Slot 1 Use IRQ No. : Auto Slot 2 Use IRQ No. : Auto Slot 3 Use IRQ No. : Auto Slot 4 Use IRQ No. : Auto Used MEM base addr : N/A Assign IRQ For USB : Enabled </pre> <hr/> <pre> ESC : Quit ↑↓↓ : Select Item F1 : Help PU/PD/+- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults </pre>
---	---

PNP OS Installed

Select Yes if the system operating environment is Plug-and-Play aware (e.g. Windows 95). The Choice: Yes and No (Default).

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.

The choice: *Auto* (Default) and Manual.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious

conflict that the operating system cannot boot. The choice: *Enabled* and *Disabled* (Default).

Assing IRQ For USB

Assing IRQ for USB : Enabled (Default)

Not assign IRQ for USB : Disabled

Integrated Peripherals

ROM PCI/ISA BIOS (E360-000)
 INTEGRATED PERIPHERALS
 AWARD SOFTWARE, INC.

<pre> IDE HDD Block Mode : Enabled IDE Primary Master PIO : Auto IDE Primary Slave PIO : Auto IDE Primary Master UDMA : Auto IDE Primary Slave UDMA : Auto On-Chip Primary PCI IDE : Enabled Onboard PCI SCSI Chip : Enabled USB Keyboard Support : Disabled Init Display First : PCI Slot KBC input clock : 8 MHz Onboard FDC Controller : Disabled Onboard Serial Port 1 : 2F8/IRQ3 Onboard Serial Port 2 : UART Mode Select : UART2 Duplex Mode : Full RxD , TxD Active : Hi,Lo IR Transmittion delay : Enabled Onboard Parallel Port : Parallel Port Mode : </pre>	<pre> ECP Mode Use DMA : 1 EPP Mode Select : EPP1.7 ESC : Quit ↑↓↓+ : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults </pre>
--	---

IDE HDD Block Mode

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled	IDE controller uses block mode.
Disabled (Default)	IDE controller uses standard mode.

IDE Primary/Secondary 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/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support. The Choice: Auto (Default), Disabled

On-Chip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled (Default) to activate each channel separately.

Onboard PCI SCSI Chip

This item allows you to determine whether onboard PCI SCSI chip is enabled (Default) or not.

USB Keyboard Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. The Choice: Enabled, Disabled (Default).

Onboard Serial Port 1/Port 2/Port 3/Port 4

This item allows you to determine access onboard serial port 1/port 2 controller with which I/O address. The Choice: 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto (Default).

UART Mode

This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The Choice: Normal (Default), ASK-IR, IrDA.

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. Choices: Enabled (Default), Disabled.

Onboard Parallel Port

Select a logical LPT port name and matching address for the physical parallel (printer) port. The choice: 378H/IRQ7 (Default), 278H/IRQ5, 3BCH/IRQ7, Disabled.

password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

IDE HDD Auto Detection

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

1. Setup Changes

<I> Auto-detection

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

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

Users can select a mode which is appropriate for them.

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

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

<II> Standard CMOS Setup

HARD DISK	TYPE	Cyls	Head s	Precomp	Landzone	Sector	Mode
Primary Master:	User (516MB)	1120	16	65535	1119	59	Normal
Primary Slave:	None (203MB)	684	16	65535	685	38	-----
Secondary	None	0	0	0	0	0	0

LARGE mode

Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award BIOS provides another alternative to support these kinds of HDD!

Example of LARGE mode:

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

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

Maximum HDD size:

no. Cylinder	(1024)
x no. Head	(32)
x no. Sector	(63)
x bytes per sector	(512)
	<hr/>
	1 Gigabytes

(3) Remarks

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

Hard Disk Low Level Format Utility

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

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

Hard Disk Low Level Format Utility SELECT DRIVE BAD TRACK LIST PREFORMAT Current select drive is: C DRIVE: C CYLINDER: 0 HEAD: 0	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 5px;">NO. CYLS HEAD</td> </tr> <tr> <td style="height: 50px;"> </td> </tr> </table>	NO. CYLS HEAD	
NO. CYLS HEAD			

		Size	Cyls	Head	Precomp	Landz	Sector	Mode
Primary Master	:	0	0	0	0	0	0	AUTO
Primary Slave	:	0	0	0	65535	65535	0	AUTO
Secondary Master	:	0	0	0	0	0	0	AUTO
Secondary Slave	:	0	0	0	0	65280	0	AUTO

Up/Down- Select item ENTER-Accept ESC-Exit/Abort
 Copyright (C) Award Software, Inc. 1992-98 All Rights Reserved

Control Keys

Use the Up and Down arrow keys to move around the selections displayed on the upper screen. Press [Enter] to accept the selection. Press Esc to abort the selection or exit the Utility.

