



User's Manual

**Intel *i945P* / *i945PL* mainboard
for Intel Socket 775 processor**

TRADEMARK

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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.

Post Port Frequently Asked Questions (Optional)

Below is a list of some basic POST Codes, possible problems and solutions. For more detailed information about POST Codes, refer to Appendix in this manual.

Post Code	Problem	Solution
FFh or CFh	<ol style="list-style-type: none"> 1. BIOS chip inserted incorrectly 2. Incorrect BIOS update version 3. Mainboard problem 4. Add-on card inserted incorrectly 	<ol style="list-style-type: none"> 1. Reinsert the BIOS chip 2. Download the correct BIOS version update from the manufacturer's Web site 3. Replace mainboard 4. Remove and replace the add-on card
C1h - C5h	<ol style="list-style-type: none"> 1. Memory module inserted incorrectly 2. Memory compatibility problem 3. Memory module damaged 	<ol style="list-style-type: none"> 1. Reinsert memroy module 2. Replace memory with correct type 3. Replace memory module
2Dh	<ol style="list-style-type: none"> 1. Error occured in VGA BIOS 2. VGA card inserted incorrectly 	<ol style="list-style-type: none"> 1. Replace VGA card 2. Reinsert the VGA card
26h	Overclock error	Clear CMOS or press the insert key to power on the system
07h - 12h	<ol style="list-style-type: none"> 1. Initial Keyboard controller error 2. RTC error 	<ol style="list-style-type: none"> 1. Ensure the Keyboard and mouse are connected correctly 2. Replace the RTC battery

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Section 1 -- Introduction

1-1 Package Contents

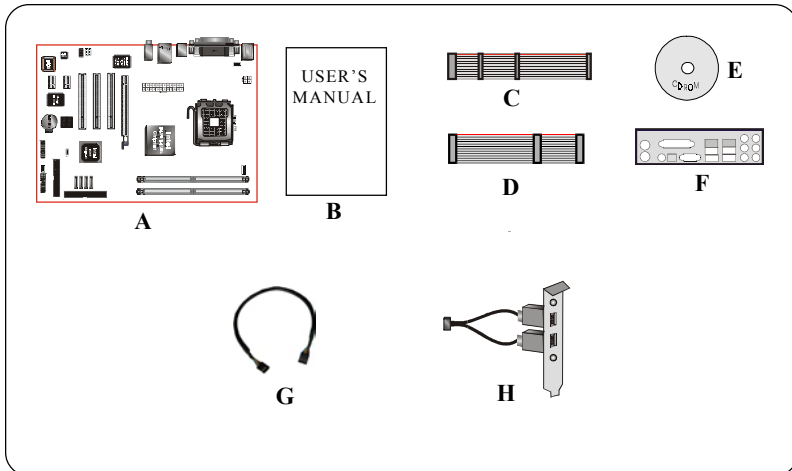
Contents

- 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

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



1-2 Mainboard Features

Brief Introduction

● **Socket 775**

Socket 775-based motherboards are designed to provide performance enhancements for Intel Pentium® 4 processor-based systems, and it also expected to be the next-generation of platform innovations.

For more details about the Pentium® 4 processor, please visit the Intel Web site at <http://www.Intel.com>.

● **Chipset**

The board is designed with Intel (945P/945PL+ICH7) chipset, featuring performance and stability with the most innovative technology and features.

For more details about the Intel Chipset, please visit the Intel Web site at <http://www.Intel.com>.

● **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.

● **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.

● **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.

● **10/100 LAN (Optional)**

This mainboard is mounted with a 10/100BASE-T Ethernet LAN controller. It allows the mainboard to connect to a local area network by means of a network hub.

● **GbE LAN (Optional)**

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.

● **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.

● **6ch**

Mainboard is equipped with 6 channel of audio to support Dolby Digital 5.1 audio for DVD-playback. The onboard audio jacks can be configured for normal 2 channel mode or 6 channel mode.

Special Features

BIOS Features:

- **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.
- **Magic Flash**
An automatic BIOS update utility in Windows environment, making DOS-based flash utility or bootable diskette a thing of the past.
- **Magic Screen**
Software utility to personalize the boot-up screen with your favorite images or logos.
- **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 FSB/Memory/Chipset voltage tweaking.

