Networking Control Board

Model Number CB-6971

AMD® Geode® LX800 Networking Control Board with four LAN or three LAN and four switch

User's Manual

Version 1.0

User's Manual Edition 1.0, Aug 2006

For more information on CB-6971 or other AEWIN products, please visit our website http://www.aewin.com.tw.

For technical supports or free catalog, please send your inquiry to info@aewin.com.tw

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Chapter 1. General Information

1.1 Introducing

The CB-6971 is a networking control board based on AMD Geode architecture with CS5536 chipset supporting the LX800 CPU.

The CB-6971 is equipped with four 10/100Mbps LAN ports, or three 10/100Mbps LAN and four 10/100Mbps switch. Based on good cost and performance, it is suitable for SMB/SOHO segment. It can really match various applications, including Firewall, VPN, Load Balancing, IPS, IDS, etc.

1.2 Specification

- CPU: AMD Geode LX800 500MHz low power processor
- BIOS: Award® 4Mb Flash BIOS
- Chipset: AMD Geode CS5536
- I/O Chipset: Winbond® 83627HG
- Memory: One 184pin DDR DIMM socket can support up to 1GB
- Enhanced IDE: One 44-pin IDE connector
- Serial port: Two RS-232 serial ports (one RJ45 connector, one pin header)
- KB/Mouse: Supports PS/2 keyboard and mouse
- USB: One USB2.0/1.1 port
- Mini PCI Expansion: One Mini PCI socket
- Display: Support CRT
- Ethernet: Four Realtek® 8139CL+ 10/100Mbps
- Digital I/O: Four digital input and four digital output
- SSD interface: One 50-pin CompactFlash™ TYPE II socket
- Watchdog timer: Can generate a system reset, support software selectable timeout interval
- System Monitoring: Built in W83627HG; support temperatures, voltage monitoring function
- Power supply voltage: Single +5V (+4.75V to +5.25V) power supply
- Max. Power Requirements: 30W
- Operating temperature: 32 to 140℉ （0 to 60℃）
- Board size: 8"(L) x 5.75"(W) (203mm x 146mm)

1.3 Order Information

We offer various combination of CB-6971 control board according to LAN difference, it is to meet various need in the market.

Model	Description
CB-6971A-050	AMD Geode LX800 Low Power Control Board with Four 10/100 LAN
CB-6971B-050	AMD Geode LX800 Low Power Control Board with Three 10/100 LAN and Four 10/100 switch
MB06018-1-01	Adapter Module of VGA header
46-I0002X6-00	2mm, 20cm cable of MB06018

1.4 Packaging

Please make sure that the following items have been included in the package before installation.

1. CB-6971 Control Board
2. Quick Installation Guide (Optional)
3. Cables (Optional)
4. CD-ROM that contains the following folders:

(1) Manual
(2) System Driver
(3) Ethernet Driver
(4) Utility Tools

If any item of above is missing or damaged, please contact your dealer or retailer from whom you purchased the CB-6971. Keep the box and carton when you probably ship or store CB-6971 in near future. After you unpack the goods, inspect and make sure the packaging is intact. Do not plug the power adapter to the main board of CB-6971 if you already find it appears damaged.

Note: Keep the CB-6971 in the original packaging until you start installation.

1.5 Precautions

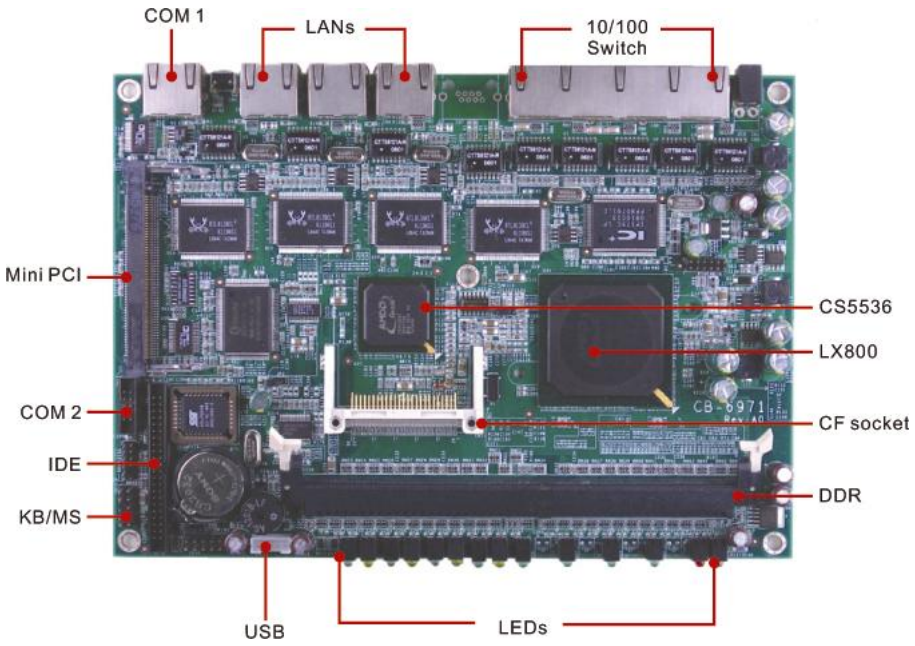
Please make sure you properly ground yourself before handling the CB-6971 control board or other system components. Electrostatic discharge can be easily damage the CB-6971 control board.

Do not remove the anti-static packing until you are ready to install the CB-6971 control board.

Ground yourself before removing any system component from it protective anti-static packaging. To ground yourself, grasp the expansion slot covers or other unpainted parts of the computer chassis.

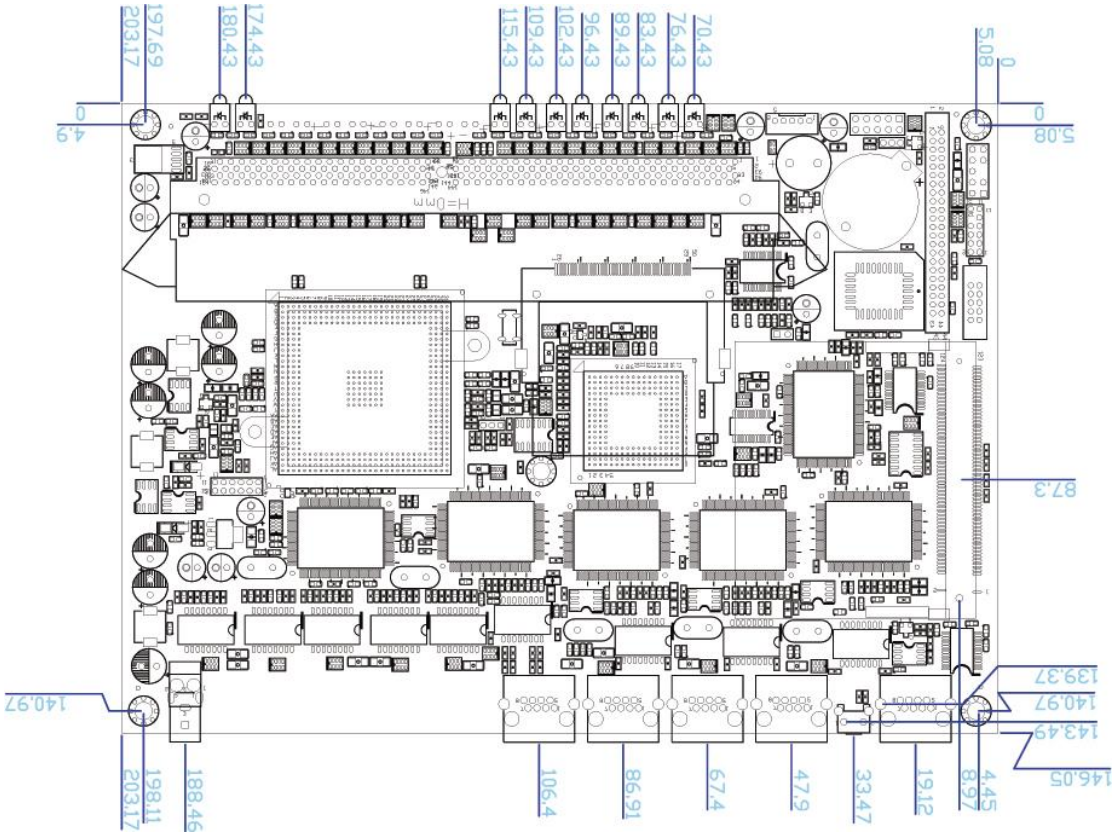
Handle the CB-6971 control board by its edges and avoid touching the components on it.

