

TC-965

Embedded MiniPC



User's guide

Safety Instructions

- 1: Please read these safety instructions carefully.
- 2: Before inserting or removing expansion cards, re-assembling or re-configuring, disconnect the computer and peripherals from their power sources to prevent electric shock or system board damage.
- 3: Before attempting to move the product, the system must be powered-down and the power cord must be disconnected from the power source.
- 4: Before connecting or disconnecting any signal line, first turn off all power resources and disconnect the power cord from power source.
- 5: To help avoid possible damage to system boards, wait at least 30 seconds after turning off the computer before re-turning on the computer.
- 6: Use cross head screwdriver to operate. A magnetic screwdriver is recommended (magnet to collect screws). Do not leave any tools or components inside the chassis.
- 7: Assure abundant cooling and streamline ventilation.
- 8: If anything unexpected exists during Equipment used, please contact the professionals.

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Packing List

Thank you very much for choosing our products. Please check your package completely as the following item checklist first, if you find any components lost or damaged, please contact your retailer.

■ TC-965	1pcs
■User's Manual	1pcs
■Drive Disk	1pcs
■Antenna	1pcs
■Power cord	1pcs
■Power adapter	1set
■HDTV Stick (Optional)	1set
■Wall-Mount	1set
■Screw	13pcs

Chapter 1

General Information

Chapter General Information

1.1 Introduction

TC-965 is an Intel®Atom processor based platform ideal for a broad range of high-definition video media PC systems from consumer set-top-boxes to HD media digital signage players. It is based on NORCO's signature fanless enclosure-ICE FIN, with high efficient heatpipe design. A high performance Intel N270 Atom processor based 1080p HD platform. It has a built-in ultra low power HD AVC/VC-1/MPEG-2 hardware decoder, capable of full HD real-time decoding of H.264, VC-1 media contents at up to 40Mbps as well as playback of Blu-ray. Playing back of 1080p H.264 HD video with the TC-965 uses less than 30% of the 2.5W Atom N270 CPU, 1080p WMV HD content uses even less.

Using this compact and easy-to-use network device, the users can control, manage and program the transmission of the multi-media contents through Ethernet. In the applications that can't provide wired connection of ethernet, WLAN function can be used; while TV function is needed, we can also choose TV tuner and HDMI to provide the high definition video. With CF and hot-swappable SD card slot, this network digital signage platform will offer great facility to the network based digital advertisements.

1.2 Features

●Compact & Robust Form Factor

It is based on NORCO's signature fanless enclosure-ICE FIN, with high efficient heatpipe design. The small foot-print and low-profile case design of TC-965 series was designed to facilitate different types of mounting and installation.

●Onboard Intel Atom Processor

Onboard low-consume, high performance Intel®Atom N270 1.6G processor, Power consumption is only 2.5W. With a high-speed Intel 945GSE chipset embedded platform constitutes the best solution.

●Easy mounting with Plasma or LCD panel

Provide TV-OUT, S-VIDEO, HDMI and VGA Ports, Can connect a variety of different display devices.

●**Support High-Definition Multimedia Play**

Integrated High-Definition hardware decoder chip,support H.264/AVC、VC-1、MPEG-2 1080p hardware decoder, Can easily achieve high-definition 1080p video play.

●**Standard WIFI Wireless LAN, Optional TVTuner module**

Standard WIFI wireless LAN, TC-965 is capable to handle the network connection through WLAN (WIFI), with optional TVTuner module, provides high definition video/audio experience for advertiser.

1.3 Hardware Specification

Processor System

- CPU: Onboard Intel®Atom N270 1.6G processor, Power consumption is only 2.5W.Support FSB for 533MHz
- Chipshet: Intel®945GSE+ICH7M
- BIOS: 8M SPI BIOS supports Plug & Play, APM 1.2
- System memory: 1x 200Pin DDR II SO-DIMM socket, support ECC DDR SDRAM Up to 2GB, DDR II 400/533MHz DRAM

Display

- Chipset: Integrated graphics built-in Intel®GMA950
- Memory: Dynamic share 224MB system memory for graphic memory (BIOS Setup)
- Display Interface: VGA, HDMI, S-VIDEO,TV-OUT
- VGA:standard DB15 interface(Rear), Support for CRT resolutions up to SXGA+(2048x1536)
- HDMI: Sdvosignal transition HDMIsignal (converted by DVI output), Panel support up to SXGA (1920x1080)
- S-VIDEO: Composite S-Video output
- TV-OUT: Compatible HDTV,SDTV,EDTV,HDTV,HDTV support for 480p,576p,720p, 1080i and 1080p,Support NTSC,PAL,SECAM color mode,Support up to UXGA (1920x1080)

Ethernet

- Ethernet Controller: REALTEK 8111C Network chip
- Speed: 1000MBps
- Support Wake on Lan (WOL)

TC-963 Based on Intel Atom Processor Network Digital Signage Platform

- Standard WIFI Wireless LAN

Storage

- Supports a drive bay space for 2.5' HDD Tray
- Supports a Compact Flash socket for Type I/II Compact Flash disk
- Supports a three in one SD Card socket, support SD、MMC、MS card

AUDIO

- Chip: ALC888 Audio control chip
- Jack: Line out, Line in, MIC IN
- Feature: Support HD 7.1 CH

I/O

- I/O Chipset: Winbond W83627HG
- Serial Port: 1x DB9 Serial port (Face), Support RS232 mode
- USB: 1x Dual-USB ports (2x USB2.0 ports)
- KB/Mouse: support PS/2 Mouse and PS/2 Keyboard (Face)

Power Supply

- Single power +12V input

Watchdog

- 255 levels hardware reset function

Mechanical

- Construction: Metal housing (NORCO Proprietary: ICE FIN housing)
- Mounting: Easy Mounting Kits for LCD or Plasma
- Dimension: 245mm(W)x156mm(H)x66.5mm(D) (9.65" x 6.14" x 2.62")
- Weight: 3Kg±0.5Kg

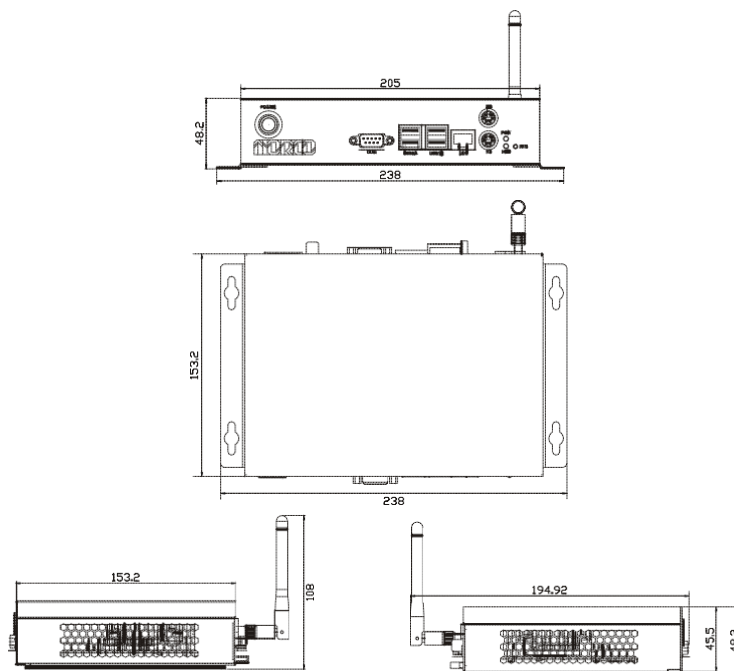
Environment Specifications

- Operating Temperature: 0°C~60°C
- Operating Humidity: 5%~90%, No Condensation

TC-963 Based on Intel Atom Processor Network Digital Signage Platform

1.4 Dimensions Diagram

Dimension: 245mm(W)x156mm(H)x66.5mm(D) (9.65" x 6.14" x 2.62")



Chapter 2

Hardware Functionality

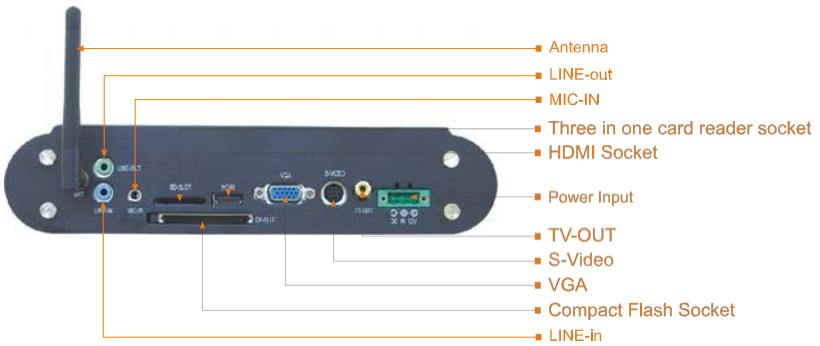
Chapter2 Hardware Functionality

2.1 External I/O Connectors

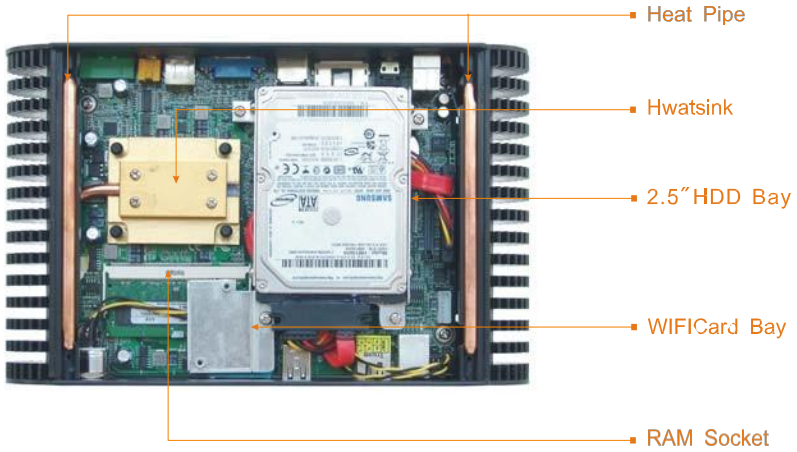
1: TC-965 Front Panel Diagram



2: TC-965 Rear Diagram



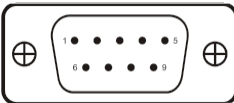
2.2 Internal Structure



2.3 Front Panel I/O Connectors

2.3.1 Serial Port (COM)

The TC-965 provides a D-sub 9-pin connector, which offers one RS-232 serial communication interface port for COM.