H/W Features:

- **Post Port (Optional)**
An onboard LED-display trouble-shooting device, facilitating user to detect boot-up problems.

1-3 Mainboard Specification

● Processor

- ◆ Socket LGA775 for Intel® Celeron D® 3xx series, Intel® Pentium 4® 5xx/6xx series
- ◆ Support Intel Pentium D® with Dual core processor
- ◆ Support 533/800/1066MHz front-side bus (533/800MHz FSB for i945PL chipset)
- ◆ Socket Intel CPU manufactured with 65nm process

● Chipset

- ◆ Intel® i945P or i945PL + ICH7

● Main Memory

- ◆ Two 240-pin DDR2 SDRAM DIMM sockets
- ◆ Support 1.8v DDR2-400/533/667 DIMMs with dual channel architecture (DDR2-400/533 for i945PL chipset)
- ◆ Support single-sided or double-sided, non-ECC, DIMMs with 256Mb/512Mb/1Gb devices
- ◆ Supports up to 2GB memory size

● Expansion Slots

- ◆ Three PCI connectors compliant with PCI v2.3
- ◆ Two PCI-Express (x1) connectors compliant with PCI Express 1.0a
- ◆ One PCI-Express (x16) connectors compliant with PCI Express 1.0a

● USB

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

● LAN

- ◆ One Gb Ethernet from Realtek RTL8110S PCI controller (Optional)
- ◆ One 10/100 Ethernet from Realtek RTL8100C PCI controller (Optional)

● P-ATA IDE

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

● S-ATA II

- ◆ Four S-ATA II ports with up to 300MB/s bandwidth from ICH7

● I/O

- ◆ Onboard Fintek 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) for quiet operation

● 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

● Audio

- ♦ Selectable 2 or 6-CH audio from ALC655 AC'97 compliant CODEC
 - Support CD-In, AUX-In
 - Support **Jack detection** for fool-proof audio device installation
 - Rear panel audio jacks configuration:

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

● Peripheral Interfaces

☞ At Rear Panel

- ♦ PS/2 keyboard and mouse ports
- ♦ One Parallel (printer) port
- ♦ Two Serial ports
- ♦ One RJ45 LAN connector
- ♦ Four USB2.0 ports
- ♦ Three Audio jacks

☞ Onboard connector and pin-header

- ♦ One floppy drive connector
- ♦ One ATA-100 IDE connectors
- ♦ Four extra USB2.0 ports
- ♦ One CD-IN and AUX-IN connectors
- ♦ One IR connector
- ♦ Four S-ATA II connectors
- ♦ 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
- ♦ Onboard Post Port LED display for system debugging (Optional)
- ♦ **PowerBIOS** for excellent overclocking features:
 - Programmable FSB and PCI Clock output frequency with 1MHz fine tuning
 - Support BIOS adjustable CPU multiplier, FSB clock, PCI-E x16 clock and DIMM frequency
 - Support BIOS adjustable CPU Core voltage, Chipset voltage and DIMM voltage

● 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 **Magic Flash** - An automatic BIOS update utility in Windows environment, making DOS-based flash utility or bootable diskette a thing of the past.


- Support **Magic Screen** - Software utility to personalize the boot-up screen with your favorite images or logos.