1.6 Board Layout

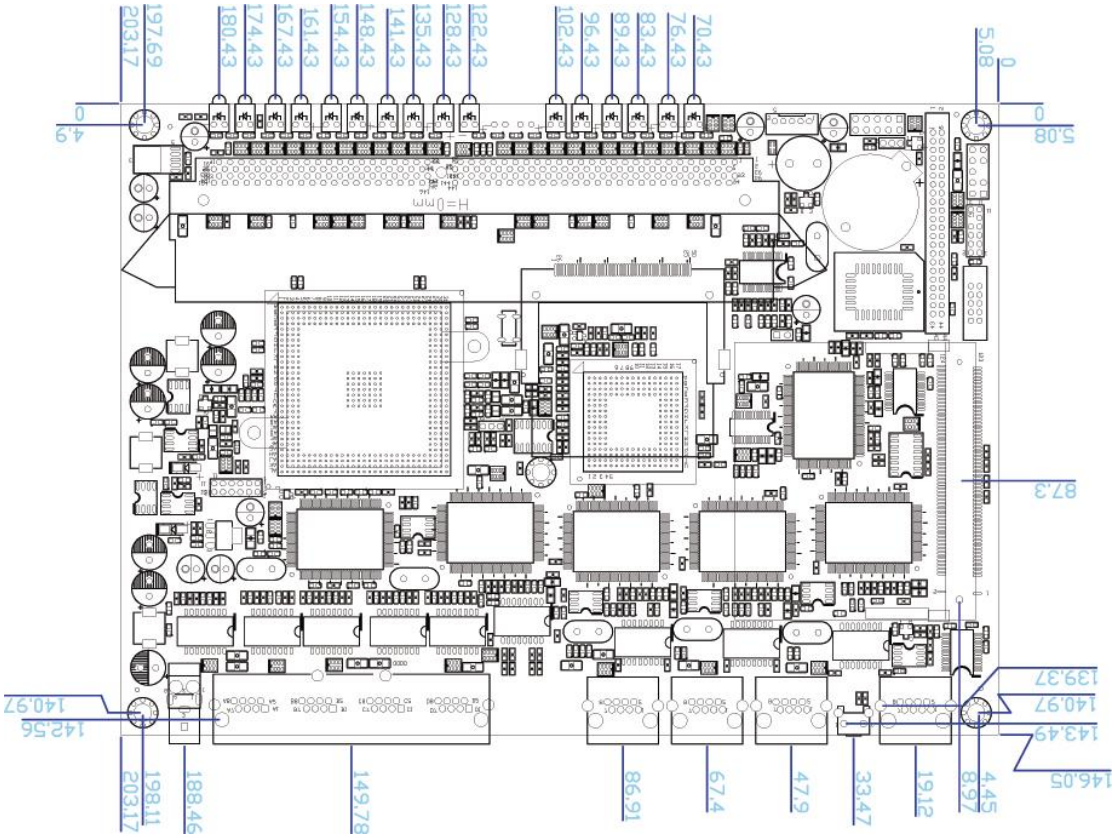


1.7 Board Dimension

CB-6971A-050

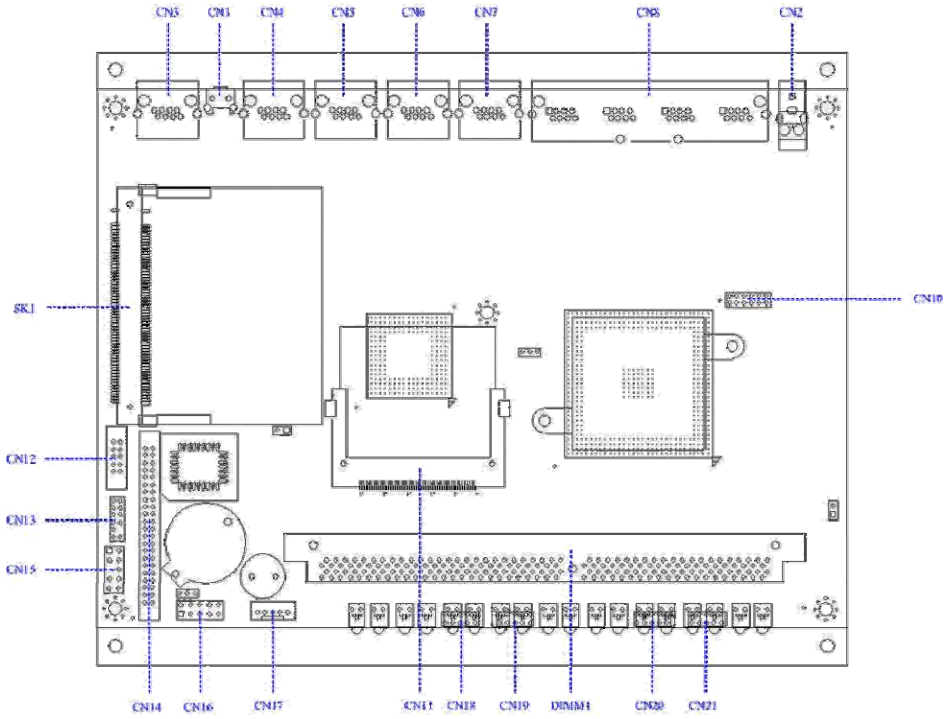


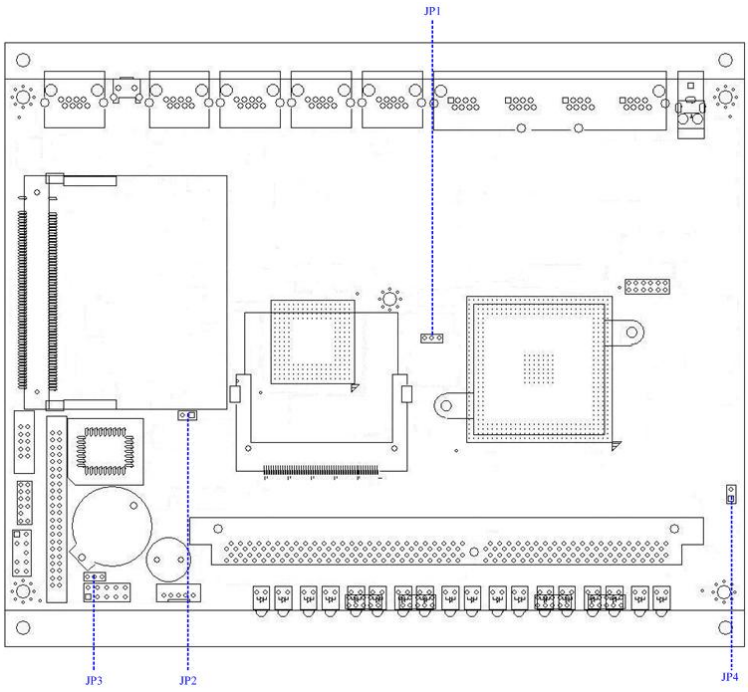
CB-6971B-050


203.17
197.69
180.43
174.43
167.43
161.43
154.43
148.43
141.43
135.43
128.43
122.43
102.43
96.43
89.43
83.43
76.43
70.43
5.08
0
4.9
0
5.08
87.3
139.37
140.97
143.49
146.05
140.97
142.56
203.17
198.11
188.46
149.78
86.91
67.4
47.9
33.47
19.12
8.97
4.45

