Single Board Computer

SBC845-VL

User's Manual

Declaration

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Chapter 1: Specification

Full-size Dual Socket 478 Pentium 4 32bit/33MHz CPU Card w/VGA/LAN

Features

- Support Intel Pentium 4 (Northwood processors in the 478 pin package)
- **3GB (Max.) SDRAM memory support, SDRAM DIMM x 3**
- Intel 845 Chipset (Brookdale)
- ATI Rage 128 Pro AGP 4X (1.5V) VGA controller with 16MB Memory
- Intel ICH2 embedded MAC with Intel 82562EM (PLC) PHY10/100 Ethernet controller
- RS232 ×2 with 16C550 UARTs
- Enhanced parallel port, support SPP/EPP/ECP
- UltraDMA 33/66/100MHZ x 2 with power connector, FDC ×1, PS/2 keyboard/mouse
- USB port ×2
- Watchdog Timer(1 sec.~64 sec.)
- ISAMAX support up to 20 slots ISA card

✓ System Architecture

- Full size SBC with PCI/ISA Golden finger
- Intel Pentium 4 (Northwood processors in the 478 pin package) with system bus at **400MHZ**
- AGP 2.0 compliant
- PCI V2.2 complied
- PICMG 1.0 (Rev.2.0) complied
- Note: The Pentium® 4 processor supports Intel's highest performance desktop system bus by delivering 3.2 GB of data per second into and out of the processor. This is accomplished through a physical signaling scheme of quad pumping the data transfers over a 100-MHz clocked system bus and a buffering scheme allowing for sustained 400-MHz data transfers. This compares to 1.06 GB/s delivered on the Pentium® III processor's 133-MHz system bus.

✓ CPU Support

- Intel Pentium 4 CPU with 256K cache on die
- Socket 478 CPU running **400MHZ** system bus, CPU speed up to 2GHz+

✓ Main Memory

- 168-pin DIMM x 3 Support Max memory size to 3GB
- ECC support (single bit error correction/Multiple bit errors reporting) No Registered DIMM Support

✓ BIOS

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

✓ Chip Set

- Intel 845 (Brookdale Chipset Memory Controller Hub) (MCH)
- Intel 82801 × 1 I/O Controller Hub (ICH2)
- Intel 82802 × 1 Firmware Hub (FWH)
- PCI V2.2 complied

✓ On Board LAN

- Intel ICH2 embedded MAC with Intel 82562EM (PLC) PHY10/100 Ethernet controller
- Single Chip 10 /100 Base TX support, full duplex
- Complied with IEEE802.3X
- Drivers support
  DOS/Windows, Windows 95/98/2000, Windows NT, Netware 5.0, SCO Open Server 5.0, Linux
- RJ45 with LED connector × 1
- Support Remote monitoring (Alerting on LAN)

✓ On Board VGA

- ATI Rage 128 Pro (Ultra 4XL) VGA Controller, 1.5V AGP 4X Interface
- 16MB VGA Memory on Board
- Fully PC 98 and PC 99 Compliant
- 15 pin CRT connector ×1, 20 pin DVI connector x 1

✓ On Chip I/O (ICH2)

- On board USB port × 2
- Ultra DMA33/66/100 support, 40 pin connector × 2. Two pins power connector for DOM (Disk On Module)

✓ On Board I/O

- ITE 8712F-A Super I/O
- SIO× 2, with 2x16C550 UARTs, 10 pin header ×1;D-sub 9 pin ×1
- PIO× 1, bi-directional, EPP/ECP support, 26 pin connector ×1
- Floppy Disk controller 34 pin connector ×1
- 6 pin mini DIN connector ×1, for PS/2 keyboard/mouse, 5 pin connector x 1(for external keyboard)
- On Board buzzer ×1
- GPIO (4 in 4 out)
- On board 2 pin header for I^2C;
- On Board 2 pin header for reset SW / 2 pin for IDE active LED / 2 pin ATX power SW
- One 3 pins power header for 3 pins Power Cable connect to Backplane Board
  to support ATX Power On function.
- On Board 4 Pin Additional Power Source Input

✓ System Monitor

- Derived from Super IO ITE 8712F-A to support system monitor.
- 8 voltage (For+1.8V, +3.3V, +5V, -5V, +12V, -12V, Vcore and Vcc5VStand-By)
- One Fan speed (For CPU) , Two for System FAN
- 3 temperature (one for CPU, the others for system)

✓ ACPI Function
(only when 3 pins Power cable connect to Backplane which connect with ATX Power Source)

- Soft Power off

- Power On LAN
- Power On Keyboard
- Power On Ring

✓ Real Time Clock

- On chip RTC with battery back up
- External Li Battery x 1

✓ Watchdog Timer

- Watchdog timeout can be programmable by Software from 1~64 seconds

✓ On Board Bus Expansion

- On Board proprietary 32bit PCI interface for EBK Upgrade Module

✓ PCI to ISA Bridge & ISAMAX Support

- ITE 8888F × 1 PCI to ISA Bridge
- Provide 64mA high driving capability to maximize ISA signals for support ISA cards up to 20 on the backplane ISA Slot.

✓ Dimensions

- 338mm(L) × 122mm(W)

✓ Power Requirements

	Maximum
+5V	10A
+12V	10A
-12V	50mA
+5Vsb	1.5A

✓ Environments

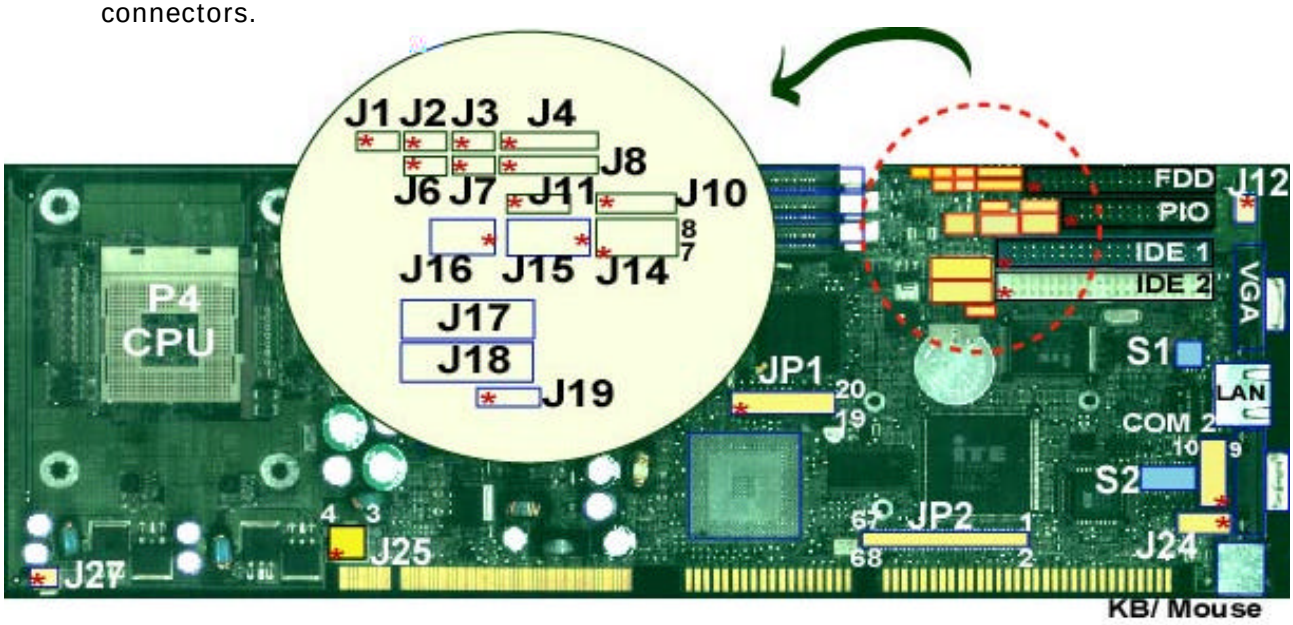
- Operating temperatures 0°C to 60°C
- Storage temperatures -20°C to 80°C
- Relative humidity 10% to 90% (Non-condensing)

