

PI-6551V
All-In-One Pentium
CPU card with on-board
VGA interface
and
Solid State Disk

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1. Introductions

1.1 Description

Welcome to the PI-6551V Pentium™ with 3D AGP VGA interface and SSD Disk Single Board Computer. The PI-6551V CPU card is an PICMG ISA and PCI bus form factor board, which comes equipped with high performance Pentium P54C/P55C(MMX),AMD K5/K6/K6-2/K6-3,Cyrix M1/M2 CPUs and advanced high performance multi-mode I/O, designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

The board build-in two disk socket which can accept DiskOnChip™(DOC) Flash Disk for embedded application. User can use any DOS command without any extra software utility. The DOC currently is available from 2MB to 128MB.

An advanced high performance super AT I/O chip – W83877TF is used in the PI-6551V board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and PCI bus Ultra DMA-33 Enhance IDE interface are compatible with IBM PC/AT and XT architecture's.

In addition, the PI-6551V provides two 168-pin DIMM sockets for its on-board SDRAM. The SDRAM module accepts 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, and 64MB.

PI-6551V VGA interface is supported for integrate H/W 3D AGP VGA controller. The VGA controller is high performance and targeted at 3D graphic application.

1.2 Specifications :

The PI-6551V Pentium with VGA interface Single Board Computer provides the following specification:

- **CPU :**
 - Intel – Pentium P54C/P55C(MMX) (350MHz or up)
 - AMD - K5/K6-2/K6-3 (450MHz or up)
 - IDT – 150 / 350 MHz or Up
 - Cyrix –6x86mx (support Linear Mode)
- **CPU voltage:**+1.30V to +3.50V (jumper selectable)
- **Host Clock:** 66MHz to 100 MHz (jumper selectable)
- **CPU Bus Ratio:** from 2.5x to 5.5x
- **Bus :**PICMG 2.1 standards interface (PCI/ISA Bus)
- **Chipsets :**
 - System - SiS530 /5595
 - I/O – Winbond W83877TF
 - VGA - Integrated in SiS530
- **System BIOS:**
 - Award PnP BIOS and VGA BIOS in a single Flash ROM
 - Y2K compliant BIOS
- **System memory :**
 - Support Two 168-pin DIMM socket up to 1GB
 - Supports 1M/2M/4M/8M/16M/32M/64MxN SDRAM
 - Support PC-100 SDRAM module when running at 100MHz CPU bus speed and use PC-66/PC-100 module when running at 66MHz CPU bus speed.
- **Cache memory :**
 - On-board 512KB up to 2MB of secondary synchronous burst-mode cache
- **Display:**
 - Integrates super CRT AGP VGA controller for Hardware 2D/3D Video/Graphics Accelerators
 - Supports tightly coupled 64 bits 100MHz host interface to VGA to speed up GUI performance and the video playback frame rate.
 - Built-in programmable 24-bit true-color RAMDAC up to 230 MHz pixel clock
 - Shared System Memory Area 2MB, 4MB and 8MB

- Support non-interlaced CRT monitor with resolutions up to 1600x1200x8
- The integrated 3D VGA controller is also built-in virtual screen mode
Which could support up to 2048x2048 resolution
- **Universal Serial Bus (USB) interface :**
 - Two USB pin-header connectors
 - USB v1.0 and Intel Universal HCI v1.0 compatible
- **Plug and Play :**
 - Dual interrupt and DMA signal steering with plug and play control.
 - MS Windows 95/98/NT and plug play BIOS compliant
- **Floppy Disk Drive Interface:**
 - Supports Up to two Floppy Disk Drives,5.25"(360KB or 1.2MB); and/or 3.5"(720KB or 1.44MB/2.88MB)
- **IDE Hard Disk Drive Interface:**
 - One channel master mode PCI supporting two enhanced IDE devices
 - Support Ultra-DMA 33
 - Supports IDE PIO Timing Mode0,1,2,3 and 4
 - Supports Multiword DMA Mode 0,1,2
 - 16 DW FIFO PCI Burst Transfers
- **Serial ports :**
 - Two NS16550 Compatible RS-232C Serial Ports.
 - Supported +5V(1A) Power Output or Ring Signal input By COM Port pin-9.(Jumper Selectable)
- **IrDA Interface**
 - Pin -header connector for optional IrDA external connector.
- **Printer Port:** One High-Speed SPP/ECP/EPP Bi-direction Parallel Port.
- **Solid State Disk (SSD)**
 - Provide Two M-System DiskOnChip Sockets
 - Compatible with JEDEC standard
- **Mouse :** Support PS/2 Mouse Port
- **Keyboard :**
 - PS/2 Type mini-DIN that supports PC/AT
 - Supports a 5-pin external keyboard connector
- **WatchDog timer :**
 - Software programmable Watchdog timer
 - 16 level timeout intervals range from 1 to 160 sec
- **Green Function :** Power management via BIOS, or External Ring wakeup
- **Temperature Monitoring :** A sensor for Monitor the CPU and system temperature

- on the Card.
- **Real-time clock/calendar :** Lithium battery with 10 year data retention
- **PC/104 Connector:** 16-bit PC/104 connector for expansion modules.
- **Support External Power Input Connector(P8)**
- **Power Supply Voltage : +5V,+12V**
- **Power Consumption :**
 - +5VDC/15A(max), +12V/200mA(max)
(Power requirement will Vary with CPU type)
- **Operating Temperature:** 32 to 140F(0 to 60C).
Humidity: 5% to 95%
(A Heat Sink With Cooling Fan is Needed on CPU)
- **Storage Temperature:** -4 to 248F(-20 to 120C)
- **Dimensions:** 339.09mm(L) x 123.19mm(W)
- **Board Type:** Dual/Side SMT, Multi-Layer P.C.B

1.3 What You Have

In addition to this *User's Manual*, the PI-6551V package includes the following items:

- PI-6551V Pentium with VGA Single Board Computer
- RS-232/Printer Cable
- FDD/HDD Cable
- 6-pin Mini-Din to 5-pin Din Keyboard Adapter Cable
- Two diskettes for Driver Utility

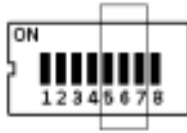
If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

1.4 Installation

This chapter describes how to install the PI-6551V. At first, the layout of PI-6551V is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the PI-6551V's configuration, such as CPU type selection, system clock setting, and watchdog timer are also included.

