

MAXI 3600

CompactPCI Computer

User's Guide

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Manual edition 1, November 2000

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How to use this guide

This manual is written to help you use the MAXI 3600. The manual describes how to arrange various settings on the board to meet your requirements. It is briefed as follows:

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

Chapter 2, Jumper Pins and Connectors describes the definitions and positions of Jumpers 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 and CPU to get more power out from the CPU board.

Chapter 4, Advanced BIOS Setup describes how to use the advanced PCI/Green BIOS to control almost every feature of the MAXI 3600, including the watchdog timer.

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

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Chapter 1 Introduction

Welcome to the MAXI 3600 CompactPCI CPU Board

The MAXI 3600 is highly integrated 3U CompactPCI CPU board based on the Pentium III with 66/100 MHz Front Side Bus and clock speeds of up to 850 MHz. Other performance features include the integration of Intel 440BX chipset, SDRAM up to 256 MB of memory, C&T 69000 AGP mode VAG controller and Intel 82559 single Ethernet controller and on board socket for Disk OnChip up to 144MB.

The MAXI 3600 is designed to optimize the applications in fields of instrument, control, industrial automation and medical equipment. For any applications needing high computing power or prompt response, the MAXI 3600 provides system integrators a fast time to market solution. The MAXI 3600 complies with PICMG hot swap standard and supports 7 PCI devices. The MAXI 3600 could be used with FDD; IDE HDD integrated together as a complete system in most of the application environments. However, if the user needs the MAXI 3600 be used in the harsh environment like high temperature, high vibration which will damage the FDD or HDD, the DOC up to 288 MB could be put on board to fully match the beauty of the CompactPCI architecture. With 850 MHz Pentium III CPU and 384 MB SDRAM running together, the MAXI 3600 is the top performer available for the mission critical applications.

1-1 Features

- Intel Celeron/Pentium III Coppermine CPU with 66/100MHz FSB up to 850MHz
- 384MB SDRAM (Max.) memory support, SO-DIMM × 2
- Intel 440BX AGP set
- C&T 69000 AGP mode VGA controller with CRT support
- Intel 82559 10/100 Base Ethernet controller
- On board socket for DiskOnChip up to 144MB
- Hot swap support

1-2 Specifications

- **System Architecture**
 - 3U Eurocard with J1 and J2 CompactPCI connector
 - PICMG 2.0 R2.1 compliant
 - PICMG 2.1 R1.0 Hot Swap compliant
- **CPU Support**
 - Intel Celeron/Pentium III CPU with 128/256K cache on die
 - Brand New Socket 370 FC-PGA CPU running at 66/100MHz FSB up to 850MHz
 - Support streaming SIMD instruction
- **Main Memory**
 - Support SDRAM up to 384MB (Max.)

- 144 pin SO-DIMM socket ×2
- **BIOS**
 - Award System BIOS
 - Plug & Play support
 - Advanced Power Management support
 - Advanced configuration & Power Interface support
 - 2M bits flash ROM

- **Chip Set**

- Intel 82440BX AGP set
- 66/100MHz FSB support
- PCI V2.1 complied
- Optimized SDRAM support

- **On Board VGA**

- C&T 69000 AGP mode VGA controller
- 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 95/98/2000, Windows NT4.0
- 15 pin CRT connector ×1
- **On Board LAN**
 - Intel 82559 Single Ethernet controller
 - 10 Base T/100 Base TX support, full duplex
 - Complies with PCI V2.1, IEEE802.3, IEEE 802.3U
 - Backward compatible with former 82558 Ethernet controller base net modules
 - Drivers support: DOS/Windows, Windows 95/98/2000, Windows NT4.0, Netware, SCO Open Server 5.0

- RJ45 connector ×1
- **On Board I/O**
 - Winbond W83977 Super I/O on board
 - SIO ×2, with 2×16C550 UARTs, 9 pin D-type ×2, optional RS422/485 ×1
 - PIO ×1, Bi-directional, EPP/ECP support, 26 pin ×1
 - Floppy Disk controller: 5.25" 360K/1.2MB, 3.5" 720K/1.2MB/1.44MB/2.88MB support, 34 pin connector ×1, 26 pin FFC connector ×2
 - On chip enhanced IDE ×1, PIO up to mode 4, DMA master up to mode 2, Ultra DMA/33 support, 44 pin ×1, total 2 E.IDE Devices support
 - On chip keyboard, mouse controller, PS/2 Keyboard, 5 pin header x 1, share with PS/2 mouse by Y cable
 - On board USB port ×2 (6 pin header ×1)
 - On board buzzer ×1
 - 2 pin for reset function (reserved), 4pin for speaker (reserved), 5pin for keylock (reserved)
- **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
- **System Monitor**
 - Winbond W83782D system monitor controller
 - Five voltage (For +3.3V, +5V, +12V, Vtt and Vcore)
 - One Fan speed (For CPU)
 - One temperature
 - Drivers support: Windows 95/98, Windows NT4.0
- **Watchdog Timer**
 - 1,2,4 4 seconds time-out intervals
- **Connectors on the front panel**
 - USB port ×2
 - Mini DIN PS/2 mouse/ Keyboard ×1

- 15 pin D-type VGA connector ×1
- 9 pin SIO ×2, 26 pin PIO ×1 (mini printer connector)
- RJ45 connector ×1
- **Dimensions**
 - 160mm(L) × 100mm(W)
- **Power Requirements**
 - +3.3V : 4A (Max.)
 - +5V : 10A (Max.)
 - +12V : 600mA (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

1-3 What you'll have from the package

The MAXI 3600 series package includes the following items.

ITEM	Model	Maxi 3600
C3600 Full system		1
CPU assembly tooling		1
Keyboard/mouse adapter cable		1
CD-ROM x 1 (manual, C&T69000, BTB878A, Adaptec 7890, Realtek 8139S driver)		1
Reference Guide		1

If any of these items is missed or damaged, please contact your vendor for what you want

