User's Manual

for

AMD Socket A Processor based mainboard

Table of Contents

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, mainboard, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the device in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

WARNING

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Package Contents

Mainboard
User's manual
Floppy disk drive cable
IDE disk drive cable
Game and serial port cables
I/O shield
CD (contains drivers and utilities)

If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

Deluxe Pack Item

IEEE 1394 two ports cable

Other Optional Items

USB 2.0 port cable
SPD650 card

If you need any of the optional items listed above, please contact your dealer for assistance.

Quick Installation Guide

Step 1
Install the CPU, CPU fan / heatsink and other system fans.

Step 2
Install the DIMM.

Step 3
Install add-in cards.

Step 4
Configure the jumpers.

Step 5
Connect the floppy disk drive cable and IDE disk drive cable to their respective devices.

Step 6
Connect the ATX power supply's cables to the appropriate connectors and devices.

Step 7
Connect devices to the ports located at the rear panel.

Step 8
Connect the front panel cables (LED indicators and switch connectors) to the front panel connectors.

Step 9
Power on the PC.

Step 10
Configure the BIOS.

Step 11
Reboot the PC.

Step 12
Install the drivers and utilities that are in the provided CD.

POST Codes - Frequently Asked Questions

The table below is a list of POST codes that are frequently encountered, with its corresponding problems and solutions. For a complete list of the POST Codes, please refer to appendix B.

POST Codes	Problem	Solution
FFh or CFh	Incorrect insertion of the BIOS chip.	Reinsert the BIOS chip properly.
	Updated the incorrect BIOS version.	Update the correct BIOS version.
	Mainboard problem.	Replace the mainboard.
	Incorrect insertion of add-on cards.	Reinstall the add-on card properly.
C1h or C5h	Incorrect insertion of the memory module.	Reinsert of the memory module properly.
	Memory compatibility problem.	Insert the correct type of memory module.
	Damaged memory module.	Replace the memory module.
2Dh	An error occurred on the VGA BIOS.	Replace the VGA card.
	Incorrect insertion of the VGA card.	Reinsert the VGA card properly.
26h	Overclocking error occurred.	Clear the CMOS data then press the <Insert> key to power on the system.
07h or 12h	Keyboard error occurred during initialization.	Make sure the keyboard and mouse are properly connected.
	RTC error occurred.	Replace the RTC battery.

Chapter 1

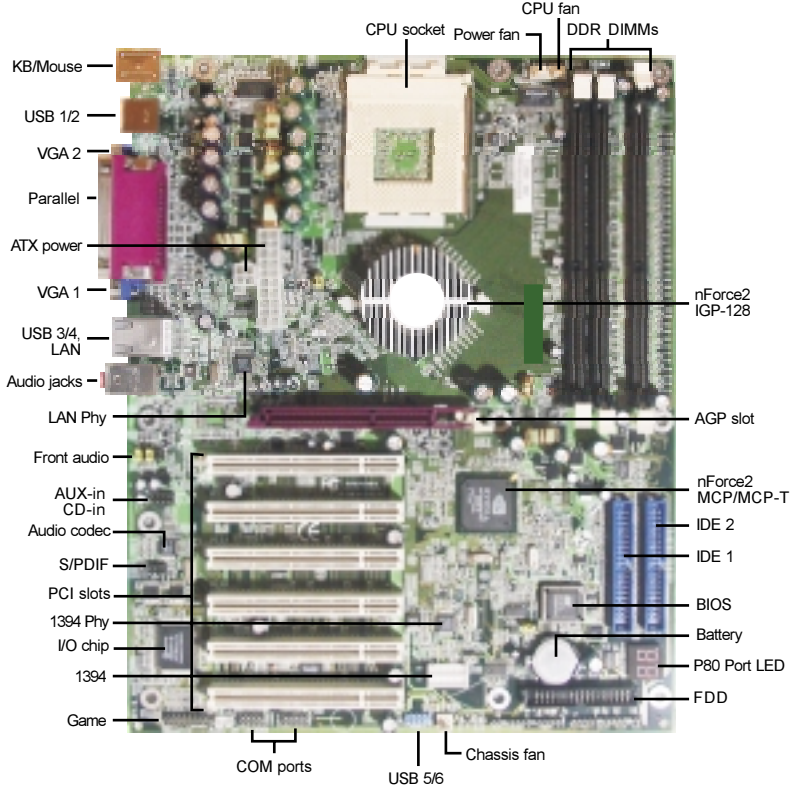**Features**

User's Manual

Thank you for choosing the AMD Socket A based mainboard. This mainboard uses the nVidia nForce2 chipset which provides powerful features.

1.1 The Components of the Mainboard

CPU fan
CPU socket   Power fan   DDR DIMMs

KB/Mouse

USB 1/2

VGA 2

Parallel

ATX power

VGA 1

nForce2
IGP-128

USB 3/4,
LAN

Audio jacks

LAN Phy   AGP slot

Front audio

AUX-in
CD-in   nForce2
                                            MCP/MCP-T
Audio codec   IDE 2

S/PDIF   IDE 1

PCI slots   BIOS

1394 Phy   Battery

I/O chip   P80 Port LED

1394   FDD

Game

COM ports   Chassis fan

USB 5/6

North Bridge Controller

The nVidia nForce2 IGP-128 north bridge controller delivers twice the bandwidth by implementing the new nVidia Dual DDR Memory Architecture that supports up to DDR 400 memory. It also implements the AGP 8x interface and Hyper Transport Link; and is fully compliant with industry standard power management specifications such as ACPI 2.0 and PCI Power Management Interface (PMI) 1.1 specification.

South Bridge Controller

The nVidia nForce2 Media and Communications Processor (MCP) includes the richest set of integrated connectivity solutions in the industry. In its second generation, the nForce2 MCP-T, it simultaneously handles multiple streams of audio and video from integrated IEEE-1394 MAC, AC-3 encoder for S/PDIF-out, USB 2.0, and Ultra ATA/133 ports. Your mainboard may come equipped with either the MCP or MCP-T south bridge controller.

CPU Socket

The mainboard is equipped with Socket A (462-pin) for installing one of the following supported CPUs.

- AMD Athlon™ XP 266/333MHz FSB
- AMD Duron™ 200MHz FSB

DDR SDRAM DIMM

Double Data Rate SDRAM (DDR SDRAM) is a type of SDRAM that doubles the data rate through reading and writing at both the rising and falling edge of each clock. This effectively doubles the speed of operation therefore doubling the speed of data transfer.

- Three 184-pin DDR DIMM sockets for 64-bit, unbuffered single/double side and non-ECC DDR 200/266/333/400 DIMMs
- Supports 128-bit dual channel memory architecture
- Supports up to 3GB memory size
- Supports complete FSB/memory and FSB/AGP asynchronous scheme for overclocking

IEEE 1394 (optional)

IEEE 1394 is a high-speed serial bus developed by Apple and Texas Instruments that allows connecting up to 63 devices to the serial bus of a PC. It is fully compliant with the 1394 OHCI (Open Host Controller Interface) 1.1 specification.

1394 is a fast external bus standard that supports data transfer rates of up to 400Mbps. In addition to its high speed, it also supports isochronous data transfer which is ideal for video devices such as audio/video (A/V) appliances, storage peripherals, digital cameras or inter-PC communications that need to transfer high levels of data in real-time. 1394 supports both Plug-and-Play and hot plugging allowing devices to be attached or removed from the system, even with the power on.

USB 2.0

The mainboard supports USB 1.1 and USB 2.0 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

LAN (optional)

The onboard LAN supports 10/100Mbps. It allows the mainboard to connect to a local area network by means of a network hub.

Graphics

The integrated GeForce4 graphics controller delivers new levels of graphics performance and dual display flexibility using the onboard VGA ports.

Onboard Audio

There are 3 audio jacks at the rear panel of the mainboard.

- The line-out jack (lime green) is used to connect external speakers or headphone.
- The line-in jack (light blue) is used to connect audio sources such as CD player, AM/FM radio tuner, synthesizer, etc.
- The mic-in jack (pink) is used to connect a microphone.

6-channel Audio

The mainboard uses the ALC-650 AC'97 codec which supports six channel audio with analog and digital output.

- AC'97 version 2.2 compliant
- Supports 2 channel mode via the mic-in (pink), line-in (light blue) and line-out (lime green) jacks that are at the rear panel.
- Supports 6 channel mode via center/subwoofer (pink), rear out (light blue) and front out (lime green) jacks that are at the rear panel.

Internal Audio Connectors

The CD-in and AUX-in connectors are used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

Front Panel Audio

The mainboard is also equipped with a front panel line-out and mic-in connector to conveniently connect a microphone and a speaker/headphone at the front panel.

S/PDIF-in/out Interface

The mainboard is equipped with a digital audio interface -   S/PDIF (Sony/Philips Digital Interface). S/PDIF is a standard audio file transfer format that transfers digital audio signals to a device without having to be converted first to an analog format. This prevents the quality of the audio signal from degrading whenever it is converted to analog.

BIOS

- 4Mb flash EEPROM using Award BIOS
    - ACPI version 2.0 compliant
    - Supports S3 (Suspend to DRAM) sleep-state
    - SMBIOS (System Management BIOS) version 2.2 compliant
    - Supports power failure recovery
    - Capable of waking the computer up from specific states via LAN, power switch, PME#, RTC alarm, PS/2 devices and modem ring on COM 1

I/O Interface

The mainboard uses the Winbond W83627HF-AW LPC I/O controller that supports the following I/O interfaces.

- One PS/2 keyboard and one PS/2 mouse ports
- One parallel printer port
- One RJ45 LAN port (optional)
- Two serial ports
- One game port
- One floppy disk drive connector
- Two IDE disk drive connectors
- Two 1394 connectors (optional)
- Six USB 2.0 ports
- Three fan connectors

PS/2 Keyboard and PS/2 Mouse

The PS/2 ports are used to connect a PS/2 mouse and a PS/2 keyboard. The PS/2 mouse port uses IRQ12. If a mouse is not connected to this port, the system will reserve IRQ12 for other expansion cards.

Serial Ports

The two 9-pin connectors are used to connect 2 serial ports. The serial ports are RS-232C asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

Parallel Port

The standard parallel port (Burgundy) is for interfacing your PC to a parallel printer. It supports SPP, ECP and EPP modes.

- SPP (Standard Parallel Port) - Allows normal speed operation but in one direction only.
- ECP (Extended Capabilities Port) - Allows parallel port to operate in bidirectional mode and at a speed faster than the SPP's data transfer rate.
- EPP (Enhanced Parallel Port) - Allows bidirectional parallel port operation at maximum speed.

Game/MIDI Port

The Game/MIDI port is identical to that of a standard PC game adapter or game I/O port. This port works well with any application that is compatible with the standard PC joystick.

Ultra ATA 33/66/100/133

The mainboard is equipped with 2 IDE disk drive connectors for connecting up to 4 ATA/133 IDE devices. It supports PIO (Programmable Input/Output) and DMA (Direct Memory Access) mode operations for a maximum data transfer rate of 133Mbps per channel.

Floppy Disk Drive Connector

The mainboard is equipped with a floppy disk drive connector for connecting up to 2 floppy disk drives.

CIR/SIR Interface

The IrDA connector is used for wireless connectivity between your computer and peripheral devices. The IRDA (Infrared Data Association) specification supports data transfers of 115K baud at a distance of 1 meter.

Wake-On-LAN

You can use the Wake-On-LAN function only when you are using a LAN add-in card that supports the wake up function. The network will detect Magic Packet and assert a wakeup signal to power-up the system. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

Fan Connectors

The 3 fan connectors are used to connect cooling fans. The fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and the PC.

System Debugging

The mainboard is equipped with a P80P LED which provides 7-segment display to a debug card that is used to display POST codes necessary for system debugging purposes.

Front Panel Controller

- Reset and soft-off switches
- HDD and power LEDs
- PC speaker

AGP (Accelerated Graphics Ports)

The AGP slot, which is AGP version 3.0 compliant, supports 1.5V AGP 4x (1066MB/sec. bandwidth) or AGP 8x (2.13GB/sec bandwidth) add-in cards. AGP is an interface designed to support high performance 3D graphics cards for 3D graphics applications. It handles large amounts of graphics data with the following features:

- Pipelined memory read and write operations that hide memory access latency.
- Demultiplexing of address and data on the bus for nearly 100 percent efficiency.

PCI Slots

- Six PCI slots that supports bus master
  - PCI 2.2 compliant

Power Connectors

The mainboard supports a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply has a standard 20-pin ATX main power connector and a 4-pin +12V power connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

PCB

- Dimensions: 305 x 245 mm
- ATX form factor

1.2 Special Added Features

Overclocking

The mainboard supports overclocking capabilities. It allows you to adjust the voltages of the CPU, memory and AGP; as well as adjust the CPU's frequency.

