MAT-680

High performance and low cost 133FSB Socket 370 5.25" SBC

VIA chipset support Intel Tualatin/ P-III/ Celeron/ VIA C3 Socket 370 CPU up to 1.3GHz+, 133/100/66MHz CPU FSB,PC133 SDRAM, DVD, PCI slot, AGP-4X SMA LVDS/TFT/DSTN LCD/ CRT, ATA100 IDEx2, LAN, USBx4, AC-97 Audio, COMx4, Parallel, PC/104, WDT, IrDA, Touch Panel, ATX, CF-2,Hardware monitoring, Digital-IO, Optional TV-out

USER'S MANUAL

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This user's manual list necessary information to assist both Embedded Computer manufacturers and end users in installing and setting up the system. The information contained in this user's manual is subject to change without any notice.

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CHAPTER 1

INTRODUCTION

THIS CHAPTER SHOWS THE INFORMATION ABOUT THIS CPU CARD AND ITS SPECIFICATIONS.

SECTIONS INCLUDE:

*** ABOUT THIS MANUAL**

*** SPECIFICATIONS**

*** SAFETY PRECAUTIONS**

1-1 ABOUT THIS MANUAL

This manual is written to assist you to install and set up the system.

Chapter 1: INTRODUCTION

This chapter introduces you the background of this manual, and the specifications for this system. Final in this chapter will indicate how to avoid the damages for this SBC.

Chapter 2: HARDWARE CONFIGURATION

This chapter outlines the components' locations and their functions. It shows the way that how to set jumper and how to configure this card.

Chapter 3: AGP-4X LCD/VGA/TV

AGP-2X 64-bit 2D/3D LCD/CRT with 2M~8M SMA memory (share system memory as display memory), support 1024x768 TFT LCD and 1600x1200 true color CRT.

Chapter 4: TOUCH PANEL INTERFACE

This chapter shows the information about touch panel interface function, also describes how to configure touch panel.

Chapter 5: AUDIO

This chapter offers the detail information about Audio. How to install the configuration also included

Chapter 6: 100/10M ETHERNET

This chapter offers the detail information about Ethernet. How to install the configuration also included

Chapter 7: WDT

Helpful information about Watchdog Timer function.

Chapter 8: AWARD BIOS SETUP

This chapter indicates how to set up the BIOS configurations.

Appendix A: TECHNICAL SUMMARY

This appendix gives you the information about the Award BIOS.

Appendix B: TROUBLE SHOOTING

This appendix outlines the errors and offers you the method how to isolate the problems.

1-2 SPECIFICATIONS

* **CPU:** Support Intel Socket 370 **Tualatin**, **Pentium III, Celeron** & VIA C3 CPU up to 1.3GHz+, ZIF socket Support **133/100/66 FSB (Front Side Bus).**

* **System chip: VIA VT8606 (PN133T Twister-T) & VT82C686A/B.**

* **Cache memory: 128K L1 Cache & 64K L2 Cache built in CPU.**

* **BIOS: Award/AMI BIOS, 256KB (Flash) EPROM**

* **MEMORY: 1 x 168-pin DIMM socket support memory up to 512MB PC133/PC100 SDRAM/ VCM-SDRAM.**

* **AGP-4X LCD/ LVDS/ CRT: AGP-4X Savage4 3D/2D LVDS/TFT/DSTN LCD/CRT W/ 8M~32M SMA memory (share system memory as display memory), support 1600x1200 TFT/DSTN/LVDS (2-channel 110MHz) LCD & 1920x1440 2D/3D CRT.**

* **DVD: Hardware-Assisted MPEG-2 architecture for DVD full-screen video playback**

* **100/10M Ethernet: Realtek 8139C LAN x 1, or, Intel 82559 LAN x 1**

* **TV-out: Signal pin for optional TV-out daughter board**

* **CMOS Backup: CMOS Back up by Li battery.**

* **IrDA and USBx4: USB and IrDA pin header on board**

* **Temperature /fan monitoring: 686B on-chip function**

* **Touch Panel interface: Support 4/5/7/8-wire Panel and almost all OS and real-time OS.**

* **CompactFlash II socket: Support CF I / II type IDE Flash Disk or IBM** 1.8" **340MB/1GB MicroDrive HDD. (optional)**

* **Keyboard & Mouse connector: 5-pin JSP header**

* **BUS TYPE: PC/104 socket, PCI slot x 1 (suitable Position for riser card for low-profile application)**

* **AC97 Audio : AC97 Audio on board**

* **Speaker: Buzzer on Board.**

* **Digital I/O:** 4-bit DI and 4-bit DO, TTL level

* **WATCHDOG:** Programmable 0 ~ 256 sec.

* **ATA100/66/33 IDE Port x 2:** Up to 4 x IDE devices.

* **FDD:** Two 3.5” or 5.25” FDD or LS120

* **Serial Port x 4:** RS-232 x 3 + RS-232/422/485 x 1

* **PARALLEL PORT:** Bi-directional SPP/EPP/ECP port

* **Power Requirement:** +/-5V & +/-12V by ATX power; and, single +5V by 2-pin power connector

* **DMA CHANNELS:** 7

* **INTERRUPT CONTROLLERS:** 82C59 X 2

* **INTERRUPT LEVELS:** 15

* **OPERATING TEMPERATURE:** 0 to 60℃ (140℉) and 0~85℃ CPU support fanless application..

* **BOARD DIMENSION:** 203mm x 146mm

* **BOARD WEIGHT:** 0.34Kg.

1-3 SAFETY PRECAUTIONS

Follow the messages below to avoid your system from damage.

1. Avoid your system from static electric power on all occasions.

2. Stay safe from the electric shock. Don’t touch any components of this card when the power is ON. Always disconnect power when the system is not in use.

3.Remove power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

CHAPTER 2

HARDWARE CONFIGURATION

THIS CHAPTER SHOWS YOU THE CONNECTORS & JUMPER SETTINGS, AND COMPONENTS' LOCATIONS.

SECTIONS INCLUDE:

*** JUMPERS/CONNECTORS QUICK REFERENCE TABLE**

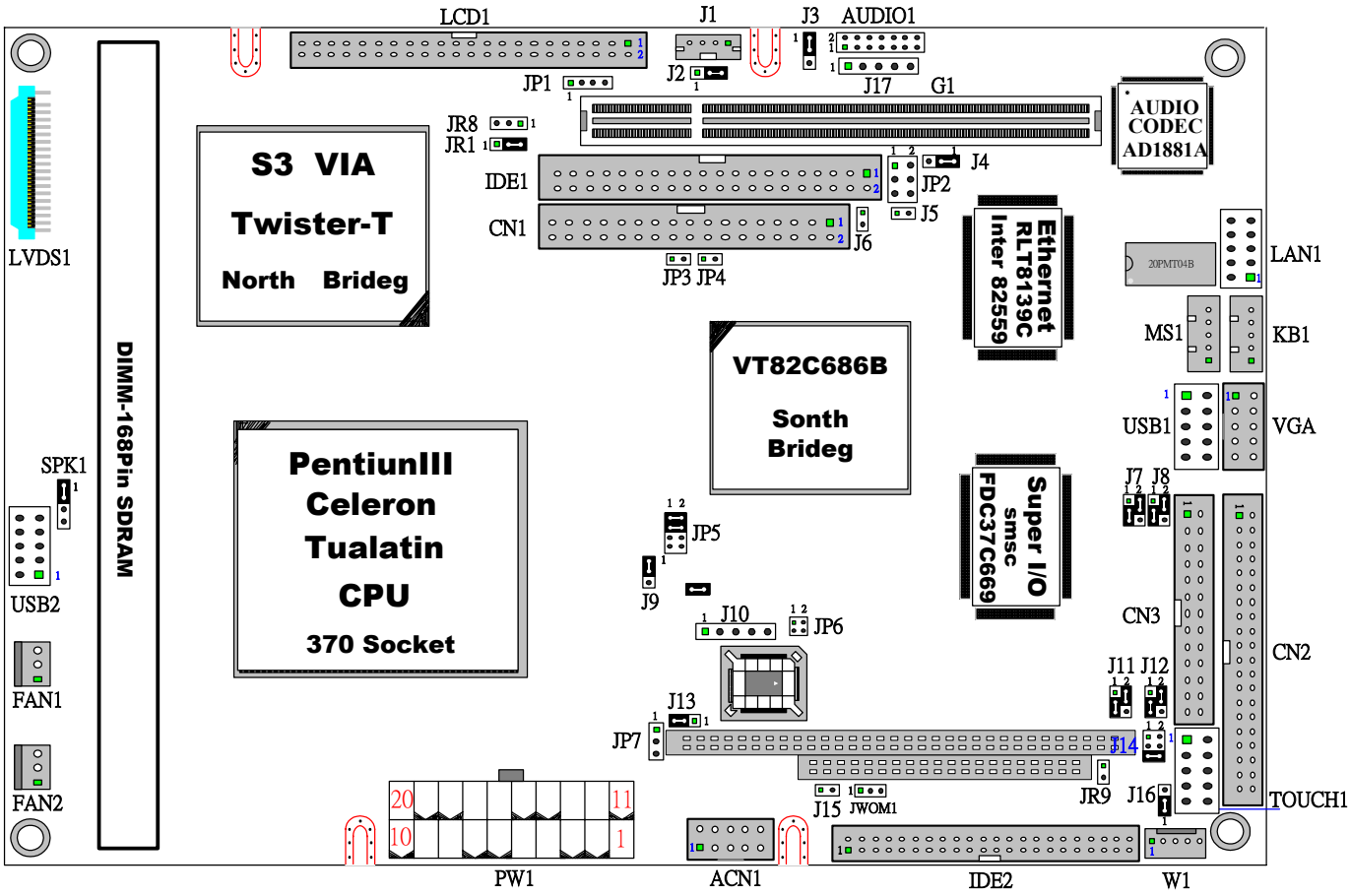
*** COMPONENTS' LOCATIONS**

*** CONNECTOR PIN ASSIGNMENTS AND JUMPER SETTINGS**

2-1 JUMPERS/CONNECTORS QUICK REFERENCE TABLE

IDE1 & IDE2 CONNECTOR	IDE1&IDE2
FLOPPY DISK DRIVE CONNECTOR	CN1
PRINTER CONNECTOR	CN3
USB0 AND USB1 CONNECTOR	USB1
LCD CONNECTOR	LCD1
USB2 AND USB3 CONNECTOR	USB2
VGA CONNECTOR	VGA
KEYBOARD JST 5-PIN CONNECTOR	KB1
PS2 MOUSE JST 5-PIN CONNECTOR	MS1
ETHERNET CONNECTOR	LAN1
COM1, COM2, COM3, COM4 CONNECTOR	CN2
DIGITAL I/O 8 BIT PORT	ACN1
FAN COOLER POWER CONNECTOR	FAN1
FAN COOLER POWER CONNECTOR	FAN2
LVDS1 CONNECTOR	LVDS1
LVDS2 CONNECTOR	LVDS2
AUDIO OUTPUT CONNECTOR	AUDIO1
TOUCH PANEL CONNECTOR	TOUCH1
ATX POWER CONNECTOR	PW1
EXTERNAL SPEAKER CONNECTOR	SPK1
RS-422 CONNECTOR	W1
COM2 RS-232/422/485 SELECT	J14
RS422/485 VOLTAGE OUTPUT SELECT (CABLE-RI)	J16
FOR DVI CONNECTOR	JP1
LAN LED CONNECTOR	JP2
POWER BUTTOM	JP3
RESET CONNECTOR	JP4
CPU CLK SETTING	JP5
4 BIT DIO PORT ADDRESS SELECT	JP6
CD-IN CONNECTOR	J1
LCD PANEL VOLTAGE SELECT	J2
PCI OR PICMG INTERFACE SELECT	J3/J4
LAN ENABLED OR DISABLED SELECT	J5
HDD LED	J6
COM2 D-SUB PIN1, 9 VOLTAGE OR SIGNAL SELECT	J7
COM1 D-SUB PIN1, 9 VOLTAGE OR SIGNAL SELECT	J8
BATTERY COMS CLEAR JUMPER	J9
COM3 D-SUB PIN1, 9 VOLTAGE OR SIGNAL SELECT	J11
COM4 D-SUB PIN1, 9 VOLTAGE OR SIGNAL SELECT	J12
WDT OUTPUT SELECT	J13

2-2 COMPONENTS' LOCATIONS



2-3 IDE1 & IDE2 CONNECTOR (IDE1 & IDE2)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RESET	2	GND
3	HD7	4	HD8
5	HD6	6	HD9
7	HD5	8	HD10
9	HD4	10	HD11
11	HD3	12	HD12
13	HD2	14	HD13
15	HD1	16	HD14
17	HD0	18	HD15
19	GND	20	NC
21	DREQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	GND
29	DACK	30	GND
31	IRQ	32	SINGLE GND
33	SA1	34	NC
35	SA0	36	SA2
37	HDCS0	38	HDCS1
39	DASP	40	GND
41	+5V (IDE2 ONLY)	42	+5V (IDE2 ONLY)
43	GND (IDE2 ONLY)	44	NC (IDE2 ONLY)

2-4 FLOPPY DISK DRIVE CONNECTOR (CN1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	DENSEL
3	GND	4	NC
5	GND	6	DRATE0
7	GND	8	INDEX
9	GND	10	MTR0
11	GND	12	DRV1
13	GND	14	DRV0
15	GND	16	MTR1
17	GND	18	DIR
19	GND	20	STEP
21	GND	22	WDATA
23	GND	24	WGATE
25	GND	26	TRK0
27	GND	28	WRTPRT
29	GND	30	RDATA
31	GND	32	SEL
33	GND	34	DSKCHG

2-5 PRINTER CONNECTOR (CN3)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STROB	2	AUTOFD
3	PD0	4	ERROR
5	PD1	6	INIT
7	PD2	8	SLCTIN
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

2-6 USB 0 AND 1 CONNECTOR (USB1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC	2	VCC
3	UV0-	4	UV1-
5	UV0+	6	UV1+
7	GND	8	GND
9	GND	10	GND

2-7 LCD CONNECTOR (LCD1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+12V	2	+12V
3	GND	4	GND
5	+5V/3.3V (J1)	6	+5V/3.3V (J1)
7	ENAVEE	8	GND
9	PD0	10	PD1
11	PD2	12	PD3
13	PD4	14	PD5
15	PD6	16	PD7
17	PD8	18	PD9
19	PD10	20	PD11
21	PD12	22	PD13
23	PD14	24	PD15
25	PD16	26	PD17
27	PD18	28	PD19
29	PD20	30	PD21
31	PD22	32	PD23
33	PD24	34	PD25
35	SHFCLK	36	VSYNC
37	M(D.0)	38	HSYNC
39	GND	40	ENABLK
41	PD26	42	PD27
43	PD28	44	PD29
45	PD30	46	PD31
47	PD32	48	PD33
49	PD34	50	PD35

Note: 'Chapter 3' show Data Output PD0 ~ PD23 for different LCD.

You can see "Advanced chipset feature" Panel Type select
Page 82. <"Click Here">

2-8 USB 2 AND 3 CONNECTOR (USB2)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC	2	VCC
3	UV2-	4	UV3-
5	UV2+	6	UV3+
7	GND	8	GND
9	GND	10	GND

2-9 VGA CONNECTOR (VGA)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RED	2	VCC
3	GREEN	4	DATA
5	BLUE	6	CLK
7	HSYNC	8	GND
9	VSYNC	10	GND

2-10 KEYBOARD JST 5-PIN CONNECTOR (KB1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	KEYBOARD CLOCK	2	KEYBOARD DATA
3	NC	4	GND
5	VCC		

2-11 PS2 MOUSE JST 5-PIN CONNECTOR (MS1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MOUSE CLOCK	2	MOUSE DATA
3	NC	4	GND
5	VCC		

2-12 ETHERNET CONNECTOR (LAN1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	TX+	2	TX-
3	RX+	4	NC
5	NC	6	RX-
7	NC	8	NC
9	GND	10	GND

2-13 COM1,2,3,4 CONNECTOR (CN2)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC	2	DSR1
3	SIN1	4	RTS1
5	SOUT1	6	CTS1
7	DTR1	8	RI1/12V
9	GND	10	NC
11	VCC	12	DSR2
13	SIN2	14	RTS2
15	SOUT2	16	CTS2
17	DTR2	18	RI2/12V
19	GND	20	NC
21	VCC	22	DSR3
23	SIN3	24	RTS3
25	SOUT3	26	CTS3
27	DTR3	28	RI3/12V
29	GND	30	NC
31	VCC	32	DSR4
33	SIN4	34	RTS4
35	SOUT4	36	CTS4
37	DTR4	38	RI4/12V
39	GND	40	NC

2-14 DIGITAL I/O 8 BIT PORT (ACN1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	Data bit in 0	2	Data bit in 1
3	Data bit in 2	4	Data bit in 3
5	Data bit out 0	6	Data bit out 1
7	Data bit out 2	8	Data bit out 3
9	GND	10	VCC

2-15 FAN COOLER POWER CONNECTOR (FAN1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	FANCS	2	+12V
3	GND		

2-16 FAN COOLER POWER CONNECTOR (FAN2)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	FANCS	2	+12V
3	GND		

2-17 LVDS1 CONNECTOR (LVDS1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VDD	2	VDD
3	GND	4	GND
5	RX0-	6	RX0+
7	GND	8	RX1-
9	RX1+	10	GND
11	RX2-	12	RX2+
13	GND	14	RXCK-
15	RXCK+	16	GND
17	RX3-	18	RX3+
19	GND	20	GND

2-18 LVDS2 CONNECTOR (LVDS2)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VDD	2	VDD
3	GND	4	GND
5	RX0-	6	RX0+
7	GND	8	RX1-
9	RX1+	10	GND
11	RX2-	12	RX2+
13	GND	14	RXCK-
15	RXCK+	16	GND
17	RX3-	18	RX3+
19	GND	20	GND

2-19 AUDIO OUTPUT CONNECTOR (AUDIO1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LINR	2	GND
3	GND	4	LINL
5	GND	6	MIN
7	MIN	8	GND
9	LOUTR	10	LOUTL
11	GND	12	PHR
13	PHL	14	GND

2-20 TOUCH PANEL CONNECTOR (TOUCH1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	X+	2	SX+
3	X-	4	SX-
5	Y+	6	SY+
7	Y-	8	SY-
9	SW	10	NC

4 WIRE: X+,X-,Y+,Y- 5 WIRE: X+,X-,Y+,Y-,SW

8 WIRE: X+,X-,Y+,Y-,SX+,SX-,SY+,SY-

Note: Touch Screen is use COM1 Port

JR5/JR6/JR7: SELECT 4WIRE OR 5WIRE OR 8WIRE

	4 WIRE	5 WIRE	8 WIRE
JR5	2-3 ON	2-3 ON	2-3 ON
JR6	2-3 ON	1-2 ON	2-3 ON
JR7	2-3 ON	2-3 ON	1-2 ON

2-21 ATX POWER CONNECTOR (PW1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	3.3V	2	3.3V
3	GND	4	5V
5	GND	6	5V
7	GND	8	PW-OK
9	5VSB	10	12V
11	3.3V	12	-12V
13	GND	14	PS-ON
15	GND	16	GND
17	GND	18	-5V
19	5V	20	5V

2-22 EXTERNAL SPEAKER CONNECTOR (SPK1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	SPKN	2	SPKA
3	NC	4	GND

2-23 RS-422 CONNECTOR (W1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RXD/TX+	2	DTR/RX-
3	DCD/TX-	4	TXD/RX+
5	CABLE-RI		

2-24 COM2 RS-232/422/485 SELECT (J14)

1-2 ON: RS-485 3-4 ON: RS-422 5-6 ON: RS-232

2-25 RS422/485 VOLTAGE OUTPUT SELECT (CABLE-RI) (J16)

1-2 ON	+5V FOR RS422/485 CONNECTOR PIN5(D-SUB PIN9)
2-3 ON	+12V FOR RS422/485 CONNECTOR PIN5(D-SUB PIN9)

2-26 FOR DVI CONNECTOR (JP1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	SPD1	2	SPCLK1
3	GOP0	4	FPTEST

2-27 LAN LED CONNECTOR (JP2)

1-2	3-4	5-6
LAN ACTIVE	10M ACTIVE	100M ACTIVE

2-28 POWER BUTTOM (JP3)

2-29 RESET CONNECTOR (JP4)

2-30 CPU CLK SETTING (JP5)

PIN / CPU CLK	1-2	3-4	5-6	7-8
AUTO	ON	ON	OFF	OFF
66 MHz	OFF	OFF	ON	ON
100 MHz	OFF	OFF	OFF	ON
133 MHz	OFF	OFF	OFF	OFF

2-31 4 BIT DIO PORT ADDRESS SELECT (JP6)

ALL OFF	1-2 ON	3-4 ON	ALL ON
320H	280H	260H	240H

2-32 CD-IN CONNECTOR (J1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CDL	2	GND
3	GND	4	CDR

2-33 LCD PANEL VOLTAGE SELECT (J2)

1-2 ON: Flat Panel LCDVCC +5V.
2-3 ON: Flat Panel LCDVCC +3.3V.

2-34 PCI OR PICMG INTERFACE SELECT (J3/J4)

J3 AND J4 1-2 ON	PCI INTERFACE
J3 AND J4 2-3 ON	PICMG INTERFACE

2-35 LAN ENABLED OR DISABLED (J5)

1-2 ON: DISABLED 1-2 OFF: ENABLED

2-36 HDD LED (J6)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC	2	SIGNAL

2-37 COM2 D-SUB PIN 1, 9 VOLTAGE OR SIGNAL SELECT (J7)

1-3 ON: +12V
2-4 ON: VCC5V (Default)
3-5 ON: RI2 (Default)
4-6 ON: DCD2

2-38 COM1 D-SUB PIN 1, 9 VOLTAGE OR SIGNAL SELECT (J8)

1-3 ON: +12V
2-4 ON: VCC5V (Default)
3-5 ON: RI1 (Default)
4-6 ON: DCD1

2-39 BATTERY CMOS CLEAR JUMPER (J9)

1-2 ON: Default
2-3 ON: Clear CMOS

2-40 COM3 D-SUB PIN 1, 9 VOLTAGE OR SIGNAL SELECT (J11)

1-3 ON: +12V
2-4 ON: VCC5V (Default)
3-5 ON: RI2 (Default)
4-6 ON: DCD2

2-41 COM4 D-SUB PIN 1, 9 VOLTAGE OR SIGNAL SELECT (J12)

1-3 ON: +12V
2-4 ON: VCC5V (Default)
3-5 ON: RI1 (Default)
4-6 ON: DCD1

2-42 WDT OUTPUT SELECT (J13)

WatchDog Timer Output for System Reset or IRQ11 Selection.
When Jumper 1-2 ON, then output signal of WDT will generate a interrupt signal to IRQ11. Once the system accept the interrupt request, will release a ISR address (CS:E000 IP:0000) for user. User can write some interrupt service routine here, to develop application software.
1-2 ON: IRQ11.
2-3 ON: SYSTEM RESET.

