PEAK 6422V

Single Board Computer

User's Guide

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How to use this guide

This manual is written to help you use Peak 6422V.   It describes how to arrange various settings on the Pentium CPU board to meet your requirements.   It is 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 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, "Award BIOS Setup" describes how to use the advanced PCI/Green BIOS to control almost every feature of the Peak 6422V.

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

Contents

Chapter 1   <u>Introduction</u>

Welcome to the PEAK 6422V Dual Pentium III with socket 370 single board computer.

The PEAK 6422V is a brand new generation of advanced technologies.   It's built with high performance Dual Pentium III CPU running 133 MHz Front Side Bus, high performance 64bits/66 MHz PCI Bus, huge memory support (2 GB), and complies with the new PICMG standard. It's excellent to the system integrators, VARs, or turnkey vendor demanding high performance computing, high performance I/O, high data availability, and great system expandability.   The PEAK 6422V is a powerful engine best for the applications such as CTI servers, image animation, video on demand, and any specialized servers needing top computing power, top I/O bandwidth.

The PEAK 6422V can run with Dual Intel Pentium III processor up to 1 GHz, memory support up to 2 GB RDRAM and the memory bus bandwidth could be 3.2 GB per second.   This generates great computing power. The PEAK 6422V also supports ECC not only at the main memory, the ECC capability also extends up to the L2 Cache in the Pentium III CPU, so the data integrity is further enhanced.

One extremely important feature of the PEAK 6422V is its 64 bits/66 MHz PCI bus.   The PCI bus could boost the PCI bandwidth up to 533 MB per second, quadrupling the traditional 32bits/33MHz PCI bus.   This makes the PEAK 6422V most balanced in computing power as well as I/O performance.   The on board VGA is C&T 69000/69030, which is graphics/video accelerator with the on chip memory 2MB/ 4MB (depending on models).   The PEAK 6422V could also be used as the powerful graphic/video platform.   It also supports TFT panel

The on board enhanced PCI IDE interface can support up to mode 4 PIO and Mode 2 DMA master, and the new TAT66 (Ultra DMA66) transfer.   The SMSC LPC47B272 integrates the floppy controller, two serial ports and one parallel port.   The two on-chip UARTs are compatible with NS16C550, and the parallel port support EPP/ECP.   The keyboard/mouse controller is also supported on chip.

The PICMG standard makes the PEAK 6422V work with the legacy ISA back plane and brand new PCI/ISA back plane, and the ISA MAX feature is also built in for ISA add-ons up to 20 boards.   The SSD solution, the socket for Disk On Chip of M-systems is reserved.   It can support the DOC up to 144 MB.

The flash ROM is used to make the BIOS update easier, and the additional keyboard connector is reserved for connecting to the keyboard connector on the back plane.   The brand new Universal Serial Bus (USB) is also supported by this product for more advanced applications. The high precision real time clock/calendar is built in for accurate scheduling and the watchdog timer is also the standard feature.

The PEAK 6422V uses the latest generation Intel 840 chipset, which delivers the fastest speed in CPU, memory as well as the PCI bandwidth.   Moreover, the major operating environments such as Windows NT 4.0, Windows 2000, SCO Open Server 5 and Novell Netware 4 can run with our PEAK 6422V without any modifications.   The emerging new Unix based operating systems like the Red Hat Linux, Free BSD, and the well-established SUN Solaris are also running well with the PEAK 6422V.

1-1 Specifications

- **System Architecture**
  - Full size SBC with 64bits PCI/ISA Golden finger
  - Intel Socket 370 Pentium III with 100/133MHz FSB
  - PCI V2.2 complied
  - PICMG 1.0 (Rev.2.0) complied
  - Intel MPS1.1/1.4 specification complied

- **CPU Support**
  - Intel Pentium III CPU with 256K cache on die
  - Brand New Socket 370 FC-PGA CPU running at 100/133MHz FSB up to 1GHz
  - Dual CPU support
  - Support streaming SIMD instruction

- **Main Memory**
  - Support RDRAM up to 2GB (Max.)
  - 184 pin RIMM socket ×4
  - ECC support (single bit error correction/ multiple bits errors reporting)

- **BIOS**
  - Award System BIOS
  - Plug & Play support
  - Advanced Power Management support
  - Advanced Configuration & Power Interface support
  - 4M bits flash ROM

- **Chipset**
  - Intel 840 Chipset support up to 2-way configurations
  - 64-bits and 66MHz PCI interface
  - 82840 ×1 Memory Controller Hub (MCH)
  - 82801 ×1 Integrated Controller Hub (ICH)
  - 82802 ×1 Firmware Hub (FWH)
  - 82806 ×1 PCI 64 bits Hub (P64H)
  - ITE 8888F ×1 PCI to ISA Bridge

- **On Board VGA**

  - C&T 69000/69030 VGA controller (PCI mode)

  - TFT LCD/DSTN LCD/CRT control

  - 2/4MB SDRAM on die

  - Maximum Res. Color & Refresh Rate

Resolution	Colors	Refresh Rate (Hz)
1280×1024	256	60
1024×768	16bits (High color)	85, 75, 65
800×600	24bits (True color)	85, 75, 65

  - Drivers support：Windows 95/98, Windows NT4.0, Windows 2000

  - 15 pin D-type connector ×1, 50 pin LCD panel connector ×1

- **On Board I/O**

  - SMSC LPC47B272 Enhanced Super I/O on board

  - SIO×2, with 2x16C550 UARTs, 10 pin header ×1, 9 pin D-type connector ×1, Optional RS422/485 ×1

  - PIO×1, bi-directional, EPP/ECP support, 26 pin connector ×1

  - Floppy Disk controller：5.25" 360KB/1.2MB, 3.5" 720KB/1.2MB/1.44MB/2.88MB support, 34 pin connector ×1

  - On chip enhanced IDE x 2, PIO up to mode 4, DMA master up to mode 2, Ultra DMA/66 support, 40 pin connector × 2, total 4 E.IDE devices support

  - On chip Keyboard, mouse controller, 5 pin connector x 1(for Backplane keyboard)； 6 pin mini DIN connector ×2, for PS/2 keyboard and mouse

  - On board USB port ×2 (6 pin header ×1)

  - On Board buzzer ×1

  - On board 2 pin header for SMBus

  - On board 4 pin header for IrDA

  - On Board 2 pin header for reset switch, 4 pin for speaker, 5 pin for keylock & power detected

- **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

  - Seven voltages (For +3.3V, +5V, +12V, −12V, Vtt and Vcore ×2)

  - Two Fan speed (For CPU)

  - Three temperature

  - Drivers support：Windows 95/98, Windows NT4.0/2000

- **Bracket Connector**

ITEM \ MODEL	Peak 6422V	Peak 6422
PS/2 connector (for keyboard/mouse)	2	2
15 pin D-type connector (for VGA)	1	0
9 pin D-type connector (for serial port)	1	1