Pin	Definition
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

2.3.2 USB Port (USB)

The TC-965 provides 2 connectors for USB interface, which gives complete Plug & Play

and hot swapping for up to 127 external devices. The USB interface complies with USB UHCI, Rev. 2.0 compliant. The USB interface can be disabled in the system BIOS setup. The USB connector is used for connecting any device that conforms to the USB interface. Many recent digital devices conform to this standard. The USB interface supports Plug and Play, which enables you to connect or disconnect a device whenever you want, without turning off the computer.



USB

Pin	Definition
1	VCC
2	USB_P+
3	USB_P-
4	GND

2.3.3 Ethernet connector (LAN)

The TC-965 is equipped with an REALTEK 8111C (WOL supported) Fast Ethernet controller that is fully compliant with IEEE 802.3u 10/100Base-T CSMA/CD standards. The Ethernet port provides a standard RJ-45 jack connector with LED indicators on the front side to show its Active/Link status (Green LED) and Speed status (Orange LED).



RJ45 PORT LED state description:

LILED(Green)	Network link status	ACTLED(Orange)	Message transfer status
on	effective	on	transferring
off	noneffective	off	No message transferring

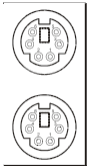
LAN define:

Signal Name	Pin	Signal Name
-------------	-----	-------------

TX+	1	2	TX-
RX+	3	4	NC
NC	5	6	RX-
NC	7	8	NC

2.3.4 PS2 Keyboard/Mouse Connector (MS/KB)

The TC-965 provides a PS/2 keyboard and PS/2 mouse connector. Green is the mouse connector, purple is the keyboard connector.



Mouse Connector

Keyboard Connector

MS:

Definition	Pin
+5V	7
GND	8
NC	9
MS_DATA	10
MS_CLK	11
GND	12

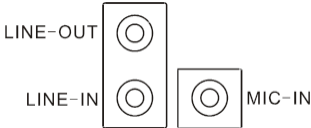
KB:

Definition	Pin
+5V	1
GND	2
NC	3
KB_DATA	4
KB_CLK	5
GND	6

2.4 Rear Panel I/O Connectors

2.4.1 Audio Jack (LINE-OUT, LINE-IN, MIC-IN)

TC-965 using ALC888 audio decoder chip, support 7.1-channel, in the back panel provides an audio input, audio output and MIC jack.



2.4.2 Three In One card reader Socket (SD-SLOT)

TC-965 to provide a three-in-one card reader SD slot can support standard SD, MMC, MS card.



Definition	Pin		Definition
CD#	1	2	WP1
SD#8	3	4	SD#7
WP2	5	6	SD#6
MS#1	7	8	MS#2
SD#5	9	10	MS#3
MS#4	11	12	SD#4
MS#5	13	14	SD#3
MS#6	15	16	MS#7
SD#2	17	18	MS#8
MS#9	19	20	SD#1
MS#10	21	22	SD#9

2.4.3 CF Card Slot (CF-SLOT)

Provide one standard Compact Flash Socket, support TYPE I and TYPE II CF card.

2.4.4 High-Definition Multimedia Interface (HDMI)

TC-965 provides 1 HDMI interface which can provide 5Gbps data transmission speed. It can transmit high definition video signal and audio signal without compress. What's more, this interface don't need to transform data between digit/analog; this feature has assured the quality of the video/audio signal. HDMI is capable to transfer the data upto 15meters, and support one

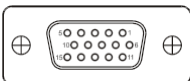
1080p video and one 8-channel audio



Definition	Pin		Definition
D2+	1	2	D2 Shield
D2-	3	4	D1+
D1 Shield	5	6	D1-
D0+	7	8	D0 Shield
D0-	9	10	CK+
CK Shield	11	12	CK-
CE Remote	13	14	NC
DDC CLK	15	16	DDC DATA
GND	17	18	+5V
HP DET	19	20	SHELL0
SHELL1	21	22	SHELL2
SHELL3	23	24	SHELL4
SHELL5	25	26	SHELL6
SHELL7	27	28	SHELL8
SHELL9	29	30	SHELL10
SHELL11	31		

2.4.5 VGA Connector (VGA)

The TC-965 provides a high resolution VGA interface by a D-sub 15-pin connector to support a VGA CRT monitor.

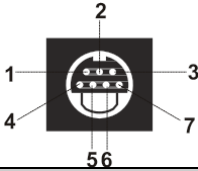


Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	Red	6	GND	11	NC
2	Green	7	GND	12	SDA
3	Blue	8	GND	13	HSYNC
4	NC	9	+5V	14	VSYNC
5	GND	10	GND	15	SLC

2.4.6 S-VIDEO Connector (S-VIDEO)

TC-965 provides 1 S-Video interface for connecting to LCD TV, to make video playing

can be displayed on LCD TV screen.



Signal Name	Pin
s_video_pr	1
GND	2
s_video_pr	3
GND	4
GND	5
s_video_cvbs	6
GND	7

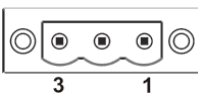
2.4.7 TV-OUT Connector (TV-OUT)

TC-965 provides 1 TV-OUT interface, supportive for video output. Video playing can be displayed on TV screen on the condition that, user need to connect video interface to TV through video output wire alone, without other devices.



2.4.8 Power input connector (POWER)

The TC-965 comes with a connector that carries +12 VDC external power input.

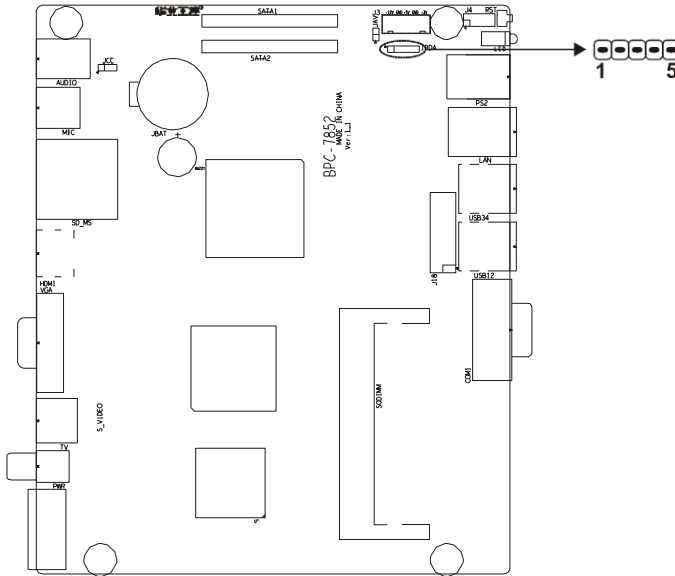


Signal Name	Pin
+12V	1
GND	2
GND	3

2.5 Inside connectors

2.5.1 IRDA interface (IRDA)

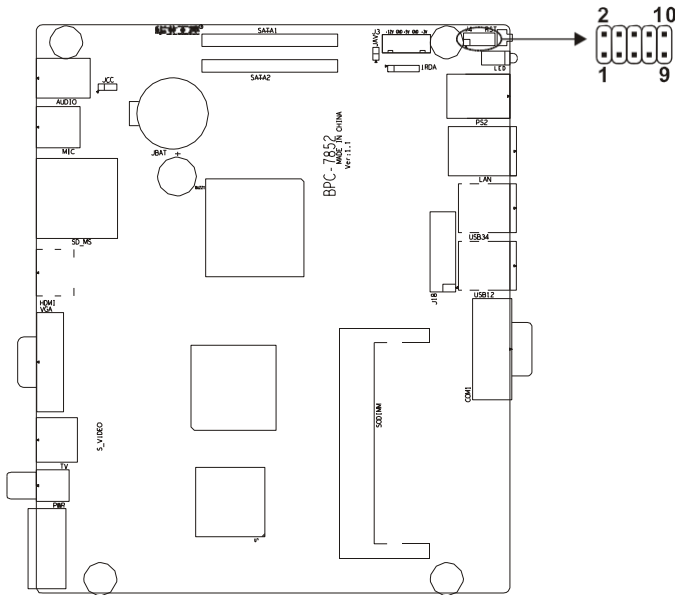
This board provides a group of IrDA pins, supports IrDA version 1.0 SIR or SHARP ASK-IR protocol infrared ray data transmission function.



Pin	Definition
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX

2.5.3 Front Panel connector (J4)

J4 use to connect function button or LED on front panel.



Definition	Pin		Definition
GRELED+	1	2	GRELED-
HDDLED+	3	4	HDDLED-
NC	5	6	GND
RESET-	7	8	GND
PWESW	9	10	5VSB

1) System Power LED Pins (J4 pin1,pin2 for PWLED)

Connecting system power LED cable and these pins, (pin 1 is LED anode),when system power switch on, power LED on: When system power switches off, power LED off.

2) IDE LED Pins (J4 pin3,pin4 for HDD LED)

As a rule, there is a HDD LED on the panel of chassis, while HDD is reading or writing, LED will flash, shows that HDD is running. Connect HDDLED on chassis panel and these pins (pin3 is LED anode).

3) Power switch button LED Pins (J4 pin5,pin6 for Power switch button LED)

Connecting power switch button LED cable and these pins, After the press the power switch, power switch button will be issued by a blue light.

4) Reset Button Pins(J4 pin7,pin8 for RESET)

Connect this pins and RESET switch on panel of chassis with cable. When system can not work on, reset can make system restart, without turning on/off the power, thereby it can prolong system serviceable life.

5) Power On/Off Control Pins (J4 pin9,pin10 for PWRSW)

Connect these two pins with bounce switch on panel of chassis, can switch-on or switch-off power.

Chapter 3

Hardware Installation

Chapter3 Hardware Installation

Prior to installation of computer accessories:

To keep your computer from any potential damage and ensure your personal safety, please follow the principle of security as below:

- 1) Make sure the computer doesn't connect to the power supply.
- 2) Wear anti-static gloves / bracelet would be preferable when touch intergrated circuit components (such as RAM.)