Chapter 2. Connector/Jumper Configuration

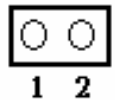
2.1 Connector/Jumper Location and Definition





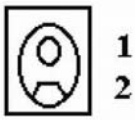
2.2 Connector and Jumper Setting

CN1: Reset button



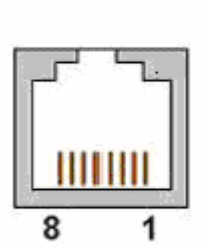
Pin	Define
1	Reset #
2	GND

CN2: External power jack



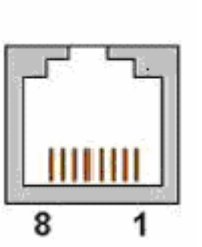
Pin	Define
1	+5V
2	Ground

CN3: COM1 RJ45 connector



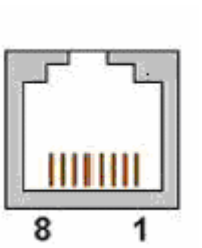
Pin	Define
1	CTS#
2	DTR#
3	TXD#
4	Console Detect#
5	GND
6	RXD#
7	DSR#
8	RTX#

CN4/5/6/7: 10/100 RJ45 connector



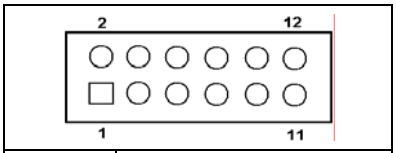
Pin	Define
1	TX+
2	TX-
3	RX+
4	Chassis Ground
5	Chassis Ground
6	RX-
7	Chassis Ground
8	Chassis Ground

CN8: Four port switch



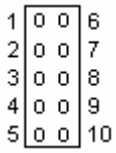
Pin	Define
1	TX+
2	TX-
3	RX+
4	Chassis Ground
5	Chassis Ground
6	RX-
7	Chassis Ground
8	Chassis Ground

CN10: VGA connector



Pin	Define
1	RED
2	GND
3	GREEN
4	+3.3V
5	BLUE
6	GND
7	GND
8	DDC DATA
9	DDC CLK
10	HSYNC
11	VSYNC
12	+5V

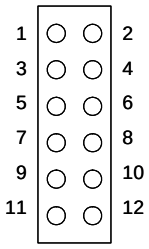
CN12: COM port pin header



Pin	Define	Pin	Define
1	DCD#	6	DSR#
2	RXD#	7	RTS#
3	TXD#	8	CTS#
4	DTR#	9	RI#
5	Ground	10	NC

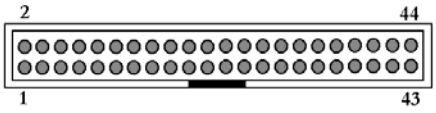
CN13: LPC bus connector

The connector is proprietary for LPC port 80 card.



Pin	Define	Pin	Define
1	VCC3	2	LAD0
3	LAD1	4	LAD2
5	LAD3	6	LFRAME#
7	PCIRST#	8	VCC
9	CLK	10	KEY PIN
11	GND	12	GND

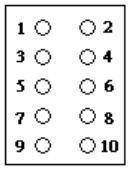
CN14: 44 Pin 2.0mm pitch IDE



Pin	Define	Pin	Define
1	RSTPIDE#	2	Ground
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	Ground	20	NC
21	PDDREQ	22	Ground
23	PDIOW#	24	Ground
25	PDIOR#	26	Ground
27	PDIORDY	28	Ground
29	PDDACK#	30	Ground
31	IRQ14	32	V5P0
33	PDA1	34	PD66#
35	PDA0	36	PDA2

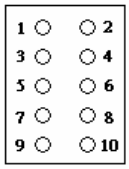
37	PDCS#1	38	PDCS#3
39	PIDELED	40	Ground
41	V5P0	42	V5P0
43	Ground	44	N/C

CN15: PS/2 Keyboard & Mouse



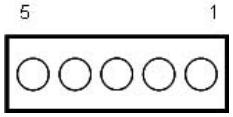
Pin	Define	Pin	Define
1	KCLK	2	MCLK
3	KDAT	4	MDAT
5	Key Pin	6	NC
7	PS2_GND	8	PS2_GND
9	PS2_VCC	10	PS2_VCC

CN16: GPIO



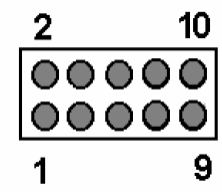
Pin	Define	Pin	Define
1	+5V	2	GPIn0
3	GPin1	4	GPIn2
5	GPin3	6	GPout0
7	GPout1	8	GPout2
9	GPout3	10	GND

CN17: USB pin header



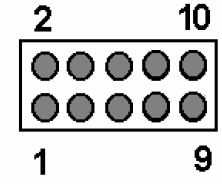
Pin	Define
1	VSBVCC
2	DATA-
3	DATA+
4	GND
5	GND

CN18: LAN LED (Optional)



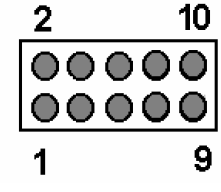
Pin	Define	Pin	Define
1	LINK 1+	2	LINK1-
3	SPEED1+	4	SPEED1-
5	LINK2+	6	LINK2-
7	SPEED2+	8	SPEED2-
9	N/C	10	N/C

CN19: LAN LED (Optional)



Pin	Define	Pin	Define
1	LINK 3+	2	LINK3-
3	SPEED3+	4	SPEED3-
5	LINK4+	6	LINK4-
7	SPEED4+	8	SPEED4-
9	N/C	10	N/C

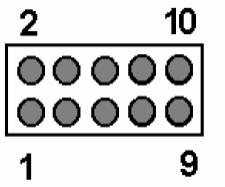
C20: Switch LED (Optional)



Pin	Define	Pin	Define
1	Switch 1 LINK+	2	Switch 1 LINK-

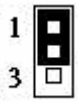
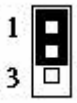
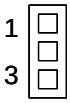
3	Switch 1 SPEED+	4	Switch 1 SPEED-
5	Switch 2 LINK+	6	Switch 2 LINK-
7	Switch 2 SPEED+	8	Switch 2 SPEED-
9	Switch 3 LINK+	10	Switch 3 LINK-

C21: Switch/Power/HDD LED

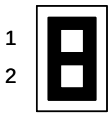
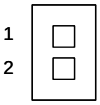


Pin	Define	Pin	Define
1	Switch 3 SPEED+	2	Switch 3 SPEED-
3	Switch 4 LINK+	4	Switch 4 LINK-
5	Switch 4 SPEED+	6	Switch 4 SPEED-
7	IDE ACTIVE+	8	IDE ACTIVE-
9	PW LED+	10	PW LED-

JP1/JP4: DDR Speed & Voltage Detect

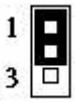
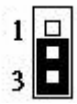
JP1		JP4		Setting
	1-2		1-2 (ON)	DDR-400/2.6V
	2-3		1-2 (OFF)	DDR-333/2.5V

JP2: Compact Flash Select

Pin		Setting
	1-2 (ON)	Master (Default)
	1-2 (OFF)	Slave

JP3: Clear CMOS

Pin	Setting

	1-2	Normal (Default)
	2-3	Clear CMOS

Chapter 3 BIOS Setup

The ROM chip of your CB-6971 board is configured with a customized Basic Input/Output System (BIOS) from Phoenix-Award BIOS. The BIOS is a set of permanently recorded program routines that give the system its fundamental operational characteristics. It also tests the computer and determines how the computer reacts to instructions that are part of programs.