1. For Single Voltage CPU : Intel P54C, Cyrix 6x86, AMD K5 CPU Core Voltage must be set to 3.3V
2. For Dual Voltage CPU : Intel P55C, Cyrix 6x86L/MX2, AMD K6/K6-2/3 CPU Core Voltage dependent CPU Type

2.3 CPU internal freq Bus/Core ratio selector : S2 [SW5 ,SW6 ,SW7]



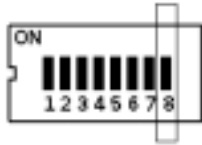
S2			
SW5	SW6	SW7	Bus/Core Ratio
ON	OFF	OFF	2.0x
ON	ON	OFF	2.5x
OFF	ON	OFF	3.0x
OFF	OFF	OFF	3.5x
ON	OFF	ON	4.0x
ON	ON	ON	4.5x
OFF	ON	ON	5.0x
OFF	OFF	ON	5.5x

2.4 CPU external clock speed selector :S2 [SW1,SW2,SW3,SW4]



S2						
SW1	SW2	SW3	SW4	CPU Fre	SDRAM	PCI Bus
ON	ON	ON	ON	90.8MHz	90.0MHz	30.0MHz
ON	ON	ON	OFF	66.7MHz	100MHz	33.3MHz
ON	ON	OFF	ON	95MHz	63.3MHz	31.7MHz
ON	ON	OFF	OFF	100MHz	66.6MHz	33.3MHz
ON	OFF	ON	ON	100MHz	75MHz	30.0MHz
ON	OFF	ON	OFF	112MHz	74MHz	37.3MHz
ON	OFF	OFF	ON	124MHz	82.7MHz	31.0MHz
ON	OFF	OFF	OFF	133MHz	88.8MHz	33.3MHz
OFF	ON	ON	ON	66.7MHz	66.7MHz	33.4MHz
OFF	ON	ON	OFF	75MHz	75MHz	30MHz
OFF	ON	OFF	ON	83.3MHz	83.3MHz	33.3MHz
OFF	ON	OFF	OFF	95MHz	95MHz	31.7MHz
OFF	OFF	ON	ON	100MHz	100MHz	33.3MHz
OFF	OFF	ON	OFF	112MHz	112MHz	37.3MHz
OFF	OFF	OFF	ON	124MHz	124MHz	31.3MHz
OFF	OFF	OFF	OFF	133.3MHz	133.3MHz	33.3MHz

2.5 CPU Linear/Interleave burst : S2[SW8]

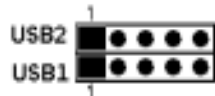


Signale Name	SW8	Remark
Interleave Burst	OFF	Default
Linear Burst	ON	For Cyrix L/MX CPU

2.6 On-Board VGA controller Enable/disable : JP1

JP1	VGA	Remark
Open	Enable	Default
Close	Disable	

2.7 USB (Universal serial Bus) connector : USB1 , USB2



Signal name.	USB-1	USB-2
+5V	Pin-1	Pin-1
USB-	Pin-2	Pin-2
USB+	Pin-3	Pin-3
GND	Pinn-4	Pinn-4
	Pin-5	Pin-5

2.8 COM Serial Port Connector : CN 10,CN 6

The On-Board serial ports of PI-6551V are a DB-9pin(CN10) and a 10 pin-header(CN6)

COM1/3 D-Type 9-pin Connector : CN 10

CN 10 (D-Type 9-pin)	
Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI or +5V

DB-pin9 signal RI or +5Vdc is selector by JP3 pin [2 , 4, 6]

COM2/4 10-pin Header : CN 6





CN 6 (10-pin Header)			
Pin No.	Signal Name	Pin No.	Signal Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI or +5V
9	GND	10	nc

CN6 Ext. by flat-cable to D-TYPE 9-pin Connector,
DB-pin9 signal RI or +5VDC is selected by JP3 pin [1 , 3 , 5]

2.9 Jumper for selecting Ring or +5VDC of COM port : JP 3

The D-Type connector pin-9 of COM1/COM2 has two purposes:

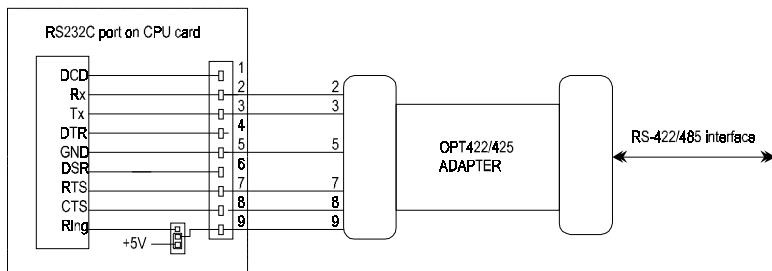
1. Directly connects to "Ring" signal of COM1/COM2 port
2. Connects to +5VDC , IF RS422/485 adapter connected to COM1/COM2 port

COM port	JP 3	Signal	Remark
COM 1/3		Ring	Default
		+5VDC	
COM 2/4		Ring	Default
		+5VDC	

2.10 Converting RS-232 serial port to RS-422/485

The RS-232C serial port(s) on this card can easily be converted to RS-422/485 interface by using OPT422/485 adapter

The OPT422/485 can convert four RS-232C level signals into RS-422/RS-485 level(Tx,Rx, RTS,CTS), and supplied by +5V through pin-9 of RS-232C connector as shown below.