2-43 IBM IDE AND CF-II CARD MASTER OR SLAVE (J15)

1-2 ON: Master
1-2 OFF: Slave

2-44 IrDA CONNECTOR (J17)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC	2	NC
3	IR-RX	4	GND
5	IR-TX		

2-45 RS-422 ALWAYS ENABLED JUMPER NO RS-485 (JR9)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+5V	2	RTSB-

2-46 CompactFlash I/II & IBM MicroDrive SOCKET(CN5)

CompactFlash II socket support CompactFlash type I & II module which meet True IDE specifications, such as: IDE Flash Disk Module or IBM 1.8" MicroDrive 340MB or 1GB HDD.

WARNING: CF II socket support +5V Module only.

2-47 MODEM WAKE UP (JWOM1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	5V	2	GND
3	SIGNAL		

2-48 168-PIN DIMM MEMORY SOCKET (DIMM)

This CPU Card use 168-pin DIMM Module.

2-49 MANUFACTURER DEFAULT JUMPER LIST

Factory default jumper list as below:
J10: PROGRAM CONNECTOR JR1: 2-3ON
JP7: ALL OFF

CHAPTER

3

AGP-4X LCD/VGA/TV

THIS CHAPTER SHOWS THE INFORMATION ABOUT VGA FUNCTIONS.

SECTIONS INCLUDE:

* **DEFINES INTEGRATED SOLUTIONS FOR VALUE PC MOBILE DESIGNS**
* **HIGH PERFORMANCE CPU INTERFACE**
* **ADVANCED HIGH-PERFORMANCE DRAM CONTROLLER**
* **EXTENSIVE LCD SUPPORT**
* **HIGH SCREEN RESOLUTION CRT SUPPORT**
* **TFT LCD DATA OUTPUT**
* **STN LCD DATA OUTPUT**
* **QUICK INSTALLATION GUIDE**

3-1 Defines Integrated Solutions for Value PC Mobile Designs

- Ψ High performance SMA North Bridge: Integrated VIA Apollo Pro133A and S3® Savage4™ in a single chip
- Ψ 64-bit Advanced Memory controller supporting PC100/PC133 SDRAM and VCM
- Ψ Combines with VIA VT82C686A/B PCI-ISA South Bridge for state-of-the-art power management

Note: ***If you need installation WinNT40 Server VGA. Remember you need installation WinNT40 Service Pack3 or up (4 ~ 6). If you don't install first then you can't install S3 VGA driver.***

3-2 High Performance CPU Interface

- Ψ Support for Intel® Pentium™ "Tualatin" processors
- Ψ 66/100/133 MHz CPU Front Side Bus (FSB)
- Ψ Built-in Phase Lock Loop circuitry for optimal skew control within and between clocking regions
- Ψ Five outstanding transactions (four In-Order Queue (IOQ) plus one output latch)
- Ψ Dynamic deferred transaction support

3-3 Advanced High-Performance DRAM Controller

- Ψ DRAM interface runs synchronous (100/100 or 133/133) mode or pseudo -synchronous (100/66, 100/133, 133/100) mode with FSB
- Ψ Concurrent CPU, AGP, and PCI access
- Ψ Supports SDRAM and VCM SDRAM memory types
- Ψ Support 3 DIMMs or 6 banks for up to 1.5 GB of DRAM (256Mb DRAM technology)
- Ψ 64-bit data width
- Ψ Supports maximum 8-bank interleave (8 pages open simultaneously); banks are allocated based on LRU
- Ψ SDRAM X-1-1-1-1-1-1-1 back-to-back accesses

Integrated Savage4 2D/3D/Video Accelerator

- Ψ Optimized Shared Memory Architecture (SMA)
- Ψ 8 / 16 / 32 MB frame buffer using system memory
- Ψ Floating point triangle setup engine

- Single cycle 128-bit 3D architecture
- 8M triangles/second setup engine
- 140M pixels/second trilinear fill rate
- Full internal AGP 4x performance
- S3 DX7 texture compression (S3TC™)
- Next generation, 128-bit 2D graphics engine
- High quality DVD video playback
- Flat panel monitor support LVDS/TFT/DSTN
- 2D/3D resolutions up to 1920x1440 is CRT

3D Rendering Features

- Single-pass Single-pass textures
- Anisotropic filtering
- 8-bit stencil buffer
- 32-bit true color rendering
- Specular lighting and diffuse shading
- Alpha blending modes
- Massive 2K x 2K textures
- MPEG-2 video textures
- Vertex and table fog
- 16 or 24-bit Z-buffering
- Reflection mapping, texture morphing, shadows, procedural textures and atmospheric effects

2D Hardware Acceleration Features

- ROP3 Ternary Raster Operation BitBLTs
- 8, 16, and 32 bpp mode acceleration

Motion Video Architecture

- High quality up/down scaler
- Planar to packed format conversion
- Motion compensation for full speed DVD playback
- Hardware subpicture blending and highlights
- Multiple video windows for video conferencing
- Contrast, hue, saturation, brightness and gamma controls
- Digital port for NTSC/PAL TV encoders

3-4 Extensive LCD Support

- Ψ 36-bit DSTN/TFT flat panel interface with 256 gray shade support
- Ψ Integrated 2-channel 110 MHz LVDS interface
- Ψ Support for all resolutions up to 1600x1200 is LCD
- Ψ ZV-Port Interface
- Ψ Panel power sequencing
- Ψ Hardware Suspend/Standby control

Flat Panel Monitor Support

- Ψ 12-bit TFT flat panel interface to TMDS encoders
- Ψ Digital Visual Interface (DVI) 1.0 compliant

Concurrent PCI Bus Controller

- Ψ PCI 2.2 compliant, 32-bit 3.3V PCI interface with 5V tolerant inputs
- Ψ Supports up to 5 PCI masters
- Ψ PCI to system memory data streaming support
- Ψ Delay transaction from PCI master accessing DRAM
- Ψ Symmetric arbitration between Host/PCI bus for optimized system performance

Advanced System Power Management Support

- Ψ Dynamic power down of SDRAM (CKE)
- Ψ Independent clock stop controls for CPU / SDRAM, AGP, and PCI bus
- Ψ PCI and AGP bus clock run and clock generator control
- Ψ VTT suspend power plane preserves memory data
- Ψ Suspend-to-DRAM and self-refresh power down
- Ψ Low-leakage I/O pads
- Ψ ACPI 1.0B and PCI Bus Power Management 1.1 compliant

3-5 High Screen Resolution CRT Support

Resolutions Supported	System Memory Frame Buffer Size	
	8MB	16/32 MB
640x480x8/16/32	√	√
800x600x8/16/32	√	√
1024x768x8/16/32	√	√
1280x1024x8	√	√
1280x1024x16	√	√
1280x1024x32	√	√
1600x1200x8	√	√
1600x1200x16	√	√
1600x1200x32	√	√
1920x1440x8	√	√
1920x1440x16	√	√

3-6 TFT LCD DATA OUTPUT

(SR3D_3=0)

Pin Name	TFT 9	TFT 2x9	TFT 12	TFT 2x12	TFT 15	TFT 2x15	TFT 18	TFT 2x18	TFT 24	Note
PD0							R0	R00	R2	
PD1								R10	R0	
PD2					R0	R00	R1	R01	R3	
PD3						R10		R11		
PD4			R0	R00	R1	R01	R2	R02	R4	
PD5				R10		R11		R12		
PD6	R0	R00	R1	R01	R2	R02	R3	R03	R5	
PD7		R10		R11		R12		R13	R1	
PD8	R1	R01	R2	R02	R3	R03	R4	R04	R6	
PD9		R11		R12		R13		R14		
PD10	R2	R02	R3	R03	R4	R04	R5	R05	R7	
PD11		R12		R13		R14		R15		
PD12							G0	G00	G2	
PD13								G10	G0	
PD14					G0	G00	G1	G01	G3	
PD15						G10		G11		
PD16			G0	G00	G1	G01	G2	G02	G4	
PD17				G10		G11		G12		
PD18	G0	G00	G1	G01	G2	G02	G3	G03	G5	
PD19		G10		G11		G12		G13	G1	
PD20	G1	G01	G2	G02	G3	G03	G4	G04	G6	
PD21		G11		G12		G13		G14		
PD22	G2	G02	G3	G03	G4	G04	G5	G05	G7	
PD23		G12		G13		G14		G15		
PD24							B0	B00	B2	
PD25								B10	B0	
PD26					B0	B00	B1	B01	B3	
PD27						B10		B11		
PD28			B0	B00	B1	B01	B2	B02	B4	
PD29				B10		B11		B12		
PD30	B0	B00	B1	B01	B2	B02	B3	B03	B5	
PD31		B10		B11		B12		B13	B1	
PD32	B1	B01	B2	B02	B3	B03	B4	B04	B6	
PD33		B11		B12		B13		B14		
PD34	B2	B02	B3	B03	B4	B04	B5	B05	B7	
PD35		B12		B13		B14		B15		

(SR3D_3=1) IS DEFAULT ASSIGNMENT

Pin Name	TFT 18	TFT 2x18	TFT 24
PD0		R14	B0
PD1		R15	B1
PD2	B0	B00	B2
PD3	B1	B01	B3
PD4	B2	B02	B4
PD5	B3	B03	B5
PD6	B4	B04	B6
PD7	B5	B05	B7
PD8		R12	G0
PD9		R13	G1
PD10	G0	G00	G2
PD11	G1	G01	G3
PD12	G2	G02	G4
PD13	G3	G03	G5
PD14	G4	G04	G6
PD15	G5	G05	G7
PD16		R10	R0
PD17		R11	R1
PD18	R0	R00	R2
PD19	R1	R01	R3
PD20	R2	R02	R4
PD21	R3	R03	R5
PD22	R4	R04	R6
PD23	R5	R05	R7
PD24		G10	
PD25		G11	
PD26		G12	
PD27		G13	
PD28		G14	
PD29		G15	
PD30		B10	
PD31		B11	
PD32		B12	
PD33		B13	
PD34		B14	
PD35		B15	

3-7 STN LCD DATA OUTPUT

(SR3D_3=0)

Pin Name	SS-STN 8	SS-STN 16	SS-STN 24	DD-STN 8	DD-STN 16	DD-STN 24	Note
PD0	R0	R0	R0	LR0	LR0	LR0	
PD1	G0	G0	G0			LR3	
PD2	B0	B0	B0	LG0	LG0	LG0	
PD3	R1	R1	R1				
PD4	G1	G1	G1	LB0	LB0	LB0	
PD5	B1	B1	B1				
PD6	R2	R2	R2	LR1	LR1	LR1	
PD7	G2	G2	G2			LG3	
PD8		B2	B2		LG1	LG1	
PD9		R3	R3				
PD10		G3	G3		LR2	LB1	
PD11		B3	B3				
PD12		R4	R4		LG2	LR2	
PD13		G4	G4			LB3	
PD14		B4	B4			LG2	
PD15		R5	R5				
PD16			G5			LB2	
PD17			B5				
PD18			R6	UR0	UR0	UR0	
PD19			G6			UR3	
PD20			B6	UG0	UG0	UG0	
PD21			R7				
PD22			G7	UB0	UB0	UB0	
PD23			B7				
PD24				UR1	UR1	UR1	
PD25						UG3	
PD26					UG1	UG1	
PD27							
PD28					UB1	UB1	
PD29							
PD30					UR2	UR2	
PD31						UB3	
PD32					UG2	UG2	
PD33							
PD34						UB2	
PD35							

(SR3D_3=1) IS DEFAULT ASSIGNMENT

Pin Name	DD-STN 16	DD-STN 24
PD0		LB3
PD1		LB2
PD2	LB1	LB1
PD3	LB0	LB0
PD4		UB3
PD5		UB2
PD6	UB1	UB1
PD7	UB0	UB0
PD8		LG3
PD9	LG2	LG2
PD10	LG1	LG1
PD11	LG0	LG0
PD12		UG3
PD13	UG2	UG2
PD14	UG1	UG1
PD15	UG0	UG0
PD16		LR3
PD17	LR2	LR2
PD18	LR1	LR1
PD19	LR0	LR0
PD20		UR3
PD21	UR2	UR2
PD22	UR1	UR1
PD23	UR0	UR0
PD24		
PD25		
PD26		
PD27		
PD28		
PD29		
PD30		
PD31		
PD32		
PD33		
PD34		
PD35		

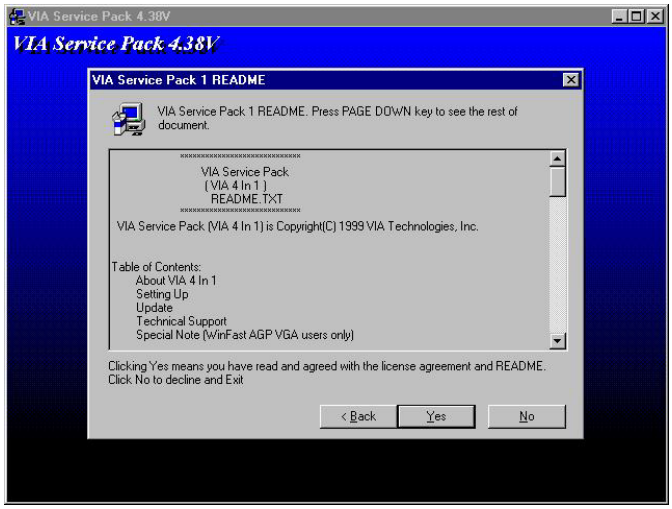
3-8 QUICK INSTALLATION GUIDE

☆VGA DRIVER FOR WIN9X & ME

You will install VGA driver first
Step
A: Double click “4in1439.exe”

B: Click “Next >”

A: Click “Yes”



See 4in1 Setup Mode Option
A: Select “Normally Install”

B: Click “Next”

Setup Component select all
A: Click “Next >”

A: Select “Install VIA ATAPI Vendor Support Driver”

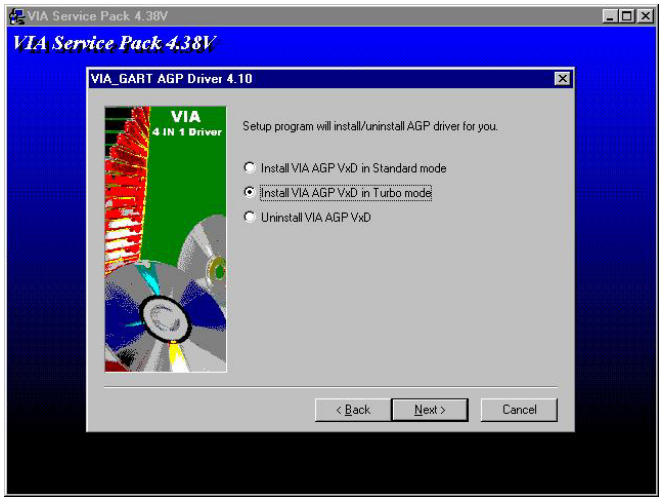
B: Click “Next >”

A: Enable Select .

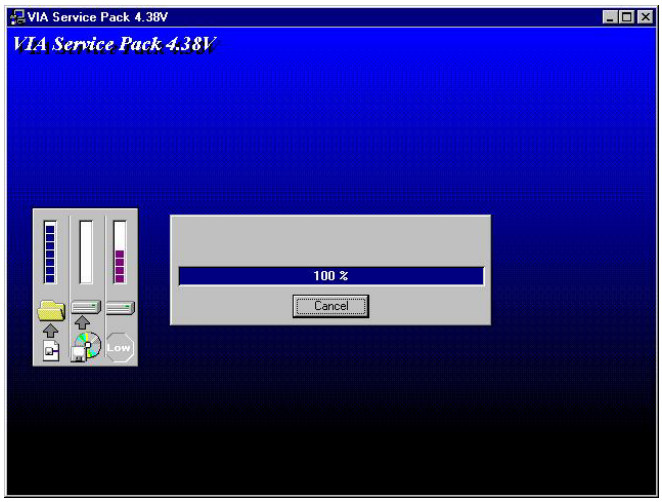
B: Click “Next >”

A: Select “Install VIA AGP VxD in turbo mode.”

B: Click “Next >”

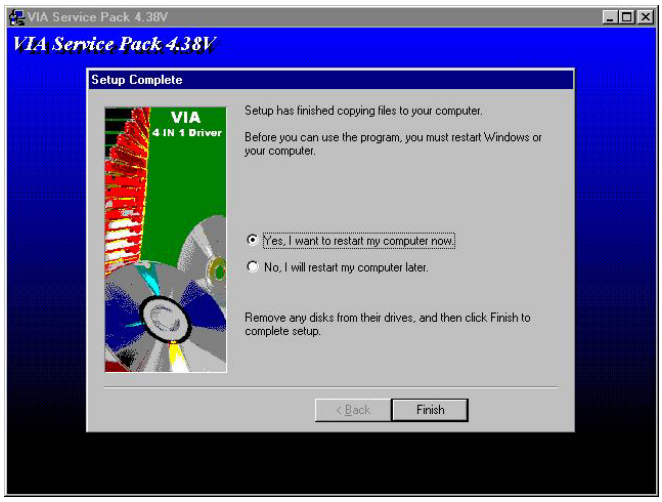


Install Step



A: Install Finish Select “ Yes, I want to restart my computer now.”

B: Click “ Finish”.

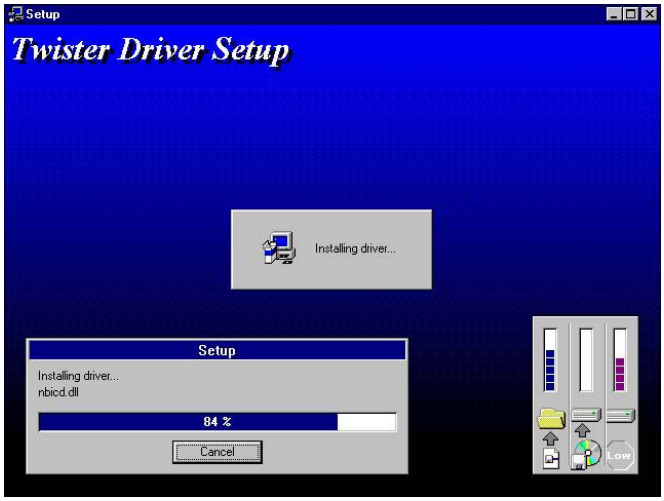


Restart Later.
A: Unzip
“d:\MAT680681\VGA\Win9x”

B: Double Click “Setup.exe”.

A: Click “Next >”

Continual Setup



A: Setup Finish Select “ Yes, I want to restart my computer now.”

B: Click “Finish”.