- **ISAMAX Support**
  - Maximize ISA signals to support ISA cards up to 20 pcs

- **Watch Dog Timer**
  - 1,2,4…64 seconds time-out intervals

- **Dimensions**
  - 340mm(L) $\times$ 122mm(W)

- **Power Requirements**
  - +5V：20A(Max)
  - +12V：500mA(Max)
  - −12V：50mA(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

- **Model Available**
  - PEAK 6422V -- Full-size Dual Socket 370 Pentium III CPU Card w/VGA
  - PEAK 6422 -- Full-size Dual Socket 370 Pentium III CPU Card

1-2   *What you'll have from the package*

In addition to this manual, the PEAK 6422V package includes the following items

ITEM	PEAK6422 / PEAK6422V
PEAK 6422 series CPU Card	1
ATA66 IDE Cable (Ultra DMA66)	2
FDD Cable	1
Serial Port 2 and Parallel Port Cable set	1
Keyboard Cable	1
Rambus RIMM Continuity Module (Dummy Board)	2
Driver Source CD	1
Manual (User's Guide)	1
Thermal Resistor Cabel	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

2-1   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.

Switch Setting Table (*: default setup)

CPU Frequency Setting: (S2)

Frequency	S2.2	S2.3	S2.4
*100MHz	ON	OFF	OFF
133MHz	OFF	OFF	OFF

Serial Port 2: (S3, S4)

Mode	S4.5	S4.6	S4.7	S3.1	S3.2	S3.3	S3.4	S3.5	S3.6	S3.7	S3.8
*RS232	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
RS422	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
RS485	OFF	OFF	ON	ON	OFF	ON	OFF	ON	OFF	ON	OFF

U20: Disk On Chip Configuration Table: (S4)

Active Address	S4.1	S4.2	S4.3	S4.4
C000H	ON	OFF	OFF	OFF
C800H	OFF	ON	OFF	OFF
D000H	OFF	OFF	ON	OFF
*D800H	OFF	OFF	OFF	ON

RTC Clearing: (S2)

Mode	S2.5	S2.6
Clear RTC	OFF	ON
*Normal	ON	OFF

BIOS Hardware Protection: (S4)

Mode	S4.8
*Disable protection	**ON**
Enable Protection	OFF

Approval Panel Model List

Brand	Model	Type	Resolution	Size	Voltage	Panel Switch
Sharp	LM12S40	DSTN	800X600	12.1"	5V	#4 (Note 1)
Sharp	LM12S49	DSTN	800X600	12.1"	3.3V	#4
Sharp	LM12S402	DSTN	800X600	12.1"	3.3V	#4
Prime View	P64CV1	TFT (18Bits)	640X480	6.4"	5V	#5/#6
Prime View	P64CV2	TFT (18Bits)	640X480	6.4"	5V	#5/#6
Sharp	LQ64D341	TFT (18Bits)	640X480	6.4"	5V	#5/#6
Sharp	LQ10D42	TFT (18Bits)	640X480	10.4"	5V	#5/#6
Samsung	121S1-105	TFT (18Bits)	800X600	12.1"	3.3V	#8/#9
Sharp	LQ12S41	TFT (18Bits)	800X600	12.1"	3.3V	#8/#9
Toshiba	LTM12C257A	TFT (18Bits)	800X600	12.1"	5V	#8/#9
Sharp	LQ12S56A	TFT (18Bits)	800X600	12.1"	3.3V	#10
Sharp	LQ14X03E	TFT (36Bits)	1024X768	13.8"	5V	#13
Sharp	LQ15X01W	TFT (36Bits)	1024X768	15"	5V	#13
Sharp	LQ15X1DG11	TFT (36Bits)	1024X768	15"	5V	#13
Samsung	LT133X1-104	LVDS (36Bits)	1024X768	13.3"	5V	#13
Samsung	LT150X1-151	TFT (36Bits)	1024X768	15"	5V	#13

Note 1

Panel Switch	S1.8 (HSB)	S1.7	S1.6	S1.5 (LSB)
*#4	**ON**	**ON**	OFF	OFF
#5	**ON**	OFF	**ON**	**ON**
#6	**ON**	OFF	**ON**	OFF
#8	**ON**	OFF	OFF	OFF
#9	OFF	**ON**	**ON**	**ON**
#10	OFF	**ON**	**ON**	OFF
#13	OFF	OFF	**ON**	**ON**

JP7: Panel Power Switch

Voltage	1-2	2-3
*3.3 V	Open	Short
5 V	Short	Open

2-2 Connectors

<u>Jumper/Connector Define</u>

Connector	Function	Pin No.	Description
J1	CPU2 FAN Connector	1	GND
		2	+12V
		3	Sense
J2	CPU1 FAN Connector	1	GND
		2	+12V
		3	Sense
J3	RIMM_B2		
J4	RIMM_B1		
J6	RIMM_A2		
J7	RIMM_A1		
J8	PANEL Connector	1	Back light control
		2	+12 V
		3	Horizontal Sync.
		4	Data enable
		5	Clock
		6	Vertical Sync.
		7	Data0
		8	Panel power (3.3V/5V)
		9	Data2
		10	Data1
		11	Data24
		12	Data3
		13	Data4
		14	Data25
		15	Data6
		16	Data5
		17	Data26
		18	Data7
		19	Data8
		20	Panel power (3.3V/5V)
		21	Data10

Connector	Function	Pin No.	Description
		22	Data27
		23	Ground
		24	Data9
		25	Data28
		26	Data11
		27	Data12
		28	Data29
		29	Data14
		30	Panel Voltage Bias Enable
		31	Data30
		32	Data13
		33	Ground
		34	Data15
		35	Data16
		36	Data31
		37	Data18
		38	Data17
		39	NC
		40	Ground
		41	Data32
		42	Data19
		43	Data20
		44	Data33
		45	Data22
		46	Data21
		47	Data34
		48	Data23
		49	Ground
		50	Data35
J10	IR Connector	1	+5V
		2	NC
		3	Receive Data
		4	Ground
		5	Transmit Data

Connector	Function	Pin No.	Description
J11	Key Lock Connector	1	+5V
		2	NC
		3	Ground
		4	Key Lock Signal
		5	Ground
J12	Speaker Connector	1	Low Active Signal
		2	Ground
		3	Ground
		4	+5V
J13	Reserved		
J14	Reset Connector	1	Reset Signal
		2	Ground
J15	Primary IDE Connector	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	NC
J16	Secondary IDE Connector	1	Reset #
		2	Ground
		3	Data 7

Connector	Function	Pin No.	Description
		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	NC
		21	DMA REQ
		22	Ground
		23	IOW
		24	Ground
		25	IOR
		26	Ground
		27	IOCHRDY
		28	Pull Down
		29	DMA ACK
		30	Ground
		31	Interrupt 15
		32	NC
		33	Disk Address 1
		34	ATA66 (Ultra DMA66) Detect
		35	Disk Address 0
		36	Disk Address 2
		37	HD (CS100h)
		38	HD (CS300)
		39	HDD Active LED