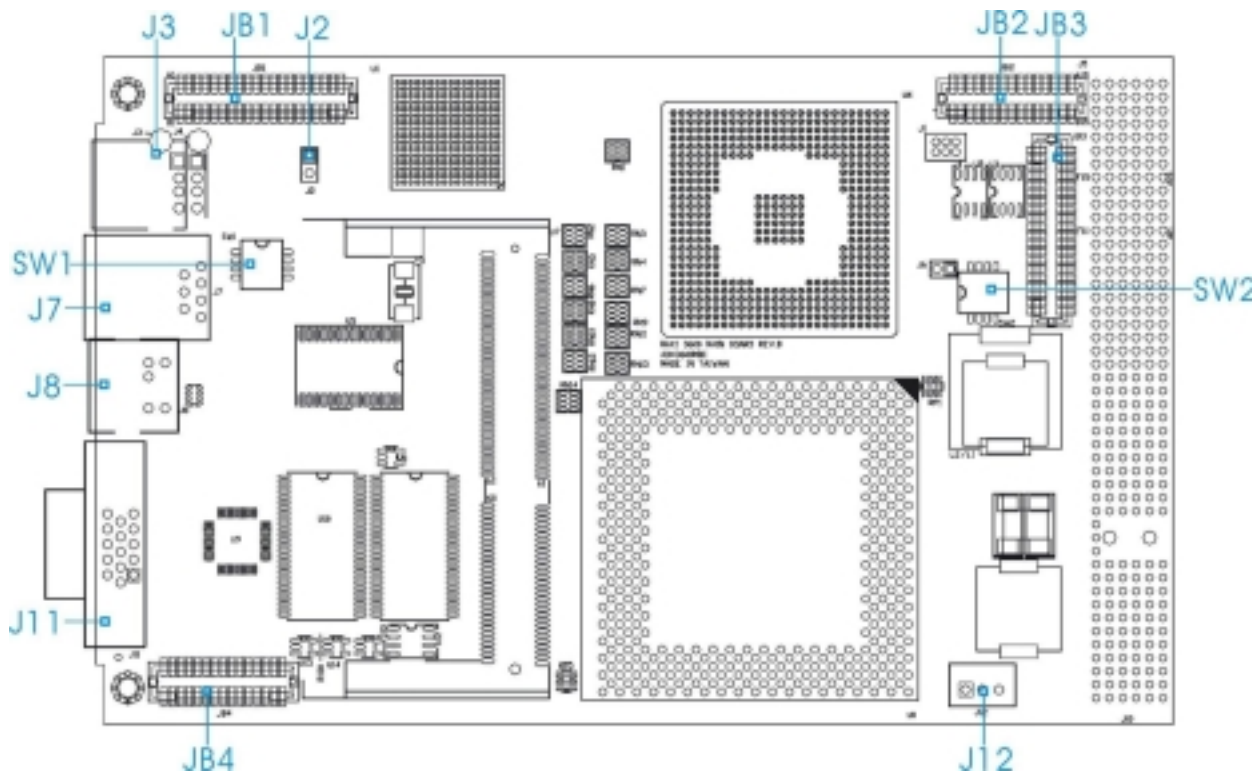
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Chapter 2 Switches and Connectors

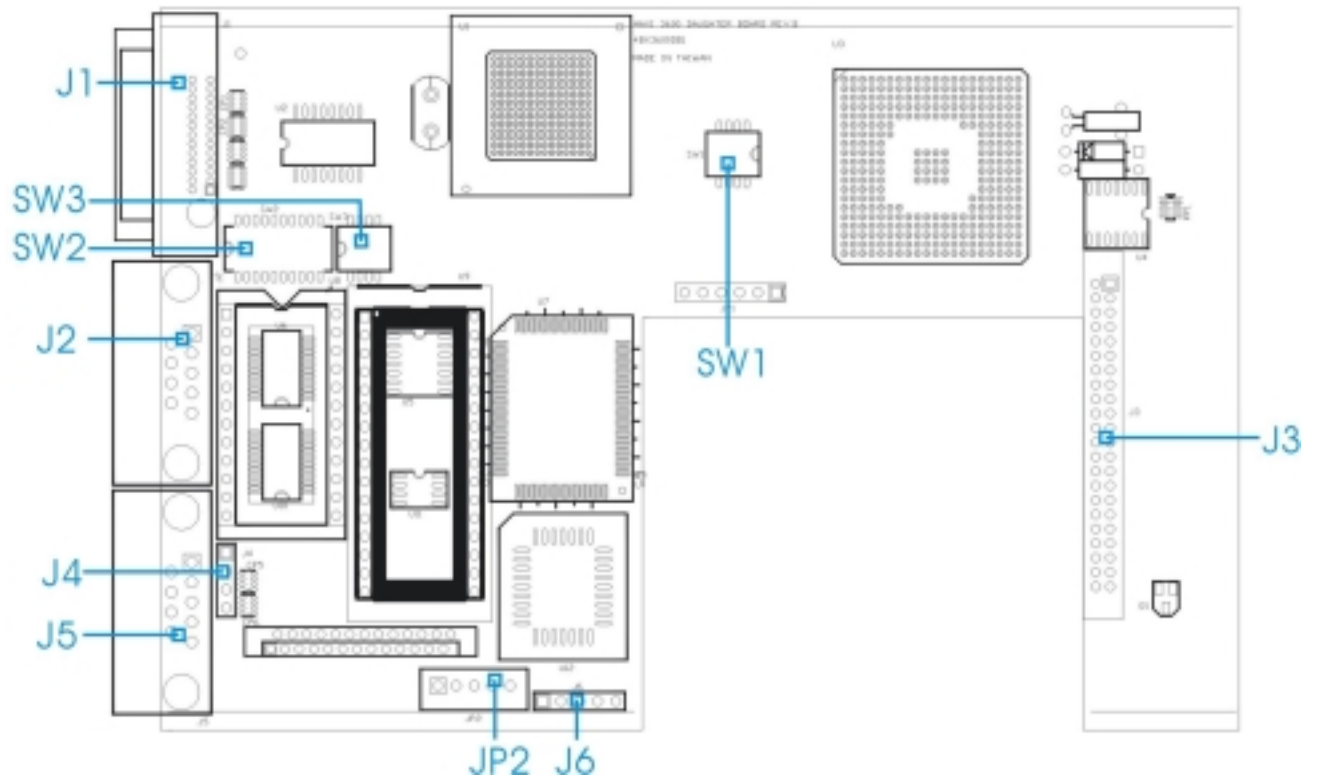
This chapter gives the definitions and shows where to locate the positions of switches and connectors.

2-1 Main Board Layout

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



2-2 Daughter Board Layout



2-3 Switches

Switches on the CPU board are used to select options for different functions used. The switch-on or off is to accommodate the variations of the following table.

