NEX 6320A

ATX Industry Server Board

User's Guide

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How to use this guide

This manual is written to help you use NEX 6320A. It 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'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 Board by changing the system memory and CPU to get more power out from the board.

Chapter 4, "Award BIOS Setup" describes how to use the advanced PCI/Green BIOS to control almost every feature of the NEX 6320A

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

Contents

Chapter 1   Introduction

Welcome to the NEX 6320A ATX Dual Socket 370 Celeron/Pentium III AIO Main Board.

The NEX 6320A is a full function ATX main board with VGA, Dual LAN, Dual SCSI and other enhanced I/O interfaces.   This NEX 6320A supports Intel Dual Pentium III up to 66/100/133 FSB MHz up to 1 GHz CPU clock.   Memory accepts up to 1GB SDRAM and 4 DIMMs on board.   It equips on board C&T 69000 VGA controller with 2MB on die supporting CRT and Panel and provides dual Intel 82559 Ethernet controllers.   In addition, it offers Adaptec AIC 7899 dual channel Ultra 160 SCSI controller. Providing dual-channel Ultra/160m SCSI and dual Ethernet ports on board, the NEX 6320A meets the requirement of the ISP servers without slots expansion. The major feature summarize as follow:

1. Dual Pentium III FC-PGA support, 66/ 100 / 133 MHz FSB, up to 1 GHz CPU clock.

2. Memory up to 1 GB SDRAM, all ECC support, 4 DIMMs on board.

3. On board VGA with 2 MB on die, CRT and Panel support. C&T 69000 single chip VGA.

4. On board Dual 10/ 100 baseTX Ethernet ports, Intel 82559 Ethernet controller x 2.

5. On board Dual-channel Ultra/160m SCSI, Adaptec 7899 SCSI controller.

6. On board PCI bridgex1, Intel 21150 PCI bridge controller.

7. Expansion slots: PCIx5, ISAx1, 2X AGP slotx1.

8. 2S1P, FDCx1, IDEx2 with power header for DOM, Watch Dog Timer, I^2C, GPIO, RTC….,etc.

Features vs. Form Factor

With rich features including LAN, SCSI and VGA on board, the NEX 6320A could be used in the 1U/2U chassis for Internet/Intranet Web servers now in high demand in the market.   The NEX 6320A offers dual-channel Ultra/160m SCSI and dual LAN ports on board meeting the requirement of the ISP servers without slots expansion.   Moreover, all these features could be put into a 1U chassis. The NEX 6320A is the smallest all-in-one DP server board in its kind. Following the rigid standards of the ATX form factors, The NEX 6320A would be the best choice for any ATX compliant chassis or container. The NEX 6320A series are created for the PC chassis from desktop to big tower, for the rack mount chassis from 1U to 10U. NEXCOM bring the industrial grade servers with the popular form factors for all the users requiring rock-solid reliability and space efficient.

1-1   Specifications

- **System Architecture**
  - Standard ATX form factor with dual Pentium III CPU support
  - AIO board with dual channel Ultra 160 SCSI, dual channel Ethernet and VGA
  - Next generation sever with industry specificatio

- **CPU Support**
  - Intel Dual Celeron/Pentium III (Coppermine process) CPU with 128/256K cache on die
  - Brand New Socket 370 FC-PGA CPU running at **66/100/133MHz FSB up to 933MHZ+**
  - Support streaming SIMD instruction

- **Main Memory**
  - Support SDRAM up to 1GB (Max.)
  - 168 pin DIMM socket $\times$4
  - ECC support (single bit error correction/Multiple bit errors reporting)

- **BIOS**
  - Award System BIOS
  - Plug & Play support
  - Advanced Power Management support
  - Advanced Configuration & Power Interface support
  - Jumperless for CPU FSB
  - 2M bits flash ROM, upgradeable to 4M bits

- **Chip Set**
  - Intel 440BX AGP set
  - 66/100/133MHz FSB support
  - PCI V2.1 complied
  - Optimized SDRAM support

- **On Board VGA**

  - C&T 69000 VGA controller (PCI mode)

  - 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

- **On Board LAN**

  - Intel 82559 Single Ethernet controller × 2

  - 10 Base T/100 Base TX support, full duplex

  - Complied with PCI V2.1, IEEE802.3, IEEE 802.3U

  - Drivers support：DOS/Windows, **Windows 95/98/2000**, Windows NT4.0, Netware, SCO Open Server 5.0, **Linux**

  - Rear Panel 4 LAN LED (active/link ×2, speed ×2)

- **On Board SCSI**

  - Adaptec AIC 7899 dual channel Ultra 160 SCSI controller

  - Brand New Ultra 160 SCSI support

  - 80MB/s (Max.) transfer rate, up to 12 meter cable

  - Backward compatible with Ultra Wide SCSI, SCSI II, etc.