CPU Overheat Protection

The CPU Overheat Protection function has the capability of monitoring the CPU's temperature during system boot-up. Once it has detected that the CPU's temperature exceeded 110ºC, the system will automatically shut down while emitting warning beeps from the speaker.

EZ Boot

EZ Boot provides a fast way of selecting the boot sequence of the drive without having to go through the process of entering the BIOS setup program. Just press <Esc> when the system boots then select the boot sequence.

Hardware Monitor

The mainboard is equipped with the Winbond W83627HF-AW chip which supports the hardware monitor function. Hardware Monitor is essential in keeping the PC in good working condition. When the system boots, it will display the CPU and system temperature, the fan speed of the CPU, chassis and power fans as well as the voltage of the CPU, DIMM and AGP.

KBPO

The mainboard supports the keyboard wake up function which allows you to use the <Ctrl> + <F1> keys (default setting) to power-on the system. The "Power On Function" field in the Integrated Peripherals submenu of the BIOS provides other keyboard key options for powering-on the system.

Power Lost Recovery

When power returns after an AC power failure, you may choose to either power-on the system manually, let the system power-on automatically or return to the state where you left off before power failure occurs.

ACPI

The mainboard is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management.

Chapter 2

Installation

2.1 Handling the Mainboard

It is quite easy to inadvertently damage the mainboard even before install-ing it in your system unit. Electrostatic discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling the mainboard to ensure that no static build-up is present.

2.2 Tips in Handling the Mainboard

1. To prevent electrostatic build-up, leave the mainboard in its anti-static bag until you are ready to install it.

2. Do all preparation work on a static-free surface with mainboard components facing up.

3. Hold the mainboard by its edges only. Be careful not to touch any of the components, contacts or connections, especially gold contacts, on the board.

2.3 Quick Installation Steps

The following list the basic steps required prior to installing the mainboard into the system chassis.

IMPORTANT

- Make sure the PC and all other peripheral devices connected to it has been powered-off.
- Disconnect all power cords and cables.

Step 1
Install the CPU, CPU fan / heatsink and other system fans.

Step 2
Install the DIMM.

Step 3
Install add-in cards.

Step 4
Configure the jumpers.

Step 5
Connect the floppy disk drive cable and IDE disk drive cable to their respective devices.

Step 6
Connect the ATX power supply's cables to the appropriate connectors and devices.

Step 7
Connect devices to the ports located at the rear panel.

Step 8
Connect the front panel cables (LED indicators and switch connectors) to the front panel connectors.

Step 9
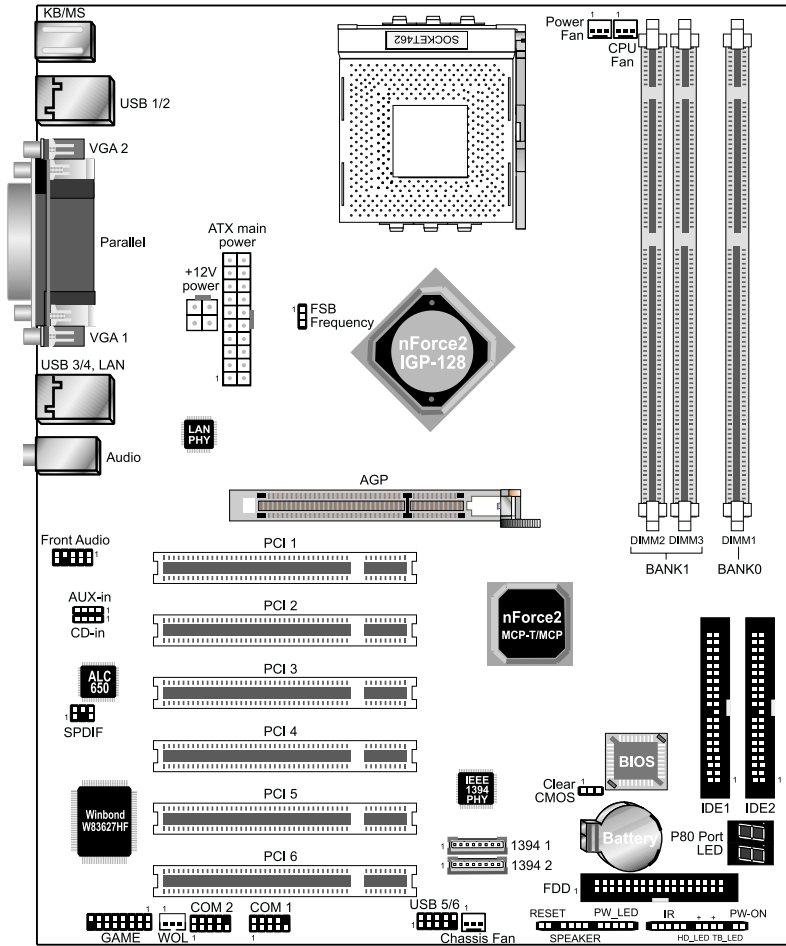Power on the PC.

Step 10
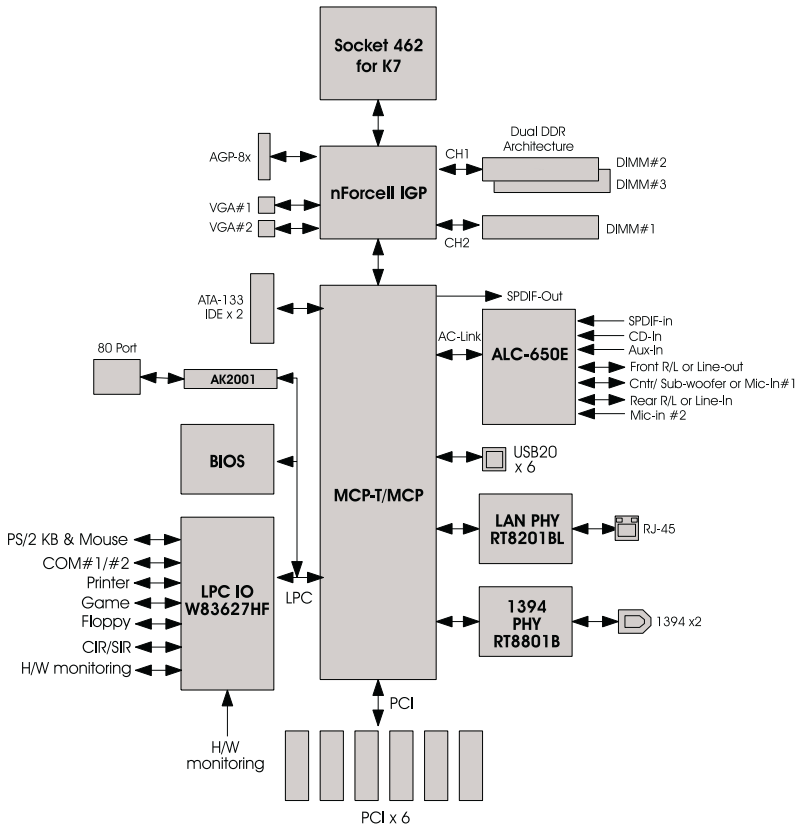Configure the BIOS.

Step 11
Reboot the PC.

Step 12
Install the drivers and utilities that are in the provided CD.

2.4 The Mainboard Layout

KB/MS

USB 1/2

VGA 2

Parallel

ATX main power

+12V power

VGA 1

USB 3/4, LAN

Audio

Power Fan

CPU Fan

SOCKET462

FSB Frequency

nForce2 IGP-128

DIMM2 DIMM3 DIMM1

BANK1 BANK0

LAN PHY

AGP

Front Audio

PCI 1

AUX-in

PCI 2

CD-in

nForce2 MCP-T/MCP

ALC 650

PCI 3

SPDIF

PCI 4

Winbond W83627HF

PCI 5

IEEE 1394 PHY

BIOS

Clear CMOS

IDE1 IDE2

PCI 6

1394 1

1394 2

Battery

P80 Port LED

FDD

COM 2 COM 1

USB 5/6

RESET PW_LED IR PW-ON

GAME WOL

Chassis Fan

SPEAKER HD_LED TB_LED

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2.5 Block Diagram

2.6 CPU

2.6.1 Overview

The mainboard is equipped with a surface mount 462-pin CPU socket. This socket is exclusively designed for installing an AMD processor.
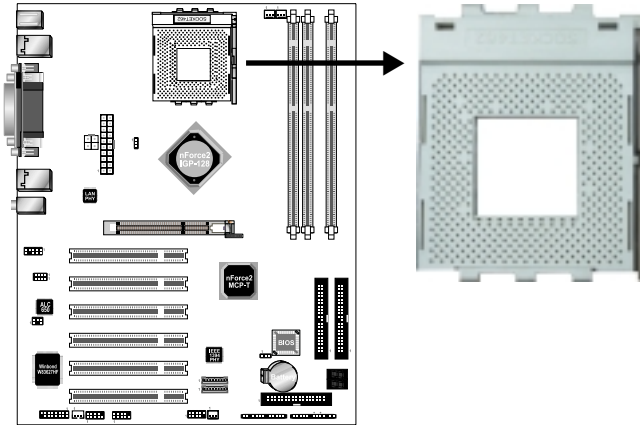
2.6.2 Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

2. Disconnect all power cords and cables.

3. Locate Socket 462 on the mainboard.

4. Unlock the socket by pushing the lever sideways, away from the socket, then lifting it up to a 90º angle. Make sure the socket is lifted to at least this angle otherwise the CPU will not fit in properly.

Lever ——

5. Position the CPU above the socket then align the gold mark on the corner of the CPU (designated as pin 1) with pin 1 of the socket.

Gold mark

Pin 1
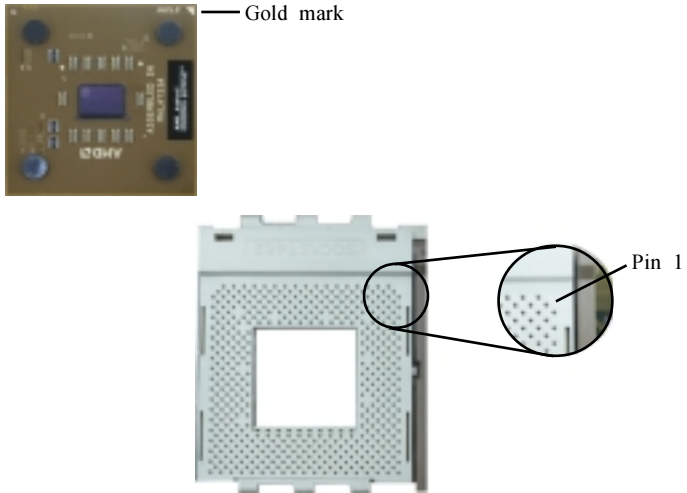
IMPORTANT

Handle the CPU by its edges and avoid touching the pins.

---

6. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force.
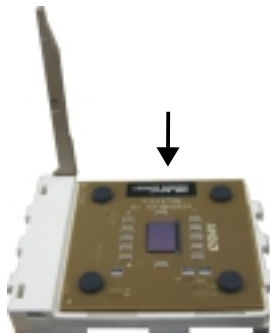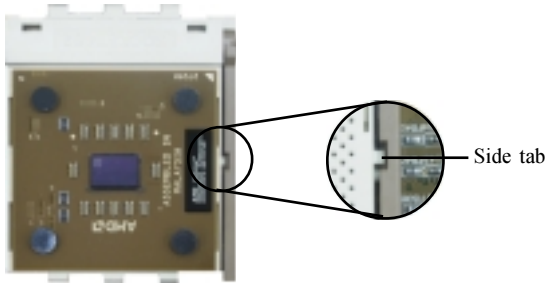
> **WARNING**
>
> Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.

7. Once the CPU is in place, push down the lever to lock the socket. The lever should click on the side tab to indicate that the CPU is completely secured in the socket.


Side tab

8. Before you install the fan/heatsink, you must apply a silicone thermal compound onto the top of the CPU. The thermal compound is supplied somewhat similar to the one shown below. When you place the heatsink on top of the CPU, the compound will disperse evenly. Do not spread the compound all over the surface.

If the fan/heatsink already has a patch of compound on its underside, you don't need to apply the thermal compound. Peel the strip that covers the compound then place the fan/heatsink on top of the CPU.

