USER'S MANUAL
Of
AMD 790GX & AMD SB750
Based

M/B For Socket AM2+ Quad Core

AMD Processor

Trademark:

* Specifications and information contained in this documentation are furnished for information use only, and are

subject to change at any time without notice, and should not be construed as a commitment by manufacturer.

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

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USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
4.0	Forth Edition	October. 2008

Item Checklist

- ☑ AMD790GX Platform Processor Chipset based motherboard
- ☑ User's Manual
- ☑ CD for motherboard utilities
- ☑ Switch Card
- ☑ Cable Package

AMD K10 Processor Family
Cooling Solutions

As processor technology pushes to faster speeds and higher performance with increasing operation clock, thermal management becomes increasingly crucial while building computer systems. Maintaining the proper computing environment without thermal increasing is the key to reliable, stable, and 24 hours system operation. The overall goal is keeping the processor below its specified maximum case temperature. Heatsinks induce improved processor heat dissipation through increasing surface area and concentrated airflow from attached active cooling fans. In addition, interface materials allow effective transfers of heat from the processor to the heatsink. For optimum heat transfer, AMD recommends the use of thermal grease and mounting clips to attach the heatsink to the processor.

Please refer to the website below for collection of heatsinks evaluated and recommended for Socket AM2+ processors by AMD. In addition, this collection is not intended to be a comprehensive listing of all heatsinks that support Socket-AM2+ processors.

Chapter 1

Introduction of AMD790GX Motherboards

1-1   Features of motherboard

The AMD790GX chipset motherboard series are based on the latest AMD790GX Chipset and the SB750 chipset which supports the innovative 64-bit AMD Socket AM2+ dual core and quad core AMD Phenom™ processors and 64-bit AMD Socket AM2+/AM2 multi-tasking Socket AM2 Athlon64 X2 processors and Sempron Processors. With an integrated low-latency high-bandwidth DDRII memory controller and a highly-scalable Hyper Transport technology-based system bus up to HT 3.0. AMD790GX Platform Processor Chipset motherboard series deliver the outstanding system performance and professional desktop platform solution with the advantages of new generation 64-bit AMD Socket AM2+ and Socket AM2 AMD Phenom™ FX, AMD Phenom™ Athlon64 FX ，Athlon64 X2，Athlon64 & Sempron processors.

The AMD790GX Series motherboards support new generation Socket AM2+ processors with an integrated DDRII memory controller for Dual channel DDRII400/ DDRII533 /DDRII667 /DDRII800/DDRII 1066 (AM2 Sempron processors only support up to DDRII667 memory) DDRII Module up to 8GB, also provide optional   DDRII or DDRIII 128Mb GPU Memory . The motherboard is embedded with SB750 chipset of providing ULTRA ATA 133 connectors and Serial ATA2 with RAID 0, 1, 10,5 functions which support up to one IDE and six Serial ATA2 devices to accelerate hard disk drives and guarantee the data security without failure in advanced computing performance.

The AMD790GX motherboards provide 10/100/1000 LAN function with RTL8111C PCI-E Gigabit LAN which supports 10/100/1000Mbps data transfer rate. And the embedded 8-channel HD Audio CODEC is fully compatible with Sound Blaster Pro standards that offer you with the home cinema quality and satisfying software compatibility.

The AMD790GX Series motherboards deliver outstanding value and performance for gamers, with a true bandwidth design for Multi-GPU configurations. This high bandwidth architecture in the AMD 790GX chipset are with the flexibility for single or dual card or three cards configurations. The AMD 790GX chipset provide 2 x16@8 line PCI Express slots to support simultaneous operation of graphics cards for astonishing performance with brilliant and intense 3D graphics.

AMD790GX Series motherboard series offer two PCI-Express2.0x16 graphics slots. Two PCI-Express x16@8 deliver up to 4Gbyte/sec data transfer rate at each relative direction. When PE4 installed switch card, the PE1 will doubled its bandwidth. Two PCI Express x1 I/O slot offers 1024 Mbyte/sec concurrently, over 7 times more bandwidth than PCI at 133Mbye/sec, tackling the most demanding multimedia tasks nowadays .The AMD790GX motherboards also carry two 32-bit PCI slots guarantee the rich connectivity for the I/O peripheral devices. This motherboard support Hybrid CrossFireX function, the VGA Card on PE1 or PE4 will activate a Hybrid CrossFire with the onboard VGA Card, the performance will be increased 15% to 75%.

_1_

Embedded USB controllers as well as capability of expanding to 12 of USB2.0 functional ports delivering 480Mb/s bandwidth of rich connectivity, these motherboards meet the future USB demands which are also equipped with hardware monitor function on system to monitor and protect your system and maintain your non-stop business computing.

Some special features--- *CPU Thermal Throttling/ CPU Vcore 7-shift / CPU Smart Fan / DeBug Port /OC-CON (optional)/ DIY Clear / Power On Button/ Reset Button.* in this motherboard are designed for power user to use the over-clocking function in more flexible ways. But please be caution that the over-clocking maybe causes the fails in system reliabilities. This motherboard provides the guaranteed performance and meets the demands of the next generation computing. But if you insist to gain more system performance with variety possibilities of the components you choose, please be careful and make sure to read the detailed descriptions of these value added product features, please get them in the coming section.

1-1.1 Special Features of Motherboard

CPU Thermal Throttling Technology---(The CPU Overheat Protection Technology)
To prevent the increasing heat from damage of CPU or accidental shutdown while at high workload, the CPU Thermal Throttling Technology will force CPU to enter partially idle mode from 87.5% to 12.5% according to preset CPU operating temperature in BIOS (from 40℃ to 90℃). When the system senses the CPU operating temperature reaching the preset value, the CPU operating bandwidth will be decreased to the preset idle percentage to cool down the processor. When at throttling mode the beeper sound can be optionally selected to indicate it is in working. (For detail operating please read Section 3-11 Bi-turbo Configuration)

CPU Smart Fan---(The Noise Management System)
It's never been a good idea to gain the performance of your system by sacrificing its acoustics. CPU Smart Fan Noise Management System is the answer to control the noise level needed for now-a-day's high performance computing system. The system will automatically increase the fan speed when CPU operating loading is high, after the CPU is in normal operating condition, the system will low down the fan speed for the silent operating environment. The system can provide the much longer life cycle for both CPU and the system fans for game use and business requirements.

CPU Vcore 7-Shift--- (Shift to Higher Performance)
The CPU voltage can be adjusted up by 31 steps for the precisely over-clocking of extra demanding computing performance.

Debug Port --- (The Professional Hardware Diagnosis System)
Being bugged of abnormal system failure through the tossed and turned nights no more, the embedded Hardware Debug Port offers you the real-time visual system healthy for the demanding usage of computing. No more bugging by unknown system failure and no more time wasted in the first moment of 24-hour nonstop ping business computing, the embedded Debug Port will turn you into a well training hardware professional with the seeing system situation. (The Post Code please refer to appendix)

Optional OC-CON --- （High-polymer Solid Electrolysis Aluminum Capacitors）
The working temperature is from 55 degrees Centigrade below zero to 125 degrees Centigrade, OC-CON capacitors possess superior physical characteristics that can be while reducing the working temperature between 20 degrees Centigrade each time, intact extension 10 times of effective product operation lives, at not rising degrees Centigrade of working temperatures each time a relative one, life of product decline 10% only too.

DIY Clear… The CMOS button is to facilitate the clear CMOS process for power user overclocking function. The user can easily clear or restore CMOS setting by pressing the button without tacking trouble to remove the case and locate the jumper for clear CMOS .

Power On Button…   You can easily start the computer by pressing down this button for a few seconds, without troubling yourself to locate the front panel jumpers to find the Power on jumper.

Reset Button..:   You can easily restart the computer by pressing down this button for a few seconds, without troubling yourself to locate the front panel jumpers to find the reset jumper**.**

1-2   Specification

Spec	Description
Design	● ATX form factor 4 layers PCB size: 30.5cm*24.5cm
Chipset	● AMD790GX North Bridge Chipset ● AMD SB750 South Bridge Chipset
CPU Socket AM2+	● Support 64bit AMD Athlon64 940-Pin package utilizes Flip-Chip Pin Grid Array package processor ● Support for future AMD Athlon64 940-pin Dual –Core Athlon 64x2 processor, Athlon 64 & Sempron Processors with HTT Frequency 1GHz and the latest AMD Phenom™ FX, quad core AMD Phenom™ processors with HTT 3.0.
Memory Socket	● 240-pin DDRII Module socket x 4 ● Support 4pcs DDRII400/DDRII533/DDRII667/DDRII800/DDRII1066 Modules Expandable to 8GB ● Dual channel supported ● DDRII 128Mb GPU Memory(for HA07 &HA07-GT) ● DDRIII 128Mb GPU Memory(for HA07ULTRA)
Expansion Slot	● 2pcs PCI-Express x16 by 8 lane ● 2pcs PCI-Express x1 slot ● 32-bit PCI slot x 2pcs
Integrate IDE and Serial ATA2 RAID	● One IDE controllers support PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100/133 functions that deliver the data transfer rate up to 133 MB/s for 2 IDE Devices and for 4 Serial ATA2 ports providing 300 MB/sec data transfer rate with RAID 0, 1, 10,5 functions
Gigabit LAN	● Integrated RTL8111C PCI-E 10 / 100 / 1000 LAN. ● Support Fast Ethernet LAN function of providing 10Mb/100Mb/1000 Mb/s data transfer rate
8 CH-Audio	● Realtek ALC888 Azalia 8-channel Audio Codec integrated ● Support 8-channel 3D surround & Positioning Audio ● Audio driver and utility included
BIOS	● Award 8MB Flash ROM BIOS
Multi I/O	● PS/2 keyboard and PS/2 mouse connectors ● HDMI Connector / DVI Connector / VGA Connector ● USB2.0 port x 4 and headers x 4 ● ESATA Connector x1(optional) ● RJ-45 Connector x1 ● Audio connector x1 (8CH Audio) ● Floppy disk drive connector x1 /Hard Disk Drive Connector x1 ● Serial port header x1 ● HDMI-SPDIF header x1 ● IR header x1

1-3   Performance List

The following performance data list is the testing result of some popular benchmark testing programs. These data are just referred by users, and there is no responsibility for different testing data values gotten by users (the different Hardware & Software configuration will result in different benchmark testing results.)

Performance Test Report

CPU: Athlon 5000+
DRAM: SamSun 667MHz 1*2
VGA Card: onboard
Hard Disk Driver: Seagate160GB SATA

BIOS: T01
OS: Windows XP Professional (SERVICE PACK 2)

	AMD 790GX
3D Mark 2001SE	10814
3D Mark 2003	3589
3D Mark 2005	2797
AQUAMRK3	4146
PCMark2004	
System / CPU / Memory	4283/5232/3281
Graph / HDD	2029/4977
Content Creation Winstone 2004	37.4
Business Winstone 2004	28.3
Winbench 99 V2.0:	
Business/Hi-end Disk Winmark99	20070023
Business/Hi-end Graphic Winmark	N/A
SYSMark 2004: SISMark Rating(Internet Content Creation / Office Productivity)	
SYSMark 2004	332/194
3D Creation/2D Creation	297/399
Web publication	309
Communication/Document Creation	167/233
DATA Analysis	188
SISOFT Sandra 2007 : 1.CPU Arithmetic Benchmark 2.Memory bandwidth Benchmark 3.CPU Multi-Media Benchmark ver:1140	
1. Dhrystone ALU MIPS	18856
Whetstone FPU iSSE3 FLOPS	15937
2.Int/Float Buffered iSSE2 MB/S	6738/6691
3.Integer/Floating-Point IT/S	48962/53968
UT2003 Benchmark (flyby/botmatch)	158.51/84.602921
Quake3 DEMO1 /DEMO2 FPS	334.4/332.8
DOOM 3 FPS	N/A
Super Pi (1M) Second	36.2611
CPUZ System / CPU Clock	26GHz

1-4 Layout Diagram

Rear I / O for AMD790GX based Motherboard

Optional ESATA
DVI Connector
RJ-45 LAN
Line-IN
RS-OUT
PS/2 Mouse
Line-OUT
CS-OUT
PS/2 Keyboard
SS-OUT
MIC-IN
HDMI
VGA Connector
USB
USB

ATX 12V Power Connector
PS2 KB/Mouse Port
SYSFAN2 Connector
CPUFAN
KBMB/USB Power On(JP1)
HDMI Connector
DDR2 Socket x 4
VGA and DVI Connector
Optional E-SATA1
ATX Power Conn.
E-SATA Over USB Connector (CN1)
ATA 133 IDE Conn.(IDE1)
RJ45 Over USB Connector (UL1)
CPU Socket AM2+
Audio Connector (J1)
Floppy Connector
DDR3 128Mb GPU Memory for HA07ULTRA
Optional 4-pin PWR Connector (HA07/HA07 Ultra)
DDR2 128Mb GPU Memory for HA07/HA07-GT
Reset
RTL8111C Gigabit LAN
AMD 790GX Chipset
AMD SB750 Chipset
Power
PCI Express x1
CHA FAN
PCI Express x16 by 8-lane
PCI Express x1
Serial-ATAII Connectors SATA1, 2,3,4,5,6
HDMI-SPDIF
Clear CMOS （JBAT）
Realtek ALC888 Audio Decode
8MBit Flash ROM BIOS
Speaker Power Led
PCI Slot
Front Panel Connector
CMOS1
Audio
CDIN IR Connector
USB Port (USB1, 2,3,4)
SYSFAN1 Connector
COM Connector

5

Jumpers

Jumper	Name	Description	Page
JP1	Keyboard/USB Power On Enabled/Disabled	3-pin Block	P.7
JBAT	Clear CMOS Header	3-pin Block	P.7

Connectors

Connector	Name	Description	Page
ATXPWR1	ATX Power Connector	24-pin Block	P.13
ATX12V	ATX 12V Power Connector	8-pin Block	P.13
KB	PS/2 Mouse & PS/2 Keyboard Connector	6-pin Female	P.13
CN1 for USB	USB2.0 Port Connector	4-pin Connector	P.13
J3 (optional)	Power Connector	4-Pin Block	P.13
UL1 for RJ45LAN	Gigabit LAN Port Connector	RJ-45 Connector	P.13
J1	8-CH HD Audio Connector	6- phone jack Conn.	P.14
FDD	Floppy Driver Connector	34-pin Block	P.14
IDE1	Primary IDE Connector	40-pin Block	P.14
SATA1~SATA6, E-SATA1(optional)	Serial ATAII IDE Connectors	7-pin Connector	P.14
CN1 for ESATA(optional)	External Serial ATAII Connector	7-pin Connector	P.15
VGA1	Serial ATAII IDE Connectors	15-pin Connector	P.15
DVI	Serial ATAII IDE Connectors	29-pin Connector	P.15
HDMI	Serial ATAII IDE Connectors	19-pin Connector	P.15

Headers

Header	Name	Description	Page
AUDIO1	Front Panel SPEAKER, MIC header	9-pin Block	P.16
USB1, USB2,USB3,USB4	USB Port Headers	9-pin Block	P.16
SPEAK	PC Speaker connector	4-pin Block	P.16
PWR LED	Power LED	3-pin Block	P.16
JW−FP1 (Reset/IDE LED/Power Button)	Front Panel Header (including IDE activity LED/Reset switch / Power On Button lead)	9-pin Block	P.16
SYSFAN1/2, CHAFAN	FAN Headers	3-pin Block	P.17
CPUFAN	FAN Header	4-pin Block	P.17
CDIN1	CD Audio-In Header	4-pin Block	P.17
IR	IR infrared module Headers	5-pin Block	P.17
COM1	Serial Port COM1 Header	9-pin Block	P.18
HDMI-SPDIF	SPDIF Out header	2-pin Block	P.18