✓ Certification

- CE approval
- FCC Class A

Chapter 2 Switches and Connectors

This chapter gives the definitions and shows where to locate the positions of 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)

82562EM Enable/Disable

	S1.1	S1.2	S1.3	S1.4
*Enable	OFF	OFF	OFF	OFF
Disable	ON	ON	ON	ON

COM2 RS232 /RS485/RS422

	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6	S2.7	S2.8	S2.9	S2.10
*RS232	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
RS422	OFF	OFF	ON	OFF	ON	OFF	ON	ON	ON	ON
RS485	ON	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	ON

AT/ATX FUNCTION SELECT

	*AT Function	ATX Function
J11	1-2	2-3

RTC Clear

	J19
*Normal	1-2
Clear	2-3

2-2 Connectors

Jumper/Connector define

Connector	Function	Remark
J1	Reset Connector	
J2,J6	FAN sensor	
J3	IDE Active LED	
J4	IR Connector	
J5	FDD Connector	
J7	ATX Power Button	
J8	Key Lock	
J10	Speaker Connector	
J11	Power type select	
J12	+5V power connector	
J13	Parallel Connector	
J14	GPIO pin	
J15	ATX Power Connector	
J16	SMBUS Connector	
J17,J18	USB Connector	
J19	RTC clear	
J20	LAN, RJ45 Connector	
J21	COM2	
J22	COM1	
J23	Reserved	
J24	EXT Keyboard Connector	
J25	AUX Power connector	
J26	KB/MS Connector	
J27	CPU Fan Header	
DIMM1,DIMM2, DIMM3	DIMM Socket	
IDE1	Primary IDE Connector	
IDE2	Secondary IDE Connector	
VGA1	CRT Connector	
RT1, RT2	Temperature Connector	
JP1	DVI Connector	
JP2	Proprietary PCI Connector	

Pin definitions of connectors

- **J27: CPU Fan Header Connector**

PIN No.	Description
1	GND
2	+12V
3	Sense

- **IDE1 / IDE2: IDE Connector**

PIN No.	Description	PIN No.	Description
1	Reset#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Ground
29	DMA ACK	30	Ground
31	Interrupt	32	NC
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS1#	38	HDC CS3#
39	HDD Active#	40	Ground

- **J15: ATX Power Connector**

PIN No.	Description
1	5VSB
2	GND
3	Power On#

- **J10: Speaker Connector**

PIN No.	Description
1	Speaker Signal
2	GND
3	GND
4	+5V

- **J5: FDD Connector**

PIN No.	Description	PIN No.	Description
1	Ground	2	Density Select
3	Ground	4	N/C
5	Ground	6	N/C
7	Ground	8	Index#
9	Ground	10	Motor Enable A#
11	Ground	12	Drive Select B#
13	Ground	14	Drive Select A#
15	Ground	16	Motor Enable B#
17	Ground	18	Direction#
19	Ground	20	Step#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Write Protect#
29	N/C	30	Read Data#
31	Ground	32	Head Side Select#
33	N/C	34	Disk Change#

- **J21,J22: RS232 Connector**

PIN No.	Description
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)
10	Ground (GND,J21 only)

- **J21: RS422 Connector**

PIN No.	Description
1	TXD-
2	TXD+
3	RXD+
4	RXD-
5	Ground (GND)
6	RTS-
7	RTS+
8	CTS+
9	CTS-
10	Ground (GND)

- **J21: RS485 Connector**

PIN No.	Description
1	DATA-
2	DATA+
3	N/C
4	N/C
5	Ground (GND)
6	N/C
7	N/C
8	N/C
9	N/C
10	Ground (GND)

- **J1: Reset Connector**

PIN No.	Description
1	RESET
2	GND

- **J13: Parallel Port Connector**

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

- **J17,J18: USB Connector**

PIN No.	Description
1	+5V
2	USBD0-
3	USBD0+
4	USBD1-
5	USBD1+
6	GND

- **J20: LAN (RJ45) connector**

PIN No.	Description
1	TD+
2	TD-
3	RD+
4	TERMPLANE
5	TERMPLANE
6	RD-
7	TERMPLANE
8	TERMPLANE
9	Speed LED
10	V3SB
11	Link LED
12	Active LED

- **VGA1: CRT connector**

PIN No.	Description
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	+5V
10	GND
11	NC
12	Display Data channel DATA
13	Horizontal Sync
14	Vertical Sync
15	Display Data Channel CLK

- **J26: Keyboard/Mouse Connector**

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

- **RT1/RT2: Temperature Connector**

PIN No.	Description
1	Temperature sensor
2	GND

- **J16: SMBUS Connector**

PIN No.	Description
1	SMBDATA
2	SMBCLK

- **J7: ATX Power Button**

PIN No.	Description
1	+3.3VSB
2	PWRBT#

- **J4: IR Connector**

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

- **J8: KEYLOCK Connector**

PIN No.	Description
1	VCC
2	N/C
3	GND
4	KEYLOCK
5	GND

- **J3: IDE Active LED**

PIN No.	Description
1	+5V
2	ACTIVE#

- **J24: Ext Keyboard Connector**

PIN No.	Description
1	Keyboard Clock
2	Keyboard Data
3	N/C
4	GND
5	+5V

- **JP2: Proprietary PCI Connector**

PIN No.	Description	PIN No.	Description
1	VCC5	2	AD0
3	AD1	4	AD2
5	AD3	6	AD4
7	AD5	8	AD6
9	AD7	10	Ground
11	VCC5	12	AD8
13	AD9	14	AD10
15	AD11	16	AD12
17	AD13	18	AD14
19	AD15	20	Ground
21	VCC5	22	AD16
23	AD17	24	AD18
25	AD19	26	AD20
27	AD21	28	AD22
29	AD23	30	Ground
31	VCC5	32	AD24
33	AD25	34	AD26
35	AD27	36	AD28
37	AD29	38	AD30
39	AD31	40	Ground
41	VCC5	42	C/BE#0
43	C/BE#1	44	C/BE#2
45	C/BE#3	46	PAR
47	FRAME#	48	TRDY#
49	IRDY#	50	Ground
51	VCC5	52	STOP#
53	DEVSEL#	54	NC
55	SERR#	56	REQ#
57	GNT#	58	NC
59	NC	60	Ground
61	PCICLK	62	NC
63	PCIRST#	64	PLOCK#
65	INTA#	66	INTB#
67	INTC#	68	INTD#