Form Factor

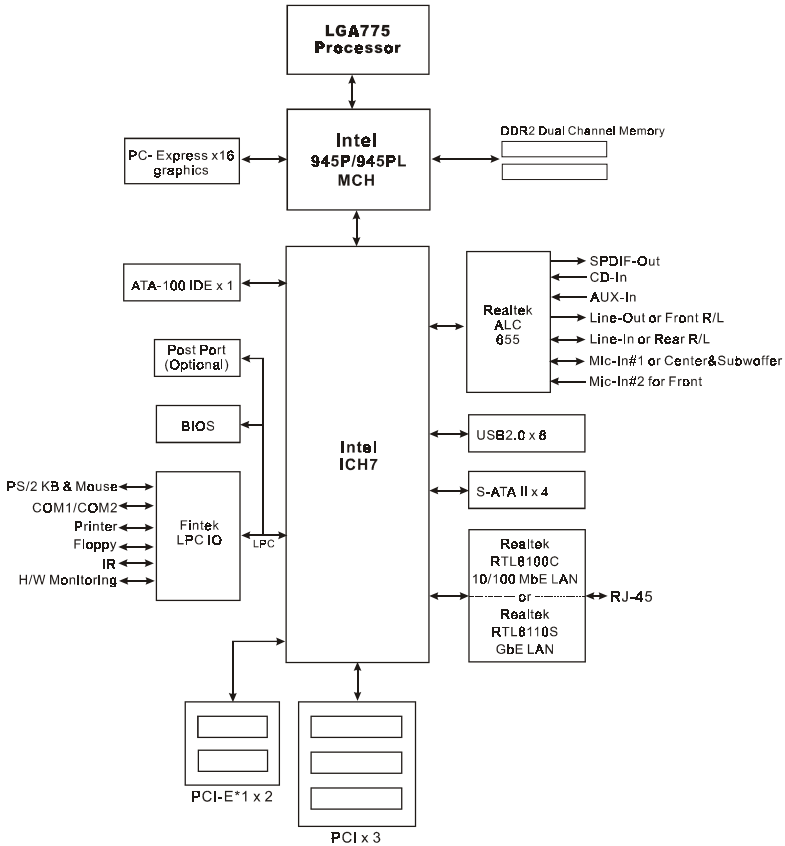
- 305mm x 220 mm ATX size

Supported Operating System

- Windows 2000, Windows XP

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

1-4 System Block Diagram

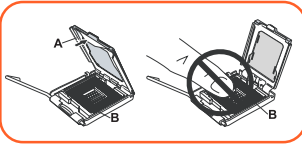


Section 2 -- Installation



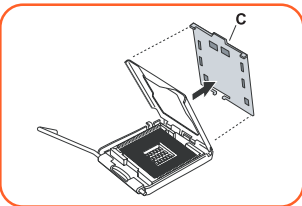
Always have the power supply unplugged and powered off when inserting and removing devices within the computer chassis.

2-1 CPU Installation



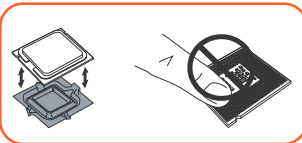
Step 1

Open load plate (A) , DO NOT touch socket contacts (B).



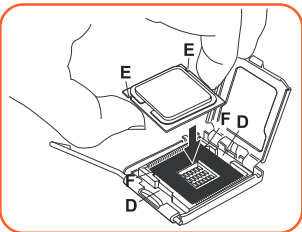
Step 2

Remove protective cover (C) from load plate. Please do not discard the protective cover. Always replace the protective cover if the processor is removed from the socket.




Step 3

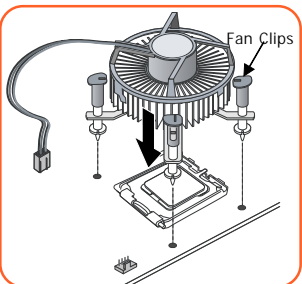
Remove the processor from the protective cover. Do not touch the bottom of the processor. The processor cover should not be discarded. Always replace the processor cover if the processor is removed from the socket.



Step 4


Hold the processor with thumb and index fingers as shown. Ensure fingers align to the socket cutouts (D) , processor notches (E) align to socket convexes (F). Place the processor straight down without tilting or sliding in the socket.

-  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.

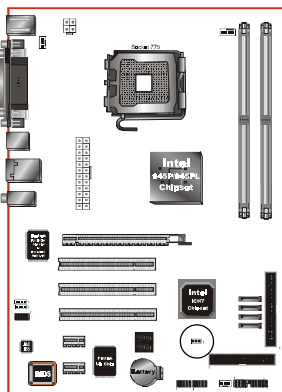


Step 5

Place the fan heatsink onto the mainboard with the fasteners align to the holes. Be care not to damage the thermal interface material attached to the bottom of the heatsink. Rotate the clips 90 degrees to lock the CPU cooler in place. Connect the fan cable to the mainboard header JCPU_FAN.