☆ VGA DRIVER FOR Win2000

A: Unzip “d:\MAT680681\VGA\Win2K\Win2K.zip”

B: Double Click “C:\Program Files\MAT680681\Win2K\Setup.exe”

A: Click “Next >”

Twister Driver Setup

Installing Driver

Setup Complete

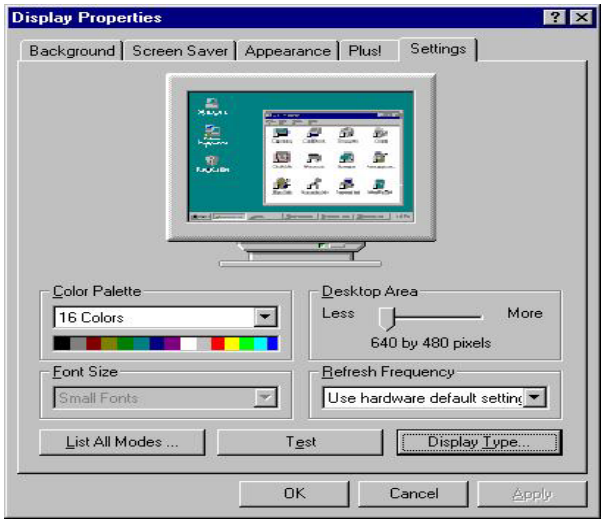
A: Click “ Finish”

B: Reboot System

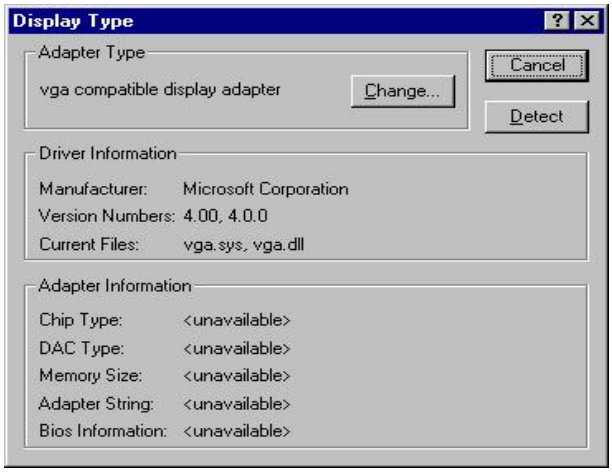
☆ VGA DRIVER FOR WinNT40

A. Select “Start” →”Seting” →”Control Panel”→ ”Display” → ”Display Properties”.

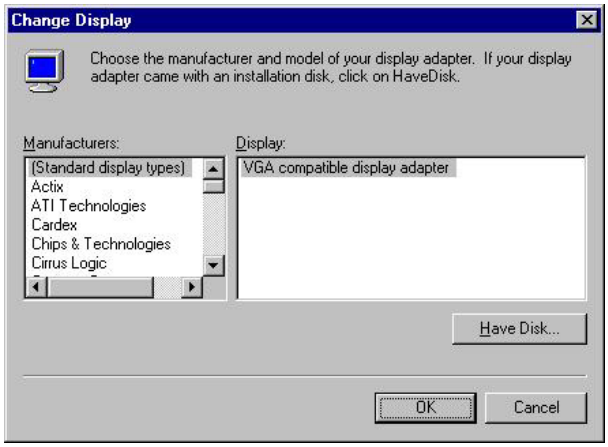
B. Click “Display Type”



A. Click “Change”

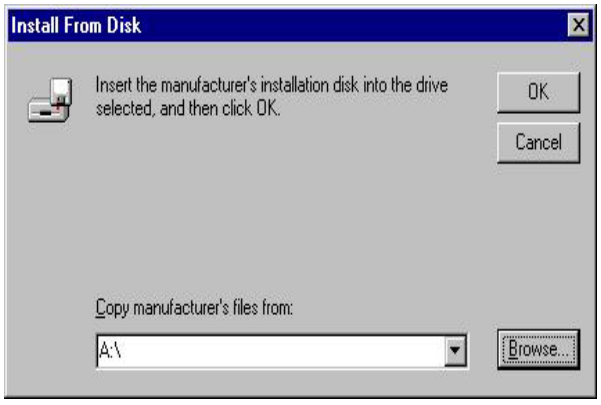


A. Click “Have Disk”.



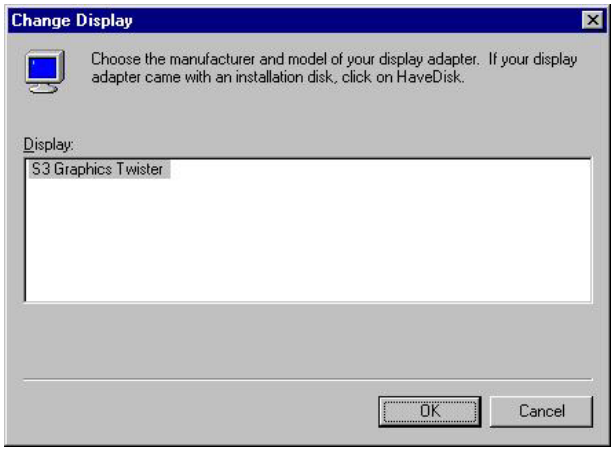
A. Insert CD-ROM Select C:\Program Files\MAT680681\VGA\NT40\VGA

B. Click “OK”.



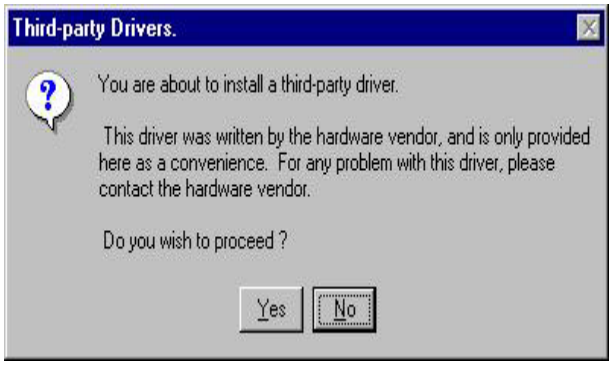
A. You can see “S3 Graphics Twister “

B. Click “OK”.



A: The system will show “Do you wish to proceed?”

B: Click “Yes”



A: Show “ The drivers were Successfully installed”

B: Click “OK”

CHAPTER 4

TOUCH PANEL INTERFACE

THIS CHAPTER SHOWS THE INFORMATION ABOUT TOUCH PANEL INTERFACE FUNCTIONS, ALSO DESCRIBED HOW TO CONFIGURE TOUCH PANEL HARDWARE. THIS FUNCTION IS OPTIONAL.

SECTIONS INCLUDE:

* INTRODUCTION

* TOUCH PANEL SOFTWARE SUPPORT

* TOUCH SCREEN DEFINICTION (TOUCH1)

* QUICK INSTALL GUIDE

4-1 INTRODUCTION

This chip has been written for users of users of the touch screen function.. The touch screen controller and software described within this document are Assumed to be used with four, five or eight wire analog resistive touch screen Products manufactured by a variety of touch screen manufacture. Touch screen between manufactures very with regards to light transmission, sensitivity and electrical characteristics.
The touch screen controller allows for 12-bit resolution of an analog resistive touch screen. The resolution of the controller is 4096X4096 (16,777,216 point in the field). Because touch screen quality and resistance varies from touch screen technologies and manufacturers the actual overall resolution may vary (slightly) between touch screen overlay manufacturers' products.
Touch screen drivers are designed to integrated smoothly with PC and MAC based operating system. If you have a touch only application you may save considerable cost by using the touch serene controller.

4-2 TOUCH PANEL SOFTWARE SUPPORT

Both versions provide 4-pin pin header direct connect signals X+, X-, Y+, Y-, SX+, SX-, SY+, SY-, SW to the 4, 5, 8 wire Touch screen. The driver circuit are internally built in. As far as possible, provide very short trace lengths to the touch screens.
Typically there is no additional charge for this touch screen device drivers. Drivers are available for Windows™, Windows NT™, DOS™, Windows CE™, Linux™.

4-3 TOUCH PANEL DEFINICTION (TOUCH1)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	X+	2	SX+
3	X-	4	SX-
5	Y+	6	SY+
7	Y-	8	SY-
9	SW	10	NC

4 WIRE: X+,X-,Y+,Y- 5 WIRE: X+,X-,Y+,Y-,SW
8 WIRE: X+,X-,Y+,Y-,SX+,SX-,SY+,SY-

JR5/JR6/JR7: SELECT 4WIRE OR 5WIRE OR 8WIRE

	4 WIRE	5 WIRE	8 WIRE
JR5	2-3 ON	2-3 ON	2-3 ON
JR6	2-3 ON	1-2 ON	2-3 ON
JR7	2-3 ON	2-3 ON	1-2 ON

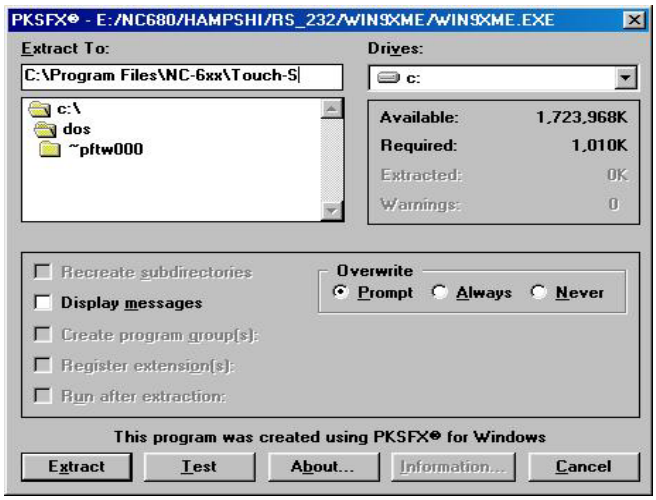
4-4 QUICK INSTALL GUIDE

☆INSTALLATION FOR WINDOWS 95/98/ME

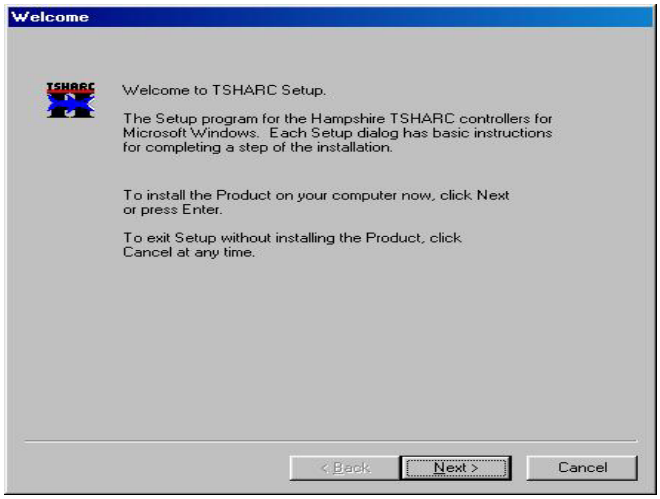
A: Double Click “Win9xme.exe”

B: Extract To: C:\xxxx\xxxx\xxx
By yourself what you like.

C: Click “Extract”

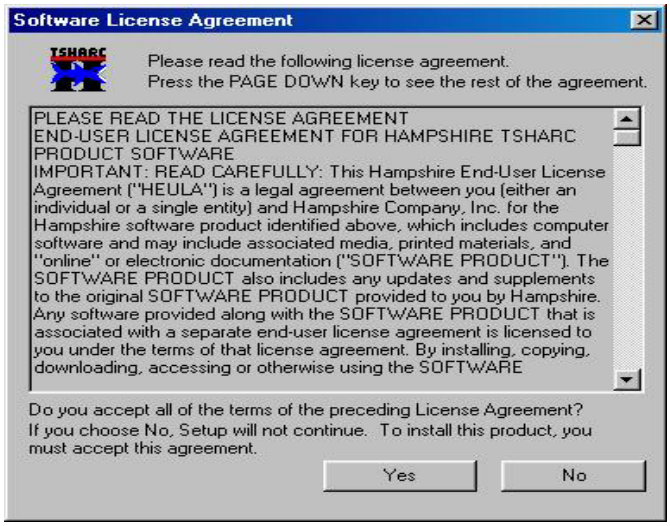


A: Click “ Next >”



A: The Software License Agreement

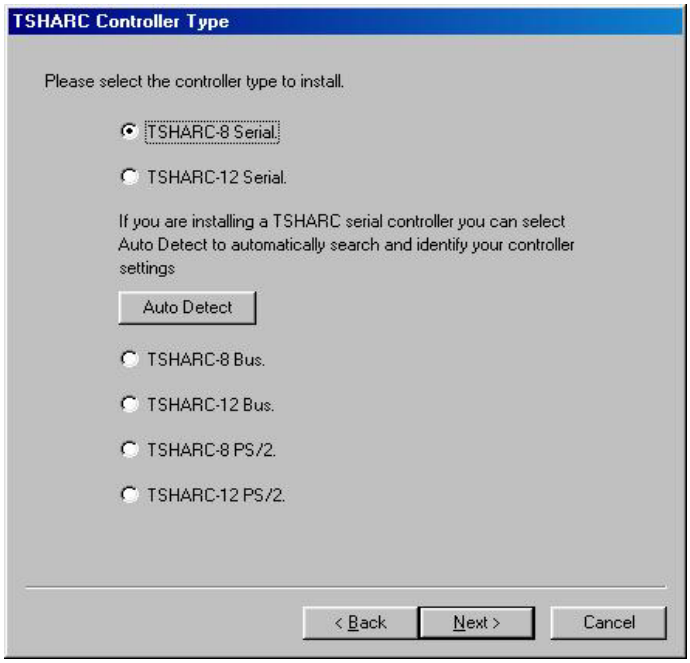
B: Click “Yes”



A: You can select TSHARC Controller Type :

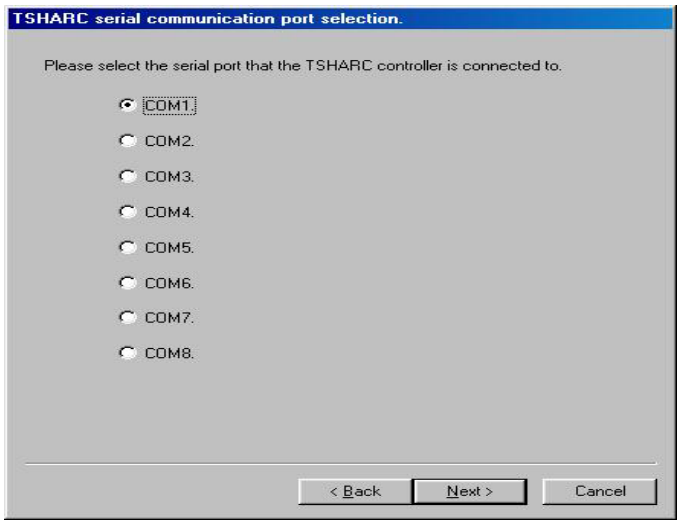
B: Select TSHARC-8 Serial

C: Click “Next >”



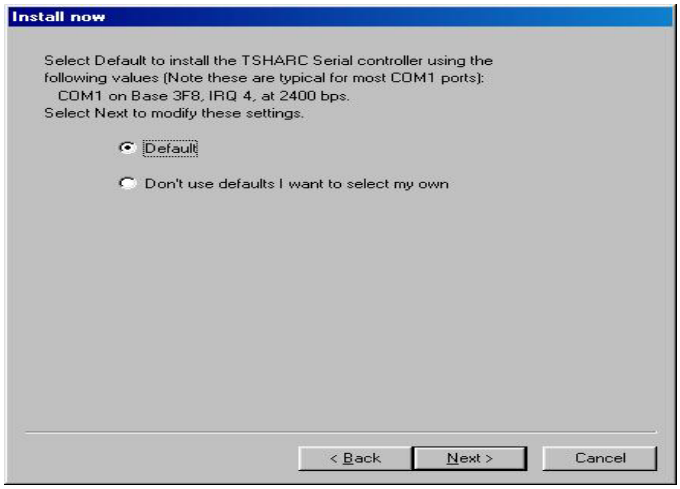
A: Select “COM1” Port

B: Click “Next >”

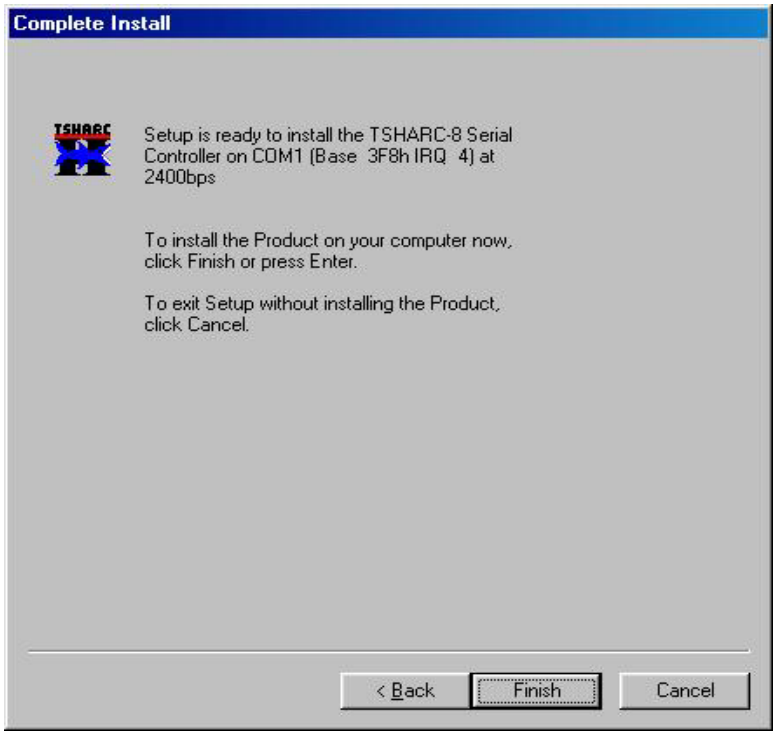


A: Set “Default”

B: Click “ Next >”



A: Click “Finish”



A: Setup is Complete.

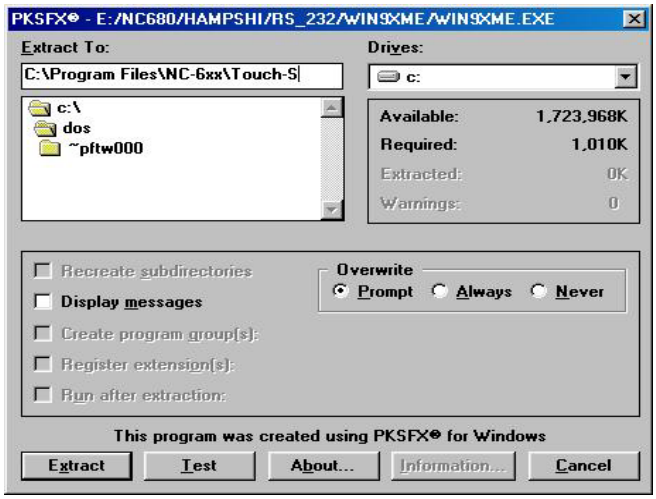
B: Click “ OK”

☆INSTALLATION FOR WINDOWS 2000

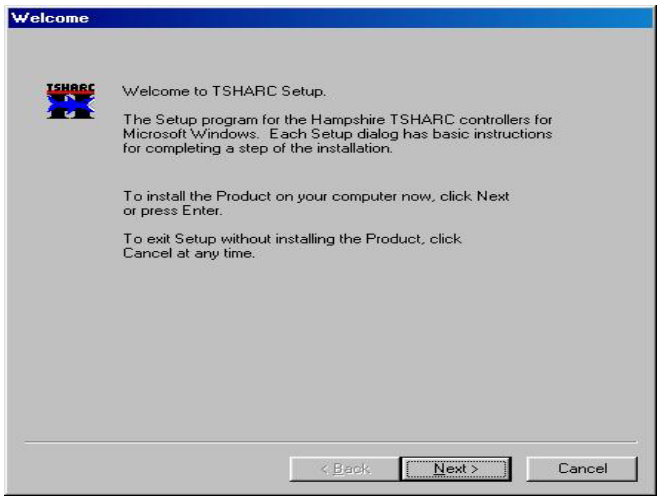
A: Double Click “Win2kxp.exe”

B: Extract To: C:\xxxx\xxxx\xxx
By yourself what you like.

C: Click “Extract”

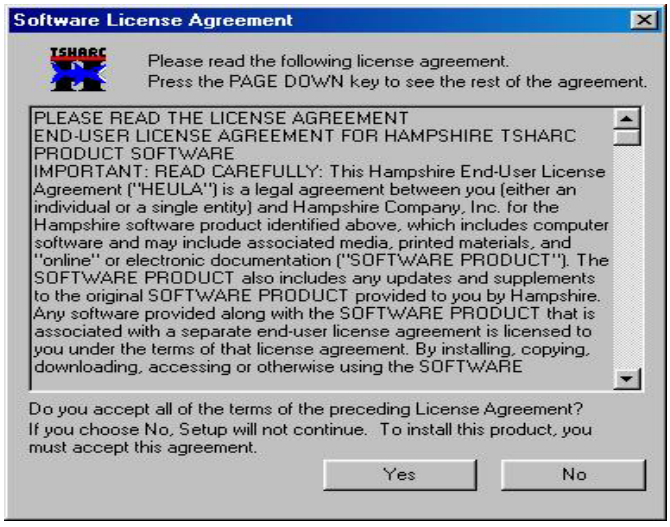


A: Click “ Next >”



A: The Software License Agreement

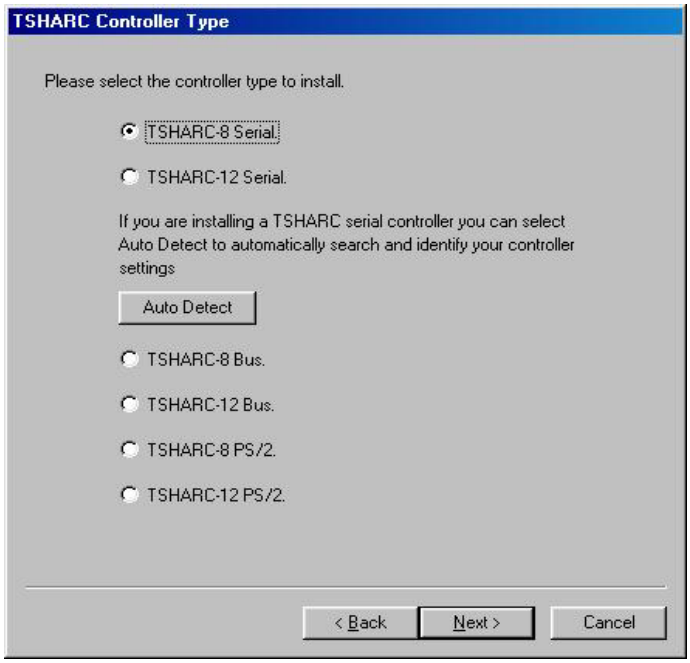
B: Click “Yes”



A: You can select TSHARC Controller Type :

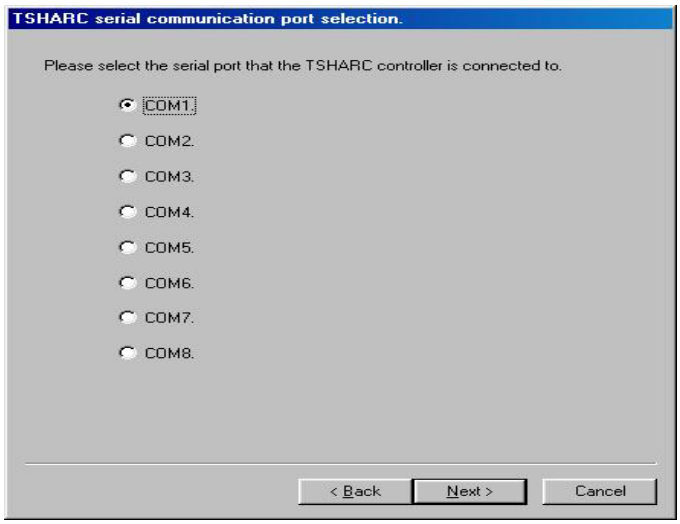
B: Select “TSHARC-8 Serial”

C: Click “Next >”



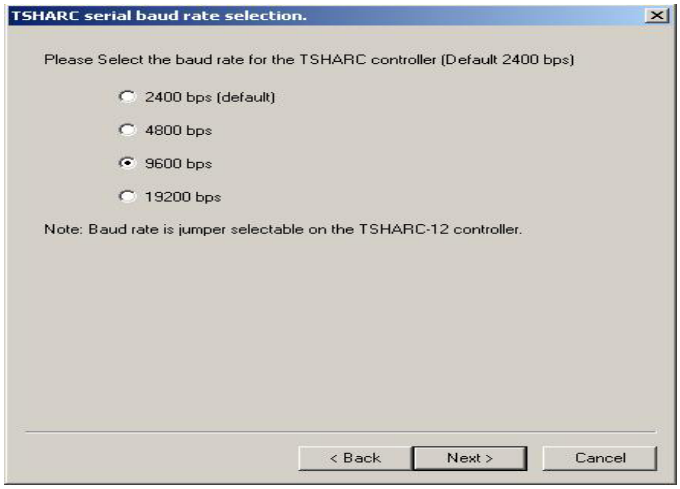
A: Select “COM1” Port

B: Click “Next >”

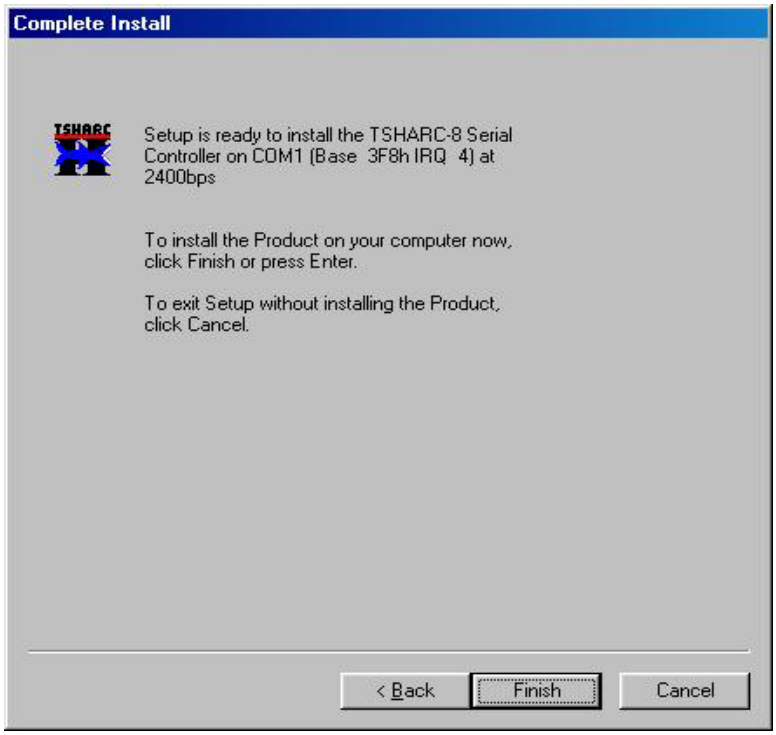


A: Set “9600 bps”

B: Click “ Next >”



A: Click “Finish”



A: Setup is Complete.