  - Drivers support：**Windows 95/98/2000**, Windows NT4.0, SCO Open Server 5.0

  - 68 pin SCSI connector × 2

  - On board 4 pin header for LED

- **On Board I/O**

  - Winbond W83977 Super I/O on board

  - SIO × 2, with 2 × 16C550 UARTs

  - PIO × 1, Bi-directional, EPP/ECP support

  - 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 × 2, PIO up to mode 4, DMA master up to mode 2, Ultra DMA/33 support, total 4 E.IDE Devices support, 40 pin connector × 2

  - On chip keyboard, mouse controller

  - On board USB port × 2

  - On board buzzer × 1

- IrDA connector × 1
- On board 2 pin header for I^{2}C
- On board reserved 4 in/4 out digital I/O
- On board 2 pin header for reset SW, 4 pin for speaker, 5 pin for keylock and power LED

- **ACPI Function**
  - Soft off
  - Wake On LAN
  - Wake On Keyboard
  - Wake On Ring
  - RTC alarm wake up

- **On Board Slot**
  - Total 6 slots, include AGP slot ×1, ISA slot ×1, PCI slot ×5 (reserved 1 horizontal PCI slot expand for 1U chassis, **2 or 3 horizontal PCI slot expand for 2U chassis**)

- **On Board RTC**
  - High precision real time clock/calendar with battery back up

- **IDE interface Disk On Module support**
  - On board reserved power pin for DOM (DiskOnModule)：4MB~160MB, etc

- **System Monitor**
  - Winbond W83782D system monitor controller
  - Eight voltage (For +3.3V, +5V, 5V STBY, +12V, −12V, Vtt and Vcore ×2)
  - Two Fan speed (For CPU)
  - Two temperature (For CPU)
  - Drivers support：Windows 95/98, Windows NT4.0/2000

- **Power Input**
  - ATX power connector ×1

- **Back Panel**
  - PS2 connector × 2 (for Keyboard/Mouse)
  - USB port × 2
  - RJ45 connector × 2 (for LAN)
  - 15 pin D-type connector × 1 (for VGA)
  - 9 pin D-type connector × 2 (for SIO)
  - 25 pin D-type connector × 1 (for PIO)
  - LAN LED × 4 (active/link × 2, speed × 2)

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

- **Dimensions**
  - Dimensions：305mm(L) x 244mm(W)

- **Power Requirements**
  - +3.3V：10A
  - +5V：20A
  - +12V：500mA
  - 5VSTBY：1A

- **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**
  - NEX 6320A -- ATX Dual Socket 370 Celeron/Pentium III AIO Main Board
  - NEX 6320VL2-- ATX Dual Socket 370 Celeron/Pentium III Main Board w/VGA/Dual LAN
  - NEX 6320 -- ATX Dual Socket 370 Celeron/Pentium III Main Board

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

In addition to this manual, the NEX 6320A package includes the following items

ITEM Model	NEX 6320A	NEX 6320VL2	NEX 6320
NEX 6320 series ATX Server Board	1	1	1
Cable Set for IDE & FDD cable	1	1	1
SCSI Cable	Optional	X	X
Quick reference guide sticker	1	1	1
Driver CD (User manual included)	1	1	1
Rear I/O Gasket	1	1	1