Strip
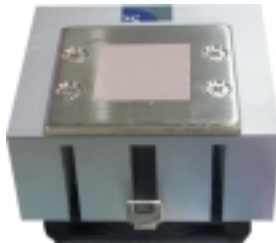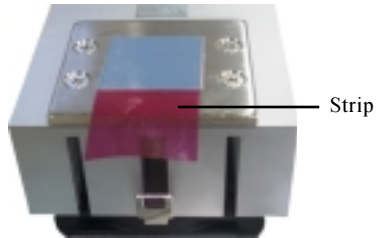
Underside of the fan/heatsink

9. After placing the fan/heatsink on top of the CPU, latch one side of the retaining clip onto the protruding tab on the side of the socket.

Retaining clip

Tab
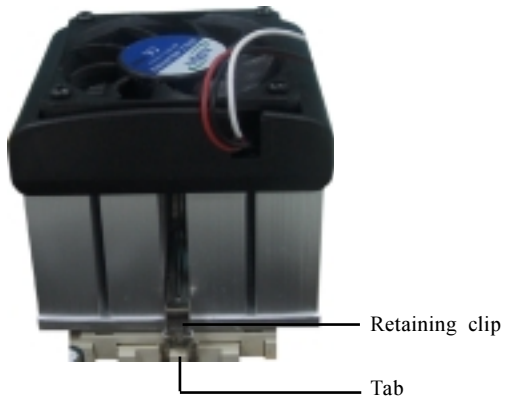
10. Push down the other side of the retaining clip until it latches and lock onto the protruding tab on that side of the socket. Make sure there is sufficient air circulation across the CPU fan heatsink.

INFORMATION

For more information about installing an AMD CPU, go to http://www.amd.com/products/cpg/athlon/pdf/23986.pdf.

2.7 System Memory

2.7.1 Memory Configuration

DIMM 1 (Bank 0)
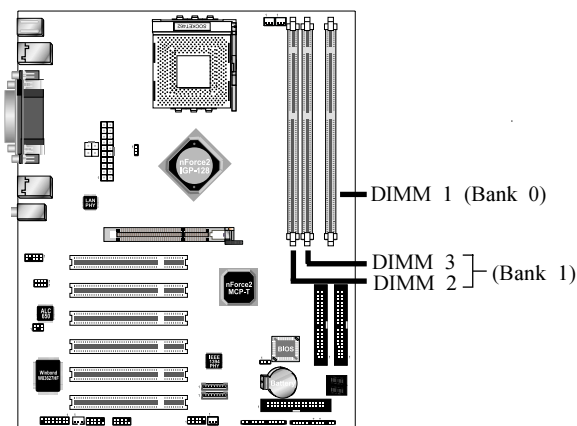
DIMM 3
DIMM 2 } (Bank 1)

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

The three DIMM sockets are divided into 2 banks - bank 0 (DIMM 1) and bank 1 (DIMM 2 and DIMM 3).

If you are installing:

- One DIMM - install a 64-bit DIMM anywhere between DIMM 1, DIMM 2 and DIMM 3.
- Two DIMMs - install 64-bit DIMMs in DIMM 2 and DIMM 3 and a 128-bit DIMM in DIMM 1. Use the same type and size of DIMMs.
- Three DIMMs - install 128-bit DIMMs in DIMM 1, DIMM 2 and DIMM 3.

> **IMPORTANT**
>
> • Use the same type and size of DIMMs.
> • Using non-compliant DIMMs or overclocking the memory bus speed may severely damage the mainboard.

BIOS Setting

You can further configure the system memory in the Advanced Chipset Features of the BIOS. Refer to chapter 3 for more information.

2.7.2 Installing a DIMM

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

2. Disconnect all power cords and cables.

3. Unlock the DIMM socket by pulling the "tabs" that are at the ends of the socket to the side.

Tab ——

4. Position the DIMM above the socket with the "notch" in the module aligned with the "key" on the socket.
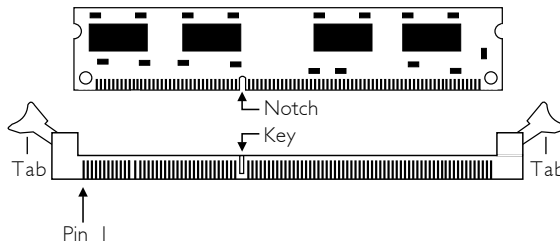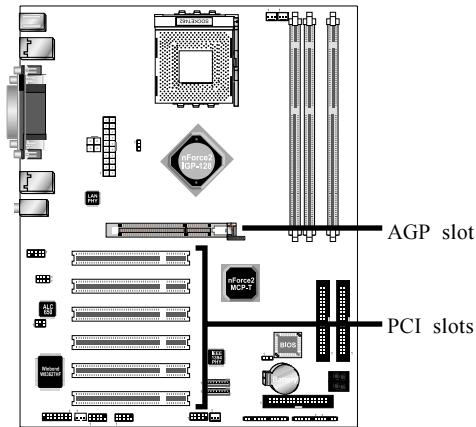
5. Insert the module vertically into the socket until the tabs snap back in place. Make sure it is completely seated. The tabs will hold the DIMM in place.

IMPORTANT

The DIMM is keyed with a notch so that it will fit in only one orientation. It can easily be inserted without exerting any force.

2.8 Expansion Slots

AGP slot

PCI slots

AGP Slot

The mainboard is equipped with an AGP slot. Make sure you install a card that supports the 1.5V specification.

PCI Slots

The mainboard is equipped with 6 PCI slots. It supports PCI cards that comply with the PCI specification.

2.8.1 Installing an Expansion Card

The steps below assume that the mainboard is already installed in the system chassis.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Remove the system unit cover.
4. Remove the bracket of the slot that you intend to use. (You need to remove the screw in order to remove the bracket.)
5. Align the card above the slot then press it down firmly until it is completely seated in the slot.
6. Secure the card to the chassis with the screw you removed in step 4.
7. Replace the system unit cover.
8. Power on the PC.
9. Enter the BIOS setup program to make the necessary settings.
10. Save the settings and restart the PC.
11. Install the software drivers of the expansion cards, if necessary.

2.9 Jumpers

2.9.1 Clear CMOS Data

1-2 On: Normal
(default)

2-3 On:
Clear CMOS Data
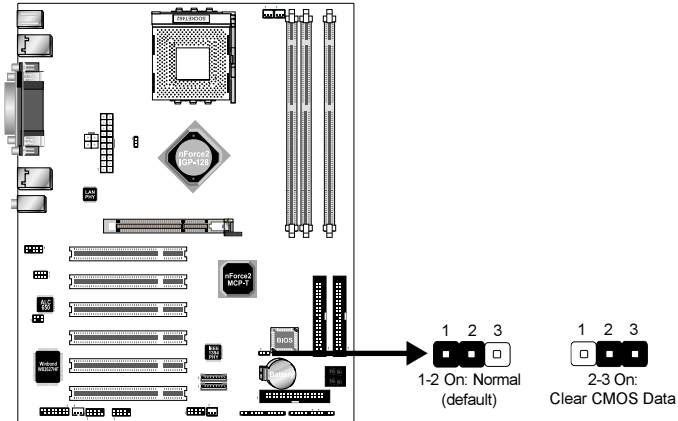
If the CMOS data becomes corrupted or you forgot the supervisor or user password, clear the CMOS data to reconfigure the system back to the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS:

1. Power-off the system.

2. Set JCMOS pins 2 and 3 to On. Wait for a few seconds and set JCMOS back to its default setting, pins 1 and 2 On.

3. Power-on the system.

2.9.2 CPU FSB Select

1-2 On: 100/133MHz
(default)

2-3 On:
133/166MHz
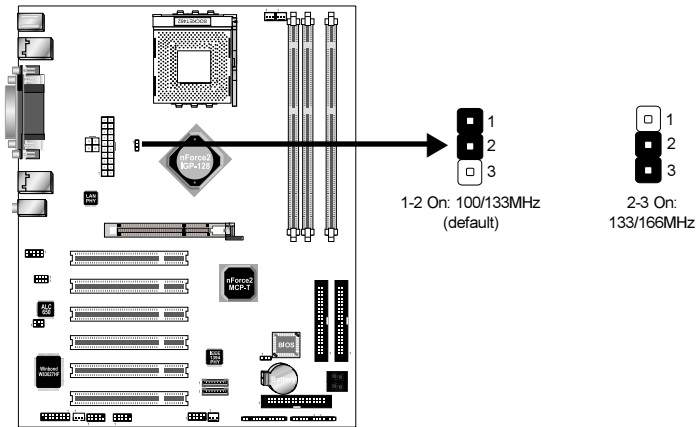
This jumper is used to select the front side bus of the CPU installed on the mainboard.

IMPORTANT

Overclocking may result to the CPU's or system's instability and are not guaranteed to provide better system performance.

2.10 Connectors

2.10.1 PS/2 Mouse and PS/2 Keyboard

Mouse

Keyboard

The mainboard is equipped with an onboard PS/2 mouse (Green) and PS/2 keyboard (Purple) ports.

Connect a PS/2 mouse into the PS/2 mouse port.

Connect a standard keyboard that has a PS/2 plug into the PS/2 keyboard port. If your keyboard has a standard AT size plug, you have to use a DIN to mini DIN adapter on the AT keyboard.

BIOS Setting - Keyboard Wake Up

The mainboard supports the keyboard wake up function which allows you to use the keyboard to power-on the system. To use this function:

The "Power On Function" field in the Integrated Peripherals submenu of the BIOS must be set accordingly. Refer to chapter 3 for more information.
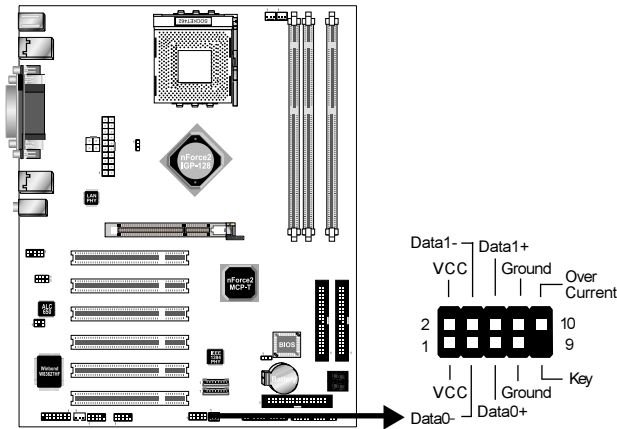
WARNING

Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the mainboard.

2.10.2 USB Ports

USB 2

USB 1   USB 3/4

The mainboard is equipped with onboard USB 2.0/1.1 ports.

It is also equipped with a 10-pin connector for connecting 2 additional external USB 2.0/1.1 ports. If you want to use the additional USB ports, install the optional card-edge bracket to the system chassis then insert the connector that is attached to the USB port cables to the 10-pin connector.

Data1- ┐ ┌ Data1+
VCC ┐ │ │ ┌ Ground   Over
│ │ │ │   Current

2 [   ] 10
1 [   ] 9

│ │ │ │ └ Key
VCC ┘ │ │ └ Ground
Data0- ┘ └ Data0+

BIOS Settings

- The "OnChip USB" field in the Integrated Peripherals submenu of the BIOS must be set accordingly. Refer to chapter 3 for more information.

- The mainboard supports the USB wake up function which allows you to use a USB device to power-on the system. To use this function:

  "USB Resume From S3/S4" in the Power Management Setup submenu of the BIOS must be set to Enabled.
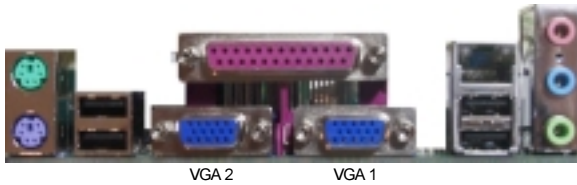
Driver Installation

If you are using the Windows XP operating system, you need to install the NVIDIA USB 2.0 driver. Refer to chapter 4 for more information.

Some USB devices may require installing its driver. Refer to the documentation that came with the device for more information.

2.10.3 VGA Port

VGA 2   VGA 1

The VGA ports only support analog video monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor cable into the VGA port, gently tighten the cable screws to hold the connector in place.

Driver Installation

Install the "NVIDIA VGA Driver" which is included in the provided CD. Refer to chapter 4 for more information.

2.10.4 Parallel Port
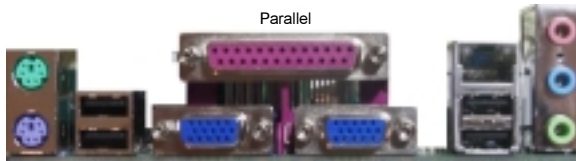
Parallel

The parallel port is used for interfacing your PC to a parallel printer.