3 .1 Setting Jumpers

Note:

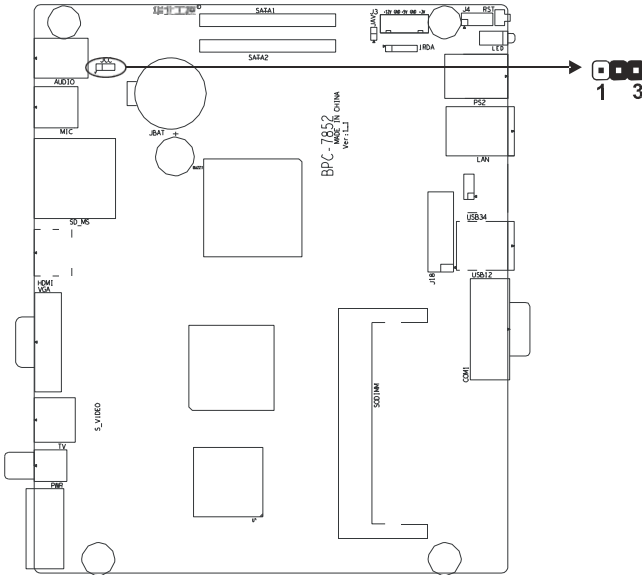
Jumpers are located on the motherboard, they represent clear CMOS jumper JCC etc. pin1 for all jumpers are located on the side with a thick white arrow refer to the motherboard's silkscreen , jumpers with three pins will be shown as 1-2 to represent pin1&pin2 connected and 2-3 to represent pin2&pin3 connected.

3.1.1 Clear CMOS (JCC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS; you can clear the CMOS memory of date, time and system setup parameters by erasing the CMOS RTC RAM data.the onboard button cell battery powers the RAM data in CMOS, which include setup information such as system passwords.


To erase the RTC RAM:

- (1)Turn OFF the computer and unplug the power cord.
- (2)Move the jumper cap from pins 1-2(default) to pins 2-3.Keep the cap on pins 2-3 for about 5~10 seconds,then move the cap back to pins 1-2.
- (3)Plug the power cord and turn ON the computer, Hold down the key during the boot process and enter BIOS setup to re-enter data.
- (4)Save CMOS value changes to CMOS and exit setup.



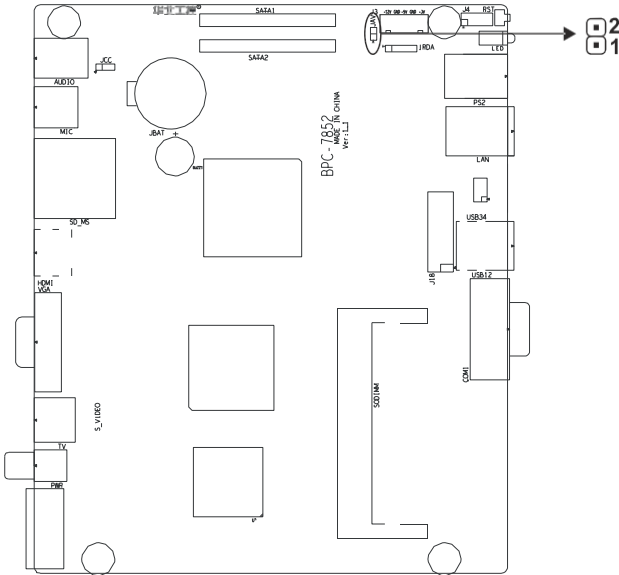
Setting JCC:

Setting	JCC
1-2	Clear CMOS(BIOS renew to initialization)
2-3	Nomal status(default)

 Do not clear CMOS when power switch on, or it harm to the motherboard.

3.1.2 BIOS-protect Jumper (JAV)

The BIOS of the motherboard is contained in the Flash ROM. If the jumper JAV is set as closed, you will be unable to flash the BIOS. However in this status, the system BIOS is protected from being attacked by serious virus such as CIH virus.



Setting JAV :

Setting	JAV
Open	Enable to flash BIOS
Closed	Disable to flash BIOS(default)

3.2 Installing the DDR SDRAM Memory Module

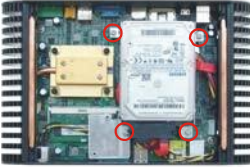
The TC-965 provides one 200-pin SODIMM (Small Outline Dual Inline Memory Module) socket, support DDR II 400 / 533MHz SDRAM memory up to 2GB. You can install from 512 MB up to 2 GB of DDR II SDRAM memory. The procedure of installing a DDR II SDRAM SODIMM into the TC-965 is detailed below, please follow these steps carefully.

- 1 : Turn Off power , Remove the power line first.
- 2 : Twist off the screws of host bottom and front panel , remove the top cover.
- 3: Twist off the screws of HDD bay , take out the 2.5" HDD bay.
- 4: Insert the RAM into the slot with a lean angle, and make sure the gold finger of the RAM is in aligning with the slot. Push the RAM with force to the slot, and then rotate the RAM and press it down in the hatch.
- 5: Press down the DRAM module and you will hear the "Click".

3.3 Installing the 2.5" Hard Disk Drive (HDD)

TC-965 provides users with a 2.5" HDD bay inside. Please follow the following steps to install HDD:

- 1 : Turn Off power, Remove the power line first.
- 2: Twist off the screws of host bottom and front panel, remove the top cover.
- 3: Twist off the screws of HDD bay, take out the 2.5" HDD bay.

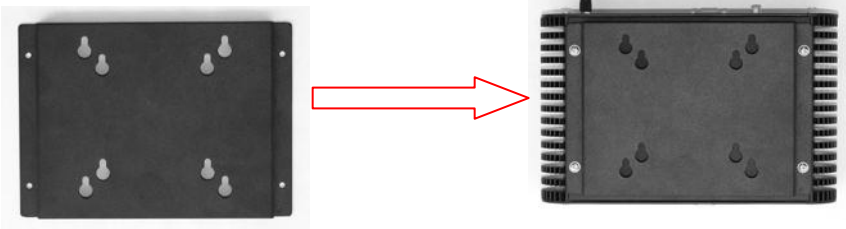


- 4: Choose the motherboard interface specification 2.5-inch hard drive, will be fixed in the HDD bay.
- 5: Put the installed HDD bay into chassis, tighten screws. .
- 6: After completing installation of Hard disk, get the motherboard fixed inside the chassis and connect all the signals-Lines.

3.4 Installing Wall-Mount

TC-965 in line with standard VESA MOUNT, Can be achieved wall-mount function, Please follow the following steps to install Assemble Rail:

- 1: Take out the wall-mount as per accessories
- 2: Aim it to screw hole and install it to the bottom panel of TC-965 according to the chart as below.



- 3: Place TC-965 installed wall-mount where you need.

3.5 Connecting Power

- 1: Insert the plug to the male connector on the rear of the computer.
- 2: Insert the other plug to the power strip.

Chapter 4

BIOS Setup

Chapter4 BIOS Setup

Award BIOS upgrade:

It is true that hardware and software are upgrading all the time. When your IPC can not support the newest processor (for example), you should upgrade the BIOS to try to keep up with the latest technology. Upgrading (or flashing) the BIOS is not an easy attempt. To make sure upgrade succeed, please follow the instruction below:

Set jumper JAV as open

AWDFLASH.EXE is the program for BIOS to modify and upgrade, need to be run in DOS mode.

Use boot disk load DOS, run Amiflash.exe and write the newest file:XXXX.ROM into the Flash IC.

Order format: A:\Awdflash XXXX.bin

If you need to add other parameters, please add <space>/? after the order format.

Example: Afudos 78521100.bin /P /B /C /N /X

Remarks:

1. Upgrading BISO may cause your system crash, so please operate carefully.
2. Please use the upgrading program in the CD-ROM provided by us
3. Please do not power off or reboot the system when upgrading, otherwise, the BIOS maybe be damaged.
4. Please backup your BIOS before upgrading

Award BIOS Description:

Awards BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed memory (CMOS RAM) so that it retains the setup information when the power is turned off

Award BIOS Setup

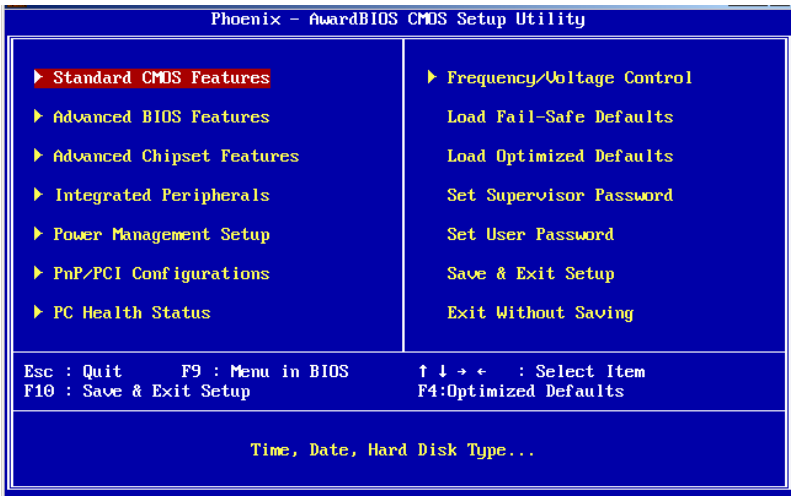
Power on your computer, when this information display in your screen: Del->SETUP please press "DEL", then it will enter BIOS setup interface.

1. Power on or Reset computer.
2. When "Press to enter setup" in screen, please press .

3. Use the “←↑→↓”to choose the option which your want to modify, press <Enter> and show the sub-menu.
4. Use the “←↑→↓”and <Enter> to modify the value.
5. At any time, press<Esc> can back to the father-menu

Note! The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

When the SETUP program starts, you can see the CMOS Setup Utility Main screens are as follows:



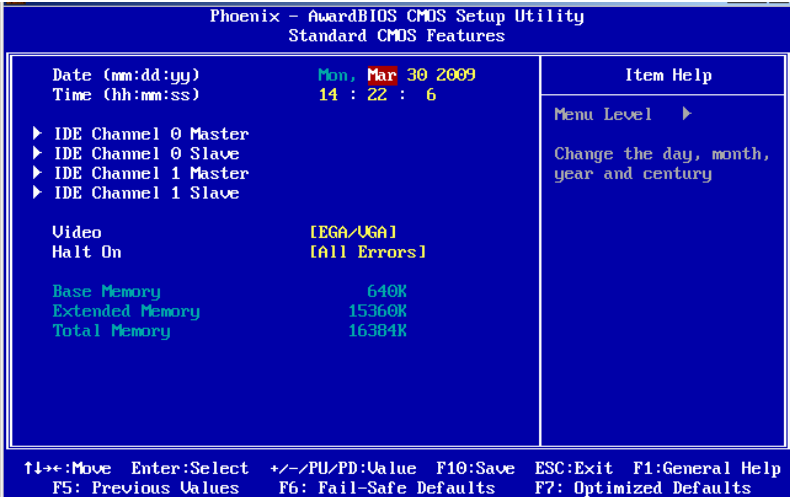
Award BIOS on the map is the main menu. Main Menu 12 set to provide the functions and two out of the way, the user needs according to their own set of corresponding projects. The following BIOS settings will be explained the various items.