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

Chapter 2   Switches and Connectors

2-1   Main Board Layout

This chapter gives the definitions and shows where to locate the positions of switches and connectors.
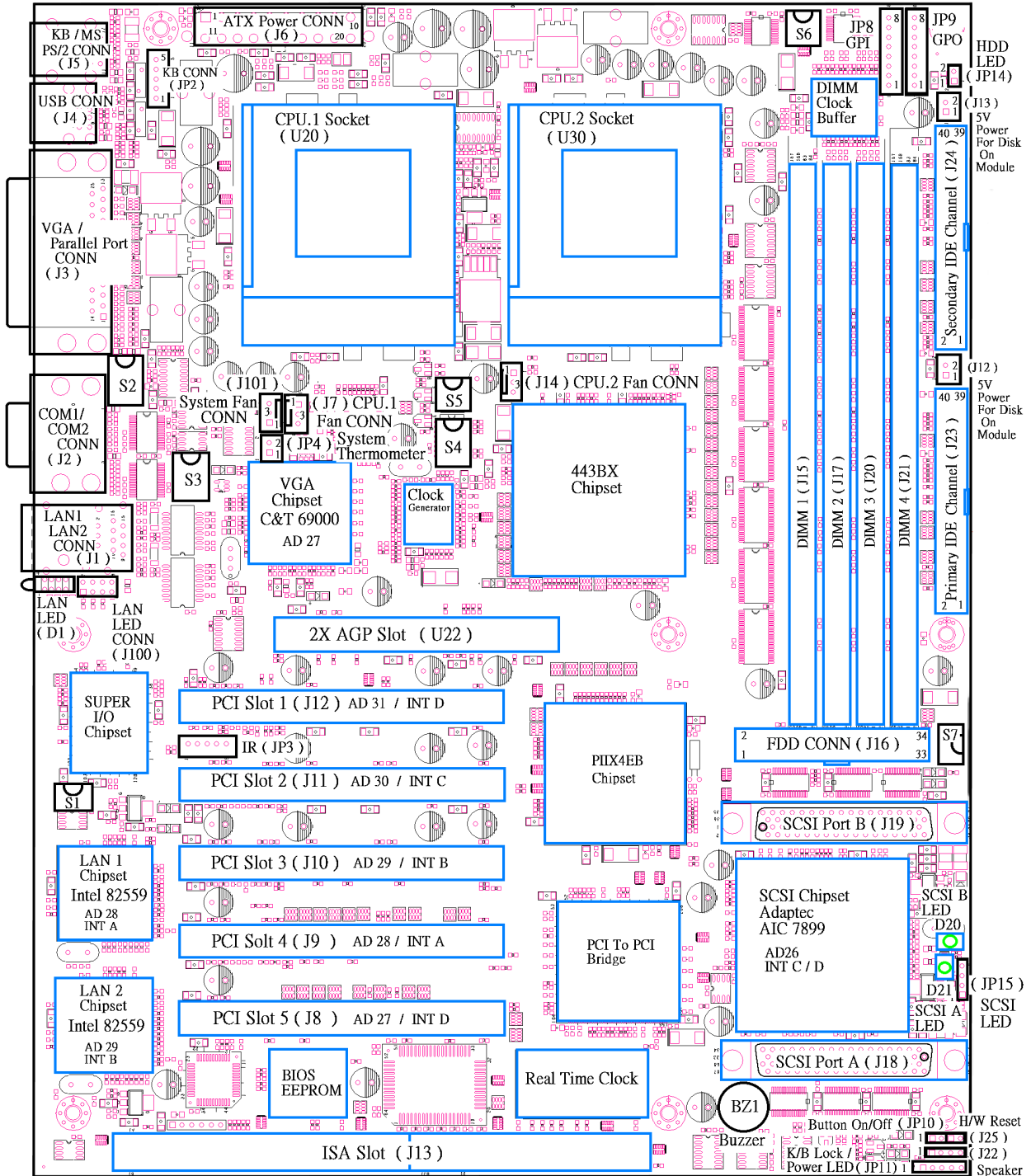
2-2   Switches

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)

Host Bus Frequency

	S4.1	S4.2	S4.3
66 / 60 MHz	ON	ON	ON
* 100 /133 MHz	**OFF**	**OFF**	**ON**

CPU Clock Frequency

CPU Clock	PCI Clock	S4.4	S4.5
* 100MHz	**33MHz**	**OFF**	**ON**
66MHz	33MHz	ON	ON
133MHz	33MHz	OFF	OFF

CPU Type

* Pentium III (Coppermine)	**S5.1**	**ON**
	S5.2	**OFF**
	S5.3	**ON**
	S5.4	**OFF**
Celeron	S5.1	OFF
	S5.2	ON
	S5.3	OFF
	S5.4	ON

On Board SCSI Active Terminal Resistor

		* Auto	**Always Enable**
Channel A	S7.1	**OFF**	ON
Channel B	S7.2	**OFF**	ON

COM2 Mode   (RS 232 / 422 / 485)

	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S2.7	S2.8	S3.1	S3.2	S3.3
* RS232	**OFF**	**ON**	**OFF**	**ON**	**OFF**	**ON**	**OFF**	**ON**	**ON**	**OFF**	**OFF**
RS422	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
RS485	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	ON