BIOS Setting

Select the port's mode in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

2.10.5 LAN Port (optional)

The RJ45 fast-ethernet LAN port allows the mainboard to connect to a local area network by means of a network hub.

BIOS Setting

Enable or disable the LAN port in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

2.10.6 Audio Jacks

The mainboard is equipped with the line-out, line-in and mic-in jacks for connecting devices at the rear panel. It is also equipped with a 10-pin connector providing you the option of connecting line-out and mic-in jacks at the front panel of the chassis.

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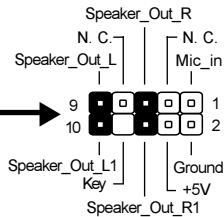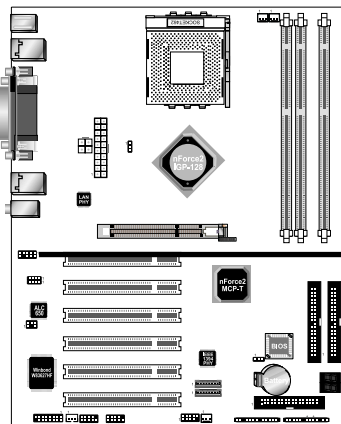
User's Manual

Settings

| Pins 5-6 and 9-10 short (default)	The front audio is disabled. The rear audio is enabled.
Pins 5-6 and 9-10 open	The front audio is enabled. The rear audio is disabled.

NOTE

In 2-channel audio mode, mic-in is supported in both the front panel audio and rear panel audio.

In 6-channel audio mode, mic-in is supported by the front audio while mic-in at the rear will switch into center and subwoofer functions.

2.10.7 CD-in and AUX-in Connectors

The CD-in and AUX-in connectors are used to receive audio from a CD-ROM drive, TV tuner or MPEG card.
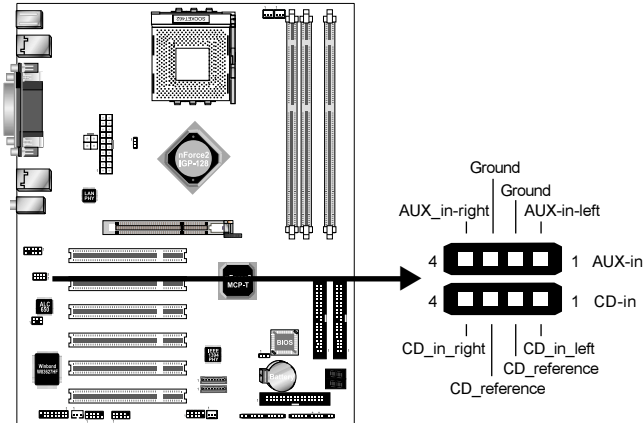
2.10.8 S/PDIF Connector

A S/PDIF card mounted with S/PDIF ports will be provided as an option. Install the card-edge bracket to the system chassis then connect the audio cable connectors from the card to the 6-pin S/PDIF connector on the mainboard.
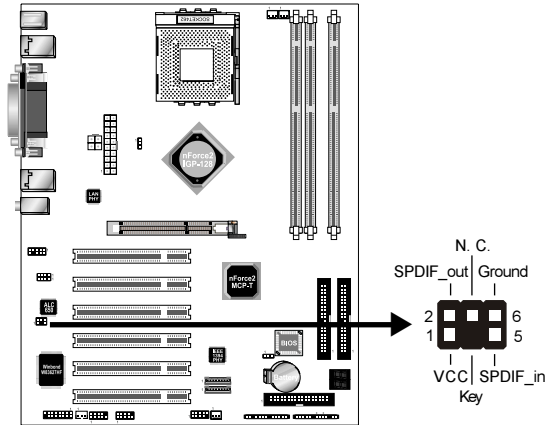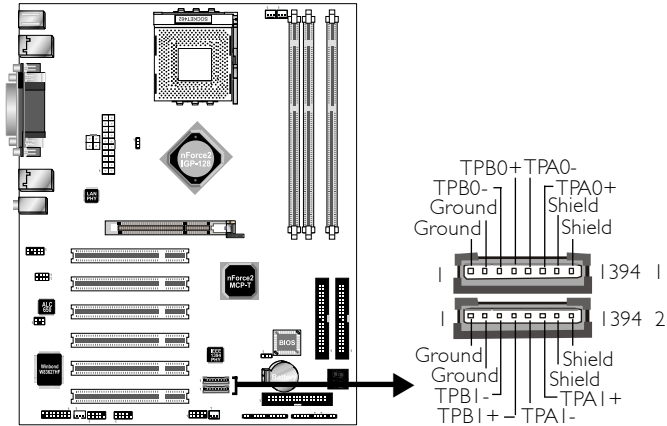
2.10.9 1394 Connectors (optional)

One card-edge bracket mounted with two 1394 ports will be provided as an option. Install the card-edge bracket to the system chassis then connect the 1394 port cables to the 1394 connectors on the mainboard.

BIOS Setting

Configure the 1394 function in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

2.10.10 Game/MIDI Connector

One card-edge bracket mounted with a game/MIDI port cable is provided in the package. Install the card-edge bracket to the system chassis then connect the game/MIDI port cable to the 15-pin game connector on the mainboard. The colored edge of the ribbon cable (red) should align with pin 1 of the game connector.

BIOS Setting

You can configure the game port in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

2.10.11 Serial Connectors

One card-edge bracket mounted with serial ports is provided in the package. Install the card-edge bracket to the system chassis then connect the serial port cables to the 9-pin COM 1 and COM 2 connectors on the mainboard. The colored edge of the ribbon cable (red) should align with pin 1 of the connectors.
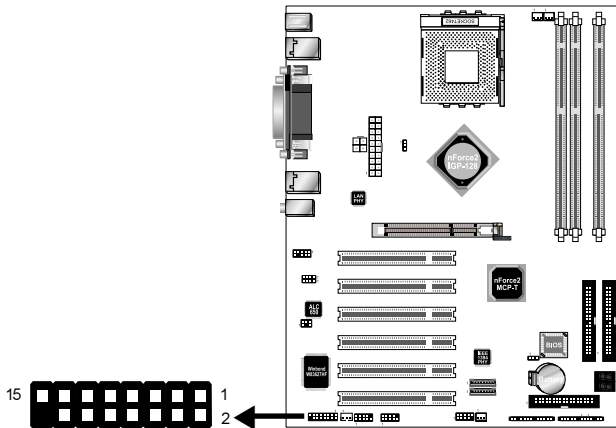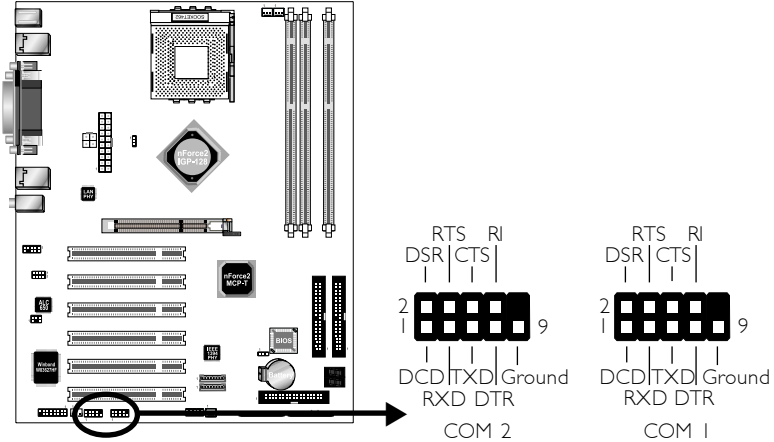

BIOS Setting

Enable or disable this function in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

2.10.12 Floppy Disk Drive Connector

Connect one end of the provided floppy ribbon cable into the floppy disk drive connector and the other end to your floppy disk drive. The colored edge of the ribbon cable (red) should align with pin 1 of the floppy disk drive connector.

BIOS Setting

Enable or disable this function in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

2.10.13 IDE Disk Drive Connectors

Connect one end of the provided IDE ribbon cable into the IDE disk drive connector and the other end to your IDE disk drive. Pin 20 on each connector has been removed to prevent improper installation. The colored edge of the ribbon cable (red) should align with pin 1 of the IDE disk drive connector.

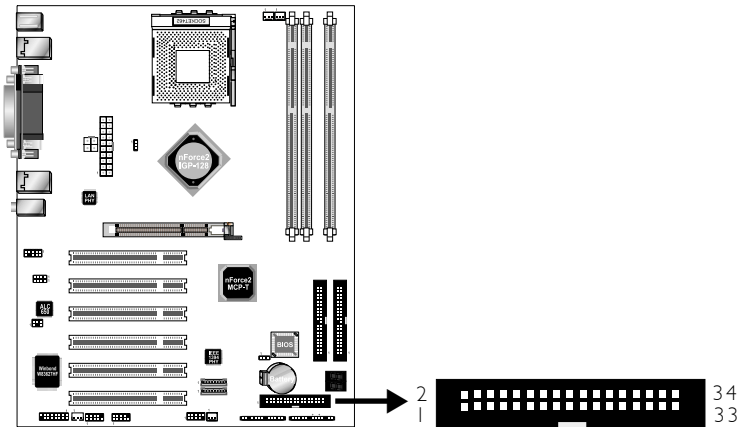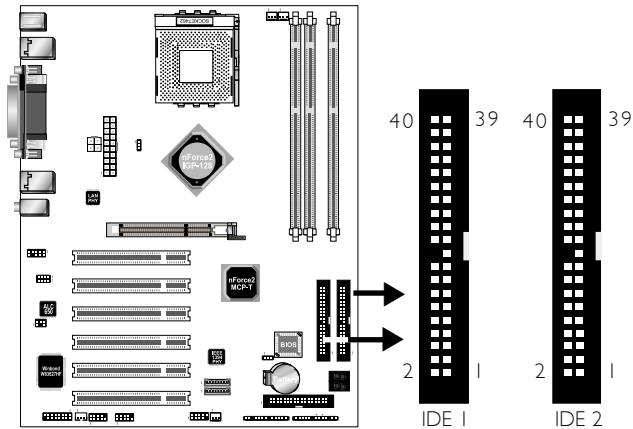**BIOS Setting**

Enable or disable this function in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

WARNING

When using two IDE drives, one must be set to Master mode and the other one to Slave mode. Refer to your disk drive user's manual for information about selecting the proper drive switch settings.

2.10.14 Fan Connectors

CPU Fan

The CPU must be kept cool by using a fan with heatsink. Connect the CPU fan to the 3-pin CPU fan connector on the mainboard.

Chassis Fan

The chassis fan will provide adequate airflow throughout the chassis to prevent overheating the CPU. Connect the fan's connector to the 3-pin chassis fan connector on the mainboard.

Power Fan

If you are installing an additional fan in the system unit, connect the fan's connector to the 3-pin power fan connector on the mainboard.
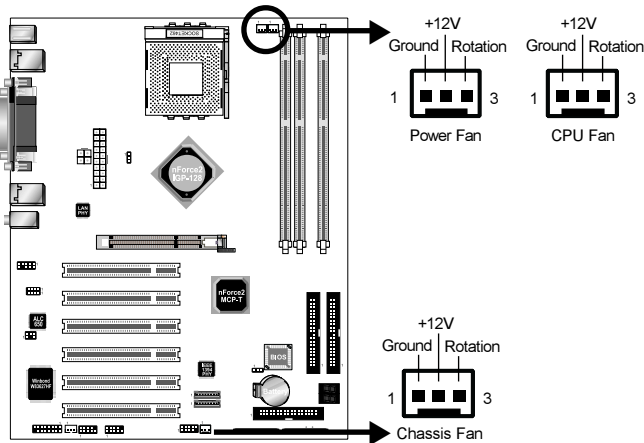
BIOS Setting

The system is capable of monitoring the fan speed in RPM (Revolutions Per Minute). Refer to the PC Health Status submenu of the BIOS for the current speed of the CPU fan, power fan and chassis fan. Refer to chapter 3 for more information.

