



User's Manual

**AMD 580X CrossFire mainboard for
AMD Socket AM2 (940-pin) processor**

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HANDLING PROCEDURES:

Static electricity can severely damage your equipment. Handle the mainboard and any other device in your system with extreme care and avoid unnecessary contact with system components on the mainboard. Always work on an antistatic surface to avoid possible damage to the mainboard from static discharge. Always have the power supply unplugged and powered off when inserting and removing devices within the computer chassis. The Manufacturer assumes no responsibility for any damage to the mainboard that results from failure to follow instruction or failure to observe safety precautions.



CAUTION



The mainboard is subject to damage by static electricity.
Always observe the handling procedures.

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Section 1 -- Introduction

1-1 Package Contents

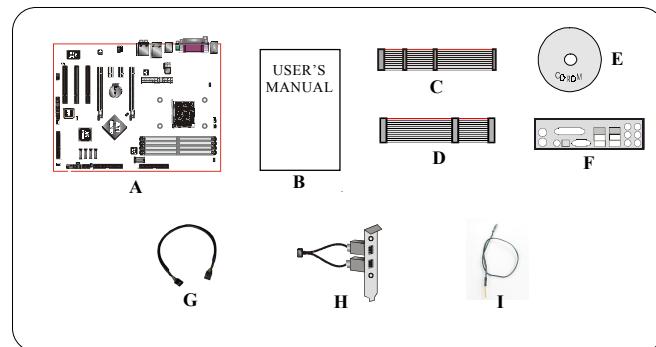
Contents

- A. Mainboard
- B. User's manual
- C. Floppy drive cable
- D. HDD drive cable
- E. CD (drivers and utilities)
- F. I/O Shield
- G. SATA II data cable

Optional items

- H. Extra USB2.0 port cable
- I. Thermo Stick cable

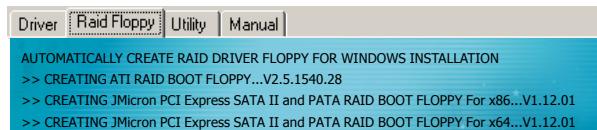
If you need the optional item, please contact your dealer for assistance.



If you intend to setup RAID:

When installing Windows XP/2000 into any RAID drive, the O/S setup will require a floppy disk containing the RAID driver. This step will show you how to prepare this driver floppy.

1. Locate a PC and insert the bundled CD into its CD-ROM drive.
2. A main menu screen will appear (Autorun feature)
3. Select the page "RAID floppy"



4. Insert a blank floppy into the A:drive
5. Click on the required RAID controller driver to begin copy into the floppy

1-2 Mainboard Features

Brief Introduction

● **Socket AM2**

Socket AM2 (940-pin) based motherboards are designed to provide performance enhancements for AMD Athlon AM2 processor-based systems, and it also expected to be the next-generation of platform innovations.

For more information about all the new features Athlon™ AM2 Processor deliver, check out the AMD website at <http://www.amd.com>

● **Chipset**

The board is designed with AMD 580X CrossFire chipset, featuring performance and stability with the most innovative technology and features.

For more details about the chipset, please visit the AMD website: <http://www.ati.amd.com>.

● **PCI-Express (PCI-E)**

Next generation peripheral interface to succeed to current PCI bus for the next decade. With smaller slot size and 250MB/sec (PCI-E*1) or 4GB/sec (PCI-E*16) maximum transfer, PCI-Express overcomes PCI bus bottleneck.

● **ATI CrossFire™**

ATI CrossFire™ Xpress 3200 is the first to unleash true, unrestricted single chip 2x16 PCI Express® interfaces. Developed for the enthusiast and professional, this advanced solution pumps an unparalleled bandwidth of up to 8 GB/s to each GPU. With extreme overclocking and unprecedented control over system behavior, the result is astonishing performance with brilliant and intense 3D graphics.

● **DDR2**

DDR2 ushers in the new era of DDR memory technology. DDR2 memory offers faster speed, higher data bandwidth and lower power consumption over DDR.

● **Dual Channel**

Supports dual channel of DDR2 memory to give you twice the memory bandwidth for greater system performance.

● **Hardware Monitoring**

Hardware monitoring enables you to monitor various aspects of the system operation and status. This includes CPU temperature, voltage and fan speed in RPMs.

● **GbE LAN**

The new Gigabit Ethernet LAN allows data transmission at 1,000 megabits per second (Mbps), which runs 10 times faster than conventional 10/100BASE-T Ethernet LANs.

● **Serial ATA II**

S-ATA II is the second generation SATA interface with double the transferring speed up to 300MB/sec. It supports NCQ to provide faster reading speed for your storage devices.

● **SATA RAID**

RAID function available on chipset's SATA ports.

● **More S-ATA II (Optional)**

An extra S-ATA II controller is added to allow for more S-ATA II ports expansion in the form of JMicron's JMB363 complete with RAID function.

● **e-SATA (Optional)**

With this new standard, you can now hot-plug external SATA drives to your system similar to USB devices. With transfer speed up to 6 times faster than USB2.0, RAID capability and Port Multiplier function, e-SATA brings unseen before performance to storage out of the box. This function is available only on S-ATA II ports from JMicron's JMB363 controller.

● **USB2.0**

A popular USB standard for plugging in peripherals with up to 480Mbps transfer speed while maintaining backward compatibility with older USB1.1 device.

● **8ch**

Delivers 8 channel audio to bring you the latest in audio realism from DVD movies and games. Perfect for your home theatre system.