B: Click “ OK”

CHAPTER 5

AUDIO

This chapter shows the information about Audio functions.

SECTIONS INCLUDE:

* **INTRODUCTION**
* **QUICK INSTALLATION GUIDE**
* **FEATURES**

5-1 INTRODUCTION

The CPU Card on-board audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the VIA VT1612 audio controller and Codec chip. The audio interface can record, compress, and play back voice, sound, and music with a built-in mixer control. The CPU CARD on-board AC97 audio interface also supports the Plug and Play (PnP) standard. The ESFM synthesizer is register compatible with the OPL3 and has extended capabilities.

5-2 QUICK INSTALLATION GUIDE

Before installing the audio driver, please note the detail procedures as below. You must know which operating system you are using in your CPU CARD, and then refer to the corresponding installation flow chart and follow the steps in the flow chart. You can quickly and successfully complete the installation, even though you are not familiar with instructions for Windows.

Note: ***The driver on CD is designated as device "D" through-out this chapter.***

You must unzip CD driver first

☆INSTALLATION FOR WINDOWS 95/98

A: C:\Program files\MAT680681\Audio

B: Double Click “Setup”

A: Click “Next >”

A: Select “Install driver”

B: Click “Next >”

A: Install Finish.

B: Click “Finish”

☆INSTALLATION FOR WINDOWS NT40

A: Double click" Setup.exe"

B: Click " Next >

A: Select "Install drive"

B: Click "Next >"

A: You can select "Yes, I want to Restart my computer now"

B: Click "Finish"

☆INSTALLATION FOR WINDOWS 2000

A: Double click" Setup.exe"

B: Click " Next >"

A: Select "Install drive"

B: Click "Next >"

A: click "Finish"

5-3 FEATURES

- AC'97 2.2 S/PDIF extension compliant codec
- 18-bit stereo full duplex ∑∇ codec
- 1Hz resolution VSR (Variable Sampling Rate)
- Integrated IEC958 line driver for S/PDIF
- S/PDIF compressed digital or LPCM audio out
- 3D stereo expansion for simulated surround
- 18-bit independent rate stereo ADC/DAC
- Hardware VU peak meters for PCM streams
- 4 stereo, 2 mono analog line-level inputs
- Alt. line-level output with volume control, or
- Headphone Amplifier with Thermal Protection
- Low Power consumption mode
- Exceeds Microsoft® WHQL logo requirements
- 3.3V digital, 3.3 or 5V analog power supply
- 48-pin LQFP small footprint package

CHAPTER 6

100/10M ETHERNET

This chapter shows the information about 100/10M Ethernet functions.

SECTIONS INCLUDE:

6-1 INTRODUCTION

The Board is equipped with a high performance PCI Ethernet chipset which is fully compliant with IEEE 802.3 100 Mbps CSMA/CD standards. It is supported by major network operating systems. It is also both 100Base-T and 10Base-T compatible. The medium type can be configured Reltek the 8139C.exe program include on the utility CD. The Board provides one 10-pin pin header as ethernet connector.

6-2 INSTALLATION OF ETHERNET DRIVER

Before install the Ethernet driver, please note the procedures as below. You must know which operating system you are using in your NC-529 and refer to the corresponding installation flow chart, then follow the steps described in the flow chart. You will quickly and successfully complete the installation, even if you are not familiar with instructions for MS-DOS or Windows.

Note: ***The windows illustrations in this chapter are examples only. You must follow the flow chart instructions and pay attention to the instructions which then appear on your screen.***

☆ Installation for MS-DOS and Windows 3.1

If you want to set up your Ethernet connection under the MS-DOS or Windows3.1 environment, you should first check your server system model. For example, MS-NT or IBM-LAN server, and so on. Then choose the correct driver to install in your system.

The installation procedures for various servers can be found on CD. The file path is: D:\>MAT680681\NIC\Rtl8139c

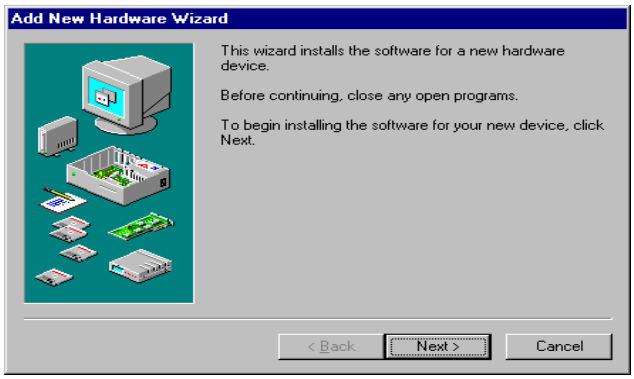
☆Installation for Windows 95/98

A. Select “Start” →”Setting” → “Control Panel”.

B. Double Click “Add New Hardware”

A. Can see “Add New Hardware Wizard”.

B. Click “Next >”.



A. Insert your CD.

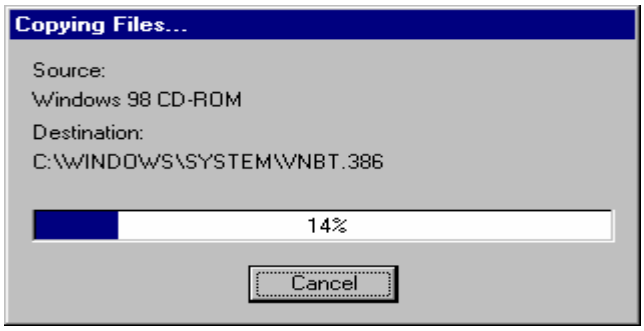
B. Select “Browse”

C. C:\Program Files\MAT680681\ NIC\Rtl8139c\Win98

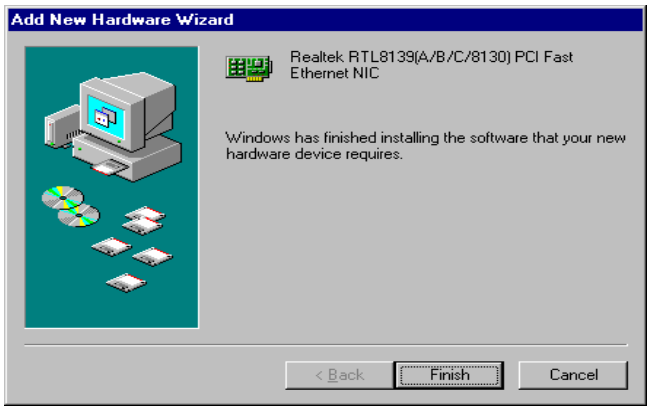
A. Windows driver can show “Realtek RTL8139(A/B/C/8130) PCI Fast Ethernet NIC.

B. Click “ Next >”.

A. **Copying Files.**



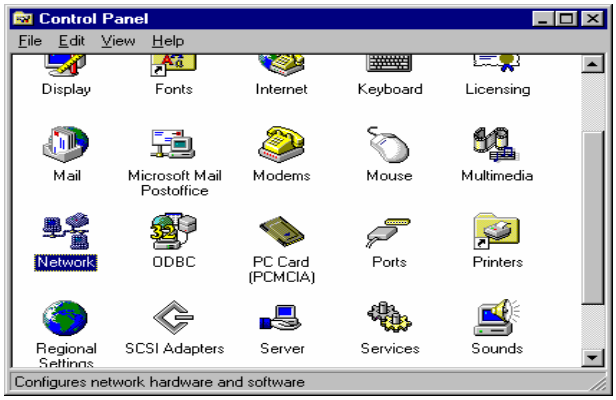
A. **Click " Finish".**



☆Installation for Windows NT

A. Select “Start”, “settings”, “Control Panel”.

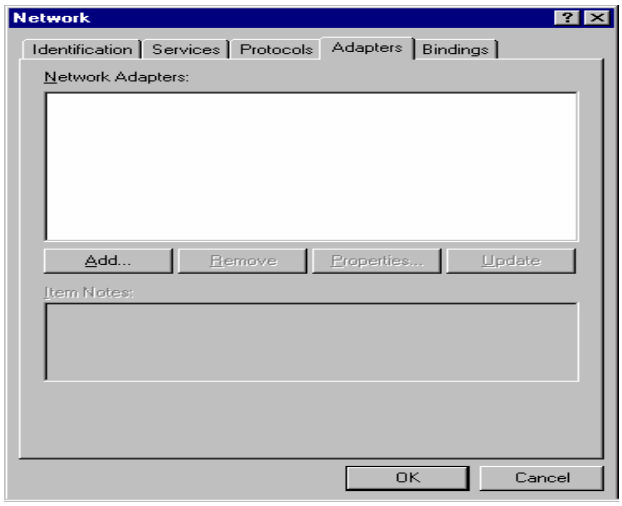
B. Double click “Network”.



A. Choose the “Adapters” label.

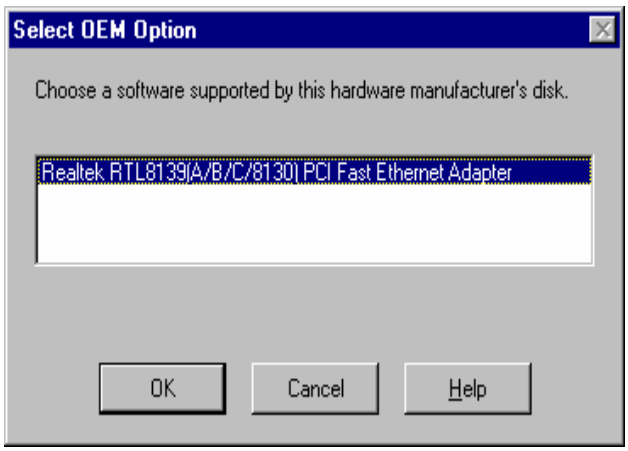
B. Click the “Add” button.

C. Insert CD key-in
D:\5.25 Board\MAT680681\NIC\Rtl8139c\winnt4



A. show Select OEM Option
Realtek
RTL8139(A/B/C/8130)
PCI Fast Ethernet Adapter

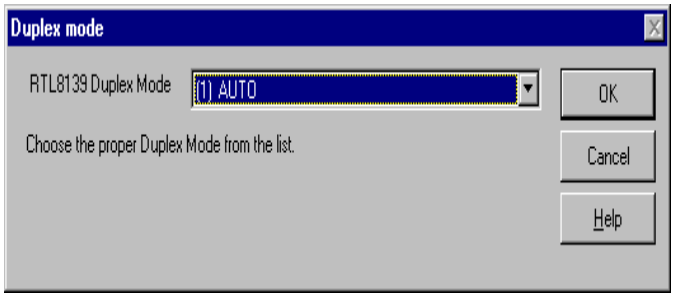
B. Click “OK”.



A. Select RTL8139 Duplex Mode

B. Select “(1) AUTO “

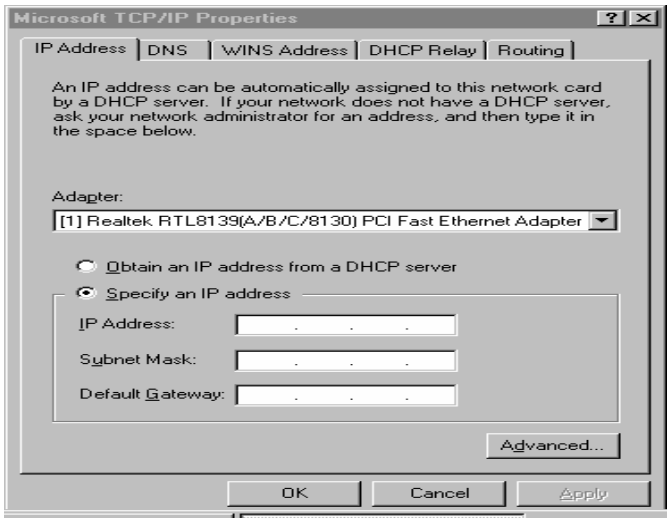
C. Click “ OK “.



A. Can See Microsoft TCP/IP Properties

B. Key-in “IP Address”
“Subnet Mask”
“Default Gateway”

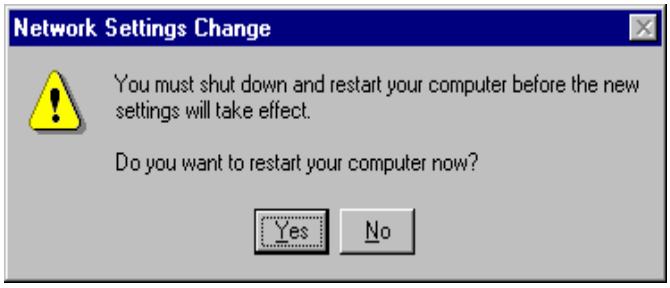
C. Click “OK”.



A. Network Settings Change.

B. Click “Yes”.

C. Restart your computer now.



6-3 FURTHER INFORMATION

Please reference Realtek website: www.realtek.com.tw

6-4 INTRODUCTION

The CPU BOARD is equipped with two high performance Intel 82559 PCI 100/10M Ethernet chipset which is fully compliant with IEEE 802.3 100 Mbps CSMA/CD standards. It is supported by major network operating systems. The medium type can be configured via the 82559.exe program included on the utility CD.
The CPU BOARD provides two 10-pin pin header as Ethernet connector on board. It also support boot ROM socket which can be utilized by incorporating the boot ROM image files for the appropriate network operating system.

6-5 INSTALLATION OF ETHERNET DRIVER

Before install the Ethernet driver, note the procedures as below. You must know which operating system you are using in your CPU BOARD and refer to the corresponding installation flow chart, then follow the steps described in the flow chart. You will quickly and successfully complete the installation, even if you are not familiar with instructions for MS-DOS or Windows.

Note: ***The windows illustrations in this chapter are examples Only. You must follow the flow chart instructions and Pay attention to the instructions which then appear on your screen.***
It's must unzip d:\5.25board\MAT680681\NIC\82559.EXE

∇ Installation for MS-DOS and Windows 3.1

If you want to set up your Ethernet connection under the MS-DOS or Windoes3.1 environment, you should first check your server system model. For example, MS-NT, IBM-LAN server, and so on.
Then choose the correct driver to install in your panel PC.
The installation procedures for various servers can be found on CD-ROM.
The file path is:

"C:\>Program files\MAT680681\NIC\DOS"

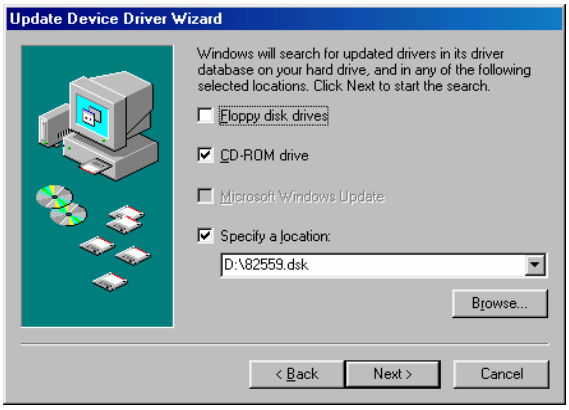
∇ Installation 82559 for Windows 95/98

A. Win98 Auto search
PCI Ethernet Controller

B. Click “Next >”.

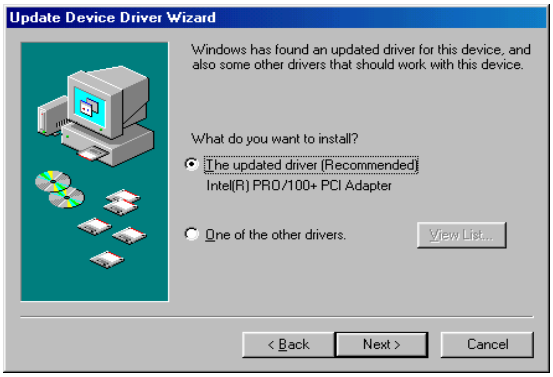
A. Install CD Select
“C:\>Program Files\ MAT680681\NIC\ 82559.”

B. Click “Next >”.



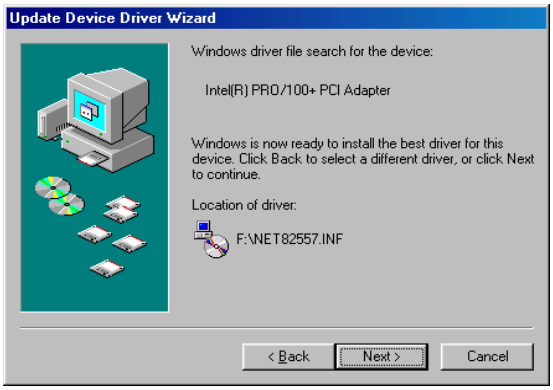
A. Select The updated driver
[Recommended] Intel[R] PRO/100+ PCI Adapter.

B. Click “Next >”.



A. Computer found Location of driver
NET82557.INF

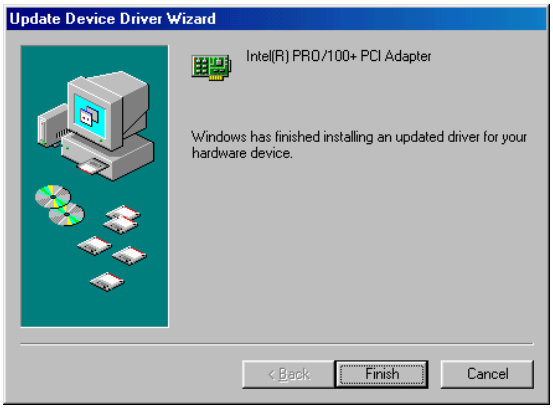
B. Click “Next >”.



A. Found the New hardware
Intel[R] PRO/100+ PCI Adapter

B. Click “Finish”.

C. Then Restart Computer.



∇ Installation 82559 for Windows NT

1. a. Select “Start”, “settings”,
“Control Panel”.
b. Double click “Network”

2. a. Choose the “Adapters” label.
b. Click the “Add” button.

3. Select the “Adapter” item to add the Ethernet card.

4. Click “Have Disk” to install the driver.

5. a. Insert the CD into the D:\ . It’s Unzip First
b. Type: C:\>Program Files\MAT680681\NIC\82559
c. Click “OK”.

6. a. Choose the “Intel” item.
b. Click “OK” button.

7. a. Make sure the configurations of relevant items are set correctly.
b. Click “OK” to reboot.

6-6 FURTHER INFORMATION

Intel website: www.intel.com

CHAPTER 7

W D T

THIS CHAPTER SHOWS THE INFORMATION OF WDT FUNCTION, ALSO DESCRIBES HOW TO INSTALL THE WATCHDOG CONFIGURATION.

SECTIONS INCLUDE:

*** WATCHDOG TIMER FUNCTION**

*** WATCHDOG TIMER SOFTWARE GUIDE**

7-1 WATCHDOG TIMER FUNCTION

The watchdog timer can reset the system or generate a IRQ11 signal automatically. It is defined at I/O port 0443H. When you want to enable the watchdog timer, please write code to I/O port 0443H, then the system will generate a reset or IRQ11 signal. When you want to disable the function, write I/O port 043H (1043H ~ D043H), the system will stop the WDT function.

This CPU board watchdog functions: write I/O port address 0443 to enable watchdog and write I/O port address 043 (1043, 2043, 3043,…D043) to disable watchdog. The following program shows you how to program the watchdog timer in your program.