2.10.15 Wake-On-LAN Connector

Your LAN card package should include a cable. Connect one end of the cable to the wakeup header on the card and the other end to the Wake-On-LAN connector on the mainboard. The network will detect Magic Packet and assert a wakeup signal to power-up the system.
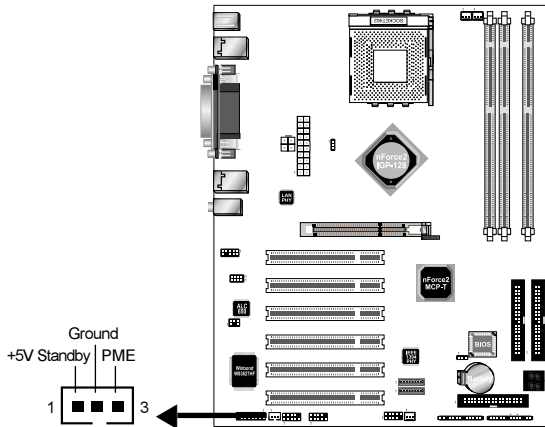
BIOS Setting

To use the Wake-On-LAN function, you must enable the "WOL(PME#) from Soft-Off" field in the Power Management Setup submenu of the BIOS. Refer to chapter 3 for more information.

WARNING

- Refer to the add-in card's manual for details.
- The LAN card must support the remote wake up function.

2.10.16 Power Connectors

The mainboard is equipped with a standard 20-pin ATX main power connector and a 4-pin +12V power connector for connecting an ATX12V power supply. The plugs of the power cables are designed to fit in only one orientation. Find the proper orientation then insert the plugs into the connectors until they fit in place.
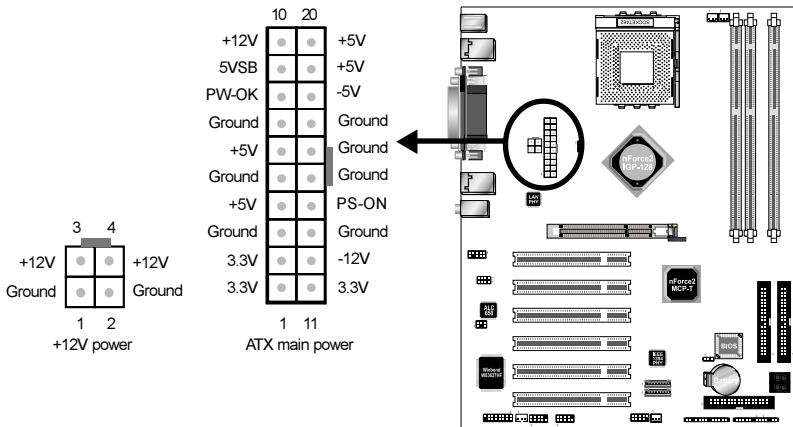
IMPORTANT

- The mainboard requires a minimum of 250 Watt power supply to operate. Your system configuration (amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, use a 300 Watt (or greater) power supply.
- To maintain the DDR's power whenever the system is in the STR mode, the 5VSB power source of your power supply must support ≥1A.

2.10.17 Front Panel Connectors
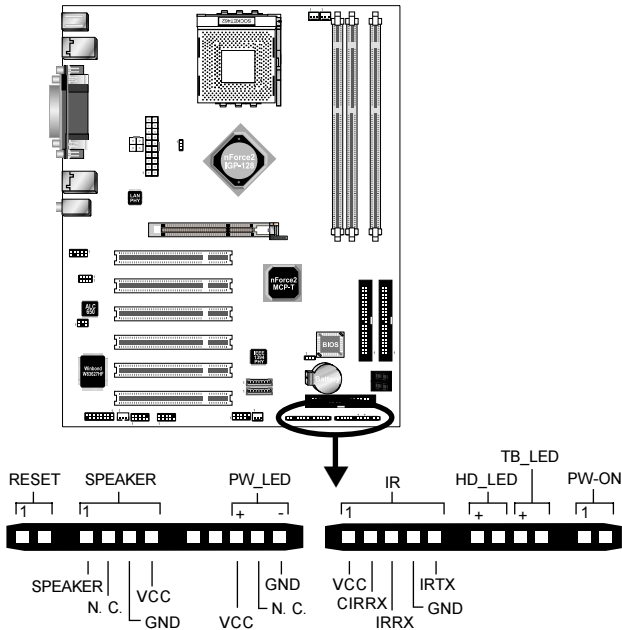
RESET

This switch allows you to reboot without having to power off the system thus prolonging the life of the power supply or system.

SPEAKER

This connects to the speaker installed in the system chassis.

PW_LED

This connects to the power button of the system chassis.

IR

Connect your IrDA cable to the IR connector.

- **BIOS Setting**

   Configure the IR in the Integrated Peripherals submenu of the BIOS to the type of IrDA standard supported by your device. Refer to chapter 3 for more information.

- **Driver Installation**

  Some IR devices may require installing its driver. Refer to the documentation that came with the device for more information.

IMPORTANT

The sequence of the pin functions on some IR cable may be reversed from the pin function defined on the mainboard. Make sure to connect the IR cable to the IR connector according to their pin functions.

HD-LED

This LED will light when the hard drive is being accessed.

PW-ON

Depending on the setting in the BIOS setup (Instant Off or Delay 4 Second), this switch is a "dual function power button" that will allow your system to turn off or enter the Suspend mode. Refer to "Soft-Off By PBTN" in the Power Management Setup of the BIOS (chapter 3).

2.10.18 80-Port Debug LED
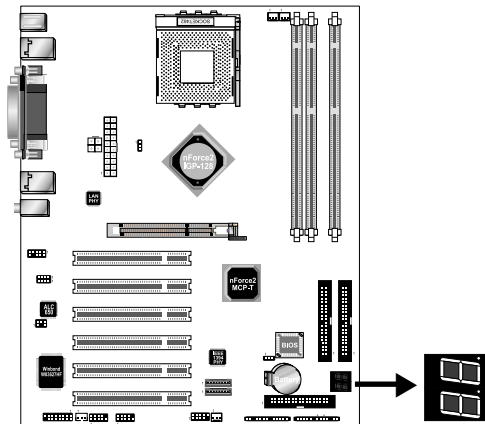
The 80-port debug LED is a 7-segment LED that displays POST codes. Refer to appendix B for the description of a particular POST code.

2.11 Suspend to RAM

The mainboard supports the STR (Suspend To RAM) function. Power source to the DDR SDRAM must be kept active with appropriate power states of the DDR SDRAM interface signals maintained.

The mainboard design meets the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. Currently, only Windows® 98/2000/ME/XP supports the ACPI function. ACPI, when enabled, will allow you to use the Suspend to RAM function. ACPI provides many Energy Saving Features for operating systems that support Instant ON and QuickStart™ function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting "Standby" when you shut down Windows® 98/2000/ME/XP without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

To enable the Suspend to RAM function, please follow the steps below.

1. Install ACPI compliant add-on cards such as AGP, LAN, modem cards, etc.

2. The following fields must be configured in the Power Management Setup of the BIOS.

    ACPI Function - Enabled
    ACPI Suspend Type: S3(STR)
    USB Resume from S3/S4 - Enabled (required only if a USB device is connected).

3. Install Windows® XP/2000/ME/98SE.

4. Restart the system.

5. Open the Control Panel Power Management application then click the Advanced tab. In the Power buttons section, select "Stand by" from the drop-down list.

6. To enter the STR mode, click the Start button on your desktop then click Shut Down. In the Shut Down Windows dialog box, select Stand by.

The following lists the advantages of the STR power saving mode over Green (or Suspend) mode.

1. STR is the most advanced Power Management mode.

2. STR cuts all the power supplied to peripheral devices except to the DDR SDRAM - maximum power saving.

3. STR saves and keeps all on-screen data including any executed applications to DDR SDRAM.

4. In STR mode, you must push the power button or move/click your USB device to wake up the system and return to the display screen at the time the system was powered-off.

2.12 CPU Overheat Protection

The mainboard supports the CPU Overheating Protection function. This function has the capability of monitoring the CPU's temperature during system boot-up. Once it has detected that the CPU's temperature exceeded 110ºC, the system will automatically shut down while emitting warning beeps from the speaker. This function is a hardware design therefore you do not need to configure the BIOS to support this function.

To power on the system again, we recommend that you follow the steps below.

1. Make sure the system's power is off then turn off the power supply's switch or unplug the power cord.

2. Wait till the warning beep stops before turning on the power supply's switch again or plugging the power cord, then power-on the system.

IMPORTANT

The CPU Overheat Protection function is supported only if you are using a CPU that supports thermal diode. Thermal diode is supported in AMD's Athlon™ XP or later CPUs.

Chapter 3

BIOS Setup

3.1 Overview

The BIOS is a program that takes care of the basic level of communication between the processor and peripherals. In contains codes for various advanced features found in this mainboard. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.

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

IMPORTANT

The BIOS is constantly updated to improve the performance of the mainboard; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purposes only.

3.2 Entering the BIOS Setup Program

After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to enter setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

3.3 Legends

Keys	Function
Up and Down arrows	Moves the highlight up or down between fields.
Right and Left arrows	Moves the highlight left or right between the items in the main menu.
<Esc>	Returns to the previous menu.
<Enter>	Selects the option for the particular field.
<PgUp>	Moves the cursor to the first field.
<PgDn>	Moves the cursor to the last field.
+ (plus key)	Scrolls forward through the values of the highlighted field.
- (minus key)	Scrolls backward through the values of the highlighted field.
<F1>	Displays General Help.
<F5>	Displays the previous value.
<F6>	Loads the Fail-Safe Defaults
<F7>	**Loads the Optimized Defaults**
<F9>	Shows the menu in the BIOS.
<F10>	Saves and exits the Setup program.

Scroll Bar

When a scroll bar appears to the right of the fields on the setup screen, it indicates that there are more available fields that did not fit in the screen. Use the <PgUp> and <PgDn> or up and down arrow keys to scroll through all the available fields.

Submenu

When a "➤ " appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

3.4 Main Menu

The main menu displays all the available menu items. To select the item you want to configure, move the highlight to the menu item then press <Enter>.

3.4.1 Standard CMOS Features

The Standard CMOS Features allows you 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.

Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1994 to 2079.

Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

IDE Primary Master, IDE Primary Slave, IDE Secondary Master and IDE Secondary Slave

Move the cursor to the "IDE Primary Master", "IDE Primary Slave", "IDE Secondary Master" or "IDE Secondary Slave" field, then press <Enter>.

- IDE HDD Auto Detection
  Detects the parameters of the drive. The parameters will automatically be shown on the screen.

- IDE Primary Master/Slave and IDE Secondary Master/Slave
  If you wish to define your own drive type manually, select "Manual". The drive type information should be included in the documentation from your hard disk vendor. If you select "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show the IDE for the HDD & CD-ROM drive. If a hard disk has not been installed, select "None".

- Access Mode
  For hard drives larger than 528MB, you would typically select the LBA type. Certain operating systems require that you select Normal or Large. Please check your operating system's manual or Help desk on which one to select.

- Capacity
  Displays the approximate capacity of the disk drive. Usually the size is slightly greater than the size of a formatted disk given by a disk checking program.

- Cylinder
  This field displays the number of cylinders.

- Head
  This field displays the number of read/write heads.

- Precomp
  This field displays the number of cylinders at which to change the write timing.

- Landing Zone
  This field displays the number of cylinders specified as the landing zone for the read/write heads.

- Sector
  This field displays the number sectors per track.

Drive A and Drive B

These fields identify the types of floppy disk drives installed.

None	No floppy drive is installed
360K, 5.25 in.	5-1/4 in. standard drive; 360KB capacity
1.2M, 5.25 in.	5-1/4 in. AT-type high-density drive; 1.2MB capacity
720K, 3.5 in.	3-1/2 in. double-sided drive; 720KB capacity
1.44M, 3.5 in.	3-1/2 in. double-sided drive; 1.44MB capacity
2.88M, 3.5 in.	3-1/2 in. double-sided drive; 2.88MB capacity

Video

This field selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type. The default setting is EGA/VGA.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters.
CGA 40	Color Graphics Adapter. Power up in 40-column mode.
CGA 80	Color Graphics Adapter. Power up in 80-column mode.
Mono	Monochrome adapter. Includes high resolution monochrome adapters.

Halt On

This field determines whether the system will stop if an error is detected during power up. The default setting is All Errors.

No Errors	The system boot will not stop for any errors detected.
All Errors	The system boot will stop whenever the BIOS detects a non-fatal error.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a disk or keyboard error; it will stop for all other errors.

Base Memory

Displays the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

Displays the amount of extended memory detected during boot-up.

Total Memory

Displays the total memory available in the system.