● **AMD Cool'n'Quiet™ Technology**

AMD's Cool'n'Quiet™ Technology lowers CPU operating voltage when the system is in idle mode. This helps to reduce heat dissipation and in effect lowers the fan speed to noise from your PC.

Special Features

BIOS Features:

● **Ghost BIOS**

No more worries if BIOS gets corrupted causing your system unable to boot. The onboard backup BIOS will rescue & recover main BIOS in just a few easy steps.

● **Thunder Probe**

A hardware diagnostic software to monitor voltage, temperature and speed of a variety of hardware. It also includes an ingenious built in fan control feature called Smart Fan.

● **Thunder Flash**

A Windows based innovation tool to provide safe and easy BIOS rescue function, BIOS flash function and personal start up screen.

● **Magic Health**

Reports your system hardware status for every boot-up to help detect faults early. Monitor hardware status including CPU temperature, CPU/Memory/Chipset voltage, fan RPM speed for chassis fan, CPU fan & Power supply fan.

● **EZ-Boot**

Simply press "ESC" to select your bootable device. No more hassle to search the BIOS menu, change and re-start.

● **PowerBIOS**

Supporting a full range of overclocking setting via BIOS. Various adjustable feature include CPU/Memory/ Chipset voltage tweaking.

H/W Features:

● **QuickSPDIF**

On board SPDIF-out connector for quick connection to multi-channel speakers. Not only removes cable cluttering but also delivers loss-free digital audio to let you enjoy DVD movies and games with crystal clear sound.

● **EZ-Button**

A handy power-on button located onboard to turn on/off the system easily, especially while debugging or testing the system.

● **LEDION**

Onboard LED indicators to show the power status CPU, Chipset and DRAM. You know immediately where to look if the system fails to start.

● **Thermo Stick (Optional)**

Flexible thermometer to let you measure any temperature by software. Ideal for monitoring VGA card, chipset or even disk drives temperatures.

1-3 Mainboard Specification

Processor

- ◆ Support Socket-AM2 (940 pin) based AMD Athlon-X2/Athlon-64/Sempron processors
- ◆ Support 2.0GTs 16X16 wide Hyper Transport bus
- ◆ Support VMM (Virtualization-Machine-Monitoring)

Chipset

- ◆ AMD 580X CrossFire (580X + SB600) Chipset

Main Memory

- ◆ Four 240-pin unbuffered non-ECC DDR2 SDRAM DIMM sockets
- ◆ Support single-sided or double-sided 1.8v DDR2-533/667/800 DIMMs with dual channel architecture in 256Mb/512Mb/1Gb technologies
- ◆ Supports up to 16GB memory size

Expansion Slots

- ◆ Three PCI connectors compliant with PCI v2.3
- ◆ Two PCI-E (x1) connectors compliant with PCI Express 1.0a
- ◆ Two PCI-E (x16) connectors compliant with PCI Express 1.0a to support ATI CrossFire™ technology

USB

- ◆ Ten USB connectors compliant with USB2.0 from embedded USB controller (4 connectors at rear panel)

LAN

- ◆ One Gigabit Ethernet from onboard Marvell 88E8056 PCI-E controller

P-ATA IDE

- ◆ One IDE interface (up to 2 IDE devices) with UDMA-33/66/100/133 support from embedded IDE controller

S-ATA II RAID

- ◆ Four S-ATA II ports with up to 300MB/s from chipset with RAID 0, 1, 0+1 support

More S-ATA (Optional)

- ◆ Two S-ATA II ports and One P-ATA port from JMicron's JMB363 PCI-Express to 2S1P controller and e-SATA support

I/O

- ◆ Onboard EPoX EP1308 LPC bus I/O controller
- ◆ Legacy peripheral interface for PS/2 keyboard & mouse, FDD, Parallel, Serial, and IrDA (v1.0 compliant)
- ◆ Support Hardware Monitoring for fan speed monitoring and CPU temperature sensing
- ◆ Intelligent fan speed control for CPU-fan (PWM) and Chassis-fan for quiet operation

Audio

- ◆ 8 channel audio from onboard Realtek ALC8xx High Definition audio compliant CODEC
- Support CD-In
- Support **Jack detection** for fool-proof audio device installation
- Rear panel audio jacks configuration:

Phone Jack Color	2 channel	6 channel	8 channel
Light Blue	Line-in	Line-in	Line-in
Lime	Line-out	Front stereo-out	Front stereo-out
Pink	Mic-in	Mic-in	Mic-in
Gray			Side stereo-out
Black		Rear stereo-out	Rear stereo-out
Orange		Center&Subwoofer	Center&Subwoofer

● BIOS

- ◆ Flash EEPROM with Award Plug&Play BIOS
- ◆ Support **EZ Boot** for fast bootable device selection
- ◆ Support **Magic Health** for system hardware status report during system boot-up
- ◆ Support **Ghost BIOS** for BIOS Recovery

● Peripheral Interfaces

☞ At Rear Panel

- ◆ PS/2 keyboard and mouse ports
- ◆ One Parallel (printer) port
- ◆ One S/PDIF-Out Coaxial jack
- ◆ One S/PDIF-Out Optical
- ◆ One Serial port
- ◆ One RJ45 LAN connector
- ◆ Four USB2.0 ports
- ◆ Six Audio jacks

☞ Onboard connector and pin-header

- ◆ One floppy drive connector
- ◆ One ATA-100/133 IDE connector from AMD SB600
- ◆ One ATA-100/133 IDE connector from JMicron's JMB363 (Optional)
- ◆ Six extra USB2.0 ports
- ◆ One CD-IN connector
- ◆ One IR connector
- ◆ Four S-ATA II connectors from AMD SB600
- ◆ Two S-ATA II connectors from JMicron's JMB363 (Optional)
- ◆ Three Fan connectors