Expansion Sockets

Socket/Slot	Name	Description	Page
ZIF Socket AM2+	CPU Socket	940-pin PGAB Athlon64 CPU Socket	P.9
DIMM1~4	DDRII Module Socket	240-pin DDRII Module Socket	P.10
PCI1~ PCI2	PCI Slots	32-bit PCI Local Bus Expansion slots	P.12
PE2,PE3	PCI-Express x1Slot	PCI-Express x1 Expansion Slot	P.12
PE1,PE4	PCI-Express x16 Slot	PCI-Express x16 Expansion Slot	P.12

Chapter 2
Hardware Installation

WARNING!	Turn off your power when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

2-1 Hardware installation Steps

Before using your computer, you had better complete the following steps:

1. Check motherboard jumper setting
2. Install CPU and Fan
3. Install System Memory (DIMM)
4. Install Expansion cards
5. Connect IDE and Front Panel /Back Panel cable
6. Connect ATX Power cable
7. Power-On and Load Standard Default
8. Reboot
9. Install Operating System
10. Install Driver and Utility

2-2 Checking Motherboard's Jumper Setting

(1) Keyboard/USB function Enabled/Disabled: JP1

JP1

1-2 Closed KB/USB Power ON Disable (Default**)**

JP1

2-3 Closed KB/USB Power ON Enabled

Keyboard/Mouse & USB Power On Setting
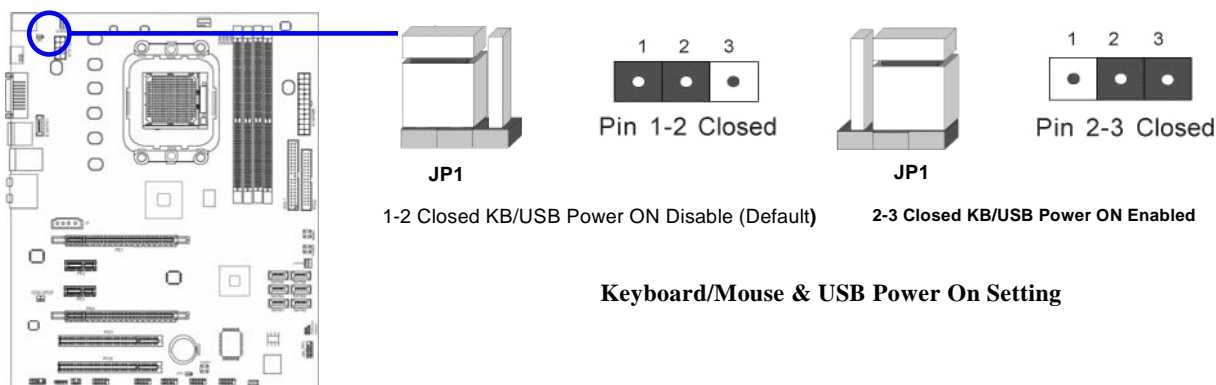
(2) CMOS RAM Clear (3-pin) : JBAT

A battery must be used to retain the motherboard configuration in CMOS RAM short 1-2 pins of JBAT to store the CMOS data.

To clear the CMOS, follow the procedure below:

1. Turn off the system and unplug the AC power
2. Remove ATX power cable from ATX power connector
3. Locate JBAT and short pins 2-3 for a few seconds
4. Return JBAT to its normal setting by shorting pins 1-2
5. Connect ATX power cable back to ATX power connector

Note: When should clear CMOS

1. Troubleshooting

2. Forget password

---

3. After over clocking system boot fail

JBAT   **JBAT**

1-2 Closed   Normal   2-3 Closed   Clear CMOS

CMOS RAM Clear Setting
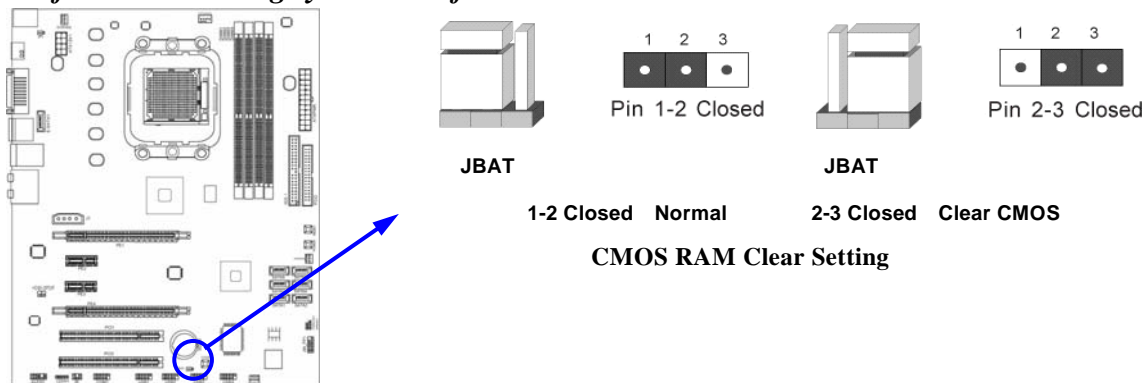
2-3   Install CPU

2-3-1 Glossary

Chipset (or core logic) - two or more integrated circuits which control the interfaces between the system processor, RAM, I/O devises, and adapter cards.

Processor socket - the socket used to mount the system processor on the motherboard.

Slot (PCI-E, PCI, RAM) - the slots used to mount adapter cards and system RAM.

PCI - **P**eripheral **C**omponent **I**nterconnect - a high speed interface for video cards, sound cards, network interface cards, and modems; runs at 33MHz.

PCI Express2.0- Peripheral Component Interconnect Express2.0, developed in 2003, the speed of each line doubled from the previous PCI-E of 2.5 Gbps to 5 Gbps.

Serial Port - a low speed interface typically used for mouse and external modems.

Parallel Port - a low speed interface typically used for printers.

PS/2 - a low speed interface used for mouse and keyboards.

USB - **U**niversal **S**erial **B**us - a medium speed interface typically used for mouse, keyboards, scanners, and some digital cameras.

Sound (interface) -   the interface between the sound card or integrated sound connectors and speakers, MIC, game   controllers, and MIDI sound devices.

LAN (interface) -   **L**ocal **A**rea **N**etwork - the interface to your local area network.

BIOS (**B**asic **I**nput/**O**utput **S**ystem) - the program logic used to boot up a computer and establish the relationship between the various components.

Driver - software, which defines the characteristics of a device for use by another device or other software.

Processor - the "central processing unit" (CPU); the principal integrated circuit used for doing the "computing" in "personal computer"

Front Side Bus Frequency - the working frequency of the motherboard, which is generated by the clock generator for CPU, DRAM and PCI BUS.

CPU L2 Cache - the flash memory inside the CPU, normal it depend on CPU type.

2-3-2 About AMD Athlon64 Socket AM2+ CPU

This motherboard provides a socket AM2+ surface mount, Zero Insertion Force (ZIF) socket, referred to as the mPGA940 socket supports AMD AM2+ processor in the 940 Pin package utilizes Flip-Chip Pin Grid Array package technology.

The CPU that comes with the motherboard should have a cooling FAN attached to prevent overheating. If this is not the case, then purchase a correct cooling FAN before you turn on your system.

WARNING!	Be sure that there is sufficient air circulation across the processor's heatsink and CPU cooling FAN is working correctly, otherwise it may cause the processor and motherboard overheat and damage, you may install an auxiliary cooling FAN, if necessary.

To install a CPU, first turn off your system and remove its cover.   Locate the ZIF socket and open it by first pulling the level sideways away from the socket then upward to a 90-degree angle.   Insert the CPU with the correct orientation as shown below.   The notched corner should point toward the end of the level.   Because the CPU has a corner pin for two of the four corners, the CPU will only fit in the orientation as shown.

Colden Arrow →

Socket AM2+

CPU ZIF mPGAB Socket
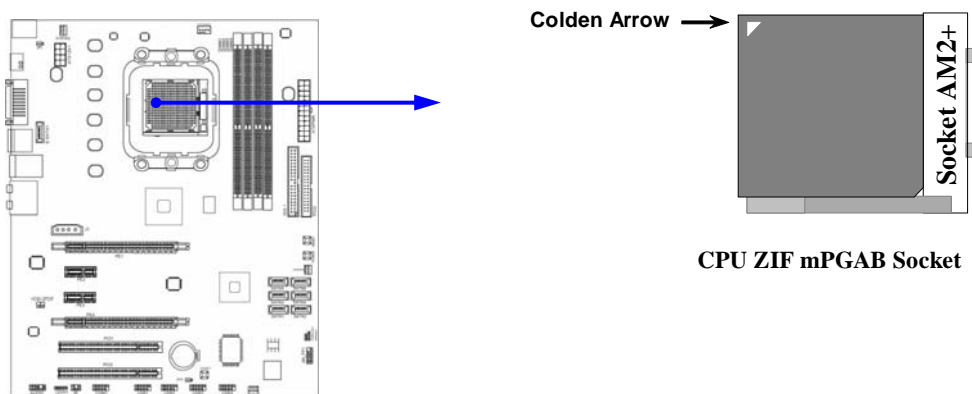
When you put the CPU into the ZIF socket, No force required to insert of the CPU, and then press the level to locate position slightly without any extra force.

2-4   Install Memory

This motherboard provides four 240-pin DDR2 DUAL INLINE MEMORY MODULES (DIMM) socket for DDR2 memory expansion available from minimum memory volume of 128MB to maximum memory volume of 8GB DDRII SDRAM.

Valid Memory Configurations

Bank	240-Pin DIMM	PCS	Total Memory
Bank 0, 1 (DIMM1)	DDR2 667/DDR2 800/DDR2 1066	X1	128MB~2GB
Bank 2, 3 (DIMM2)	DDR2 667/DDR2 800/DDR2 1066	X1	128MB~2GB
Bank 4, 5 (DIMM3)	DDR2 667/DDR2 800/DDR2 1066	X1	128MB~2GB
Bank 6, 7 (DIMM3)	DDR2 667/DDR2 800/DDR2 1066	X1	128MB~2GB
Total	System Memory (Max 8GB)	4	128MB~8GB

Dual channel Limited!
1.   Dual channel function only supports when 2 DIMM Modules plug in either both DIMM1 & DIMM2or DIMM3 &DIMM4, or four DIMM Modules plug in DIMM1~DIMM4.
2.   DIMM1 & DIMM2, or DIMM3& DIMM4 must be the same type, same size, same frequency for dual channel function.

Install DDR SDRAM modules to your motherboard is not difficult, you can refer to figure below to see how to install a 240-Pin DDRII533/DDR2 667/DDR2 800/DDR2 1066SDRAM module.
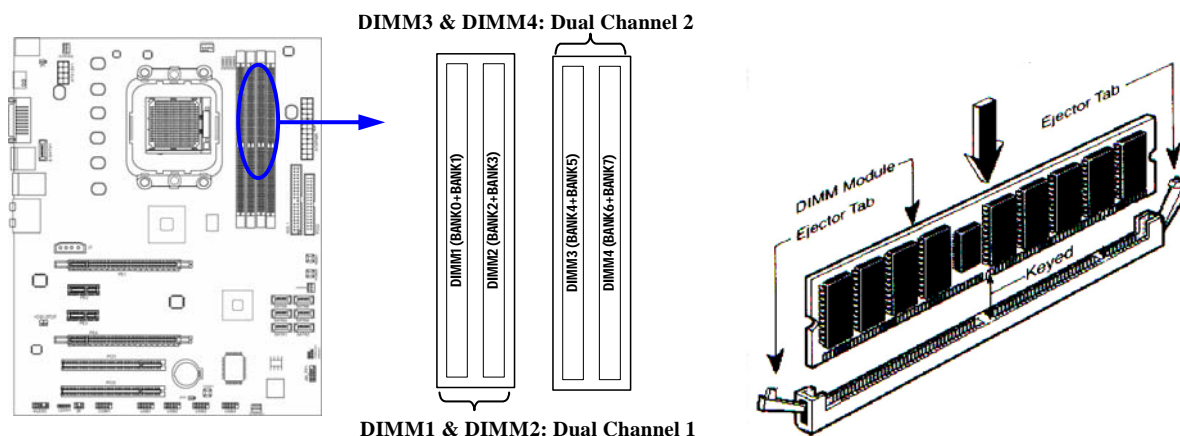
Graph 2-4

NOTE!	When you install DIMM module fully into the DIMM socket the eject tab should be locked into the DIMM module very firmly and fit into its indention on both sides.
WARNING!	For the DDR SDRAM CLOCK is set at 400MHz, use only DDR2 800- compliant DDR2 Modules. When this motherboard operate at 400Mhz, most system will not even boot if non-compliant modules are used because of the strict timing issues, if your DDR Modules are not DDR2 800-compliant, set the SDRAM clock to 200MHz to ensure system stability.

2-5   Expansion Cards

2-5-1 Procedure For Expansion Card Installation

1. Read the documentation for your expansion card and make any necessary hardware or software setting for your expansion card such as jumpers.
2. Remove your computer's cover and the bracket plate on the slot you intend to use.
3. Align the card's connectors and press firmly.
4. Secure the card on the slot with the screen you remove above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary.
7. Install the necessary software driver for your expansion card.

2-5-2 Assigning IRQs For Expansion Card

Some expansion cards need an IRQ to operate.   Generally, an IRQ must exclusively assign to one use.   In a standard design, there are 16 IRQs available but most of them are already in use.

Standard Interrupt Assignments

IRQ	Priority	Standard function
0	N/A	System Timer
1	N/A	Keyboard Controller
2	N/A	Programmable Interrupt
3 *	8	Communications Port (COM2)
4 *	9	Communications Port (COM1)
5 *	6	Sound Card (sometimes LPT2)
6 *	11	Floppy Disk Controller
7 *	7	Printer Port (LPT1)
8	N/A	System CMOS/Real Time Clock
9 *	10	ACPI Mode when enabled
10 *	3	IRQ Holder for PCI Steering
11 *	2	IRQ Holder for PCI Steering
12 *	4	PS/2 Compatible Mouse Port
13	N/A	Numeric Data Processor
14 *	5	Primary IDE Channel
15 *	1	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices.

2-5-3 Interrupt Request Table For This Motherboard

Interrupt request are shared as shown the table below:

	INT A	INT B	INT C	INT D	INT E	INT F	INT G	INT H
Slot 1	√							
Slot 2		√						
Onboard USB 3			√					
HD Audio/MC97			√					

NOTE!	If using PCI cards on shared slots, make sure that the drivers support "Shared IRQ" or that the cards don't need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

2-5-4 PCI Express Slot

Two PCI-Express2.0 x16@8 lane graphic slot offer 4Gbyte/sec data transfer rate at each relative direction and up to 8Gbyte/sec concurrent bandwidth at full speed. Two x1 PCI Express Slot offer 1024Mbyte/sec concurrently over 7 times more bandwidth than PCI at 133Mbye/sec, tackling the most demanding multimedia tasks nowadays. Fully compliant to the *PCI Express Base Specification revision2.0*, support PCI Express VGA card, and other PCI Express device. This motherboard support Hybrid CrossFireX function.