The BIOS is made up of code and programs that provide the device-level control for the major I/O devices in the system. It contains a set of routines (called POST, for Power-On Self Test) that check out the system when you turn it on. The BIOS also includes CMOS Setup program, so no disk-based setup program is required CMOS RAM stores information for:

- Date and time
- Memory capacity of the main board
- Type of display adapter installed
- Number and type of disk drives

The CMOS memory is maintained by battery installed on the CB-6971 board. By using the battery, all memory in CMOS can be retained when the system power switch is turned off. The system BIOS also supports easy way to reload the CMOS data when you replace the battery of the battery power lose.

3.1 Quick Setup

In most cases, you can quickly configure the system by choosing the following main menu options:

1. Choose "Load Optimized Defaults" from the main menu. This loads the setup default values from the BIOS Features Setup and Chipset Features Setup screens.
2. Choose "Standard COS Features" from the main menu. This option lets you configure the date and time, hard disk type, floppy disk drive type, primary display and more.
3. In the main menu, press F10 ("Save & Exit Setup") to save your changes and reboot the system.

3.2 Entering the CMOS Setup Program

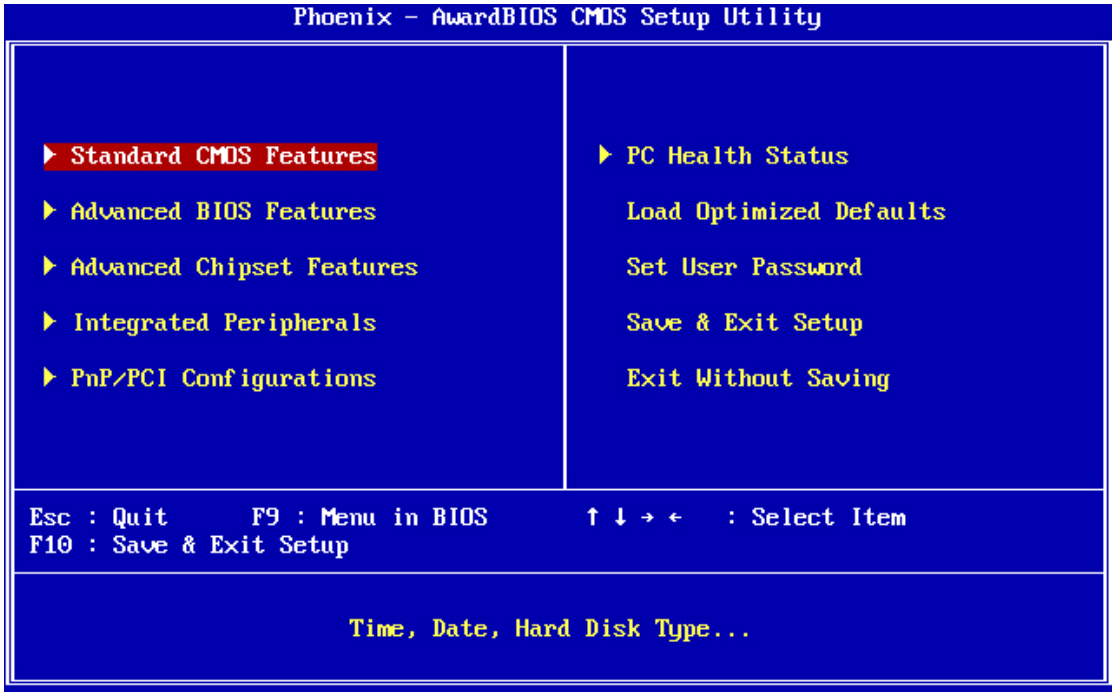
Use the CMOS Setup program to modify the system parameters to reflect the options installed in your system and to customize your system. For example, you should run the Setup program after you:

- Received an error code at startup
- Install another disk drive
- Use your system after not having used it for a long time
- Find the original setup missing
- Replace the battery
- Change to a different type of CPU
- Run the Phoenix-Award Flash program to update the system BIOS

Run the CMOS Setup program after you turn on the system. On-screen instructions explain how to use the program.

⇩ **Enter the CMOS Setup program's main menu as follows:**

1. Turn on or reboot the system. After the BIOS performs a series of diagnostic checks, the following message appears:
   "Press DEL to enter SETUP"
2. Press the <DEL> key to enter CMOS Setup program. The main menu appears:



3. Choose a setup option with the arrow keys and press <Enter>. See the following sections for a brief description of each setup option.

In the main menu, press F10 ("Save & Exit Setup) to save your changes and reboot the system. Choosing "EXIT WITHOUT SAVING" ignores your changes and exits the program. Pressing <ESC> anywhere in the program returns you to the main menu.

3.3 Menu Options

The main menu options of the CMOS Setup program are described in the following and the following sections of this chapter.

STANDARD CMOS FEATURES:

Configure the date & time, hard disk drive type, floppy disk drive type, primary display type and more

ADVANCED BIOS FEATURES:

Configure advanced system options such as enabling/disabling cache memory and shadow RAM

ADVANCED CHIPSET FEATURES:

Configure advanced chipset register options such DRAM timing

INTEGRATED PERIPHERALS:

Configure onboard I/O functions

PNP/PCI CONFIGURATION:

Configure Plug & Play IRQ assignments and PCI slots

PC HEALTH STATUS:

Configure the CPU speed and, if the optional system monitor IC is installed, view system information

LOAD OPTIMIZED DEFAULTS:

Loads optimized BIOS settings

SET USER PASSWORD:

Configure the system so that a password is required when the system boots or

you attempt to enter the CMOS setup program. When you log in with this password, you will be able to enter the CMOS Setup main menu, but you can not enter other menus in the CMOS Setup program.

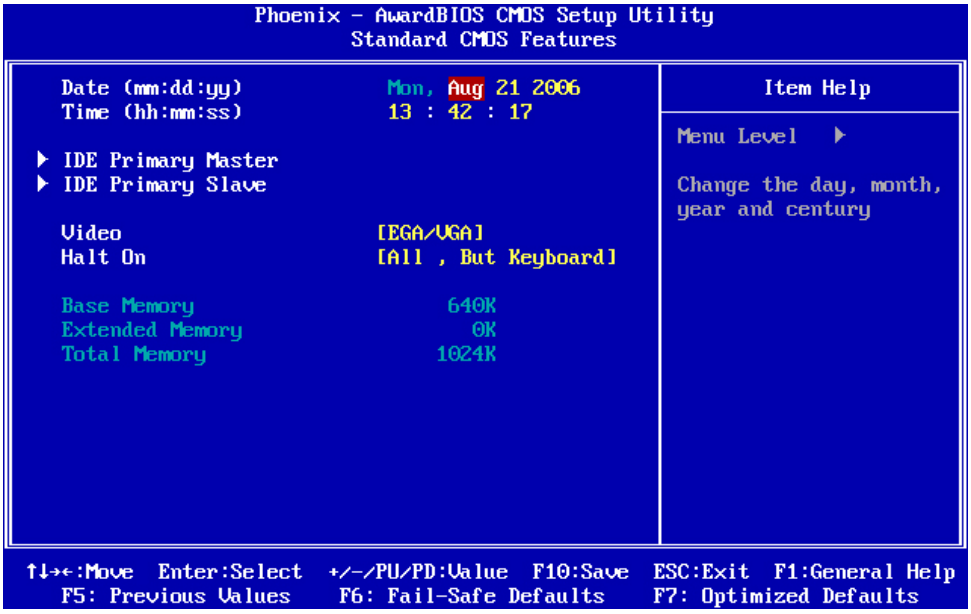
SAVE & EXIT SETUP:
Save changes of values to CMOS and exit the CMOS setup program

EXIT WITHOUT SAVING:
Abandon all CMOS changes and exit the CMOS setup program

3.4 Standard CMOS Features Setup

⇩ **Use the Standard CMOS Setup option as follows:**

1. Choose "Standard CMOS Features" from the main menu. The following screen appears:



2. Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDN/+/- keys. Some fields let you enter numeric values directly.