Connector	Function	Pin No.	Description
		40	Ground
J17	Floppy Connector	1	Ground
		2	Drive Density Select 0
		3	Ground
		4	NC
		5	Ground
		6	Drive Density Select 1
		7	Ground
		8	Index Pulse Input
		9	Ground
		10	Motor On 0
		11	Ground
		12	Drive Select 1
		13	Ground
		14	Drive Select 0
		15	Ground
		16	Motor On 1
		17	Ground
		18	Step Direction
		19	Ground
		20	Step Pulse
		21	Ground
		22	Write Disk Data
		23	Ground
		24	Write Gate
		25	Ground
		26	Track 0
		27	Ground
		28	Write Protected
		29	NC
		30	Read Disk Data
		31	Ground
		32	Head Select
		33	NC
		34	Disk Change
J18	Parallel Connector	1	Strobe

Connector	Function	Pin No.	Description
		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	NC
J19	Serial Port #2	1	Data Carrier Detect (DCD)
		2	Receive Data (RXD)
		3	Transmit Data (TXD)
		4	Data Terminal Ready (DTR)
		5	Ground
		6	Data Set Ready (DSR)
		7	Request To Send (RTS)
		8	Clear To Send (CTS)
		9	Ring Indicator (RI)
		10	Ground
J19	Optional to RS422/485	1	Transmit Data Positive

Connector	Function	Pin No.	Description
		2	Transmit Data Negative
		3	Receive Data Negative (RS-422)
		4	Receive Data Positive (RS-422)
J20	USB Connector	1	+5V
		2	Data 0 Negative
		3	Data 0 Positive
		4	Data 1 Negative
		5	Data 1 Positive
		6	Ground
J21	CRT Connector	1	Red
		2	Green
		3	Blue
		4	+5V Pull-High
		5	Analog Ground
		6	Analog Ground
		7	Analog Ground
		8	Analog Ground
		9	+5V
		10	Analog Ground
		11	NC
		12	DDC Data
		13	Horizontal Sync.
		14	Vertical Sync.
		15	DDC Clock
J22	PS/2 Mouse Connector	1	Data
		2	NC
		3	Ground
		4	+5V
		5	Clock
		6	NC
J23	Serial Port #1	1	Data Carrier Detect (DCD)
		2	Receive Data (RXD)
		3	Transmit Data (TXD)
		4	Data Terminal Ready (DTR)
		5	Ground
		6	Data Set Ready (DSR)

Connector	Function	Pin No.	Description
		7	Request To Send (RTS)
		8	Clear To Send (CTS)
		9	Ring Indicator (RI)
J24	PS/2 Keyboard Connector	1	Data
		2	NC
		3	Ground
		4	+5V
		5	Clock
		6	NC
JP2	HD LED	1	+5V
		2	Low Active Signal
JP3	SMBUS Connector	1	SMBUS Data
		2	SMBUS Clock
JP4	System Thermal Connector	1	Signal Input
		2	Signal Input
JP5	Disk On Module Power Connector	1	+5V
		2	Ground
		3	Ground
		4	+5V
JP6	Keyboard Connector	1	Clock
		2	Data
		3	NC
		4	Ground
		5	+5V

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2-3 Main Board Layout

This chapter gives the definitions and shows where to locate the positions of switches and connectors.
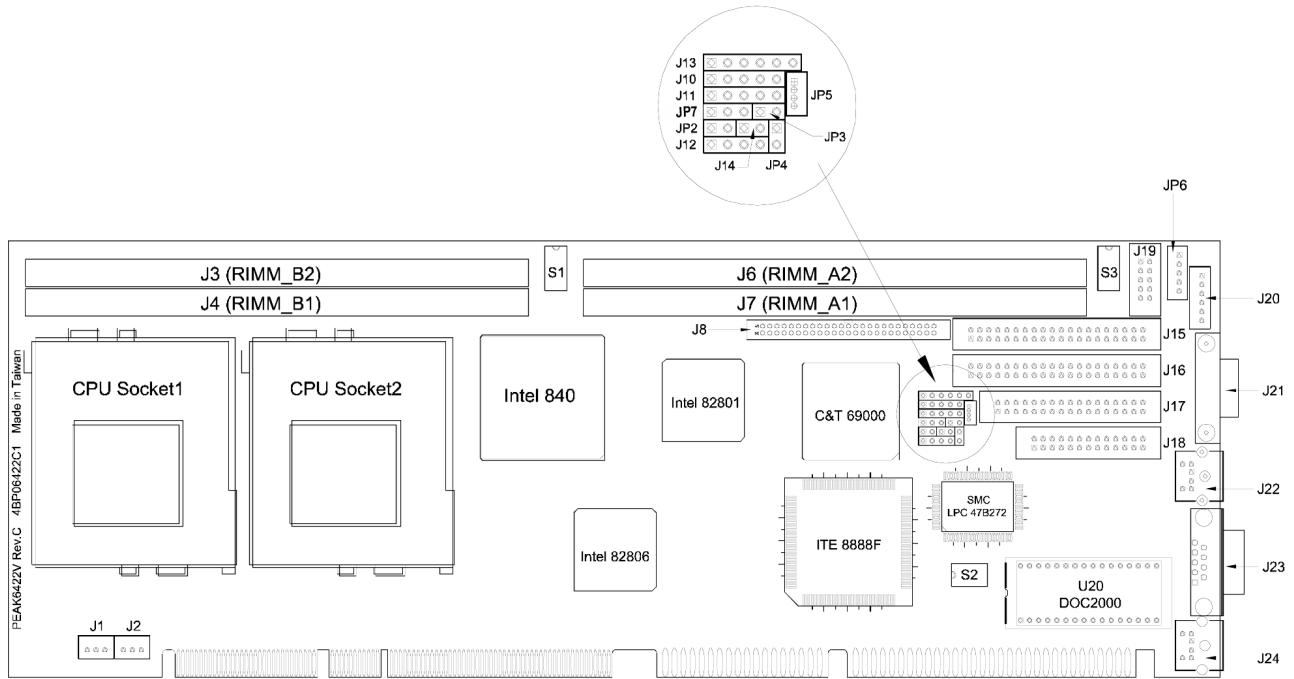
Chapter 3   <u>Capability Expanding</u>

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

3-1   System Memory

PEAK 6422 series can install from 128 MB to 512MB of PC600 or PC800 RDRAM into the four RIMM sockets. The Max.   Support Memory size of 2 GB may be supported with the availability of 512 MB RIMM.