-  When sending the mainboard for repair, please put back this protective cover onto the socket.

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.

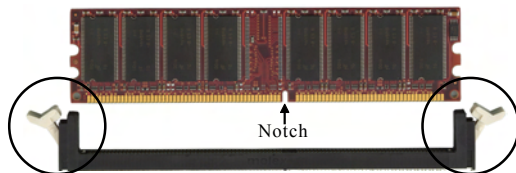
2-3 System Memory Configuration

The mainboard accommodates two 240-pin DDR2 DIMM sockets.

- Supports up to 2GB of 400/533/667MHz DDR2 SDRAM (DDR2-400/533 for i945PL chipset).
- Supports dual channel memory interface.
- Supports unbuffered DIMM configurations defined in JEDEC DDR2 DIMM specification.

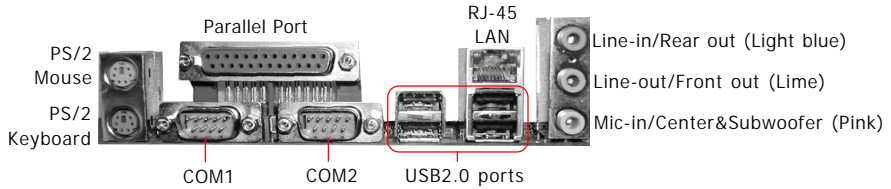
Memory Installation :

- ① To install, align the notch on the DIMM module with the connector.
- ② Press straight down as shown in the figure until the white clips close and the module fits tightly into the DIMM socket.

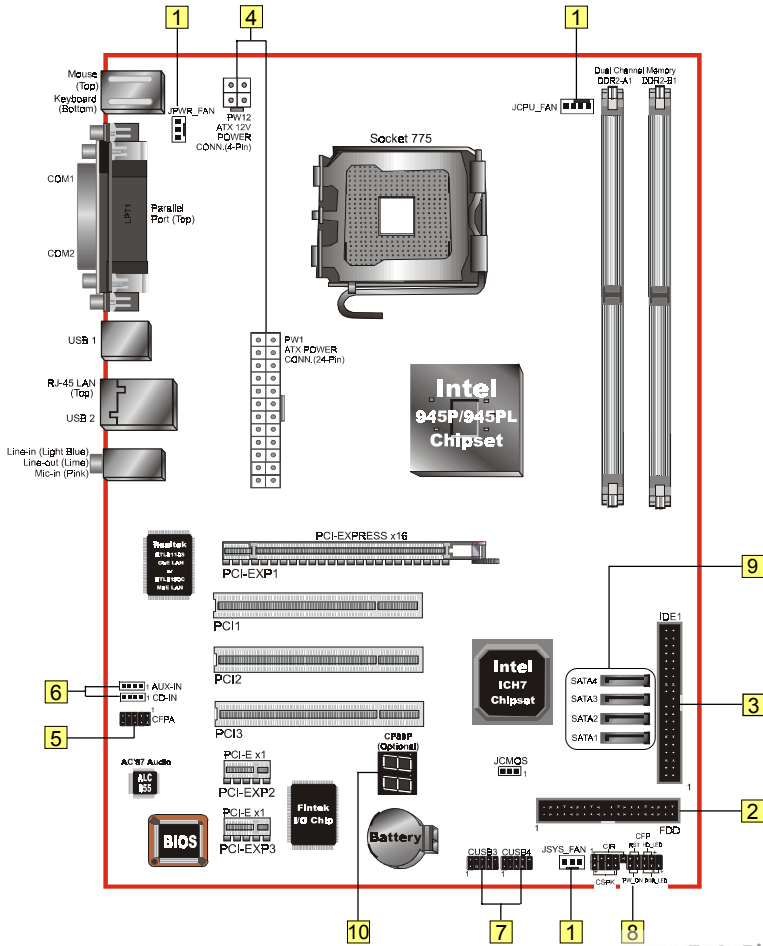


2-4 Rear IO Port

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.