4.1 Standard CMOS Setup

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environments causes a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note: If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen

message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error" Message appears again and again, please check to see if you need to replace the battery in your system.



Date

Format: Day/Month/Date/Year ;< Day><Month><Date><Year> can be set by user.

Time

The times format in <hour> <minute> <second>, base on the 24-hour time

IDE Channel 0/1 Master/Slave

These 4 options are IDE HDD setting items. Important: Please select the right option for your IDE devices. Please make sure that the specifications of the IDE devices are comply with the content of the device list. If not: the device will be fail. In the main menu, we have another auto detection function item to facilitate the settings.If the HDD interface is SCSI, please select Not Installed.

1. <LBA/Large>: HDD LBA/Large mode On/Off mode switch. Currently, HDD that size is bigger than 540MB should turn on this Option. But in some Novell Netware 3.xx or 4.xx etc version netbased OS need it be Off.
2. <Block Mode>: Turn this option to be On will help the R/W speed of HDD to be faster. But some of the old HDD don't support this mode, and this option should be Off in this case.

3. <PIO Mode>: Support PIO Mode0~Mode5(DMA/33)。 Use BIOS program to auto check the HDD, this option of PIO mode will be set.

Important: If your system installed an IDE device (i.e. HDD, CD-ROM Driver), you should go to the BIOS setting, and let the system auto detect the device. If you are using swappable HDD, you can change the type to Auto, or set the Primary and Secondary to Auto. Here, Primary means the first IDE interface: IDE0 on the motherboard; and Secondary means the second IDE device, and it refers to the IDE1 interface on the motherboard.

Every IDE device can have two IDE devices as Master/Slave.

Video

Select EGA or VGA display.option item: EGA/VGA, CGA 40, CGA 80, MONO.

Halt On

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

<No Errors>: The system boot will not stop for any error.

<All Errors>: Whenever the BIOS detects a non-fatal error the system will be stopped

<All, But Keyboard>: The system boot will not stop for a keyboard error; it will stop for all other errors. (Default value)

Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

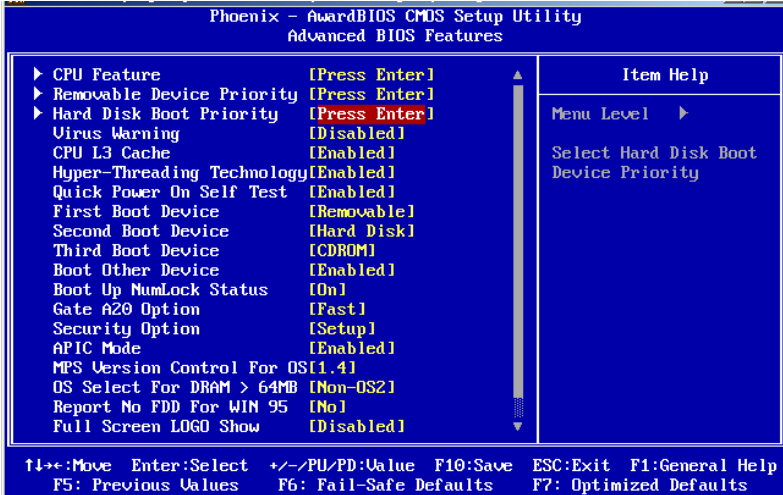
Extended Memory

The BIOS POST will determine the amount of extended memory (above 1 MB in CPU's memory address map) installed in the system.

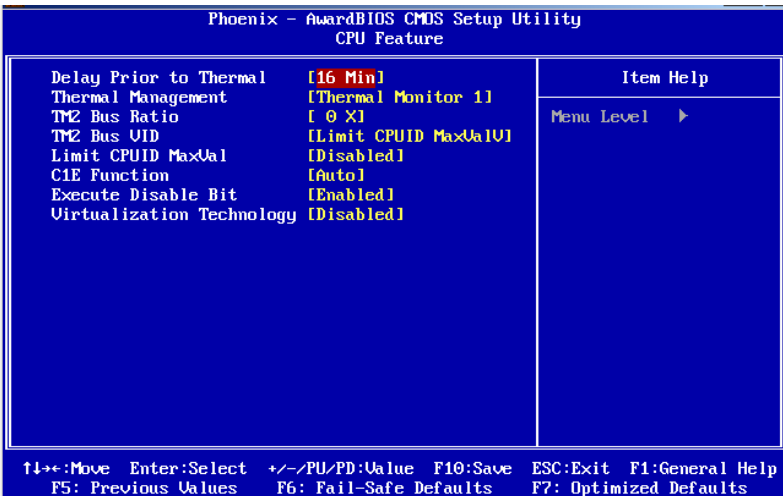
Total Memory

This item displays the total system memory size.

4.2 Advanced BIOS Features



4.2.1CPU Feature



Delay Prior to Thermal

When the temperature of CPU has reached the preset temperature by the factory, the clock of the motherboard will be delayed. The temperature device is activated, and the detector inside the CPU is also activated to maintain the limit of temperature of CPU. This can be set to <4 Min>, <8 Min>, <16 Min>, <32 Min>.

Thermal Management

Choice of thermal management monitor. option: <Thermal Management 1(default)>, <Thermal Management 2>.

TM2 Bus Ratio

Performance Management bus will be activated when the hard mode detector turn hot from cool. Min=0 Max= 255 Input DEC code = Option:<0X (Default)>.

TM2 Bus VID

Performance Management bus voltage will be activated when the hard mode detector turn hot from cool.Option: <0.8375 V(Default)>,<0.8375-1.6000>.

Limit CPUID Maxval

Set CPU ID MaxVal, Max is 3. In WinXP, it is set as<Disabled>. Option: <Disabled (Default)>, <Enabled>.

C1E Function

CPU C1E Funcion option. Option: <Auto (default)>.

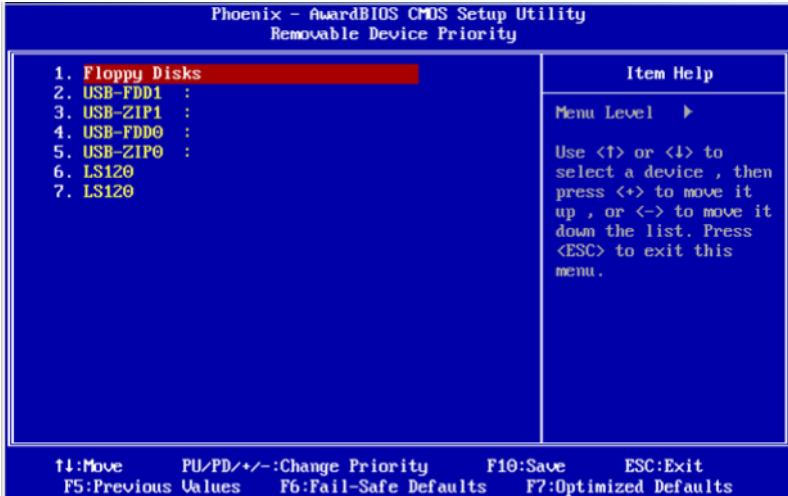
Execute Disable Bit

Set if the CPU is protected by hardware antivirus Option: <Disabled>, <Enabled(Default)>.

Virtualization Technology

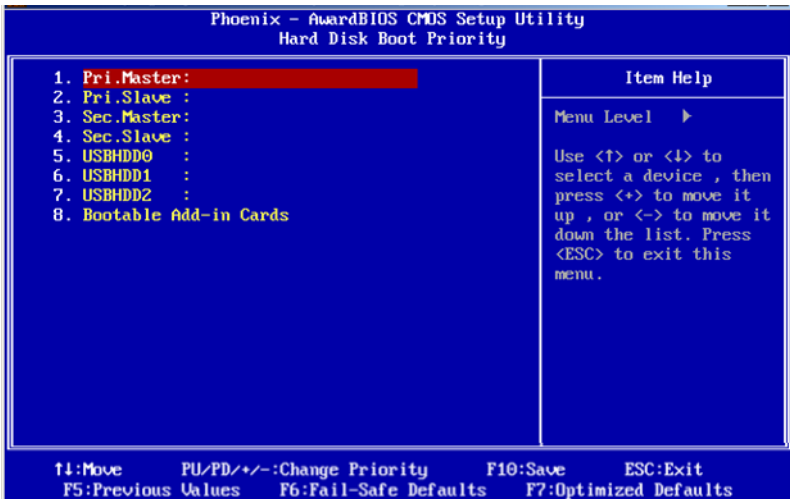
Set if use the additional hardware funtion provided by Vanderpool technology. Option: <Disabled>, <Enabled(Default)>

4.2.2 Removable Device Priority



The above-mentioned items are the order of boot devices, can not be amendment.

4.2.3 Hard Disk Boot Priority



The above-mentioned items are the order of boot devices, can not be amendment

Virus Warning

If enabled, a warning message and alarm beep activates if someone attempts to write here.The commands are <Enabled> or <Disabled>.

CPU L3 Cache

This item allows the user to <Enabled (default)>/<Disable> CPU L3 cache.

Hyper-Threading Technology

This item allows the user to Enabled/Disabled Hyper-threading support for the Intel®Pentium®4 processor with HT Technology. The default is :< Enabled>.

Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When enabled, BIOS shortens or skips some of the items during the test. When disabled, the computer conducts normal POST procedures.

First/Second/Third Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: <Floppy>, <LS/ZIP>, <HDD>, <SCSI>, <CDROM>, <LAN>, and <Disabled>.

Boot Other Device

If this option is set as [Enabled], system can be booted from other devices if it is fail to boot from the first, second or third device. Options: <Disabled (Prohibited)>; <Enabled (Default)>.

Boot Up NumLock Status

This item allows the user to activate the Number Lock key at system boot. The default is:<On>.

Gate A20 Option

<Normal>: A pin in keyboard controller controls GateA20

<Fast (Default)>: Chipset controls GateA20

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are "Enabled" or "Disabled." Enabling allows the typematic rate and delay to be selected.

Security Option

This field allows you to limit access to the System and Setup. The default value is Setup. When you select System, the system prompts for the User Password every time you

boot up. When you select Setup, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is <Enabled>.

MPS Version Control For OS

This option specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is <1.4>.

Boot OS/2 DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is Non-OS/2.

Report NO FDD For WIN95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Full Screen LOGO Show

The splash screen can display the company LOGO. Option: [Enabled],[Disabled].