Option	Description
Date (mm:dd:yy)	Type the current date
Time (hour: min: sec)	Type the current time (24-hour clock)
IDE channel	Select from "Auto", "User", or "None"

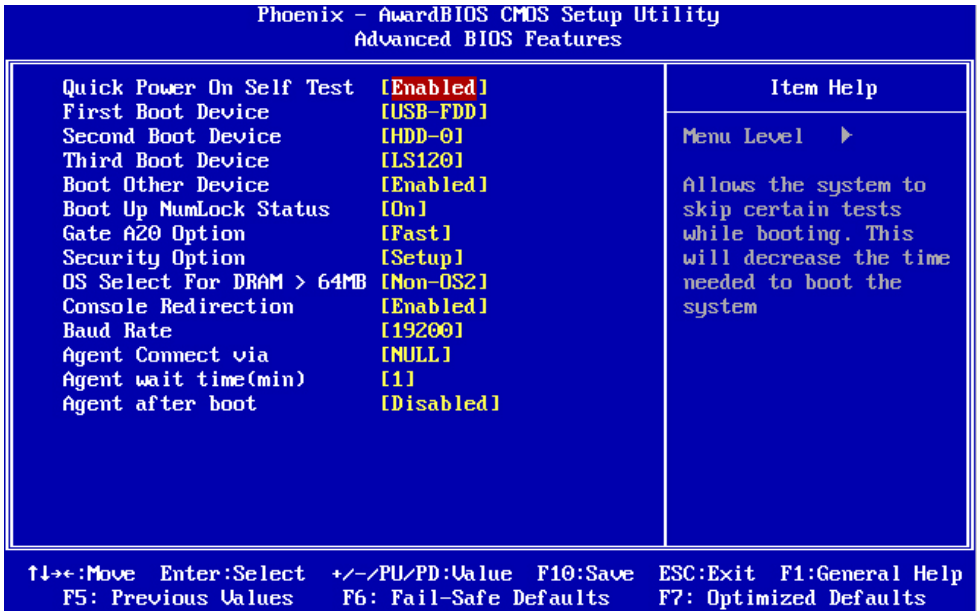
	If your drive is not one of the predefined types, choose "User" and enter the following drive specifications: Cylinders, heads, Wpcom, L-Zone, sectors, and mode Consult the documentation received with the drive for the values that will give you optimum performance.
Video	Select the default video device: EGA/VGA, CGA 40, CGA 80, Mono
Halt On	Select the situation what you want BIOS to stop power on self test process and notice you. Choose: <All Errors> <No Errors/ All> <But Keyboard> <All, But Diskette> <All, But Disk/Key>

3. After you have finished with the Standard CMOS Features program, press the <ESC> key to return to the main menu.

3.5 Advanced BIOS Features Setup

⇩ **Use the Advanced BIOS Features Setup option as follows:**

1. Choose "Advanced BIOS Features Setup" from the main menu. The following screen appears:



2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUP/PgDN keys. Press the <F1> "Help"

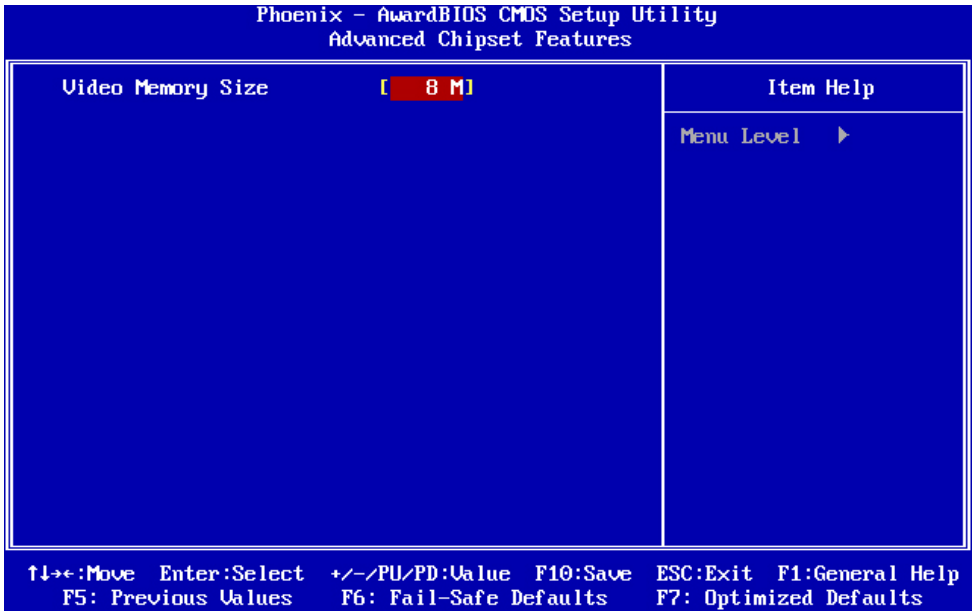
key for information on the available options:

Option	Description
Quick Power On Self Test	Skip some checking items and speed up the power on process.
First/Second/Third Boot Device	The BIOS attempts to load the operating system from the devices in the sequence selected in these items. Choose: HDD-0, LS-120, USB FDD…..
Boot Other Device	Set up other device to be bootable.
Boot Up NumLock Status	Select power on status of NumLock.
Gate A20 Option	Gate A20 is a device used to address memory above 1 MB. Fast (Default): Select chipset controller to control Gate 20. Normal: Select Keyboard controller to control Gate 20.
Security Option	Select whether the password is required for system boot or enter Setup menu. System: the system will not boot and not access Setup menu if the password is wrong. Setup: the system can boot, but not allow to access Setup menu if the password is wrong.
OS Select for DRAM > 64MB	Select OS/2 if your system is using OS/2 and has a memory size of more than 64MB. Default is Non-OS2.
Console Redirection	Choose <enabled> allowing connecting the server of hyper terminal to monitor client side. It has to be worked under DOS mode, and the client terminal doesn't need graphic function.
Baud Rate	The data transfer rate (bit per second) to agent. Choose 9600/19200/38400/57600/115200 item.
Agent Connect via	Select <Null> to let agent connect directly.
Agent wait time (min)	Agent negotiate time, choose 1/2/4/8 min.
Agent after boot	Choose <enabled> for agent to administrate the system after boot.