Connection between RS-232C port and OPT422/425

See chapter 2 to set jumper called JP3 properly before using OPT422/485 adapter

2.11 IR Connector : CN5

Pin No.	Signal
1	+5V DC
2	FIRRX
3	IRRX
4	GND
5	IRTX

2.12 Keyboard connector : CN 12 (6-pin mini DIN)

Pin No.	Signal
1	KB_data
2	N.C
3	GND
4	+5V DC
5	KB_clk
6	GND

2.13 Extended keyboard connector : CN 11 (5-pin header)



Pin No.	Signal
1	KB_clk
2	KB_data
3	N.C
4	GND
5	+5V DC

2.14 PS/2 Mouse connector : CN 4

Pin No.	Signal
1	MS_data
2	N.C
3	GND
4	+5V DC
5	MS_clk
6	N.C

Notes : Due to PS/2 Mouse and USB Controller occupied IRQ12 channel
 If you want use IRQ12 on ISA BUS must be Disabled PS/2 and USB
 function by BIOS CMOS Setup :
 INTEGRATED PERIPHERALS → PS/2 Mouse function : Disable
 → USB Controller : Disable

2.15 Clear CMOS setup : JP2

JP2	Signal	Remark
	Clear CMOS	
	Normal	Default

Note : . The system should be turned off before Clear CMOS RAM
 . You should close the JP5 pin 1-2 about 3 seconds, Then set back
 to normal operation mode(Close JP2 pin 2-3)

2.16 CPU FAN Power Connector :FAN2

FAN2 is a 3-pin header for the CPU FAN. The FAN must use +12V FAN

Pin No.	Signal
1	GND
2	+ 12V DC
3	Rotation

2.17 Chassis FAN power connector : FAN1

FAN1 is a 3-pin header for the Chassis FAN. The FAN must use +12V FAN

Pin No.	Signal
1	GND
2	+ 12V DC
3	Rotation

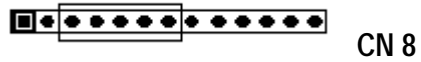
2.18 Hardware Reset Switch connector : CN 8 pin [1 , 2]



1 2

Pin No	Signal Name
1	Reset
2	GND

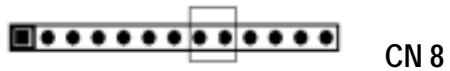
2.19 Power LED & Key Lock : CN 8 pin [3,4,5,6,7]



1 3 4 5 6 7

Pin No	Signal
3	PWR LED
4	NC
5	GND
6	Key Lock
7	GND

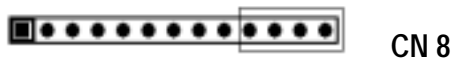
2.20 HDD LED Connector : CN 8 pin [8,9]



1 8 9

Pin No	Signal Name
8	+5V
9	GND

2.21 Ext. Speaker connector : CN 8 pin [10 , 11, 12, 13]



1 10 13

Pin No	Signal name
10	+5V
11	GND
12	GND
13	Speaker Out

2.22 External Power Input connector : CN 3

When using an AT compatible power supply, plug the power supply connector P8 into CN 3 . Make sure the power supply connector are connector in the right orientation.

Pin No	Signal Name
1	NC
2	+5V
3	+12V
4	-12V
5,6	Ground

2.23 Parallel port Connector : CN 2

Pin No.	Description	Pin No.	Description
1	-STROBE	2	DATA0
3	DATA1	4	DATA2
5	DATA3	6	DATA4
7	DATA5	8	DATA6
9	DATA7	10	ACK
11	BUSY	12	EMPTY
13	SELECT	14	Auto FEED
15	ERROR	16	INIT
17	INPUT	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	GND

2.24 VGA CRT Monitor Connector : CN 9

Pin No.	Signal
1	RED
2	GREEN
3	BLUE
4	N.C
5	GROUND
6	R/G/B return GND
7	R/G/B return GND
8	R/G/B return GND
9	N.C
10	GND
11	N.C
12	N.C
13	HSYNC
14	VSYNC
15	N.C

2.25 Floppy Disk Driver Connector : CN 1

Pin No.	Signal
1 -33 (odd)	Ground
2	High density
4,6	Unused
8	Index
10	Motor enable A
12	Driver select B
14	Driver select A
16	Motor enable B
18	Direction
20	Step pulse
22	Write data
24	Write enable
26	Track 0
28	write protect
30	Read data
32	Select head
34	Disk change

2.26 Hard Disk Driver Connector : IDE 1 , IDE 2

Primary IDE Connector : IDE 1

Secondary IDE Connector : IDE 2

Pin No.	Signal	Pin No.	Signal
1	-RST	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
-19	GND	20	N.C
21	N.C	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IRDY	28	BALE
29	N.C.	30	GND
31	IRQ	32	IO16
33	A1	34	N.C.
35	A0	36	A2 CS0
37	CS0	38	CS1
39	-ACT	40	GND

2.27 Watchdog reset setting : JP 5

The watch dog timer is programmable in 16 level from 1 to 160 seconds. When the timer counts to completion, it sets a flag and optionally asserts **Reset** or **NMI**.

It is define at I/O port 443h, When you want to enable/disable the watchdog timer, write data to I/O port 443h. IF you want to refresh watch dog timer Read I/O port from 443h.