- **JP1: DVI Connector**

PIN No.	Description	PIN No.	Description
1	TX2-	2	TX2+
3	Ground	4	TX1-
5	TX1+	6	Ground
7	VCC5	8	Ground
9	Detect	10	TX0-
11	TX0+	12	Ground
13	TXCLK+	14	TXCLK-
15	Ground	16	Ground
17	DDC Clock	18	DDC Data
19	Reserved	20	Reserved

Note: Watch Dog Timer

Watch Dog Timer Working Procedure

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

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

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

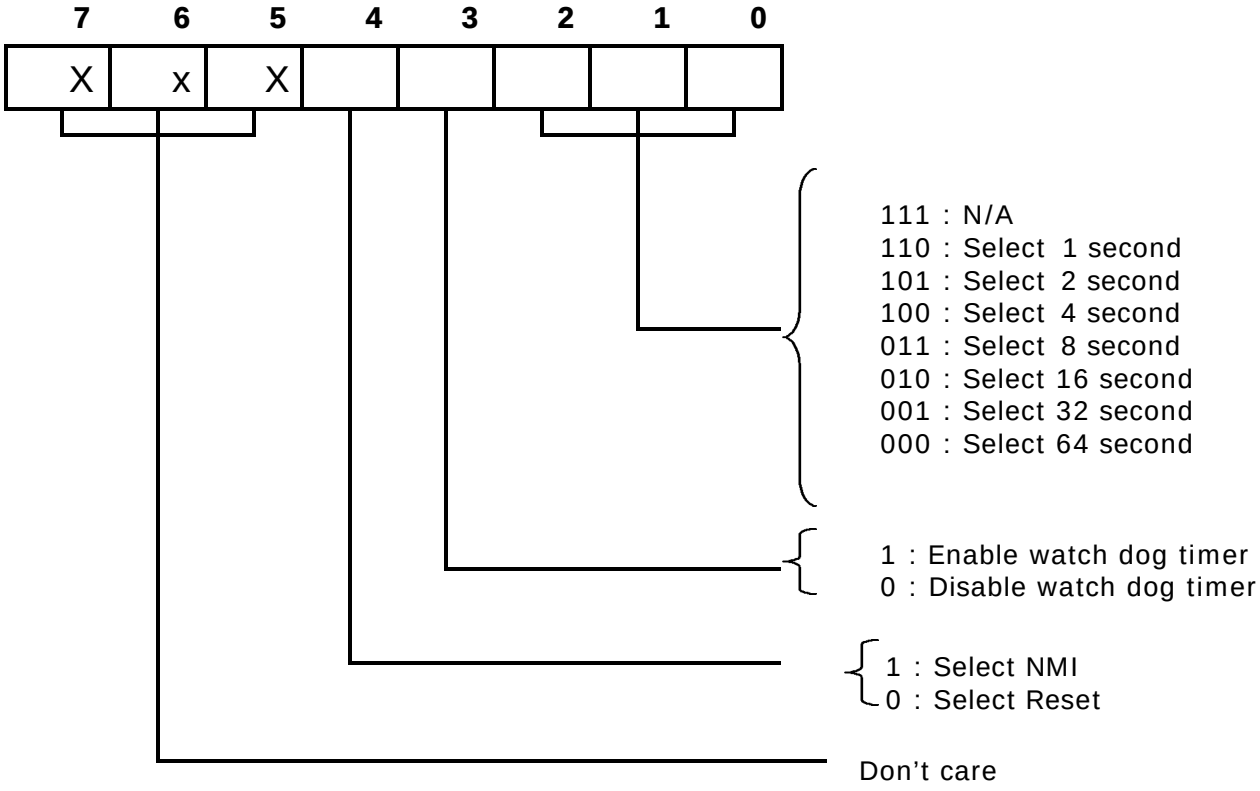
Watch Dog Timer character and function

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

Watch Dog Timer Control Register

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

The following is the Control Register bit definition.