The following table is the currently available RIMM Module technology:

Device / RIMM	64Mbits	128Mbits	256Mbits
4	N/A	64MB Module	128MB Module
8	N/A	128MB Module	256MB Module
16	128MB Module	256MB Module	512MB Module

<u>Memory Configuration</u>

The following table illustrates the memory configuration for installing RIMMs.   The PEAK 6422V has two RDRAM* channels, in which a total of four RIMMs may be installed.   When using only two RIMMs, you must install a Rambus RIMM Continuity Module in those slots that do not contain RIMMs.   In order to optimize memory performance, you must first populate RIMM-1 and RIMM-3, and RIMMs must be installed as described previously in following table, otherwise the Board will not boot.
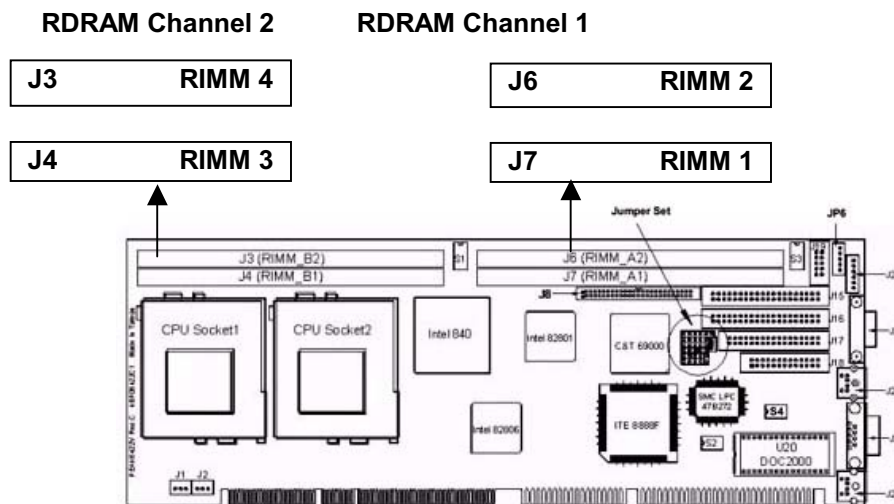
RIMM-C : Rambus RIMM Continuity Module

RIMM 1	RIMM 2	RIMM 3	RIMM 4	Total Size
128MB	RIMM-C	128MB	RIMM-C	256MB
RIMM-C	128MB	RIMM-C	128MB	256MB
256MB	RIMM-C	256MB	RIMM-C	512MB
RIMM-C	256MB	RIMM-C	256MB	512MB
128MB	128MB	128MB	128MB	512MB
256MB	256MB	256MB	256MB	1GB
512MB	RIMM-C	512MB	RIMM-C	1GB
RIMM-C	512MB	RIMM-C	512MB	1GB
512MB	512MB	512MB	512MB	2GB

Note 1:

Make sure the memory in RIMM-1 and RIMM-3 must be the same size, density, type, and speed. The memory in RIMM-2 and RIMM-4 must be the same size, density, type and speed.

Note 2:

It also could be possible with the different size for channel 1 and Channel 2 as follow example. The most important thing is the RIMM 1 and RIMM 3 should be the same, RIMM 2 and RIMM 4 should be the same.

RIMM 1	RIMM 2	RIMM 3	RIMM 4	Total Size
128MB	256MB	128MB	256MB	768MB
256MB	128MB	256MB	128MB	768MB

Installing RIMM

To install the RIMM's, first make sure the two handles of the RIMM socket are in the "open" position, i.e. the handles stay outward.   Slowly slide the RIMM modules along the plastic guides in the both ends of the socket.   Then press the RIMM module down right into the socket, until a click is heard.   That means the two handles automatically locked the memory modules into the right position of the RIMM socket as Figure shows.

Install RDRAM Module
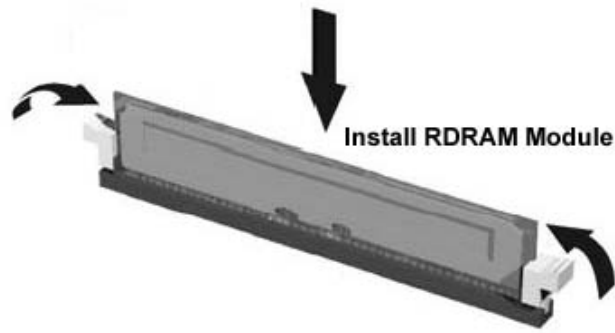
Remove RIMMs

To take away the memory module, just push the both handles outward, the memory module will be ejected by the mechanism in the socket.

3-2   Change CPU

To change the CPU, pull the handling bar of the socket upward to the other end to loosen the socket's openings.   Carefully lift the existing CPU up to remove it from the socket.
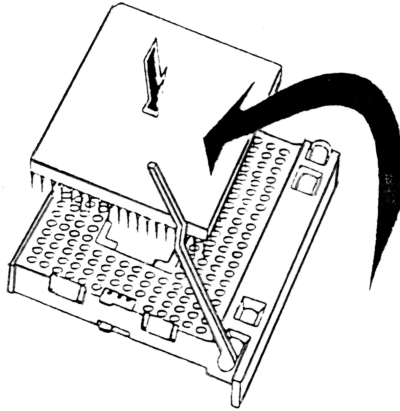
Removing CPU

Place the new CPU on the middle of the socket, orienting its beveled corner to line up with the socket's beveled corner.   Make sure the pins of the CPU fit evenly to the socket openings.   Replace the handling bar to fasten the CPU to the socket.   Be sure to re-arrange the jumper setting for the correct external clock.
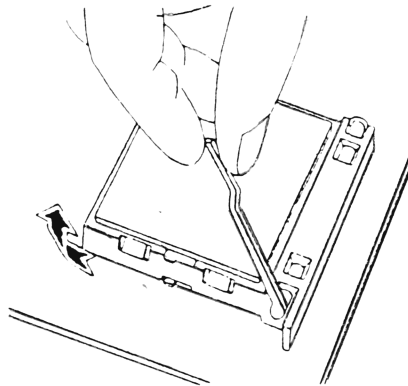
Installing CPU

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 **<Del>** 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 **<Del>** key or simultaneously press **<Ctrl>**, **<Alt>**, and **<Esc>** keys.

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

Control Keys
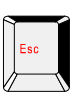
Key		Description
Up arrow	↑	Move to previous item
Down arrow	↓	Move to next item
Left arrow	←	Move to the item in the left hand
Right arrow	→	Move to the item in the right hand
Esc key	Esc	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu.
PgUp / "+" key	Page Up / +	Increase the numeric value or make changes
PgDn / "−" key	Page Down / −	Decrease the numeric value or make changes
F1 key	F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Shift (F2)	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	F3	Reserved
F4 key	F4	Reserved
F5 key	F5	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	F6	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	F7	Load the Setup default value, only for Option Page Setup Menu
F8 key	F8	Reserved
F9 key	F9	Reserved
F10 key	F10	Save all the CMOS changes, only for Main Menu

Table 4-1 Control Keys

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 among the items and press **<Enter>** to accept or enter the sub-menu.

```
        CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
 ┌─────────────────────────────────────────┬──────────────────────────────────┐
 │  ► Standard CMOS Features                │  ► Frequency/Voltage Control      │
 │                                          │                                   │
 │  ► Advanced BIOS Features                │    Load Fail-Safe Defaults        │
 │                                          │                                   │
 │  ► Advanced Chipset Features             │    Load Optimized Defaults        │
 │                                          │                                   │
 │  ► Integrated Peripherals                │    Set Supervisor Password        │
 │                                          │                                   │
 │  ► Power Management Setup                 │    Set User Password              │
 │                                          │                                   │
 │  ► PnP/PCI Configurations                │    Save & Exit Setup              │
 │                                          │                                   │
 │  ► PC Health Status                      │    Exit Without Saving            │
 ├─────────────────────────────────────────┴──────────────────────────────────┤
 │  Esc : Quit      F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item             │
 │  F10 : Save & Exit Setup                                                    │
 ├─────────────────────────────────────────────────────────────────────────────┤
 │                  Time, Date, Hard Disk Type...                              │
 └─────────────────────────────────────────────────────────────────────────────┘
```

Standard CMOS Features

Use this menu for basic system configuration. See Page 4-6 for details.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system. See Page 4-9 for details.