3.6 Advanced Chipset Features Setup

⇩ **Use the Advanced Chipset Features Setup option as follows:**

1. Choose "Advanced Chipset Features Setup" from the main menu. The following screen appears;



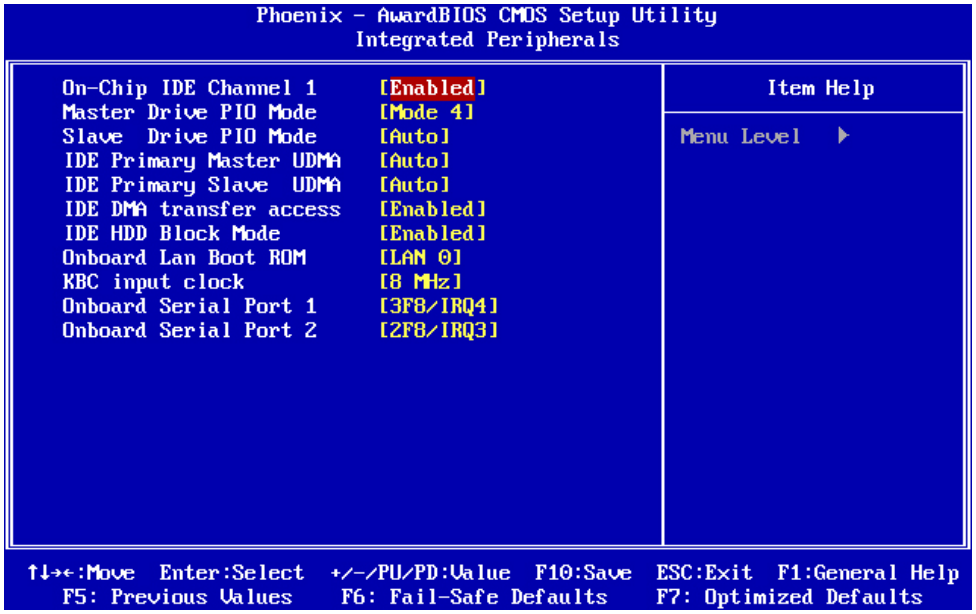
2. Move between items and select values by using the arrow keys. Modify the selected fields using the PnUP/PgDN Keys. For information on the various options, press
<F1> key .

Option	Description
Video Memory Size	Select the amount of memory taken from system memory to be used by onboard video hardware.

3.7 Integrated Peripherals

⇩ **Use the Integrated Peripherals Setup option as follows:**

1. Choose "Integrated Peripherals Setup" from the main menu. The following screen appears:



2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. Please press the <F1> key for information on the various options.

Option	Description
OnChip IDE Channel 1	Select Enabled to activate the primary IDE interface.
Master Drive PIO Mode	Allow you to set a PIO (Programmed Input/Output) mode (0-4) for Master IDE drive that the onboard IDE interface supports. In Auto mode, the system automatically determines the best mode.
Slave Drive PIO Mode	Allow you to set a PIO (Programmed Input/Output) mode (0-4) for Slave IDE drive that the onboard IDE interface supports. In Auto mode, the system automatically determines the best mode.
IDE Primary Master UDMA	If the device in IDE Primary Master interface and operation system supports DMA, select Auto to enable UltraDMA33/66/100 implementation.
IDE Primary Slave UDMA	If the device in IDE Primary Slave interface and operation system supports DMA, select Auto to enable UltraDMA33/66/100 implementation.
IDE DMA transfer access	Allow you to enable or disable DMA (Direct Memory Access) support for all IDE devices.

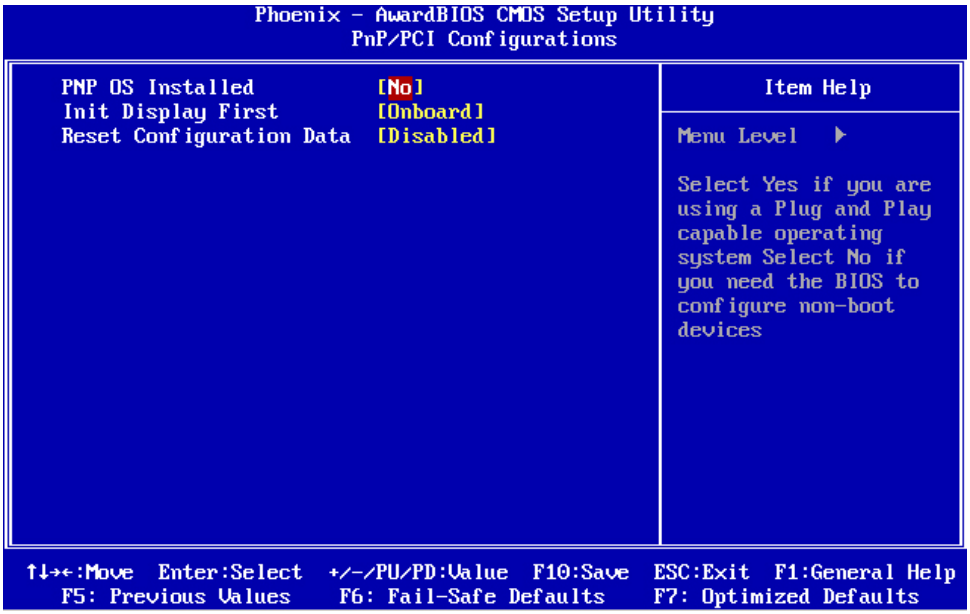
IDE HDD Block Mode	Enabled to speed up hard disk access by transferring data from multiple sectors at once instead of using the old single sector transfer mode.
Onboard Lan Boot ROM	Allow you to enable or disable the booting from the onboard LAN or a network add-in card with a remote boot ROM installed.
KBC Input Clock	Allow you to set keyboard controller frequency.
Onboard Serial Port 1	Set onboard serial port 1, the options are 3F8/IRQ4、2F8/IRQ3、3E8/IRQ4、2E8/IRQ3、AUTO.
Onboard Serial Port 2	Set onboard serial port 2, the options are 3F8/IRQ4、2F8/IRQ3、3E8/IRQ4、2E8/IRQ3、AUTO

3.8 PNP/PCI Configuration

This option is used to configure Plug and Play assignments and route PCI interrupts to designated ISA interrupts.

⇩ **Use the PNP/PCI Configuration Setup option as follows:**

1. Choose "PNP/PCI Configuration Setup" from the main menu, the following screen appears.



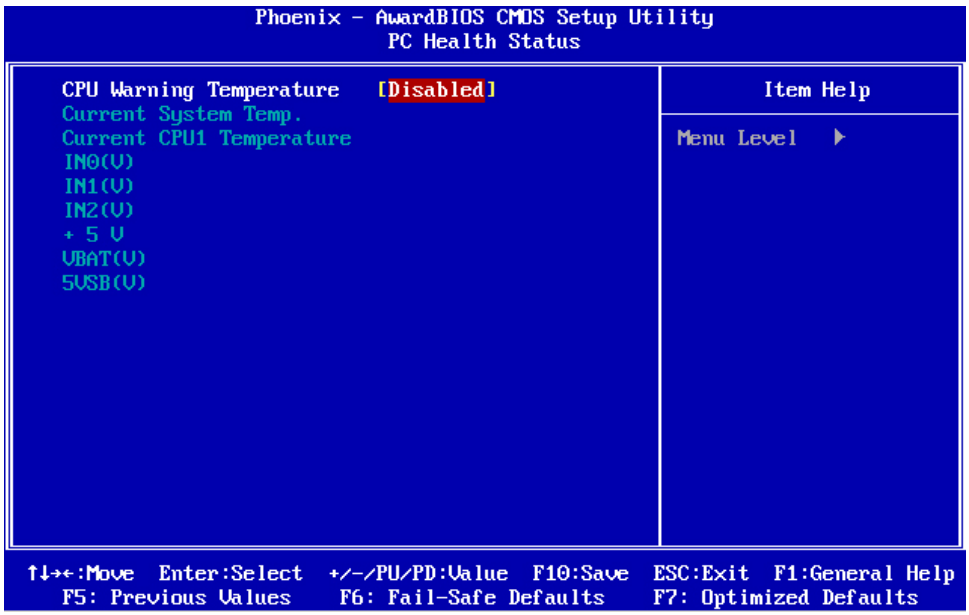
2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. For information on the various options, please press <F1> key.

Option	Description
PNP OS installed	NO: BIOS program will adjust all the set up by itself YES: When you install the system that support plug & play, press <YES>
Init Display First	Allow to choose the priority of PCI VGA card or onboard.
Reset Configuration Data	Enabled will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configure data. Disabled will not reset the configuration data.