On Board VGA Enable

	*Enable	**Disable**
S3.7	**OFF**	ON

LAN1 / LAN2 Enable

		* Enable	**Disable**
LAN1	S1.1	**OFF**	ON
LAN2	S1.2	**OFF**	ON

KEYBOARD Password On

	Disable	*** Normal**
S3.6	ON	**OFF**

Clear CMOS Memory

	Clear	*** Normal**
S3.4	ON	**OFF**

BIOS Flash-able

	* Enable	**Disable**
S3.5	**ON**	OFF

Multiplier of CPU Frequency (Only for Intel CPU Engineer Sample)

Multiplier	S6.1	S6.2	S6.3	S6.4
X2	ON	ON	ON	ON
X3	ON	OFF	ON	ON
X4	OFF	ON	ON	ON
X5	OFF	OFF	ON	ON
X2.5	ON	ON	OFF	ON
X3.5	ON	OFF	OFF	ON
X4.5	OFF	ON	OFF	ON
X5.5	OFF	OFF	OFF	ON
X6	ON	ON	ON	OFF
X7	ON	OFF	ON	OFF
X8	OFF	ON	ON	OFF
Reserved	OFF	OFF	ON	OFF
X6.5	ON	ON	OFF	OFF
X7.5	ON	OFF	OFF	OFF
X1.5	OFF	ON	OFF	OFF
X0.5	OFF	OFF	OFF	OFF

2-3   *Connectors*

Jumper/Connector Define

Connector	Function	Pin No.	Description	
Rear Panel Connectors / LED				
J1 Upper / Lower	LAN2 / LAN1 RJ45 Connector.	1	TXO+	
		2	TXO-	
		3	RXI+	
		4	TERMPLANE	
		5	TERMPLANE	
		6	RXI -	
		7	TERMPLANE	
		8	TERMPLANE	
J2 Upper / Lower	COM2 / COM1 D sub connector (Note 1)		**RS323 Mode**	**RS422/485 Mode**
		1	Data Carrier Detect (DCD)	TXD-
		2	Receive Data (RXD)	TXD+
		3	Transmit Data (TXD)	RXD+
		4	Data Terminal Ready (DTR)	RXD-
		5	GND	GND
		6	Data Set Ready (DSR)	Not Define
		7	Request to Send (RTS)	Not Define
		8	Clear to Send (CTS)	Not Define
		9	Ring Indicator (RI)	Not Define
J3 Upper / Lower	Parallel Port / VGA D sub connector.	Pin No:	Upper, Parallel Port D sub connector	Lower, VGA connector.
		1	Strobe#	RED
		2	Data 0	GREEN
		3	Data 1	BLUE
		4	Data 2	N/C
		5	Data 3	GND
		6	Data 4	GND
		7	Data 5	GND
		8	Data 6	GND
		9	Data 7	+5V
		10	Acknowledge	GND

Connector	Function	Pin No.	Description	
		11	Busy	N/C
		12	Paper Empty	Display Data Channel data
		13	Printer Select	Horizontal Sync
		14	Auto Form Feed#	Vertical Sync
		15	Error#	Display Data Channel clock
		16	Initialize	
		17	Printer Select IN#	
		18	GND	
		19	GND	
		20	GND	
		21	GND	
		22	GND	
		23	GND	
		24	GND	
		25	GND	
J4 Upper / Lower	USB2 / USB1 connector.	1	+5V	
		2	USB DATA-	
		3	USB DATA+	
		4	GND	
J5 Upper / Lower	Mouse / Key Board Mini DIM connector.		**Upper Mouse**	**Lower Key Board**
		1	Mouse Data	KB/DATA
		2	N/C	MS/DATA
		3	GND	GND
		4	+5V	+5V
		5	Mouse Clock	KB/CLK
		6	N/C	MS/CLK
D1 (with four LED)	LAN1 / LAN2 Link / Active LED	LED1	LAN1 Link / Active: Shining while Link / Glitter while Active	
		LED2	LAN1 Speed: 10/100 M bits. Shining while 100 Mb	
		LED3	LAN2 Link / Active: Shining while Link / Glitter while Active	
		LED4	LAN2 Speed: 10/100 M bits. Shining while 100 Mb	