● Front Panel Controller

- ◆ Supports Reset & Soft-Off switches
- ◆ Supports HDD & Power LEDs
- ◆ Supports PC speaker
- ◆ Supports Front Panel Audio connector

● Special Features

- ◆ Support KBPO function – Keyboard power on, turn on the computer from keyboard
- ◆ Support Wake-On-LAN by PME
- ◆ **PowerBIOS** for excellent overclocking features:
 - Programmable FSB and PCI-E Clock output frequency with 1MHz fine tuning
 - Support BIOS adjustable CPU multiplier, FSB clock, PCI-E x16 clock, DIMM frequency
 - Support BIOS adjustable CPU Core voltage, Chipset voltage and DIMM voltage
- ◆ Support **EZ-Button** – A handy power-on button onboard to turn on/off the system easily
- ◆ Support **LEDION** – onboard LED power indicator for CPU, DDR, chipset and power.
- ◆ Support **Thermo Stick** temperature (Optional)
- ◆ Support **Ghost BIOS** - Rescue, recover BIOS in an easy step and no more worry of BIOS being corrupted.

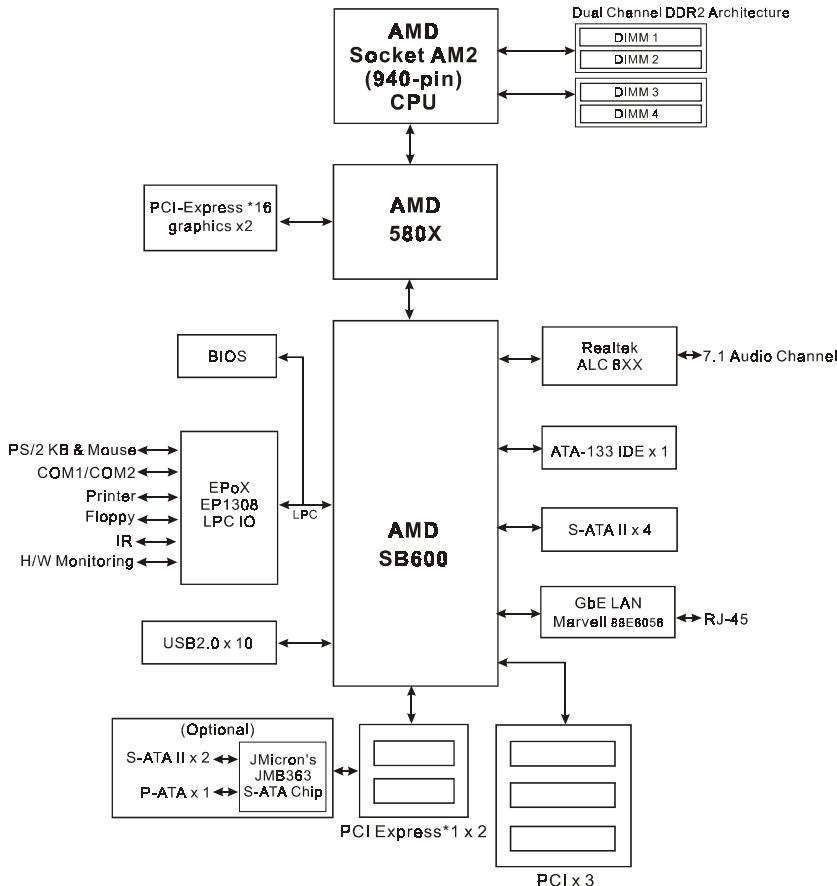
● Powerful utilities for Windows

- ◆ Support **Thunder Probe** - A hardware diagnostic software to monitor voltage, temperature and speed of a variety of hardware. It also includes an ingenious built in fan control feature called Smart Fan.
- ◆ Support **Thunder Flash** - A Windows based innovation tool to provide safe and easy BIOS rescue function, BIOS flash function and personal start up screen.

Form Factor

- 305mm x 245 mm ATX size

 Depending on the model you purchased, some components are optional and may not be available.

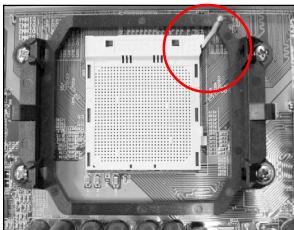
1-4 System Block Diagram

Section 2 -- Installation



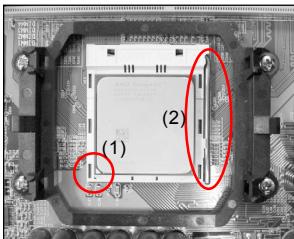
Always have the power supply unplugged and powered off when inserting and removing devices within the computer chassis.

2-1 CPU Installation



Step 1

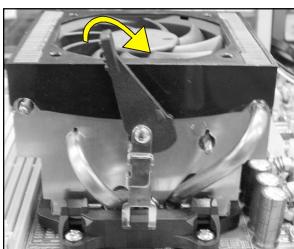
Open the socket by raising the actuation lever.



Step 2

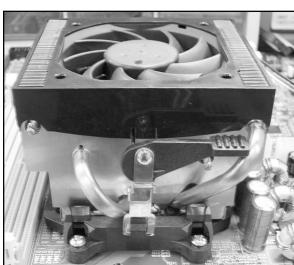
- (1) Align pin 1 on the CPU with pin 1 on the CPU socket as shown.
Insert the CPU and make sure it is fully inserted into the socket.
- (2) Close the socket by lowering and locking the actuation lever.