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3.4.2 Advanced BIOS Features

The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the mainboard, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.
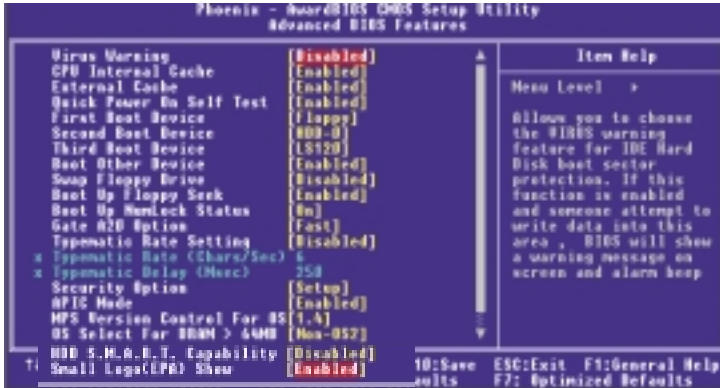
The screen above shows all the fields available in the Advanced BIOS Features submenu for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields.

Virus Warning

This field protects the boot sector and partition table of your hard disk drive. When this field is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive. If an attempt is made to write to the boot sector or partition table of the hard disk drive, the BIOS will halt the system and an error message will appear.

After seeing the error message, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

Many disk diagnostic programs which attempt to access the boot sector table will cause the warning message to appear. If you are running such a program, we recommend that you first disable this field. Also, disable this field if you are installing or running certain operating systems like Windows® 98SE/2000/ME/XP or the operating system may not install nor work.

CPU Internal Cache and External Cache

These fields speed up the memory access. The default is Enabled, which provides better performance by enabling cache.

Quick Power On Self Test

This field speeds up Power On Self Test (POST) whenever the system is powered on. The BIOS will shorten or skip some check items during POST. To attain the shortest POST time, select "Fast".

First Boot Device, Second Boot Device, Third Boot Device and Boot Other Device

Select the drive to boot first, second and third in the "First Boot Device" "Second Boot Device" and "Third Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected. Set "Boot Other Device" to Enabled if you wish to boot from another device.

The mainboard supports EZ Boot which provides a fast way of selecting the boot sequence of the drive without entering the BIOS setup program. Just press <Esc> when the system boots then select the boot sequence.

Swap Floppy Drive

When this field is enabled and the system is booting from the floppy drive, the system will boot from drive B instead of drive A. When this field is disabled and the system is booting from the floppy drive, the system will boot from drive A. You must have two floppy drives to use this function.

Boot Up Floppy Seek

When enabled, the BIOS will check whether the floppy disk drive installed is 40 or 80 tracks. Note that the BIOS cannot distinguish between 720K, 1.2M, 1.44M and 2.88M drive types as they are all 80 tracks. When disabled, the BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360KB.

Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Gate A20 Option

This entry allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 Mbyte. Initially, gate A20 was handled via the keyboard controller. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Typematic Rate Setting

Disabled Continually holding down a key on your keyboard will cause the BIOS to report that the key is down.

Enabled The BIOS will not only report that the key is down, but will first wait for a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys. You can then select the typematic rate and typematic delay in the "Typematic Rate (Chars/Sec)" and "Typematic Delay (Msec)" fields below.

Typematic Rate (Chars/Sec)

This field allows you to select the rate at which the keys are accelerated.

Typematic Delay (Msec)

This field allows you to select the delay between when the key was first depressed and when the acceleration begins.

Security Option

This field determines when the system will prompt for the password - everytime the system boots or only when you enter the BIOS setup. Set the password in the Set Supervisor/User Password submenu.

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

Leave this field in its default setting.

MPS Version Control for OS

This field is used to select the MPS version that the system board is using.

OS Select for DRAM > 64MB

This field allows you to access the memory that is over 64MB in OS/2.

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

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. The default is Disabled. If you are using hard drives that support S.M.A.R.T., set this field to Enabled. SMART is supported in ATA/33 or later hard drives.

Small Logo(EPA) Show

Enabled The EPA logo will appear during system boot-up.

Disabled The EPA logo will not appear during system boot-up.

3.4.3 Advanced Chipset Features

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources. These items should not be altered unless necessary. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system.
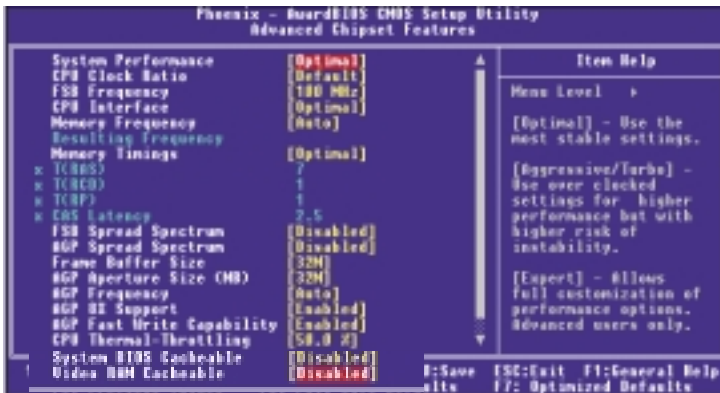
The screen above shows all the fields available in the Advanced Chipset Features submenu for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields.

System Performance

This field is used to select the mode that will provide the best performance for your system.

CPU Clock Ratio

This field is used to select the CPU's multiplier. The value of the multiplier must be set so that:

Multiplier x Front Side Bus Frequency = CPU Clock Speed

For example, if you have a CPU that is rated to run at 450 MHz and the system is running at a front side bus frequency of 100MHz, you should select the "4.5" multiplier so that:

4.5 (Multiplier) x 100 MHz (front side bus) = 450MHz (CPU clock)

FSB Frequency

This field is used to select the CPU's front side bus.

CPU Interface

This field is used to select the CPU/FSB parameters that will provide the best stability to the system.

Memory Frequency

This field is used to select the memory frequency. If you select "Auto", the system will automatically detect the frequency of the memory. If you select "By SPD, the system will run according to the information in the EEPROM. The EEPROM on a DIMM has SPD (Serial Presence Detect) data structure that stores information about the module such as the memory type, memory size, memory speed, etc.

Memory Timings

This field is used to select the timing of the DRAMs installed on the mainboard. If you select "Expert", you can manually select the option of the following fields - "T(RAS)" to "CAS Latency".

T(RAS)

This field specifies the number of clock cycles needed after a bank active command so that a precharge can occur (sets the minimum RAS pulse width).

T(RCD)

This field sets the timing parameters for the system memory such as the CAS (Column Address Strobe) and RAS (Row Address Strobe).

T(RP)

This field refers to the number of cycles required to return data to its original location in order to close the bank or it refers to the number of cycles required for page memory before the next bank activate command can be issued.

CAS Latency

This field is used to select the CAS latency time. This is usually preset according to the type of DRAM installed. Do not change the setting in this field unless you change the DRAM type.

FSB Spread Spectrum

This field is used to select an option that can significantly reduce the EMI (ElectroMagnetic Interference) generated by the CPU.

AGP Spread Spectrum

This field is used to select an option that can significantly reduce the EMI (ElectroMagnetic Interference) generated by the AGP.

Frame Buffer Size

This field is used to select the main memory frame buffer size of AGP.

AGP Aperture Size (MB)

This field is used to define the size of the aperture and is relevant to the memory-mapped graphics data of the AGP card installed on the mainboard. It refers to a section of the PCI memory address range used for graphics memory.

AGP Frequency

This field is used to select the AGP's frequency.

AGP 8X Support

This field is used to enable AGP 8x.

AGP Fast Write Capability

When the AGP Fast Write function is enabled, it will improve the system's performance.

CPU Thermal-Throttling

This field is used to set the percentage of time that the CPU will remain idle if CPU throttling is initiated by excess heat.

System BIOS Cacheable

When this field is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. The larger the range of the Cache RAM, the higher the efficiency of the system.

Video RAM Cacheable

When enabled, it allows the video RAM to be cacheable thus providing better video performance. If your graphics card does not support this function, set this field to Disabled.

3.4.4 Integrated Peripherals
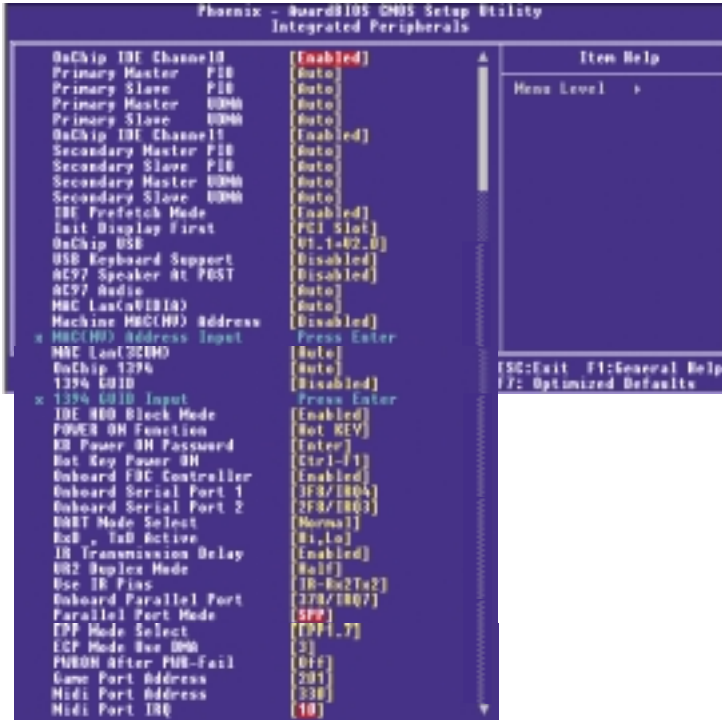
The screen above shows all the fields available in the Integrated Peripherals submenu for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields.

OnChip IDE Channel0 and OnChip IDE Channel1

The integrated peripheral controller supports two IDE channels. These fields allow you to enable or disable the primary and secondary IDE controller. The default is Enabled. Select Disabled if you want to add a different hard drive controller.

IDE Primary Master/Slave PIO and IDE Secondary Master/Slave PIO

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking your drive.

IDE Primary Master/Slave UDMA and IDE Secondary Master/Slave UDMA

These fields allow you to set the Ultra DMA in use. Set this field only if your IDE hard drive supports this function and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and system software both support Ultra DMA-33/66/100/133, select Auto. The BIOS will select the best available option after checking the IDE drive.

IDE Prefetch Mode

This allows data and addresses to be stored in the internal buffer of the chip, thus reducing access time. When Enabled, it reduces latency between each drive read/write cycle but may cause instability in IDE subsystems that cannot support such a fast performance. If you are getting disk drive errors, try setting this value to Disabled.

Init Display First

This field is used to select whether to initialize the onboard VGA/AGP or PCI first when the system boots.

Onboard/AGP   When the system boots, it will first initialize the onboard VGA or AGP.
PCI Slot   When the system boots, it will first initialize PCI.

OnChip USB

This field is used to select the type of USB specification.

USB Keyboard Support

If you are using a USB keyboard under DOS, set this field to Enabled. This field can be configured only if the "OnChip USB" field is enabled.

AC97 Speaker At POST

This field is used to enable or disable the AC97 speaker.

AC97 Audio

This field is used to enable or disable the onboard AC97 codec.

MAC Lan (nVIDIA)

This field is used to enable or disable the onboard nVIDIA LAN.

Machine MAC (NV) Address

This field is used to enable or disable the Machine MAC (NV) address. Set this field to Enabled to select an address in the field (MAC (NV) Address Input) below.

MAC (NV) Address Input

This field is used to select the MAC (NV) address.

MAC Lan (3COM)

This field is used to enable or disable the onboard 3COM LAN.

OnChip 1394

This field is used to enable or disable the onboard IEEE 1394.

1394 GUID

This field is used to enable or disable the 1394 GUID. Set this field to Enabled to select an address in the field (1394 GUID Input) below.

1394 GUID Input

This field is used to select the 1394 GUID.

IDE HDD Block Mode

Enabled The IDE HDD uses the block mode. The system BIOS will check the hard disk drive for the maximum block size the system can transfer. The block size will depend on the type of hard disk drive.

Disabled The IDE HDD uses the standard mode.

POWER ON Function

The mainboard supports the keyboard wake up function which allows you to use the <Ctrl> + <F1> keys (default setting) to power-on the system. This field provides other keyboard key options and PS/2 mouse options for powering-on the system.

Password Select this option if you want to use a password to power-on the system; then move the cursor to the "KB Power On Password" field and press <Enter>. Enter your password. You can enter up to 5 characters. Type in exactly the same password to confirm, then press <Enter>.

Keyboard 98 When this option is selected, press the "wake up" key of the Windows® 98 compatible keyboard to power-on the system.

BUTTON ONLY Use the computer's power button to power-on the system.

Any Key Press any key to power-on the system.

Mouse Right When this option is selected, double-click the right button of the mouse to power-on the system.

Mouse Left When this option is selected, double-click the left button of the mouse to power-on the system.