PCI-E x16 Slot@8-lane

PCI-E x1 Slot

PCI-E x16 Slot@8-lane

32-bit PCI Slot
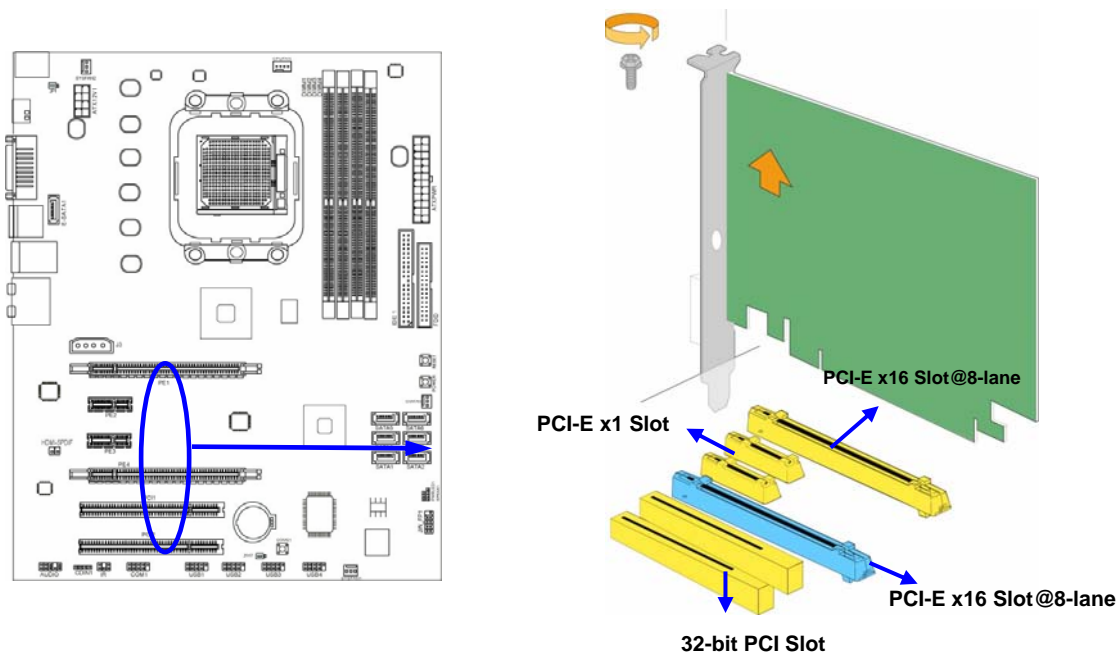
2-6 Connectors, Headers
2-6-1 Connectors
(1)   Power Connector (24-pin block) : ATXPWR1

ATX Power Supply connector: This is a new defined 24-pins connector that usually comes with ATX case. The ATX Power Supply allows using soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard.   When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed.   Press this switch again will turn off the power to the system board.

**   We recommend that you use an ATX 12V Specification 2.0-compliant power supply unit (PSU) with a minimum of 350W power rating. This type has 24-pin and 4-pin power plugs.

**   If you intend to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 15A on +12V and the power supply unit has a minimum power rating of 350W. The system may become unstable or may not boot up if the power is inadequate.

PIN	ROW1	ROW2
1	3.3V	3.3V
2	3.3V	-12V
3	GND	GND
4	5V	Soft Power On
5	GND	GND
6	5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V (for Soft Logic)	+5V
10	+12V	+5V
11	+12V	+5V
12	+3V	GND

ROW1 ROW2

ROW1 ROW2

Pin 1   Pin 1

20-Pin   **24-Pin**
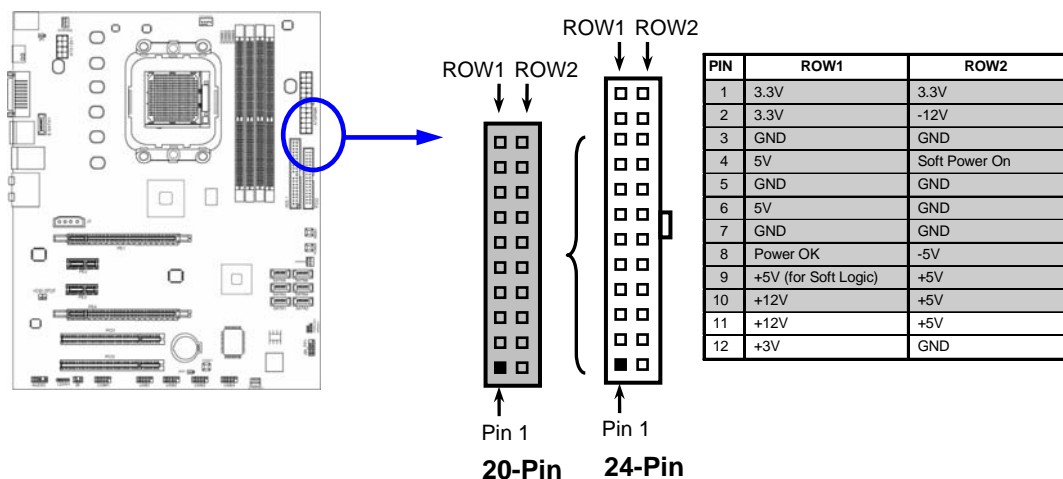
(2)   ATX 12V Power Connector (8-pin block) : ATX12V

This is a new defined 8-pins connector that usually comes with ATX Power Supply. The ATX Power Supply which fully supports Socket AM2+ processor must including this connector for support extra 12V voltage to maintain system power consumption. Without this connector might cause system unstable because the power supply can not provide sufficient current for system.

Pin 1
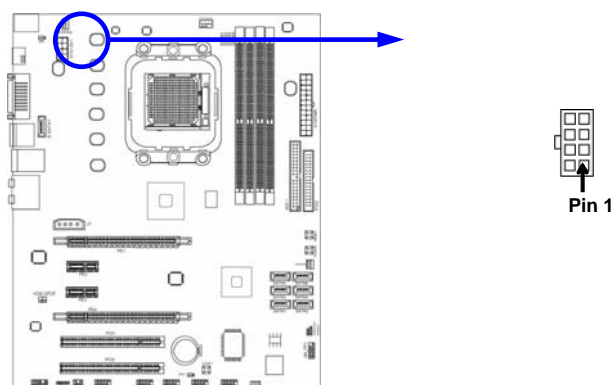
(3) PS/2 Mouse & PS/2 Keyboard Connector: KB

The connectors are for PS/2 keyboard and PS/2 Mouse.

(4) USB Port connector: CN1/ UL1 for USB

The connectors are 4-pin connector that connects USB devices to the system board.

(5) LAN Port connector: UL1 for RJ45 LAN

The connector is standard RJ45 connector for Network. It supports 10M/100Mb/1000Mb s data transfer rate

(6) J3 Power Connector: Large 4-Pin Power Connector (Optional)

The connectors are 4-pin connector that supports extra 12V / 5V power to your system

13
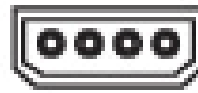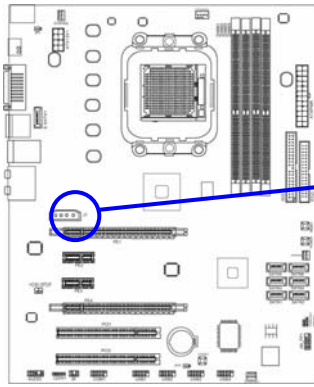
(7) Audio Line-In, Lin-Out, MIC, RS-Out, CS-Out，SS-Out connector : J1

These Connectors are 6 Phone-Jack for LINE-OUT, LINE-IN, MIC, RS-Out, CS-Out，SS-Out audio connections.

Line-in : (BLUE)	Audio input to sound chip
Line-out : (GREEN)	Audio output to speaker
MIC : (PINK)	Microphone Connector
RS-OUT : (BLACK)	Rear-Surround audio output
CS-OUT : (ORANGE)	Center/ Subwoofer audio output
SS-OUT: (GRAY)	Side-Surround audio output
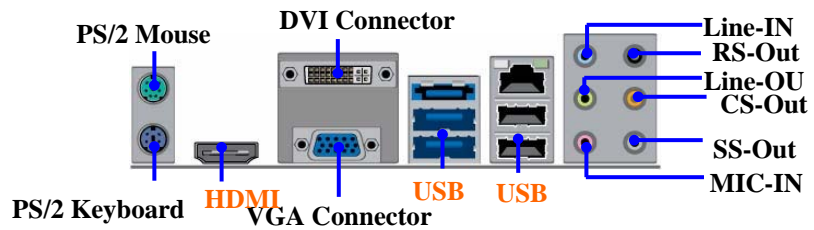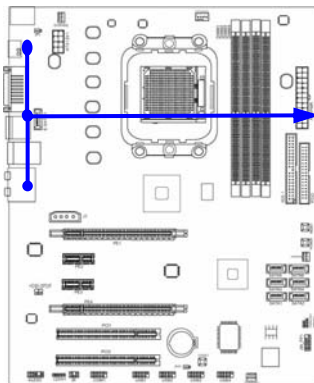
(8) Floppy drive Connector (34-pin block): FDD

This connector supports the provided floppy drive ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to the floppy drives.

Floppy Drive Connector
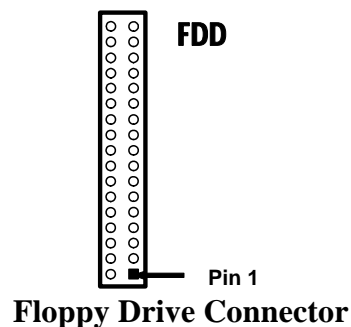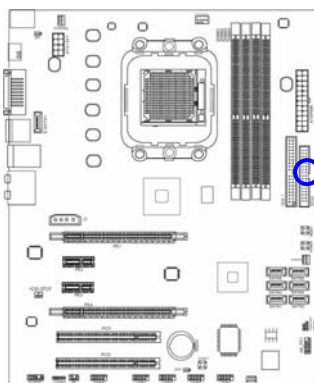
(9) Primary IDE Connector (40-pin block): IDE1

This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by

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setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings.

Primary IDE Connector
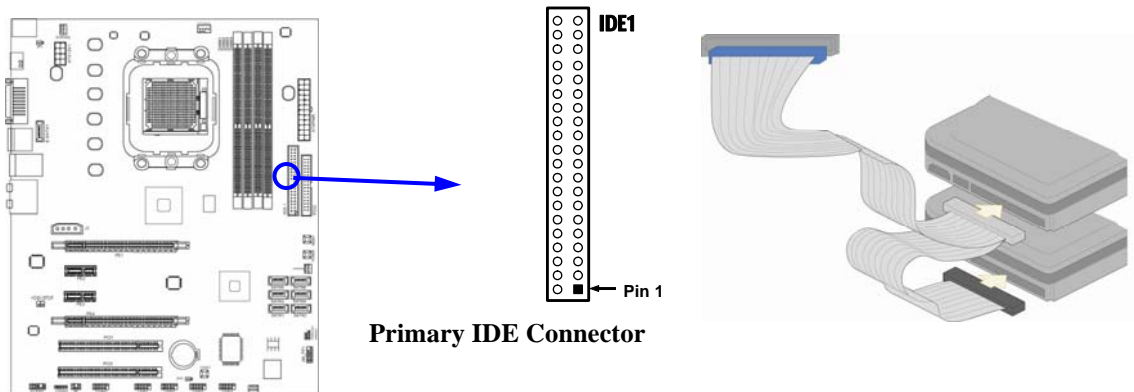
- Two hard disks can be connected to each connector. The first HDD is referred to as the "Master" and the second HDD is referred to as the "Slave".
- For performance issues, we strongly suggest you don't install a CD-ROM or DVD-ROM drive on the same IDE channel as a hard disk. Otherwise, the system performance on this channel may drop.

(10) Serial-ATAII Port connector: SATA1~SATA6; E-SATA1(optional)

This connector supports the provided Serial ATA2 IDE hard disk cable to connecting the motherboard with serial ATAII hard disk. E-SATA1 is not for SATA harddrive ,it is only for connecting to SATAII 1, SATA II 2, SATA3,SATA4,SATA5,SATA6 to let the ESATA port work.
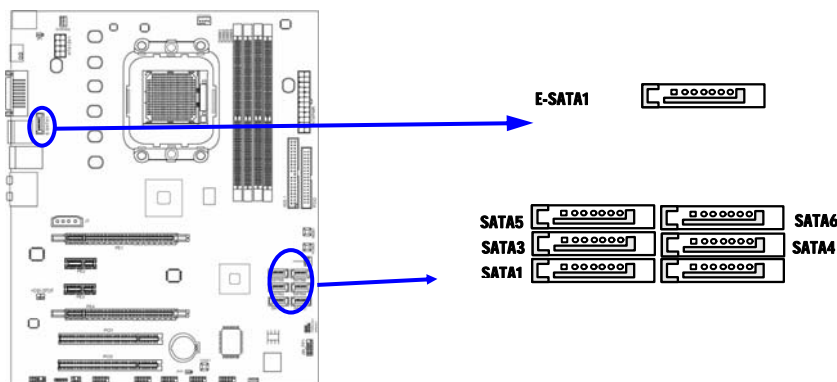
(11) ESATA Port: CN1 for ESATA(optional)

This connector supports the External Serial ATA2 (ESATA) enable the full SATA interface speed outside the chassis, up to 3Gb/s. The ESATA port can be enabled only when the E-SATA 1 is connected to one of SATA 1~SATA6.

(12) D-Sub 15-pin Connector: VGA1

VGA is the 15-pin D-Subminiature female connector; it is for the display devices, such as the CRT monitor, LCD monitor and so on.

(13) Digital Visual Interface: DVI

This interface standard designed to maximize the visual quality of digital display devices such as flat panel LCD computer displays and digital projectors.

(14) High-Definition Multimedia Interface: HDMI

This point-to-point interface is for audio and video signals designed as a single-cable solution for home theater and consumer electronics equipment.

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2-6-2 Headers
(1) Line-Out/MIC Header for Front Panel (9-pin): AUDIO

These headers connect to Front Panel Line-out, MIC connector with cable.

Line-Out, MIC Headers
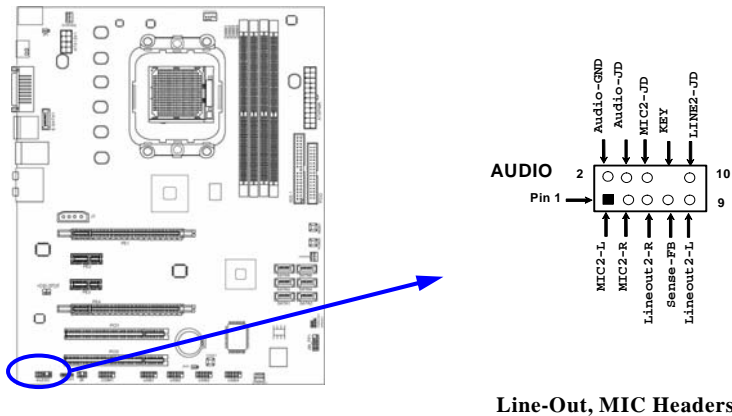
(2) USB Port Headers (9-pin):   USB1/USB2/USB3/USB4

These headers are used for connecting the additional USB port plug. By attaching an option USB cable, your can be provided with two additional USB plugs affixed to the back panel.

USB Port Headers
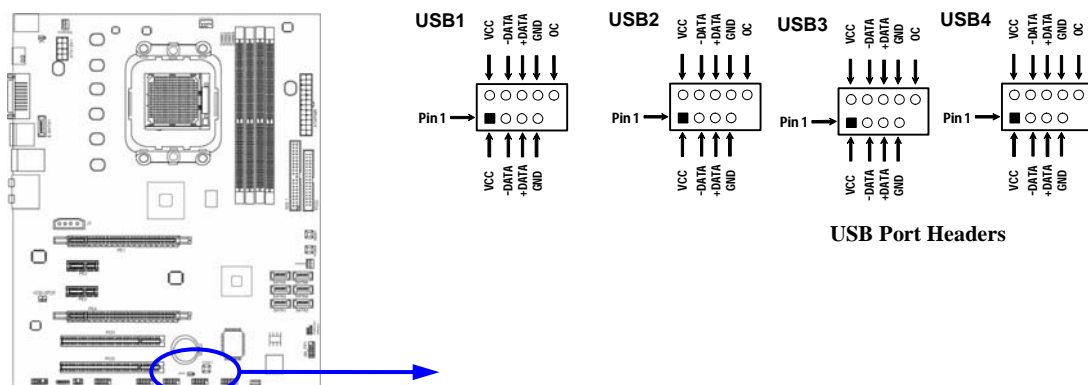
（3)Speaker connector: SPEAK

This 4-pin connector connects to the case-mounted speaker. See the figure below.

(4) Power LED: PWR LED

The Power LED is light on while the system power is on.   Connect the Power LED from the system case to this pin.

(5) IDE Activity LED: HD LED

This connector connects to the hard disk activity indicator light on the case.