WatchDog Enable program:

For Example

```
MOV AX, 000FH        (choose the values you need; start from 0 to FF )
MOV DX, 0443H
OUT DX, AX
```

Watchdog Disable program:

```
MOV AX, 000FH        (please ignore this value.)
MOV DX, 043H
OUT DX, AX
```

Please find the time you need and the corresponding value from the following Watchdog Timer Control Table:

TIME BASE IS LIST BELOW

VA Mean is Value for counter : Unit Hexdecimal
Time Mean is WDT Signal response time : Unit Decimal (second)

Va	time	Va	time	va	time	Va	time	va	time	va	time	va	time	va	time
00	1024	10	64	20	128	30	192	40	256	50	320	60	384	70	448
01	4	11	68	21	132	31	196	41	260	51	324	61	388	71	452
02	8	12	72	22	136	32	200	42	264	52	328	62	392	72	456
03	12	13	76	23	140	33	204	43	268	53	332	63	396	73	460
04	16	14	80	24	144	34	208	44	272	54	336	64	400	74	464
05	20	15	84	25	148	35	212	45	276	55	340	65	404	75	468
06	24	16	88	26	152	36	216	46	280	56	344	66	408	76	472
07	28	17	92	27	156	37	220	47	284	57	348	67	412	77	476
08	32	18	96	28	160	38	224	48	288	58	352	68	416	78	480
09	36	19	100	29	164	39	228	49	292	59	356	69	420	79	484
0a	40	1a	104	2a	168	3a	232	4a	296	5a	360	6a	424	7a	488
0b	44	1b	108	2b	172	3b	236	4b	300	5b	364	6b	428	7b	492
Oc	48	1c	112	2c	176	3c	240	4c	304	5c	368	6c	432	7c	496
0d	52	1d	116	2d	180	3d	244	4d	308	5d	372	6d	436	7d	500
0e	56	1e	120	2e	184	3e	248	4e	312	5e	376	6e	440	7e	504
0f	60	1f	124	2f	188	3f	252	4f	316	5f	380	6f	444	7f	508
Va	time	Va	time	va	time	Va	time	va	time	va	time	va	time	va	time
80	512	90	576	a0	640	b0	704	c0	768	d0	832	e0	896	f0	960
81	516	91	580	a1	644	b1	708	c1	772	d1	836	e1	900	f1	964
82	520	92	584	a2	648	b2	712	c2	776	d2	840	e2	904	f2	968
83	524	93	588	a3	652	b3	716	c3	780	d3	844	e3	908	f3	972
84	528	94	592	a4	656	b4	720	c4	784	d4	848	e4	912	f4	976
85	532	95	596	a5	660	b5	724	c5	788	d5	852	e5	916	f5	980
86	536	96	600	a6	664	b6	728	c6	792	d6	856	e6	920	f6	984
87	540	97	604	a7	668	b7	732	c7	796	d7	860	e7	924	f7	988
88	544	98	608	a8	672	b8	736	c8	800	d8	864	e8	928	f8	992
89	548	99	612	a9	676	b9	740	c9	804	d9	868	e9	932	f9	996
8a	552	9a	616	aa	680	Ba	744	ca	808	da	872	ea	936	fa	1000
8b	556	9b	620	ab	684	Bb	748	cb	812	db	876	eb	940	fb	1004
8c	560	9c	624	ac	688	Bc	752	cc	816	dc	880	ec	944	fc	1008
8d	564	9d	628	ad	692	Bd	756	cd	820	dd	884	ed	948	fd	1012
8e	568	9e	632	ae	696	Be	760	ce	824	de	888	ee	952	fe	1016
8f	572	9f	636	af	700	Bf	764	cf	828	df	892	ef	956	ff	1020

7-2 WATCHDOG SOFTWARE GUIDE

User can use WDT function by following way:

1.Direct start WDT function as procedure which described on Sec. 7-1.

FOR EXAMPLE:

```
MOV AL, 44
OUT   70, AL
IN       AL, 71
MOV DX, 0443
OUT DX, AL
RET
```

The above simple software was written under DOS DEBUG. It shows you how to get the SETUP VALUE from CMOS location 44H.

If you want to read the data correctly, you must put the data 44 value on register AL first.

Then you must put the register value (44) on port 70H (this mean you need to addressing the port 70H)

Whenever you need, you can send the data to I/O port 0443H to trigger the WDT timer and for your application.

CHAPTER 8

AWARD BIOS SETUP

THIS CHAPTER SHOWS HOW TO SETUP THE AWARD BIOS.

SECTIONS INCLUDE:

* INTRODUCTION
* STARTING SETUP
* MAIN MENU
* STANDARD CMOS SETUP
* ADVANCED BIOS FEATURES
* ADVANCED CHIPSET FEATURES
* INTEGRATED PERIPHERALS
* POWER MANAGEMENT SETUP
* PNP/PCI CONFIGURATIONS
* PC HEALTH STATUS
* FREQUENCY/VOLTAGE CONTROL
* LOAD FAIL-SAFE DEFAULTS
* SUPERVISOR/USER PASSWORD SETTING
* BIOS DEFAULT DRIVE TABLE

8-1 INTRODUCTION

This section discusses Phoenix-Award Setup program built in the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The Phoenix-Award BIOS installed in computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means it supports Intel Socket 370 **Tualatin**, **Pentium III, Celeron** & VIA C3 CPU up to 1.3GHz+, ZIF socket Support **133/100/66 FSB (Front Side Bus) processors in a standard IBM AT compatible Input/ Output system. The BIOS provides critical low-level support for standard devices such as disk drives, serial and parallel ports. Also the BIOS has been customized by adding important, but non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system. The rest of this chapter will try to guide you the process of configuring your system by using Setup.**

8-2 STARTING SETUP

The Phoenix-Award BIOS is immediately activated when the computer start power on. The BIOS reads the system information contained in the CMOS and start the process of checking out the system and configuring it. When it finish, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated by one of two ways:

1. **Press the <Del> key immediately after switching the system on, or**
2. **Press the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test)**

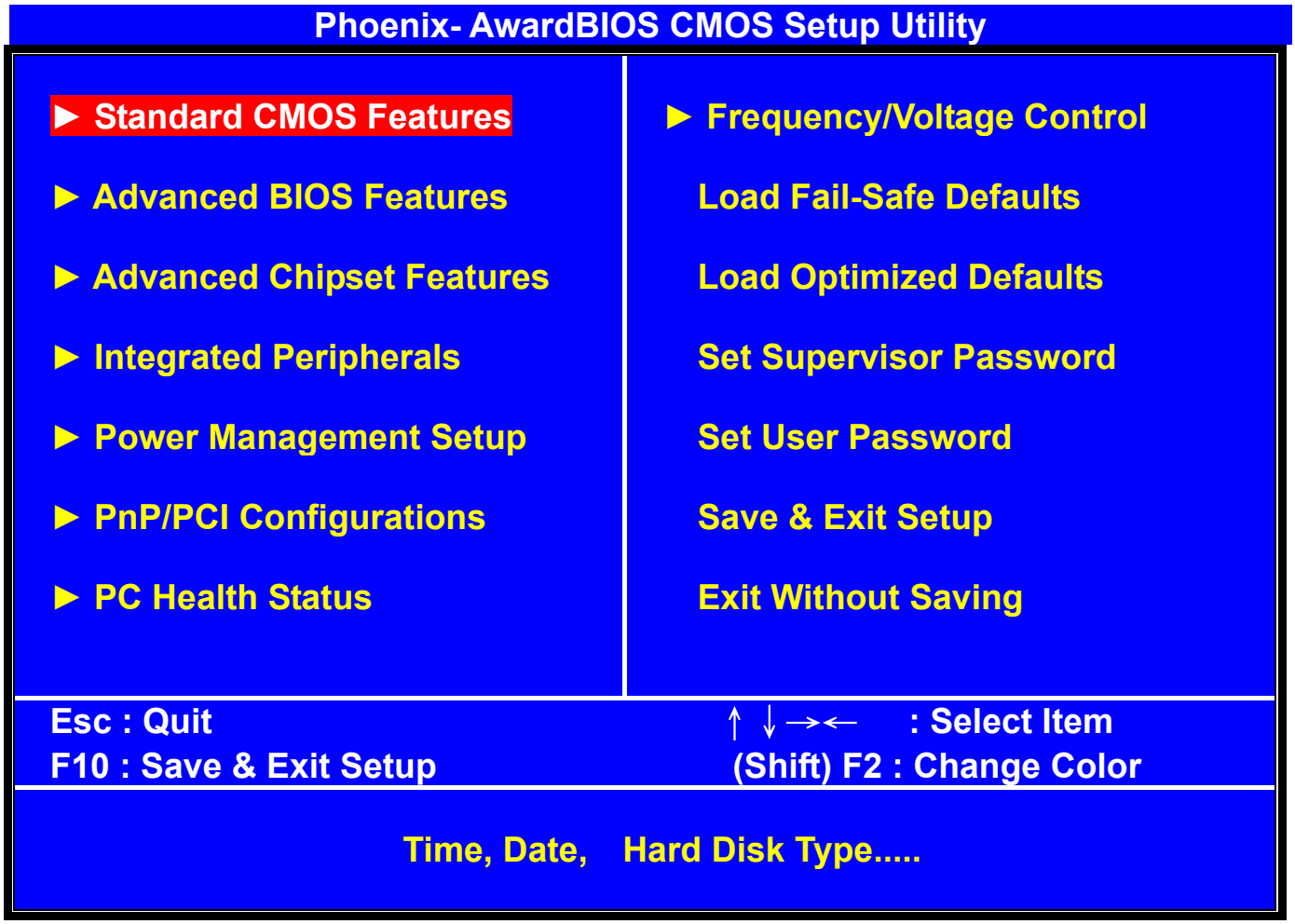
Press DEL to enter SETUP.

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" bottom 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, DEL TO ENTER SETUP

8-3 MAIN MENU

Once you enter the Phoenix-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.



Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items:

The main menu includes the following main setup categories. Please note that some systems may not include all entries.

- **Standard CMOS Features**
  Use this menu for basic system configurations, such as time, date etc.

- **Advanced BIOS Features**
  This setup includes all the items of Award special enhanced features.

- **Advanced Chipset Features**
  This setup to change the value in the chipset registers and optimize Your system's performance..

- **Integrated Peripherals**
  This setup to specify your settings for integrated peripherals.

- **Power Management Setup**
  Use this setting to specify your settings for power management.

- **PnP / PCI Configuration**
  This setup appears if your system supports PnP / PCI.

- **PC Health Status**
  This entry display the current status of your PC..

- **Frequency/Voltage Control**
  Use this item to specify your settings for Frequency/Voltage control.

- **Load Fail-Safe Defaults**
  This menu to load the BIOS default values for the minimal/stable performance of your PC

- **Load Optimized Defaults**
  This item to load the default factory settings for BIOS for optimal system performance..

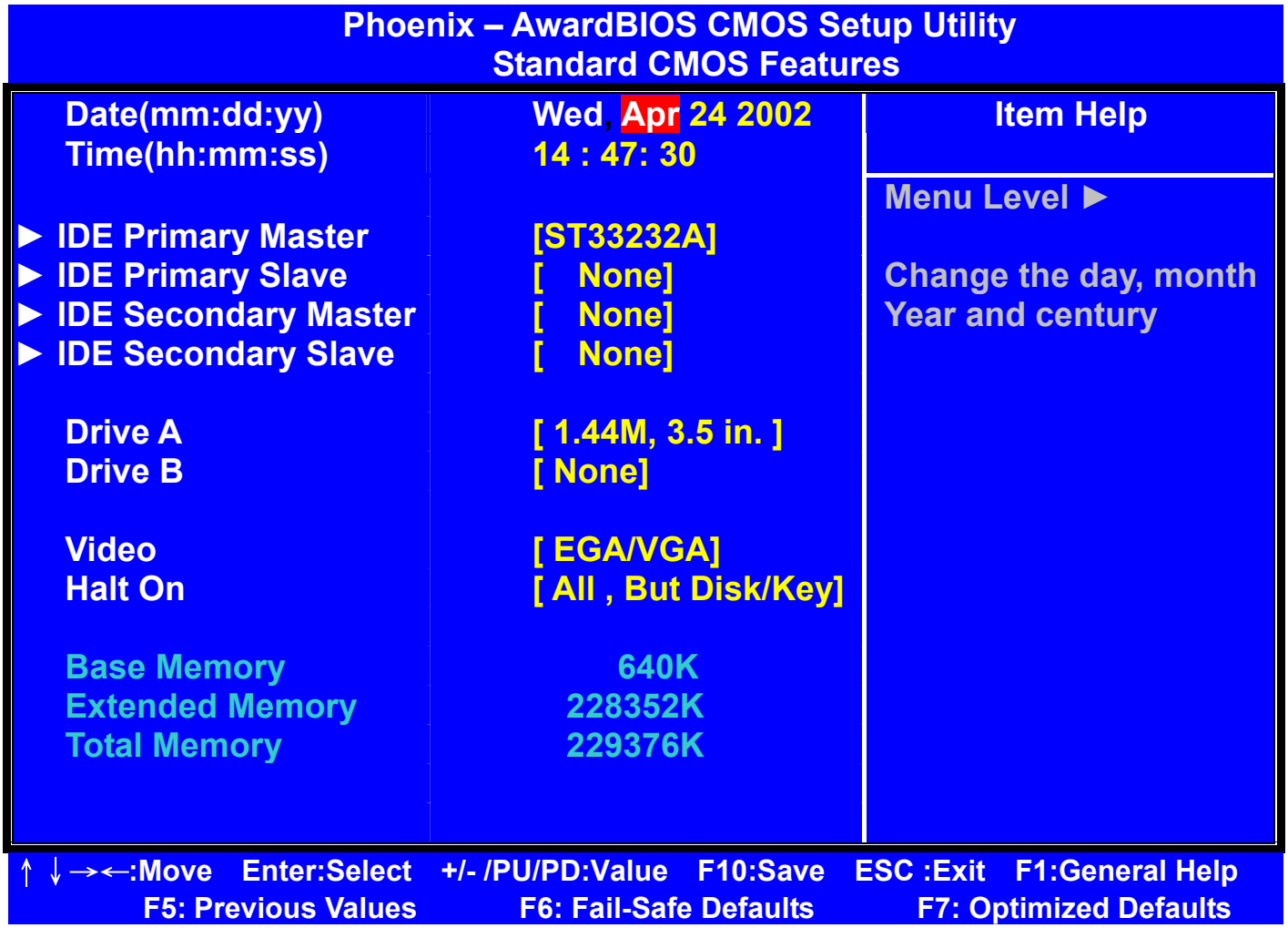
- **Supervisor / User Password Setting**
  Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.

- **Save & Exit Setup**
  Save CMOS value changes to CMOS and exit setup.

- **Exit Without Saving**
  Abandon all CMOS value changes and exit setup.

8-4 STANDARD CMOS FEATURES

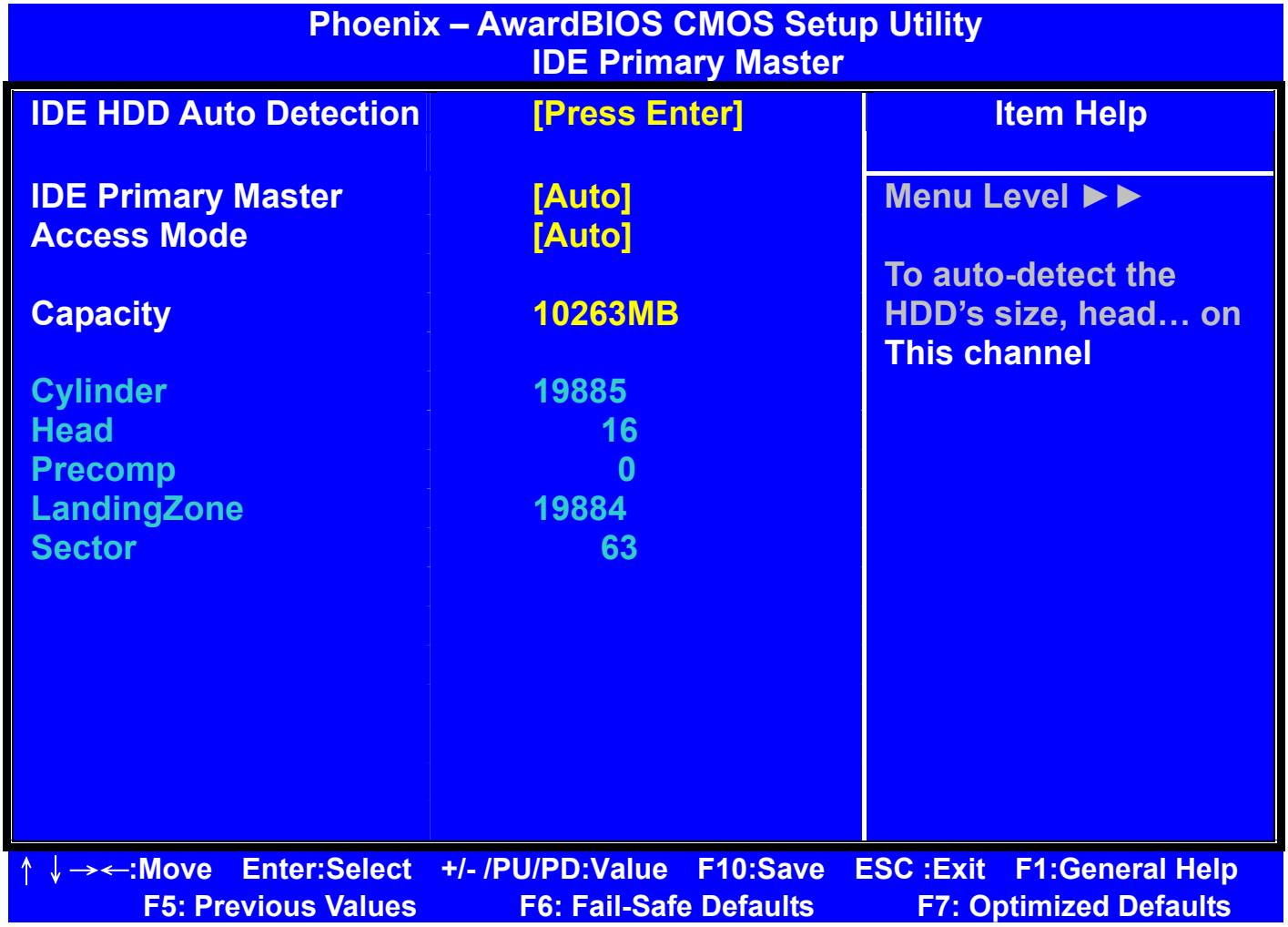
The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes none, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



- **Date**
  To assign the system date, the format is "mm:dd:yy". The input range for the Month is 1-12. Rang for Date is 1-31. Rang for Year is 1994-2099. System BIOS will calculate the day of the week automatically.

- **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.

- **IDE Primary Master/Slave /Secondary Master/Slave**
  Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The Specification of hard disk drive will show up on the right hand according To your selection.



Access Mode	The settings are Auto, CHS, LBA and Large.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation.
Landing Zone	Cylinder location of the landing zone.
Sector	Number of sectors.

- **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 include high resolution mono adapters.

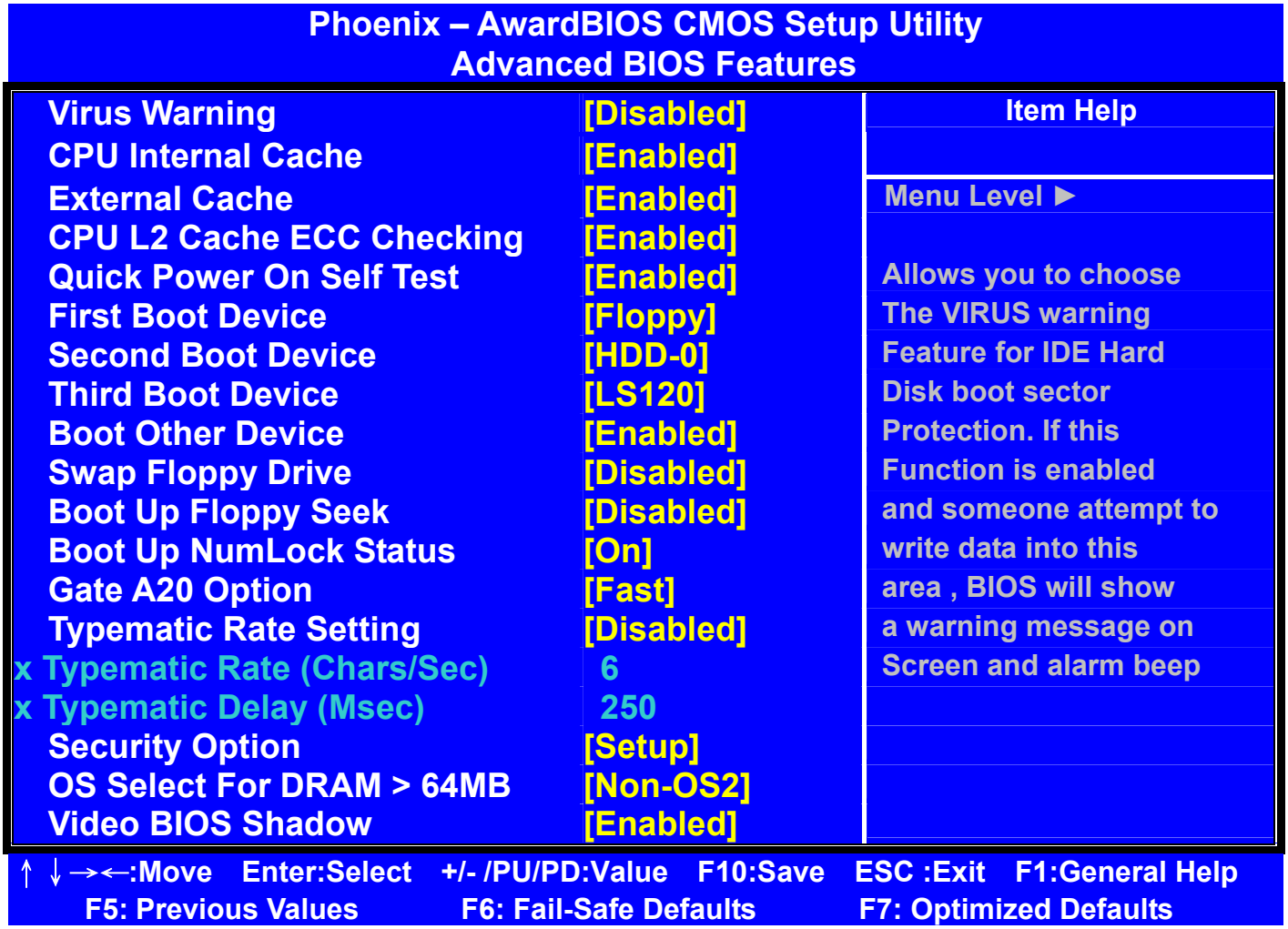
- **Halt On**

  This function allows the system to halt when an error is detected during Power-On Self-Test.