The watch dog timer base can be set at 1.0 or 10 seconds by JP 5 pin [5-6] or [7-8]

Watch Dog Active Type setting : JP 5 pin [1-2 , 3-4]



ACT Type	JP 5 pin [1-2 , 3-4]	Remark
Reset		
NMI		
Disable		Default

Watchdog timer base setting : JP 5 [5-6 , 7-8]



Time Base	JP 5 [5-6 , 7-8]	Remark
1.0 sec		Default
10 sec		

The watch dog timer table (Time Base = 1.0 sec)

Value	Time/sec	Value	Time/sec
0	Disable	17H	9
1FH	1	16H	10
1EH	2	15H	11
1DH	3	14H	12
1CH	4	13H	13
1BH	5	12H	14
1AH	6	11H	15
19H	7	10H	16
18H	8		

The watch dog timer table (Time Base = 10 sec)

Value	Time/sec	Value	Time/sec
0	Disable	17H	90
1FH	10	16H	100
1EH	20	15H	110
1DH	30	14H	120
1CH	40	13H	130
1BH	50	12H	140
1AH	60	11H	150
19H	70	10H	160
18H	80		

Example 1 :

```

; Time Base = 1.0 sec (JP5 pin[3,4] = SHORT, pin[5,6] = OPEN)
mov    dx,443h      ; Load Watch dog I/O port Addr.
mov    al,11h      ; Set to 15 sec
out    dx,al       ; Write to Control REG.
...
...
in     al,dx       ; Clear(Refresh) watch dog timer. repeat
...
...
mov    al,0        ; Disable Watch dog
out    dx,al       ; Write to Control REG.
    
```

Example 2 :

```

; Time Base = 10 sec (JP5 pin[5,6] = SHORT, pin[3,4] = OPEN)
mov    dx,443h     ; Load Watch dog I/O port Addr.
mov    al,16h     ; Set to 100 sec
out    dx,al      ; Write to Control REG.
...
...
in     al,dx      ; Clear(Refresh) watch dog timer. repeat
...
...
mov    al,0       ; Disable Watch dog
out    dx,al      ; Write to Control REG.
    
```

2.28 Solid state Disk Controller(SSD) :M1 , M2

Provide two M-system DiskOnChip socket
Compatible with JEDEC standard

2.29 SSD memory Address Select : JP 5 pin[9-10]



JP 5 pin[9-10]	Memory Addr
Open	CC000h - CFFFFh
Close	DC0000h - DFFFFh

2.30 How to install DiskOnChip

The DiskOnChip™ Flash disk chip is produced by M-Systems. The DiskOnChip™ Flash disk occupies only 8KB system memory address, and can completely emulate a disk in PC system

1. Insert DiskOnChip Flash device(s) into M1 or M2
2. Boot system form normal CMOS setup sequence
3. Format DiskOnChip flash disk at DOS prompt as:

C>format D: /S /U (if one active hard disk existed)

Or

C>format E: /S /U (if two hard active disk existed)

4. Copy your application files into DiskOnChip Flash disk by using "COPY" command
5. Reboot system and then modify System BIOS SETUP to have Hard Disk(s) not installed
6. The system will boot DOS from Flash disk

3 VGA driver installation

This chapter provides information on how to install VGA drivers that come in the floppy diskette with your PI-6551V card. Please note that there must be relevant software installed in your system before you could proceed to install the VGA drivers.

3.1 Installing the drivers for Windows 95 & windows 98

1. Click "Start" menu and select Control Panel from Settings group.
2. Select "Display" icon.
3. Select "Settings" index in the display properties sheet.
4. Select "Change Display Type" button.
5. Select "Change..." button in "Adapter Type" group.
6. Select "Have Disk" button.
7. Place the PI-6583V CD-Title Disk into CDROM Drive.
8. When the "Install from Disk" dialog box appears, type the directory storing the drivers and click "OK".
The directory in CD-Title is at "D:\VGA\WIN9x".
9. When the "Change Display" dialog box appears, click "Close".
10. Select "Close" or "Apply" button from display properties sheet.
11. A message will appear stating you must restart the windows 95 system, select "yes" to restart.
12. After restarting, windows 95 or Windows 98 will run on 640x480x256 color,

. Selecting resolution, color depth, and refresh rate:

1. Click "Start" menu and select Control Panel from Settings group.
2. Select Display icon.
3. Select Settings.
4. Select Color Palette to change between 16 color, 256 color, Hi color, and True color.
5. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640x480, 800x600, 1024x768, and 1280x1024.
6. Select Refresh rate list box to change the screen refresh rate.
7. Click "OK" or "Apply".

. Windows 95 & Windows 98 (Utility Installation)

1. Place the PI-6583V CD-Title Disk into CDROM Drive.
2. Click "Start" menu and select "Run..." menu item.
3. In "Run" dialog, typing the source execution file then press "OK".
The execution file in CD-Title is at "D:\VGA\WIN9x\SETUP.EXE".

3.2 Installing the drivers for Windows NT 4.0

1. Click "Start" menu and select Control Panel from Settings group.
2. Select Display icon.
3. Select Settings of Display Properties.
4. Select Display Type.
5. Select Change from the Adapter Type area.
6. Select Have Disk of Change Display.
7. Place the PI-6583V CD-Title Disk into CDROM Drive.
8. When the "Install from Disk" dialog box appears, type the directory storing the drivers and click "OK".
The directory in CD-Title is at "D:\VGAWINNT40".
9. When the "Change Display" dialog box appears, click "OK".
10. When the "Third-party Drivers" dialog box appears, click "Yes".
A message will appear stating that the drivers were successfully installed. Click "OK".
You must now restart Windows NT 4.0.