The CPU is keyed to prevent incorrect insertion, do not force the CPU into the socket. If it does not go in easily, check for mis-orientation.



Step 3

Insert the heatsink as shown. Press the clips in the direction of the arrows shown to secure the assembly to the CPU socket.

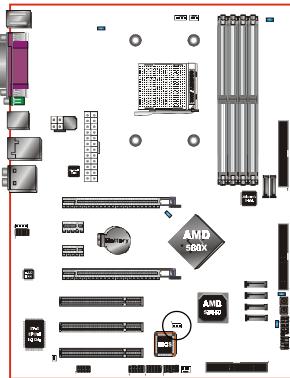


Step 4

Plug the CPU fan power into the mainboard's CPU fan connector.
The installation is complete.

-
- Thermal compound and qualified heatsink recommended by AMD are a must to avoid CPU overheat damage.
 - Apply heatsink thermal compound/paste to the CPU.

2-2 Jumper Settings



JCMOS: Clear CMOS data Jumper

If the CMOS data becomes corrupted or you forgot the supervisor or user password, clear the CMOS data to reconfigure the system back to the default values stored in the ROM BIOS.



Settings:

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



To CMOS Clear data, please follow the steps below.

1. Turn off the system.
2. Change the jumper from "1-2" to "2-3" position for a few seconds.
3. Replace the jumper back to the "1-2" position.
4. Turn on the system and hold down the key to enter BIOS setup.

2-3 System Memory Configuration

The mainboard accommodates Four 240-pin DDR2 DIMMs.

- Supports up to 16GB of 533/667/800MHz DDR2 SDRAM.
- Supports unbuffered DIMM configurations defined in JEDEC DDR2 DIMM specification.

Dual Channel interface:

- Dual channel memory access offers increased system performance.
- For dual channel to operate, both channel must be populated with same amount of memory, preferably of the same type.
- The four DIMM sockets are divided into two colors to help you identify the channel pairs <Figure 1>. Each dual channel pair has the same color, e.g. DIMM1 and DIMM2. **To obtain best performance, simply mount DIMM sockets of the same color.**



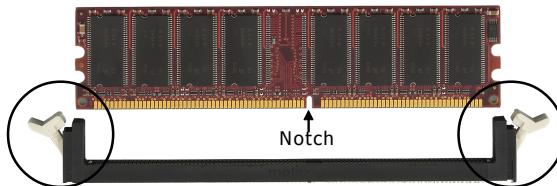
Memory configurations supported:

	1 DIMM (64-bit)		2 DIMM (64-bit)	2 DIMM (128-bit)		4 DIMM (128-bit)
DIMM#1	SS/DS		SS/DS	SS/DS		SS/DS
DIMM#2				SS/DS		SS/DS
DIMM#3		SS/DS	SS/DS		SS/DS	SS/DS
DIMM#4					SS/DS	SS/DS

* SS: Single-Sided DIMM, DS: Double-Sided DIMM

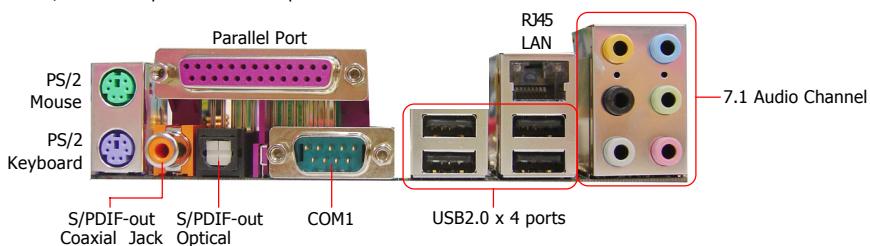
Memory Installation :

- To install, align the notch on the DIMM module with the connector.
- Press straight down as shown in the figure until the white clips close and the module fits tightly into the DIMM socket.