3. Please press the <ESC> key to return the main menu after finishing with the PNP/PCI Configuration Setup.

3.9 PC Health Status Configuration Setup

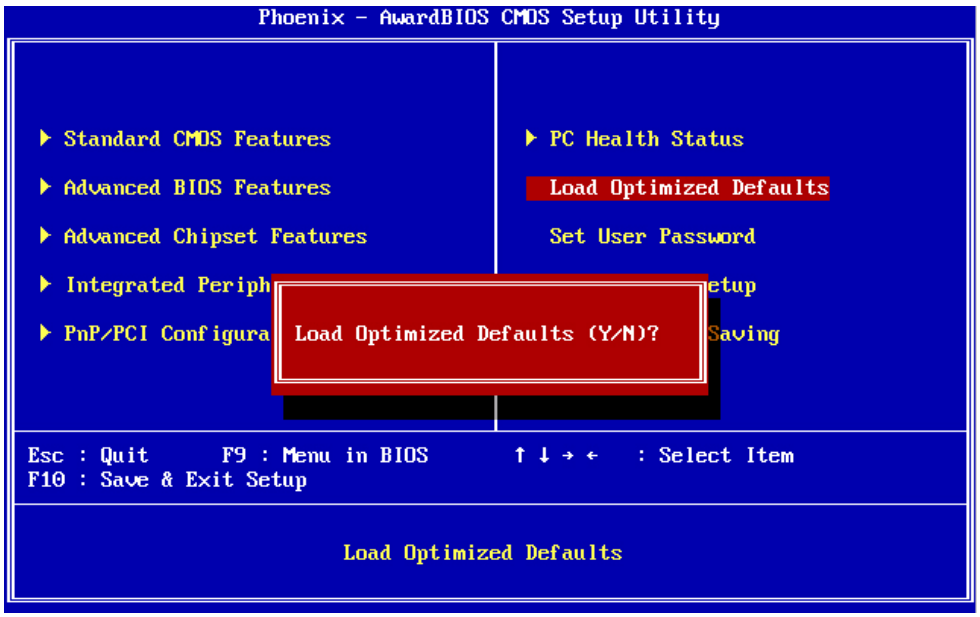
Choose "PC Health Status Configuration Setup" from the main menu, the following screen appears:



Option	Description
CPU Warning Temperature	An alarm will beep when the CPU temperature is higher than the maximum limit. The default is <Disabled> and alarm will not beep.

3.10 Load Optimized Defaults

This option loads optimized settings stored in the BIOS ROM. The auto-configured settings do not affect the Standard CMOS Setup screen.



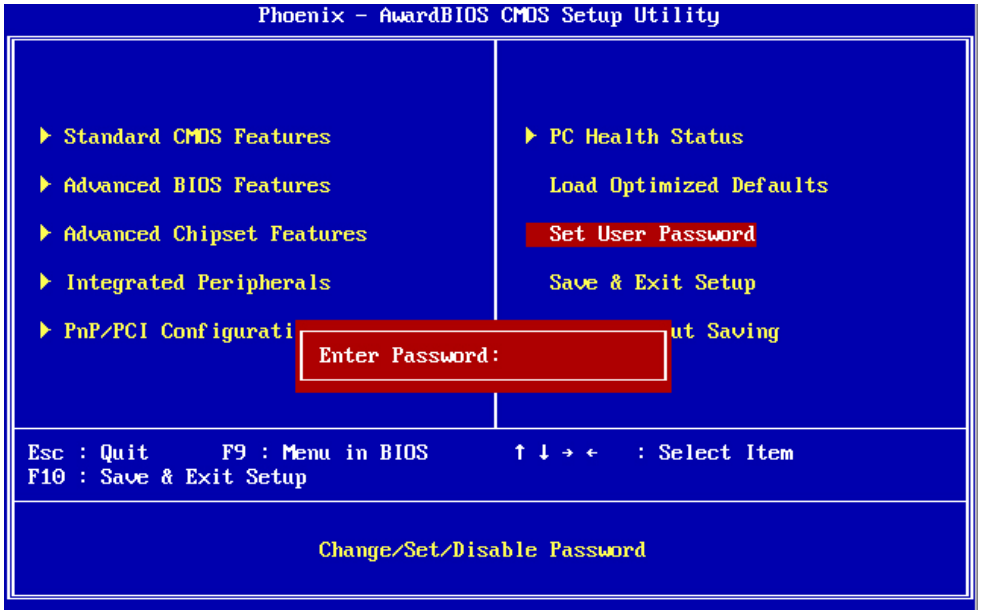
To use this feature, highlight it on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Optimized Default Values. Press the <Y> key and then press <Enter> if you want to load the SETUP default.

3.11 Set User Password

The password options let you prevent unauthorized system boot-up or unauthorized use of CMOS setup. The User Password allows access to the system and the CMOS Setup Utility main menu.

The password functions are disabled by default. You can use these options to enable a password function or, if a password function is already enabled, change the password.

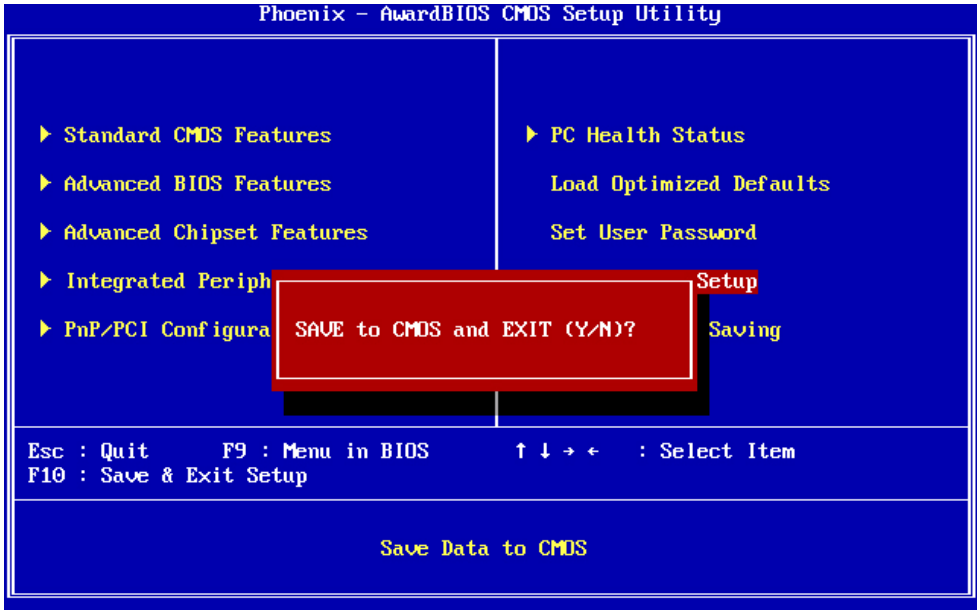
To change a password, first choose a password option from the main menu and enter the current password. Then type your new password at the prompt. The password is case sensitive and you can use up to 8 alphanumeric characters. Press <Enter> after entering the password. At the Next Prompt, confirm the new password by typing it and pressing <Enter> again.



After you use this option to enable a password function, use the "Security Option" in "BIOS Feature Setup" to specify whether a password is required every time the system boots or only when an attempt is made to enter the CMOS Setup program.