Connector	Function	Pin No.	Description
Internal Connector			
J100	LAN1/LAN2 Extend Link / Active LED connector.	1	LAN1 Active
		2	LAN1 Link
		3	330 Ω Pull Hi to 3.3V
		4	LAN1 Speed
		5	LAN2 Active
		6	LAN2 Link
		7	330 Ω Pull Hi to 3.3V
		8	LAN2 Speed
JP2	Key Board 5 Pin JST connector	1	Keyboard Clock
		2	Keyboard Data
		3	N/C
		4	GND
		5	+5V
JP3	IR connector.	1	5V
		2	NC
		3	IRRX
		4	GND
		5	IRTX
J13	ISA Slot.		
J8, J9, J10, J11,J12	PCI Slot.		
U22	2X AGP Slot.		
JP4	System Thermometer sensor connector.	1	Temperature sensor
		2	GND
J101	System Fan connector.	1	GND
		2	+12V
		3	Sense
J7 / J14	CPU.1 / CPU.2 Fan connector.	1	GND
		2	+12V
		3	Sense

Connector	Function	Pin No.	Description
J6	ATX Power input connector.	1	+3.3V
		2	+3.3V
		3	GND
		4	+5V
		5	GND
		6	+5V
		7	GND
		8	PS Power ok
		9	Stand By +5V
		10	+12V
		11	+3.3V
		12	-12V
		13	GND
		14	PS Power On
		15	GND
		16	GND
		17	GND
		18	-5V
		19	+5V
		20	+5V
JP11	Keyboard Lock.	1	VCC
		2	N/C
		3	GND
		4	Key-Board lock
		5	GND
J22	Speaker Connector.	1	Speaker Signal
		2	GND
		3	GND
		4	+5V
JP10	Button On/Off.	1	Stand By 3.3V
		2	Power Button
J25	Hardware reset.	1	Reset
		2	GND

Connector	Function	Pin No.	Description
J18 / J19	SCSI Port A / Port B connector.		
JP15	SCSI LED connector.	1	200 Ω
		2	SCSI Port A LED
		3	200 Ω
		4	SCSI Port B LED
J16	FDD connector.	1	GND
		2	Density Select bit 0
		3	GND
		4	N/C
		5	N/C
		6	Density Select bit 1
		7	GND
		8	Index#
		9	GND
		10	Motor Enabled A#
		11	GND
		12	Drive Select B#
		13	GND
		14	Drive Select A#
		15	GND
		16	Motor Enable B#
		17	GND
		18	Direction#
		19	GND
		20	Step#
		21	GND
		22	Write Data#
		23	GND
		24	Write Gate#
		25	GND
		26	Track 0#
		27	GND
		28	Write Protect #

Connector	Function	Pin No.	Description
		29	N/C
		30	Read Data#
		31	GND
		32	Head Side Select#
		33	N/C
		34	Disk Change#
J23 / J24	Primary / Secondary IDE Channel 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	N/C
		21	DMA REQ
		22	Ground
		23	IOW#
		24	Ground
		25	IOR#
		26	Ground
		27	IOCHRDY
		28	N/C

Connector	Function	Pin No.	Description
		29	DMA ACK
		30	Ground
		31	Interrupt
		32	N/C
		33	SDA 1
		34	N/C
		35	SDA 0
		36	SDA 2
		37	HDC CS1#
		38	HDC CS3#
		39	HDD Active#
		40	Ground
J12 / J13	5V Power connector for Disk On Module.	1	+5V
		2	GND
J15 / J17 / J20 / J21	DIMM 1 / DIMM2 / DIMM3 / DIMM4 socket.	1	Input
		2	Input
JP8	General Purpose Input Port connector.		Note2
JP9	General Purpose Output Port connector.		Note3
JP14	HDD Active LED.	1	+5V
		2	ACTIVE#

Note 1

Lower, COM1 (RS232) D sub connector

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

Note2

JP8: General Purpose Input.

Pin NO.	Pin Define	Mapping to PIIX4 Ball NO.
1	General Purpose Input	L2 / GPI 13
2	GND	
3	General Purpose Input	J3 / GPI 14
4	GND	
5	General Purpose Input	L5 / GPI 15
6	GND	
7	General Purpose Input	K3 / GPI 16
8	GND	

Note3

JP9: General Purpose Output

Pin NO.	Pin Define	Mappings to PIIX4 Pin define / Ball NO.
1	General Purpose Output	G4 / GPO 0
2	GND	
3	General Purpose Output	T19 / GPO 8
4	GND	
5	General Purpose Output	G5 / GPO 27
6	GND	
7	General Purpose Output	F2 / GPO 28
8	GND	

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# Chapter 3   Capability Expanding

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

3-1   System Memory

This ATX Server support 4 slots for 168-pin 3.3V Non-buffered DIMM modules, providing support for up to 1GB of main memory using DIMM modules from 8MB to 256MB. The following is the example to install the system SDRAM memory module combination: if you have two DIMM Modules, you has better install them into DIMM Slot 1 & Slot 2 with the Max possible memory size up to 512MB (256 + 256) if the 256MB DIMM module is available.