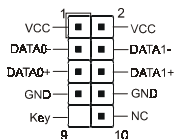
2-5 Internal Connectors



Connectors	Figure	Descriptions
<p>1 JCPU_FAN JPWR_FAN JSYS_FAN</p>		<p>CPU / Power / Chassis Fan Power Connectors</p> <p>JCPU_FAN: Connect the CPU fan to this connector.</p> <p>JPWR_FAN: Use this connector if you are installing an additional fan in the unit.</p> <p>JSYS_FAN: The chassis fan will provide adequate airflow throughout the chassis to prevent overheating the CPU.</p>
<p>2 FDD</p>		<p>Floppy Drive Connector</p>
<p>3 IDE1 Primary IDE</p>		<p>Primary IDE Connector</p> <p>Connects to the IDE device, i.e. HDD and CD-ROM device.</p>
<p> 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.</p>		
<p>4 PW1 PW12</p>		<p>PW1: 24-pin ATX Power Connector</p> <p>PW12: 4-pin ATX12V Power Connector</p> <p>The plugs of the power cables are designed to fit in only one orientation.</p>
<p> The PW1 and PW12 Power Connector must be used simultaneously.</p>		
<p>5 CFPA</p>		<p>CFPA: Front Panel Audio Connector</p> <p>This connector is used only if the speaker and microphone needs to be plugged at the front of the PC case. Otherwise, leave the jumpers at the default position.</p>
<p>6 CD-IN AUX-IN</p>		<p>CD-IN/AUX-IN: CD Audio-in connectors</p> <p>These connectors are used to receive audio from a CD-ROM drive, TV tuner or MPEG card.</p>

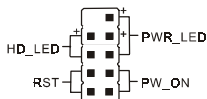
Connectors	Figure	Descriptions
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7 CUSB3
CUSB4



CUSB3/CUSB4: Four USB2.0 header
This mainboard includes 4 additional onboard USB ports. To use these additional USB ports, a USB bracket is required. Please contact your retailer for details.

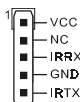
8 CFP



CFP: Case Front Panel Connector

- ◆ 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



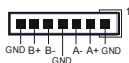
CIR: IR connector
For connection to an IrDA receiver unit.

CSPK



CSPK: Speaker
Connects to the case's speaker for PC beeps.

9 SATA1
SATA2
SATA3
SATA4



SATA1 ~ SATA4: Four Serial ATA II Connectors
These connectors enable you to connect Serial ATA HDDs or optical drives type.

10 CP80P
(Optional)



CP80P: Post Port Debug LED
Provides two-digit POST code to show why the system fail to boot. Allows quick and easy optimization. The LED will display the CPU temperature when you run the bundled Thunder Probe software.

Section 3 -- BIOS Setup

3-1 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.

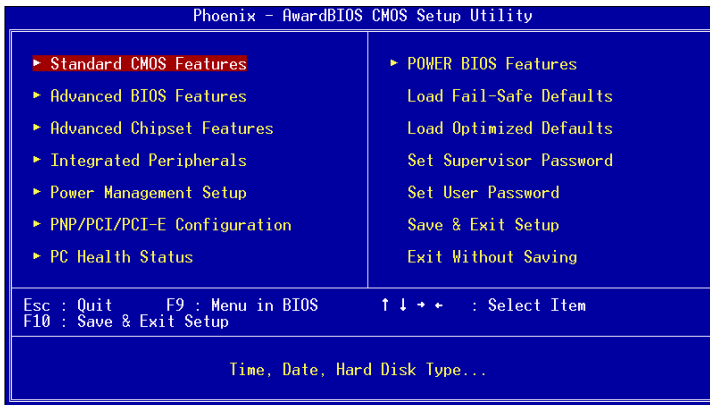
It is possible for the CMOS battery to fail causing CMOS data loss. If this happens you will need install a new CMOS battery and reconfigure your BIOS settings.



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.