(6) Reset switch lead: RESET

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch.   This is a preferred method of rebooting in order to prolong the lift of the system's power supply.   See the figure below.

(7)Power switch: PWR BTN

This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.

System Case Connections
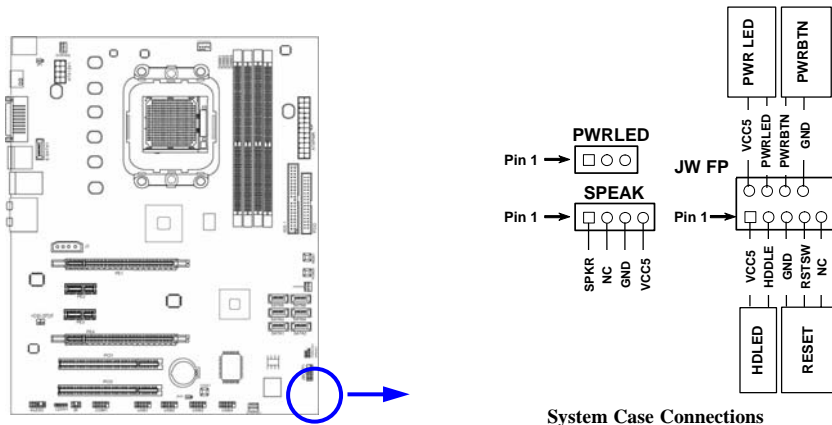
(8) FAN Power Headers: SYSFAN1, SYSFAN2, CHAFAN (3-pin), CPUFAN (4-pin)

These connectors support cooling fans of 350mA (4.2 Watts) or less, depending on the fan manufacturer, the wire and plug may be different.   The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of connector.

FAN Power Headers
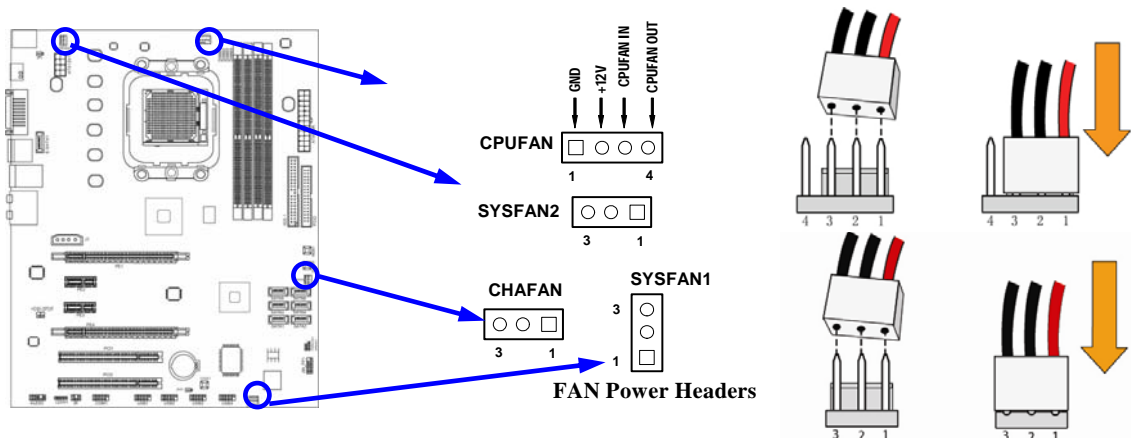
(9) CD Audio-In Headers (4-pin): CDIN1

CDIN are the connectors for CD-Audio Input signal.   Please connect it to CD-ROM CD-Audio output connector.

CD Audio-In Headers
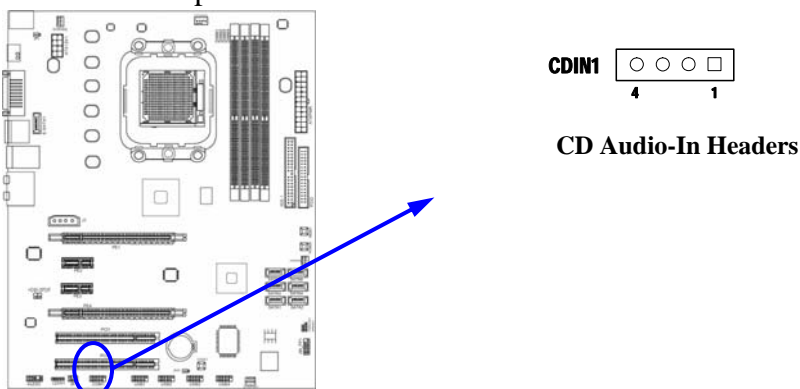
(10) IR infrared module Headers (5-pin): IR

This connector supports the optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function.

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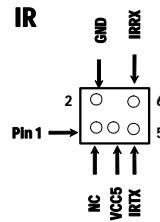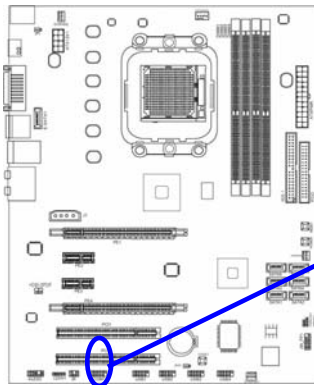
IR infrared module Headers

(11) Serial COM Port header: COM1

COM1 is the 9-pin block pin-header. The On-board serial port can be disabled through BIOS SETUP. Please refer to Chapter 3 "INTEGRATED PERIPHERALS SETUP" section for more detail information
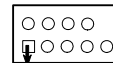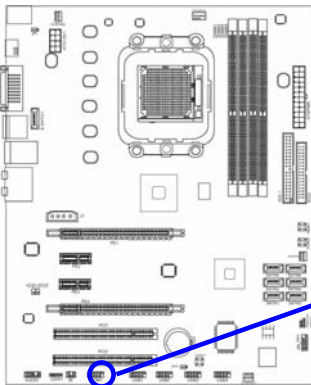
Pin1

Serial COM Port 9-pin Block

(12)   HDMI-SPDIF Out header: SPDIF Out

The SPDIF output is capable of providing digital audio to external speakers or compressed AC3 data to an external Dolby digital decoder. Use this feature only when your stereo system has digital input function. Some of the VGA Card need connect SPDIF-IN Connector，so its HDMI Port can make sounds .

SPDIF

HDMI_SPDIF_OUT → [□ ○] ← GND

1   2
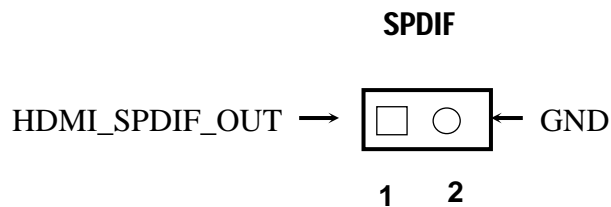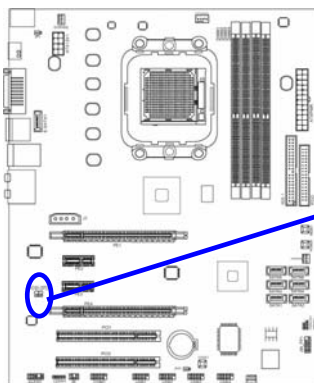
2-7   Starting Up Your Computer

1. After all connection are made, close your computer case cover.

2. Be sure all the switch are off, and check that the power supply input voltage is set to proper position, usually in-put voltage is 220V~240V or 110V~120V depending on your country's voltage used.

3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.

4. Turn on your peripheral as following order:
    a. Your monitor.
    b. Other external peripheral (Printer, Scanner, External Modem etc…)
    c. Your system power.   For ATX power supplies, you need to turn on the power supply and press the ATX power switch on the front side of the case.

5. The power LED on the front panel of the system case will light.   The LED on the monitor may light up or switch between orange and green after the system is on.   If it complies with green standards or if it is has a power standby feature.   The system will then run power-on test.   While the test is running, the BIOS will alarm beeps or additional message will appear on the screen.

    If you do not see any thing within 30 seconds from the time you turn on the power.   The system may have failed on power-on test. Recheck your jumper settings and connections or call your retailer for assistance.

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM install or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

6. During power-on, press <Delete> key to enter BIOS setup.   Follow the instructions in BIOS SETUP.

7. **Power off your computer:** You must first exit or shut down your operating system before switch off the power switch.   For ATX power supply, you can press ATX power switching after exiting or shutting down your operating system.   If you use Windows 9X, click **"Start"** button, click **"Shut down"** and then click **"Shut down the computer?"** The power supply should turn off after windows shut down.

Chapter 3

Introducing BIOS

The BIOS is a program located on a Flash Memory on the motherboard.   This program is a bridge between motherboard and operating system.   When you start the computer, the BIOS program will gain control.   The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization.   Only when these tasks are completed done it gives up control of the computer to operating system (OS).   Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

In the BIOS Setup main menu of Figure 3-1, you can see several options.   We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press <Esc> to quit the BIOS Setup.

- Press ↑↓←→ (up, down, left, right) to choose, in the main menu, the option you want to confirm or to modify.

- Press <F10> when you have completed the setup of BIOS parameters to save these parameters and to exit the BIOS Setup menu.

- Press Page Up/Page Down or +/– keys when you want to modify the BIOS parameters for the active option.

3-1   Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup.
If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.   If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to
   Press <F1> to continue, or <Del> to enter Setup

3-2   Getting Help

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

Status Page Setup Menu/Option Page Setup Menu
Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item.   To exit the Help Window, press <Esc>.

3-3   The Main Menu

Once you enter Award® BIOS CMOS Setup Utility, the Main Menu (Figure 3-1) will appear on the screen.   The Main Menu allows you to select from fourteen setup functions and two exit choices.   Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

.

```
          Phoenix – AwardBIOS CMOS Setup Utility

  ┌─────────────────────────────────┬──────────────────────────────────┐
  │  Standard CMOS Features          │  Thermal Throttling Option       │
  │  Advanced BIOS Features          │  Power User Overclock Settings   │
  │  Advanced Chipset Features       │  Password Settings               │
  │  Integrated Peripherals          │  Load Optimized Defaults         │
  │  Power Management Setup          │  Load Fail-Safe Defaults         │
  │  Miscellaneous Control           │  Save & Exit Setup               │
  │  PC Health Status                │  Exit Without Saving             │
  ├─────────────────────────────────┴──────────────────────────────────┤
  │  Esc : Quit   F9 : Menu in BIOS   ↑↓→← : Select Item                │
  │  F10 : Save & Exit Setup                                            │
  └─────────────────────────────────────────────────────────────────────┘

                            Figure 3-1
```

Standard CMOS Features
Use this Menu for basic system configurations.

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

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

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

Miscellaneous Control
Use this menu to specify your settings for **Miscellaneous Control**.

PC Health Status
This entry shows your PC health status.
Power User Overclock Settings
Use this menu to specify your settings (frequency, Voltage) for overclocking demand
CPU Thermal Throttling Setting
The selection is set for activating the active CPU Thermal Protection by flexible CPU loading adjustment in the arrange of temperature you define.
Load Fail-Safe Defaults

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This menu uses a minimal performance setting, but the system would run in a stable way.

Load Optimized Defaults
Use this menu to load the BIOS default values these are setting for optimal performances system operations for performance use.

Password Settings
This entry for setting Supervisor password and User password

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

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

3-4   Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into several categories.   Each category includes no, one or more than one setup items.   Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

```
                    Phoenix – AwardBIOS CMOS Setup Utility
                            Standard CMOS Features
┌──────────────────────────────────────────────┬──────────────────────────┐
│   Date (mm.dd.yy)          Mon* Jan1 * 2008    │         Item Help        │
│                                                │                          │
│   Time (hh:mm:ss)          22 : 46 : 33        ├──────────────────────────┤
│ > IDE Channel 0 Master       NONE              │                          │
│ > IDE Channel 0 Slave        NONE              │   Menu Level >           │
│                                                │                          │
│   Drive A                  1.44M,3.5in         │   Change the day, month, │
│   Halt On                  All Errors          │   year and century       │
│   Base Memory                 640K             │                          │
│   Extended Memory          39219K              │                          │
│   Total Memory             393216K             │                          │
│                                                │                          │
├────────────────────────────────────────────────────────────────────────┤
│    ↑↓→←  Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│         F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults │
└──────────────────────────────────────────────────────────────────────────┘
```

Date
The date format is <day><month><date><year>.
   Day   Day of the week, from Sun to Sat, determined by BIOS. Read-only.
   Month   The month from Jan. through Dec.
   Date   The date from 1 to 31 can be keyed by numeric function keys.
   Year   The year depends on the year of the BIOS.
Time
The time format is <hour><minute><second>.

IDE Channel 0 Master / Channel 0 Slave
SATA Channel 1, 2, 3, 4
Press PgUp/<+> or PgDn/<–> to select Manual, None, Auto type.   Note that the specifications of your drive must match with the drive table.   The hard disk will not work properly if you enter improper information for this category.   If the type of hard disk drives is not matched or listed, you can use Manual to define your own drive type manually.
If you select Manual, related information is asked to be entered to the following items. Enter the information directly from the keyboard.   This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be "None".
If the controller of HDD interface is CD-ROM, the selection shall be "None"
Access Mode   The settings are Auto Normal, Large, and LBA.
Cylinder   number of cylinders
Head   number of heads
Precomp   write precomp
Landing Zone   landing zone
Sector   number of sectors

3-5   Advanced BIOS Feature

```
             Phoenix – AwardBIOS CMOS Setup Utility
                      Advanced BIOS Features
┌────────────────────────────────────────────┬─────────────────────┐
│   Hard Disk Boot Priority      Press Enter   │                     │
│   Virus Warning                Disabled      │      Item Help      │
│   CPU Internal Cache           Enabled       │                     │
│   External Cache               Enabled       ├─────────────────────┤
│   Quick Power on self Test     Enabled       │                     │
│   First Boot Device            Hard Disk     │  Menu Level >       │
│   Second Boot Device           CDROM         │                     │
│   Third Boot Device            Floppy        │                     │
│   Boot other  Device           Enabled       │                     │
│   Boot Up Floppy Seek          Disable       │                     │
│   Boot Up NumLock Status       On            │                     │
│   Typematic Rate Setting       Disabled      │                     │
│   Typematic Rate (Chars/Sec)   6             │                     │
│   Typematic Delay (Msec)       250           │                     │
│   Security Option              Setup         │                     │
│   APIC Mode                    Enabled       │                     │
│   MPS Version Control For OS   1.4           │                     │
│   OS Select For DRAM > 64MB    Non-OS2       │                     │
│   HDD S.M.A.R.T. Capability    Disabled      │                     │
├────────────────────────────────────────────┴─────────────────────┤
│   ↑↓→←  Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│        F5:Previous Values   F6:Optimized Defaults    F7:Standard Defaults │
└───────────────────────────────────────────────────────────────────┘
```

Hard Disk Boot Priority
The selection is for you to choose the hard disk drives priorities to boot from.
Virus Warning
The selection Allow you to choose the VIRUS Warning
  feature for IDE Hard Disk boot sector protection.   If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.
    Disabled (default) No warning message to appear when anything attempts to access the boot sector or hard disk partition table.
    Enabled   Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector of hard disk partition table.
CPU Internal Cache
    The default value is Enabled.
    Enabled (default)   Enable cache
    Disabled   Disable cache
Note: The internal cache is built in the processor.

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External Cache

Choose Enabled or Disabled.   This option enables the Level 2 cache memory.

Quick Power On Self-Test

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

    Enabled (default)   Enable quick POST

    Disabled   Normal POST

First/Second/Third/Fourth Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.   The settings are Floppy, LS/ZIP, HDD-0/HDD-1/HDD-3, SCSI, CDROM, LAD and Disabled.

Boot Up Floppy Seek

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

Boot Up NumLock Status

The default value is On.

    On (default)   Keypad is numeric keys.

    Off   Keypad is arrow keys.

Gate A20 Option

    Normal   The A20 signal is controlled by keyboard controller or chipset hardware.

    Fast (default)   The A20 signal is controlled by port 92 or chipset specific method.