SELECT DRIVE

Select from installed hard disk drive C or D. List at the bottom of the screen is the drive automatically detected by the utility.

BAD TRACK LIST

Auto scan bad track

The utility will automatically scan bad tracks and list the bad tracks in the window at the right side of the screen.

Add bad track

Directly type in the information of the known bad tracks in the window at the right side of the screen.

Modify bad track

Modify the information of the added bad tracks in the window at the right side of the screen.

Delete bad track

Delete the added bad tracks in the window at the right side of the screen.

Clear bad track table

Clear the whole bad track list in the window at the right side of the screen.

PREFORMAT

Interleave

Select the interleave number of the hard disk drive you wish to perform low level format. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for utility automatic detection.

Auto scan bad track

This allows the utility to scan first then format by each track.

Start

Press <Y> to start low level format.

Power-On Boot

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

BIOS Reference - POST Message

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 is only one beep code 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.

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 installed 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 CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

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

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, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found
PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

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

Should Have EISA Board But Not Found
PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

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

Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

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

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.

BIOS Reference - POST Codes

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

POST (hex)	Description
C0	1. Turn off OEM specific cache, shadow... 2. Initialize all the standard devices with default values standard devices includes: -DMA controller (8237) -Programmable Interrupt Controller (8259) -Programmable Interval Timer (8254) -RTC chip
C1	Auto-detection of onboard DRAM & Cache
C3	1. Test system BIOS checksum 2. Test the first 256K DRAM 3. Expand the compressed codes into temporary DRAM area including the compressed System BIOS & Option ROMs
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS only)
04	Reserved
05	1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS' s basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
09	1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 2. OEM specific cache initialization (if needed)

0A	<ol style="list-style-type: none">1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-120 with Dummy(Suprious) Interrupt Handler2. Issue CUID instruction to identify CPU type3. Early Power Management initialization (OEM specific)
----	--

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

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

☞ **This page is for Non-Compressed Version only**

01-02	Reserved
C0	Turn off OEM specific cache, shadow...
03	<ol style="list-style-type: none"> 1. Initialize EISA registers (EISA BIOS only) 2. Initialize all the standard devices with default values Standard devices includes: <ul style="list-style-type: none"> -DMA controller (8237) -Programmable Interrupt Controller (8259) -Programmable Interval Timer (8254) -RTC chip
04	Reserved
05	<ol style="list-style-type: none"> 1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS' s basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
C1	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	<ol style="list-style-type: none"> 1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 2. OEM specific cache initialization (if needed)
0A	<ol style="list-style-type: none"> 1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-120 with Dummy(Suprious) Interrupt Handler 2. Issue CPUID instruction to identify CPU type 3. Early Power Management initialization (OEM specific)

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

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

16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved
1E	If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)
1F-29	Reserved
30	Detect Base Memory & Extended Memory Size
31	1. Test Base Memory from 256K to 640K 2. Test Extended Memory from 1M to the top of memory
32	1. Display the Award Plug & Play BIOS Extension message (PnP BIOS only) 2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port... according to setup value
POST(hex)	Description
33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h
BF	1. Program the rest of the Chipset's value according to Setup. (Later Setup Value Program) 2. If auto-configuration is enabled, programmed the chipset with pre-defined values in the MODBINable Auto-Table
41	Initialize floppy disk drive controller
42	Initialize Hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports
44	Reserved
45	Initialize math coprocessor.
46-4D	Reserved

4E	If there is any error detected (such as video, kb...), show all the error messages on the screen & wait for user to press <F1> key
4F	1. If password is needed, ask for password 2. Clear the Energy Star Logo (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS
51	Reserved
52	1. Initialize all ISA ROMs 2. Later PCI initializations (PCI BIOS only) -assign IRQ to PCI devices -initialize all PCI ROMs 3. PnP Initializations (PnP BIOS only) -assign IO, Memory, IRQ & DMA to PnP ISA devices -initialize all PnP ISA ROMs 4. Program shadows RAM according to Setup settings 5. Program parity according to Setup setting 6. Power Management Initialization -Enable/Disable global PM -APM interface initialization
53	1. If it is NOT a PnP BIOS, initialize serial & parallel ports 2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value
60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup settin