Note: It is highly recommended to use the PC-100 or PC-133 Spec. DIMM module

Q'ty of Module	DIMM1	DIMM2	DIMM3	DIMM4	Module Size	Max. Size
1	1 st				8~256 MB	256 MB
2	1 st	2 nd			8~256 MB	512 MB
3	1 st	2 nd	3 rd		8~256 MB	768 MB
4	1 st	2 nd	3 rd	4th	8~256 MB	1 GB
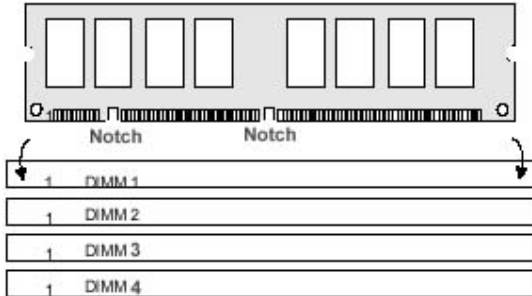
To insert the DIMMs, the modules must be oriented in the correct way. Notice the notches of the DIMM. Align these notches as shown in the diagram below. Gently push the DIMM until the retainers on both sides of the socket lock the module in place.

To remove a DIMM, push the retainers outwards to release the module then pull the module out of the socket.

Chapter 4 <u>AWARD BIOS Setup</u>

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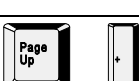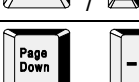
Power on the computer and press **<Del>** immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press **<Del>** key or simultaneously press **<Ctrl>**,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

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 , 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 4-16 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 4-22 for details.

PC health Status

Display CPU/System Temperature, Fan speed and Voltages Value.   See Page 4-24 for details.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.   See Page 4-25 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 4-26 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.

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                             Standard CMOS Features
┌─────────────────────────────────────────────────┬──────────────────────┐
│    Date (mm:dd:yy)            Thu, Sep  7 2000    │      Item Help       │
│    Time (hh:mm:ss)            16 : 14 : 19        ├──────────────────────┤
│                                                   │  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            │                      │
│                                                   │                      │
│    Video                      EGA/VGA             │                      │
│    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 Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in	Select the type of floppy disk drive installed in your system

	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 CRT AUTO LCD&CRT	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

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 Table 3 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        LS120                   │  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   Off                     │  area ,  BIOS will show  │
 │ Gate A20 Option          Fast                    │  a 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
  ┌──────────────────────────────────────────────────┬─────────────────────┐
  │  Auto Configuration          Enabled              │      Item Help      │
  │  EDO DRAM Speed Selection     60ns                │                     │
  │  EDO CASx# MA Wait State      1                    │  Menu Level    ▶    │
  │  EDO RASx# Wait State         1                    │                     │
  │  SDRAM RAS-to-CAS Delay       3                    │                     │
  │  SDRAM RAS Precharge Time     3                    │                     │
  │  SDRAM CAS latency Time       3                    │                     │
  │  SDRAM Precharge Control      Disabled             │                     │
  │  DRAM Data Integrity Mode     Non-ECC              │                     │
  │  System BIOS Cacheable        Enabled              │                     │
  │  Video  BIOS Cacheable        Enabled              │                     │
  │  8 Bit I/O Recovery Time      1                    │                     │
  │  16 Bit I/O Recovery Time     1                    │                     │
  │  Memory Hole At 15M-16M       Disabled             │                     │
  │  Passive Release              Disabled             │                     │
  │  Delayed Transaction          Disabled             │                     │
  │  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.

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-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 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

Integrated Peripherals

```
         CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Integrated Peripherals
   ┌──────────────────────────────────────────────┬─────────────────────────┐
   │  IDE Primary Master PIO     Auto            ▲ │      Item Help          │
   │  IDE Primary Slave  PIO     Auto              │                         │
   │  IDE Secondary Master PIO   Auto              │  Menu Level     ▶       │
   │  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              │                         │
   │  On-Chip Primary   PCI IDE  Enabled           │                         │
   │  On-Chip Secondary PCI IDE  Enabled           │                         │
   │  Onboard PCI SCSI Chip      Enabled           │                         │
   │  USB Keyboard Support       Disabled          │                         │
   │  Init Display First         AGP               │                         │
   │  IDE HDD Block Mode         Enabled           │                         │
   │  KBC input clock            8 MHz             │                         │
   │  Onboard FDC Controller     Enabled           │                         │
   │  Onboard Serial Port 1      3F8/IRQ4          │                         │
   │  Onboard Serial Port 2      2F8/IRQ3          │                         │
   │  UART Mode Select           Normal          ▼ │                         │
   └──────────────────────────────────────────────┴─────────────────────────┘
     ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
          F5:Previous Values      F6:Fail-Safe Defaults    F7:Optimized Defaults
```

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

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.