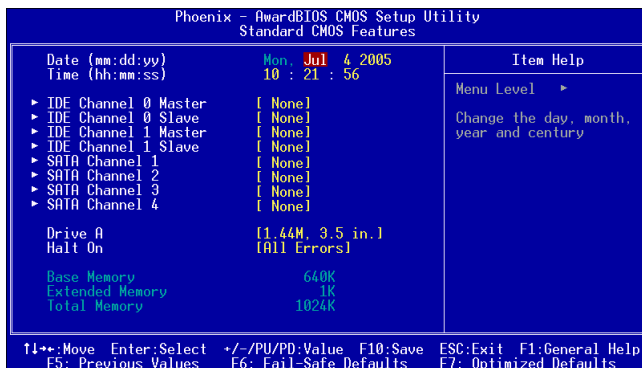
The main menu displays all the major selection items. Select the item you need to reconfigure. The selection is made by moving the cursor, press any direction (arrow key) to the item and pressing the 'Enter' key. An on-line help message is displayed at the bottom of the screen as the cursor is moved 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.

3-2 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.



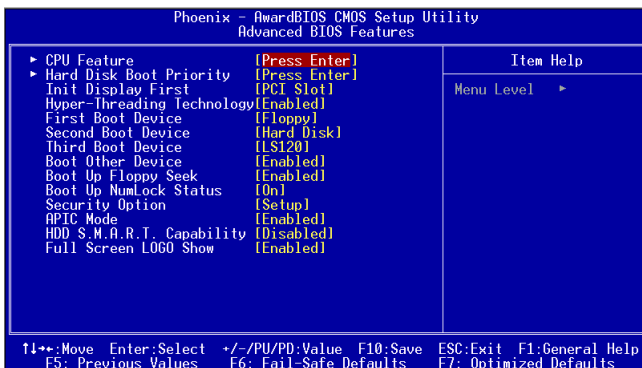
Notes:

- 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.

3-3 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.



► CPU Feature

This field is available only for Pentium® CPU Features.

► 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.

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, PCI Express.

Hyper-Threading Technology

Enables the CPU Hyper-Threading Technology.

Options: Enables, Disabled.



It is recommend to enable Hyper-Threading Technology on system with Windows XP and Linux 2.4 and disabling it for legacy OS.

First /Second/Third Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Options: Removable, Hard Disk, 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.

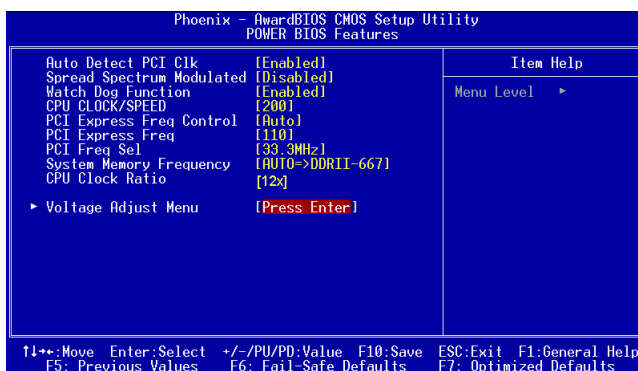
Options: Enabled, Disabled.

3-4 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.

**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.

Spread Spectrum

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

Options: Enabled, Disabled.

Watch Dog Function

If you select "Enabled" and overclock fail before POST code 26h, the system will reset automatically by default configuration.

Options: Enabled, Disabled.

CPU CLOCK/SPEED

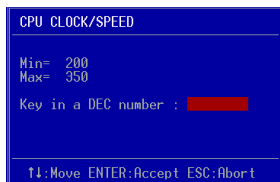
Enables you to increment the CPU's clock generator at 1 MHz step. This works together with CPU Clock Ratio (below) to set the CPU operating frequency.

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

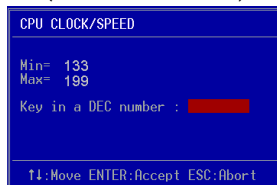
For example, if you have a processor that is rated at 2.4GHz and the clock generator is 200MHz, then $200\text{MHz} \times 12 = 2.4\text{GHz}$

Press <Enter> to display the following screen:


(When FSB is 800MHz)



(When FSB is 533MHz)



Key in the DEC (decimal) number for the CPU CLOCK/SPEED.