BIOS Default Drive Table

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

Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
1	10	306	4	17	128	305	TEAC SD510, MMI 112, 5412
2	21	615	4	17	300	615	Seagate ST225, ST4026
3	32	615	6	17	300	615	
4	65	940	8	17	512	940	
5	49	940	6	17	512	940	
6	21	615	4	17	65535	615	Seagate ST125, Tandon TM262
7	32	462	8	17	256	511	
8	31	733	5	17	65535	733	Tandon TM 703
9	117	900	15	17	65535	901	
10	21	820	3	17	65535	820	
11	37	855	5	17	65535	855	
12	52	855	7	17	65535	855	
13	21	306	8	17	128	319	Disctron 526, MMI M125
14	44	733	7	17	65535	733	
15		Reserved					
16	21	612	4	17	0	663	Microscience HH725, Syquest 3250, 3425
17	42	977	5	17	300	977	
18	59	977	7	17	65535	977	
19	62	1024	7	17	512	1023	
20	31	733	5	17	300	732	
21	44	733	7	17	300	732	

22	31	733	5	17	300	733	Seagate ST4038
23	10	306	4	17	0	336	
24	42	977	5	17	65535	976	Seagate ST4051
25	80	1024	9	17	65535	1023	Seagate ST4096
26	74	1224	7	17	65535	1223	Maxtor 2085
27	117	1224	11	17	65535	1223	Maxtor 2140, Priam S14
28	159	1224	15	17	65535	1223	Maxtor 2190, Priam S19
Type	Size (MB)	Cylinders	Heads	Sectors	Write Precomp	Land Zone	Example Model
29	71	1024	8	17	65535	1023	Maxtor 1085, Micropoli s 1325
30	98	1024	11	17	65535	1023	Maxtor 1105, 1120, 4780
31	87	918	11	17	65535	1023	Maxtor 1170
32	72	925	9	17	65535	926	CDC 9415
33	89	1024	10	17	65535	1023	
34	106	1024	12	17	65535	1023	
35	115	1024	13	17	65535	1023	
36	124	1024	14	17	65535	1023	
37	17	1024	2	17	65535	1023	
38	142	1024	16	17	65535	1023	
39	119	918	15	17	65535	1023	Maxtor 1140, 4380
40	42	820	6	17	65535	820	Seagate ST251
41	44	1024	5	17	65535	1023	Seagate 4053 Miniscrib e 3053/605 3

42	68	1024	5	26	65535	1023	Miniscribe 3053/6053 RLL
43	42	809	6	17	65535	852	Miniscribe 3650
44	64	809	6	26	65535	852	Miniscribe 3675 RLL
45	104	776	8	33	65535	775	Conner CP3104
Auto							
User							
None							

Appendix 1

Watch Dog Timer

Watch Dog Timer Working Procedure

The Watch Dog Timer (WDT) is the special hardware device. The WDT function is to monitor the computer system whether work normally, otherwise, it will have some measures to fix up the system.

It contains a receivable SQW signal from RTC, and could set time and can clear the counter function. When time is up, WDT can send Reset or NMI signal.

Operator has to write a value into WDT Configuration Register (Write the control value to the Configuration Port), and clear WDT counter (read the Configuration Port).