No errors	Whenever the BIOS detects a non-fatal error the system Would be stopped and you will be prompted.
All errors	The system boot will not be stopped whenever any error Detected.
All, But Keyboard	The system boot will not stop for a keyboard error but it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error but it will Stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk Error but it will stop for all other errors.

8-5 ADVANCED BIOS FEATURES

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



- **Virus Warning**

  When this function is enabled, the BIOS 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 then display an error message. Afterwards, if necessary, you can run an anti-virus program to locate and remove the problem before any damage is done. Many disk diagnostic programs will attempt to access the boot sector table, which can cause the above warning message. If you run such a program, we recommend that you first disable the Virus Warning function beforehand. The default value is disabled.

- **CPU Internal Cache**
  This field configures the CPU internal cache (L1 cache). The default value is enabled.

- **External Cache**
  This field configures the system's external cache (L2 cache). The default value is enabled.

- **CPU L2 Cache ECC Checking**
  This field specifies whether the CPU L2 cache supports ECC or not. The default value is enabled.

- **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.

- **First Boot Device**
  This option allows user to assign first boot of the system. Available options are A, C, D, E, F, CD-ROM, LAN, SCSI and LS120/ZIP100.

- **Second Boot Device**
  This option allows user to assign second boot of the system. Available options are A, C, D, E, F, CD-ROM, LAN, SCSI and LS120/ZIP100.

- **Third Boot Device**
  This option allows user to assign third boot of the system. Available options are A, C, D, E, F, CD-ROM, LAN, SCSI and LS120/ZIP100.

- **Boot Other Device**
  This option allows user to other Device , you can select Enabled or Disabled.

- **Swap Floppy Drive**
  When enabled, physical drive A will be assigned to logical drive B, and physical drive B will be assigned to logical drive A.

- **Boot Up Floppy Seek**
  The system will detect and verify operation of the floppy drive type.

- **Boot Up NumLock Status**
  The option allows the <NumLock> key to be activated after system boot up.

- **Gate A20 Option**
  This item allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard. Today, even keyboards still provide this support, it is more common and much faster for the system chipset to provide gate A20 support.

- **Typematic Rate Setting**
  This item 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 to 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)**
  Use this option to set the rate at which a character keeps repeating while you hold down a key.

- **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 the acceleration begins.

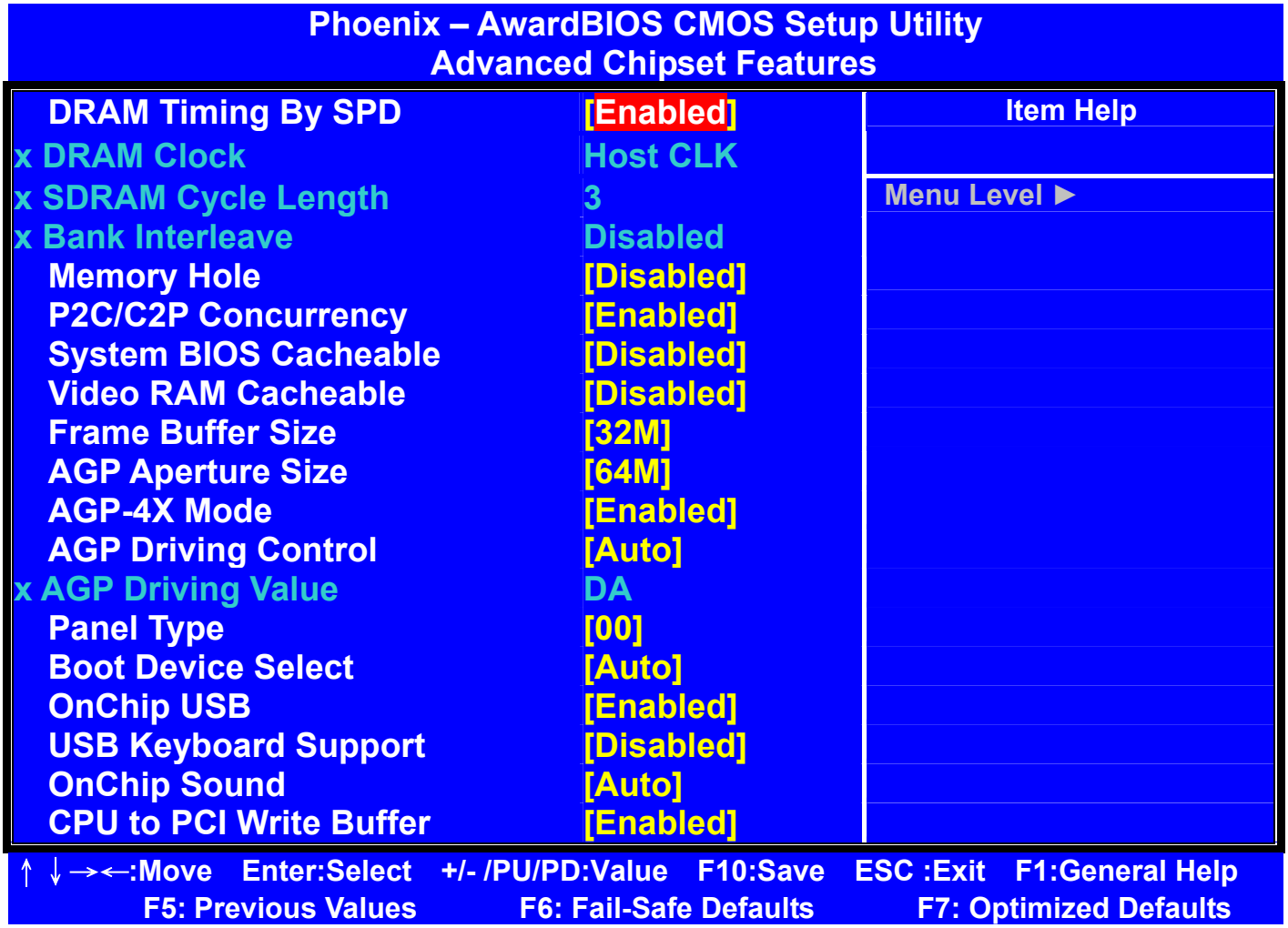
- **Security Option**
  You can select whether the password is required every time the system boots or only when you enter the Setup. You can assign "Supervisor Password" and "User Password" in the main CMOS Setup Utility Screen.

- **OS Select for DRAM > 64**
  If you are using OS/2 operating system and installed memory is larger than 64MB. You need to have the setting in the enable mode.

- **Video BIOS Shadow**
  Video shadow copies BIOS code from slower ROM to faster RAM. BIOS can then execute from RAM.

- **C8000 - CBFFF Shadow/DC000 - DFFFF Shadow**
  Optional firmware will be copied from ROM to RAM. When this option is enabled.

8-6 ADVANCED CHIPSET FEATURES



Note: **Change these settings only if you are familiar with the chipset.**

- **DRAM Timing by SPD**

  Selects whether DRAM timing is configured by reading the contents of the SPD (Serial Presence Detect) device on the DRAM module. Setting to Enabled makes both DRAM Cycle Length and DRAM Clock automatically Determined by BIOS according the configurations on the SPD.

- **DRAM Clock**

  The chipset supports synchronous and asynchronous mode between host clock and DRAM clock frequency. The settings are:

  Host CLK **The DRAM clock will be equal to the Host Clock.**

  HCLK-33M **The DRAM clock will be equal to the Host Clock minus 33MHz, For example, if the Host Clock is 133MHz, the DRAM clock will be 100MHz.**

  HCLK+33M **The DRAM clock will be equal to the Host Clock plus 33MHz, For example, if the Host Clock is 100MHz, the DRAM clock will be 133MHz.**

- **SDRAM Cycle Length**

  The option controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Settings are 2 and 3 (clock cycles). 2 increases system performance while 3 provides more stable system performance..

- **Memory Hole**

  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 16MB. When this area is reserved, it cannot be cached. The settings Are Enabled and Disabled (default).

- **P2C/C2P Concurrency**

  This field enables or disables the PCI to CPU and CPU to PCI concurrency Feature, which allows synchronous data transmission from PCI to CPU and vice versa. Selecting the default Enabled will increase system performance.

- **System BIOS Cacheable**

  System BIOS ROM at F000h-F0000h is always copied to RAM for faster Execution. Selecting Enabled allows the contents of F0000h RAM memory Segment to be written to and read from cache memory, resulting in better System performance. However, if any program writes to this memory area, A system error may result.
  The settings are Enabled and Disabled (default).

- **Video RAM Cacheable**

  The field allows the caching of video memory, resulting in increased system Performance. Settings are Enabled and Disabled (default).

- **Frame Buffer Size**

  Frame Buffer is the video memory that stores data for video display (frame). This field is used to determine the memory size for Frame Buffer. Larger Frame buffer size increases video performance.
  Setting are 2M, 4M and 8M (default).

- **AGP Aperture Size**

  Select the size of the Accelerated Graphics Port(AGP) aperture. 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. Options are 4M, 8M, 16M, 32M, 64M and 128M.

- **Panel Type**

  This item is select LCD Panel type.

Panel Type	Support Function
0	640 x 480 TFT
1	800 X 600 TFT
2	1024 X 768 TFT 2pixel/clk at 32MHz
3	1280 x 1024 TFT
4	640 X 480 DSTN
5	800 X 600 DSTN
6	1024 X 768 DSTN
7	1024 X 768 TFT 1pixel/clk at 65MHz
8	640 x 480 TFT
9	800 X 600 TFT
A	1024 X 768 TFT
B	1280 X 1024 TFT
C	640 X 480 DSTN
D	800 X 600 DSTN
E	1024 X 768 DSTN
F	1280 X 1024 DSTN

- **Boot Device Select**

  This item is select Boot Device. The Default is "Auto"

- **OnChip USB**

  This is used to enable or disable the USB ports. Settings are Enabled and Disabled. The default is Enabled..

- **USB Keyboard Support**

  Set to Enabled if you need to use an USB keyboard in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix. Default is Disabled.

- **OnChip Sound**

  Auto allows the mainboard to detect whether an audio device is used. If The device is detected, the onboard audio controller will be enabled; if Not, the controller is disabled. Disabled the controller if you want to use other controller cards to connect an audio device.
  Settings are Auto (default) and Disabled..

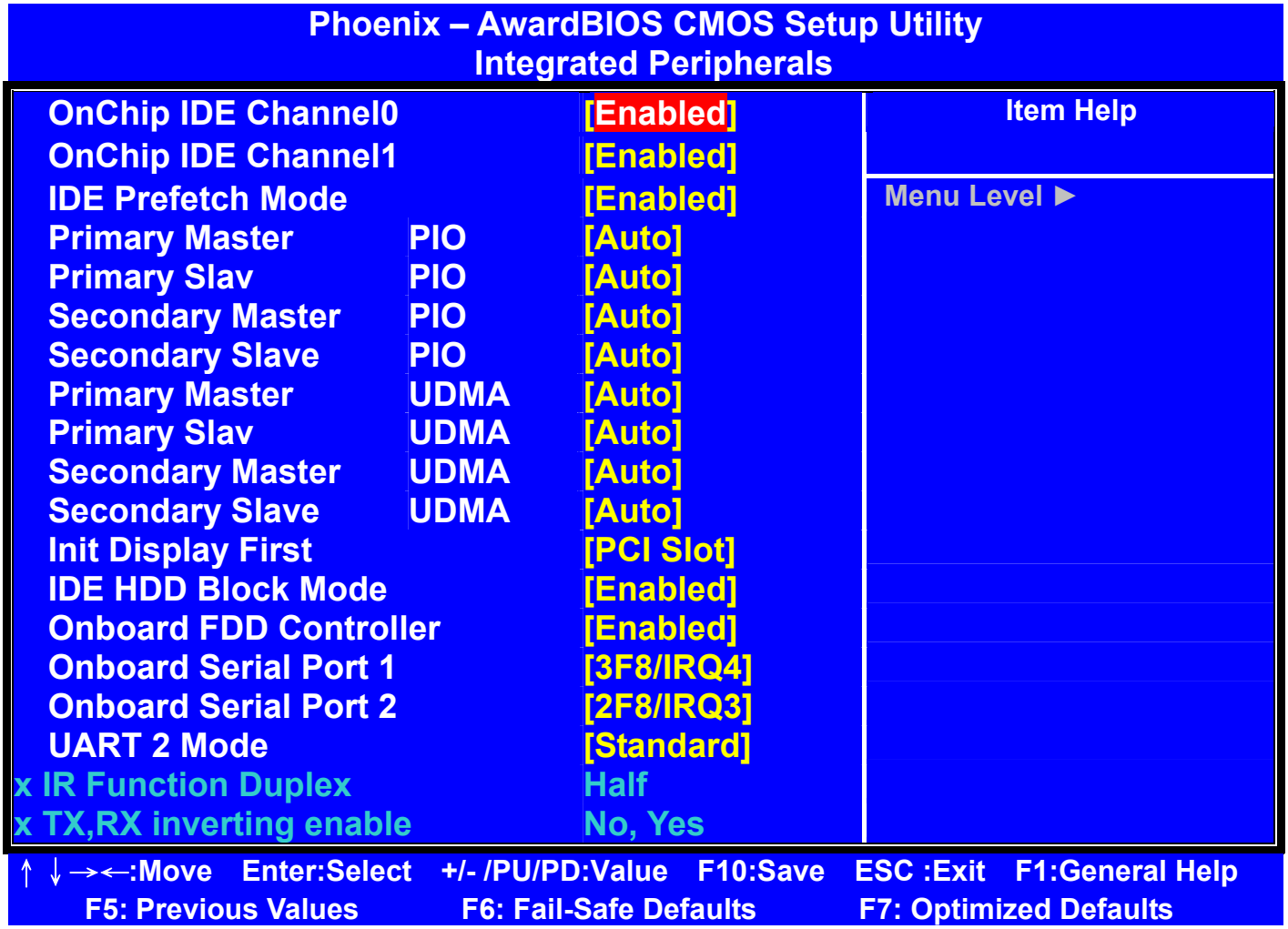
- **Memory Hole At 15M-16M**
  Enabling this feature reserves 15MB to 16MB memory address space to ISA Expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB.

- **Passive Release**
  This function is used to meet the latency of the ISA bus master. Try to enable or disable it, if you have ISA card compatibility problem.

- **Delayed Transaction**
  This function is used to meet the latency of PCI cycles to from ISA bus. Try to enable or disable it, if you have ISA card compatibility problem.

- **AGP Aperture Size (MB)**
  Choose 4, 8, 16, 32, 64, 128, 256MB. Memory-mapped, graphics data structure can reside in the Graphics Aperture.

8-7 INTEGRATED PERIPHERALS SETUP



- **OnChip IDE Channel 0/1**
  The integrated peripheral controller contains an IDE interface with Support for two IDE channels. Choose the default value Enabled to Activate each channel separately..

- **IDE Prefetch Mode**
  The onboard IDE drive interface support prefetching, for faster drive accesses. Set to Disabled if your primary and/or secondary add-in IDE interface does not Support prefetching.

- **Primary/Secondary Master/Slave PIO:**
  The four fields allow you to set a PIO (Programmed Input/Output) mode For each of the four IDE devices that the onboard IDE interface supports. Modes 0~4 provide increased performance. In Auto mode, BIOS automatically determines the best mode for each IDE device.

- **Primary/Secondary Master/Slave UDMA:**
  Ultra DMA implementation is possible only if you IDE device supports it and your operating environment contains a DMA driver. If both your hard drive and software support Ultra DMA, select Auto (default) to enable BIOS support.

- **Init Display First:**
  This item specifies which VGA card is your primary graphics adapter. Available options are PCI Slot and AGP. Default value is AGP..

- **IDE HDD Block Mode:**
  This allows your hard disk controller to use the fast block mode to transfer date To and from the hard disk drive. Block mode is also called block transfer, multiple Commands or multiple sector read/write. Enabled enables IDE controller to use block mode; Disabled allows the controller to use standard mode. Default is Enabled.

- **Onboard FDD Controller:**
  This is to enable or disable the onboard Floppy controller. Set to Enabled if you have A floppy disk device installed on the mainboard and want to use it.

- **Onboard Serial Port 1/2:**
  These items specify the base I/O port address and IRQ for the onboard Serial Port 1 (COM 1)/ Serial Port 2 (COM 2). Selecting to Auto allows BIOS to automatically determine the correct base I/O port address. Available options are Auto, *3F8/IRQ4*, *2F8/IRQ3*, *3E8/IRQ4*, *2E8/IRQ3* and Disabled. Default is Auto. If you have ISA add-on card, the suggested configuration is an the following:

If the ISA add-on card has				Onboard Serial port to be set at			
COM1 3F8H	COM2 2F8H	COM3 3E8H	COM4 2E8H	PORT1	IRQ ASSIGNED	PORT2	IRQ ASSIGNED
√	√	√	√	DISABLED	X	DISABLED	X
√	√	X	X	COM3	4	COM4	3
X	X	√	√	COM1	4	COM2	3
√	X	X	√	COM2	3	COM3	4
X	√	√	X	COM1	4	COM4	3
√	√	√	X	COM4	3	DISABLED	X
√	√	X	√	COM3	4	DISABLED	X
√	X	√	√	COM2	3	DISABLED	X
X	√	√	√	COM1	4	DISABLED	X
X	X	X	X	COM1	4	COM2	3
√	X	X	X	COM2	3	COM3	4
X	√	X	X	COM1	4	COM3	4
X	X	√	X	COM1	4	COM2	3
X	X	X	√	COM1	4	COM2	3

- **UART2 Mode:**

  The item allows you to specify the operation mode for serial port "COM 2", Settings are:

  Standard RS-232C Serial Port
  HPSIR IrDA- compliant Serial Infrared Port.
  ASKIR Amplitude Shift Keyed Infrared Port.

- **IR Function Duplex:**

  This filed specifies a duplex value for the IR device connected to COM2. Full-Duplex Mode permits simultaneous two-direction transmission. Half-Duplex mode permits Transmission in one direction only at a time. Settings are Half and Full. The default is Half.

- **TX,RX inverting enable:**

  This item allows you to enable the TX, RX inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system. Settings are "No, Yes" (default), "Yes, No", "Yes, Yes" and "No, No".

- **Onboard Parallel port:**

  This specifies the base I/O port address and IRQ of the onboard Parallel Port. Settings are 378/IRQ7, 278/IRQ5, 3BC/IRQ7 and Disabled. Default Is 378/IRQ7. If you have an ISA add-on card, the suggested configuration Is as below:

If the ISA add-on card has			Onboard parallel port to be set as	
LPT1 278H	LPT2 278H	LPT3 3BCH	PORT ASSIGNED	IRQ ASSIGNED
√	√	√	DISABLED	X
√	√	X	LPT3	5
√	X	√	LPT2	5
X	√	√	LPT1	7
√	X	X	LPT2	5
X	√	X	LPT1	7
X	X	√	LPT1	7
X	X	X	LPT1	7

Note: ***If the onboard parallel port interrupt and ISA add-on card interrupt are in conflict, the parallel port will not work properly. Please Disable one of the devices.***

- **Onboard Parallel Mode:**

  Select an operating mode for the parallel port. Mode options are SPP, EPP1.7, EPP1.9, ECP and ECP/EPP1.7, ECP/EPP1.9 .

- **ECP Mode Use DMA:**
  This item specifies an DMA channel 1 or 3 for the Parallel Port when it is set to ECP or ECP+EPP mode..

- **Parallel Port EPP Type:**
  This item selects the EPP version used by the parallel port if the port is Set to EPP or ECP+EPP mode. Settings are EPP1.7 and EPP1.9..

- **Onboard Legacy Audio:**
  This item enables or disables the onboard audio features of the mainboard and the following audio options in the BIOS.

- **Sound Blaster:**
  This item turns on/off the sound blaster feature of the board. If you want to play Sound Blaster compatible games, you need to set the field to Enabled..

- **SB I/O Base Address**
  This item specifies the I/O Base Address for the Sound Blaster. Settings .are 220H, 240H, 260H and 280H.

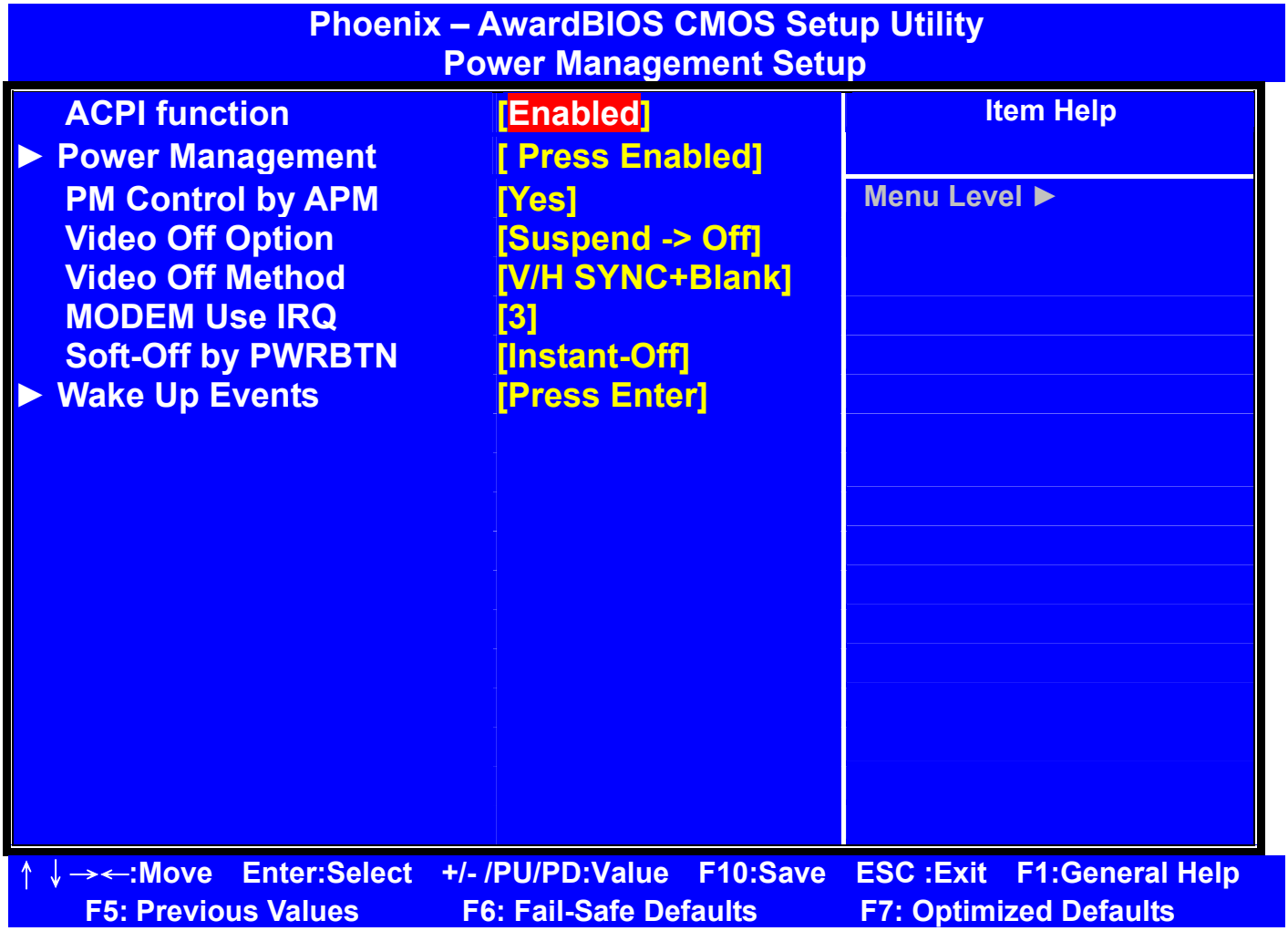
- **SB IRQ Select:**
  This item specifies the IRQ for the Sound Blaster. Settings are IRQ5, IRQ7, IRQ9 and IRQ10.