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 IDE interface.   Select Disabled to deactivate this interface

The Choice: Enabled, Disabled.

Onboard PCI SCSI Chip

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 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

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.

```
            CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                            Power Management Setup

   ACPI function              Enabled      ▲  │       Item Help
   Power Management           Min Saving      │
   PM Control by APM          Yes             │   Menu Level    ▶
   Video Off Method           V/H SYNC+Blank  │
   Video Off After            Standby         │
   MODEM Use IRQ              3               │
   Doze Mode                  Disable         │
   Standby Mode               Disable         │
   Suspend Mode               Disable         │
   HDD Power Down             Disable         │
   Throttle Duty Cycle        62.5%           │
   VGA Active Monitor         Disabled        │
   Soft-Off by PWR-BTTN       Instant-Off     │
   PowerOn by Ring            Enabled         │
   Wake Up On LAN             Enabled         │
   IRQ 8 Break Suspend        Disabled        │
   ** Reload Global Timer Events **           │
   IRQ[3-7,9-15],NMI          Disabled     ▼  │
   Primary IDE 0              Disabled        │
   Secondary IDE 0            Disabled        │
   Secondary IDE 1            Disabled        │
   Floppy Disk                Disabled        │
   Serial Port                Enabled         │
   Parallel Port              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 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's**. 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.

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.

Options Doze, Standby, Suspend / NA

MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The choice: 3, 4, 5, 7, 9, 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

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%

VGA Active Monitor

If enabled, the system goes into power saving mode if there' s 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

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.

PowerOn by Ring

When enabled, the PC can power-on through an external modem connected to your PC. For example, you may send an e-mail message to your PC from another location, and this will power-on your PC. When using this feature, you must have a modem, and your PC must be turned off.

Note: This feature alone doesn' t allow you to power off your PC (see **Suspend Mode**).

The Choice: Enabled, Disabled

Wake Up On LAN

When enabled, the PC can power-on or "wake up" through LAN (Local Area Network). Used only when your PC is connected to a network system.

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

This field configures the events to reload the power saving mode timer.

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

```
        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)        │                          │
 │ x IRQ Resources            Press Enter       │  Select Yes if you are   │
 │ x DMA Resources            Press Enter       │  using a Plug and Play   │
 │ x Memory Resources         Press Enter       │  capable operating       │
 │                                              │  system Select No if     │
 │  PCI/VGA Palette Snoop      Disabled         │  you need the BIOS to    │
 │  Assign IRQ For USB         Enabled          │  configure non-boot      │
 │  INT Pin 1 Assignment       Auto             │  devices                 │
 │  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 and 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 and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

The choice: Enabled, Disabled .

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.   If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢").

The choice: Auto (ESCD), Manual.

PCI/VGA Palette Snoop

Leave this field at Disabled.

The choice: Enabled, Disabled.

Assign IRQ For USB

Enable/Disable to assign a IRQ for USB.

Choices are Enabled, Disabled.

PC Health Status

```
              CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                                PC Health Status
       ┌────────────────────────────────────────────┬──────────────────────┐
       │  CPU Warning Temperature      120           │      Item Help       │
       │  Current System Temp.                       ├──────────────────────┤
       │  Current CPU1 Temperature                   │  Menu Level     ▶    │
       │  Current CPU2 Temperature                   │                      │
       │  Current CPUFAN1 Speed                      │                      │
       │  Current CPUFAN2 Speed                      │                      │
       │  Current CPUFAN3 Speed                      │                      │
       │  IN0(V)                                     │                      │
       │  IN1(V)                                     │                      │
       │  IN2(V)                                     │                      │
       │  + 5 V                                      │                      │
       │  +12 V                                      │                      │
       │  -12 V                      _               │                      │
       │  - 5 V                      _               │                      │
       │  VBAT(V)                                    │                      │
       │  5VSB(V)                                    │                      │
       │  Shutdown Temperature        Disabled       │                      │
       │                                             │                      │
       └────────────────────────────────────────────┴──────────────────────┘
          ↑↓→←: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
┌─────────────────────────────────────────────┬──────────────────────────┐
│  Auto Detect DIMM/PCI Clk    Enabled         │        Item Help         │
│  CPU Clock/Spread Spectrum   Default         ├──────────────────────────┤
│                                              │  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
```

Auto Detect DIMM/PCI C1k

When enabled, the DBD100 motherboard will automatically disable the clock source for a DIMM

socket, which does not have a module on it. This is true for all PCI slots.