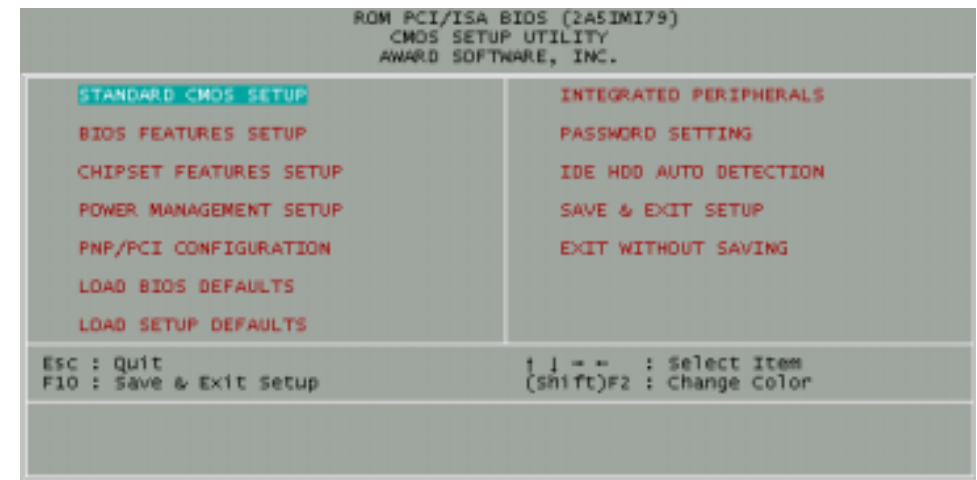
Selecting resolution and color depth:

1. Click "Start" menu and select Control Panel from Settings group.
2. Select Display icon.
3. Select Settings.
4. Select Color Palette to change between 16 colors, 256 colors, 32768 colors, 65536 colors, and 16777216 colors.
5. To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640x480, 800x600, 1024x768 to 1280x1024.
6. Select Test to test the resolution. If the display test screen was good then select "Yes" when the "Testing Mode" dialog box appears. If the display test screen was bad then select "No".
Windows NT will give you an error message.
7. Click "OK". If the display test screen was good and you select "Yes",
Windows NT 4.0 will change the mode without restarting Windows NT 4.0.

4 BIOS Setup

4.1 Main menu

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



■ Standard CMOS Setup

This setup page includes all the items in a standard, AT-compatible BIOS

■ BIOS Features Setup

This setup page includes all the items of Award special enhanced features

■ Chipset Features Setup

This setup page includes all the items of chipset special features.

■ Power Management Setup

This entry only appears if your system supports Power Management, "Green PC", standards PNP / PCI Configuration Setup. This entry appears if your system supports PNP / PCI.

■ Load BIOS Defaults

The BIOS defaults have been set by the manufacturer and represent settings which provide the minimum requirements for your system to operate.

■ **Load Setup Defaults**

The chipset defaults are settings which provide for maximum system performance. While Award has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.

■ **Password setting**

Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup

■ **Integrated Peripherals**

This section page includes all the items of IDE hard drive and Programmed Input / Output features.”.

■ **IDE HDD Auto Detection**

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk’s parameters. See also Section 2, “Standard CMOS Setup”.

■ **Save & Exit Setup**

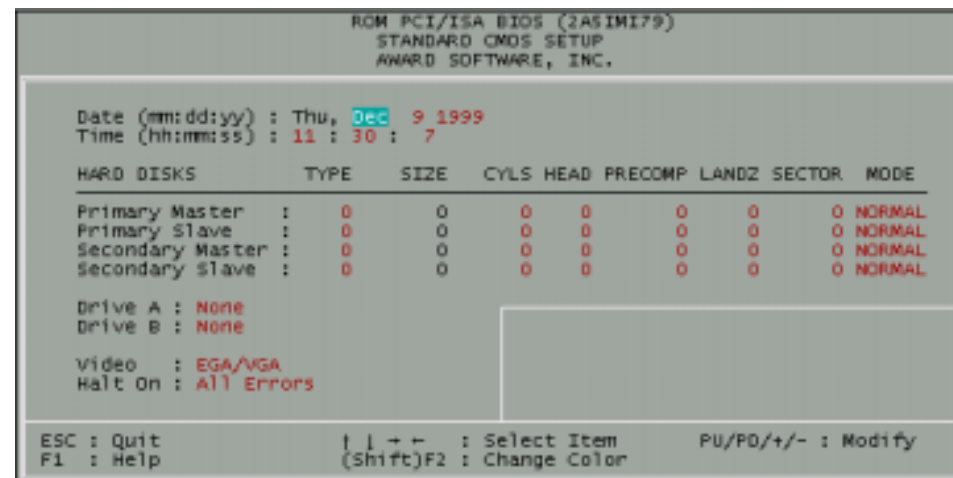
Save CMOS value changes to CMOS and exit setup.

■ **Exit Without Save**

Abandon all CMOS value changes and exit setup.

4.2 Standard SMOS setup

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.



■ **Date**

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

day	The day, from Sun to Sat, determined by the BIOS and is display-only
date	The date, from 1 to 31 (or the maximum allowed in the month)
month	The month, Jan through Dec.
year	The year, from 1900 through 2099

■ **Time**

The time format is <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

■ **Primary Master/Primary Slave/Secondary Master/Secondary Slave**

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

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

If you select Type "User", you will need to know the information listed below. Enter the information directly from the keyboard and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.

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

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

If you select Type "Auto", BIOS will Auto-Detect the HDD & CD-ROM Drive at the POST stage and showing the IDE for HDD & CD-ROM Drive.