Main Board Switch Setting Table (*: default setup)

SW1 (On Board VGA Disable)

SW. No.	VGA ENABLE	VGA DISABLE
1	ON*	OFF
2	OFF*	ON
3	OFF*	ON
4	ON*	OFF

SW2 (Reserved for 133 MHz Front Side Bus for Test only)

SW. No.	66 or 100 MHz	133MHz
1	OFF*	OFF
2	OFF*	ON
3	OFF*	OFF
4	OFF*	OFF

Daughter Board Switch Setting Table (*: default setup)**SW1 (RTC Clear & On Board LAN Disable)**

SW. No.	KEEP RTC DATA	RTC CLEAR
1	OFF*	OFF
2	OFF*	ON

SW. No.	LAN ENABLE	LAN DISABLE
3	ON*	OFF
4	ON*	OFF

SW2 (COM2 Transaction Mode)

SW. No.	RS232	RS422	RS485
1	OFF*	ON	ON
2	OFF*	ON	ON
3	OFF*	ON	OFF
4	ON*	OFF	ON
5	OFF*	ON	ON
6	ON*	OFF	OFF
7	OFF*	ON	OFF
8	OFF*	ON	OFF
9	OFF*	ON	OFF
10	OFF*	ON	ON

SW3 (Solid State Disk mapping address selection and BIOS Reflash enable/disable)

SW. No.	C000	C800	D000	D800
1	ON	ON	ON	ON*
2	ON	ON	OFF	OFF*
3	ON	OFF	ON	OFF*

SW. No.	BIOS REFLASH ENABLE	BIOS REFLASH DISABLE
---------	---------------------	----------------------

4	ON*	OFF
---	-----	-----

2-4 Connectors

Main Board Connectors Pin Definition

Board to Board Connector (JB1, JB2, JB3, JB4)

JB1

PIN No.	Description	PIN No.	Description
A1	USBP1+	B1	USBP0+
A2	USBP1-	B2	USBP0-
A3	OC#1	B3	OC#0
A4	VCC(5V)	B4	VCC(5V)
A5	PXI_TRIG6	B5	TERMPANE
A6	PXI_TRIG5	B6	TX+
A7	PXI_TRIG4	B7	TX-
A8	PXI_TRIG3	B8	RX+
A9	VCC(5V)	B9	RX-
A10	SUSTAT#	B10	TERMPANE
A11	STPCLK#	B11	VCC(5V)
A12	SLP#	B12	MCLK
A13	SMBDATA	B13	KCLK
A14	SMBCLK	B14	MDAT
A15	GND	B15	KDAT
A16	24MHZ_977	B16	GND
A17	GND	B17	48MHZ
A18	PCLK_PX4	B18	GND
A19	GND	B19	PX_OSC
A20	PCLK_LAN	B20	GND

JB2

PIN No.	Description	PIN No.	Description
A1	PHLD#	B1	AD0
A2	PHLDA#	B2	AD1
A3	PIRQ#A	B3	AD2
A4	PIRQ#B	B4	AD3
A5	PIRQ#C	B5	AD4
A6	PIRQ#D	B6	AD5
A7	C/BE#0	B7	AD6

PIN No.	Description	PIN No.	Description
A8	C/BE#1	B8	AD7
A9	C/BE#2	B9	AD8
A10	C/BE#3	B10	AD9
A11	PAR	B11	AD10
A12	SERR#	B12	AD11
A13	PERR#	B13	AD12
A14	AD15	B14	AD13
A15	AD16	B15	AD14

JB3

PIN No.	Description	PIN No.	Description
A1	PREQ#3	B1	VCC3(3.3V)
A2	PREQ#2	B2	AD17
A3	PREQ#1	B3	AD18
A4	PREQ#0	B4	AD19
A5	PXI_TRIG2	B5	AD20
A6	PXI_TRIG7	B6	AD21
A7	PXI_TRIG0	B7	AD22
A8	PXI_TRIG1	B8	AD23
A9	IRQ14	B9	AD24
A10	IRQ15	B10	AD25
A11	SYSEN#	B11	VCC3(3.3V)
A12	VCC3(3.3V)	B12	VCC3(3.3V)
A13	PCI_RST#	B13	AD26
A14	FRAME#	B14	AD27
A15	DEVSEL#	B15	AD28
A16	IRDY#	B16	AD29
A17	TRDY#	B17	AD30
A18	STOP#	B18	AD31
A19	PGNT#1	B19	VCC3(3.3V)
A20	GND	B20	GND

JB4

PIN No.	Description	PIN No.	Description
A1	STEP-	B1	INDEX-
A2	WD-	B2	DSA-
A3	WE-	B3	DSKCHG-
A4	TRAK0-	B4	MOA-
A5	WP-	B5	DIR-
A6	RDATA-	B6	RWC-
A7	HEAD-	B7	GND
A8	VCC(5V)	B8	GND
A9	EXTSMI#	B9	PX4_PERR#
A10	PXPWRGD1	B10	IGNNE#
A11	VRM_PG D	B11	HINIT#
A12	CPUPWR	B12	LINT0
A13	VCC(5V)	B13	SPK2
A14	PX4_SMI#	B14	B_NMI
A15	A20M#	B15	PWROK

J12: FAN CONNECTOR

PIN No.	Description
1	GND
2	+12V
3	FAN SENSOR

J2: I2C CONNECTOR

PIN No.	Description
1	I2C Data
2	I2C Clock

J3: USB CONNECTOR

PIN No.	Description
1	VCC
2	SBD0-
3	SBD0+
4	SBD1-
5	SBD1+
6	Ground

J7: LAN CONNECTOR

PIN No.	Description
1	TD+
2	TD-
3	RD+
4	TERMPANE
5	TERMPANE
6	RD-
7	TERMPANE
8	TERMPANE
9	NC
10	NC
11	GND
12	GND

J8: PS/2 KEY BOARD / MOUSE CONNECTOR

PIN No.	Description
1	Keyboard DATA
2	Mouse DATA
3	Ground
4	+5V
5	Keyboard CLK
6	Mouse CLK

J11: CRT CONNECTOR

PIN No.	Description
1	RED
2	Green
3	Blue
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	VCC(5V)
10	Ground
11	NC

12	Display Data channel data
13	Horizontal Sync
14	Vertical Sync
15	Display Data Channel CLK

Daughter Board Connectors Pin Definition

Board to Board Connector (JB1, JB2, JB3, JB4)

JB1

PIN No.	Description	PIN No.	Description
A1	USBP1+	B1	USBP0+
A2	USBP1-	B2	USBP0-
A3	OC#1	B3	OC#0
A4	VCC(5V)	B4	VCC(5V)
A5	PXI_TRIG6	B5	TERMPANE
A6	PXI_TRIG5	B6	TX+
A7	PXI_TRIG4	B7	TX-
A8	PXI_TRIG3	B8	RX+
A9	VCC(5V)	B9	RX-
A10	SUSTAT#	B10	TERMPANE
A11	STPCLK#	B11	VCC(5V)
A12	SLP#	B12	MCLK
A13	SMBDATA	B13	KCLK
A14	SMBCLK	B14	MDAT
A15	GND	B15	KDAT
A16	24MHZ_977	B16	GND
A17	GND	B17	48MHZ
A18	PCLK_PX4	B18	GND
A19	GND	B19	PX_OSC
A20	PCLK_LAN	B20	GND

JB2

PIN No.	Description	PIN No.	Description
A1	PHLD#	B1	AD0
A2	PHLDA#	B2	AD1
A3	PIRQ#A	B3	AD2
A4	PIRQ#B	B4	AD3