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.   The settings are: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a keystroke when you hold the key down.   The settings are: 6, 8, 10, 12, 15, 20, 24, and 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before beginning to repeat the keystroke. The settings are 250, 500, 750, and 1000.

Security Option

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

    System   The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.

    Setup (default)   The system will boot, but access to Setup will be denied if the correct password is not entered prompt.

HDD S.M.A.R.T Capability

This option allow you to enable the HDD S.M.A.R.T Capability (Self-Monitoring, Analysis and Reporting Technology) . You can choose from Enabled and Disabled.

MPS Version Control For OS   **1.4**

This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use.

Full Screen Logo (EPA) Show

The selection is for you to choose the EPA small logo to show or not.

OS Select For DRAM > 64MB

Allows OS2® to be used with >64MB or DRAM. Settings are Non-OS/2 (default) and OS2. Set to OS/2 if using more than 64MB and running OS/2®.

3-6   Advanced Chipset Features

The Advanced Chipset Features Setup option is used to change the values of the chipset registers.   These registers control most of the system options in the computer.

```
            Phoenix – AwardBIOS CMOS Setup Utility
                    Advanced Chipset Features
┌─────────────────────────────────────────┬─────────────────────────┐
│ HT Link Control            press enter    │                         │
│ PCIE Configuration          press enter   │      Item Help          │
│ IGX Configuration           press enter   │                         │
│ HDMI Audio                 Disabled       ├─────────────────────────┤
│ NB Power Management        Auto           │   Menu Level >          │
│ Memory Hole                Disabled       │                         │
│ System BIOS Cacheable      Disabled       │                         │
├───────────────────────────────────────────┴─────────────────────────┤
│  ↑↓→←  Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│      F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults │
└─────────────────────────────────────────────────────────────────────┘
```

System BIOS Cacheable

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

3-6-1 PCIE Configuration

```
            Phoenix – AwardBIOS CMOS Setup Utility
                    PCIE Configuration
┌─────────────────────────────────────────┬─────────────────────────┐
│ Primary dual slot config        Auto      │                         │
│ GFX  Port 1              Press Enter      │      Item Help          │
│ GFX  Port 2              Press Enter      │                         │
│ GPP1                     Press Enter      ├─────────────────────────┤
│ GPP2                     Press Enter      │   Menu Level >          │
│ GPP3                     Press Enter      │                         │
│ NB-SB Port Features      Press Enter      │                         │
├───────────────────────────────────────────┴─────────────────────────┤
│  ↑↓→←  Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│      F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults │
└─────────────────────────────────────────────────────────────────────┘
```

Primary Dul Slot Config

Selecting Auto allows PCI-E x16by8lane socket can make Hybrid CrossFire with the onboard VGA Card.

3-6-2 IGX Configuration

```
              Phoenix – AwardBIOS CMOS Setup Utility
                       IGX Configuration
┌─────────────────────────────────────────────┬──────────────────────────┐
│  Iternal Graphics Mode        UMA+Side port  │                          │
│  UMA frame Buffer Size        Auto           │       Item Help          │
│  Frame Buffer Location        Above 4G       │                          │
│  IGX  Engine Clock OVERRIDE   Enabled        │                          │
│  IGX  Engine Clock            700            │   Menu Level >           │
│  Surround View                Auto           │                          │
│  IGX Clock Speek              400MHz         │                          │
│  UMA-SP Inter leave Mode      Auto           │                          │
│  Size                         4MB            │                          │
│  Ratio (SP:UMA)               1:1            │                          │
│  SP Power Management          Auto           │                          │
│  SB NB Termination             Disabled      │                          │
│  SP ODT                        Disabled      │                          │
│  SP CMD Hold                  Auto           │                          │
│  SP DATA Hold                 Auto           │                          │
│                                              │                          │
├─────────────────────────────────────────────┴──────────────────────────┤
│   ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│       F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults  │
└──────────────────────────────────────────────────────────────────────────┘
```

```
              Phoenix – AwardBIOS CMOS Setup Utility
                       IGX Configuration
┌─────────────────────────────────────────────┬──────────────────────────┐
│  Iternal Graphics Mode        UMA+Side port  │                          │
│  UMA frame Buffer Size        Auto           │       Item Help          │
│  Frame Buffer Location        Above 4G       │                          │
│  IGX  Engine Clock OVERRIDE   Enabled        │                          │
│  IGX  Engine Clock            700            │   Menu Level >           │
│  Surround View                Auto           │                          │
│  IGX Clock Speek              400MHz         │                          │
│  UMA-SP Inter leave Mode      Auto           │┌────────────────────────┐│
│  Size                         4MB            ││SIZE                    ││
│  Ratio (SP:UMA)               1:1            ││                        ││
│  SP Power Management          Auto           ││  4MB       [ ]         ││
│  SB NB Termination             Disabled      ││  8MB       [ ]         ││
│  SP ODT                        Disabled      ││  16MB      [ ]         ││
│  SP CMD Hold                  Auto           ││  ………….             ││
│  SP DATA Hold                 Auto           ││  128MB     [ ]         ││
│                                              │├────────────────────────┤│
│                                              ││↑↓:Move ENTER:Accept    ││
│                                              ││ESC:Abort               ││
├─────────────────────────────────────────────┴┴────────────────────────┴┤
│   ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│       F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults  │
└──────────────────────────────────────────────────────────────────────────┘
```

IGX Engine Clock OVERRIDE

The setting are Disabled and Enabled. If setted by Enabled, the minimum of the IGX Engine Clock is 150,the maximum is 1023.

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3-7 Integrated Peripherals

```
              Phoenix – AwardBIOS CMOS Setup Utility
                     Integrated Peripherals
┌────────────────────────────────────────────┬─────────────────────┐
│  CMIX-SB750 Revision           2.5.0        │      Item Help      │
│                                             │                     │
│  Superio  Function  Setup      Press Enter  ├─────────────────────┤
│                                             │                     │
│  South onchip PCI Device       Press Enter  │  Menu Level >       │
│                                             │                     │
│  South Onchip IDE Device       Press Enter  │                     │
│  South  Onchip SATA Device      Press Enter │                     │
├────────────────────────────────────────────┴─────────────────────┤
│  ↑↓→←  Move Enter: Select +/-/PU/PD: Value F10:Save ESC: Exit  F1:General Help│
│      F5:Previous Values   F6:Optimized Defaults    F7:Standard Defaults │
└───────────────────────────────────────────────────────────────────┘
```

3-7-1   Super IO Device

```
              Phoenix – AwardBIOS CMOS Setup Utility
                     Super IO Function Setup
┌────────────────────────────────────────────┬─────────────────────┐
│  Onboard FDC Controller        Enabled      │                     │
│  Onboard Serial Port 1         3F8/IRQ4     │      Item Help      │
│  UART Mode Select              IrDA         ├─────────────────────┤
│  * Irda Duplex Mode            Half         │                     │
│  PWROM After PWR-Fail          [OFF]        │  Menu Level >>      │
│                                             │                     │
├────────────────────────────────────────────┴─────────────────────┤
│   ↑↓→←  Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help│
│      F5:Previous Values   F6:Optimized Defaults    F7:Standard Defaults │
└───────────────────────────────────────────────────────────────────┘
```

Onboard FDC Controller
Select Enabled if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it.   If you install add-on FDC or the system has no floppy drive, select Disabled in this field.   The settings are: Enabled and Disabled.
Onboard Serial Port2
Select an address and corresponding interrupt for the first and the second serial ports.   The settings are: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.
UART Mode Select
This item allows you to determine which InfraRed(IR) function of the onboard I/O chip, this functions uses.
IrDA Duplex Mode
This field is available when UART Mode is set to either ASKIR or IrDA. This item enables you to determine the infrared function of the onboard infrared chip. The options are Full and Half (default). Full-duplex means that you can transmit and send information simultaneously. Half-duplex is the transmission of data in both directions , but only one direction at a time.
Onboard Parallel Port
There is a built-in parallel port on the on-board Super I/O chipset that Provides Standard, ECP, and EPP features. It has the following option:
   Disabled
   (3BCH/IRQ7)/   Line Printer port 0
   (278H/IRQ5)/   Line Printer port 2

27

(378H/IRQ7)   Line Printer port 1

Parallel Port Mode

SPP   : **Standard Parallel Port**

EPP   : **Enhanced Parallel Port**

ECP   : **Extended Capability Port**

SPP/EPP/ECP/ECP+EPP

To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To operate the onboard parallel port in the EPP modes simultaneously, choose "EPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP+EPP" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously. The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA" at this time, the user can choose between DMA channels 3 to 1. The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: "EPP Mode Select." At this time either EPP 1.7 spec. or EPP 1.9 spec. can be chosen.

Poweron After Power Failure

This determines the manner when the power recovery after power failure. The setting are: Off, On.

3-7-2   Onchip IDE Function

```
              Phoenix – AwardBIOS CMOS Setup Utility
                         OnChip IDE Function
 ┌─────────────────────────────────────────┬──────────────────────────┐
 │ IDE HDD Block Mode          Enabled      │                          │
 │ IDE DMA Transfer            Enabled      │        Item Help         │
 │ Onchip IDE Channel IO       Enabled      │                          │
 │ Primary Master   PIO          Auto       ├──────────────────────────┤
 │ Primary Slave    PIO          Auto       │   Menu Level >>          │
 │ Primary Master   UDMA         Auto       │                          │
 │ Primary Slave    UDMA         Auto       │                          │
 ├─────────────────────────────────────────┴──────────────────────────┤
 │   ↑↓→←  Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
 │       F5:Previous Values   F6:Optimized Defaults    F7:Standard Defaults │
 └─────────────────────────────────────────────────────────────────────┘
```

IDE DMA transfer access

The integrated peripheral controller contains an IDE interface with support for one IDE channels. Select Enabled to activate each channel separately. The settings are: Enabled and Disabled.

Primary Master/Slave PIO

The two IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-2) for each of the two IDE devices that the onboard IDE interface supports. Modes 0 through 2 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The settings are: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

Primary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33 and Ultra DMA/66, select Auto to enable BIOS support. The settings are: Auto, Disabled.

IDE HDD Block Mode
Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. The settings are: Enabled, Disabled.

Onchip SATA Controller
This item allows you to control Serial ATA controller.

3-7-3   Onchip PCI Device

```
              Phoenix – AwardBIOS CMOS Setup Utility

                        OnChip PCI  Device

┌─────────────────────────────────────────────┬──────────────────────┐
│ Onboard PCIE LAN  Device          Enabled    │                      │
│ Onboard PCIE Lan BootRom          Disabled   │      Item Help       │
│ HD Audio                          Enable     ├──────────────────────┤
│ Onchip USB Controller             Enabled    │                      │
│ USB EHCI Controller               Enabled    │   Menu Level >>      │
│ USB keyboard Support              Enabled    │                      │
├─────────────────────────────────────────────┴──────────────────────┤
│  ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│      F5:Previous Values  F6:Optimized Defaults    F7:Standard Defaults │
└─────────────────────────────────────────────────────────────────────┘
```

Onboard LAN device   (Enabled)
This option allows you to control the onboard LAN device.

HD Audio
This item allows you to decide to enable/disable the chipset family to support HD Audio. The settings are: Enabled, Disabled.

Onchip USB Controller
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB peripherals. The settings are: Enabled, Disabled.

USB Device Support
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB device. The settings are: Enabled, Disabled.

3-8   Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy saving while operating in a manner consistent with your own style of computer use.

```
               Phoenix – AwardBIOS CMOS Setup Utility
                      Power Management Setup
┌────────────────────────────────────────────────┬──────────────────────┐
│   ACPI function              Enabled            │                      │
│   ACPI Suspend Type          S3(STR)            │      Item Help       │
│   C2 Disabled /Enabled        Disabled          │                      │
│   Power Management Option    User Define        ├──────────────────────┤
│   HDD Power Down              Disabled          │  Menu Level >        │
│   Video Off Option           suspend - off      │                      │
│   Video off Method           V/H SyNC + BlANK   │                      │
│   Modem  Use IRQ             3                  │                      │
│   Soft-OFF by PWRBTN          Instant off       │                      │
│   Power on by PCI Card        Disabled          │                      │
│   ACPI XSDTTable              Enabled           │                      │
│   Power On by keyboard       Disabled           │                      │
│   Power on by mouse          Disabled           │                      │
│   RTC Alarm Resume           Disabled           │                      │
│    ● Date of month            0                 │                      │
│    ● Resume Time  <hh:mm:ss>  0                 │                      │
├────────────────────────────────────────────────┴──────────────────────┤
│    ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help│
│        F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults │
└─────────────────────────────────────────────────────────────────────────┘
```

ACPI Function
This item allows you to Enabled/Disabled the Advanced Configuration and Power Management (ACPI).   The settings are Enabled and Disabled.
HDD Power Down (Disabled)
The IDE hard drive will spin down if it is not accessed within a specified length of time.Options are from 1 Min to 15 Min and Disable.
Video Off Method
This determines the manner in which the monitor is blanked.
DPMS (default) Initial display power management signaling.
Blank Screen   This option only writes blanks to the video buffer**.**
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.
.MODEM Use IRQ
If you want an incoming call on a modem to automatically resume the system from a power-saving mode, use this item to specify the interrupt request line (IRQ) that is used by the modem. You might have to connect the fax/modem to the motherboard Wake On Modem connector for this feature to work.
Soft-Off by PWRBTN
Under ACPI (Advanced Configuration and Power management Interface) you can create a software power down. In a software power down, the system can be resumed by Wake up Alarms. This item lets you install a software power down that is controlled by the power Button on your system. If the item is set to Instant-Off, then the power button causes a software power down. If the item is set to Delay 4 Sec, then you have to hold the power button down for four seconds to cause a software power down.
RTC Alarm Resume
When set to Enabled, additional fields become available and you can set the date (day of the

month), hour, minute and second to turn on your system. When set to 0 (zero) for the day of the month, the alarm will power on your system every day at the specified time .

Date (of month)
You can choose which month the system will boot up.   Set to 0, to boot every day.
Time (hh:mm:ss)
You can choose what hour, minute and second the system will boot up.
Note: If you have change the setting, you must let the system boot up until it goes to the operating system, before this function will work.

3-9 Miscellaneous Configuration

```
               Phoenix – AwardBIOS CMOS Setup Utility
                        Miscellaneous Control
┌────────────────────────────────────────────┬─────────────────────────┐
│ Init Display First            PCIEx         │                         │
│ Reset Configuration Date      Disabled      │       Item Help         │
│ Resource Controlled by        Auto [ESCD]   │                         │
│ * IRQ Resource                Press Enter   ├─────────────────────────┤
│ PCI /VGA Palette SNOOP        Disabled      │                         │
│ Assign IRQ for VGA            Enabled       │   Menu Level >          │
│ Assign IRQ for  USB           Enabled       │                         │
│ PCI Latency Timer (CLK)       [64]          │                         │
│ * PCI Express Relative Items                │                         │
│  Maximum Payload Size          4096         │                         │
├────────────────────────────────────────────┴─────────────────────────┤
│   ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│        F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults  │
└───────────────────────────────────────────────────────────────────────┘
```

Reset Configuration Data
If you enable this item and restart the system, any Plug and Play configuration data stored in the BIOS Setup is cleared from memory.
Init Display First
Use this item to specify whether your graphics adapter is installed in one of the PCI E slots or is integrated on the motherboard. If a PCI E graphics card is installed, the onboard VGA will be disabled.
PCI/VGA Palette Snoop
This item is designed to overcome problems that can be caused by some non-standard VGA cards. This board includes a built-in VGA system that does not require palette snooping so you must leave this item disabled.
Assign IRQ For USB
Names the interrupt request (IRQ) line assigned to the USB on your system. Activity ofthe selected IRQ always awakens the system.