Watch Dog Timer Programming Procedure

- **Power on or reset the system**

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

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

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

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

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

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

      Out   dx, al        ; Out port 71h = 0Ah
```

- **Clear the WDT**

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

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

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

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

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

You can set the WDT Control Register to control the WDT working mode.
The initial value of the WDT Control Register is as the following.

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

You must plan the option of following:

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

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

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

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

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

2. Select the time-out intervals of WDT (decide the values of D2, D1, D0 in F2)
   Example: D2~D0 = 0, the time-out interval will be 64 sec.

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

3. Enable or Disable the WDT (decide D3 value in F2)
   i.e. D3=0, Disable the WDT

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

   i.e. D3=1, Enable the WDT

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

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

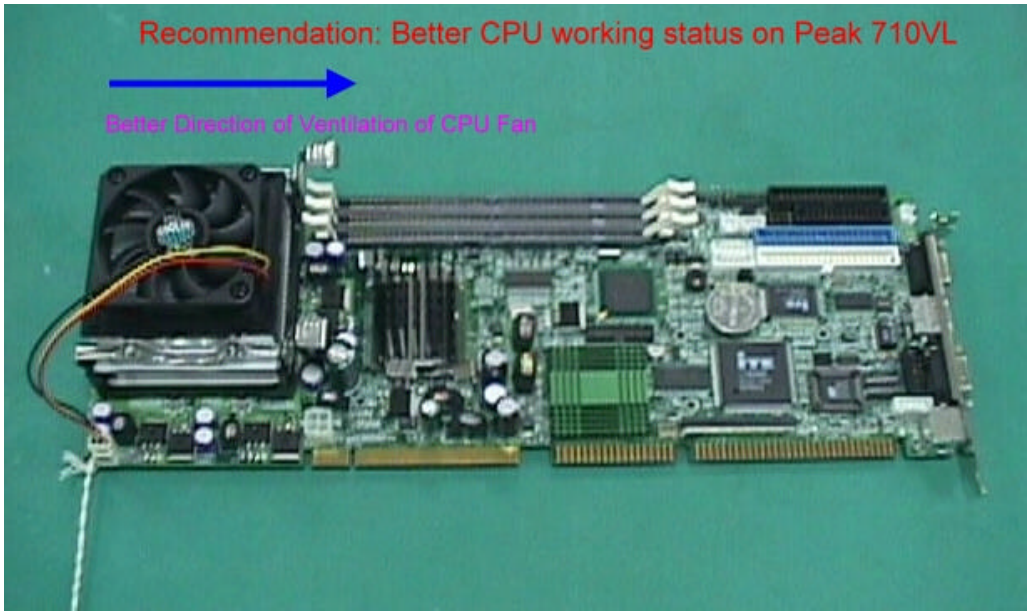
```
MOV dx, F2h     ; Setting WDT Configuration Port
OUT  dx, al             ; Output the Control Register Value
```

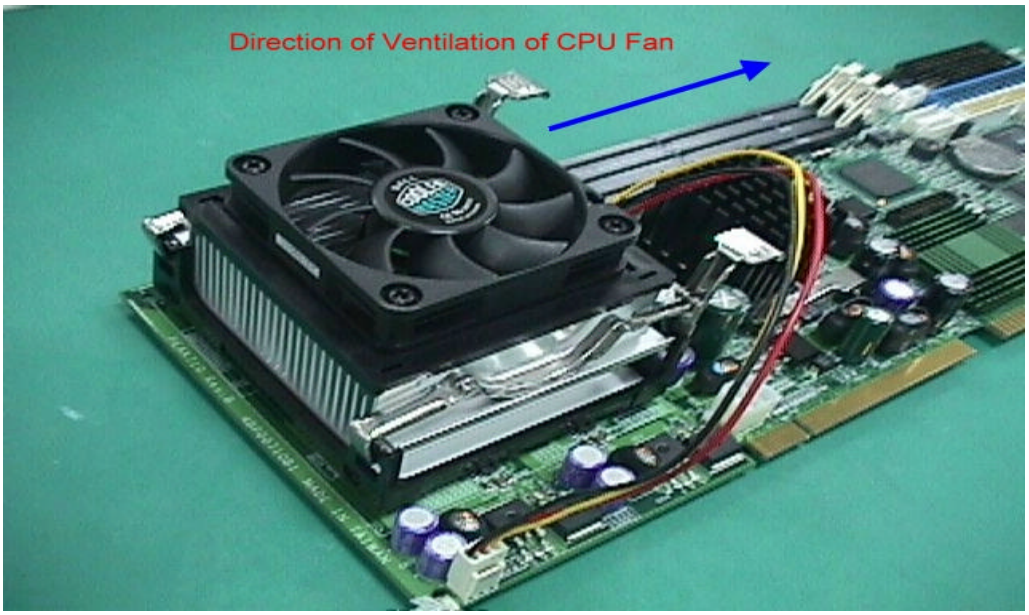
- You should build in a mechanism in the program to continue to read the WDT

  Configuration Port for clearing WDT before the time out.

Note:

Type of CPU Fan with Horizontal direction of ventilation will cause the P4 CPU works in better performance





Chapter 3 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.

The Chapter shows the currently BIOS setup picture is for reference only, which may change by the BIOS modification in the future. Any Major updated items or re-version, user can download from BCM web site http://www.bcmcom.com or any unclear message, can contact BCM Customer Service people for help http://www.support@bcmcom.com

3-1 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

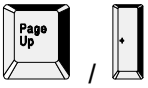
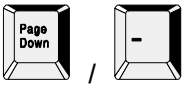
Up arrow 	Move to previous item
Down arrow 	Move to next item
Left arrow 	Move to the item in the left hand