PIN No.	Description	PIN No.	Description
A5	PIRQ#C	B5	AD4
A6	PIRQ#D	B6	AD5
A7	C/BE#0	B7	AD6
A8	C/BE#1	B8	AD7
A9	C/BE#2	B9	AD8
A10	C/BE#3	B10	AD9
A11	PAR	B11	AD10
A12	SERR#	B12	AD11
A13	PERR#	B13	AD12
A14	AD15	B14	AD13
A15	AD16	B15	AD14

JB3

PIN No.	Description	PIN No.	Description
A1	PREQ#3	B1	VCC3(3.3V)
A2	PREQ#2	B2	AD17
A3	PREQ#1	B3	AD18
A4	PREQ#0	B4	AD19
A5	PXI_TRIG2	B5	AD20
A6	PXI_TRIG7	B6	AD21
A7	PXI_TRIG0	B7	AD22
A8	PXI_TRIG1	B8	AD23
A9	IRQ14	B9	AD24
A10	IRQ15	B10	AD25
A11	SYSEN#	B11	VCC3(3.3V)
A12	VCC3(3.3V)	B12	VCC3(3.3V)
A13	PCI_RST#	B13	AD26
A14	FRAME#	B14	AD27
A15	DEVSEL#	B15	AD28
A16	IRDY#	B16	AD29
A17	TRDY#	B17	AD30
A18	STOP#	B18	AD31
A19	PGNT#1	B19	VCC3(3.3V)
A20	GND	B20	GND

JB4

PIN No.	Description	PIN No.	Description
A1	STEP-	B1	INDEX-
A2	WD-	B2	DSA-
A3	WE-	B3	DSKCHG-
A4	TRAK0-	B4	MOA-
A5	WP-	B5	DIR-
A6	RDATA-	B6	RWC-
A7	HEAD-	B7	GND
A8	VCC(5V)	B8	GND
A9	EXTSMI#	B9	PX4_PERR#
A10	PXPWRGD1	B10	IGNNE#
A11	VRM_PG D	B11	HINIT#
A12	CPUPWR	B12	LINT0
A13	VCC(5V)	B13	SPK2
A14	PX4_SMI#	B14	B_NMI
A15	A20M#	B15	PWROK

JP2: IR CONNECTOR

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

J4: Speaker CONNECTOR

PIN No.	Description
1	SPEAKER
2	GND
3	GND
4	VCC(5V)

J6: KEY LOCK CONNECTOR

PIN No.	Description
1	VCC(5V)
2	NC
3	GND
4	KEYLOCK#
5	GND

J3: IDE INTERFACE CONNECTOR

PIN No.	Description	PIN No.	Description
1	Reset#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	N/C
29	DMA ACK	30	Ground
31	Interrupt	32	IOCS16#
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground
41	VCC(5V)	42	VCC(5V)
43	Ground	44	NC

FDD1: FDC CONNECTOR

PIN No.	Description	PIN No.	Description
1	VCC(5V)	14	Step#
2	Index#	15	Ground
3	VCC(5V)	16	Write Data#
4	Drive Select A#	17	Ground
5	VCC(5V)	18	Write Gate#
6	Disk Change#	19	Ground
7	NC	20	Track 0#
8	NC	21	Ground
9	NC	22	Write Protect#
10	Motor Enable A#	23	Ground
11	NC	24	Read Data#
12	Direction#	25	Ground
13	Density Select	26	Head Side Select#

J1: Parallel Port CONNECTOR

PIN No.	Description	PIN No.	Description
1	Strobe#	2	Data 0
3	Data 1	4	Data 2
5	Data 3	6	Data 4
7	Data 5	8	Data 6
9	Data 7	10	Acknowledge
11	Busy	12	Paper Empty
13	Printer Select	14	Auto Form Feed#
15	Error#	16	Initialize
17	Printer Select IN#	18	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	GND

J2, J5: Serial Port CONNECTOR

PIN No.	Description
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)

Chapter 3 Capability Expanding

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

3-1 *Installing SO-DIMM*

Your system memory is provided by two 144 pin SO-DIMM (Dual In-line Memory Modules) on the CPU board. The user could install another SDRAM based SO-DIMM onto the on board socket.

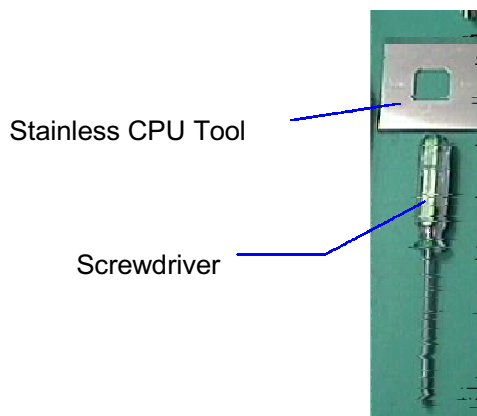
Note: SO-DIMM1 on the front of CPU board support up to 128MB, SO-DIMM2 on the rear of CPU board support up to 256MB.

SO-DIMM1	SO-DIMM2	Total Memory
0~128MB	0~256	0~384MB

1. 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.
2. 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.

3-2 *CPU Installation*

To install CPU, you need a “—” type screwdriver, a stainless CPU tool and a thermal dissipation paste.

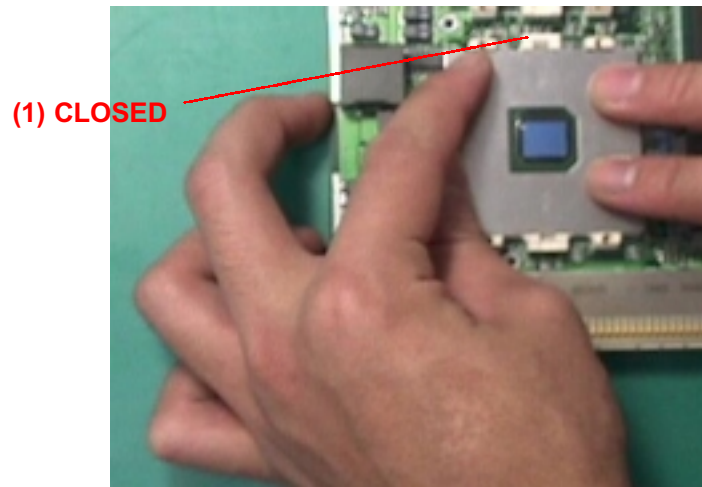


Step 1

Place the CPU in the empty socket.

Step 2

Place the stainless CPU tool on the top of the CPU. The **lose** on the tool should be set toward the position of **(1)** in the below picture.