3-10 PC Health Status

This section shows the Status of you CPU, Fan, and Warning for overall system status.   This is only available if there is Hardware Monitor onboard.

```
              Phoenix – AwardBIOS CMOS Setup Utility
                       PC Health Status
┌──────────────────────────────────────────┬───────────────────────┐
│  Show PC  Health in Post        Enabled   │                       │
│  Shutdown Temperature           Disabled  │       Item Help       │
│  smart FAN Configuration        Press Enter├──────────────────────┤
│   Vcc3.3                        3.36V      │                       │
│   Vcore                         1.35V      │    Menu Level >       │
│   NBVCC                         1.12V      │                       │
│  +5V                             4.85V     │                       │
│   +12V                          12.05V     │                       │
│  5VSB                           12.05V     │                       │
│  VDIMM                          5.07V      │                       │
│  CPU Temperature                34°C       │                       │
│  SYS  Temperature               32°C       │                       │
│  CPUFAN Speed                   2550 RPM   │                       │
│  SYS FAN1 Speed                 0 RPM      │                       │
│  SYS FAN2 Speed                 0 RPM      │                       │
├──────────────────────────────────────────┴───────────────────────┤
│  ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│      F5:Previous Values   F6:Optimized Defaults  F7:Standard Defaults      │
└───────────────────────────────────────────────────────────────────┘
```

Show PC Health in Post

During Enabled, it displays information list below.   The choice is either Enabled or Disabled

Shutdown Temperature

This item can let users setting the Shutdown temperature, when CPU temperature over this setting the system will auto shutdown to protect CPU.

PS CPU Smart FAN Configurations

CPU Full-Speed Temp

This item allows you setting the FAN works in full speed when the temperature over the value which out set.   If the temperature below the value but over the Idle Temperature, the FAN will works over 60% of full speed, and the higher temperature will gain higher FAN speed, after over the temperature which this item setting, the FAN works in full speed.

CPU Idle Temp

This item allows you setting the FAN works in 60% of full speed, when the temperature lower than the temperature which you setting.

Current CPU Temperature/Current System Temp/Current FAN1, FAN2 Speed/Vcore/ Vdd/3.3V/+5V/+12V/-12V/VBAT(V)/5VSB(V)

This will show the CPU/FAN/System voltage chart and FAN Speed.

3-11 Power User Overclock Setting

Power User Overclock Setting

		Item Help
CPU Feature	Press Enter	
CPU Clock At Next BOOT	200	
PCIE Reference Clock	[100]	
SB Refence Clock	【100】	Menu Level >
Spread Spectrum	Enabled	
CPU RATIO at Next BOOT	Auto	
AOD Compatibility	Disabled	
CPU Voltage At Next Boot	Default	
CPU Vorce 7-Shift	Normal	
VDIMM Select	1.95V	
NB Voltage Setting	1.15v	
NB-VDDHT Setting	1.26v	
Memory clock Mode	Auto	
DRAM Clock at Next Boot	DDR533	
DRAM Configuration	Press Enter	
HT Link Frequency	Auto	
Embedded Memtest Test	Disabled	

↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults

Phoenix – AwardBIOS CMOS Setup Utility
CPU   VOLTAGE at NEXT BOOT

		Item Help
CPU Feature	Press Enter	
CPU Clock At Next BOOT	200	
PCIE Reference Clock	[100]	Menu Level >
SB Refence Clock	【100】	
Spread Spectrum	Enabled	
CPU RATIO at Next BOOT	Auto	
AOD Compatibility	Disabled	CPU Voltage at Next Boot
CPU Voltage At Next Boot	Default	
CPU Vorce 7-Shift	Normal	Default [ ]
VDIMM Select	1.95V	1.550v [ ]
NB Voltage Setting	1.15v	1.525v [ ]
NB-VDDHT Setting	1.26v	1.500v [ ]
Memory clock Mode	Auto	………
DRAM Clock at Next Boot	DDR533	0.800v [ ]
DRAM Configuration	Press Enter	↑↓:Move ENTER:Accept
HT Link Frequency	Auto	ESC:Abort
Embedded Memtest Test	Disabled	

↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    CPU  VCORE  7---SHIFT
┌──────────────────────────────────────────┬─────────────────────────┐
│                                           │       Item Help         │
│  CPU Feature                Press Enter   ├─────────────────────────┤
│  CPU Clock At Next BOOT     200           │                         │
│  PCIE Reference Clock       [100]         │   Menu Level >          │
│  SB Refence Clock           【100】       │                         │
│  Spread Spectrum            Enabled       ├─────────────────────────┤
│  CPU RATIO at Next BOOT     Auto          │  CPU Vcore 7-shift      │
│  AOD Compatibility          Disabled      │                         │
│  CPU Voltage At Next Boot    Default      │   Normal        [  ]    │
│  CPU Vorce 7-Shift          Normal        │   +5%           [  ]    │
│  VDIMM Select               1.95V         │   +10%          [  ]    │
│  NB Voltage Setting         1.15v         │        .........        │
│  NB-VDDHT Setting           1.26v         │   +35%          [  ]    │
│  Memory clock Mode          Auto          ├─────────────────────────┤
│  DRAM Clock at Next Boot    DDR533        │  ↑↓:Move ENTER:Accept   │
│  DRAM Configuration          Press Enter  │  ESC:Abort              │
│  HT Link Frequency          Auto          │                         │
│  Embedded Memtest Test       Disabled     │                         │
│                                           │                         │
├──────────────────────────────────────────┴─────────────────────────┤
│  ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│       F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults │
└──────────────────────────────────────────────────────────────────────┘
```

```
            Phoenix - AwardBIOS CMOS Setup Utility
                    CPU  VCORE  7---SHIFT
┌──────────────────────────────────────────┬─────────────────────────┐
│                                           │       Item Help         │
│  CPU Feature                Press Enter   ├─────────────────────────┤
│  CPU Clock At Next BOOT     200           │                         │
│  PCIE Reference Clock       [100]         │   Menu Level >          │
│  SB Refence Clock           【100】       │                         │
│  Spread Spectrum            Enabled       ├─────────────────────────┤
│  CPU RATIO at Next BOOT     Auto          │  CPU Vcore 7-shift      │
│  AOD Compatibility          Disabled      │                         │
│  CPU Voltage At Next Boot    Default      │   Normal        [  ]    │
│  CPU Vorce 7-Shift          Normal        │   +5%           [  ]    │
│  VDIMM Select               1.95V         │   +10%          [  ]    │
│  NB Voltage Setting         1.15v         │        .........        │
│  NB-VDDHT Setting           1.26v         │   +35%          [  ]    │
│  Memory clock Mode          Auto          ├─────────────────────────┤
│  DRAM Clock at Next Boot    DDR533        │  ↑↓:Move ENTER:Accept   │
│  DRAM Configuration          Press Enter  │  ESC:Abort              │
│  HT Link Frequency          Auto          │                         │
│  Embedded Memtest Test       Disabled     │                         │
├──────────────────────────────────────────┴─────────────────────────┤
│  ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│       F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults │
└──────────────────────────────────────────────────────────────────────┘
```

CPU **Vcore**

This item allows you select the CPU Vcore Voltage xx% more than the standard value, by this function for the precise over-clocking for extra demanding of performance.

NB Voltage
This item allows you to select value of Voltage for North Bridge Chipset.

IH Flow-Control Mode:
Isochronous (ISOC) Flow Control Mode enable will make the HT Link communication have the complex ordering rules for Isochronous source to make sure it can get service from the system with deterministic worst-case latency. However, the latency time cost of ISOC flow control mode is an important consideration. Normal flow control mode will be a simpler solution for most system.

HT Link Tristate:
Disabled mode will make the link transmitter is driven but in and under fined state during the disconnect sequence. And the PHY (transmitter) is placed in LS0. LS0 state keeps all lanes active to maintain DLL and phase recovery lock.
Enabled mode will make the link transmitter is placed into high impedance states during the disconnect sequence. And the PHY (transmitter) is placed in LS1, LS2 or LS3. LS1, LS2 and LS3 are each states that shut down parts of the PHY to save power.
LS1 state: CLK running, CAD/CTL sending TxIdle.
LS2 state: CLK/CAD/CTL sending TxIdle.
LS3 state: CLK/CAD/CTL sending either HiZ or TxGndTrm.

UnitID Clumping:
Originally, a single UnitID only allow 32 outstanding nonposted transactions within the chain. If a device uses more than one UnitID to achieve greater concurrency, the transactions in different UnitIDs are not required to be ordered together.
But if UnitID clumping enable on a chain, after/during UnitID assignment, software will check each node for the presence of a Clumping capability block, indicating full clumping support. Software will OR together the result of all the reads to create a combined Clumping "Mask". If all the nodes on the chain have indicated Full support, the Clumping Support register of the host can also be read and Ored into the Clumping Mask. The Mask will then be written into the Clumping Enable register of all nodes on the chain.

AOD Compatibility:
Choose Enabled means only AMD over drive can adjust voltage
Choose Disabled means only BIOS can adjust voltage

> **Note!**   The warning logo as follows shall appear . If you set certain parameters in three cases of Power User Overclock Settings item and press F10 to save the parameters.
>
> **1:**Setting the voltage at CPU directly over 1.500v in the CPU Voltage at Next Boot Item .
>
> **2:** Indirectly setting the voltage of CPU over 1.500v by adding certain percentage of voltage over the previous voltage set in the CPU Voltage at Next Boot Item.
>
> **3:** When the voltage of Memory is set over 2.4v.

3-11-1   CPU Feature

```
              Phoenix – AwardBIOS CMOS Setup Utility
                           CPU Feature
┌─────────────────────────────────────────┬──────────────────────────┐
│ Virtualization               Enabled     │                          │
│ AMD K8 Cool & Quiet control  Disabled    │       Item Help          │
│ TLB Check                    Enabled     │                          │
│ Advanced clock calibration   Disabled    │  Menu Level >            │
│ Value (ALL Cores)            2%          │                          │
│ Value (Cores 0)              2%          │                          │
│ Value (Cores 1)              2%          │                          │
│ Value (Cores 2)              2%          │                          │
│ Value (Cores 3)              2%          │                          │
│                                          │                          │
├─────────────────────────────────────────┴──────────────────────────┤
│  ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help │
│      F5:Previous Values   F6:Fail-safe Defaults   F7:Optimized Defaults   │
└──────────────────────────────────────────────────────────────────────────┘
```

3-11-2   DRAM Configuration

```
              Phoenix – AwardBIOS CMOS Setup Utility
                         DRAM Configuration
┌───────────────────────────────────────────────┬──────────────────────┐
│   DRAM Latency(tcl)                  Auto      │                      │
│   (Trcd)RAS to CAS R/W Delay         6 Clocks  │     Item Help        │
│   (Trp) Row precharge Time           6 Clocks  │                      │
│   (Tras)Minimum RAS Active Time      18 bus clocks                     │
│   DRAM Command Rate                  2T        │                      │
│   CKE base Power dowe mode           Enabled   │                      │
│   CKE BASED Powerdown                per channel                       │
│   Memclock tri-slating               Disabled  │                      │
│   Memory Hole Remapping              Enabled   │                      │
│   Auto optimize Bottom IO            Enabled   │                      │
│   *Bottom of 【31：24】IO space       DO        │                      │
│   Bottom of UMA DDRAM [31:24]        FC        │                      │
│   DDRII Timing Item                  Disabled  │                      │
│   Refresh Mode Select                Auto      │                      │
│   Idle cycle limit                   Auto      │                      │
│   TwTr Command Delay                 3 bus clocks                      │
│  Trfc 0 for DIMM0                    75ns      │                      │
│    * Trfc 1 for DIMM 1               75ns      │                      │
│   * Trfc 2 for DIMM 2                75ns      │                      │
│   * Trfc 3 for DIMM 3                75ns      │                      │
│   * (Twr) write Recovery Time        6 bus clock                       │
│   * (Trtp) Precharge Time            3 clocks  │  Menu Level >>       │
│   (Trc) Row cycle Time               26 bus clocks                     │
│   Trc RAS to RAS Delay               5 clocks  │                      │
│   Trcd RAS to CAS R/W Delay          6 clocks  │                      │
├────────────────────────────────────────────────┴──────────────────────┤
│  ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help │
│      F5:Previous Values   F6:Optimized Defaults   F7:Standard Defaults    │
└──────────────────────────────────────────────────────────────────────────┘
```

CAS # Latency

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.   The settings are: Auto,3, 4 and 5.

RAS-to-CAS Delay

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

Row Precharge Time

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

3-12   Thermal Throttling Options

```
              Phoenix – AwardBIOS CMOS Setup Utility
                     Thermal Throttling Options
┌──────────────────────────────────────────────────────────────────┐
│   CPU Thermal-Throttling           Disabled  │                     │
│   CPU Throttling Temp              70         │     Item Help       │
│   CPU Throttling Duty              50%        │                     │
│                                               ├─────────────────────┤
│                                               │  Menu Level         │
├──────────────────────────────────────────────────────────────────┤
│    ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│        F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults    │
└──────────────────────────────────────────────────────────────────┘
```

3-13 Load Fail-Safe Defaults

Load Fail-Safe Defaults

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:

   Load Fail-Safe Defaults (Y/N)? N

Pressing <Y> loads the default values that are factory settings for stable performance system operations.

3-14 Load Optimized Defaults

Load Optimized Defaults

When you press <Enter> on this item, you get a confirmation dialog box with a message similar to:

   Load Optimized Defaults (Y/N)? N

Pressing <Y> loads the default values that are factory settings for optimal performance system operations.

3-15 Password Settings