Right arrow 	Move to the item in the right hand
Esc key 	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu.
PgUp / "+" key 	Increase the numeric value or make changes
PgDn / "–" key 	Decrease the numeric value or make changes
F1 key 	General help, only for Status Page Setup Menu and Option Page Setup Menu
F5 key 	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key 	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key 	Load the Setup default , only for Option Page Setup Menu
F9 key 	Menu in BIOS
F10 key 	Save all the CMOS changes, only for Main Menu

Table 3-1 Control Keys

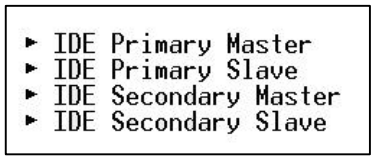
Getting Help

Main Menu

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

Sub-Menu

If you find a right pointer symbol appears to the left of certain fields (as shown in the right view), that means a sub-menu containing additional options for the field can be launched from this field.



To enter the sub-menu, highlight the field and press <Enter>. Then you can use control keys to move between and change the settings of the sub-menu.

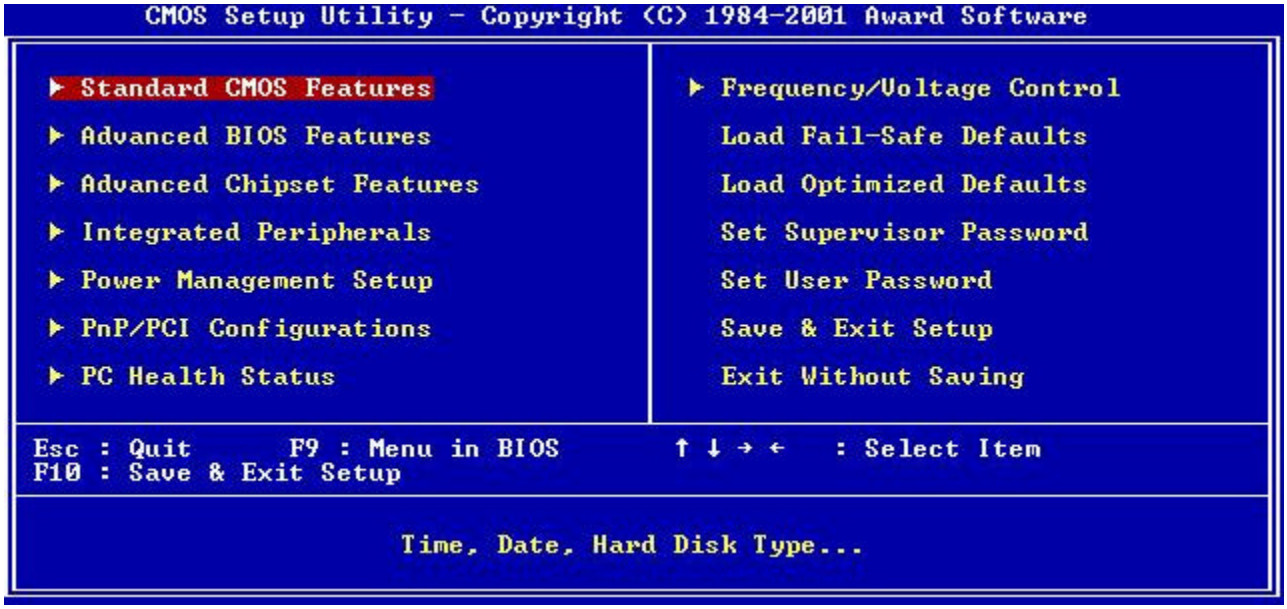
To return to the main menu, press <Esc> to trace back.

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 **<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.



Standard CMOS Features

Use this menu for basic system configuration.

Advanced BIOS Features

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

Advanced Chipset Features

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

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management setup

Use this menu to specify your settings for power management

PNP/PCI Configuration

This entry appears if your system supports PnP / PCI.

PC health Status

Display CPU/System Temperature, Fan speed.

Frequency/Voltage Control

Use this menu to manage CPU frequency/voltage control.

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 Password

Enter and change the options of the setup menus. If password error or disable, some read only INFO will be displayed on the menu.

Set User Password

Change, set, or disable password of user while posting. Switched by Security Option Item in Advanced BIOS Features Function.

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.

Main Menu Selections

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu (Please see Table-3-3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (Please see Table-3-3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (Please see Table-3-3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (Please see Table-3-3)	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 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system

Floppy3 Mode Support	Disabled Drive A Drive B Both	Select and define which device can support Floppy3 Mode