■ **Drive A Type / Drive B Type**

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

■ **Video**

The category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

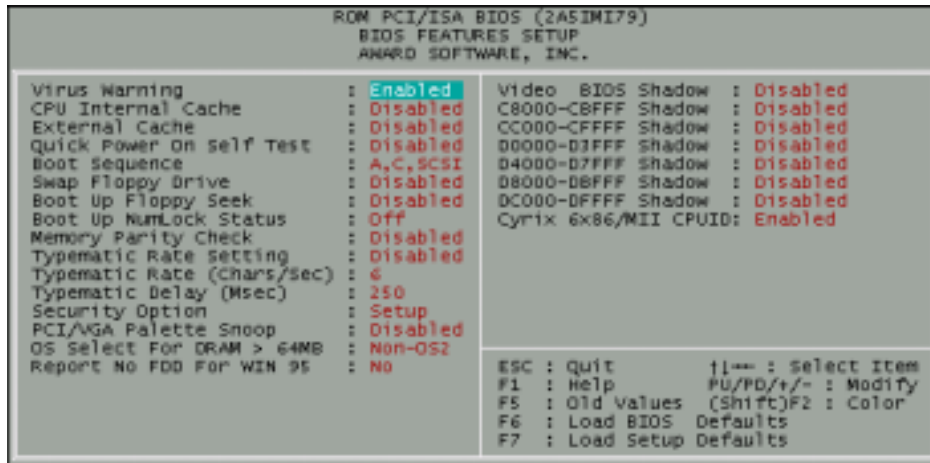
■ **Halt On**

The category determines whether the computer will stop if an error is detected during power up.

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

4.3 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

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

■ CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is enable.

■ Quick Power On Self Test

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

■ Boot Sequence

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

■ Swap Floppy Drive

This item allows you to determine whether enable the swap floppy drive or not.

The choice: Enabled/Disabled.

■ Boot Up Floppy Seek

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

■ Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on.

■ Boot Up System Speed

Selects the default system speed -- the normal operating speed at power up.

■ Typematic Rate Setting

This determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin the report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys.

■ Typematic Rate (Chars/Sec)

When the typematic rate is enabled, this selection allows you select the rate at which the keys are accelerated.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

■ Typematic Delay (msec)

When the typematic rate is enabled, this selection allows you to select the delay between when the key was first depressed and when the acceleration begins.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

■ Security Option

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

■ PCI / VGA Palette Snoop

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

■ OS Select for DRAM > 64

This item allows you to access the memory that over 64MB in OS/2.

The choice: Non-OS2, OS2.

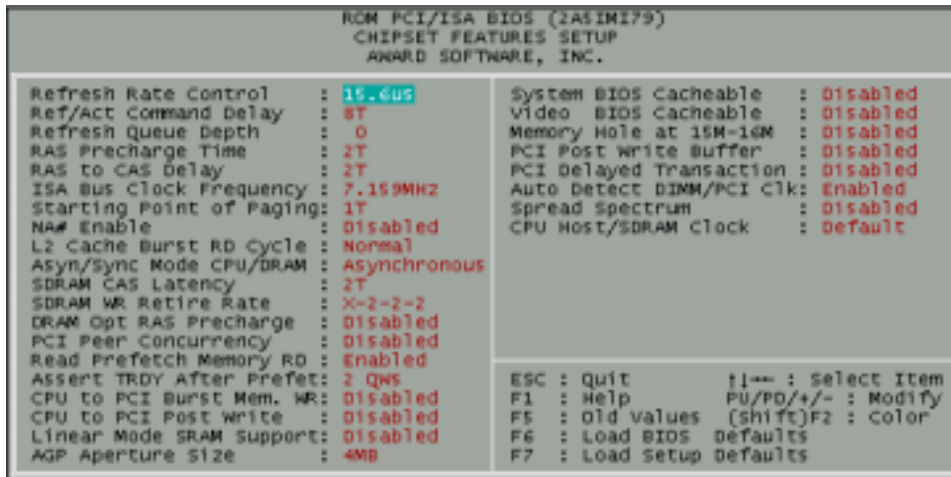
■ Video BIOS Shadow

Determines whether video BIOS will be copied to RAM. However, it is optional depending on chipset design. Video Shadow will increase the video speed.

■ C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

These categories determine whether option ROMs will be copied to RAM. An example of such option ROM would be support of on-board SCSI.

4.4 Chipset Feature setup



■ Auto Configuration

This item allows you select pre-determined 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.

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

■ Refresh Rate Control

Select the period required to refresh the DRAMs, according to DRAM specifications.

■ Ref / Act Command Delay

Set the DRAM clock of the refresh command to refresh/active command delay.

■ Refresh Queue Depth

Set the depth of refresh queue.

■ RAS Precharge Time

The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refreshes. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

■ RAS to CAS Delay

When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe).

■ ISA Bus Clock Frequency

You can set the speed of the AT bus at one-third or one-fourth of the CPU clock speed.

■ Starting Point of Paging

This value controls the start timing of memory paging operations.

■ NA# DRAM

Selecting *Enabled* permits pipelining, in which the chipset signals the CPU for a new memory address before all data transfers for the current cycle are complete, resulting in faster performance.

■ L2 Cache Burst RD Cycle

These timing numbers are the pattern of cycles the CPU uses to read data from the cache.

■ Asyn/Sync Mode CPU/DRAM

This feature can only be enabled when the frequency of CPU clock and the frequency of DRAM clock are the same and the skew between these two clocks should be zero.

■ SDRAM CAS Latency

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

■ SDRAM WR Retire Rate

The system designer must select the correct timing for data transfers from the write buffer to memory, according to DRAM specifications

■ DRAM Opt RAS Precharge

The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refreshes. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

■ PCI Peer Concurrency

Peer concurrency means that more than one PCI device can be active at a time.

■ Read Prefetch Memory RD

When this item is *Enabled*, the system is allowed to prefetch the next read instruction and initiate the next process.

■ Assert TRDY After Prefet

When you select 1QWs, SiS530 asserts its first TRDY# for 1 transaction after it prefetched 1 quadword of data from system memory. Otherwise, SiS530 asserts its first TRDY# after 2 quadwords are prefetched.

■ CPU to PCI Burst Mem. WR

Select enabled permits PCI burst memory write cycles, for faster performance. When disabled, performance is slightly slower, but more reliable.