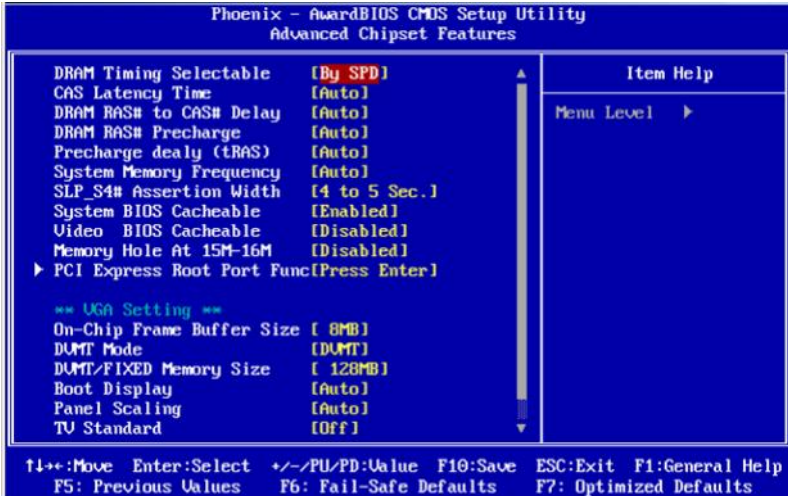
Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is Enabled.

Summary Screen Show

This item allows you to open or close the screen shows a summary. Option: <Disabled (default)>, <Enabled>.

4.3 Advanced Chipset Features



DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is <By SPD>.

CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The default is <Auto>.

DRAMA RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the DRAM is written to, read from or refreshed. Reducing the delay improves the performance of the DRAM. The default is <Auto>.

DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the DRAM refreshes. The default setting for the Active to Precharge Delay is <3>.

Precharge dealy (tRAS)

This item allows user to adjust memory precharge time. . option item: <7>,<6>and <5(clocks)>.

System Memory Frequency

This item allows user to adjust memory frequency to improvement performance.

SLP_S4# Assertion Width

This item allow user to set the SLP_S4# Assertion Width. Option: <4---5 Sec(default)>, <3 to 4 Sec>, <2 to 3 Sec>, <1 to 2Sec>.

System BIOS Cacheable

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

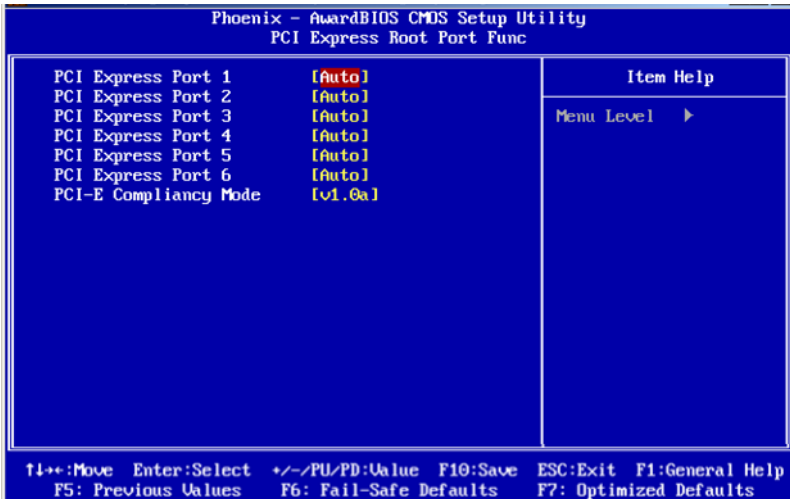
Video BIOS Cacheable

The Setting Enabled allows caching of the video BIOS ROM at C0000h-C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards.This memory must be mapped into the memory space below 16 MB. The choices are <Enabled> and <Disabled>.

PCI Express Root Port Func



PCI Express port 1-6

Set whether use PCI-E 1-6 port. Option: <Auto(default)>, <Disabled>, <Enabled>.

PCI-E Compliancy Mode

This option allows you to choose the PCI-E Compliancy Mode. Option: <v1.0a (default)>, <v1.0>.

VGA Setting

On-Chip Frame Buffer Size

This item allows the user to adjust on-chip graphics of memory buffer.. Optional for: <1MB>, <8MB(default)>.

DVMT Mode

This item allows the user to adjust Intel's Dynamic Video Memory Technology (DVMT). Bios provides three options to choose (DVMT, FIXED and Both).

DVMT/FIXED Memory Size

This item allows the user to adjust DVMT/FIXED graphics memory size.

Boot Display

This item allows the user to decide that display mode.

Panel Scaling

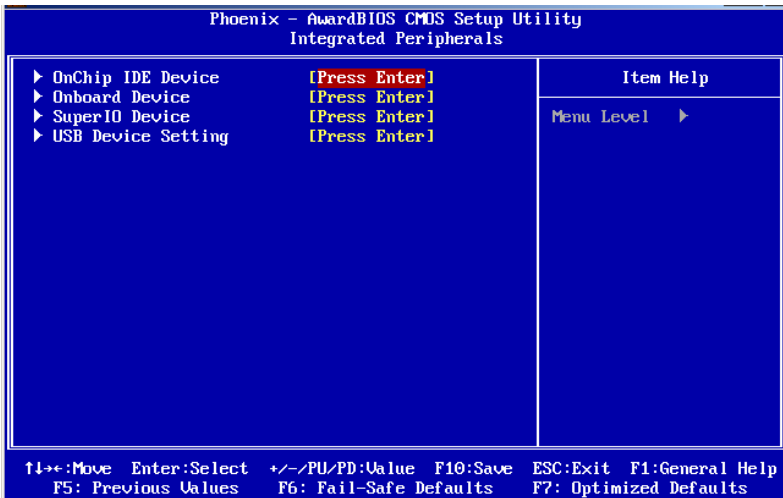
Set Panel Scaling function.option:<Auto (default) >,<On>,<Of>.

Panel Number

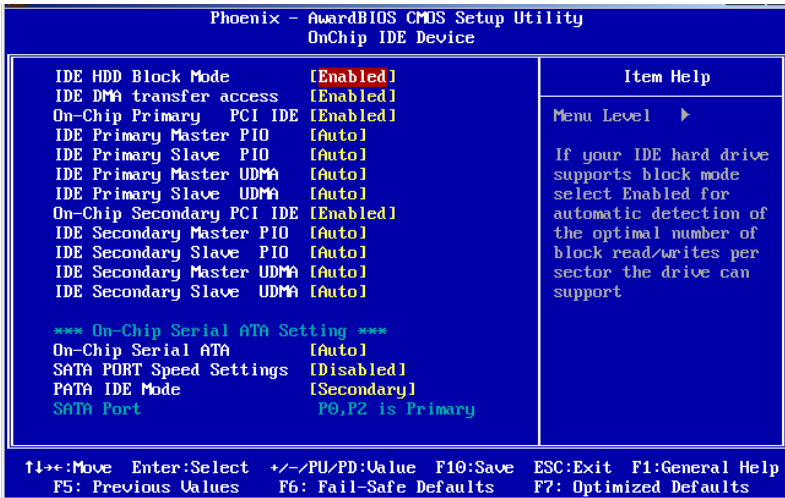
These fields allow you to select the LCD Panel type. The setting values for these ports are:

- 640 x 480 18bit SC
- 800 x 600 18bit SC
- 1024 x 768 18bit SC
- 1280 x 1024 24bit SC
- 1400 x 1050 18bit SC
- 1024 x 768 24bit SC
- 1600 x 1200 24bit SC

4.4 Integrated peripherals



4.4.1 OnChip IDE Device



IDE HDD Block Mode

You can enable the Primary IDE channel and/or the Secondary IDE channel. Any channel not enabled is disabled. This field is for systems with only SCSI drives.

IDE DMA transfer access

DMA transfer access, Settings: <Disabled>, <Enabled(default)>.

On-Chip Primary/Secondary PCI IDE

Some UDMA cables use a hole in the ribbon cable as a cable detect mechanism to determine if a UDMA IDE or standard IDE cable is installed. The default setting is <Enabled>.

IDE Primary/Secondary Master/Slave PIO

Four IDE PIO (Programable Input and Output) options can allow you to assign PIO mode(1-4) for each IDE device. Mode 0 to 4 provides the increasing performance. In Auto mode, the system will auto detect the best working mode. Settings: <Auto>, <Mode 0>, <Mode 1>, <Mode 2>, <Mode 3>, <Mode 4>.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33/66/100 can be used when your IDE HDD support this kind of function. In the

meantime, the OS includes a DMA driver (Windows 95 OSR2 or third-party IDE BUS control and driving programe)。 If your HDD and your OS can support Ultra DMA/33, Ultra DMA/66 or Ultra DMA/100, Select Auto to enable BIOS support. Options: [Auto], [Disabled]。

On-Chip Serial ATA Setting

On-Chip Serial ATA

This can be set to [Disabled: SATA Prohibited], [Auto: Detect SATA device by BIOS], [Combined Mode: Simulate the IDE setting], [Enhanced Mode: Allow to use all IDE and SATA connection interface], [SATA Only: use SATA only]。

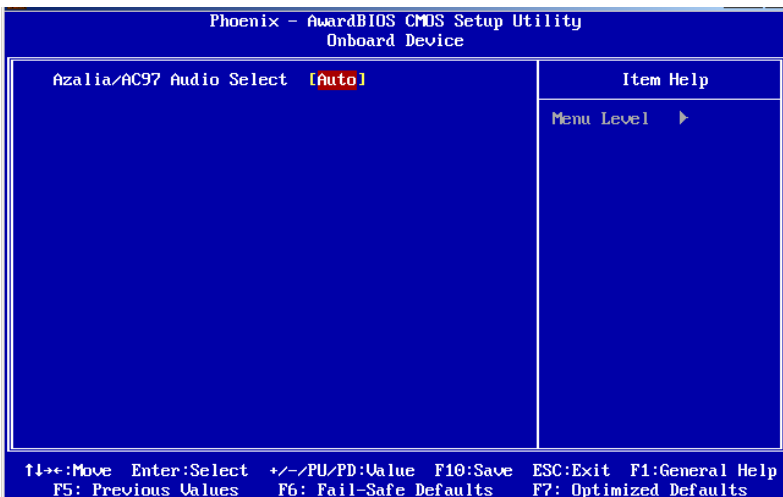
SATA PORT Speed Setting

This option is used to set the speed of SATA ports。 Option: <Disabled>,<Force GED I >,<Force GED II >.