VIDEO	EGA/VGA CGA40 CGA80 MONO	16/256 colors or higher display card CGA4 Colors display card CGA8 Colors display card Mono display card
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 3-2 Main Menu Selections

IDE Adapters

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

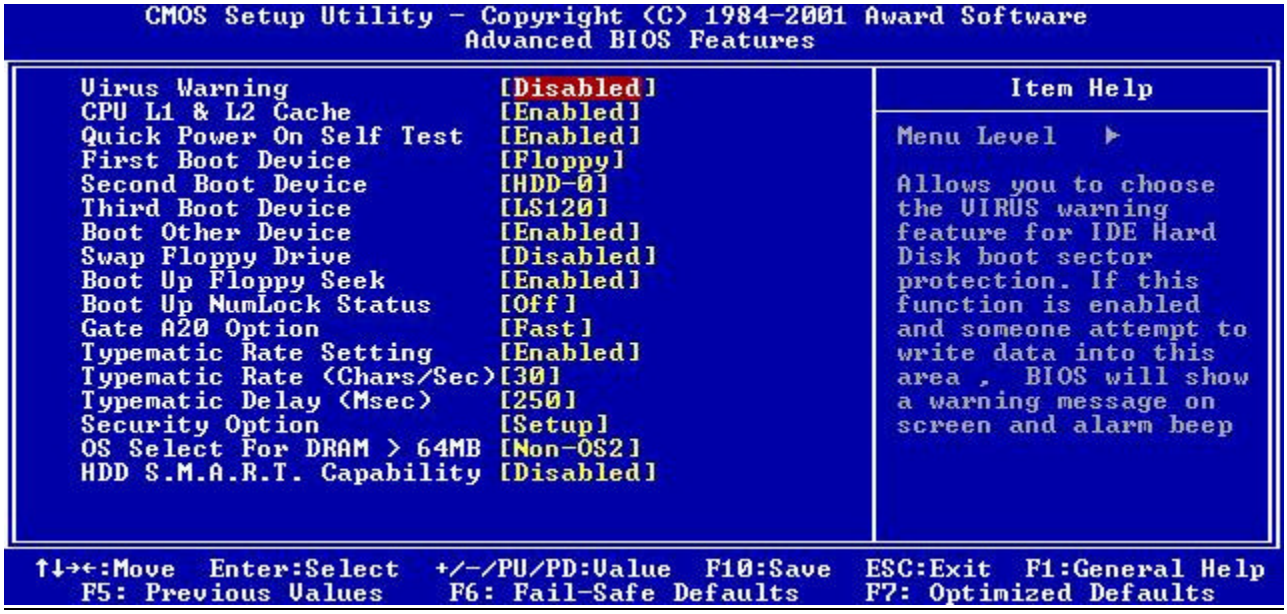
Use the legend keys to navigate through this menu and exit to the main menu. Use Table 3-3 to configure the hard disk.

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 IDE Primary Slave IDE Secondary Master IDE Secondary 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 3-3 Hard disk selections

Advanced BIOS Features Setup

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



Virus Warning

Allow 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 L1 & L2 Cache

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.

Enabled	Enable quick POST
Disabled	Normal POST

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, LS120, HDD-0, SCSI, CDROM, HDD-1, Hdd-2, HDD-3, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled

Boot Other Device

The choice: Enabled/Disabled.

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: On/Off.

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

OS Select for DRAM > 64MB

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

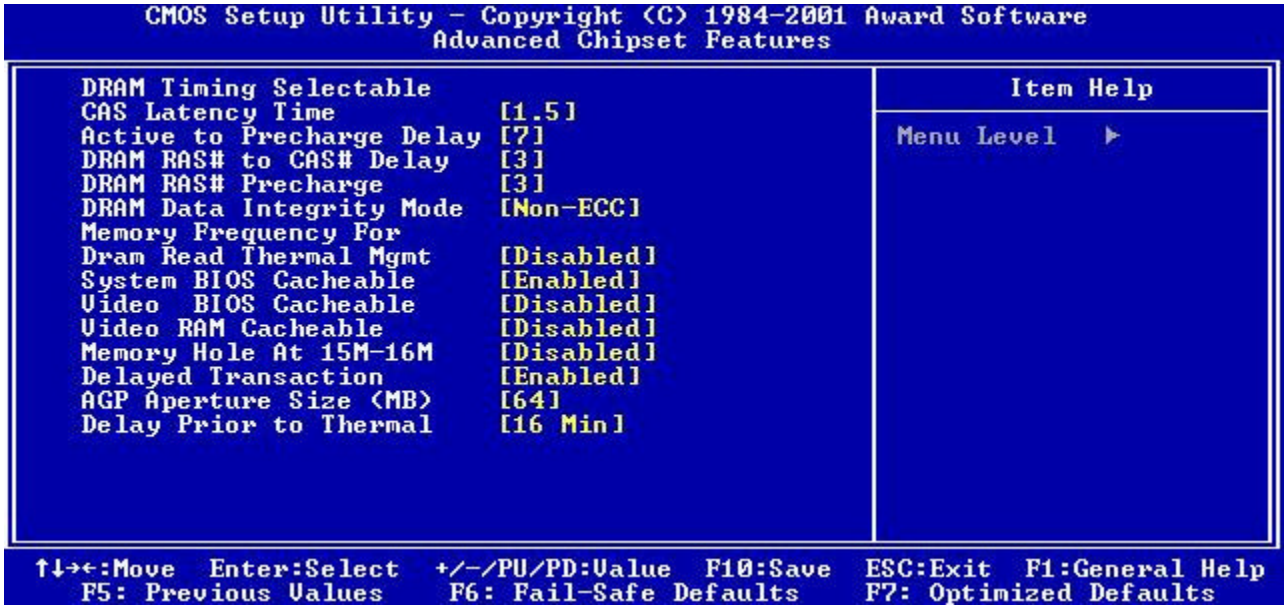
The Choice: Non-OS2, OS2

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

The Choice: Enabled, Disabled.

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.



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.

DRAM Timing Selectable

The choice: By SPD/Manual.

CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.

The choice: 1.5, 2, 2.5, 3

Active to Precharge delay

This item controls the number of DRAM clocks for TRAS.

The choice: 7, 6, 5.

DRAM RAS# to CAS# Delay

This field let's you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

The choice: 3, 2.

DRAM RAS# to CAS# Delay

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

The choice: 3, 2.

DRAM Data Integrity Mode

This item allows you to enable/disable the DRAM ECC function which will recover the single bit errors when user plug-in ECC 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

It can greatly improve the display speed by catching the display data.

The choice: Enabled/Disabled.

Video RAM Cacheable

Select Enabled allows caching of the A/B segment, resulting in better system performance.

The Choice: Enabled/Disabled.

Memory Hole at 15-16M

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: Disabled, 15M - 16M.

Delay 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

This field determines the effective size of the Graphic Aperture used for a particular GMCH configuration. It can be updated by the GMCH-specific BIOS configuration sequence before the PCI standard bus enumeration sequence takes place. If it is not updated then a default value will select an aperture of maximum size.