■ CPU to PCI Post Write

Select enabled to use a fast buffer for posting writes to memory. Using a fast buffer releases the CPU before completion of a write cycle to DRAM.

■ AGP Aperture Size

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 APG information.

■ 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.

■ Video BIOS Cacheable

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

■ Memory Hole at 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

■ VGA Shared Memory Size

Specify the size of system memory to allocate for video memory, from 1 MB to 8 MB.

■ VGA Memory Clock (MHz)

Set the speed (MHz) of the VGA memory clock.

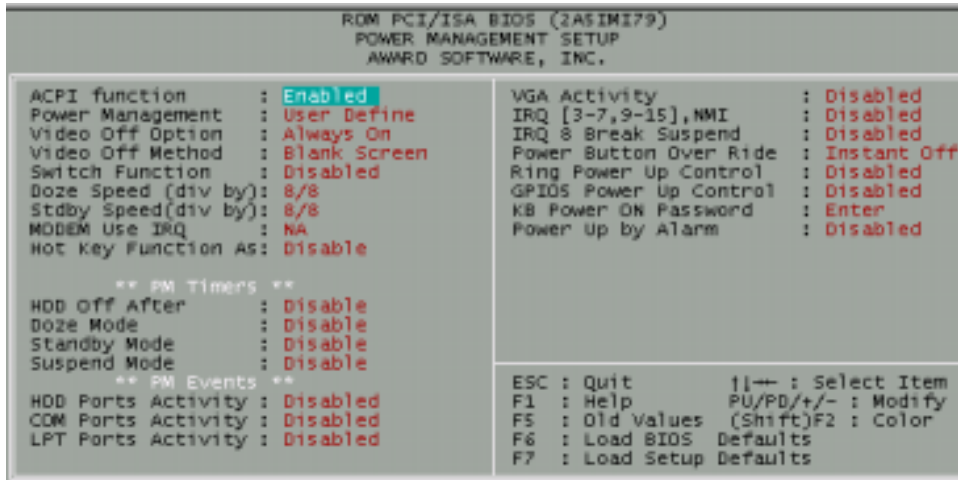
■ PCI Post Write Buffer

Enable/disable PCI post write buffer.

■ PCI 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.

4.5 Power Management Setup



■ ACPI function

Select *Enabled* if your system has an ACPI function.

■ Power management

This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. See the section *PM Timers* for a brief description of each mode.

This table describes each power management mode:

Disable	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	Allow you to set each mode individually. When not disabled, each of the ranges is from 1 min. to 1 hr. except for HDD Power Down, which ranges from 1 min. to 15 min. and disable.
--------------	--

■ PM Control APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If Advance Power Management (APM) is installed on your system, selecting Yes gives better power savings.

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

■ Video Off Option

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

Always On	Monitor will remain on during power saving modes.
Suspend--> Off	Monitor blanked when the systems enters the Suspend mode.
Susp,Stby--> Off	Monitor blanked when the system enters either Suspend or Standby modes.
All Modes --> Off	Monitor blanked when the system enters any power saving mode.

■ 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	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

■ Switch Function

You can choose whether or not to permit your system to enter complete Suspend mode. Suspend mode offers greater power savings, with a correspondingly longer awakening period..

■ Doze Speed (div by)

Sets the CPU's speed during Doze mode. The speed is reduced to a fraction of the CPU's normal speed. The divisors range from 1 to 8

■ Stdby Speed (div by)

Select a divisor to reduce the CPU speed during *Standby* mode to a fraction of the full CPU speed. The speed is reduced to a fraction of the CPU's normal speed. The divisors range from 1 to 8-0.

■ Modem Use IRQ

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

■ Hot Key Power Off

Select *Enabled* if your system has a hot key for soft power off.

■ PM Timers

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

HDD Off After

By default, this item is disabled, meaning that no matter the mode the rest of the system, the hard drive will remain ready. Otherwise, you have a range of choices from 1 to 15 minutes or Suspend. This means that you can elect to have your hard disk drive be turned off after a selected number of minutes or when the rest of the system goes into a Suspend mode.

Doze Mode

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

Standby Mode

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

Suspend Mode

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

■ PM Events

You may disable activity monitoring of some common I/O events and interrupt requests so they do not wake up the system. The default wake-up event is keyboard activity. When *On* (or named, in the case of LPT & COM), any activity from one of the listed system peripheral devices or IRQs wakes up the system.

HDD Ports Activity

When set to *On* (default), any event occurring at a HDD (serial) port will awaken a system which has been powered down.

COM Ports Activity

When set to *On* (default), any event occurring at a hard or floppy drive port will awaken a system which has been powered down.

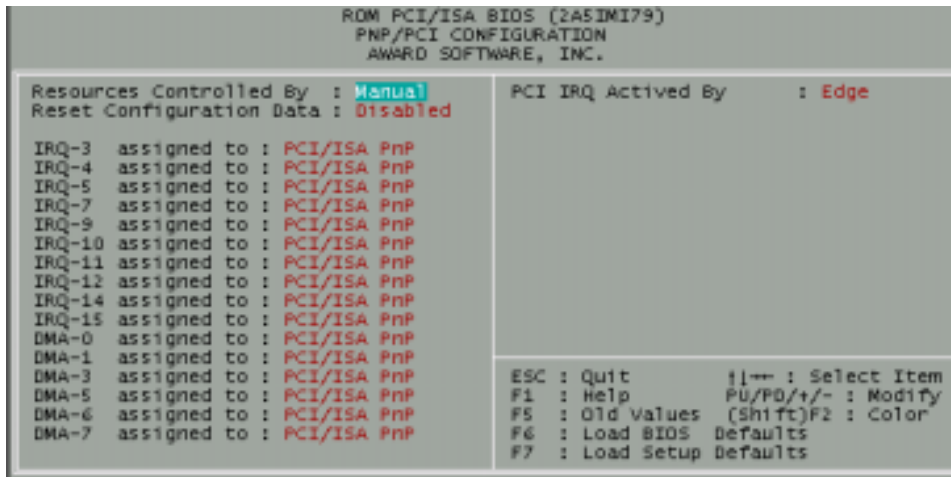
LPT Ports Activity

When set to *On* (default), any event occurring at a LPT (printer) port will awaken a system which has been powered down.