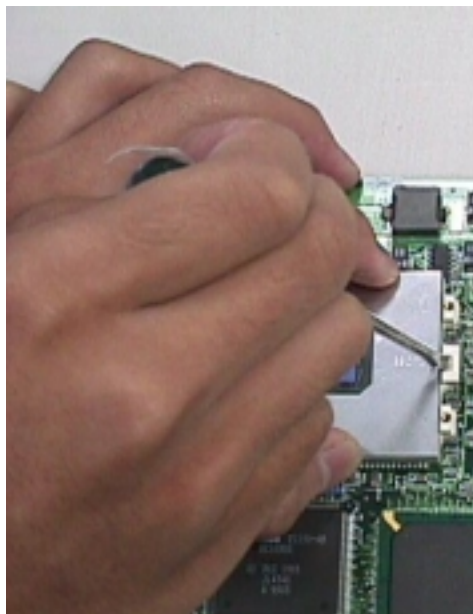


Step 3

Stick the screwdriver into **lose** on the tool at 45 degree.

Step 4

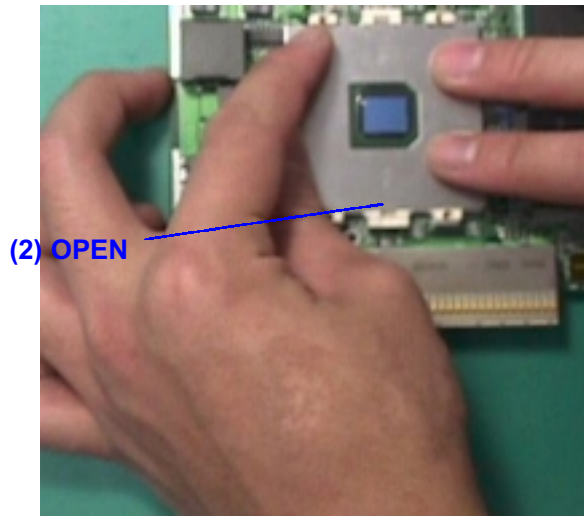
Push the screwdriver inward and the CPU is buckled on the socket.



3-3 CPU Removal

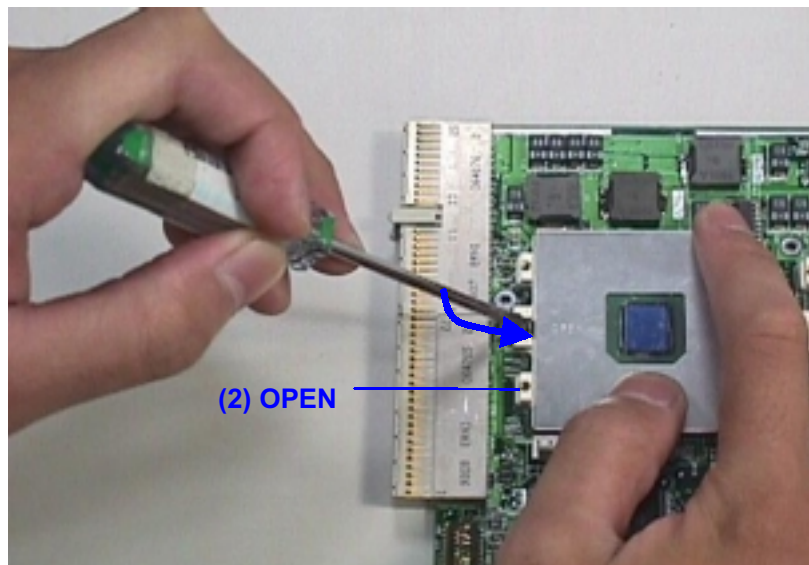
Step 1

Place the stainless CPU tool on the top of the CPU. The pen on the tool should be set toward to the position of (2) in the below picture.



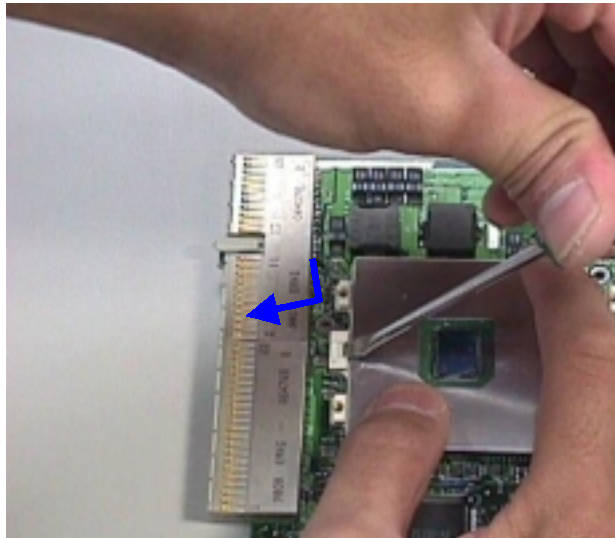
Step 2

Stick the screwdriver into pen on the tool at 45 degree.



Step 3

Push the screwdriver inward and unbuckle the CPU, then CPU can be removed from the socket.



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.

4-1 BIOS Setup

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 will appear on the below screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select among the items and press **<Enter>** to accept or enter the sub-menu.

ROM PCI/ISA BIOS (M3600-00)
 CMOS SETUP UTILITY
 AWARD SOFTWARE, INC.

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

Standard CMOS Features

Use this menu for basic system configuration. See Page 4-7 for details.

BIOS Features

Use this menu to set the Advanced Features available on your system. See Page 4-10 for details.

Chipset Features Setup

Use this menu to change the values in the chipset registers and optimize your system's performance. See Page 4-15 for details.

Power Management Setup

Use this menu to specify your settings for power management. See Page 4-19 for details.

PNP/PCI Configuration

This entry appears if your system supports PnP / PCI. See Page 4-24 for details.

Load BIOS Defaults

BIOS defaults indicate 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 indicate 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 section page includes all the items of IDE hard drive and Programmed Input / Output features. See Page 4-26 for details.

Password Setting

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 4-30 for details.