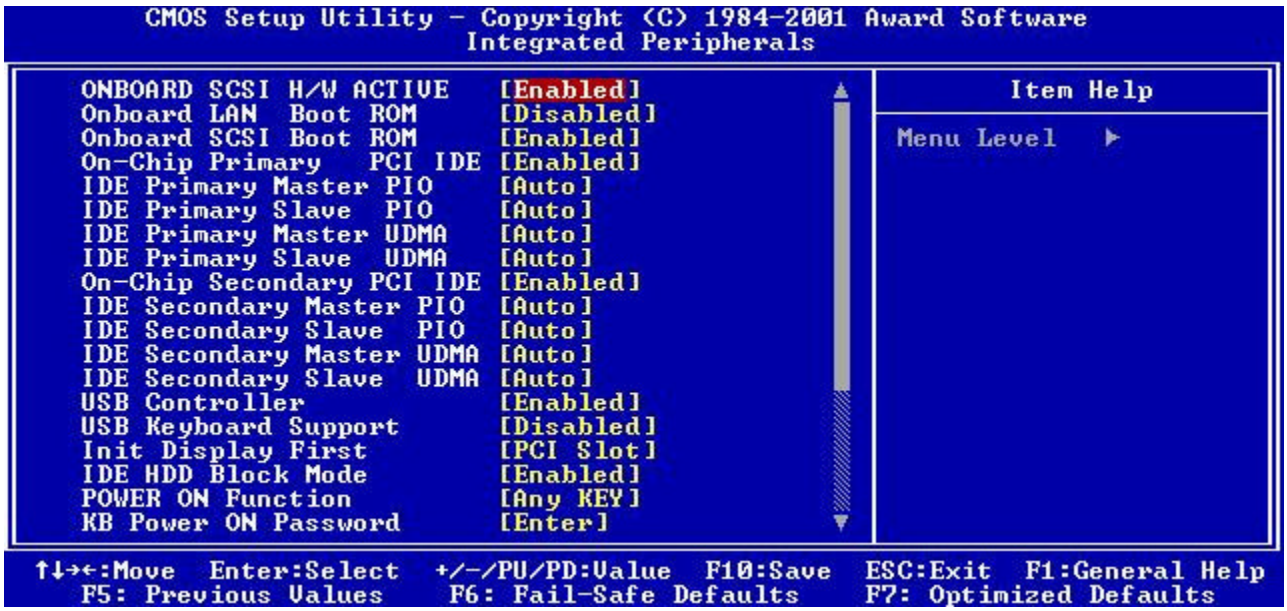
The choice: 4, 8, 16, 32, 64, 128, 256

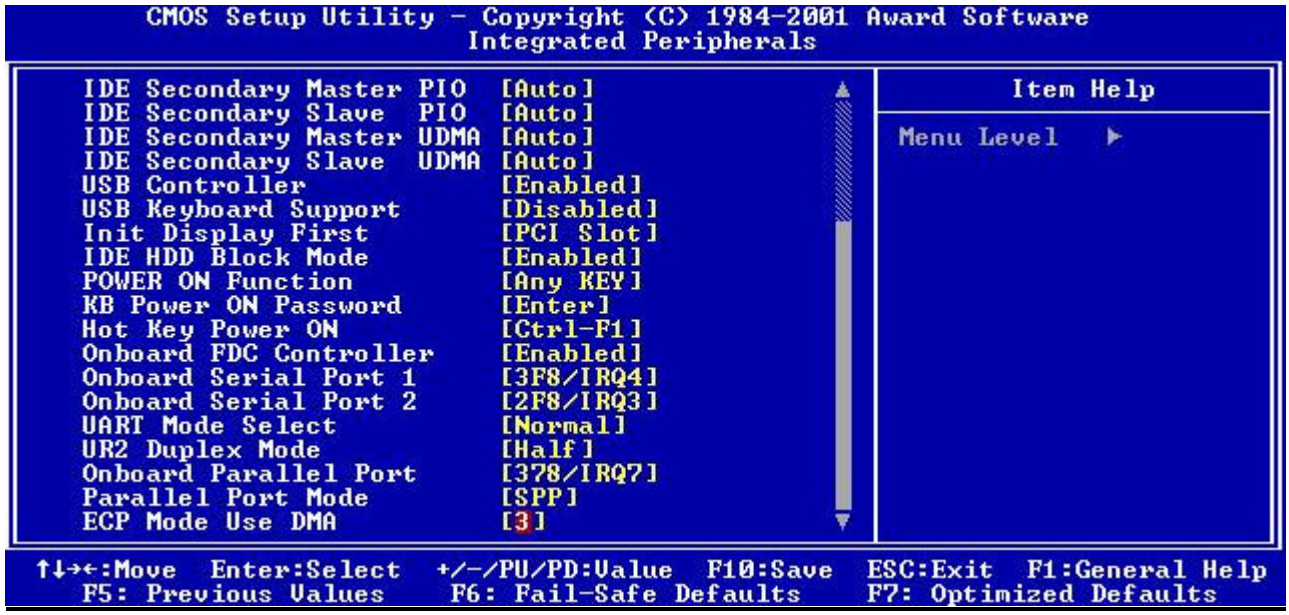
Data Prior to Thermal

This item allows you to select the delayed time to enable P4 CPU Thermal function. When enter into NT 4.0, this function must be active to prevent from the system hanged.

The Choice: 4 Min, 8 Min, 16 Min, 32Min.

Integrated Peripherals





ONBOARD SCSI H/W ACTIVE

Support for the EBK SCSI Upgraded

The choice: Enabled/Disabled.

Onboard LAN Boot ROM

Select enabled if you wish to run the LAN Boot Agent ROM as boot–up your computer.

The choice: Enabled/Disabled.

Onboard SCSI Boot ROM

Select enabled if you wish to run the SCSI Boot Agent ROM as boot–up your computer

The choice: Enabled/Disabled.

OnChip Primary / Secondary PCI IDE

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

The choice: Enabled/Disabled.

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 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, 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.

POWER ON Function

This item allows you the select power on event. Function effects only use ATX power.

The choice: Password, Hot KEY, Mouse Move, Mouse Click, Any KEY, BUTTON ONLY, Keyboard 98.

KB Power ON Password

This item allows you to set the keyboard power on password.

Key Power On Power ON

This item allows you to select the hot key of the keyboard power on.

The choice: Ctrl-F1~F12.

Onboard FDC Controller

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

The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

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

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

UART Mode Select

This item allows you to select second serial port mode.

The choice: Normal, IrDA, ASKIR, SCR.

UR2 Duplex Mode

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

The choice: Half, Full.

Onboard Parallel Port

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

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

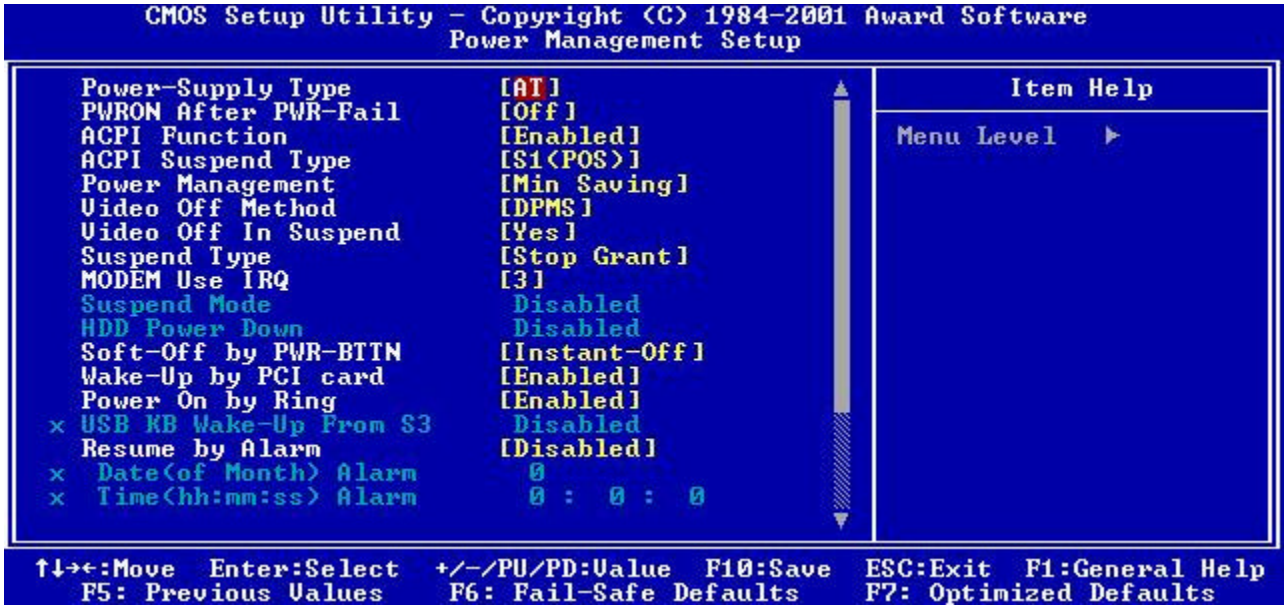
ECP Mode Use DMA

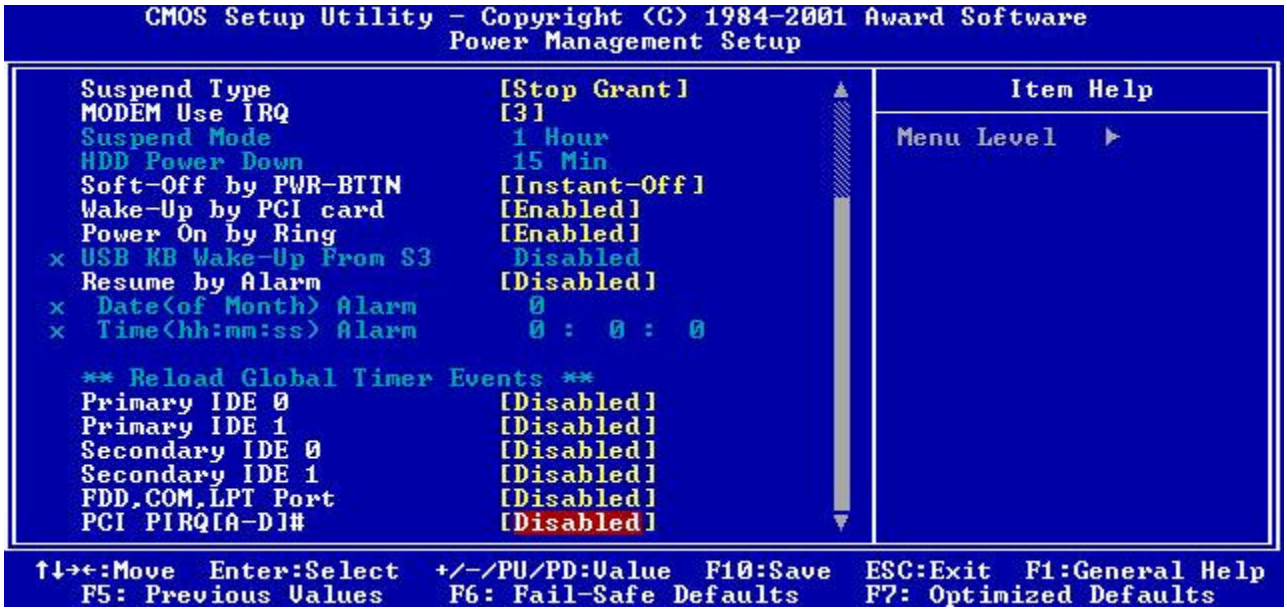
Select a DMA channel for the parallel port for use during ECP mode.

The choice: 3, 1.

Power Management

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.





Power-Supply Type

The choice: AT/ATX.

PWRON After PWR-Fail

This item allows you to select if you want to power on the system after power failure.

The choice: Off, On, Former-Sts.

ACPI Function

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

The choice: Enabled, Disabled.

ACPI Suspend Type

This item allows you to select the APCI suspend type.