Hot Key Select this option if you want to use a hot key combination to power-on the system. When this option is selected, move the cursor to the "Hot Key Power On" field to select a function key. The options are from Ctrl-F1 to Ctrl-F12.

KB Power ON Password

Press <Enter> to set a password that you will use when you power-on the system. Make sure the "POWER ON Function" field is set to "Password".

Hot Key Power ON

Select a hot key combination that you will use when you power-on the system. Make sure the "POWER ON Function" field is set to "Hot Key".

Onboard FDC Controller

Enabled   Enables the onboard floppy disk controller.
Disabled   Disables the onboard floppy disk controller.

Onboard Serial Port 1 and Onboard Serial Port 2

Auto   The system will automatically select an I/O address for the onboard serial port 1 and serial port 2.
3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3   Allows you to manually select an I/O address for the onboard serial port 1 and serial port 2.
Disabled   Disables the onboard serial port 1 and/or serial port 2.

UART Mode Select

The mainboard supports IrDA function for wireless connectivity between your computer and peripheral devices. You may not use IrDA and the COM 2 serial port at the same time. If you are using the COM 2 serial port, make sure this field is set to Normal.

RxD, TxD Active

This field configures the receive and transmit signals generated from the IR port.

IR Transmission Delay

If this field is Enabled, transmission of data will be slower. This is recommended when you encounter transmission problem with your device.

UR2 Duplex Mode

Half   Data is completely transmitted before receiving data.
Full   Transmits and receives data simultaneously.

Use IR Pins

This item allows you to select the IR transmission routes.

Onboard Parallel Port

378/IRQ7, 3BC/IRQ7, 278/IRQ5   Selects the I/O address and IRQ for the onboard parallel port.
Disabled   Disables the onboard parallel port.

Parallel Port Mode

The options are SPP, EPP, ECP and ECP+EPP. These apply to a standard specification and will depend on the type and speed of your device. Refer to your peripheral's manual for the best option.

SPP   Allows normal speed operation but in one direction only.
ECP   (Extended Capabilities Port) Allows parallel port to operate in bidirectional mode and at a speed faster than the normal mode's data transfer rate.
EPP   (Enhanced Parallel Port) Allows bidirectional parallel port operation at maximum speed.

EPP Mode Select

This is used to select the EPP mode.

ECP Mode Use DMA

This is used to select the DMA channel of the parallel port.

PWRON After PWR-Fail

This item enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

Off   When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.
On   When power returns after an AC power failure, the system will automatically power-on.
Former-Sts   When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Game Port Address

This field is used to select the game port's address.
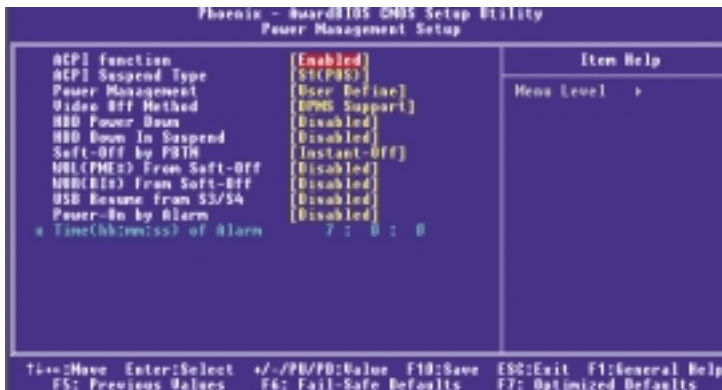
Midi Port Address

This field is used to select the midi port's address. If you have selected the midi port's address, you may select its IRQ in the "Midi Port IRQ" field.

Midi Port IRQ

This field is used to select the midi port's IRQ.

3.4.5 Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy.

ACPI Function

By default, the ACPI function is enabled. This function should be enabled only in operating systems that support ACPI.

ACPI Suspend Type

This field is used to select the type of Suspend mode.

S1(POS)	Enables the Power On Suspend function.
S3(STR)	Enables the Suspend to RAM function.
Auto	This option is applicable only when you are using the Windows® XP operating system. S3 will automatically be enabled since this function is supported by the system board.

Power Management

This field is used to select the type (or degree) of power saving by changing the length of idle time that elapses before the HDD Power Down field is activated.

Min Saving	Minimum power saving time. The inactivity period is 1 hour for each mode.
Max Saving	Maximum power saving time. The inactivity period is 1 minute for each mode.
User Define	Allows you to configure the "HDD Power Down" field.

Video Off Method

This field is used to select how the video will be disabled by power management.

V/H Sync + Blank	The system turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
Blank Screen	The system only writes blanks to the video buffer.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

HDD Down In Suspend

When enabled, the hard drive will be powered off once the system enters the Suspend mode.

Soft-Off by PBTN

This field allows you to select the method of powering off your system.

Delay 4 Second	Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally "hit" or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.
Instant-Off	Pressing and then releasing the power button at once will immediately power off your system.

WOL(PME#) From Soft-Off

Access to the onboard LAN or a PCI card such as a LAN card will cause the system to wake up. The PCI card must support the wake up function. An input signal from the PME of the PCI card will wake up the system from a Soft-Off state.

WOR(RI#) From Soft-Off

Access to the PCI card such as a modem card will cause the system to wake up. The PCI card must support the wake up function. An input signal from the RI of the PCI card will wake up the system from a Soft-Off state.

USB Resume from S3/S4

This field, when enabled, allows you to use a USB device to wake up the system from the S3 or S4 mode.

Power-On by Alarm

Enabled When Enabled, you can set the date and time you would like the Soft Power Down (Soft-Off) PC to power-on in the field below. However, if the system is being accessed by incoming calls or the network prior to the date and time set in these fields, the system will give priority to the incoming calls or network.

Disabled Disables the alarm function.

3.4.6 PnP/PCI Configurations

This section describes configuring the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.
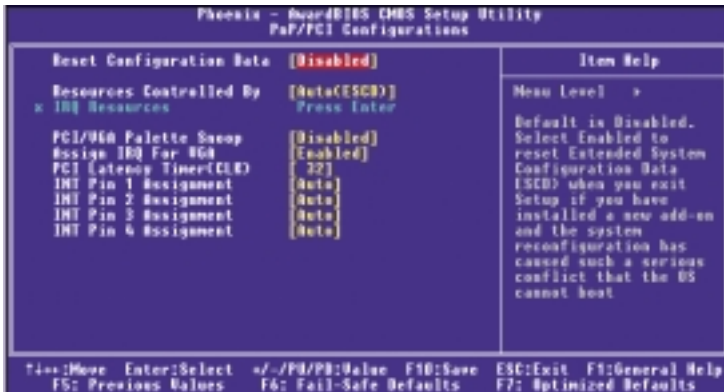
Reset Configuration Data

Enabled If you have installed Legacy cards and they were recorded in the ESCD (Extended System Configuration Data), you can set this field to Enabled to clear the ESCD. The BIOS will automatically reset the Extended System Configuration Data (ESCD) once. It will then recreate a new set of configuration data.

Disabled The BIOS will not reset the configuration data.

Resources Controlled By

The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug and Play (PnP) compatible devices.

Auto   If your ISA and PCI cards support PnP, the system will automatically assign resource interrrupts for these cards.

Manual   This option allows you to manually assign specific IRQs in the "IRQ Resources" field.

IRQ Resources

Move the cursor to this field and press <Enter>. This field is used to set each system interrupt to either Legacy ISA or PCI.

PCI   For devices compliant with the PCI bus architecture.

Legacy ISA For devices compliant with the original PC AT bus specification.

PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not. It is to overcome problems that may be caused by some nonstandard VGA cards. The mainboard comes with a built-in VGA system that does not require palette snooping therefore leave this field disabled.

Enabled   MPEG ISA/VESA VGA cards work with PCI/VGA.

Disabled MPEG ISA/VESA VGA cards does not work with PCI/VGA.

Assign IRQ for VGA

When Enabled, the system automatically assigns an IRQ for the VGA card installed. Your VGA card will need an IRQ only when using the video capture function of the card. If you are not using this function and a new device requires an IRQ, you can set this field to Disabled. The IRQ (previously occupied by the VGA card) will be available for your new device.

PCI Latency Timer(CLK)

This field is used to select the clock speed of the PCI.

INT Pin 1 Assignment to INT Pin 4 Assignment

By default, an IRQ is automatically assigned to the PCI devices that are installed in the PCI slots. If a PCI device has not been assigned an IRQ, you must manually assign an IRQ for the device. During system boot-up, you will see "NA" for the device that does not have an IRQ assigned.

The table below shows the interrupt request shared between the slots.

	INT A	INT B	INT C	INT D
PCI slot 1			✓	
PCI slot 2				✓
PCI slot 3	✓			
PCI slot 4		✓		
PCI slot 5			✓	
PCI slot 6				✓
AGP slot				✓
AC97	✓			
Onboard USB 1	✓			
Onboard USB 2		✓		
USB 2.0			✓	
Onboard LAN (optional)	✓			
1394 (optional)	✓			

IMPORTANT

If there is a PCI card installed in shared slot, make sure the card's driver supports "Shared IRQ" or that the card does not need IRQ assignment. Conflicts will arise making the system unstable or the card inoperable.

3.4.7 PC Health Status

CPU Warning Temperature

This field is used to select the temperature that will allow the system to respond indicating CPU overheat.

Current CPU Temperature

This field shows the current temperature of the CPU.

Current System Temperature

This field shows the current temperature of the system.

Current Power Fan Speed, Current Chassis Fan Speed and Current CPU Fan Speed

These fields show the current fan speed of the power, chassis and CPU fans in RPM (Revolutions Per Minute).

Vdd(V)

This field shows the voltage of the chipset.

Vcore(V)

This field shows the voltage of the CPU (Vcore).

Vdimm(V)

This field shows the voltage of the DRAM.

+5V, +12V, -12V, -5V, VBAT(V) and 5VSB(V)

These fields show the output voltage of the power supply.

Shutdown Temperature

This field is used to select a temperature that would shutdown the system to prevent system overheat. If the system detected that its temperature exceeded the one set in this field, the system will automatically shutdown. This requires setting the "ACPI Function" field in the Power Management Setup submenu to Enabled and making sure your operating system supports ACPI.

3.4.8 Power BIOS Features
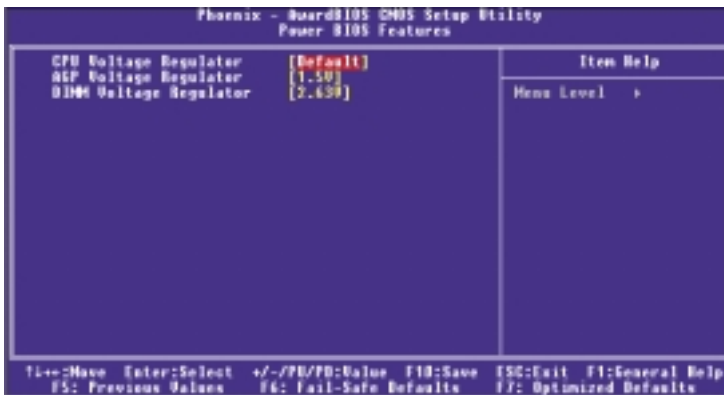
CPU Voltage Regulator

This field allows you to manually adjust to a higher core voltage that is supplied to the CPU. If you wish to use the CPU's default core voltage, leave this field in its default setting, which is "Default". The CPU's Vcore will be generated according to the CPU VID configuration.

Although this function is supported, we do not recommend that you use a higher voltage because unstable current may be supplied to the mainboard causing damage.

AGP Voltage Regulator

This field allows you to manually select higher voltage supplied to the AGP. If you wish to use the default voltage, leave this field in its default setting.

Although this function is supported, we do not recommend that you use a higher voltage because unstable current may be supplied to the system board causing damage.

DIMM Voltage Regulator

This field allows you to manually select higher voltage supplied to the DRAM. If you wish to use the DRAM's default voltage, leave this field in its default setting.

Although this function is supported, we do not recommend that you use a higher voltage because unstable current may be supplied to the system board causing damage.

3.4.9 Load Fail-Safe Defaults

The "Load Fail-Safe Defaults" option loads the troubleshooting default values permanently stored in the ROM chips. These settings are not optimal and turn off all high performance features. You should use these values only if you have hardware problems. Highlight this option in the main menu and press <Enter>. The message below will appear.

If you want to proceed, type <Y> and press <Enter>. The default settings will be loaded.

3.4.10 Load Optimized Defaults

The "Load Optimized Defaults" option loads optimized settings from the BIOS ROM. Use the default values as standard values for your system. Highlight this option in the main menu and press <Enter>. The message below will appear.