```
              Phoenix – AwardBIOS CMOS Setup Utility
                       Password Settings
┌──────────────────────────────────────────────────────────────────┐
│                                               │     Item Help       │
│   Set Supervisor Password          Press Enter│                     │
│    Set User Password               Press Enter│                     │
│                                               ├─────────────────────┤
│                                               │  Menu Level >       │
├──────────────────────────────────────────────────────────────────┤
│    ↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help │
│        F5:Previous Values    F6:Optimized Defaults   F7:Standard Defaults    │
└──────────────────────────────────────────────────────────────────┘
```

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

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

   User password: Can only enter but do not have the right to change the options of the setup menus.   When you select this function, the following message will appear at the

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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 that 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.

Chapter 4

DRIVER & FREE PROGRAM INSTALLATION

Check your package and there is A MAGIC INSTALL CD included. This CD consists of all DRIVERS you need and some free application programs and utility programs. In addition, this CD also include an auto detect software which can tell you which hardware is installed, and which DRIVERS needed so that your system can function properly. We call this auto detect software MAGIC INSTALL.

MAGIC INSTALL supports WINDOWS 9X/NT/2K/XP

Insert CD into your CD-ROM drive and the MAGIC INSTALL Menu should appear as below. If the menu does not appear, double-click MY COMPUTER / double-click CD-ROM drive or

click START / click RUN / type X:\SETUP.EXE (assuming X is your CD-ROM drive).

From MAGIC INSTALL MENU you may take 8 selections:

1. ATI   install ATI   integrated driver
2. SOUND   install ALC 888HD Audio driver
3. LAN   install LAN
4. RAID   install RAID SATA Driver and Utility
5. PC-CILLIN   install PC-CILLIN2007 anti-virus program
6. PC-HEALTH   install My Guard PC-Health utility
7. BROWSE CD   to browse the contents of the CD
8. EXIT   to exit from MAGIC INSTALL menu

4-1 Install ATI Driver Pack

1. Click ATI in the MAGIC INSTALL MENU appears.

2. Click NEXT when ATI software driver pack appears.
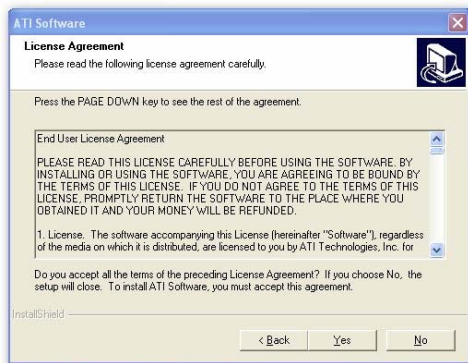
3. Click "Yes" to accept the license agreement and start installation..

4. click "finish"

* The path of the file is X:\ATI \DRIVER\SETUP.EXE

NOTE: Please upgrade your Windows XP to Service Pack 1 / Windows 2000 to Service Pack 4 or later before you install the HD Audio CODEC driver

4-2   SOUND   Install ALC888 HD Codec Audio Driver
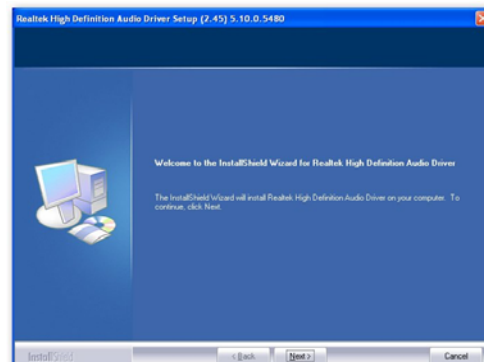
1. Click SOUND when MAGIC INSTALL MENU appears

2. Click NEXT When Realtek High Definition Audio driver windows appear
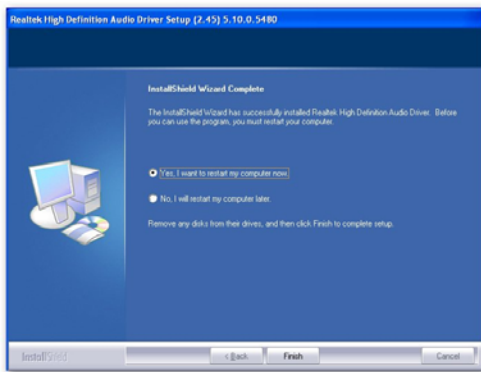
3. Click FINISH and restart your computer

4. Manual Sound Effect Setting

5. Devices and mixer setting

6. Audio input and output setting.

7. Microphone effect setting.

8. 3D demo setting.

NOTE: Please upgrade your Windows XP to Service Pack 1 / Windows 2000 to Service Pack 4 or later before you the HD Audio CODEC driver.

4-3 LAN   Install LAN

1 Click LAN when MAGIC INSTALL MENU appears
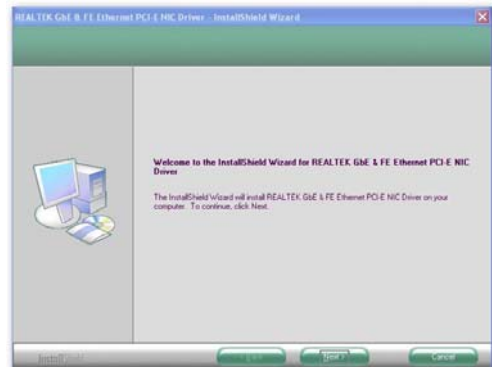
2. Click Next .
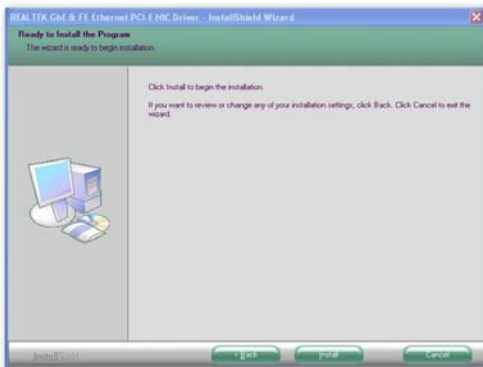
3 Click Install

2. Finish.

4-4 RAID   Install ATI SATA Driver and Utility

1 Click RAIDDisk when MAGIC INSTALL MENU appears

2. Install RAID Disk.

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4-5 Install PC-CILLIN 2007 Anti-virus program

1 Click PC-CILLIN when MAGIC INSTALL MENU appears
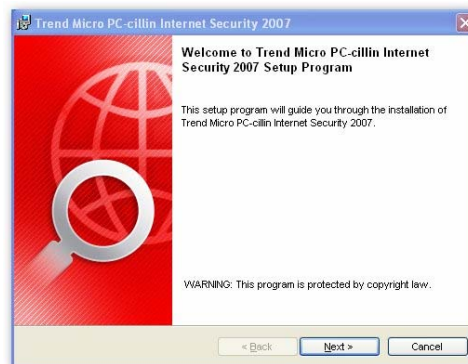
2. Please select Next when the "Trend Micro internet security" install shield wizard windows appears

3. This is license agreement, select "I accept the terms in the license agreement" and Click NEXT.

4. . Click Next after you select the features you want to install and the folder to install it.

5 Click Install after you select to install the optional online services.

6. Click "automatically restart your computer now "and Finish to activate this function.

4-6　PC-HEALTH　Install MyGuard Hardware monitor Utility

1. Click PC-HEALTH when MAGIC INSTALL MENU appears

2. Click Next on Install shield wizard Window appears
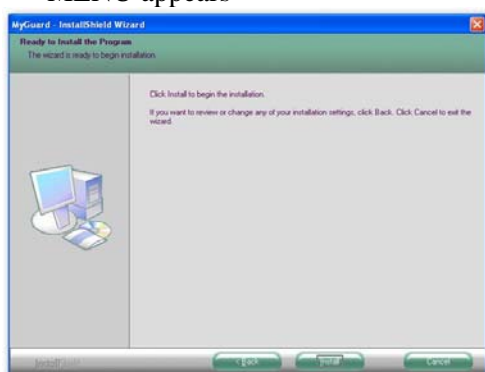
3. Click Install to begin the installation.

4. Click Finish to complete the installation.

NOTE: MAGIC INSTALL will auto detect file path X:\NF-ORCE4\MYGUARD\SETUP.EXE

4-7 HOW TO UPDATE BIOS

STEP 1. Prepare a boot disc. (You may make one by click START click RUN type SYS A: click OK)

STEP 2. Copy utility program to your boot disc. You may copy from DRIVER CD X:\FLASH\AWDFLASH.EXE or download from our web site.

STEP 3. Download and make a copy of the latest BIOS for 770 SERIES motherboard series from the web site to your boot disc.

STEP 4. Insert your boot disc into A:,
Start the computer, type "Awdflash A:\xxxxxx.BIN /SN/PY/CD/CH/WB/CC/R"
xxxxxx.BIN is the file name of latest BIOS

SN　　means　　don't save existing BIOS data
PY　　means　　renew existing BIOS data
CD　　means　　clear DMI data after programming
CH　　means　　update HOLE
WB　　means　　always programming BootBlock
CC　　means　　clear existing CMOS data
R　　　means　　restart computer

STEP 5. Type ENTER to update and flash the BIOS, then the system will restart automatically.

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4-8 AMD Platform RAID Function Installation

Please set these choice in the BIOS as RAID：BIOS setup \Integrated Peripherals \Onchip SATA Device \ Onchip SATA Type. When the below figures appeared, please press [Ctrl-F] into figure 2

[figure1]

Function: press[1] key, showing the RAID; press [2] key，building RAID; press [3] key, delete the RAID; press[4] key, showing the information of controller.
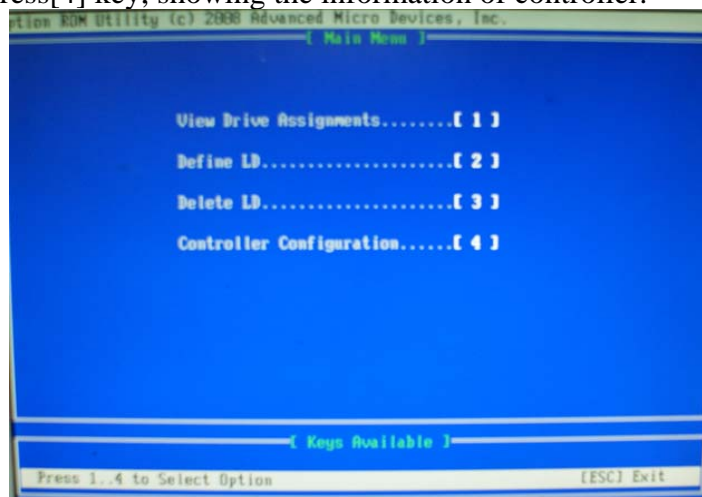
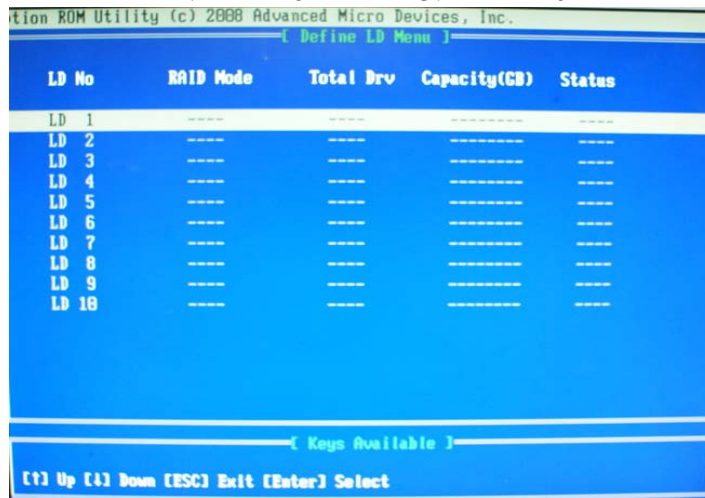[figure2]

press[1] key，showing the RAID，as the below figure

[figure3]

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Press [2] key, the interface of RAID, as figure 4.

RAID function:

1.RAID 1   2. RAID 0   3. RAID 10   4. JBOD

[figure4]

Choose LD 1 then press Enter.

Take Raid0 for example, use [↑] [↓] to shift the cursor, press space key to change the choice, press [Ctrl-Y] to keep.

Set Assignment mode as [Y], press [Ctrl-Y] to keep , then figure 5 appeared, erase the MBR.

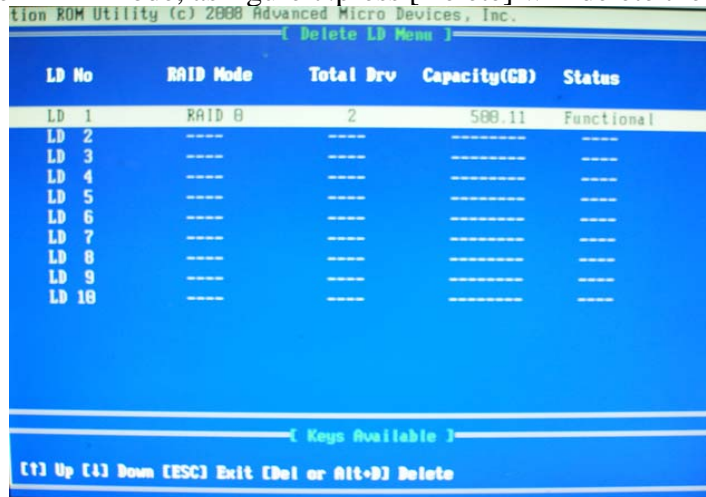choose [Ctrl-Y],figure 6 appeared. Press any key, finished the RAID.
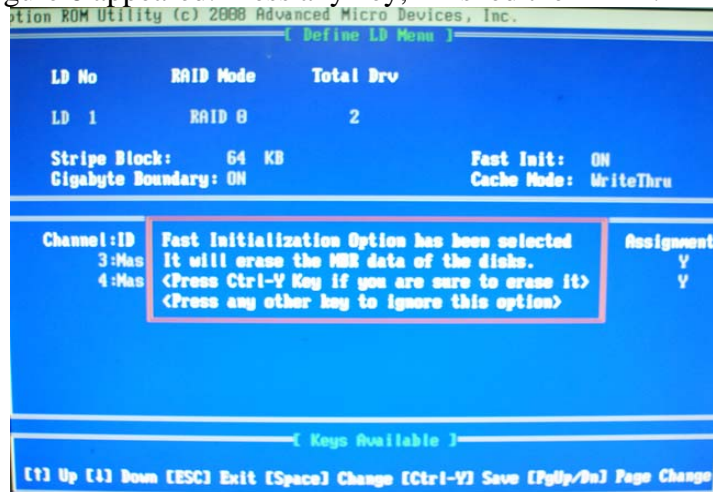
[figure5]
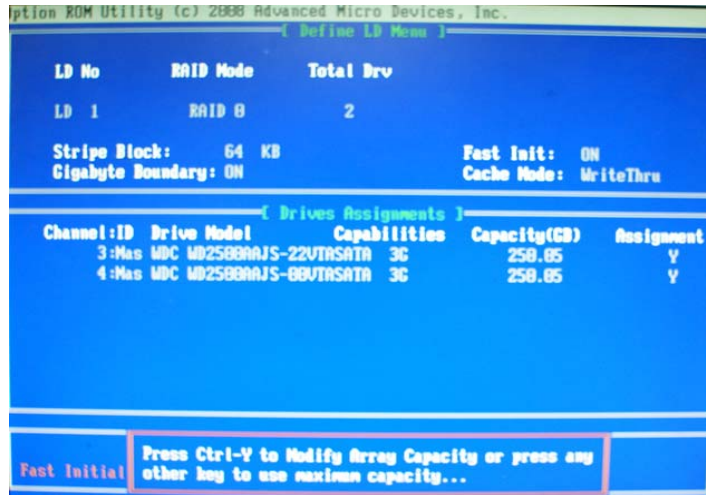
[figure6]

Press [3], delete the RAID mode, as figure 7.press [Delete] will delete the array. As figure 7 .

[figure7]

Press [4], showing the information of controller, as figure 8.

[figure8]

Making RAID driver diskette before Install WindowsXP/2000

Before you install the Windows XP or Windows 2000, you will need to make a RAID driver diskette before you start to install the Operating System.

How to make a RAID driver diskette?

1: Insert the diskette which is being formatted in floppy drive on a system which can start OS.
2: After booting OS insert the bundle CD in your CD-ROM
3: Copy all the files from \NF-orce4\RAIDDisk to floppy diskette

Once you have the SATA driver diskette ready, you may start to install Windows XP or Windows 2000 on your System.

Installation of Windows XP/ Windows 2000

For installation of Windows XP or Windows 2000, please insert Windows XP or Windows 2000 CD into the CD-ROM drive. Then remove the floppy diskette, and boot the system. At the very beginning, you will see the message at the bottom of screen, "Press F6 if you need to install a third party SCSI or RAID driver…."

At this moment, please press <F6> key and follow the instructions of Windows XP or Windows 2000 for the proper installation.

Execute Start → programs → NVIDIA corporation → RAID manager , you can view RAID function status or rebuild RAID function from Windows OS
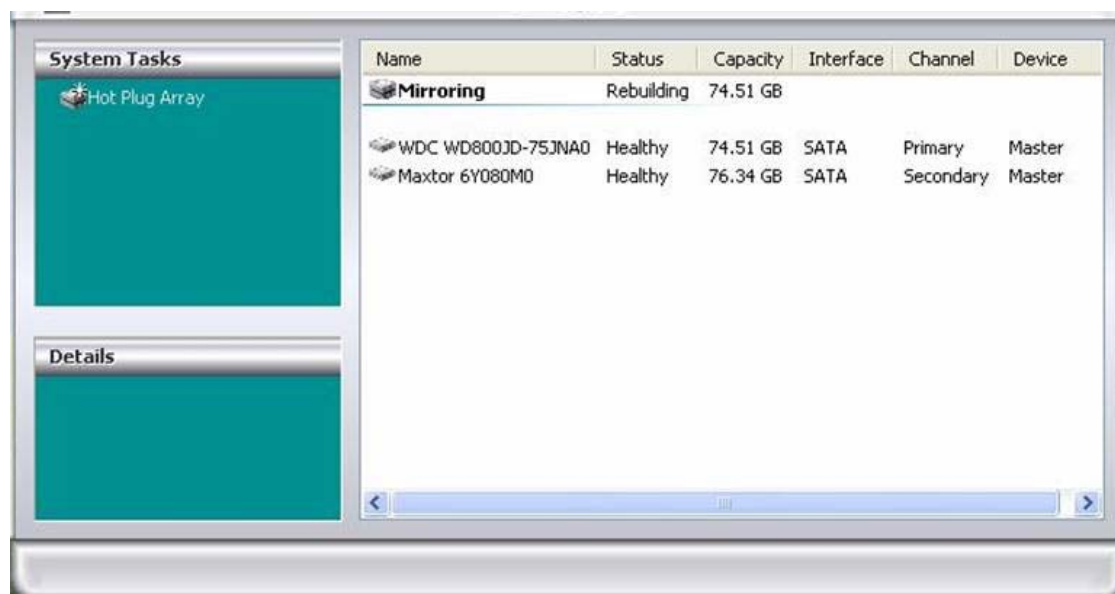
# 4-9   Pro Magic Plus Function Introduction
What's Pro Magic Plus?

Tired with reinstall OS each time when it doesn't work?   Does your computer often crash down or unable to work after installed new software? Have you had great loses and troubles because of computer problems? Still using time-consuming backup software that occupies lots of HD space?

Pro Magic Plus- an instant system recovery software tailored to solve these problems for you. It combines various application tools (e.g. anti-virus, backup software, uninstall software, multi-boot software) to satisfy your needs of all sorts of system protections.

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What functions does Pro Magic Plus have?

1. **Instant System Restoration** – Regardless of mis-operation or system crash, install Pro Magic Plus beforehand would allow you to instantly restore your system back by simply reboot your computer.

2. **Easy-to-use** – Auto installation from CD ROM; Supports Mouse

3. **System Uninstall** – Pro Magic provides a protection mode, which allows user to freely test any software.   If user does not want to keep the software, just reboot the computer to restore back to the previous state, and Pro Magic will remove it completely from you computer.

4. **Password Security** – Pro Magic provides double password protection, including user password for entering each OS and manager password for managing 'Pro Magic', which can effectively prevent others from using your computer without permission or data from being stolen. (disable item for OEM version)

5. **Complete Protection** – Pro Magic not only protects the system disk, but also can protect your data disk, and does not require to reboot when backup or restore data disk.

6. **Multipoint Save/Restore** – You can backup your system whenever you need and restore them back to anytime you wish, 1 hour, 1 day or 1 month ago.   Restore points are unlimited. (disable item for OEM version)

7. **Data Disk Protection** – Pro Magic Plus now comes with data disk protection, provides complete protection for your computer! (disable item for OEM version)

8. **You can choose to change the default path of 'My Document', 'My Favorite' and 'Outlook Express'**, so that when you are restoring the system, data in these folders will not be restored as well. (This is optional, you can leave it as it is).
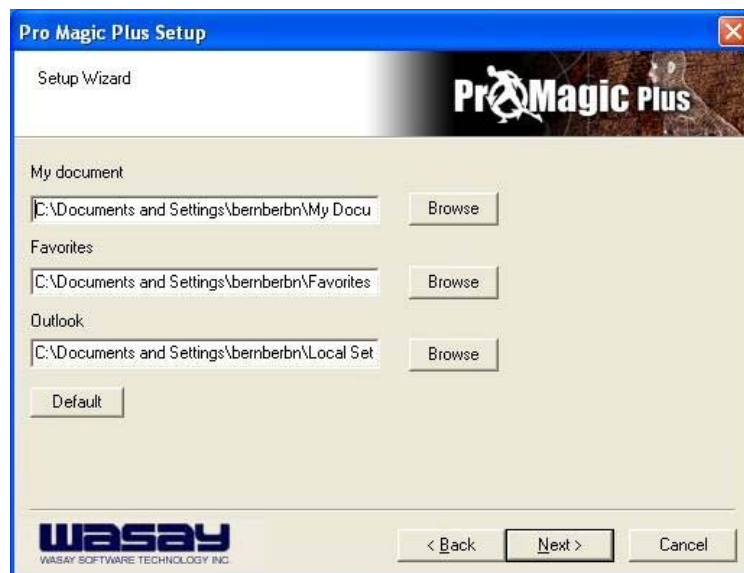
graph 4

📂**NOTE:** Functions of each version will differ from each other, and will be based on the function descriptions of each version.

System Requirements

◇ First OS must be Windows 98 SE/ME/2000/XP/VISTA
◇ Support Only Windows OS (No Linux)
◇ Windows server OS and Windows NT not supported
◇ Minimum of Intel 486 or above, 16MB of memory or above

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◇ Minimum of 500MB free/usable space or above
◇ Support for SCSI & SATA Hard disk

Pro Magic Plus only supports SCSI hard disk with Windows 2000 or OS above

Notice Before Installation

1. Before install Pro Magic Plus, turn off all anti-virus software. (Include BIOS anti-virus function)

2. Pro Magic Plus does not support multiple PRI partitions.   If you have multiple PRI partitions, please repartition your HD before installation.

3. If your HDD is not fully partitioned (with un-partitioned/unused space at end of HDD), please repartition the HDD before install Pro Magic Plus.

APPENDIX

Debug Port Post Code

Normal POST Codes

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