Advanced Chipset features

Use this menu to change the values in the chipset registers and optimize your system's performance. See Page 4-13 for details.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. See Page 4-15 for details.

Power Management setup

Use this menu to specify your settings for power management   See Page 4-18 for details.

PnP/PCI Configuration

This entry appears if your system supports PnP / PCI Configuration.   See Page 4-21 for details.

PC health Status

Display CPU/System Temperature, Fan speed and Voltages Value.   See Page 4-23 for details.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.   See Page 4-24 for details.

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Set 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 4-25 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 11 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.

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                           Standard CMOS Features
 ┌──────────────────────────────────────────────────┬──────────────────────┐
 │   Date (mm:dd:yy)           Fri, Sep  8 2000      │      Item Help       │
 │   Time (hh:mm:ss)           15 : 26 : 11          ├──────────────────────┤
 │                                                   │  Menu Level    ►     │
 │  ► IDE Primary Master                             │                      │
 │  ► IDE Primary Slave                              │  Change the day, month, │
 │  ► IDE Secondary Master                           │  year and century    │
 │  ► IDE Secondary Slave                            │                      │
 │                                                   │                      │
 │   Drive A                   1.44M, 3.5 in.        │                      │
 │   Drive B                   None                  │                      │
 │   Floppy 3 Mode Support     Disabled              │                      │
 │                                                   │                      │
 │   LCD&CRT                   Auto                  │                      │
 │   Halt On                   All,But Keyboard      │                      │
 │                                                   │                      │
 │   Base Memory                     640K            │                      │
 │   Extended Memory               64384K            │                      │
 │   Total Memory                  65024K            │                      │
 └──────────────────────────────────────────────────┴──────────────────────┘

  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
          F5:Previous Values     F6:Fail-Safe Defaults    F7:Optimized Defaults
```

Main Menu Selections

Item	Options	Description
Date	MMM DD YYYY	Set the system date. Note that the 'Week day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu (Described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (Described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (Described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Slave	Options are in its sub menu (Described in Table 4-3)	Press <Enter> to enter the sub menu of detailed options
Drive A	None	Select the type of floppy disk drive installed in your system

Drive B	360K, 5.25 in	
	1.2M, 5.25 in	
	720K, 3.5 in	
	1.44M, 3.5 in	
	2.88M, 3.5 in	
Floppy 3 Mode	Disabled, Drive A, Drive B, Both	3 Mode floppy disk drives (FDD) are 3 1/2" drives used in Japanese computer systems. If you need to access data stored in this kind of floppy, you must select this mode, and of course you must have a 3 Mode floppy drive.
LCD&CRT	LCD	Select the default video device
	CRT	
	AUTO	
	LCD&CRT	
Halt On	All Errors	Select the situation in which you want the BIOS to stop the POST process and notify you
	No Errors	
	All, but Keyboard	
	All, but Diskette	
	All, but Disk/Key	
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

Table 4-2 Main Menu Selections

IDE Adapters

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

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

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

Table 4-3 Hard disk selections

Advanced BIOS Features Setup Menu

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

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Advanced BIOS Features
 ┌──────────────────────────────────────────────┬─────────────────────────┐
 │ Virus Warning              Disabled        ▲ │        Item Help        │
 │ CPU Internal Cache         Enabled           ├─────────────────────────┤
 │ External Cache             Enabled           │ Menu Level    ▶         │
 │ CPU L2 Cache ECC Checking  Enabled           │                         │
 │ Processor Number Feature   Enabled           │ Allows you to choose    │
 │ Quick Power On Self Test   Disabled          │ the VIRUS warning       │
 │ First Boot Device          Floppy            │ feature for IDE Hard    │
 │ Second Boot Device         HDD-0             │ Disk boot sector        │
 │ Third Boot Device          LS/ZIP            │ protection. If this     │
 │ Boot Other Device          Enabled           │ function is enabled     │
 │ Swap Floppy Drive          Disabled          │ and someone attempt to  │
 │ Boot Up Floppy Seek        Enabled           │ write data into this    │
 │ Boot Up NumLock Status     On                │ area, BIOS will show a  │
 │ Gate A20 Option            Fast              │ warning message on      │
 │ Typematic Rate Setting     Enabled           │ screen and alarm beep   │
 │ Typematic Rate (Chars/Sec) 30               │                         │
 │ Typematic Delay (Msec)     250               │                         │
 │ Security Option            Setup             │                         │
 │ MPS Version Control For OS 1.1             ▼ │                         │
 │ OS Select For DRAM > 64MB  Non-OS2           │                         │
 │ HDD S.M.A.R.T. Capability  Disabled          │                         │
 │ 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        ▼ │                         │
 └──────────────────────────────────────────────┴─────────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5:Previous Values     F6:Fail-Safe Defaults    F7:Optimized Defaults
```

Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection.   If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

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: Enabled/Disabled

CPU L2 Cache ECC Checking

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

The Choice: Enabled/Disabled

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: Enabled/Disabled

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: Enabled/Disabled

First / Second / Third Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

The Choice: Floppy, LS/ZIP, HDD, SCSI, CDROM, Disabled.

Boot Other Device

If all the selected boot devices failed to boot, select **Enabled** the BIOS will try to boot from the other boot devices (in a predefined sequence) which are present but not selected as boot devices in the setup (and hence have not yet been tried for booting). If select **Disabled**, that may be present but not selected as boot devices in setup.

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 Gate A20

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.

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 / 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	Optional shadow is disabled

Note: For C8000-DFFFF option-ROM on PCI BIOS , BIOS will automatically enable the shadow RAM. User does not have to select the item.