 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.

PCI Express Freq Control

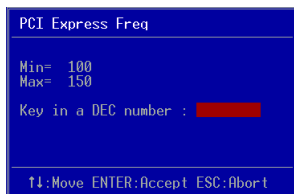
Enables you to control the PCI Express Frequency.

"Enabled" allows you to fine tune its frequency at 1MHz steps using the next selection item below. Selecting "Disabled" will lock the PCI-E frequency at 100MHz. "Auto" will increment the PCI-E frequency by a prefixed value according to FSB.

Options: Auto, Enabled, Disabled.

PCI Express Freq

Enables you to subtle tune the PCI Express frequency at increments of 1MHz step. Press <Enter> to display the following screen:



Key in the DEC (decimal) number for the PCI Express frequency.

PCI Freq Sel

Enables you to select the PCI Frequency.

Options: Sync., 37.5MHz, 40MHz, 33.3MHz.

System Memory Frequency

Enables you to select a ratio of the DDRII DRAM to match the installed DRAM frequency. We recommend that you leave this item at the default value.

Options available depend on system FSB.

For I945PL chipset:

CPU Clock	CPU FSB	DDRII frequency options
133MHz	533MHz	2:3=> DDRII400, 1:2=> DDRII533, Auto (by SPD)
200MHz	800MHz	1:1=> DDRII400, 3:4=> DDRII533, Auto (by SPD)

For I945P chipset:

CPU Clock	CPU FSB	DDRII frequency options			
133MHz	533MHz	2:3 => DDRII-400	2:4 => DDRII-533	Auto => DDRII-667 (by SPD)	
200MHz	800MHz	1:1 => DDRII-400	3:4 => DDRII-533	3:5=>DDRII-667	Auto => DDRII-667 (by SPD)
266MHz	1066MHz	4:3 => DDRII-400	1:1 => DDRII-533	4:5=>DDRII-667	Auto => DDRII-667 (by SPD)


CPU Clock Ratio

Use this item to select a multiplier to set the CPU frequency. See CPU CLOCK/SPEED item above for explanation. If your CPU multiplier is locked this option will be unavailable.

▶ Voltage Adjust Menu

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

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
Voltage Adjust Menu		Menu Level ▶▶
Default CPU Vcore(Max)	1.3875 V	
CPU Vcore(Max)	[+0.000 V]	
New CPU Vcore(Max)	1.3875 V	
Default Chipset Voltage	1.40 V	
Chipset Voltage	[+0.00 V]	
New Chipset Voltage	1.40 V	
Default VDIMM Voltage	1.80 V	
VDIMM Voltage	[+0.00 V]	
New VDIMM Voltage	1.80 V	

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

CPU Vcore Voltage

This item allows you to adjust the CPU Vcore voltage.

Options: -0.1000V to +0.2875V in 0.0125V increments. We recommend that you leave this at the default value.

Chipset Voltage

This item allows you to adjust the Chipset voltage.

Options: +0.00V to +0.30V in 0.1V increments. We recommend that you leave this at the default value.

VDIMM Voltage

This item allows you to adjust the DIMM slot voltage.

Options: +0.00V to +0.30V in 0.1V increments. We recommend that you leave this at the default value.

Section 4 -- 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 "**INTEL CHIPSET INF FILES**" to install chipset driver.

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

Step 3 : Click "**REALTEK AUDIO Driver**" to install audio driver.

Step 4 : Click "**USB 2.0 Driver**" to install USB 2.0 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.

5. Flashing the BIOS



Do NOT flash the system BIOS unless it is really necessary.

Updating and flashing the BIOS content risks BIOS data corruption which may cause system unable to power-on.

Download the xxxxx.EXE file corresponding to your model from our website to an empty directory on your hard disk or floppy. Run the downloaded xxxxx.EXE file and it will self extract. Copy these extracted files to a bootable floppy disk.

Note: The floppy disk should contain NO device drivers or other programs.