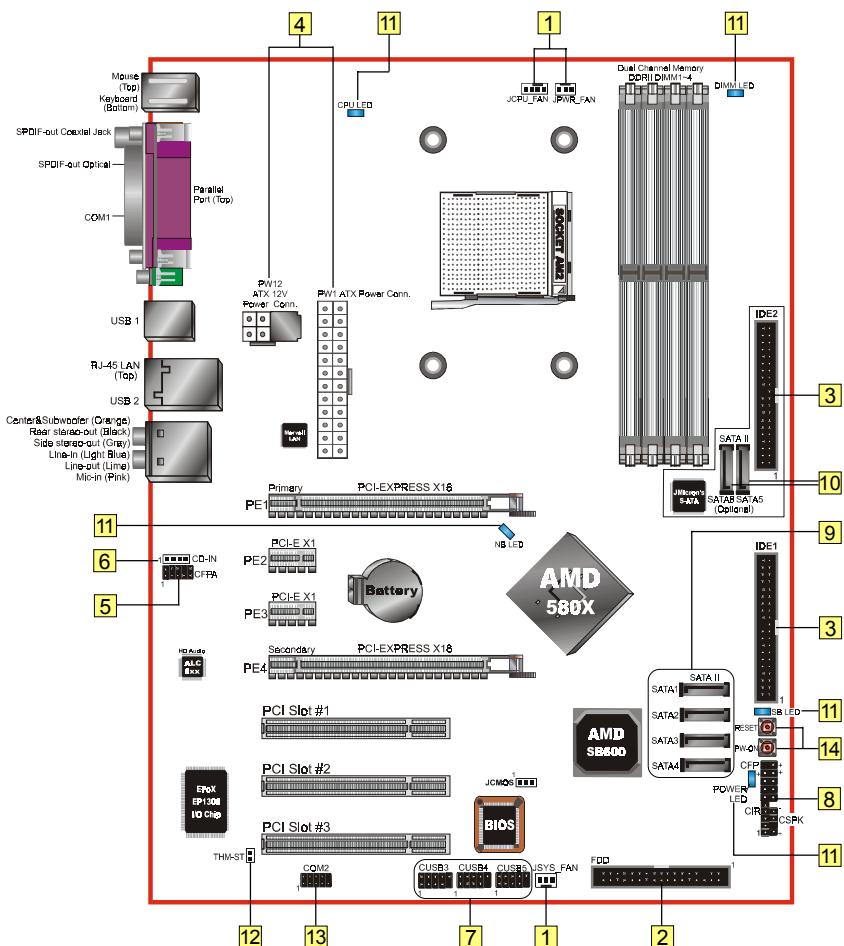


2-4 Rear IO Port

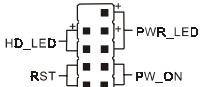
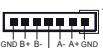
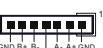
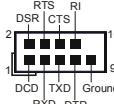
The I/O back panel for this mainboard is shown below. When installing the mainboard into the computer case, use the bundled I/O shield to protect this back panel.



2-5 Internal Connectors



Connectors	Figure	Descriptions
[1] JCPU_FAN JPWR_FAN JSYS_FAN		CPU / Power / Chassis Fan Power Connectors JCPU_FAN: Connect the CPU fan to this connector. JPWR_FAN: Use this connector if you are installing an additional fan in the unit. JSYS_FAN: The chassis fan will provide adequate airflow throughout the chassis to prevent overheating the CPU.
[2] FDD		Floppy Drive Connector
[3] IDE1 Primary IDE		Primary IDE Connector Connects to the IDE device, i.e. HDD and CD-ROM device.
IDE2 Secondary IDE (Optional)		Secondary IDE Connector Connects to the HDD device only.
		 When using two IDE drives on the same connector, one must be set to Master mode and the other to Slave mode. Refer to your disk drive user's manual for details.
[4] PW1 PW12		PW1: 24-pin ATX Power Connector PW12: 8-pin ATX12V Power Connector The plugs of the power cables are designed to fit in only one orientation.
		 The PW1 and PW12 Power Connector must be used simultaneously.
[5] CFPA		CFPA: Front Panel Audio Connector This audio connector connects to the audio jacks located on the front panel. Refer to your case manual to match the pin-out names.
[6] CD-IN		CD-IN: CD Audio-in connectors This connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.
[7] CUSB3 CUSB4 CUSB5		CUSB3/CUSB4/CUSB5: Six USB2.0 header This mainboard includes 6 additional onboard USB ports. To use these additional USB ports, a USB bracket is required. Please contact your retailer for details.

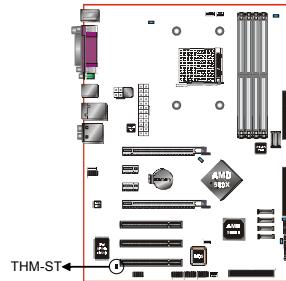
Connectors	Figure	Descriptions
[8] CFP		CFP: Case Front Panel Connector <ul style="list-style-type: none"> • HD_LED This LED indicates hard drive activity. • PWR_LED Connects to the power indicator on the PC case. • RST Connects to the RESET switch on the PC case. • PW_ON Connects to the Power button on the PC case, to turn on the system. To turn off the system, press the power button for 4 seconds.
CIR		CIR: IR connector For connection to an IrDA receiver unit.
CSPK		CSPK: Speaker Connects to the case's speaker for PC beeps.
[9] SATA1 SATA4		SATA1 ~ SATA4: Four S-ATA II Connectors These connectors enable you to connect Serial ATA HDDs or optical drives type.
[10] SATA5 SATA6 (Optional)		SATA5 ~ SATA6: Two S-ATA II Connectors These connectors enable you to connect Serial ATA HDDs or optical drives type with e-SATA.
[11] LEDION		LEDION: Onboard LED indicators to show the power status of CPU, Chipset, DRAM and power. You know immediately where to look if the system fails to start.
[12] THM-ST (Optional)		Thermo Stick: Flexible thermometer to let you measure any temperature by software. Ideal for monitoring VGA card, chipset or even disk drives temperatures.
 Refer to Thermo Stick page on Section 3.		
[13] COM2		COM2: Serial Port Connector The serial port can be used with modems, serial printers, remote display terminals, and other serial device.
[14] EZ-Button		EZ-Button — RESET, PW-ON: These onboard buttons lets you turn on/off the system easily, it is especially handy for debugging or testing the system.

Section 3 -- Thermo Stick (Optional)

This mainboard is equipped with a digital thermometer capability to monitor any temperature. This is useful for measuring heat on peripherals such as VGA cards, hard disk drives, DIMMs or even on-board components such as chipset, MOSFETS, etc.

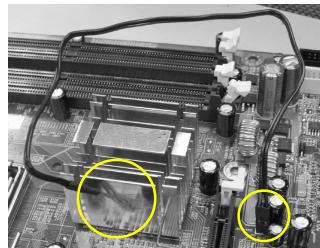
Thermo Stick consists of:

- 1) THM_ST header located on the mainboard.
- 2) Thermostick sensor cable with heat-tolerant adhesive sticker bundled in the mainboard package.
- 3) Thunder Probe software utility.