IDE HDD Auto Detection

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

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 Features

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

ROM PCI/ISA BIOS (M3600-00)
 STANDARD CMOS SETUP
 AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Tue, Nov 7 2098	
Time (hh:mm:ss) : 11 : 28 : 2	
Drive C : 0 (0Mb)	CYLS. HEADS PRECOMP LANDZONE SECTORS MODE
Drive D : 0 (0Mb)	0 0 0 0 0 CHS
Drive A : None	
Drive B : None	
Floppy 3 Mode Support : Disabled	
LCD&CRT : Both	
Halt On : All Errors	
ESC : Quit	↑ ↓ → ← : Select Item
F1 : Help	(Shift)F2 : Change Color
	PU/PD/+/- : Modify

Main Menu Selections

Date

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

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

Time

The time format is <hour> <minute> <second>. which accepts both 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

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

Press **PgUp/<+>** or **PgDn/<->** to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information 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 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 one

If the controller of HDD interface is CD-ROM, the selection shall be one

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 types of floppy disk drive A or drive B that have 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

LCD & CRT

This Field may appear as an alternative to the Video field. Select your video display device:

LCD	Notebook liquid crystal display
CRT	Auxiliary monitor
AUTO	The BIOS autosenses the device in use (this value lets you switch between devices without being left in the dark)
LCD&CRT	Display on both devices

Halt On

During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:

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

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

ROM PCI/ISA BIOS (M3600-00)
 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
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Processor Number Feature	: Enabled	D4000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot From LAN First	: Disabled	DC000-DFFFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI		
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Disabled		
Boot Up NumLock Status	: Off		
Gate A20 Option	: Normal		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup	ESC : Quit	↑↓→← : Select Item
PCI/VGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
OS Select For DRAM > 64MB	: Non-OS2	F5 : Old Values	(Shift)F2 : Color
HDD S.M.A.R.T. capability	: Disabled	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.

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	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

! WARNING!

Disk boot sector is to be modified

Type "Y" to accept write or "N" to abort write

Award Software, Inc.

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.

The Choice: Enable/Disable

CPU L2 Cache ECC Checking

This category could turn on the ECC of Pentium II L2 Cache or just disable it.

The Choice: Enable/Disable

Processor Number Feature

Intel included a serial number in their Pentium III processors as a unique system identifier. For privacy reasons, you can disable this setting to prevent the release of this identifier.

The Choice: Enable/Disable

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.

The Choice: Enable/Disable

Boot From LAN First

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

The Choice: Enable/Disable

Boot Sequence

This field configures the boot sequence of drive devices.

Options Description

A, C, SCSI (*)	System will first try to boot from floppy drive, then master IDE disk drive on primary channel, and then SCSI disk drive
C, A, SCSI	Master IDE disk drive on primary channel, floppy drive, SCSI disk driver
C, CDROM, A	Master IDE disk drive on primary channel, ATAPI CDROM drive, floppy drive
CDROM, C, A	ATAPI CDROM drive, master IDE disk drive on primary channel, floppy drive
D, A, SCSI	Slave IDE disk drive on primary channel, floppy drive, SCSI disk drive
SCSI, A, C	SCSI disk drive, floppy drive, ATAPI CD-ROM drive
SCSI, C, A	SCSI disk drive, master IDE disk drive on primary channel, floppy drive
C only	Master IDE disk drive on primary channel only
LS/ZIP, C	LS-120 or ZIP drive, master IDE disk drive on primary channel

Swap Floppy drive

If the system has two floppy drives, you can swap the logical drive name assignments.

The choice: Enabled/Disabled.

Boot Up Floppy Seek

Seeks disk drives during boot up. Disabling speeds boot up.

The choice: Enabled/Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Enabled/Disabled.

Gate A20 Option

Select if chipset or keyboard controller should control GateA20.

Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

Typematic Rate Setting

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

The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a key stroke when you hold the key down.

The choice: 6, 8, 10, 12, 15, 20, 24, 30

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.

The choice: 250, 500, 750, 1000.

Security Option

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.

PCI/VGA Palette Snoop

It determines whether the MPEG ISA/VESA VGA Cards can work with PCI/VGA or not.

Enabled	When PCI/VGA working with MPEG ISA/VESA VGA Card.
Disabled	When PCI/VGA not working with MPEG ISA/VESA VGA Card.

MPS Version control For OS

This field specifies the version of MPS used by the motherboard.

The choice: 1.1, 1.4

OS Select for DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2

HDD S.M.A.R.T. Capability

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a technology developed to manage the reliability of the hard disk by predicting future device failures. The hard disk needs to be S.M.A.R.T. capable. The settings for this option are Disabled or Enabled.

* Note: S.M.A.R.T. cannot predict all future device failures. S.M.A.R.T. should be used as a warning tool, not as a tool to predict the device reliability.

The choice: Enabled/Disabled.

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	Video shadow is enabled
Disabled	Video shadow is disabled

C8000 - CFFFF Shadow / D8000 - 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	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 isable 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 of the chipset features.

ROM PCI/ISA BIOS (M3600-00)
 CHIPSET FEATURES SETUP
 AWARD SOFTWARE, INC.

Auto Configuration	: Disabled	Auto Detect DIMM/PCI Clk	: Enabled
EDO CAS _x # MA Wait State	: 1	Spread Spectrum	: Disabled
EDO RAS _x # Wait State	: 1	CPU Host Clock (CPU/PCI)	: Default
SDRAM RAS-to-CAS Delay	: 3	CPU Warning Temperature	: 120
SDRAM RAS Precharge Time	: 3	Current System Temp.	:
SDRAM CAS latency Time	: 2	Current CPU1 Temperature	:
SDRAM Precharge Control	: Disabled	Current CPUFAN1 Speed	:
DRAM Data Integrity Mode	: Non-ECC	IN0(V) :	IN1(V) :
System BIOS Cacheable	: Disabled	IN2(V) :	+ 5 V :
Video BIOS Cacheable	: Disabled	+12 V :	VBAT(V):
8 Bit I/O Recovery Time	: NA	Warning Temp. Beep	: Enabled
16 Bit I/O Recovery Time	: NA	ESC : Quit	↑↓→← : Select Item
Memory Hole At 15M-16M	: Disabled	F1 : Help	PU/PD/+/- : Modify
Passive Release	: Disabled	F5 : Old Values (Shift)	F2 : Color
Delayed Transaction	: Disabled	F6 : Load BIOS Defaults	
AGP Aperture Size (MB)	: 4	F7 : Load Setup Defaults	

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.

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

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, Disabled.

EDO CASx# MA Wait State

You could select the timing control type of EDO DRAM CAS MA (memory address bus).

The choice: 1, 2.

EDO RASx# MA Wait State

You could select the timing control type of EDO DRAM RAS MA (memory address bus).

The choice: 1, 2.

SDRAM RAS-to-CAS Delay

You can select RAS to CAS Delay time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

The Choice: 2, 3.

SDRAM RAS Precharge Time

Defines the length of time for Row Address Strobe is allowed to precharge.

The Choice: 2, 3

SDRAM CAS latency Time

You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The choice: 2, 3.

SDARAM Precharge Control

When Enabled, all CPU cycles to SDRAM result in an All Banks Precharge Command on the SDRAM interface.

The Choice: Enabled, Disabled.

DRAM Data Integrity Mode

Select Parity or ECC (error-correcting code), according to the type of installed DRAM.

The Choice: Non-ECC, ECC.

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.

The Choice: Enabled, Disabled

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.

The Choice: Enabled, Disabled

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 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 from NA, 1 to 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.

The Choice: Enabled, Disabled

Enabled	Memory hole supported.
Disabled	Memory hole not supported.