Advanced 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.

```
            CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Advanced Chipset Features

    RDRAM Bus Frequency       300 MHz           │         Item Help
    DRAM Data Integrity Mode  Non-ECC           │
    System BIOS Cacheable     Enabled           │  Menu Level    ►
    Video  BIOS Cacheable     Enabled           │
    Video RAM Cacheable       Disabled          │
    Memory Hole At 15M-16M    Disabled          │
    Delayed Transaction       Enabled           │
    AGP Aperture Size (MB)    64                │




↑↓→+:Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help
      F5:Previous Values      F6:Fail-Safe Defaults      F7:Optimized 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.

RDRAM Bus Frequency

This item defines the RDRAM bus frequency.

The Choice: 400MHz, 356MHz, 300MHz, 266MHz.

DRAM Data Integrity Mode

Select Parity or ECC (error check & correction), according to the type of installed DRAM.

The Choice: Non-ECC, ECC.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance.　　However, if any program writes to this memory area, a system error may result.

The Choice: Enabled, Disabled.

Video BIOS Cacheable

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

The Choice: Enabled, Disabled.

Video RAM Cacheable

Select Enabled allows caching of the video RAM, resulting in better system performance.　　However, if any program writes to this memory area, a system error may result.

The Choice: Enabled, Disabled.

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.

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 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.

The Choice: 4M, 8M, 16M, 32M, 64M, 128M, 256M.

Integrated Peripherals

```
       CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                         Integrated Peripherals
  ┌──────────────────────────────────────────────┬─────────────────────┐
  │ On-Chip Primary   PCI IDE    Enabled      ▲   │      Item Help      │
  │ On-Chip Secondary PCI IDE    Enabled          │                     │
  │ IDE Primary Master PIO       Auto             │  Menu Level    ▶    │
  │ IDE Primary Slave  PIO       Auto             │                     │
  │ IDE Secondary Master PIO     Auto             │                     │
  │ IDE Secondary Slave  PIO     Auto             │                     │
  │ IDE Primary Master UDMA      Auto             │                     │
  │ IDE Primary Slave  UDMA      Auto             │                     │
  │ IDE Secondary Master UDMA    Auto             │                     │
  │ IDE Secondary Slave  UDMA    Auto             │                     │
  │ USB Controller               Enabled          │                     │
  │ USB Keyboard Support         Disabled         │                     │
  │ Init Display First           PCI Slot         │                     │
  │ IDE HDD Block Mode           Enabled          │                     │
  │ Onboard FDC Controller       Enabled          │                     │
  │ Onboard Serial Port 1        3F8/IRQ4         │                     │
  │ Onboard Serial Port 2                         │                     │
  │ UART Mode Select                              │                     │
  │ UR2 Duplex Mode              Half         ▼   │                     │
  │ TxD, RxD Polarity Active     Lo, Hi           │                     │
  │ Use IR Pins                  IR-Rx2Tx2        │                     │
  │ Onboard Parallel Port                         │                     │
  │ Parallel Port Mode                            │                     │
  │ ECP Mode Use DMA             3           ▼   │                     │
  └──────────────────────────────────────────────┴─────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5:Previous Values     F6:Fail-Safe Defaults    F7:Optimized Defaults
```

On-Chip Primary/Secondary PCI IDE

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

The choice: Enabled, Disabled.

Note: 1. On-chip Secondary PCI IDE:

> Enabled: enable secondary IDE port and BIOS will assign IRQ15 for this port.

> Disabled: disable secondary IDE port and IRQ15 is available for other device. The item is optional only for PCI BIOS.

2. 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 "disabled" then CD-ROM can work.

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 on-Board IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3 and Mode 4.

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, Disabled.

USB Controller

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

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.

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

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 add-on FDC Controller Card 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: Normal, .IrDA, ASKIR

UR2 Duplex Mode

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

The Choice: Half, Full.

TxD, RxD Polarity Active

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

The Choice: "Hi, Hi", "Lo, Lo", "Lo, Hi", "Hi, Lo".

Use IR Pins

This item allows you to select IR transmission routes, one is RxD2m, TxD2 (COM Port) and the other is IR-Rx2Tx2.

The Choice: IR-Rx2Tx2, RxD2,TxD2.

Onboard Parallel Port

This item allows you to determine access On-Board 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 On-Board 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.

Power Management Setup

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

```
        CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Power Management Setup
  ┌─────────────────────────────────────────────────┬──────────────────────┐
  │ ACPI Function             Enabled                │     Item Help        │
  │ Power Management          Min Saving             ├──────────────────────┤
  │ Video Off Method          DPMS                   │ Menu Level     ►     │
  │ Video Off In Suspend      Yes                    │                      │
  │ Suspend Type              Stop Grant             │                      │
  │ MODEM Use IRQ             3                       │                      │
  │ Suspend Mode              1 Hour                 │                      │
  │ HDD Power Down            15 Min                 │                      │
  │ Soft-Off by PWR-BTTN      Instant-Off            │                      │
  │ Wake-Up by PCI card       Disabled               │                      │
  │ CPU THRM-Throttling       50.0%                  │                      │
  │                                                  │                      │
  │ ** Reload Global Timer Events **                 │                      │
  │ Primary IDE 0             Disabled               │                      │
  │ Primary IDE 1             Disabled               │                      │
  │ Secondary IDE 0           Disabled               │                      │
  │ Secondary IDE 1           Disabled               │                      │
  │ FDD,COM,LPT Port          Disabled               │                      │
  │ PCI PIRQ[A-D]#            Disabled               │                      │
  └─────────────────────────────────────────────────┴──────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
      F5:Previous Values    F6:Fail-Safe Defaults    F7:Optimized Defaults
```

ACPI Function

This item allows you to Enable/Disable the Advanced Configuration and Power Interface (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.

Disabled (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'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 Disabled. |

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 In Suspend

This determines the manner in which the monitor is blanked.

The Choice: Yes, No.

Suspend Type

Select the Suspend Type.

The Choice: PWRON Suspend, Stop Grant.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The Choice: 3, 4, 5, 7, 9, 10, 11, NA.

Suspend Mode

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

The Choice: Enabled, Disabled.

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.

The Choice: Enabled, Disabled.

Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung".

The Choice: Delay 4 Sec, Instant-Off.

Wake-Up by PCI card

When enabled, you can "wake-up" your system using a PCI rev2.2 card, when a "PME#" event occurring.

The Choice: Enabled, Disabled.

CPU THRM-Throttling

Select the CPU THRM-Throttling rate.

The Choice: 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

PM Events (Reload Global Timer Events)

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

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

If enabled, timer will be reloaded when any of these interrupts occurs.

Primary IDE 0

If enabled, timer will be reloaded when master disk of primary IDE channel is active.

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

If enabled, timer will be reloaded when any of these interrupts occurs.

Primary IDE 0

If enabled, timer will be reloaded when master disk of primary IDE channel is active.

Primary IDE 1

If enabled, timer will be reloaded when slave disk of primary IDE channel is active.

Secondary IDE 0

If enabled, timer will be reloaded when master disk of secondary IDE channel is active.

Secondary IDE 1

If enabled, timer will be reloaded when slave disk of secondary IDE channel is active.

Floppy Disk

If enabled, timer will be reloaded when floppy disk is active.

Serial Port

If enabled, timer will be reloaded when serial port is active.

Parallel Port

If enabled, timer will be reloaded when parallel port is active.

PnP/PCI Configuration

This section describes configuring the PCI bus system. **P**eripheral **C**omponent **I**nterface, 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.