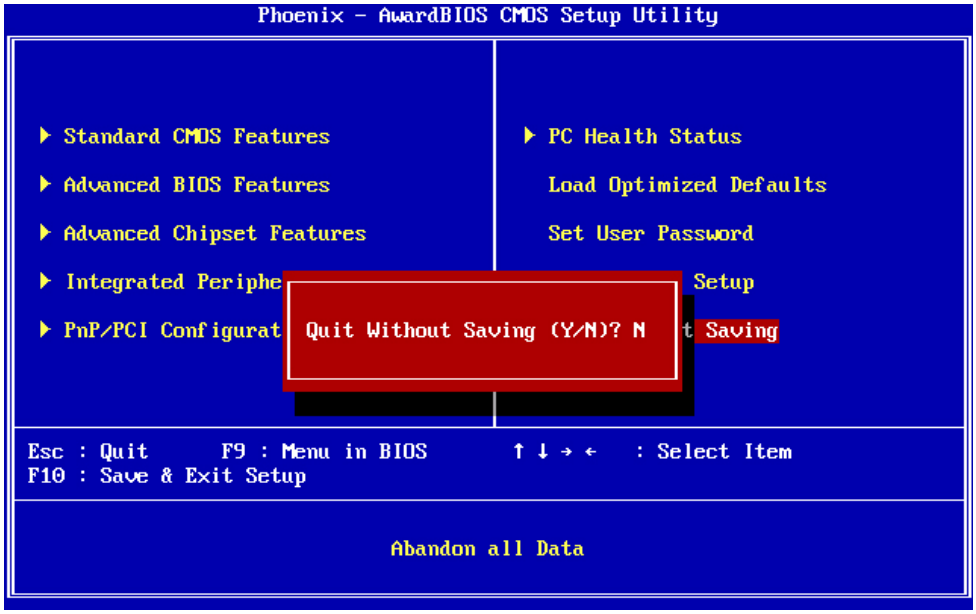
3.12 Save and Exit Setup

This function automatically saves all CMOS values before exiting Setup.



3.13 Exit Without Saving

Use this function to exit Setup without saving the CMOS value.



Chapter 4. Utility & Driver Installation

4.1 Operation System Supporting

CB-6971 can support Windows® and Linux® operation system as follows. Before installation, please check your OS version. If your OS is not in the following list, please upgrade your OS version.

OS	Version
Windows®	Windows® 2000 SP4/Windows® XP SP2
Linux®	Fedora Core 2/Linux® 2.6 or above

4.2 System Driver Installation

CB-6971 offers the system driver in the setup CD. Please install the driver follow the below procedures.

1. Click the [Device Manager] tab.
2. Choose "Entertainment Encryption/Decryption Device" in Other Devices.
3. Right click it and pick update driver.
4. Choose "Install from a list or specific location" and click next.
5. Choose "Don't search. I will choose the driver to install." and click next.
6. Choose "Show All Devices", select "Have Disk".
7. Aim at the Setup CD and click OK.
8. Find "Geode LX AES Crypto Driver", click next.
9. Following the instruction to finish the installation.

4.3 VGA Driver Installation

CB-6971 offers the VGA driver in the setup CD. Please install the driver follow the below procedures.

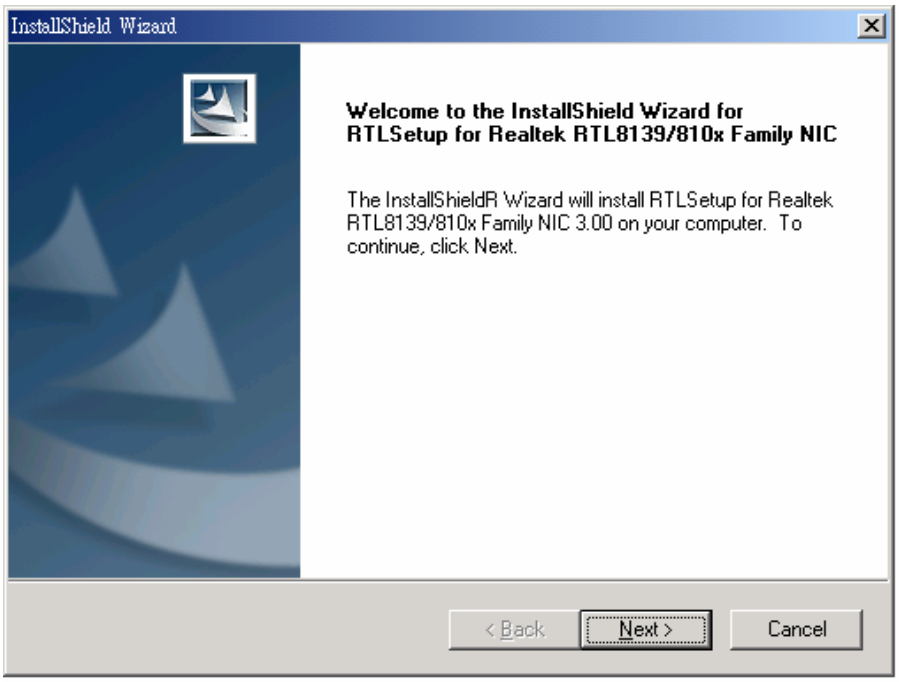
1. Click the [Device Manager] tab.
2. Choose “Video Controller (VGA Compatible)” in Other Devices.
3. Right click it and pick update driver.
4. Choose "Install from a list or specific location" and click next.
5. Choose "Don't search. I will choose the driver to install." and click next.
6. Choose "Display Adapters".
7. Aim at the Setup CD and click OK.

8. Find the suitable driver file, click next.
9. Following the instruction to finish the installation.

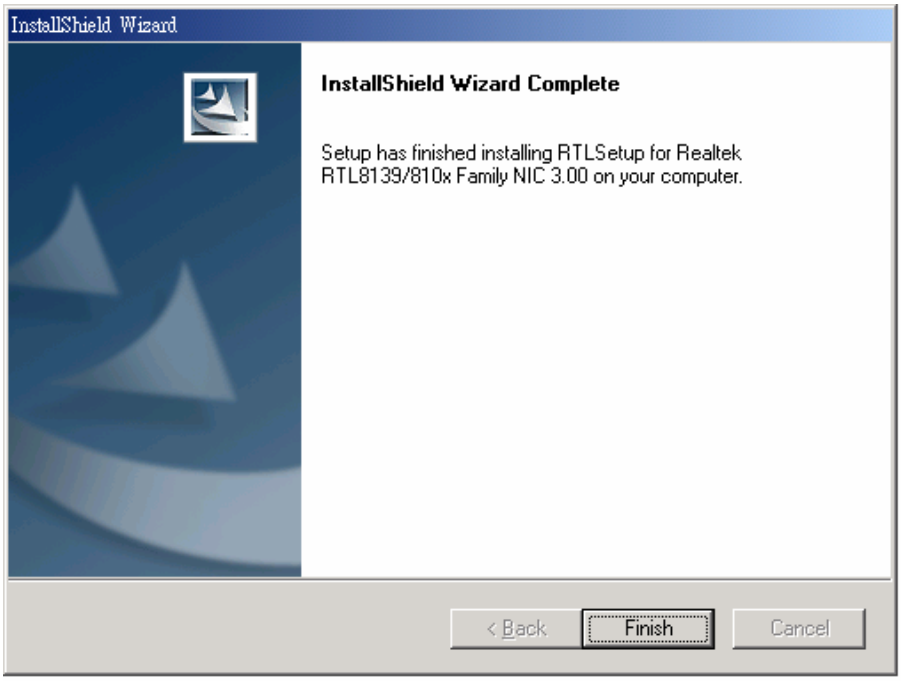
4.4 LAN Driver Installation

CB-6971 support Ethernet controlled by using Realtek® 8139CL+ chipset. Please install the driver follow the below procedures.

1. Insert the setup CD of CB-6971 into your CD-ROM drive.
2. Choose the Drivers file to click the Setup icon.
3. Click [Next] button.



4. Click [Finish] button.



Appendix A: Optional Accessory and Cable List

The VGA header of CB-6971 must work via additional adapter card and cable as follows. It can be for customer to test or developing use.

Part No.	Item	Description
MB06018-1-01	VGA adapter card	Adapter Module of VGA header
46-I0002X6-00	2*6 Cable	2mm, 20cm cable of MB06018