Passive Release

When Enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

The choice: Enabled, Disabled.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

The choice: Enabled, Disabled.

AGP Aperture Size (MB)

Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for AGP information.

The choice: 4, 8, 16, 32, 64, 128, 256

Auto Detect DIMM/PCI Clk

This item auto detects the clock generator. The unused pins of DIMM/PCI Clk are disabled. The amplitudes of the radiated electromagnetic emissions are reduced.

The options are: Enabled, Disabled

Spread Spectrum Modulated

The clock generator generates a clock that is frequency modulated in order to increase the bandwidth that it occupies. By increasing the bandwidth of the fundamental and its harmonics, the amplitudes of the radiated electromagnetic emissions are reduced.

The options are: Enabled, Disabled

CPU Host Clock (CPU/PCI)

Depending on the CPU FSB, the options are: Default, 66/33 MHz, 75/37 MHz, 83/41 MHz, 100/50 MHz

The Default value is in fact 66 MHz

CPU Warning Temperature

This item will prevent CPU from overheating.

The choice: 30-120.

Current System Temp.

Show you the current system temperature.

Current CPU1 Temperature

Show you the current CPU1 temperature.

Current CPUFAN 1/2/3 Speed

Show you the current CPUFAN operating speed.

IN0/1/2 (V)

Show you the voltage of Vin (0)/(1)/(2).

+5V/+12V/-12V/-5V

Show you the voltage of +5V/+12V/-12V/-5V.

Warning Temp. Beep

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.

ROM PCI/ISA BIOS (M3600-00)
 POWER MANAGEMENT SETUP
 AWARD SOFTWARE, INC.

ACPI function : Enabled Power Management : User Define PM Control by APM : No Video Off Method : Blank Screen Video Off After : NA MODEM Use IRQ : NA Doze Mode : Disable Standby Mode : Disable Suspend Mode : Disable HDD Power Down : Disable Throttle Duty Cycle : 12.5% PCI/VGA Act-Monitor : Disabled PowerOn by Ring : Disabled IRQ 8 Break Suspend : Disabled	** 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 : Disabled Parallel Port : Disabled
	ESC : Quit ↑↓+* : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

Power Management

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

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

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

Disable (default)	No power management. Disables 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	Maximum power management -- ONLY AVAILABLE FOR SL CPU . Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting **Yes** will give better power savings.

Video Off Method

This determines the manner in which the monitor is blanked.

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

Video Off After

This determines the manner in which the monitor is blanked.

The choice: Doze, Standby, Suspend / NA

Modem User IRQ

For external modem, 3 or 4 will be used for card type modem. It is up to card definition. Default is 3.

The choice: 3,4,5,7,9, 4,10,11,NA

Doze Mode

This determines the time the system enters Doze Mode. It is available only when the Power Management item set to User Define.

The choice: Disable, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour

Standby Mode

This determines the time the system enters Standby Mode. It is available only when the Power Management item is set to User Define.

The choice: Disable, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour

Suspend Mode

This determines the time the system enters power saving mode. It is available only when the Power Management item is set to User Define.

The choice: Disable, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour

HDD Power Down

This determines the time the system enters HDD power down. It is available only when the Power Management item is set to User Define.

The choice: Disable, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15 Min

Throttle Duty Cycle

This determines system performance when system is in suspend mode. The more performance required, less energy saved.

The Choice: 12.5, 25%, 37.5, 50%, 62.5%, 75%

PCI/VGA Act-Monitor

If enabled, the system goes into power saving mode if there is no activity on the monitor screen.

If disabled, the system goes into power saving mode, whether or not there is activity on the monitor screen.

The Choice: Enabled, Disabled

IRQ 8 Break Suspend

When disabled, this feature allows the system to go into suspend mode. When enabled, IRQ 8 (RTC) is broken, and the system cannot go into suspend mode.

The Choice: Enabled, Disabled

Reload Global Timer Events

IRQ [3-7, 9-15], NMI

Choose enabled, timer restarts whenever any of these interrupts occurs.

The Choice: Enabled, Disabled

Primary/Secondary IDE 0/1

Choose enabled, timer restarts whenever the master/slave disk of the primary/secondary IDE channel is

active.

The Choice: Enabled, Disabled

Floppy Disk

Choose enabled, timer restarts whenever the floppy disk is active.

The Choice: Enabled, Disabled

Serial Port

Choose enabled, timer restarts whenever the serial port is active.

The Choice: Enabled, Disabled

Parallel Port

Choose enabled, timer restarts whenever the parallel port is active.

The Choice: Enabled, Disabled

PnP/PCI Configuration

This section describes how to configure the PCI bus system. PCI, or **Peripheral Component Interconnect**, is a system that allows I/O devices to operate at speeds near the speed the CPU itself used 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 (M3600-00)
 PNP/PCI CONFIGURATION
 AWARD SOFTWARE, INC.

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

PNP OS Installed

Select **Yes** if the system operating environment is Plug-and-Play aware (e.g. Windows 95).

The Choice: Yes and No.

Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95/98/NT. If you set this field to **anual** choose specific resources by going into each of the sub menu that follows this field.

The choice: Auto, Manual.

Reset Configuration Data

This item allows you to determine reset the configuration data or not.

Choices are Enabled and Disabled

IRQ/DMA assigned to

This item allows you to determine the IRQ / DMA assigned to the ISA bus and is not available to any PCI slot. (Legacy ISA) or PnP for both ISA and PCI.

Choices are Legacy ISA and PCI/ISA PnP.

Slot 1 use IRQ No

Assign IRQ to slot 1, 2, 3, 4 by User or Auto.

Used MEM Base Addr

Some add-in cards ask for a specific address space in the system memory. This field specifies the memory base (start address) of the reserved memory space.

The Choice: N/A, C800, CC00, D000, D400, D800, DC00

Assign IRQ For USB

Enable/Disable to assign a IRQ for USB.

Choices are Enabled, Disabled.

Integrated Peripherals

ROM PCI/ISA BIOS (M3600-00)
 INTEGRATED PERIPHERALS
 AWARD SOFTWARE, INC.

IDE HDD Block Mode : Disabled	EPP Mode Select : EPP1.9
IDE Primary Master UDMA : Disabled	
IDE Primary Slave UDMA : Disabled	
On-Chip Primary PCI IDE: Disabled	
USB Keyboard Support : Disabled	
Init Display First : PCI Slot	
KBC input clock : 6 MHz	
Onboard FDC Controller : Disabled	
Onboard Serial Port 1 : Disabled	
Onboard Serial Port 2 : Disabled	
UART Mode Select : IrDA	
UART2 Duplex Mode : Full	
RxD , TxD Active : Hi,Hi	ESC : Quit ↑↓+* : Select Item
IR Transmission delay : Disabled	F1 : Help PU/PD/+/- : Modify
Onboard Parallel Port : Disabled	F5 : Old Values (Shift)F2 : Color
Parallel Port Mode : SPP	F6 : Load BIOS Defaults
ECP Mode Use DMA : 1	F7 : Load Setup Defaults

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled

IDE Primary 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, Disabled.