```
              CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                              PnP/PCI Configurations
 ┌─────────────────────────────────────────────────────┬──────────────────────┐
 │   PNP OS Installed           Yes                     │      Item Help       │
 │   Reset Configuration Data   Disabled                ├──────────────────────┤
 │                                                      │ Menu Level    ►      │
 │   Resources Controlled By    Auto(ESCD)              │                      │
 │   M-System Memory Base       N/A                     │ Select Yes if you are│
 │ x IRQ Resources              Press Enter             │ using a Plug and Play│
 │ x DMA Resources              Press Enter             │ capable operating    │
 │ x Memory Resources           Press Enter             │ system Select No if  │
 │                                                      │ you need the BIOS to │
 │   PCI/VGA Palette Snoop       Disabled               │ configure non-boot   │
 │   Assign IRQ For VGA          Enabled                │ devices              │
 │   Assign IRQ For USB          Enabled                │                      │
 │   INT Pin 1 Assignment        Auto                   │                      │
 │   INT Pin 2 Assignment        Auto                   │                      │
 │   INT Pin 3 Assignment        Auto                   │                      │
 │   INT Pin 4 Assignment        Auto                   │                      │
 │                                                      │                      │
 │                                                      │                      │
 └─────────────────────────────────────────────────────┴──────────────────────┘
 ↑↓→←:Move   Enter:Select   +/-/PU/PD:Value  F10:Save   ESC:Exit  F1:General Help
      F5:Previous Values      F6:Fail-Safe Defaults     F7:Optimized Defaults
```

PNP OS Installed

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

The Choice: Yes, No.

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 Card and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

The choice: Enabled, Disabled .

Resources 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. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field.

The Choice: Auto (ESCD), Manual.

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*.

Memory Resources

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

Used MEM Length

This item is available only when the Used MEM Base Addr has been assigned a base address. It specifies the memory size for the add-in card used.

The Choice: 8K, 16K, 32K, 64K

M-System Memory Base

N/A

PCI/VGA Palette Snoop

Leave this field at Disabled.

The Choice: Enabled, Disabled.

Assign IRQ For VGA/USB

Enabled/Disable to assign a IRQ for VGA/USB.

The Choice: Enabled, Disabled.

PC Health Status

```
         CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                            PC Health Status
┌───────────────────────────────────────────────┬─────────────────────────┐
│  Warning Temp. Beep          Enabled           │        Item Help        │
│  CPU Warning Temperature     120               │                         │
│  Current CPU1 Temperature                      │   Menu Level    ►       │
│  Current CPU2 Temperature                      │                         │
│  Current System Temp.                          │                         │
│  Vtt                                           │                         │
│  + 3.3V                                        │                         │
│  + 5  V                                        │                         │
│  +12  V                                        │                         │
│  -12  V                       _                │                         │
│  - 5  V                       _                │                         │
│  + 2.5V                                        │                         │
│  CPU1 Vcore                                    │                         │
│  CPU2 Vcore                                    │                         │
│  Current CPUFAN1 Speed                         │                         │
│  Current CPUFAN2 Speed                         │                         │
│                                                │                         │
│                                                │                         │
│                                                │                         │
└───────────────────────────────────────────────┴─────────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5:Previous Values    F6:Fail-Safe Defaults    F7:Optimized Defaults
```

CPU Warning Temperature

This item will prevent CPU from overheating.

The Choice: 30-120.

Frequency/Voltage Control