PATA IDE Mode

Select this option to set the mode of the parallel IDE interface。 default setting for <Secondary>.

4.4.2 Onboard Device

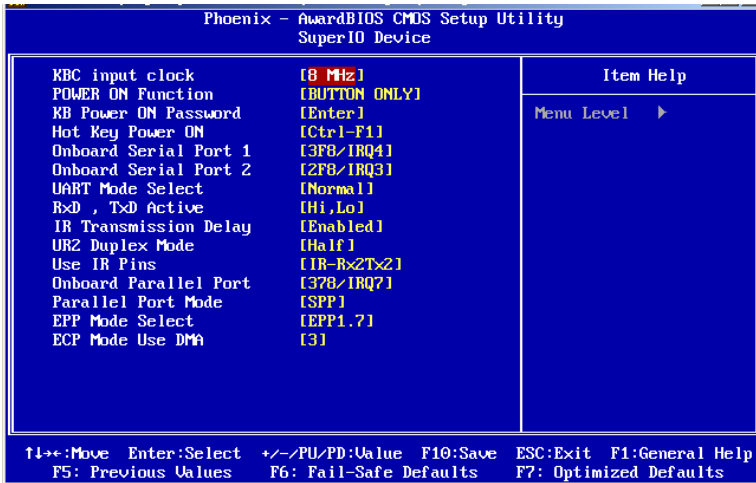


Azalia/AC97 Audio Select

Select <Disabled> if you do not want to use AC-97 audio/Modem. Option is <Auto

(default)>, <Disabled>.

4.4.3 Super IO Device



KBC input clock

Select KBC (KeyBroad Control) 's clock. The faster the clock, the faster the speed.
Options: <8MHz>, <12MHz>, <16MHz>.

POWER ON Function

Select the method to start the computer. Button Only is use the power button to control. Keyboard 98 is use some special power switch. Hotkey is use shortcut of Ctrl+F11 or ALT+F12. If the keyboard is too old, the boot of the computer may fail. Mouse Left and Mouse Right is use mouse to start the computer, some PS/2 mice probably don't support this option. Options: <Button Only>, <Keyboard 98>, <Hot Key>, <Mouse Left>, <Mouse Right>.

KB Power ON Password

If this is setted as <Password> in POWER ON Function, you can use this to set the password for the booting of PS2 mouse

Hot Key Power ON

If this is setted as <HotKey> in POWER ON Function, you can use this to set the hot key

for PS/2 keyboard, options are from CtrlF1 to CtrlF12.

Onboard Serial Port 1/2

For settings reference the Appendix for the serial resource allocation, and Disabled for the onboard serial connector.

UART Mode Select

This item allows you to select UART mode. The choices: <IrDA>, <ASKIR>, <Normal>.

RxD, TxD Active

This item allows you to determine the active of RxD, TxD. The Choices: <Hi, Hi,> ,<Lo, Lo> <Lo,Hi>,<Hi, Lo>.

IR Transmission Delay

This item allows you to enable/disable IR transmission delay. The choices: <Enabled>, <Disabled>.

UR2 Duplex Mode

This item allows you to select the IR half/full duplex function. The choices:< Half>, <Full>.

Use IR Pins

Please refer to your IR equipment, setting the correct signal TxD and RxD.Option: <RxD2>, <TxD2>, <IR-Rx2Tx2>.

Onboard Parallel Port

This field sets the address of the on-board parallel port connector. You can select either 3BCH/IRQ7, 378H/IRQ7, 278H/IRQ5 or Disabled. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The CPU card can support up to three parallel ports, as long as there are no conflicts for each port.

Parallel Port Mode

This field allows you to set the operation mode of the parallel port. The setting "Normal" allows normal speed operation, but in one direction only. "EPP" allows bi-directional parallel port operation at maximum speed. "ECP" allows the parallel port to operate in

bi-directional mode and at a speed faster than the maximum data transfer rate. "ECP + EPP" allows normal speed operation in a two-way mode.

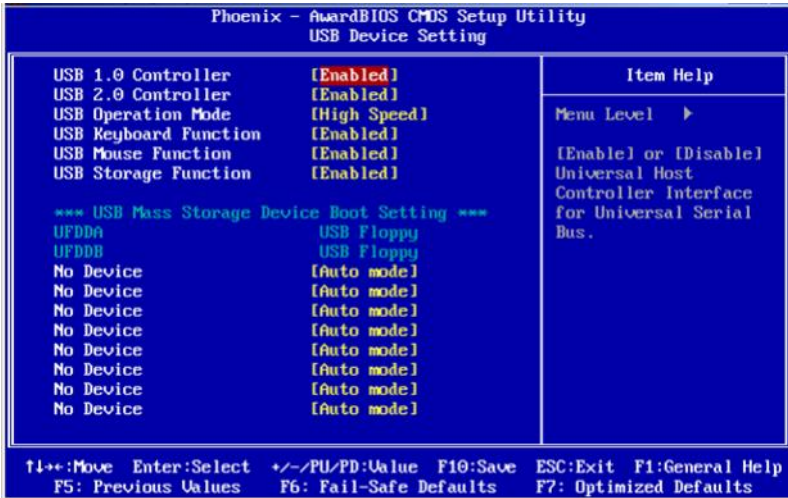
EPP Mode Select

This field allows you to select EPP port type 1.7 or 1.9. The choices: <EPP1.7>, <1.9>.

ECP Mode Use DMA

This selection is available only if you select "ECP" or "ECP + EPP" in the Parallel Port Mode field. In ECP Mode Use DMA, you can select DMA channel 1, DMA channel 3, or Disable. Leave this field on the default setting.

4.4.4 USB Device Setting



USB 1.0 Controller

Select Enabled, if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices are <Enabled> and <Disabled>.

USB 2.0 Controller

This entry is used to disable/enable the USB 2.0 controller only. The BIOS itself may or may not have high-speed USB support. If the BIOS has high speed USB support built in, the support will automatically turn on when a high speed device is attached. The choices are <Enabled> or <Disabled>.

USB Operation Mode

Set the USB 2.0 controller to Hi Speed (480 Mbps) or Full Speed (12 Mbps).

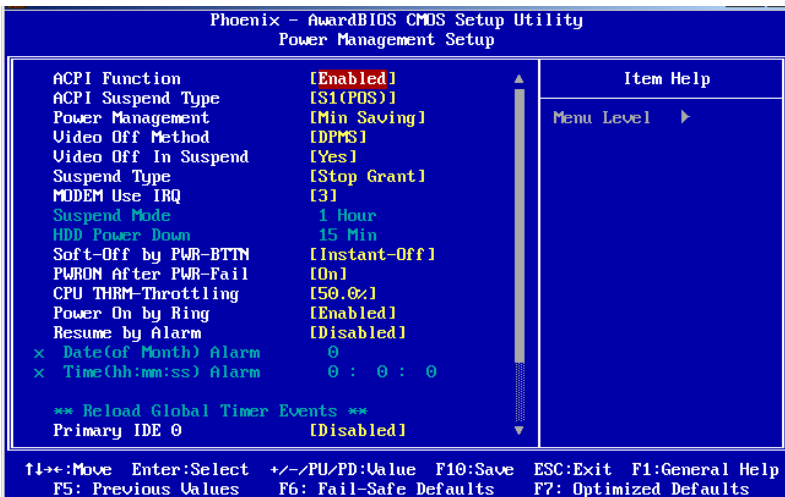
USB Keyboard/Mouse Function

Select .Enabled. if you plan to use a USB keyboard/Mouse. The choices are "Enabled" and "Disabled".

USB Storage Function

Select "Enabled" if you plan to use an external USB storage device to boot system under DOS mode. The choices are <Enabled> and <Disabled>.

4.5 Power Management Setup



ACPI Function

This is item to activate the ACPI function. If you OS support ACPI-aware, For example: Windows 98SE/2000/ME, choice <Enabled>. Option: <Enabled>, <Disabled>.

ACPI Suspend Type

This item allows user to select sleep state when in suspend.

<S1 (POS)>: The suspend mode is equivalent to a software power down;

<S3 (STR) (default)>: The system shuts down with the exception of a refresh current to the system memory.

Power Management

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

1. HDD Power Down
2. Suspend Mode

There are four selections for Power Management, three of which have fixed mode settings <User Define(default)>: Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hour. except for HDD Power Down which ranges from 1 min. to 15 min. and disable

<Min Saving>: Minimum power management, Suspend Time Out = 1 Hour, HDD Power Down = 15 Min

<Max Saving>: Maximum power management, Suspend Time Out = 1 Min, HDD Power Down = 1 Min

Video Off Method

This item allows user to determine the manner in which the monitor is blanked.

V/H SYNC+Blank: This option will cause system to turn off vertical and horizontal synchronization ports and write blanks to the video buffer.

<Blank Screen>: This option only writes blanks to the video buffer.

<DPMS(default)>: Initial display power management signaling.

Video Off In Suspend

This item allows users to turn off video when system is in suspend mode. option item: <No>, <Yes(default)>.

Suspend Type

This item allows users to determine the suspend type. option item: <Stop Grant(default)>, <PwrOn Suspend>.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use. The choices: <3(default)>, <4>, <5>, <7>, <9>, <10>, <11>, <NA>.

Soft-Off by PER-BTIN

If you choose "Instant-Off", then pushing the ATX soft power switch button once will switch the system to "system off" power mode. You can choose "Delay 4 sec." If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to "suspend" mode. The choices: <Instant-off (default)>, <Delav 4 Sec>.

PWRON After PWR-Fail

Use this to set up the system after power failure. The "Off" setting keeps the system powered off after power failure, the "On" setting boots up the system after failure, and the "Former-Sts" returns the system to the status before power failure. Default setting :<on>.

Wake-Up by PCI Card

Select [Enabled] when the incident occurred in any PCI cards, PCI cards will be issued by PME signal so that the boot system back to full status. The choices : [Enabled], [Disabled(default)].

Power On by Ring

When Enabled an input signal on the serial Ring Indicator (RI) line (in other words, anincoming call on the modem) awakens the system from a soft off state. The choices :< Enabled (default)>, <Disabled>.

Resume by Alarm

When Enabled, your can set the date and time at which the RTC (real time clock) alarm awakens the system from Suspend mode. The choices :<Enabled>,<Disabled (default)>.

Primary and Secondary IDE 0/1

When Enabled, the system will resume from suspend mode if Primary IDE 0 /1 or Secondary IDE 0/1 is active. The choice :< Enabled>,<Disabled>.