The Choice: Enabled, Disabled

CPU Clock/Spread Spectrum

This item configures radiation emitted from the system. When enabled, system will release less radiation.

The Choice: Default, 66MHz/On, 66MHz/Off, 75MHz/On, 83MHz/On, 95MHz/On, 100MHz/Off, 100MHz/On, 112MHz/On, 117MHz/Off, 124MHz/On, 133MHz/Off, 133MHz/On, 138MHz/Off, 140MHz/On, 150MHz/On.

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 CNTRLR ERROR OR NO CNTRLR PRESENT

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

FLOOPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOOPY DISK(S) fail (40)

Floppy Type dismatch.

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 configurating 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 fail 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 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 E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	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 C000:0.

POST (hex)	Description
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard 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 64K 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 USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	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_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
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. Set up 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)

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).
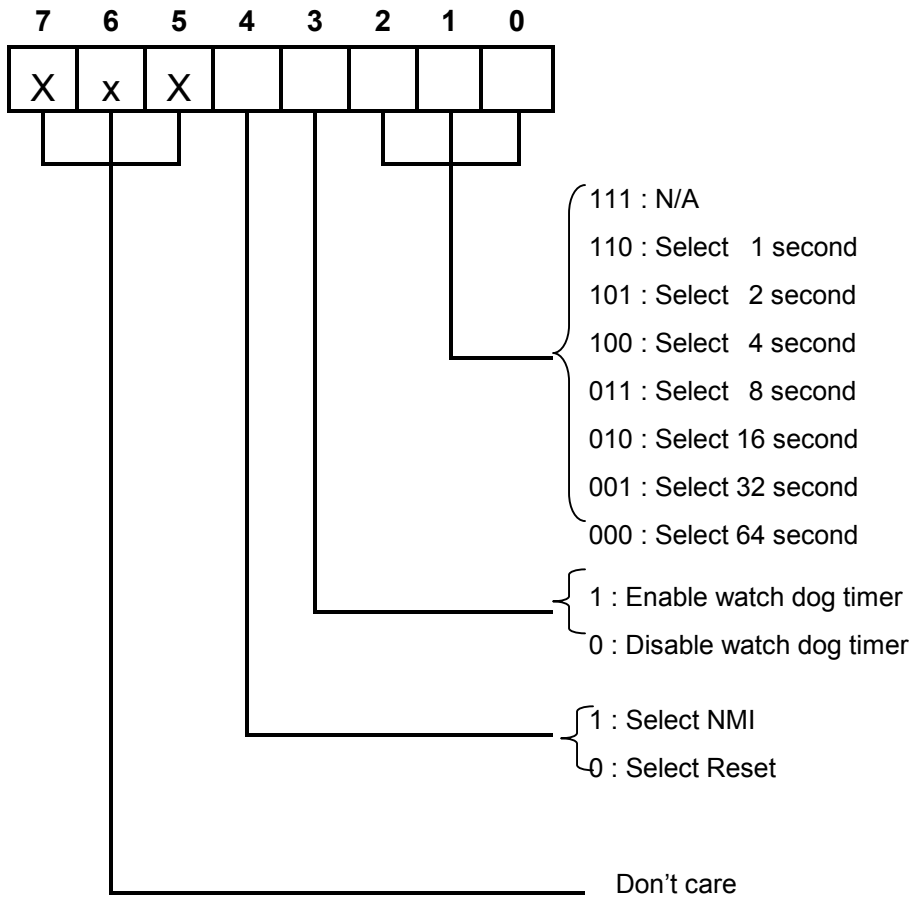
Watch Dog Timer character and function

WDT Configuration port	F2	Default at F2
Watch Dog Timer	Disabled	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 processor is to set the SQW signal which is output period=0.5 second.   It offers the basic frequency of the WDT counter.

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

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

- **Clear the WDT**

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

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

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

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

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

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

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

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

  You must plan the option of following:

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

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

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

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

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

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

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

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

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

     i.e. D3=0, Disable the WDT

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

     i.e. D3=1, Enable the WDT

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

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

```
MOV    dx, F2h    ; Setting WDT Configuration Port

OUT    dx, al     ; Output the Control Register Value
```

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

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