To setup Thermo Stick,

1. Insert the sensor cable to THM_ST header on the mainboard.
2. Using the adhesive sticker, affix the sensor head of the cable to your desired point of measure. e.g. the chipset as in the picture below. Trim the adhesive sticker to a suitable size so that it will not affect the heat dissipation of any heatsink.



3. Ensure the cable is neatly tucked away from fans or other moving parts.
4. Install and run the Thunder Probe software. The temperature will be shown as below.



Section 4 -- BIOS Setup

4-1 Main Menu

The ROM BIOS contains a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data is stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail causing CMOS data loss. If this happens you will need install a new CMOS battery and reconfigure your BIOS settings.



The BIOS setup screen and description are for reference only, and may not exactly match what you see on your screen. The contents of BIOS are subject to change without notice. Please visit our website for BIOS updates.

To enter the Setup Program :

Power on the computer and press the key during the POST (Power On Self Test). The BIOS CMOS SETUP UTILITY opens.



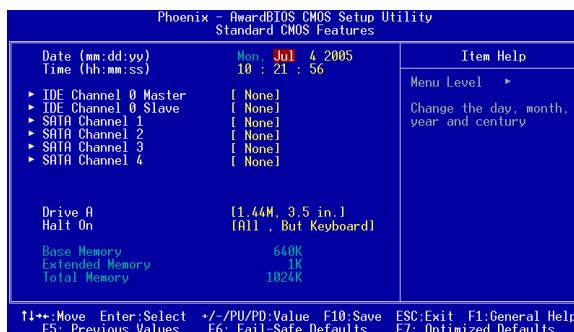
The main menu displays all the major selection items. Select the item you need to reconfigure. The selection is made by moving the cursor, press any direction (arrow key) to the item and pressing the 'Enter' key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better understanding of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.



For more information regarding BIOS settings refer to the complete manual in the bundled CD.

4-2 Standard CMOS Setup

Choose "STANDARD CMOS FEATURES" in the CMOS SETUP UTILITY Menu. Standard CMOS Features Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted (use direction keys to move the cursor and the <Enter> key to select), the entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.

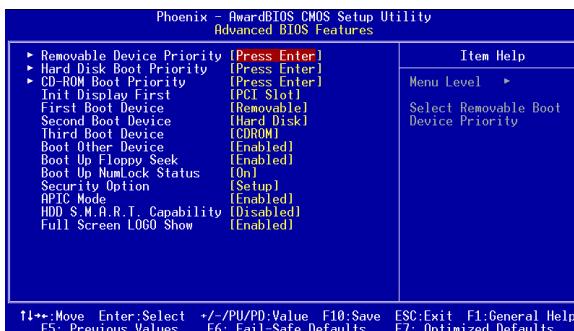


Notes:

- If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, the hard disk size and model will be auto-detected.
- The "Halt On:" field is used to determine when the BIOS will halt the system if an error occurs.

4-3 Advanced BIOS Features

Selecting the "ADVANCED BIOS FEATURES" option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values for the board. Pressing the [F1] key displays a help message for the selected item.



► **Removable Device Priority**

This item allows you to select the hard disk boot priority.

Options: Floppy, LS120, ZIP100, USB-FDD0, USB-FDD1, USB-ZIP0, USB-ZIP1.

► **Hard Disk Boot Priority**

This item allows you to select the hard disk boot priority.

Options: Pri. Master, Pri. Slave, Sec. Master, Sec. Slave, USBHDD0, USBHDD1, USBHDD2, Bootable Add-in cards.

► **CD-ROM Boot Priority**

This item allows you to select the CD-ROM boot priority.

Options: Pri. Master, Pri. Slave, Sec. Master, Sec. Slave, USB-CDROM0, USB-CDROM1.

Init Display First

This item is used to select whether to initialize the PCI-E or PCI first when the system boots.
Options: PCI Slot, PCIE.

First /Second/Third Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
Options: Floppy, LS120, Hard Disk, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, Legacy LAN, Disabled.

Boot Other Device

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the first, second, and third boot devices.
Options: Enabled, Disabled.

Boot Up Floppy Seek

If this item is enabled, it checks the size of the floppy disk drives at start-up time. You don't need to enable this item unless you have a legacy diskette drive with 360K capacity.
Options: Enabled, Disabled.

Boot Up NumLock Status

This controls the state of the NumLock key when the system boots.
On: The keypad acts as a 10-key pad.
Off: The keypad acts like cursor keys.

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 unless the correct password is entered at the prompt.
Setup: The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

APIC Mode

This item allows you to enable APIC (Advanced Programmable Interrupt Controller) functionality.
Options: Enabled, Disabled.

HDD S.M.A.R.T. Capability

The S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. Software resides on both the disk drive and the host computer. If a device failure is predicted, the host software, through the Client WORKS S.M.A.R.T applet, warns the user of the impending condition and advises appropriate action to protect the data.
Options: Enabled, Disabled.