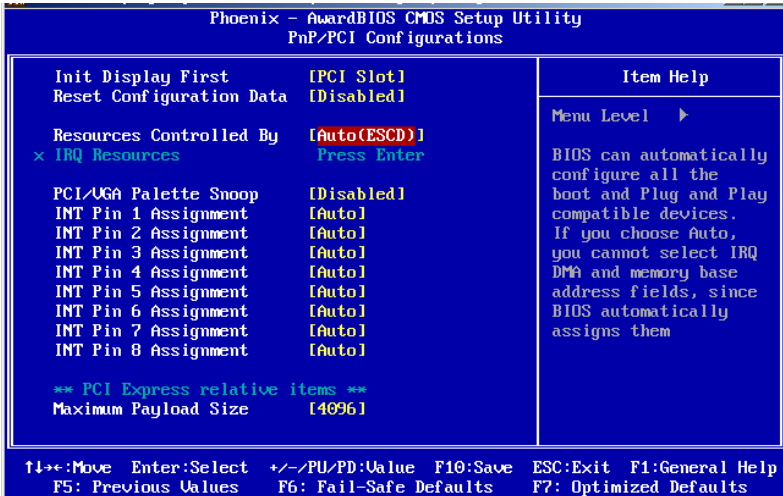
FDD, COM, LPT Port

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice :< Enabled>, <Disabled>.

PCI PIRQ[A-D]#

When Enabled, the system will resume from suspend mode if interrupt occurs. The choice is: <Enabled>, <Disabled>.

4.6 PnP/PCI Configurations



Init Display First

This option has two options: <PCI slot>/<AGP>, and you can use the options to select the sequence of display card when boot up. If you use AGP display card, you can set to [AGP]; if you are using the PCI display card, you can set it to <PCI slot>.

It is recommended using the <AGP> display card, and the graphic performance will increase dramatically.

Reset Configuration Data

Default is <Disable>. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system configuration has caused such a conflict that OS cannot boot.

Resources Controlled By

The commands here are <Auto> or <Manual>. Choosing <manual> requires you to choose resources from each following sub-menu. <Auto> automatically configures all of the boot and Plug and Play devices but you must be using Windows 95 or above.

PCI/VGA Palette Snoop

When set to <Enabled>, various VGA devices which are working on different bus can handle data from CPU on different color palette of different video device. Stored in the 5th bit in the PCI device command cache is the VGA color palette(0 is disabled). For example: if there are two VGA devices(one is PCI and the other is ISA), the setting should be like: if any ISA adaptor installed in the system require VGA color palette, this item should be set to <Enabled>.

INT Pin1-8 Assignment

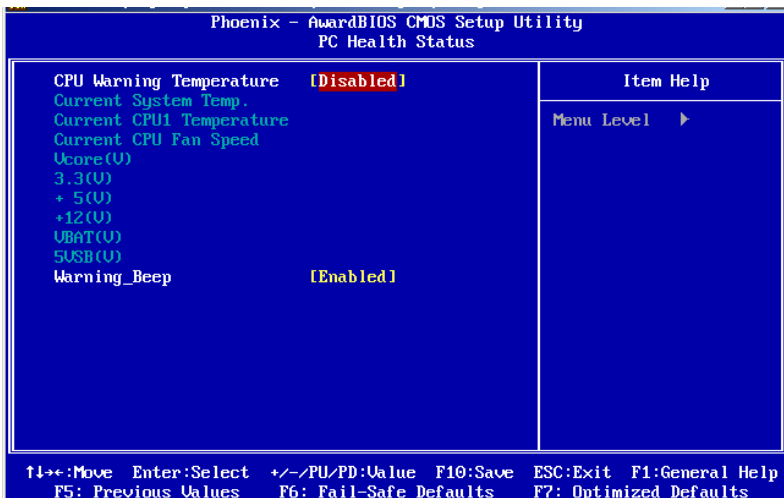
The option to connect to the computer's motherboard, a PCI interface device designated IRQ allocation, The choice: <AUTO>, <3>, <4>, <5>, <7>, <9>, <10>, <11>.

Maximum Payload Size

This allows you to set the PCI Express devices largest TLP (Transport Layer Packet) payload value. The choice: <128>, <256>, <512>, <1024>, <2048>, <4096>.

4.7 PC Health Status

Annotate: (Green shows the following numerical values for the read-only)



CPU Warning Temperature

The system will give an automatic warning if the CPU temperature goes over the selected setting. default setting :<Disabled>.

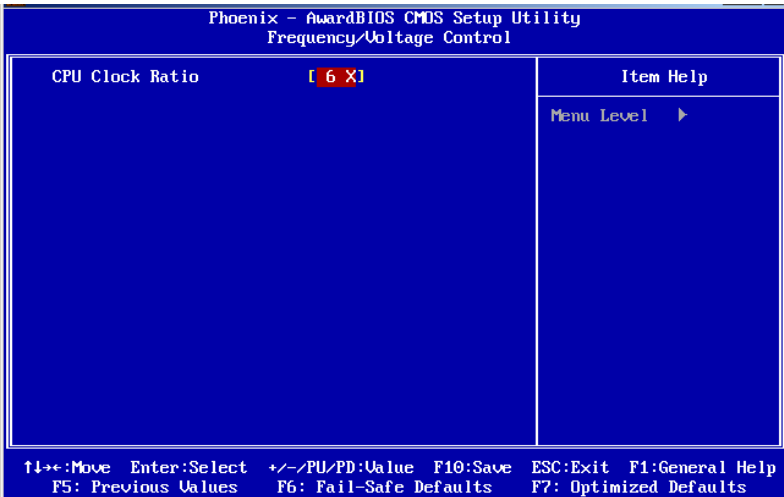
Current SYS Temperature, VCore, V1.8, 5V, 12V, Fan Speed

This shows the current monitoring of all hardware devices / components such as CPU voltage state, temperature and speed of all fans.

Warning_BEEP

This allows you to decide, if your system chassis temperature is too high or when the invasion occurred whether or not to issue a beep sound. Option: [Enabled], [Disabled].

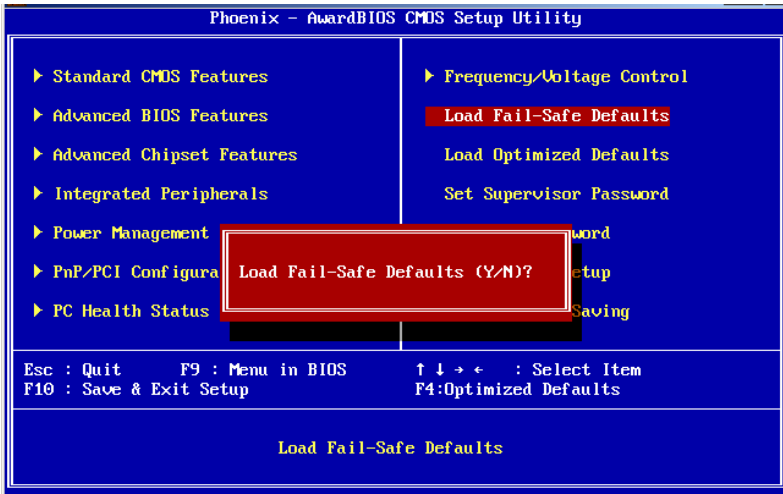
4.8 Frequency/Voltage Control



CPU Clock Ratio

If the CPU clock ratio is not set, you probably need to set the ratio of the CPU clock before the system can display properly. If you are using the CPU which clock is locked, you needn't to set CPU clock ratio and the system can be work.

4.9 Load Fail-Safe Defaults



If the system is not stable after installation, this function can be helpful. In this case, the system will cancel some of the function which enhance the system, and the system will run in very strict status. So, it is easy to find the safe value and remove errors from the motherboard. When this option is selected, the host windows will prompt:

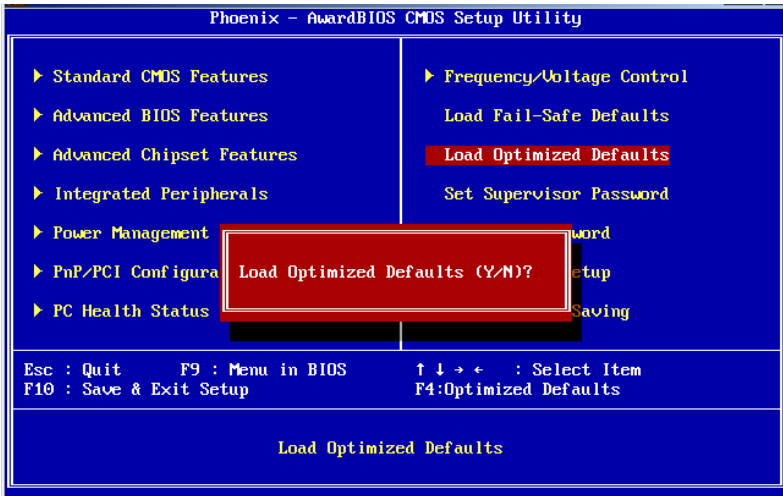
Load BIOS Defaults (Y/N) ?

Keyin "Y", and press Enter to execute this function.

important: This function will not influence the [Standard CMOS Setup].

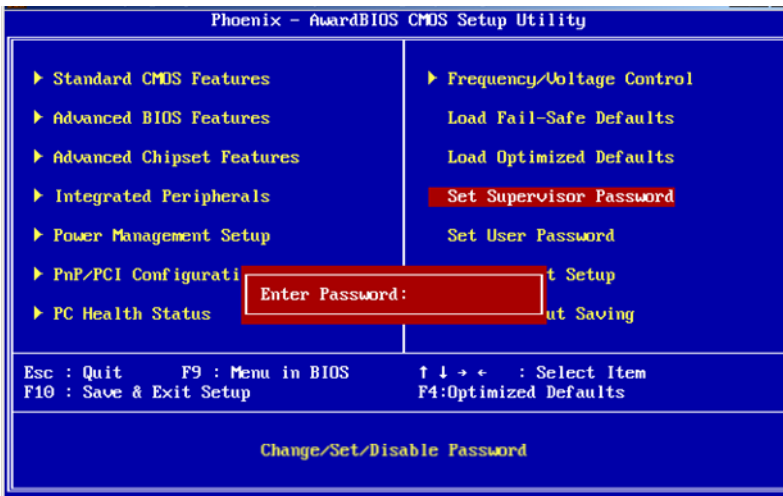
Keyin Supervisor Pass word can input and revise CMOS BIOS's value, and Supervisor Password is set to protect the CMOS against willful revising. If IDE HDD is used by user, function can get the parameters of the HDD and record them to standard CMOS settings. Max four IDE parameters can be get from HDD.