ISA POST codes are output to port address 80h.

Code(hex)	Name	Description
C0	Turn Off Chipset And CPU test	OEM Specific-Cache control cache Processor Status (1FLAGS) Verification. Tests the following processor status flags: Carry, zero, sign, overflow, The BIOS sets each flag, verifies They are set, then turns each flag off and verifies it is off. Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00. RAM must be periodically refreshed to keep the memory from decaying. This function ensures that the memory refresh function is working properly.
C1	Memory Presence	First block memory detect OEM Specific-Test to size on-board memory. Early chip set initialization Memory presence test OEM chip set routines Clear low 64K of memory Test first 64K memory.
C2	Early Memory Initialization	OEM Specific- Board Initialization
C3	Extend Memory DRAM select	OEM Specific- Turn on extended memory Initialization Cyrix CPU initialization Cache initialization
C4	Special Display Handling	OEM Specific- Display/Video Switch Handling so that Switch Handling display switch errors never occurs
C5	Early Shadow	OEM specific- Early shadow enable for fast boot
C6	Cache presence test	External cache size detection
CF	CMOS Check	CMOS checkup
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot.
BF	Program Chip Set	To program chipset from defaults values
E1-EF	Setup Pages	E1- Page 1, E2 - Page 2, etc.
1	Force load Default to chipset	Chipset defaults program
2	Reserved	
3	Early Superio Init	Early Initialized the super IO
Code(hex)	**Name**	**Description**
4	Reserved	
5	Blank video	Reset Video controller
6	Reserved	
7	Init KBC	Keyboard controller init
8	KB test	Test the Keyboard
9	Reserved	
A	Mouse Init	Initialized the mouse

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B	Onboard Audio init	Onboard audio controller initialize if exist
C	Reserved	
D	Reserved	
E	CheckSum Check	Check the intergraty of the ROM,BIOS and message
F	Reserved	
10	Auto detec EEPROM	Check Flash type and copy flash write/erase routines to 0F000h segments
11	Reserved	
12	Cmos Check	Check Cmos Circuitry and reset CMOS
13	Reserved	
14	Chipset Default load	Program the chipset registers with CMOS values
15	Reserved	
16	Clock Init	Init onboard clock generator
17	Reserved	
18	Identify the CPU	Check the CPU ID and init L1/L2 cache
19	Reserved	
1A	Reserved	
1B	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT TBL
1C	Reserved	
1D	Early PM Init	First step initialize if single CPU onboard
1E	Reserved	
1F	Re-initial KB	Re-init KB
20	Reserved	
21	HPM init	If support HPM, HPM get initialized here
22	Reserved	
23	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery. If failed, load CMOS defaults and load into chipset
24	Reserved	
25	Reserved	
26	Reserved	
27	KBC final Init	Final Initial KBC and setup BIOS data area
28	Reserved	
29	Initialize Video Interface	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
2A	Reserved	
2B	Reserved	
2C	Reserved	
2D	Video memory test	Test video memory, write sign-on message to screen.
2E	Reserved	Setup shadow RAM - Enable shadow according to Setup.
2F	Reserved	
30	Reserved	
31	Reserved	
32	Reserved	
33	PS2 Mouse setup	Setup PS2 Mouse and reset KB
34	Reserved	
35	Test DMA Controller 0	Test DMA channel 0
36	Reserved	
37	Test DMA Controller 1	Test DMA channel 1
38	Reserved	
39	Test DMA Page Registers	Test DMA Page Registers.
3A	Reserved	
3B	Reserved	

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3C	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
3D	Reserved	
3E	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
3F	Reserved	
40	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
41	Reserved	
42	Reserved	
43	Test Stuck8259's Interrupt Bits Test 8259 Interrupt Functionality	Turn off interrupts then verify no interrupt mask register is on. Force an interrupt and verify the interrupt occurred.
44	Reserved	
45	Reserved	
46	Reserved	
47	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests an clear EISA mode flag.
48	Reserved	
49	Size Base and Extended Memory	Size base memory from 256K to 640K and extended memory above 1MB.
4A	Reserved	
4B	Reserved	
4C	Reserved	
4D	Reserved	
4E	Test Base and Extended Memory	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. NOTE: This test is skipped in EISA mode and can be skipped with ESC key in ISA mode.
4F	Reserved	
50	USB init	Initialize USB controller
51	Reserved	
52	Memory Test	Test all memory of memory above 1MB using Virtual 8086 mode, page mode and clear the memory
53	Reserved	
54	Reserved	
55	CPU display	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features
56	Reserved	
57	PnP Init	Display PnP logo and PnP early init
58	Reserved	
59	Setup Virus Protect	Setup virus protect according to Setup
5A	Reserved	
5B	Awdflash Load	If required, will auto load Awdflash.exe in POST
5C	Reserved	
5D	Onboard I/O Init	Initializing onboard superIO
5E	Reserved	
5F	Reserved	
60	Setup enable	Display setup message and enable setup functions
61	Reserved	
62	Reserved	
63	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt

		vectors.
64	Reserved	
65	PS2 Mouse special	Special treatment to PS2 Mouse port
66	Reserved	
67	ACPI init	ACPI sub-system initializing
68	Reserved	
69	Setup Cache Controller	Initialize cache controller.
6A	Reserved	
6B	Setup Entering	Enter setup check and auto-configuration check up
6C	Reserved	
6D	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and any drives.
6E	Reserved	
6F	FDD install	Install FDD and setup BIOS data area parameters
70	Reserved	
71	Reserved	
72	Reserved	
73	Initialize Hard Drive & Controller	Initialize hard drive controller and any drives.
74	Reserved	
75	Install HDD	IDE device detection and install
76	Reserved	
77	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
78	Reserved	
79	Reserved	
7A	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
7B	Reserved	
7C	HDD Check for Write protection	HDD check out
7D	Reserved	
7E	Reserved	
7F	POST error check	Check POST error and display them and ask for user intervention
80	Reserved	
81	Reserved	
82	Security Check	Ask password security (optional).
83	Write CMOS	Write all CMOS values back to RAM and clear screen.
84	Pre-boot Enable	Enable parity checker Enable NMI, Enable cache before boot.
85	Initialize	Initialize any option ROMs present Option ROMs from C8000h to EFFFFh. NOTE: When FSCAN option is enabled, ROMs initialize from C8000h to F7FFFh.
86	Reserved	
87	Reserved	
88	Reserved	
89	Reserved	
8A	Reserved	
8B	Reserved	
8C	Reserved	
8D	Reserved	
8E	Reserved	
8F	Reserved	
90	Reserved	
91	Reserved	
92	Reserved	
93	Boot Medium detection	Read and store boot partition head and cylinders values in RAM

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94	Final Init	Final init for last micro details before boot
95	Special KBC patch	Set system speed for boot Setup NumLock status according to Setup
96	Boot Attempt	Set low stack Boot via INT 19h.
FF	Boot	

Quick POST Codes

Code(hex)	Name	Description
65	Init onboard device	Early Initialized the super IO Reset Video controller Keyboard controller init Test the Keyboard Initialized the mouse Onboard audio controller initialize if exist. Check the intergraty of the ROM, BIOS and message Check Flash type and copy flash write/erase routines to 0F000h segments Check Cmos Circuitry and reset CMOS Program the chipset registers with CMOS values Init onboard clock generator
66	Early System setup	Check the CPU ID and init L1/L2 cache Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL First step initialize if single CPU onboard. Re-init KB If support HPM, HPM get initialized here
67	KBC and CMOS Init	Verifies CMOS is working correctly, detects bad battery. If failed, load CMOS defaults and load into chipset Final Initial KBC and setup BIOS data area.
68	Video Init	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter. Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
69	8259 Init	Init 8259 channel 1 and mask IRQ 9
6A	Memory test	Quick Memory Test
6B	CPU Detect and IO init	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features Display PnP logo and PnP early init Setup virus protect according to Setup. If required, will auto load Awdflash.exe in POST Initializing onboard superIO
6C	Reserved	
6D	Reserved	
6E	Reserved	
6F	Reserved	

Code	Name	Description
70	Setup Init	Display setup message and enable setup functions Detect if mouse is present, initialize mouse, install interrupt vectors. Special treatment to PS2 Mouse port ACPI sub-system initializing
71	Setup Cache Controller	Initialize cache controller.
72	Install FDD	Enter setup check and auto-configuration check up Initialize floppy disk drive controller and any drives. Install FDD and setup BIOS data area parameters
73	Install HDD	Initialize hard drive controller and any drives. IDE device detection and install Initialize any serial and parallel ports (also game port).
74	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
75	HDD Check for Write protection	HDD check out
76	Reserved	
77	Display POST error	Check POST error and display them and ask for user intervention Ask password security (optional).
78	CMOS and Option ROM Init	Write all CMOS values back to RAM and clear screen. Enable parity checker Enable NMI, Enable cache before boot. Initialize any option ROMs present from C8000h to EFFFFh. NOTE: When FSCAN option is enabled, ROMs initialize from C8000h to F7FFFh.
79	Reserved	
7A	Reserved	
7B	Reserved	
7C	Reserved	
7D	Boot Medium detection	Read and store boot partition head and cylinders values in RAM
7E	Final Init	Final init for last micro details before boot
7F	Special KBC patch	Set system speed for boot Setup NumLock status according to Setup
80	Boot Attempt	Set low stack Boot via INT 19h.
FF	Boot	

S4 POST Codes

Code(hex)	Name	Description
5A	Early Chipset Init	Early Initialized the super IO

		Reset Video controller
		Keyboard controller init
		Test the Keyboard
		Initilized the mouse
5B	Cmos Check	Check Cmos Circuitry and reset CMOS
5C	Chipset default Prog	Program the chipset registers with CMOS values. Init onboard clock generator
5D	Identify the CPU	Check the CPU ID and init L1/L2 cache
5E	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and INT 00h-1Fh according to INT_TBL First step initialize if single CPU Onboard. Re-init KB If support HPM, HPM get initialized Here.
5F	Test CMOS Interface and Battery status	Verifies CMOS is working correctly, detects bad battery. If failed, load CMOS defaults and load into chipset
60	KBC final Init	Final Initial KBC and setup BIOS data area
61	Initialize Video Interface	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
62	Video memory test	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
63	Setup PS2 mouse and test DMA	Setup PS2 Mouse and reset KB Test DMA channel 0
64	Test 8259	Test 8259 channel 1 and mask IRQ 9
65	Init Boot Device	Detect if mouse is present, initialize mouse, install interrupt vectors. Special treatment to PS2 Mouse port ACPI sub-system initializing Initialize cache controller.
66	Install Boot Devices	Enter setup check and auto-configuration check up Initialize floppy disk drive controller and any drives. Install FDD and setup BIOS data area Parameters Initialize hard drive controller and any drives. IDE device detection and install
67	Cache Init	Cache init and USB init
68	PM init	PM initialization
69	PM final Init and issue SMI	Final init Before resume
FF	Full on	

BootBlock POST Codes

Code(hex)	Name	Description
1	Base memory test	Clear base memory area (0000:0000--9000:ffffh)
5	KB init	Initialized KBC
12	Install interrupt vectors	Install int. vector (0-77), and initialized 00-1fh to their proper place
0D	Init Video	Video initializing
41	Init FDD	Scan floppy and media capacity for onboard superIO

FF	Boot	Load boot sector

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