Full Screen LOGO Show

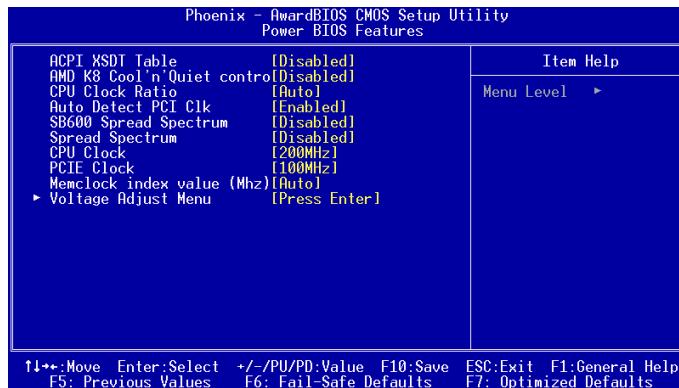
This item allows you determine Full Screen LOGO display during POST.
Options: Enabled, Disabled.

4-4 POWER BIOS Features

This page lets you adjust various parameters to obtain improved performance for overclocking.

Warning:

Overclocking requires expert knowledge and risks permanent damage to system components.
We recommend you leave these parameters at their default values for proper operation.



ACPI XSDT Table

This table is for 64 Bits OS using. Don't use for Win2K or WinXP 32 Bits mode.

Options: Enabled, Disabled.

AMD K8 Cool'n'Quiet

Reduce the noise and heat from your PC when AMD's Cool'n'Quiet™ technology is Auto.

Options: Auto, Disabled.

CPU Clock Ratio

Use this item to select a multiplier to set the CPU frequency. See CPU Frequency item below for explanation. If your CPU multiplier is locked this option will be unavailable.

Auto Detect PCI Clk

When enabled the mainboard automatically disables the clock source for a PCI slot which does not have a module in it, reducing EMI (ElectroMagnetic Interference). Options: Enabled, Disabled.

SB600 Spread Spectrum

If you enable spread spectrum, it can significantly reduce the EMI (ElectroMagnetic Interference) generated by the south bridge.

Options: Disabled, Enabled.

Spread Spectrum

If you enable spread spectrum, it can significantly reduce the EMI (ElectroMagnetic Interference) generated by the system.

Options: Disabled, +/-0.1% ~ +/-0.9%.

CPU Frequency

Enables you to increment the CPU's clock generator at 1 MHz step. This works together with CPU Clock Ratio (below) to set the CPU operating frequency.

$$\text{CPU Clock Generator} \times \text{CPU Clock Ratio} = \text{CPU Frequency}$$

For example, if you have a processor that is rated at 2.4GHz and the clock generator is 200MHz, then $200\text{MHz} \times 12 = 2.4\text{GHz}$
Options: 200 to 400 in 1MHz increments.

- ✍ Overclocking failure will cause no display on the monitor. To overcome this switch off the power supply and switch on again. Restart the system, press and hold <Insert> key. This will revert the BIOS to default or initial setting.

PCIE clock

This item allows you to enable PCI-Express clock.
Options: 100 to 200 in 1MHz increments.

Memory clock

This item sets the memory clock.

CPU Core Clock Multiplier vs. DRAM Interface Speed

CPU Ratio	CPU Frequency	DDRII 400 (200MHz)		DDRII 533 (266MHz)		DDRII 667 (333MHz)		DDRII 800 (400MHz)	
		DIV	Freq.	DIV	Freq.	DIV	Freq.	DIV	Freq.
4	0.8 GHz	5	160MHz	5	160MHz	5	160MHz	5	160MHz
5	1 GHz	5	200MHz	5	200MHz	5	200MHz	5	200MHz
6	1.2 GHz	6	200MHz	5	240MHz	5	240MHz	5	240MHz
7	1.4 GHz	7	200MHz	6	233MHz	5	280MHz	5	280MHz
8	1.6 GHz	8	200MHz	6	266MHz	5	320MHz	5	320MHz
9	1.8 GHz	9	200MHz	7	257MHz	6	300MHz	5	360MHz
10	2.0 GHz	10	200MHz	8	250MHz	6	333MHz	5	400MHz
11	2.2 GHz	11	200MHz	9	244MHz	7	314MHz	6	366MHz
12	2.4 GHz	12	200MHz	9	266MHz	8	300MHz	6	400MHz
13	2.6 GHz	13	200MHz	10	260MHz	8	325MHz	7	371MHz
14	2.8 GHz	14	200MHz	11	254MHz	9	311MHz	7	400MHz
15	3.0 GHz	15	200MHz	12	250MHz	9	333MHz	8	375MHz
16	3.2 GHz	16	200MHz	12	266MHz	10	320MHz	8	400MHz
17	3.4 GHz	17	200MHz	13	261MHz	11	309MHz	9	377MHz

* Memory Frequency = CPU Frequency / Division

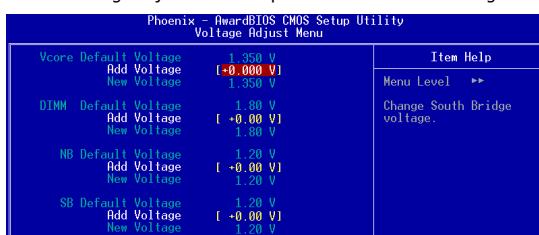
For example, if you have a processor clock is 2GHz and the memory is DDRII 533 (266MHz), then the actual value of Memory clock is 2GHz / 8 = 250MHz.



In the following items, "Default Voltage" indicates the original factory value, and "New Voltage" indicates the value that you assign.

► Voltage Adjust Menu

Scroll to Voltage Adjust Menu and press <Enter>. The following screen appears:

**CPU Vcore Voltage**

This item allows you to adjust the CPU Vcore voltage.
Options available depend on CPU. We recommend that you leave this at the default value.

DIMM Voltage

This item allows you to adjust the DIMM slot voltage.
Options: +0.00V to +0.70V in 0.10V increments. We recommend that you leave this at the default value.