On-Chip Primary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface

The choice: Enabled, Disabled.

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.

Init Display First

This item allows you to decide to active whether PCI Slot or on-chip VGA first

The choice: PCI Slot, Onboard.

KBC input clock

Set the frequency for the keyboard controller input clock

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.

The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART Mode Select

This item allows you to select UART mode.

The choice: Enabled, Disabled.

UART2 Duplex Mode

This item allows you to select the IR half/full duplex function.

The choice: Half, Full.

RxD, TxD Polarity Active

This item allows you to determine the active of RxD, TxD.

The Choice: i, Hi o, Lo o, Hi i, Lo

IR Transmission delay

This item allows you to select IR transmission delay.

The choice: Enabled, Disabled.

Onboard Parallel Port

This item allows you to determine access onboard parallel port controller with which I/O address.

The choice: 3BC/IRQ7, 378/IRQ7, 278/IRQ5, Disabled.

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select *Normal*, *Compatible*, or *SPP* unless you are certain your hardware and software both support one of the other available modes.

The choice: SPP, EPP, ECP, ECP+EPP.

ECP Mode Use DMA

Select a DMA channel for the parallel port for use during ECP mode.

The choice: 3, 1.

EPP Mode Select

When the Parallel Port Mode field is configured as EPP, ECP+EPP mode, the EPP version needs to be specified. Please check the EPP specifications before selecting field.

The choice: EPP1.7, EPP 1.9

Supervisor/User Password Setting

You can set either supervisor or user password, or both of them. 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 function, 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 you try to enter Setup.

IDE HDD Auto Detection

The Enhance IDE features are 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.

<II> Standard CMOS Setup

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

When HDD type is in user type, the ODE option will be opened for user to select their own HDD mode.

2. HDD Modes

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

NORMAL mode

Generic access mode with neither the BIOS nor the IDE controller will make transformations during access.

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

no. Cylinder	(1024)
x no. Head	(16)
x no. Sector	(63)
x no. per sector	(512)

528 Megabytes

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

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.

4-2 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 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 is no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

FLOOPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOOPY 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.

Hard Disk(s) fail (08)

Sector Verify failed.

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.

Keyboard is locked out-Unlock the key

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

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.

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 test fail

BIOS reports the memory test failure if the onboard memory is tested error.

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.
--

4-3 BIOS Reference - POST Codes

Compressed Version only

POST (hex)	Description
C0	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	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-FFFFFF 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 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	1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers Initialize INT no from 33-120 with Dummy(Spurious) Interrupt Handler 2. Issue CPUID instruction to identify CPU type 3. Early Power Management initialization (OEM specific)
09h	Reserved

For boot block

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	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

Non-Compressed Version only

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

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 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

POST (hex)	Description
30	Detect Base Memory & Extended Memory Size
31	1. Test Base Memory from 256K to 640K 2. Test Extended Memory from 1M to the top of memory
32	1. Display the Award Plug & Play BIOS Extension message (PnP BIOS only) 2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port... according to setup value
33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h
BF	1. Program the rest of the Chipset 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

POST (hex)	Description
	<ul style="list-style-type: none">-initialize all PnP ISA ROMs4. Program shadows RAM according to Setup settings5. Program parity according to Setup setting6. Power Management Initialization<ul style="list-style-type: none">-Enable/Disable global PM-APM interface initialization
53	<ul style="list-style-type: none">1. If it is NOT a PnP BIOS, initialize serial & parallel ports2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value
60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting

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Appendix

Appendix A 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).

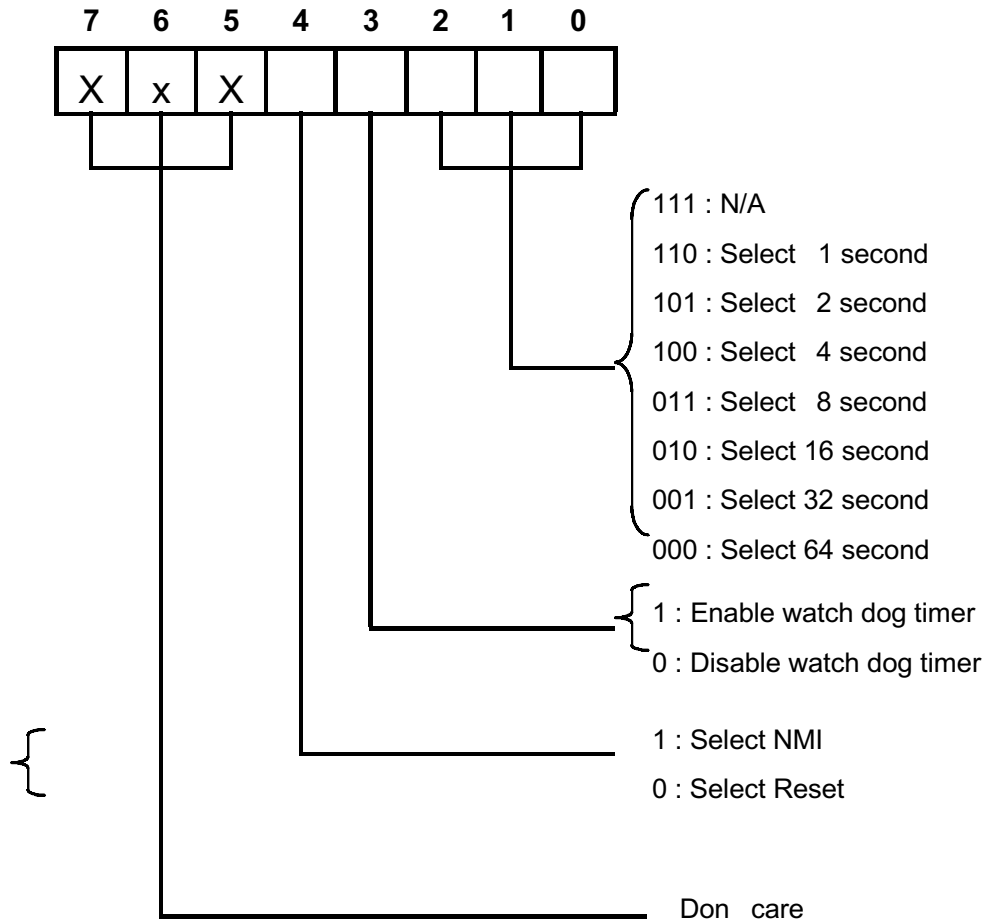
Watch Dog Timer character and function

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	0 0 0	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 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.