4.10 Load Optimized Defaults



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

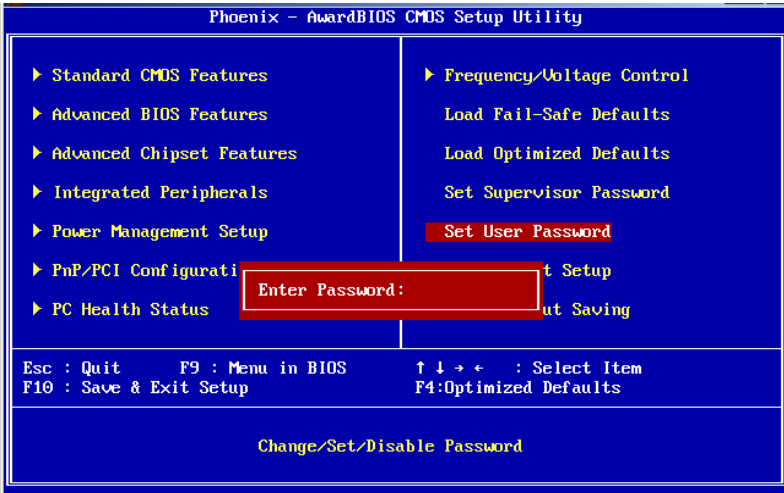
4.11 Set Supervisor Password



Supervisor password level is high than users, you can load CMOS, amend setup by supervisor, also can be used to boot PC. If you select this option and press enter ,the

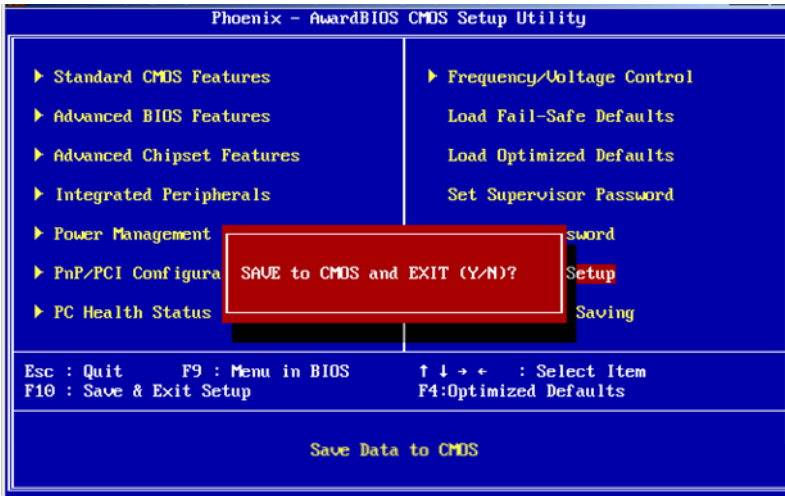
information "ENTER PASSWORD" will be shown on screen, here you can input your password. do not be excess than 8 characters, then press enter, the password you inputted will replace the former one. Press enter again to confirm.

4.12 Set User Password



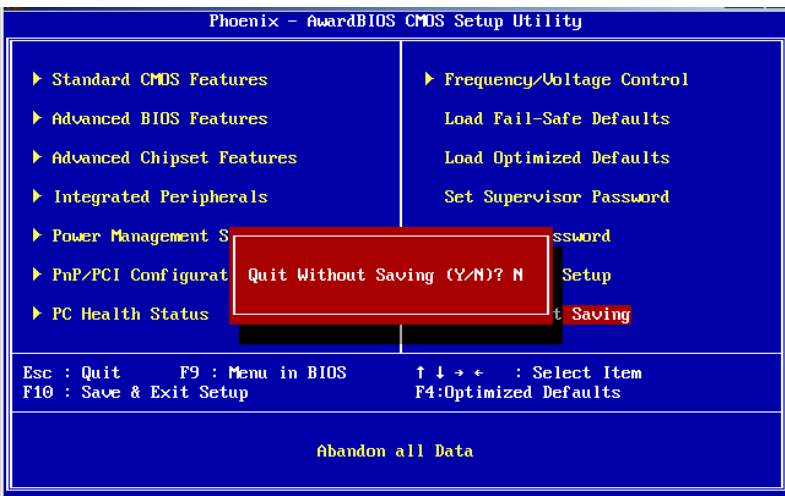
<User Password Setting> function for a setting password. If you want to set the password, first enter the current password to identify your password by y, the screen automatically return to the main screen. Enter the User Password can use the system, but can not modify the contents of CMOS.

4.13 Save&Exit Setup



Save CMOS value changes to CMOS and exit setup. Enter <Y> to store the selection made in the menus in CMOS, a special section in memory that stays on after turning the system off. The BIOS configures the system according to the Setup selection stored in CMOS when boot the computer next time. The system is restarted after saving the values.

4.14 Exit Without Saving



Abandon all CMOS value changes and exit setup, and the system is restarted after exiting

Appendix

Appendix

Appendix 1: Driver Installation

Please install the driver as per the following steps:

Plug programme disk into CD-ROM, so installation of the driver can be made either automatically or manually. Now manually installation instructions are given as below:

- 1) A variety of options available regarding manually installation, which you can check from Device Manager.
- 2) Right click "my computer ", select "management", and go to "Device Manager"
- 3) Right click "display controller" in the menu of graphic card, select "Properties ", click "Dirver", select " update driver".
- 4) Select "Show the list of all drivers which are designated locations so that choices can be made from it ", select "next."
- 5) Select the location of display driver, click "ok"
- 6) Implement the installation, restart the system.

Proceed with the installation of other drivers after restarting the system, till all installations are implemented. Then user can see that it says device is working

Appendix 2: Watchdog programmer guide

watchdog reference code (ASM) :

Set the port to realize watchdog function through DEBUG order, so that it can carry out Watchdog Timer's various functions.

port instruction:

2EH : Address register

2FH : Data register

Example: Set Watchdog Timer for 48 Seconds, DEBUG in DOS:

```
C:\>debug
```

```
-o 2e 87
```

```
-o 2e 87 ; Decode
```

```
-o 2e 2b
```

```
-o 2f e0 ; bit4=0, Select watchdog pin
```

```
-o 2e 07
```

```
-o 2f 08 ; Choose register
```

```
-o 2e 30
```

```
-o 2f 01 ; Activation logic devices
```

```
-o 2e f5
```

```
-o 2f 00 ; Set timer units as second / (set as min: o 2f 08)
```

```
-o 2e f6
```

```
-o 2f 30 ; Set Timer Count to 48 sec. (Max support FF = 255, when it set as 00
```

Watchdog function stop

```
-o 2fe aa ; locked register
```

```
-q
```

```
C:\>
```

=====
watchdog reference code(**c++ language**):

```
outputb (0x2e, 0x87)
outputb (0x2e, 0x87) // Open SUPER IO register
outputb (0x2e, 0x2B)
outputb (0x2f, 0xE0) //bit4=0 ,set pin as watchdog func
outputb (0x2E, 0x07)
outputb (0x2F, 0x08) //select logical device
outputb (0x2e, 0x30)
outputb (0x2f, 0x01) //active the device
outputb (0x2e, 0xF5)
outputb (0x2f, 0x00) // Set timer units as second / (Set timer units as minute: outputb (0x2f,
0x08))
outputb (0x2e, 0xF6)
outputb (0x2f, 0x30) // Set Timer Count to 48 sec
outputb (0x2E, 0xAA) // locked register
//----- code end -----
```

Appendix 3: Glossary

ACPI

Advanced Configuration and Power Management Interface for short.ACPI specifications allow OS to control most power of computer and its extended devices. Windows 98/98SE, Windows 2000 and Windows ME are all support ACPI, it provide users a flexible system power management.

ATX:

AT extended, a motherboard layout according with modern standard replaced BabyAT. It changes disposal of many components, and do some new high efficiency design, so it is widely used now.

BIOS

Basic in/out system.It's a kind of software including all in/out control code interface in PC. It will do hardware testing while system booting, then system runs, it provides an interface between OS and hardware. BIOS is stored in a ROM chip.

BUS

In a computer system, it's the channels among different parts for exchanging data; it's also a group of hardware line. BUS here means part lines inside CPU and main components of memory.

Chipset

Integrated chips for executing one or more function.Here "Chipset" means system level chipset structured by Southbridge & Northbridge; it decides motherboard's structure and main functions.

CMOS

Complementary Metal-Oxide Semiconductor, a widely used semiconductor with the characteristic of high speed but low power. CMOS we mention here means part of obligate space in on-board CMOS RAM, for saving date, time, system information and system

parameter etc.

COM

Computer-Output Microfilmer. A universal serial communication interface, usually adopts normative OB 9 connector.

DIMM: Dual Inline Memory Module. It's a small circuit board with memory chipset, providing 64bit bus width.

DRAM

Dynamic Random Access Memorizer. It's a normal type of memory often with a transistor and a capacitance to store 1 bit. With the development of the technology, more and more types and specification of ORAM exist in computer application. Now: SDRAM, DDR SDRAM and RDRAM are generally used.

IDE:

Driver specification for integrated device electronics, for connecting HDD / CD-ROM device.

IRDA:

Infrared Data Association for short, here means infrared transmit interface, to connect infrared transmit devices. This sort of device transmits data by infrared light-wave without connecting any cables. It has been developed a standard now.

LAN

Network interface. Network grouped by correlative computers in a small area, generally in a company or a building. Local area network is buildup by sever, workstation, some communications links, as a rule. Terminals can access data and devices anywhere through cables, so, many users can share costly device and resource.

LED

Light-Emitting Diode. a semiconductor device that shines when power supply is connected, often use to denote info lightly, for example, to denote power on or HDD work normally.

LPT

Line print terminal. The denomination reserved by DOS, is used to denote universal parallel

interface, and connect printer in a general way.

POST

Self-test when power on. While booting, BIOS will do once uninterrupted testing operation to the system, including RAM, keyboard, hard disk driver etc. Check them in normal situation and work well.

PS/2

A keyboard & mouse connective interface specification developed by IBM. PS/2 is a DIN

interface with only 6PIN; it also can connect other devices, like modem.

USB

It's Universal Serial Bus for short. A hardware interface adapts to low speed external devices, and is always used to connect keyboard, mouse etc. One PC can connect 127 USB

devices Max, providing 12Mbit/s transmit bandwidth; USB supports hot swap and multi- data

stream, namely, you can plug USB devices while system is running, system can auto-detect and makes it work on.