- **SB DMA Select**
  This item specifies the DMA channel for the Sound Blaster. Settings are DMA 1, DMA 2, DMA 3, and DMA 0. .

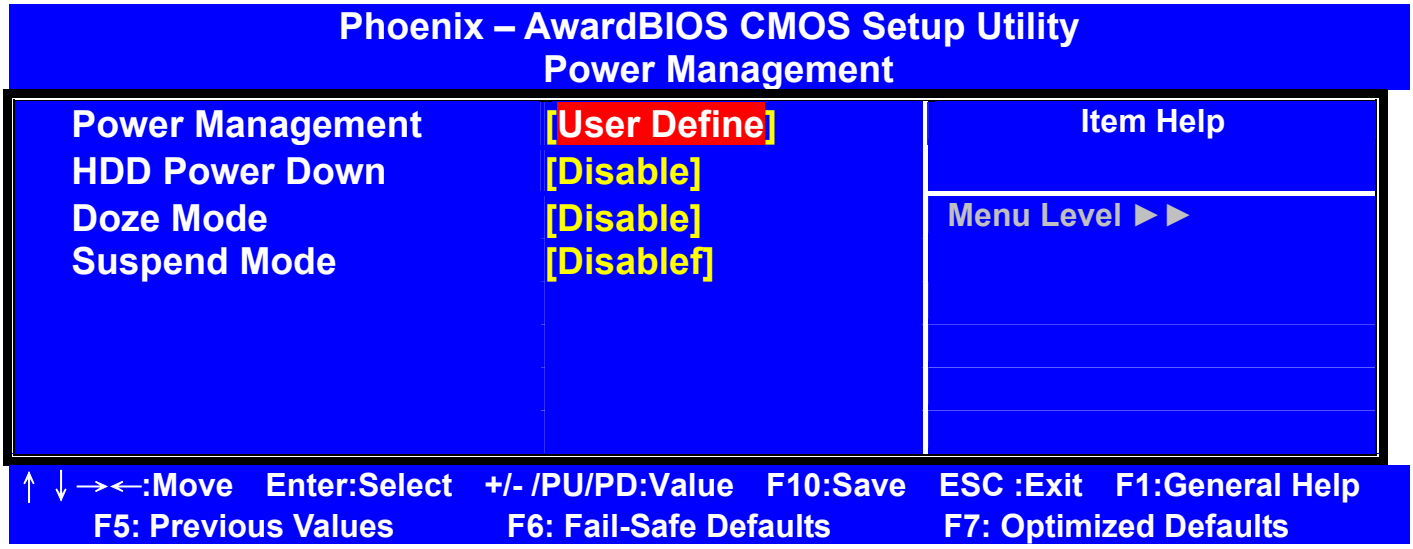
- **MPU-401**
  The field enables or disables the MPU-401 interface (the Yamaha Sound Blaster mode).

- **MPU-401 I/O Address:**
  This item selects the base I/O port address for the MPU-401 interface. Settings are 330-333H, 300-303 and 310-313..

8-8 POWER MANAGEMENT SETUP



- **ACPI Function**
  This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, Such as Windows 98 SE/2000/ME, select Enabled. Settings are Enabled and Disabled. Default is Enabled.



- **Power Management**

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

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

Disabled	The system operates in Normal conditions (Non-GREEN), and the Power Management function is disabled.
Max. saving	Maximum Power Management. Doze Mode = 10 sec, Suspend Mode = 10 sec, and HDD Power Down= Disabled.
Min. saving	Minimum Power Management. Doze Mode = 1 hour, Suspend Mode = 1 hour, and HDD Power Down= Disabled.
User define	Allow end users to configure each mode separately. Each of the ranges are from 1 min. to 1 hour except for HDD Power Down which ranges from 1 min to 15 min..

- **HDD Power Down**

  If HDD activity is not detected for the length of time specified in this field, The hard disk drive will be powered down while all other devices remain active. Settings are Disable and 1 through 15 Min.

- **Doze Mode**

  If System activity is not detected for the length of time specified in this Field, the CPU clock will run at slower speed while other devices still run at full speed. Settings are Disable, 1Min, 2 Min, 4 Min, 6 Min, 8Min, 10 Min, 20 Min, 30 Min, 40 Min and 1 Hour. .

- **Suspend Mode**

  If system activity is not detected for the length of time specified in this Field, all devices except CPU will be shut off. Settings are Disable, . 1Min, 2 Min, 4 Min, 6 Min, 8Min, 10 Min, 20 Min, 30 Min, 40 Min and 1 Hour.

- **PM Control by APM**

  Setting to *Yes* will activate an Advanced Power Management (APM) Device to enhance Max Saving mode and stop CPU internal clock. Settings are *Yes* and *No*. Default is *Yes*.

- **Video Off Option**

  The settings are Always On, Suspend and All Modes, This option is for choosing the setting in which the monitor will turn off.

Always On	**Always turn on.**
Suspend → Off	**During Suspend mode, the monitor will be turn off.**
All Mode → Off	**The monitor is turned off during Doze, Standby or Suspend 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 Support	**Initial display power management signaling**

- **MODEM Use IRQ**

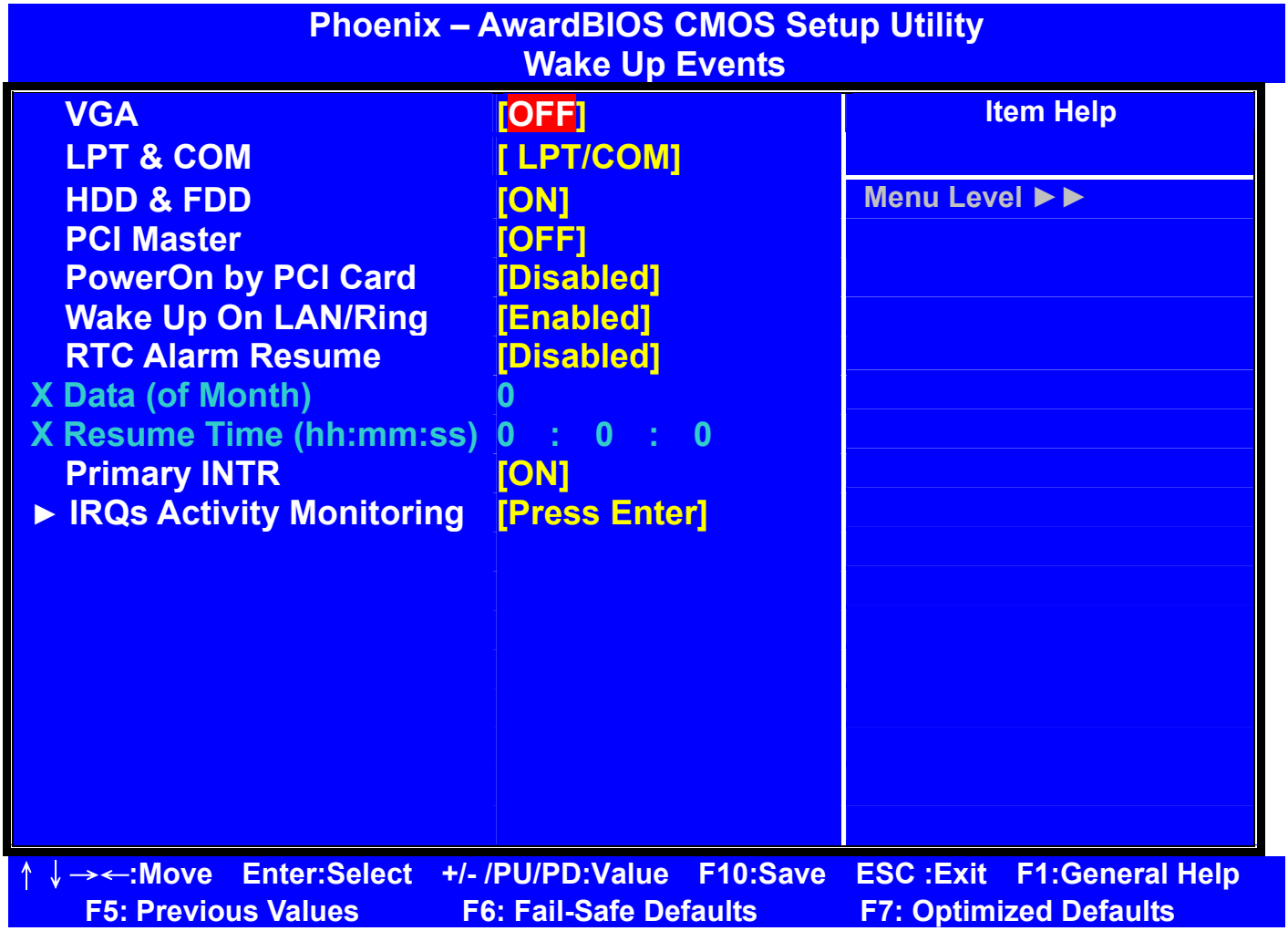
  Name the interrupt request (IRQ) line assigned to the modem(if any) on Your system. Activity of the selected IRQ always awakens the system. Settings are 3,4,5,7,9,10,11 and NA.

- **Soft-Off by PWRBTN**

  This feature allows users to configure the power button as a normal Power on/off button or a soft-off button. Setting are:

Instant-Off	**The power button functions as a normal power –on/ -off button.**
Delay 4 Sec.	**Pressing the power button for more than 4 seconds Will place the system in a very low-power-usage State (Soft-Off state), with only enough circuitry receiving power to detect power button activity or Wake Up On LAN/Ring activity.**

Default is *Instant-Off.*



- **VGA, LPT & COM, HDD & FDD, PCI Master, Wake Up On LAN, PowerOn by PCI Card, Modem Ring Resume**

  These items specify whether the system will be awakened from power Saving modes when activity or input signal of the specified hardware peripheral or component is detected.

  Note: ***To use the function of Wake Up On LAN and Modem Ring Resume, you need to install a LAN card/modem supporting Power on function.***

- **RTC Alarm Resume**

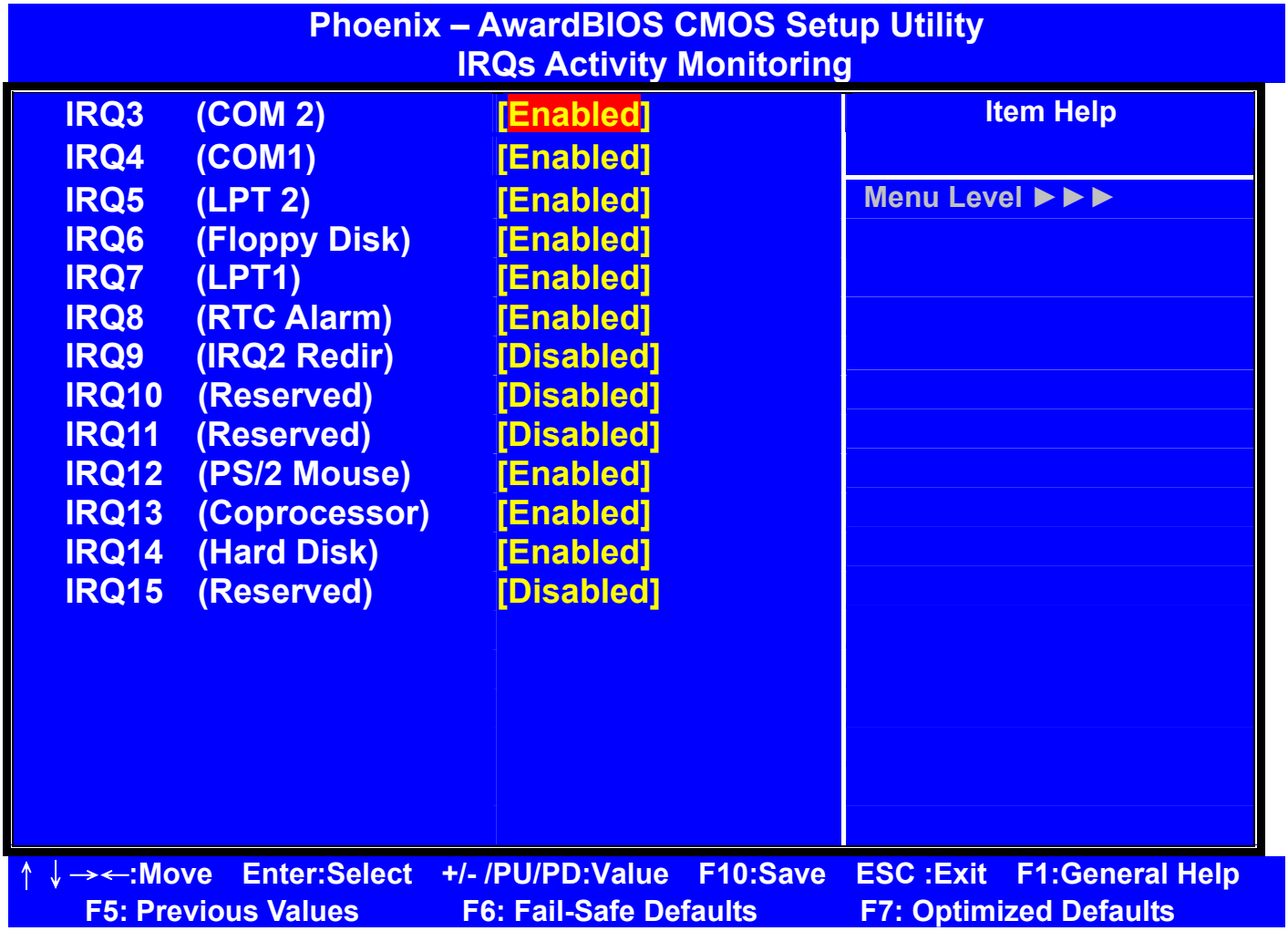
  This is to enable or disable the feature of booting up the system on a Scheduled time/date. Settings are *Enabled* and *Disabled*(default)

- **Data(of Month)**

  Specifies the data for RTC Alarm Resume. Settings are 0~31...

- **Resume Time(hh:mm:ss)**

  Specifies the time for RTC Alarm Resume. Format is <hour><minute><second>f.

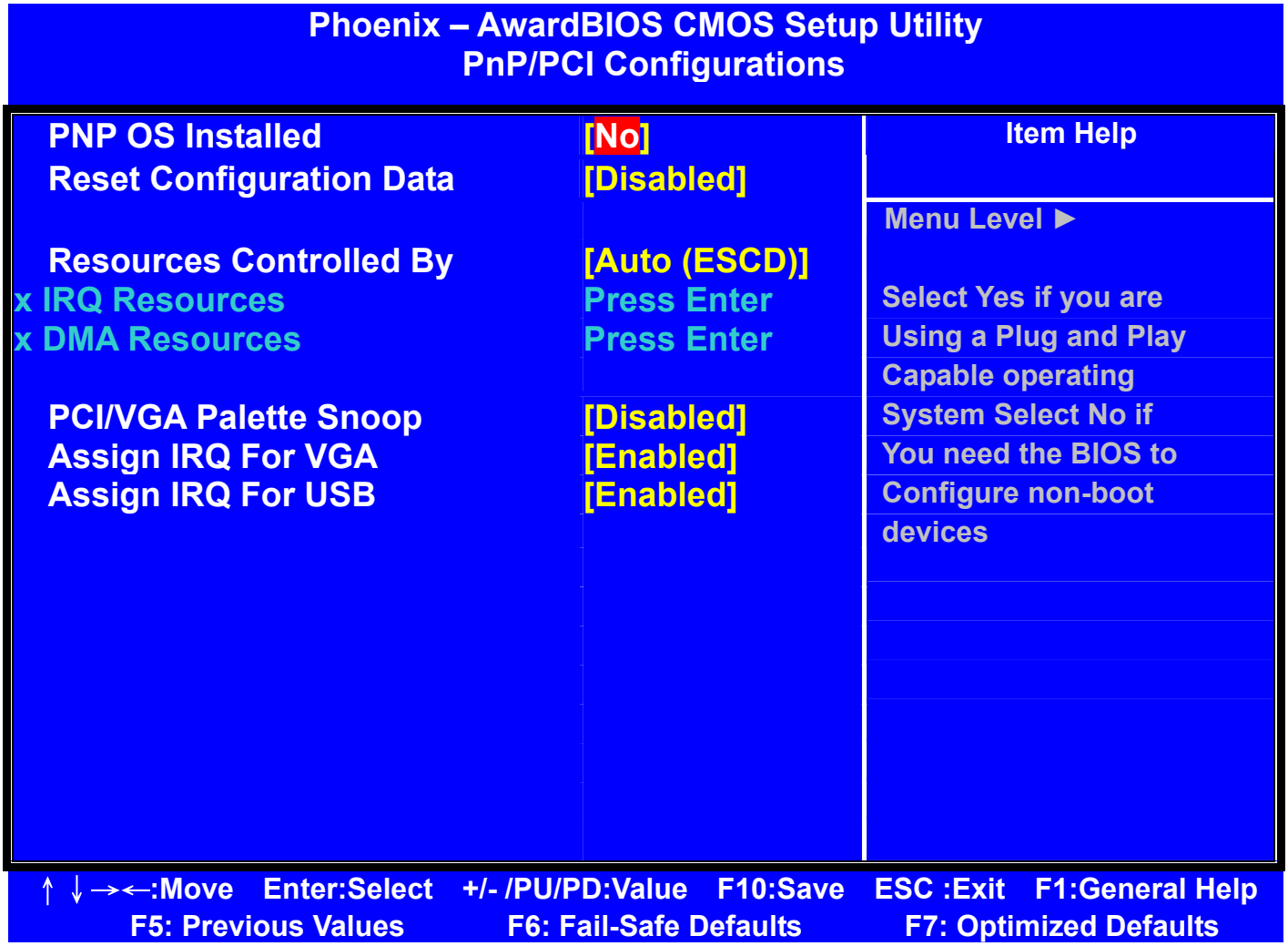


- **IRQ [3-15]**
  Enables or disables the monitoring of the specified IRQ line. If set to Enabled, the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes.

Note: *IRQ (Interrupt Request) line are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the I/O device.*

8-9 PNP/PCI CONFIGURATION SETUP

This section describes about configuring the PCI bus system. PCI (Personal Computer Interconnect) is a bus standard which allows I/O devices to operate at the speed near to the speed which is the CPU itself uses when communicating with its own special components. This section covers some very technical item and it is strongly recommended that only experienced users should make any changes to the default settings.



- **PNP OS Installed**
  When set to YES, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows 95 or 98. When set NO, BIOS will initialize all the PnP cards. So, select Yes if the operating system is Plug & Play aware.

- **Reset Configuration Data**
  The ESCD (Extended System Configuration Data) is a method that the BIOS uses to store resource information for both PNP and non PNP Devices in a bit string format. When Enabled, the system will rebuild ESCD and you will see the message "ESCD Update Successfully" on Boot up.

- **Resources Controlled By**
  If select Auto (ESCD), BIOS will automatically configure all the boot and PnP. (Plug & Play) compatible devices and assigns system resources like IRQ to these devices. However, this feature means absolutely nothing unless you are using a Plug and Play operating system such as Windows 95/98. If you want to configure by yourself, select Manual. Default is Auto(ESCD).