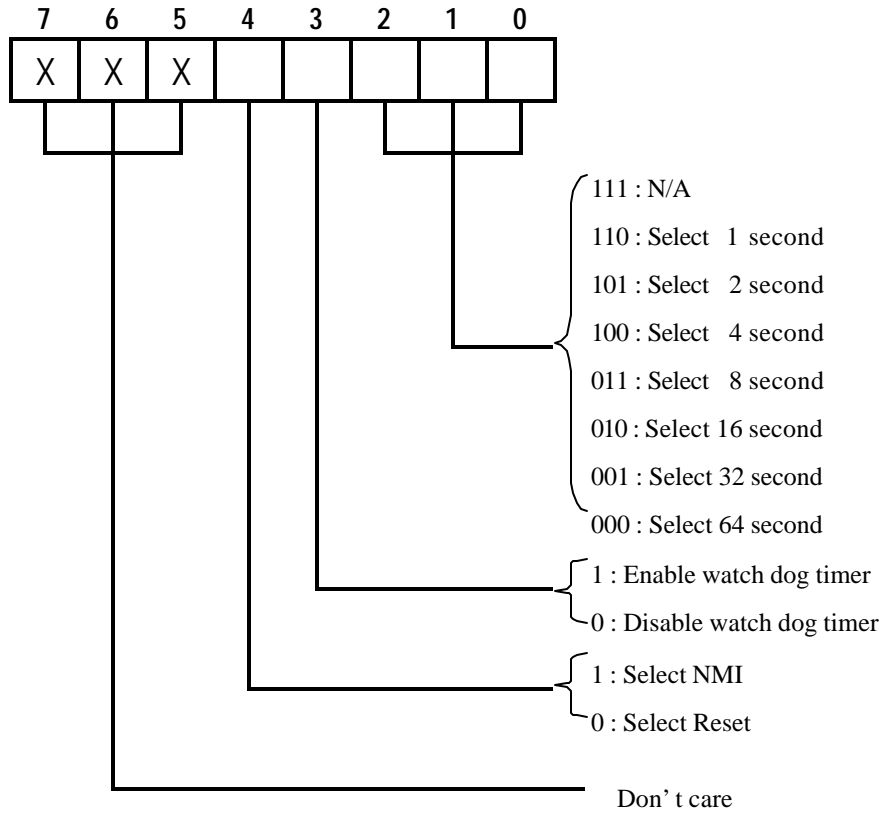
Watch Dog Timer character and function

WDT Configuration port	F2	Default at F2
Watch Dog Timer	Disabled Enabled	1. Default at disabled 2. Enabled for user's programming
WDT Time out active for	Reset NMI	Default at Reset
WDT Active Time	1 sec 2 sec 4 sec 8 sec 16 sec 32 sec 64 sec	Default at 64 sec

Watch Dog Timer Control Register

The Watch Dog Timer Control Register is to control the WDT working mode. You can write the value to WDT Configuration Port.

The following is the Control Register bit definition.



Watch Dog Timer Programming Procedure

- **Power on or reset the system**

The initial value of WDT Control Register (D4~D0) is zero, when power is on or reset the system. The following means the initial value of WDT (00000000b) :

Bit	Value	Mean
4	0	Select Reset
3	0	Disable watch dog timer
2, 1, 0	000	Select 64 second

- **Initialize the SQW of RTC (set SQW output period=0.5 second)**

To initialize the SQW of RTC processor is to set the SQW signal which is output period=0.5 second. It offers the basic frequency of the WDT counter.

The following is an example of **initializing the SQW signal program** in Intel 8086 assembly language.

```

; (Generate SQW = 0.5 Sec.)
Mov dx, 70h
Mov ax, 0Ah
Out dx, al ; Out port 70h = 0Ah
Mov dx, 71h
Mov ax, 2Fh
Out dx, al ; Out port 71h = 2Fh
; (enable the SQW output)
Mov dx, 70h
Mov ax, 0Bh
Out dx, al ; Out port 70h = 0Bh
Mov dx, 71h
Mov ax, 0Ah
Out dx, al ; Out port 71h = 0Ah
    
```

- **Clear the WDT**

Repeatedly read WDT Configuration Port and the interval cannot be longer than the preset time, otherwise, the WDT will generate NMI or Reset signal for the system.

The following is an example of **clear the WDT program** in Intel 8086 assembly language.

```
; ( Clear the WDT)
Mov  dx, F2h ;Setting the WDT configuration port
In   al, dx
```

Note: Before running WDT, you must clear the WDT. It means to make sure the initial value is zero before enabling the WDT.

- **WDT Control Register (Write to WDT configuration port)**

You can set the WDT Control Register to control the WDT working mode.

The initial value of the WDT Control Register is as the following.

```
; (Setting the WDT Control Register as AL)
Mov  al, 0h ; Setting initial value = 0 for the WDT Control Register
```

You must plan the option of following:

1. Select NMI or Reset: decide D4 value in F2.

i.e. Setting D4 = 0, then it select Reset

```
AND  al, 11101111b ; Select Reset
```

i.e. Setting D4 = 1, then it select NMI

```
OR al, 00010000b ; Select NMI
```

2. Select the time-out intervals of WDT (decide the values of D2, D1, D0 in F2)

Example: D2~D0 = 0, the time-out interval will be 64 sec.

```
AND  al, 11111000b ; Setting the time-out interval as 64 sec.
```

3. Enable or Disable the WDT (decide D3 value in F2)

i.e. D3=0, Disable the WDT

```
AND    al, 11110111b ; Disable the WDT
```

i.e. D3=1, Enable the WDT

```
OR     al, 00001000b ; Enable the WDT
```

After finishing the above setting, you must be output for the Control Register's value to the WDT Configuration Port. Then WDT will start according to the above setting.

```
MOV    dx, F2h ; Setting WDT Configuration Port
OUT    dx, al  ; Output the Control Register Value
```

- You should build in a mechanism in the program to continue to read the WDT Configuration Port for clearing WDT before the time out.

Appendix 2 Memory Mapping