1. Type "A:\AWDFLASH and press <Enter> Key.
2. You will see the following setup screen.
3. Please key in the xxxxx.bin BIOS file name.
4. If you want to save the previous BIOS data to the diskette, please key in [Y], otherwise please key in [N].

```

FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved
For XXXX -H83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type - XXXXX E82802AB /3.3V
File Name to Program : _____

Error Message:
    
```

```

FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved
For XXXX -H83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type - XXXXX E82802AB /3.3V
File Name to Program : xxxxx.bin

Error Message: Do You Want To Save Bios (Y/N)
    
```

5. Key in File Name to save previous BIOS to file.
6. To confirm and proceed, please key in [Y] to start the programming.

```

FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved
For XXXX -H83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type - XXXXX E82802AB /3.3V
File Name to Program : xxxxx.bin
File Name to Save      : xxxxx.bin

Error Message:
    
```

```

FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved
For XXXX -H83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type - XXXXX E82802AB /3.3V
File Name to Program : xxxxx.bin
Checksum             : 9834H
File Name to Save    : xxxxx.bin

Error Message: Are you sure to program (y/n)
    
```

7. The BIOS update is finished.
8. Keep this BIOS floppy disk for future use.

```

FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved
For XXXX -H83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type - XXXXX E82802AB /3.3V
File Name to Program : xxxxx.bin
Checksum             : 4B04H
Verifying Flash Memory 7FE00 OK

████████████████████████████████████████████████████████████████████████████████
█ Write OK   █ No Update   █ Write Fail

F1: Reset      F10: Exit
    
```

Section 6 -- Appendix

6-1 Post Codes (Optional)

POST (hex)	DESCRIPTION
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: <ul style="list-style-type: none"> - Disable shadow RAM - Disable L2 cache (socket 7 or below) - Program basic chipset registers
C1h	Detect memory <ul style="list-style-type: none"> - Auto-detection of DRAM size, type and ECC. - Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
01h	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	<ol style="list-style-type: none"> 1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	<ol style="list-style-type: none"> 1. Clear 8042 interface 2. Initialize 8042 self-test
08h	<ol style="list-style-type: none"> 1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	<ol style="list-style-type: none"> 1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0B-0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19-1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to URIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved

1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to URIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	<ol style="list-style-type: none"> 1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24-26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	<ol style="list-style-type: none"> 1. Program CPU internal MTRR (P6 & P11) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2A-2Ch	Reserved
2Dh	<ol style="list-style-type: none"> 1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed
2E-32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34-3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45-46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	<ol style="list-style-type: none"> 1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.

4A-4Dh	Reserved
4Eh	<ol style="list-style-type: none"> 1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53-54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	<ol style="list-style-type: none"> 1. Display PnP logo 2. Early ISA PnP initialization <ul style="list-style-type: none"> -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	<ol style="list-style-type: none"> 1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
5E-5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61-64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	<ol style="list-style-type: none"> 1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	<ol style="list-style-type: none"> 1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70-72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM....
76h	Reserved

77h	Detect serial ports & parallel ports.
78h-79h	Reserved
7Ah	Detect & install co-processor
7B-7Eh	Reserved
7Fh	<ol style="list-style-type: none"> Switch back to text mode if full screen logo is supported. <ul style="list-style-type: none"> -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: <ul style="list-style-type: none"> • Clear EPA or customization logo.
80h-81h	Reserved
82h	<ol style="list-style-type: none"> Call chipset power management hook. Recover the text font used by EPA logo (not for full screen logo) If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	<ol style="list-style-type: none"> USB final Initialization NET PC: Build SYSID structure Switch screen back to text mode Set up ACPI table at top of memory. Invoke ISA adapter ROMs Assign IRQs to PCI devices Initialize APM Clear noise of IRQs.
86-92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	<ol style="list-style-type: none"> Enable L2 cache Program boot up speed Chipset final initialization. Power management final initialization Clear screen & display summary table Program K6 write allocation Program P6 class write combining
95h	<ol style="list-style-type: none"> Program daylight saving Update keyboard LED & typematic rate
96h	<ol style="list-style-type: none"> Build MP table Build & update ESCD Set CMOS century to 20h or 19h Load CMOS time into DOS timer tick Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)



English