- **IRQ/DMA Resources**
  The items are adjustable only when Resources Controlled By is set to Manual. Press<Enter> and you will enter the sub-menu of the items. IRQ Resources & DMA Resources list IRQ 3/4/5/7/9/10/11/12/14/15 and DMA 0/1/3/5/6/7 for users to set each IRQ/DMA a type depending on the type of device using the IRQ/DMA. Settings are:

PCI/ISA PnP	**For Plug & Play compatible devices designed for PCI or ISA bus architecture.**
Legacy ISA	**For devices compliant with the PC AT bus specification, Requiring a specific interrupt.**

- **PCI/VGA Palette Snoop**
  When set to Enabled, multiple VGA devices operating on different buses Can handle data from the CPU on each set of palette registers on every Video device. Bit 5 of the command register in the PCI device configuration Space is the VGA palette Snoop bit(0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

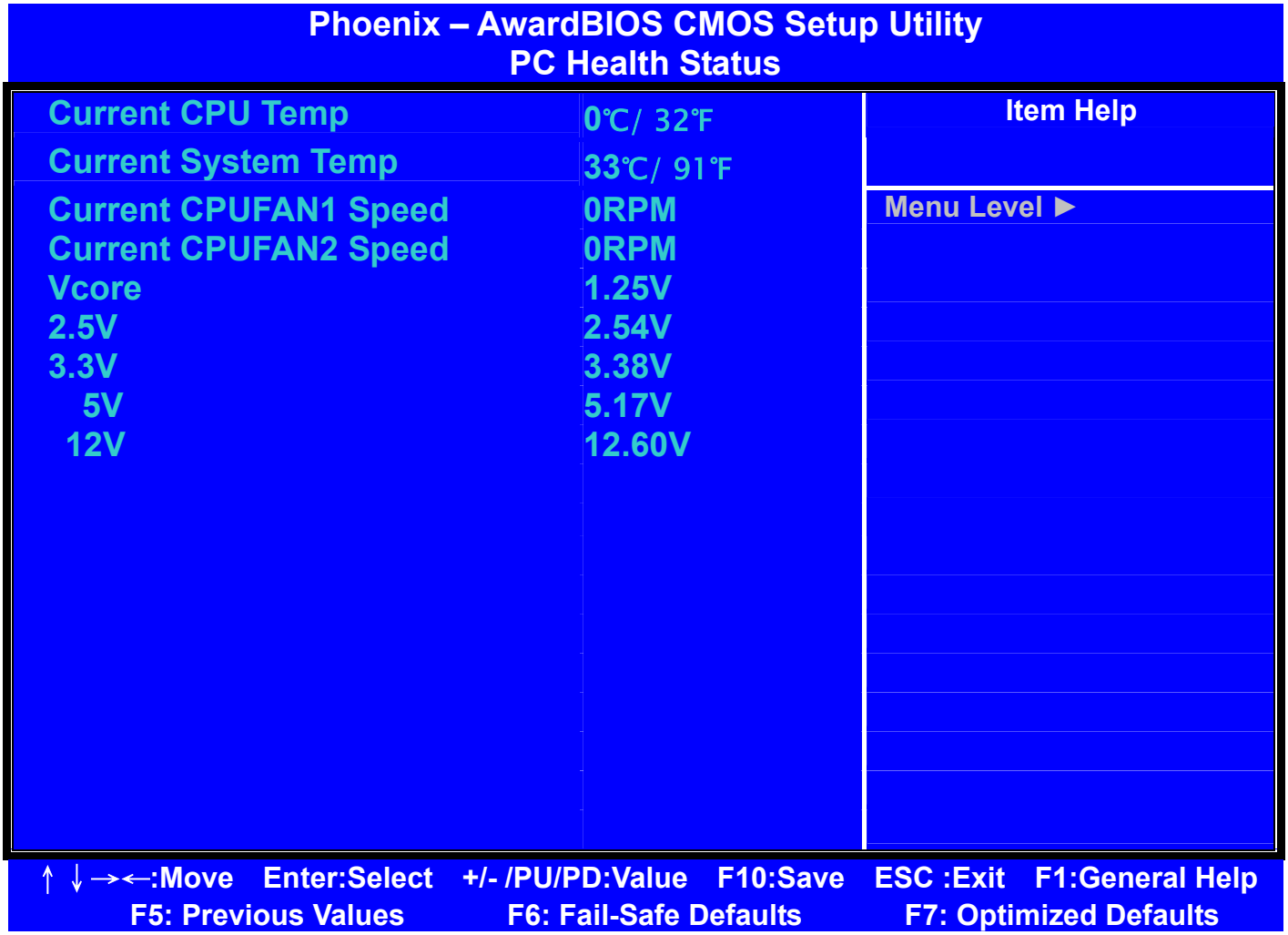
VGA Palette Snoop Bit Setting	Action
Disabled	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette Registers of both VGA devices to be indentical.

The setting must be set to *Enabled* if any ISA adapter card installed in the System requires VGA palette snooping. The Setup and BIOS default values are *Disabled*.

- **Assign IRQ For VGA/USB**

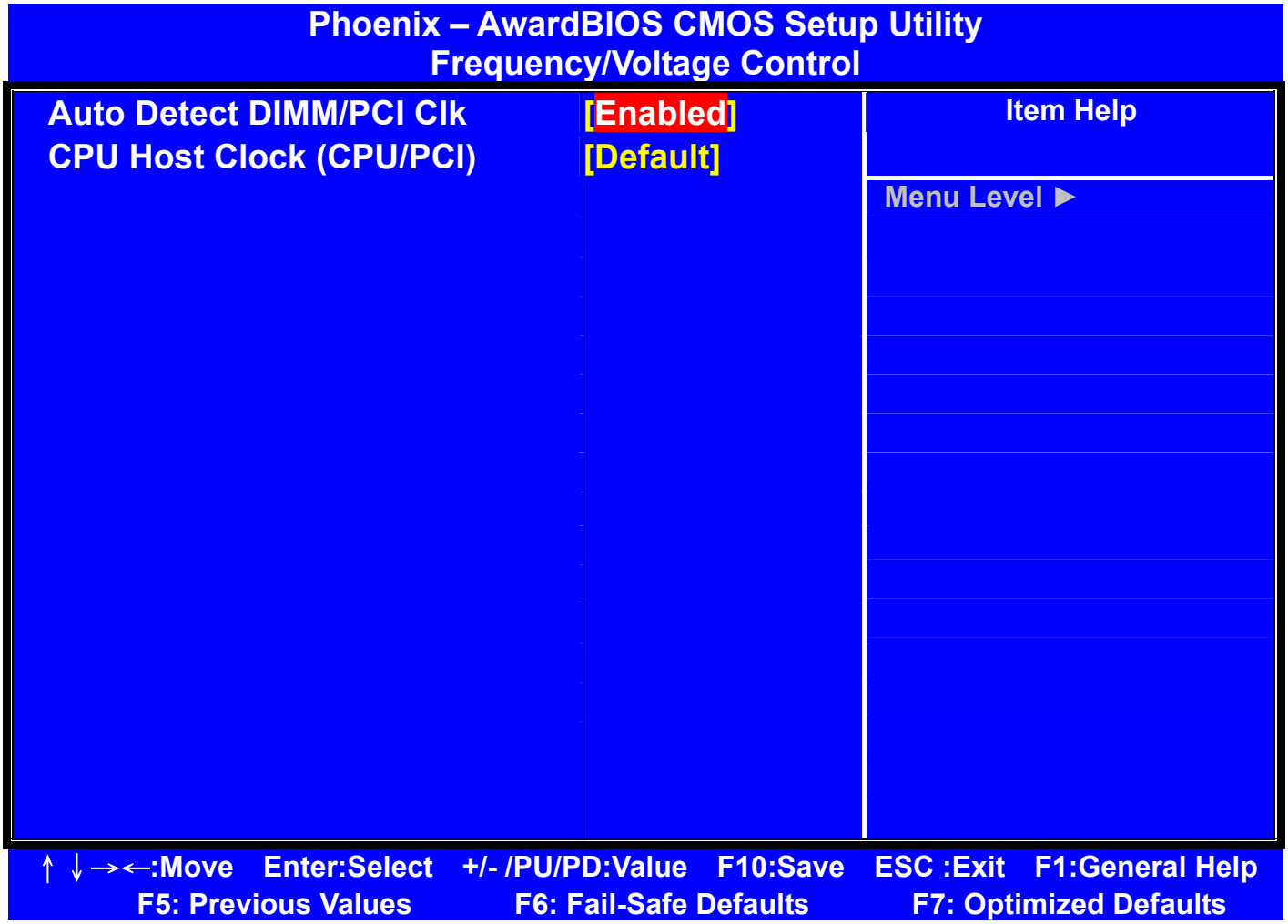
  Set to *Enabled* allows BIOS to assign an IRQ to VGA card/USB device. Choose *Disabled* if you want to release the IRQ. Default is *Enabled*.

8-10 PC HEALTH STATUS



- **Current CPU Temp; Current System Temp; Current CPUFAN1,2 Speed; Vcore, 2.5V/3.3V/5V/12V**
  This item display the current status of all of the monitored hardware devices/components such as CPU voltage, temperatures and all fans's speed.

8-11 FREQUENCY/VOLTAGE CONTROL



Warning: ***Over-clocking is not guaranteed. Users must have Substantial knowledge of proper CPU relative to Adjusting CPU speeds. Over-clocking should be done Only by experienced engineers who conduct tests.***

- **Auto Detect DIMM/PCI Clk**

Use this item to enable or disable the feature of auto detecting the clock Frequency of the installed DRAM DIMM and PCI cards, Settings are Enabled (default) and Disabled.

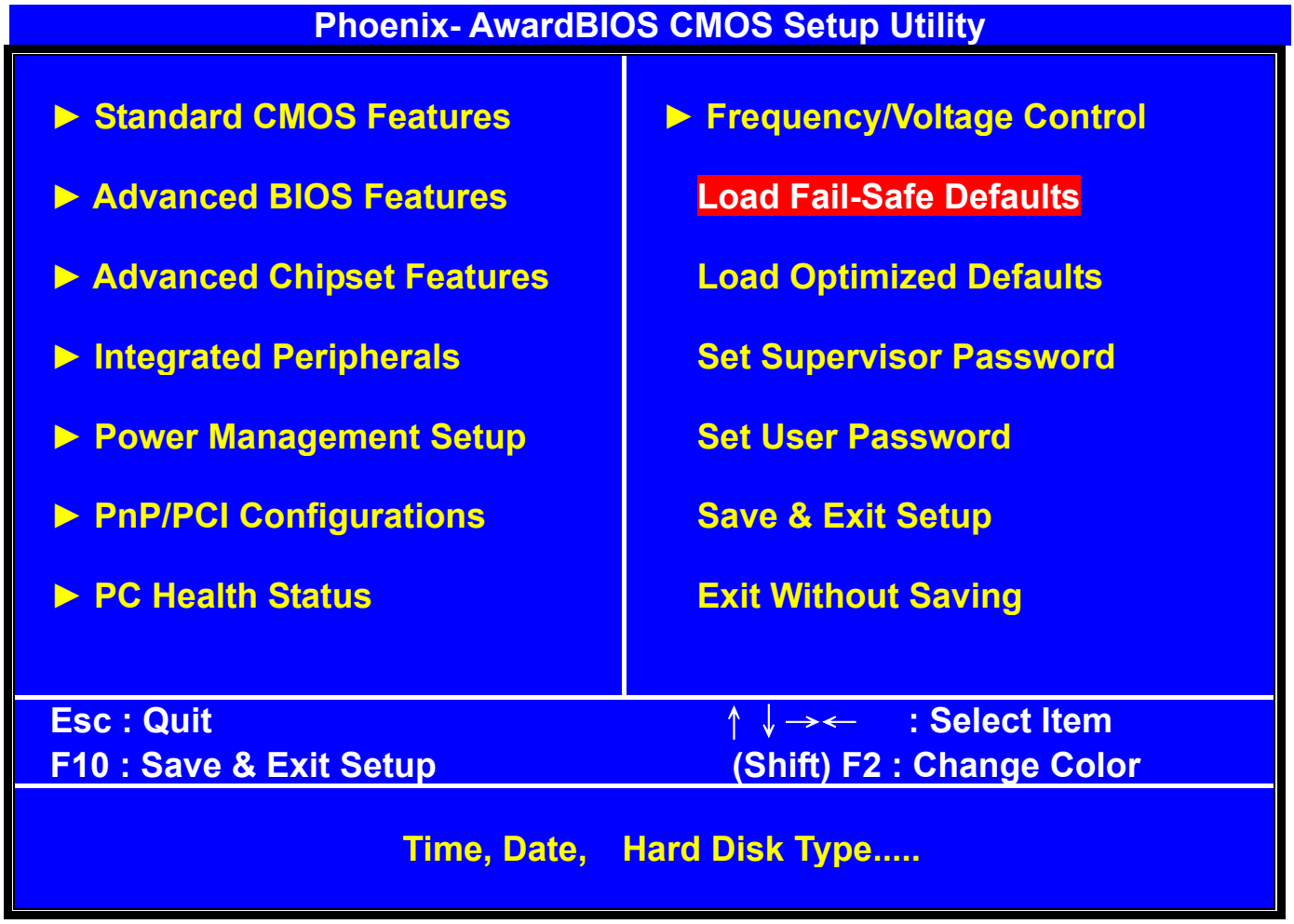
- **CPU Host Clock (CPU/PCI)**

This item specifies the clock frequency of CPU host bus (FSB) and PCI bus And provides a method for end users to overclock the processor accordingly. If the item shows Default, the clock frequency will use the default value for Both the CPU host bus and PCI bus.

8-12 LOAD FAIL-SAFE/OPTIMIZED DEFAULTDS

The two options on the main menu allow users to restore all of the BIOS Settings to the default Fail-Safe or Optimized values. The Optimized Defaults Are the defaults values set by the IPC manufacture specifically for the optimal Performance of the IPC. The Fail-Safe Defaults are the default values set by the BIOS vendor for the stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:



Pressing Y loads the BIOS default values for the most stable, minimal system. Performance.

8-13 SUPERVISOR/USER PASSWORD SETTING

You can set either supervisor or user password, or both of them. The difference between them are: 'supervisor password' can enter and change the options of the setup menus and 'user password' just can 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. 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.

APPENDIX

A

TECHNICAL SUMMARY

THIS SECTION SHOWS YOU THE MAPES CONCISELY.

SECTIONS INCLUDE:

* **INTERRUPT MAP**

* **TIMER & DMA CHANNELS MAP**

* **RTC & CMOS RAM MAP**

* **I/O & MEMORY MAP**

A-1 INTERRUPT MAP

IRQ	ASSIGNMENT
0	System TIMER interrupt from TIMER-0
1	Keyboard output buffer full
2	Cascade for IRQ 8-15
3	Serial port 2
4	Serial port 1
5	Parallel port 2
6	Floppy Disk adapter
7	Parallel port 1
8	RTC clock
9	Available
10	Available
11	Available
12	Available
13	Math coprocessor
14	Hard Disk adapter
15	Available

A-2 TIMER & DMA CHANNELS MAP

- Timer Channel Map

Timer Channel	Assignment
0	System timer interrupt
1	DRAM Refresh request
2	Speaker tone generator

- DMA Channel Map

DMA Channel	Assignment
0	Available
1	IBM SDLC
2	Floppy Disk adapter
3	Channel-3 Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

A-3 RTC & CMOS RAM MAP

CODE	ASSIGNMENT
00	Seconds
01	Second alarm
02	Minutes
03	Minutes alarm
04	Hours
05	Hours alarm
06	Day of week
07	Day of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
10	Floppy Disk drive type byte
11	Reserve
12	Hard Disk type byte
13	Reserve
14	Equipment byte
15	Base memory low byte
16	Base memory high byte
17	Extension memory low byte
18	Extension memory high byte
30	Reserved for extension memory low byte
31	Reserved for extension memory high byte
32	Date Century byte
33	Information Flag
34-3F	Reserve
40-7F	Reserved for Chipset Setting Data

A-4 I/O & MEMORY MAP

- **Memory Map**

MEMORY MAP	ASSIGNMENT
0000000-009FFFF	System memory used by DOS and application
00A0000-00BFFFF	Display buffer memory for VGA/EGA/CGA/MONO Adapter
00C0000-00DFFFF	Reserved for I/O device BIOS ROM or RAM buffer.
00E0000-00EFFFF	Reserved for PCI device ROM
00F0000-00FFFFF	System BIOS ROM
0100000-BFFFFF	System extension memory

- **I/O Map**

I/O MAP	ASSIGNMENT
000-01F	DMA controller (Master)
020-021	Interrupt controller (Master)
022-023	Chipset controller registers I/O ports.
040-05F	Timer control registers.
060-06F	Keyboard interface controller (8042)
070-07F	RTC ports & CMOS I/O ports
080-09F	DMA register
0A0-0BF	Interrupt controller (Slave)
0C0-0DF	DMA controller (Slave)
0F0-0FF	Math coprocessor
1F0-1F8	Hard Disk controller
278-27F	Parallel port-2
2B0-2DF	Graphics adapter controller
2F8-2FF	Serial port-2
360-36F	Net work ports
378-37F	Parallel port-1
3B0-3BF	Monochrome & Printer adapter
3C0-3CF	EGA adapter
3D0-3DF	CGA adapter
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port-1

APPENDIX

B

TROUBLE SHOOTING

THIS SECTION SHOWS THE ERRORS MAY OCCUR WHEN YOU OPERATE THE SYSTEM, ALSO GIVES YOU THE SUGGESTIONS ON SOLVING THE PROBLEMS.

SECTIONS INCLUDE:

*** TROUBLE SHOOTING POST MESSAGE**

*** TROUBLE SHOOTING POST BEEP**

*** TROUBLE SHOOTING POST CODE**

B-1 TROUBLE SHOOTING POST MESSAGES

During the Power On Self Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message. If a message is displayed, it will be accompanied by:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

B-2 TROUBLE SHOOTING POST BEEP

Currently there are two kind of beep codes in BIOS.
The one code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

- **Error Messages**
  One or more error messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

- **CMOS BATTERY HAS FAILED**
  CMOS battery is no longer functional. It should be replaced.

- **CMOS CHECKSUM ERROR**
  Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

- **DISKBOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER**
  No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure that the disk is formatted as a boot device. Then reboot the system.

- **DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP**
  Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

- **DISPLAY SWITCH IS SET INCORRECTLY**
  Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then turn off the selection.

- **DISPLAY TYPE HAS CHANGED SINCE LAST BOOT**
  Since last power off the system, the display adapter has been changed. You must configure the system for the new display type.

- **ERROR ENCOUNTERED INITIALIZING HARD DRIVE**
  Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

- **ERROR INITIALIZING HARD DISK CONTROLLER**
  Cannot initialize controller. Make sure the card is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check if any jumper needs to be set correctly on the hard drive.

- **FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT**
  Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

- **Invalid EISA Configuration**
  PLEASE RUN EISA CONFIGURATION UTILITY. The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

NOTE: *When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

- **KEYBOARD ERROR OR NO KEYBOARD PRESENT**
  Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot. If you are purposely configure the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

- **MEMORY ADDRESS ERROR AT ...**
  Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

- **MEMORY PARITY ERROR AT ...**
  Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

- **MEMORY SIZE HAS CHANGED SINCE LAST BOOT**
  Memory has been added or removed since the last boot. In EISA mode, use Configuration Utility to reconfigure the memory configuration. In ISA mode, enter Setup and enter the new memory size in the memory fields.

- **MEMORY VERIFY ERROR AT ...**
  Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

- **OFFENDING ADDRESS NOT FOUND**
  This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem which cannot be isolated.

- **OFFENDING SEGMENT:**
  This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem which has been isolated.

- **PRESS A KEY TO REBOOT**
  This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

- **PRESS F1 TO DISABLE NMI, F2 TO REBOOT**
  When BIOS detects a Non- maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

- **RAM PARITY ERROR - CHECKING FOR SEGMENT ...**
  Indicates a parity error in Random Access Memory.

- **SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...**
  Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

B-3 TROUBLE SHOOTING FOR POST CODES

NOTE: EISA POST codes are typically output to port address 300h.
ISA POST codes are output to port address 80h.

POST (hex)	Name	Description
C0	Turn Off Chipset Cache	OEM Specific - Cache control
1	Processor Test 1	Processor Status (1 FLAG) Verification. Tests the following processor status flags Carry, zero, sign, overflow. The BIOS will set Each of these flags, verify they are set , then Turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SQWV. Disable Video, parity checking, DMA. Reset math Coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, And 2, including set EISA timer to a known State. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed in order To keep the memory from decaying. This Function assures that the memory refresh Function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface And Battery Status	Verifies CMOS is working correctly, detects Bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory
C5	Early Shadow	OEM Specific – Early Shadow enable for fast Boot.
C6	Cache presence test	External cache size detection
8	Setup low memory	Early chipset initialization Memory presence test OEM chipset routines Clear low 64K of memory Test first 64K memory.

9	Early Cache Initialization	Cyrix CPU initialization Cache initialization
A	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or Insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional) Set NUM_LOCK status.
D	InitializeVideo Interface	Detect CPU clock. Read CMOS location 14h to find out type of Video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message To screen. Setup shadow RAM - Enable shadow According to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and Initialization.
10	Test DMA Controller 1	
11	Test DMA Page Registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by Alternately turning off and on the interrupt Lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by Alternately turning off and on the interrupt Lines.
17	Test Stuck 8259's Interrupt Bits	Turn off interrupts then verify no interrupt Mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt Occurred.
19	Test Stuck NMI Bits (Parity I/O Check)	Verify NMI can be cleared.
1A		Display CPU clock.
1B-1E	Reserved	
1F	Set EISA Mode	If EISA non-volatile memory checksum is Correct, execute EISA initialization. If not, Execute ISA tests an clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).
20	Enable Slot 0	Initialize slot 0 (System Board).

21-2F	Enable Slots 1-15	Initialize slots 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256K to 640K and Extended memory above 1MB.
31	Test Base and Extended Memory	Test base memory from 256K to 640K and Extended memory above 1MB by using Various patterns. NOTE: *This will be skipped in EISA mode And can be "skipped" with ESC key in ISA Mode.*
32	Test EISA Extended Memory	If EISA Mode flag is set then test EISA Memory found in slots initialization. NOTE: *This will be skipped in ISA mode and Can be "skipped" with ESC key in EISA Mode.*
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, Install interrupt vectors.
3E	Setup Cache Controller	Initialize cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup Values
40		Display virus protect disable or enable
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and Any drives.
42	Initialize Hard Drive & Controller	Initialize hard drive controller and any Drives.
43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also Game port).
44	Reserved	
45	Detect & Initialize math Coprocessor	Initialize math coprocessor.
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is Set. Otherwise display any messages (i.e., Any non-fatal errors that were detected During POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and Clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable Cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from

		C8000h to EFFFFh. NOTE: When FSCAN option is enabled, will Initialize from C8000h to F7FFFh.
53	Initialize Time Value	Initialize time value in 40h: BIOS area.
60	Setup Virus Protect	Setup virus protect according to Setup.
61	Set Boot Speed	Set system speed for boot.
62	Setup NumLock	Setup NumLock status according to Setup.
63	Boot Attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display. Press F1 To disable NMI, F2 reboot.
E1-EF	Setup Pages	E1 - Page 1, E2 – Page 2, etc.
FF	Boot	