VGA Activity

When set to *On* (default), any event occurring at VGA will awaken a system which has been powered down.

4.6 PNP/PCI Configuration



■ 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.

■ Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

■ IRQ3/4/5/7/9/11/12/14/15

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

■ DMA0/1/3/5/6/7 assigned to

When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt: Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

■ PCI IRQ Activated by

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system's manufacturer.

■ PCI IDE IRQ Map to

This allows you to configure your system to the type of IDE disk controller in use. By default, Setup assumes that your controller is an ISA (Industry Standard Architecture) device rather than a PCI controller. The more apparent difference is the type of slot being used.

If you have equipped your system with a PCI controller, changing this allows you to specify which slot has the controller and which PCI interrupt (A, B, C or D) is associated with the connected hard drives.

Remember that this setting refers to the hard disk drive itself, rather than individual partitions. Since each IDE controller supports two separate hard drives, you can select the INT# for each. Again, you will note that the primary has a lower interrupt than the secondary as described in "Slot x Using INT#" above.

Selecting "PCI Auto" allows the system to automatically determine how your IDE disk system is configured.

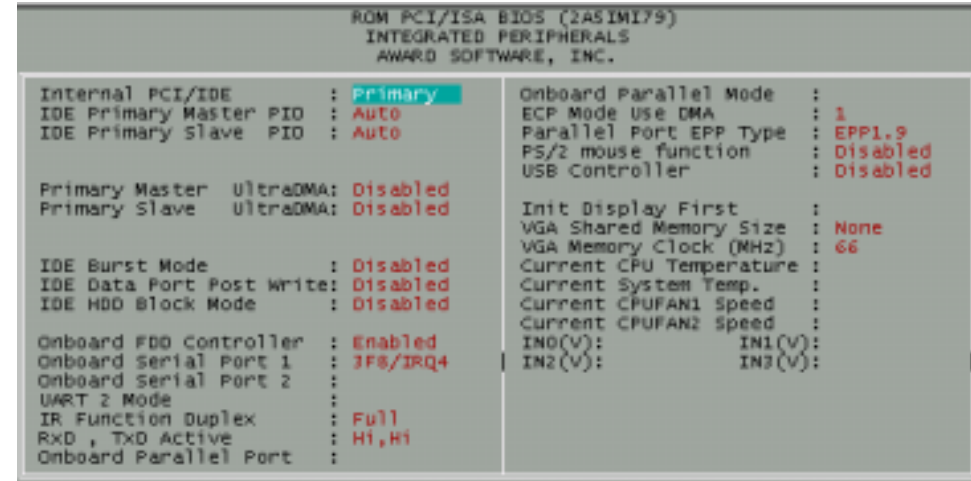
4.7 Load BIOS Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optional and disable all high-performance features

4.8 Load Setup Default

This option allows you to load the default values to your system configuration. These default settings are optional and enable all high-performance features

4.9 Integrated Peripherals



■ Internal PCI / IDE

This chipset contains an internal PCI IDE interface with support for two IDE channels.

■ IDE Primary/Secondary Master/Slave PIO

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

■ IDE Primary/Secondary Master/Slave UDMA

UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select *Auto* in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

■ IDE Burst Mode

Selecting Enabled reduces latency between each drive read/write cycle, but may cause instability in IDE subsystems that cannot support such fast performance. If you are getting disk drive errors, try setting this value to Disabled. This field does not appear when the Internal PCI/IDE field, above, is Disabled.

■ IDE Data Port Post Write

Selecting Enabled speeds up processing of drive reads and writes, but may cause instability in IDE subsystems that cannot support such fast performance. If you are getting disk drive errors, try setting this value to Disabled.

■ IDE HDD Block Mode

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary and/or secondary IDE interface. Select Disabled to deactivate this interface, if you install a primary and/or secondary add-in IDE interface IDE interface.

Enabled	Secondary HDD controller used
Disabled	Secondary HDD controller not used.

■ Onboard FDD Controller

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

■ Onboard Serial Port 1/Port 2

This item allows you to determine access onboard serial port 1/port 2 controller with which I/O address.

■ UART 2 Mode

This item allows you to determine which Infra Red (IR) function of onboard I/O chip.

■ IR Function Duplex

This item allows you to select the IR function when your select the UART 2 Mode is ASKIR

■ Rx/D, Tx/D Active

This item allows you to determine the active of Rx/D, Tx/D.

■ Onboard Parallel Port

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

■ Onboard Parallel Mode

Select an operating mode for the onboard parallel (printer) port. Normal EPP (Extended Parallel Port) ECP (Extended Capabilities Port) CEP+EPP PC AT parallel port bidirection port Fast, buffered port Fast, buffered, bidirection port. Select Normal unless you are certain your hardware and software both support EPP or ECP mode.

■ ECP Mode Use DMA

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

■ Parallel Port EPP Type

Select EPP port type 1.7 or 1.9

■ PS/2 mouse function

If your system has a PS/2 mouse port and you install a serial pointing device, select *Disabled*.

■ USB Controller

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

4.10 Password Setting

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

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

User password : just can only enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.11 IDE HDD Auto Detection

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk's parameters

4.12 Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

4.13 Exit Without Save

Abandon all CMOS value changes and exit setup.