S1 (POS) => Power On Suspend, S3 (STR) => Suspend To DRAM
The choice: S1 (POS), S3 (STR).

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. Suspend Mode

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

Min. Power Saving	Minimum power management. Suspend Mode = 1 hr.
Max. Power Saving	Maximum power management. Suspend Mode = 1 min.
User Defined	It allows you to set each mode individually. When not disabled, each of the ranges from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Video Off Method

In suspending, this item allows you to select the CRT closed method under APM mode.
The choice: Blank Screen, V/H SYNC+Blank, DPMS

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 Support	Initial display power management signaling.

Video Off In Suspend

In suspending, this item allows you to select if you want to close the CRT under APM mode.

The choice: Yes/No.

Suspend Type

This item allows you to select the suspend type. Stop Grant means wake up by IRQ, and PowerOn Suspend means wake up by ACPI wake up event.

The choice: Stop Grant/PwrOn Suspend.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

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

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

An input signal from PCI Interface awakens the system from the suspend mode or powers on system.

The choice: Enabled/Disabled.

Power on by Ring

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

The choice: Enabled/Disabled.

Resume by Alarm

When *Enabled,* your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

The choice: Enabled/Disabled.

POWER MANAGEMENT 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.

Primary IDE 0

Primary IDE 1

Secondary IDE 0

Secondary IDE 1

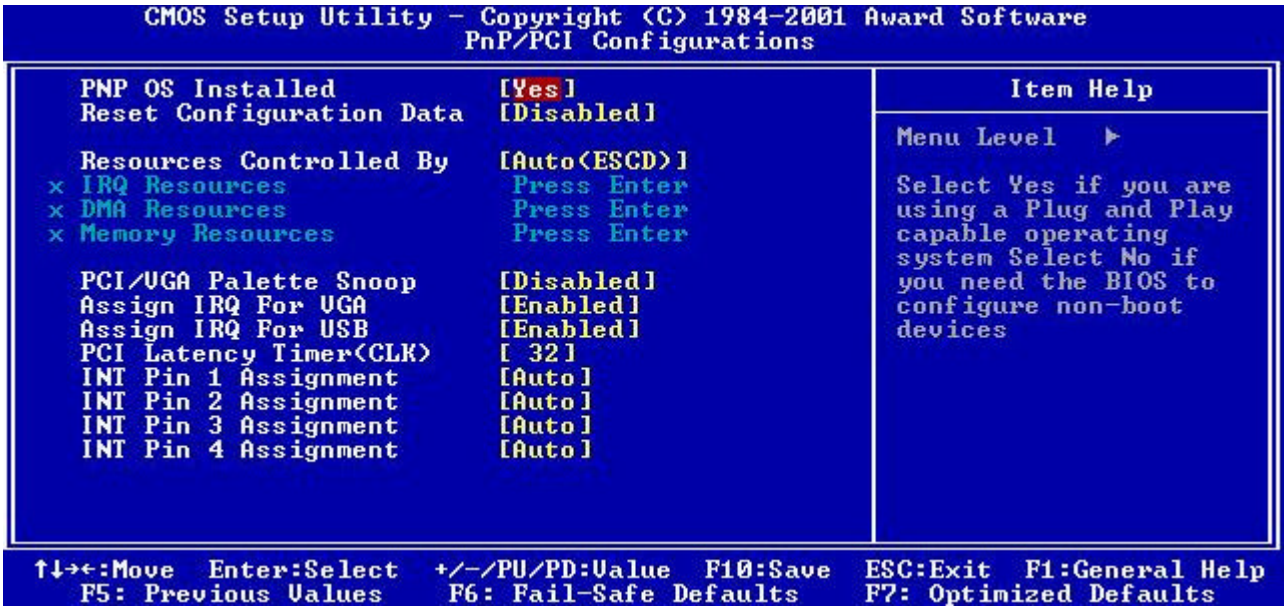
FDD, COM, LPT Port

PCI PIRQ[A-D] #

PCI PIRQ[A-D] #

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.



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 cannot 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.

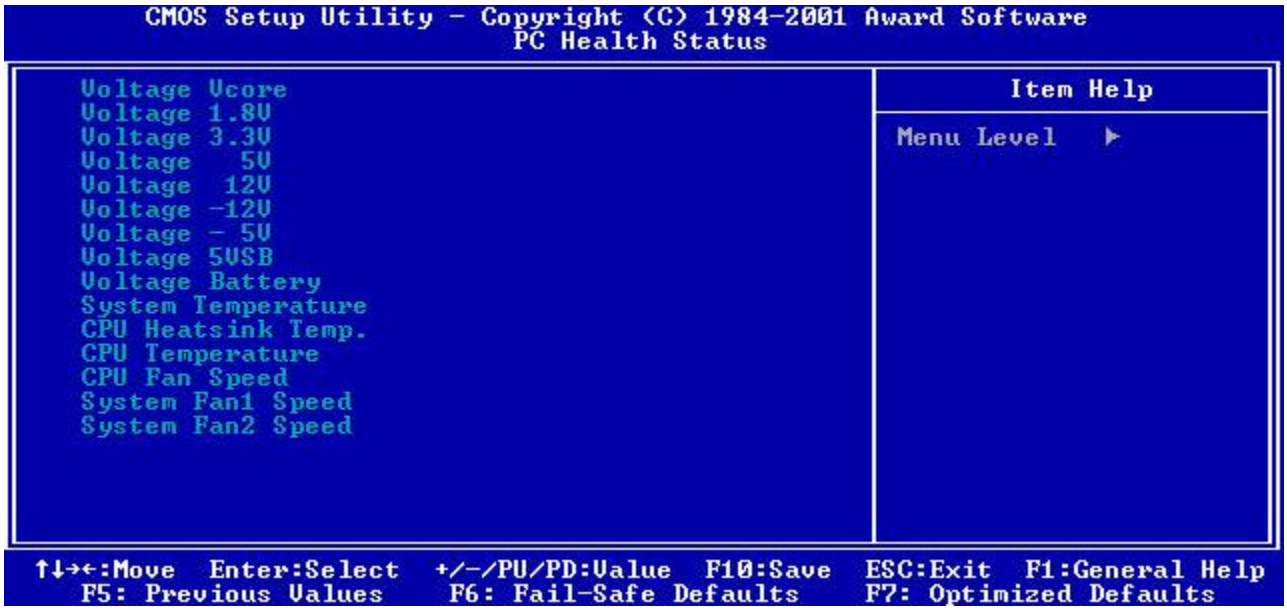
The choice: Auto (ESCD)/Manual.

PCI / VGA Palette Snoop

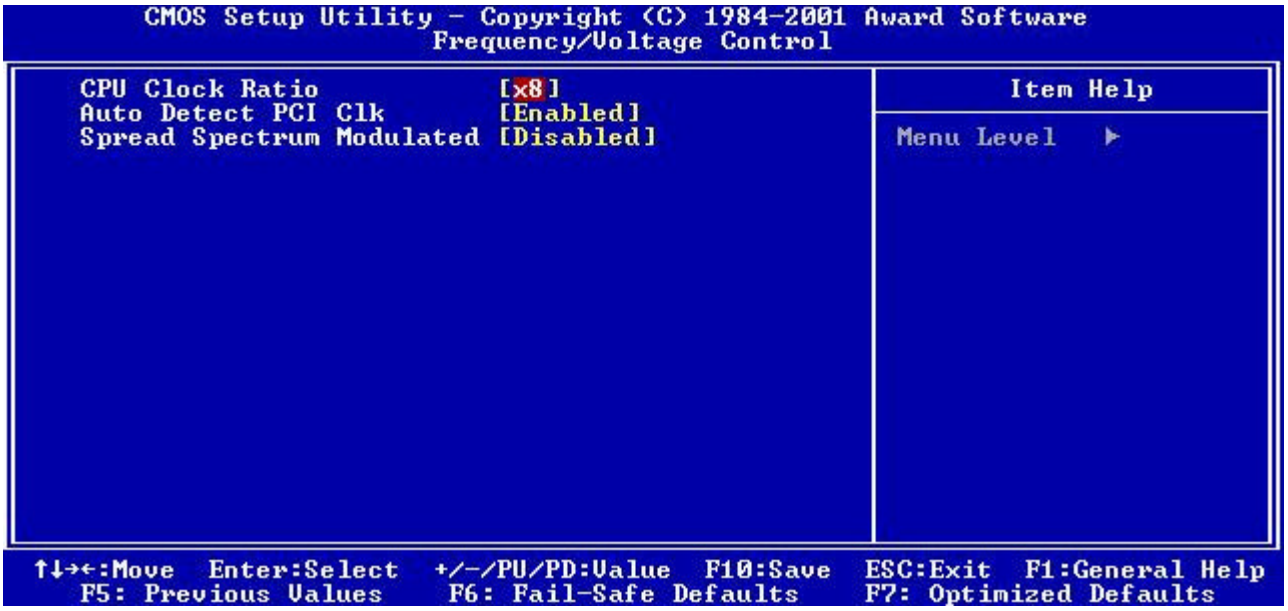
Leave this field at Disabled.

The choice: Enabled/Disabled.

PC Health Status



Frequency/Voltage Control



CPU Clock Ratio

This item allows you to set up 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: X8, X9, X10, X11, X12, X13, X14, X15.

Auto Detect PCI Clk

When enabled, this item will auto detect if the DIMM and PCI socket have devices and will send clock signal to DIMM and PCI devices. When disabled, it will send the clock signal to all DIMM and PCI socket.
The choice: Enabled/Disabled.

Spread Spectrum Modulated

This item allows you to enable/disable the spread spectrum modulate.

The choice: Enabled/Disabled.

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.