NB Voltage

This item allows you to adjust the North Bridge voltage.
Options: +0.00V to +0.30V in 0.10V increments. We recommend that you leave this at the default value.

SB Voltage

This item allows you to adjust the South Bridge voltage.
Options: +0.00V to +0.30V in 0.10V increments. We recommend that you leave this at the default value.

Section 5 -- Driver & Utility

Once the operating system has been installed, you need to install the drivers for the mainboard.



Insert the bundled CD into the CD-ROM and the main menu screen will appear. The main menu displays links to the supported drivers, utilities and software.

► Method 1

This item installs all drivers automatically.

► Method 2

This item allows you to install the drivers selectively.

Step 1 : Click "**ATI Driver**" to install chipset driver.

Step 2 : Click "**MARVELL LAN Driver**" to install LAN driver.

Step 3 : Click "**REALTEK High Definition Audio Driver**" to install audio driver.

Step 4 : Click "**JMicron PCI Express SATA II and PATA Controller Driver**" to install JMicron PCI Express SATA II and PATA Controller driver. (Optional)

Step 5 : Click "**AMD Cool'n'Quiet Processor Driver**" to install AMD series processor driver.

 **Main menu items may vary depending on model you purchased.**

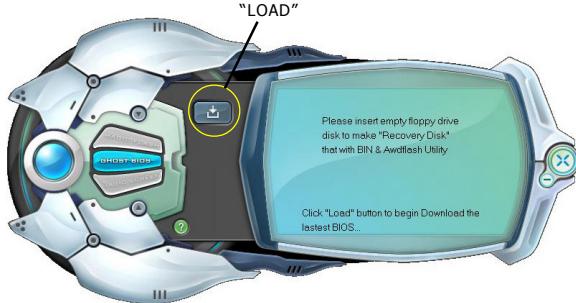
Once the drivers have been successfully installed, you may proceed to install the bundled utility software.

Section 6 -- Ghost BIOS

Ghost BIOS helps you to recover from a corrupted BIOS situation, which normally would leave your system unable to boot. Ghost BIOS lets you repair the BIOS yourself saving the hassle of returning the mainboard for repair.

Preparing for Ghost BIOS:

1. Install the Thunder Flash utility found in the bundled CD.
2. Create a BIOS Recovery Disk (BRD) with this utility.



Making BIOS Recovery Disk:

1. Run the Thunder Flash utility.
2. Connect to the internet.
3. Insert a blank floppy disk into floppy drive and click "LOAD".
4. Keep this floppy in a safe place for future use.

If BIOS gets corrupted:

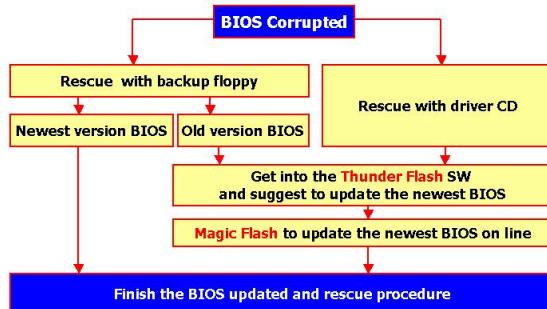
When the BIOS is corrupted or fails, restart the system and this screen will appear. You may chose to recover the BIOS from BRD Floppy created earlier or from bundled driver CD.



1. If recover from BIOS Recovery Disk floppy, insert the floppy disk created earlier and click "1".
2. If recover from mainboard driver CD, insert driver CD into optical drive and click "2".

Note that mainboard driver CD consists only of Safe Mode BIOS. Proper BIOS must be updated after you enter the O/S.

Flow Chart of the Ghost BIOS



If the screen below is shown, that means your BIOS version is not updated. Refer to Magic Flash steps to update the BIOS.



Section 7 -- Appendix

7-1 HotKey Summary

Hotkeys are special keyboard buttons that activate hidden commands at various stages of bootup. Most Hotkeys serve mainly as trouble shooting tools while others as simple shortcuts for user's convenience.

Below is a reference list of Hotkeys available:

HotKey ¹	Description	How to use ²	Note
Alt+F2	Force BIOS update from floppy	Power on the system and wait for the "Alt+F2 to enter AWDFLASH" message to appear, press the <Alt+F2> key to force BIOS update from floppy.	
Home	Enter Ghost BIOS interface	In power off state, press and hold <Home> key, then power on. The system will enter Ghost BIOS interface.	Models with Ghost BIOS only
Insert	Clear CMOS when system hang up from overclock	In power off state, press and hold <Insert> key, then power on. This will Clear CMOS and revert the BIOS to default or initial setting.	
Ctrl+F1 ~ F12	Keyboard Power On (depend on setting in BIOS)	In power off or suspend state, press hot key combination to power on or wake up the system.	
Any Key	Keyboard Power On (depend on setting in BIOS)	In power off or suspend state, press any key to power on or wake up the system.	
ESC	EZ-Boot, a pop-up manual to easily select boot device.	After power on, before jump to next page, press <ESC> key to pop-up the [Boot device list] page.	
F12	Force Memory Frequency to run at slower 200Mhz.	In power off state, press and hold <F12> key. After power on the memory frequency will run at a slow 200Mhz. This forces system to boot at safe speed so user can enter BIOS setup to adjust memory settings.	

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-  1. Hotkeys are generally common to all boards. There may be remote cases where some Hotkeys may not work due to design limitation of hardware or BIOS.
2. In some cases the Hotkey will not work after AC power has been previously disconnected.
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