```
CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                  Frequency/Voltage Control
┌─────────────────────────────────────────────┬───────────────────────┐
│  CPU Clock Ratio          X 3               │      Item Help         │
│                                             ├───────────────────────┤
│                                             │  Menu Level    ▶      │
│                                             │                        │
│                                             │                        │
│                                             │                        │
│                                             │                        │
│                                             │                        │
│                                             │                        │
│                                             │                        │
│                                             │                        │
│                                             │                        │
└─────────────────────────────────────────────┴───────────────────────┘
 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5:Previous Values    F6:Fail-Safe Defaults    F7:Optimized Defaults
```

CPU Clock Ratio

This item allows you to set the CPU clock ratio, but this function depends on different CPU performance. It is only effective for those clock ratio haven't been locked.

The Choice: X3.0, X3.5, X4.0, X4.5, X5.0, X5.5, X6.0, X6.5, X7.0, X7.5, X8.0.

Supervisor/User Password Setting

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

supervisor password : can enter and change the options of the setup menus.

user password   **:** just can only enter but do not have the right to change   the options of the setup menus. When you select this 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 trying to enter Setup.

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 <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.

BIOS ROM checksum error-System halted.

The checksum of ROM address F0000H-FFFFFH is bad.

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 CONTROLLER ERROR OR NO CONTROLLER PRESENT

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

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy Type mismatch.

Hard Disk(s) fail (80)

HDD reset failed

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate Hard 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 configurating the system without a keyboard, set the error halt condition in Setup to "HALT ON", item to "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 pulled 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 fail if the On-Board 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 find and replace the bad memory chips

OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the Address 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 configurated 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

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below). -Program basic chipset registers.
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below).
C3h	Expand compressed BIOS code to DRAM.
C5h	Call chipset hook to copy BIOS back to E000h & F000h shadow RAM..
01h	Expand the Xgroup codes locating in physical address 1000h:0.
02h	Reserved.
03h	Initial Superio_Early_Init switch.
04h	Reserved.
05h	1. Blank out screen. 2. Clear CMOS error flag.
06h	Reserved.
07h	1. Clear 8042 interface. 2. Initialize 8042 self-test.
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved.
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000

POST (hex)	Description
	for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform).
20h	Reserved
21h	HPM initialization (notebook platform).
22h	Reserved

23h	1. Check validity of RTC value:
	
	     e.g. a value of 5Ah is an invalid value for RTC minute.
	
	 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.
	
	 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information.
	
	 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots.
	
	 5. Early PCI initialization:
	
	      -Enumerate PCI bus number
	
	      -Assign memory & I/O resource
	
	      -Search for a valid VGA device & VGA BIOS, and put it into C000h:0.

POST (hex)	Description
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09h buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640KB memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: On-Board IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Ah	Reserved.
2Bh	Reserved.
2Ch	Reserved.
2Dh	1. Initialize multi-language . 2. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved.
2Fh	Reserved.
30h	Reserved.
31h	Reserved.
32h	Reserved.
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved.
35h	Reserved.
36h	Reserved.
37h	Reserved.
38h	Reserved.
39h	Reserved.
3Ah	Reserved.
3Bh	Reserved.
3Ch	Test 8254.
3Dh	Reserved.
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved.

POST (hex)	Description
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved.
42h	Reserved.
43h	Test 8259 functionality.
44h	Reserved.
45h	Reserved.
46h	Reserved.
47h	Initialize EISA slot.
48h	Reserved.
49h	1. Calculate total memory by testing the last double word of each 64KB page. 2. Program write allocation for AMD K5 CPU.
4Ah	Reserved.
4Bh	Reserved.
4Ch	Reserved.
4Dh	Reserved.
4Eh	1. Program MTRR of M1 CPU. 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved.
50h	Initialize U.SB
51h	Reserved.
52h	Test all memory (clear all extended memory to 0).
53h	Reserved.
54h	Reserved.
55h	Display number of processors (multi-processor platform).
56h	Reserved.
57h	1. Display PnP logo. 2. Early ISA PnP initialization. -Assign CSN to every ISA PnP device.
58h	Reserved.
59h	Initialize the combined Trend Anti-Virus code.

POST (hex)	Description
5Ah	Reserved.
5Bh	(Optional Feature). Show message for entering AWDFLASH.EXE from FDD (optional).
5Ch	Reserved.
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage users can enter the CMOS setup utility.
61h	Reserved.
62h	Reserved.
63h	Reserved.
64h	Reserved.
65h	Initialize PS/2 Mouse.
66h	Reserved.
67h	Prepare memory size information for function call: INT 15h ax=E820h.
68h	Reserved.
69h	Turn on L2 cache.
6Ah	Reserved.
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved.
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved.
6Fh	1. Initialize Floppy controller. 2. Setup Floppy related fields in 40:hardware.
70h	Reserved.
71h	Reserved.
72h	Reserved.
73h	(Optional Feature).

POST (hex)	Description

	Enter AWDFLASH.EXE if :
	
	     -AWDFLASH is found in Floppy Drive.
	
	     -"ALT+F2" is pressed.

74h	Reserved.
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved.
77h	Detect Serial ports & Parallel ports.
78h	Reserved.
79h	Reserved.
7Ah	Detect & install Co-processor.
7Bh	Reserved.
7Ch	Reserved.
7Dh	Reserved.
7Eh	Reserved.

7Fh	1. Switch back to text mode if full screen logo is supported.
	
	     -If errors occur, report errors & wait for keys.
	
	     -If no errors occur or "F1" key is pressed to continue.
	
	 2. Clear EPA or customization logo.

80h	Reserved.
81h	Reserved.
	E8POST.ASM starts
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo). 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS.
84h	Initialize ISA PnP boot devices.
85h	1. USB final Initialization. 2. NET PC: Build SYSID structure. 3. Switch screen back to text mode. 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs. 6. Assign IRQs to PCI devices. 7. Initialize APM.

POST (hex)	Description
	8. Clear noise of IRQs.
86h	Reserved.
87h	Reserved.
88h	Reserved.
89h	Reserved.
90h	Reserved.
91h	Reserved.
92h	Reserved.
93h	Read HDD boot sector information for Trend Anti-Virus code.
94h	1. Enable L2 cache. 2. Program boot up speed. 3. Chipset final initialization. 4. Power management final initialization. 5. Clear screen & display summary table. 6. Program K6 write allocation. 7. Program P6 class write combining.
95h	1. Program daylight saving. 2. Update keyboard LED & typematic rate.
96h	1. Build MP table. 2. Build & Update ESCD. 3. Set CMOS century to 20h or 19h. 4. Load CMOS time into DOS timer tick. 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h).

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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).
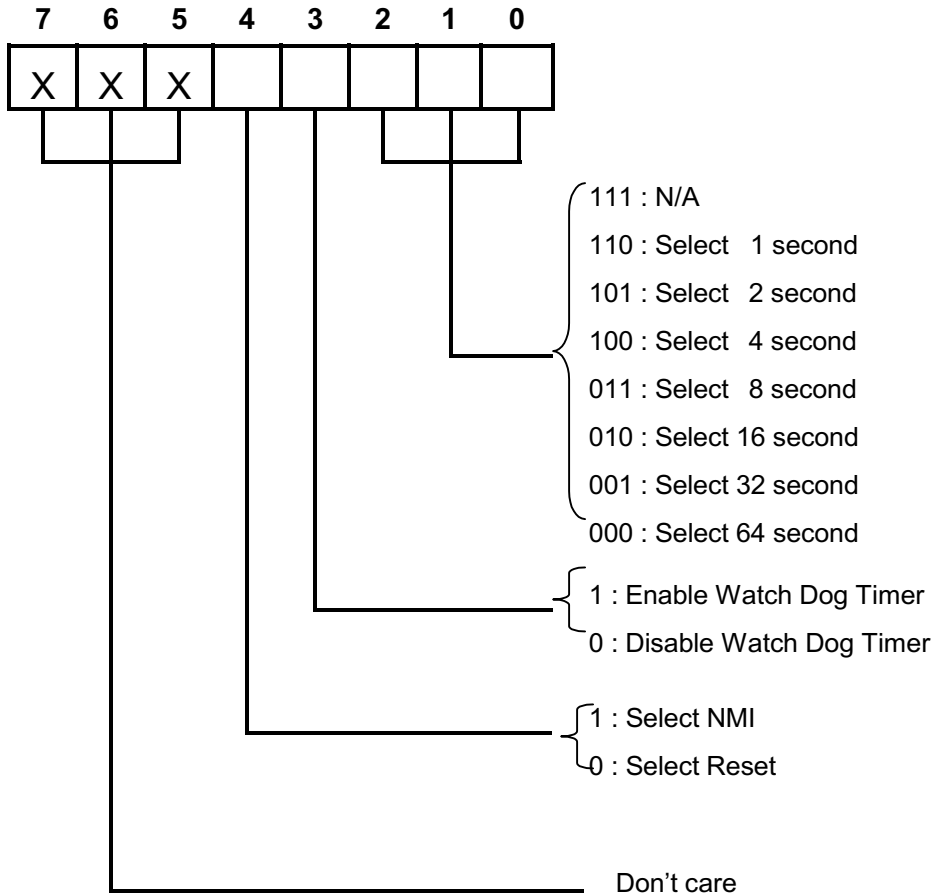
Watch Dog Timer character and function

WDT Configuration port	F2h	Default at F2h
Watch Dog Timer	Disabled	1. Default at Disabled
	Enabled	2. Enabled for user's programming
WDT Time out active for	Reset	Default at Reset
	NMI	
WDT Active Time	1 sec	Default at 64 sec
	2 sec	
	4 sec	
	8 sec	
	16 sec	
	32 sec	
	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.


```
  7   6   5   4   3   2   1   0
  X   X   X
```

111 : N/A

110 : Select   1 second

101 : Select   2 second

100 : Select   4 second

011 : Select   8 second

010 : Select 16 second

001 : Select 32 second

000 : Select 64 second

1 : Enable Watch Dog Timer

0 : Disable Watch Dog Timer

1 : Select NMI

0 : Select Reset

Don't care

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 Component 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 F2h.

   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 F2h).

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

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

3. Enabled or Disabled the WDT (decide D3 value in F2h).

   i.e. D3=0, Disabled the WDT

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

   i.e. D3=1, Enabled 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.