Type <Y> and press <Enter> to load the Setup default values.

3.4.11 Set Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor's password with the "System" option selected in the Advanced BIOS Features. If you want to protect access to setup only, but not your system, set a supervisor's password with the "Setup" option selected in the Advanced BIOS Features. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight "Set Supervisor Password" and press <Enter>. The message below will appear.

Type in the password. You are limited to eight characters. When done, the message below will appear:

<p align="center">Confirm Password:</p>

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

3.4.12 Set User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the Advanced BIOS Features. If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the Advanced BIOS Features.

Using user's password to enter Setup allows a user to access only "Set User Password" that appears in the main menu screen. Access to all other options is denied.

Use the arrow keys to highlight "Set User Password" and press <Enter>. The message below will appear.

Type in the password. You are limited to eight characters. When done, the message below will appear:

<div align="center">Confirm Password:</div>

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set User Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

3.4.13 Save & Exit Setup

When all the changes have been made, highlight "Save & Exit Setup" and press <Enter>. The message below will appear:

Type "Y" and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after memory testing is done.
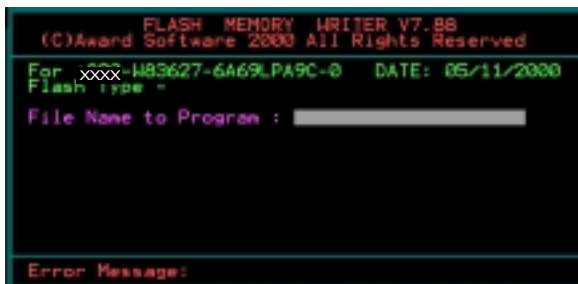
3.4.14 Exit Without Saving

When you do not want to save the changes you have made, highlight "Exit Without Saving" and press <Enter>. The message below will appear:

Type "Y" and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after memory testing is done.

3.5 Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWDFLASH.EXE. You must first download from the web site the xxxxx.EXE file that corresponds to this mainboard then copy it to the floppy or hard disk drive. Double-click the xxxxx.EXE file to execute the file. The file will self extract. Copy the extracted files to a bootable DOS floppy disk.

IMPORTANT

The DOS floppy disk should NOT contain any device drivers or programs.

---

1. Save the new BIOS file along with the flash utility AWDFLASH.EXE to a floppy disk.

2. Reboot the system and enter the Advanced BIOS Features submenu of the Award BIOS Setup Utility to set the first boot drive to "Floppy".

3. Save the setting and reboot the system.

4. After the system booted from the floppy disk, execute the flash utility by typing AWDFLASH.EXE.

5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

```
          FLASH  MEMORY  WRITER V7.88
      (C)Award Software 2000 All Rights Reserved

For  xxxx-W83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type =

File Name to Program : ██████████████████



Error Message:
```

6. "Do You Want to Save BIOS (Y/N)" at the bottom of the screen will appear.
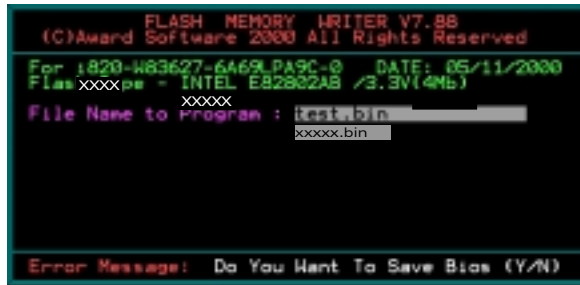
This question refers to the current existing BIOS in your system. We recommend that you save the current BIOS and its flash utility; just in case you need to reinstall it. To save the current BIOS, press <Y> then enter the file name of the current BIOS. Otherwise, press <N>.

7. If you press <Y>, type the BIOS file name to save the current BIOS.

8. "Are you sure to program (y/n)" will then appear at the bottom of the screen.

9. Press <Y> to flash the new BIOS.

Chapter 4

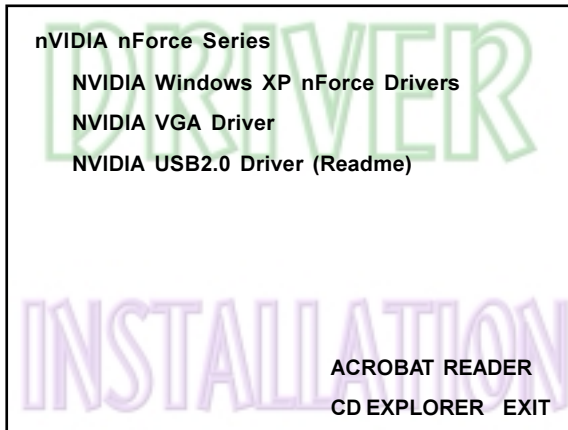**Software**

4.1 Drivers, Utilities and Software

The CD that came with the mainboard contains drivers, utilities and software required to enhance the performance of the mainboard.

To use the CD, simply insert the CD into a CD-ROM drive. The main menu screen will appear. The main menu displays buttons that link you to the supported drivers, utilities and software.

nVIDIA nForce Series

   NVIDIA Windows XP nForce Drivers

NVIDIA VGA Driver

NVIDIA USB2.0 Driver (Readme)

ACROBAT READER

CD EXPLORER   EXIT

If after inserting the CD, the main menu did not automatically start, please go directly to the root directory of the CD and double-click "Setup".

4.1.1 NVIDIA Windows XP nForce Drivers

To install the nVIDIA Windows XP nForce driver:

1. Click "NVIDIA Windows XP nForce Drivers" on the main screen.

2. Follow the prompts on the screen to complete installation.

4.1.2 NVIDIA VGA Driver

To install the nVIDIA VGA driver:

1. Click "NVIDIA VGA Driver" on the main screen.

2. Follow the prompts on the screen to complete installation.

4.1.3 NVIDIA USB 2.0 Driver (Readme)

You need to install the NVIDIA USB 2.0 driver only when you are using the Windows XP operating system. To read the installation instructions for USB 2.0 driver:

1. Click "NVIDIA USB 2.0 Driver (Readme)" on the main screen.

2. Make sure to follow the installation instructions carefully.
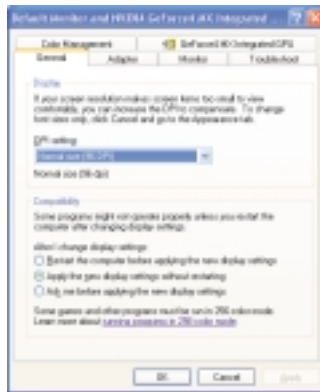
4.2 GeForce4 MX Integrated GPU

GeForce4 MX Integrated GPU is available only after installing the NVIDIA VGA Driver. To configure the display, click Start on your Windows desktop, point to Settings then click Control Panel. In the Control Panel dialog box, double-click the Display icon. The Display Properties dialog box will appear.

The Settings tab is used to set the display's resolution and color quality.

The General tab is used to enlarge or reduce the font size by selecting the DPI.

The GeForce4 MX Integrated GPU tab is used to configure the supported Direct3D. Click "More Direct3D" to further configure this function.

The screen below is used to further configure Direct3D by selecting the refresh rate.

The screen below is used to select the orientation of the display.

The screen below shows information such as the DirectX version, driver version, etc.
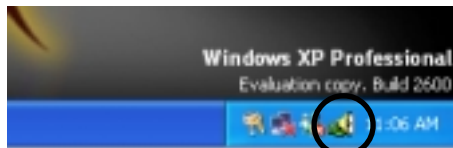

4.3 nForce Audio Control Panel

The nForce Audio Control Panel is supported only if the mainboard uses the nVidia nForce2 MCP-T south bridge controller.

1. **Audio Utility**

   You can run the audio utility either from the taskbar or from the Control Panel.

   a. Right-click the audio utility icon which you will find in the taskbar at the lower right corner of the desktop screen.

b. On your Windows desktop, click Start, point to Settings then click
    Control Panel. The Control Panel dialog box will appear. Double-
    click NVIDIA nForce Control Panel.
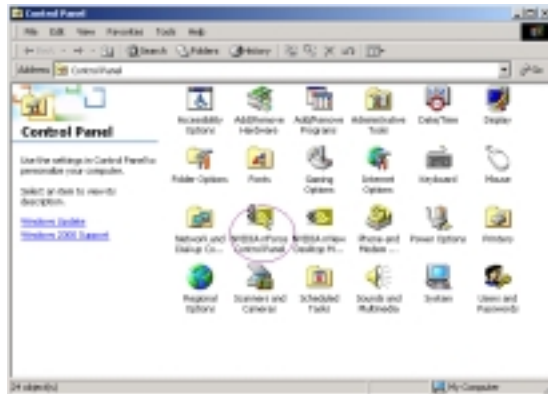
2 . **M a i n**

The Main menu includes controls for the Equalizer and Audio Mixer. It
includes the primary sliders for adjusting the volume of all sound
sources, recording input levels, equalizations settings (and presets), as
well as a signal meter to visually verify the sound being produced. If
you want to modify the volume of the CD audio playback, game audio,
or MP3 music, this is the area where you can make such changes.

There are sections for recording (what goes into a recorded WAV file),
for digitized input (the analog sources that are passed on to the digital
speakers), and for various outputs. Please take note that the sliders for
recording and digitized input are not volume levels but are gains (boost)
that go from 0 db (at the bottom) to infinity (at the top).

Speaker Output Levels
Displays a graphical view of the digital signal's volume.

Equalizer
This is used to customize responses to the specified digital audio frequencies.

Input
This is used to select the analog inputs on the audio device and adjust the gain of the analog signal.

Output
This is used to adjust the relative volume levels of the sources being routed to the speaker.

3. **Speaker Setup**

The Speaker Setup menu includes options for selecting the output format of the audio device, a control for Premix Volume Levels and a speaker setup wizard.

Listening Mode
This is used to specify the speaker configuration. To increase the amount of resources available for audio effects, select a configuration with fewer speakers.

Dolby Surround Encoding
This is used to set the format of the analog output to Dolby Surround.

Dolby Digital Encoding
This is used to set the format of the digital output to 5.1 Dolby Digital.

Create Center Channel
In six-speaker mode, enabling this option will create center channel content from a stereo or mono sample. Stereo content provides left and right channels while mono provides only one channel for all speakers.

Center Channel 3D Pan
In six-speaker mode, enabling this option will include the center channel speaker with positional 3D sound.

Create LFE Channel
In six-speaker mode, enabling this option will create center channel content from a stereo or mono sample. Stereo content provides left and right channels while mono provides only one channel for all speakers.

Rear Speaker Phase Shift
Enable this option if your rear speaker is playing sounds in mono mode.

Speaker Setup Wizard
This is used to launch the speaker setup wizard to help configure your control panel settings so that it matches your speaker setup.

4. **MIDI**

The MIDI menu is used to setup a custom listening environment using digital audio effects. It allows you to change settings specific to the MIDI playback.

You can test MIDI songs in the Audition section using all available effects or just the highlighted effect. The Downloadable Sounds section allows the loading and unloading of DLS or SoundFont sample banks from the system memory. These banks provide the instrument sounds for any MIDI files played on the system. The Effects panel at the bottom is very similar to the Environment menu therefore please refer to the Environment section for more information.
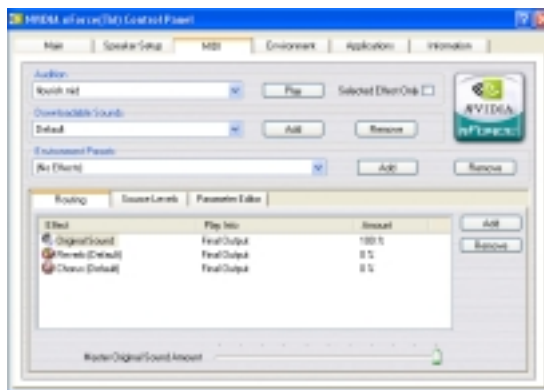
Audition
This control allows you to audition the configured effects.

Downloadable Sounds
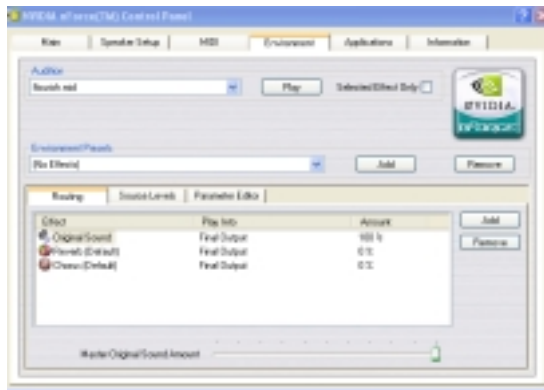This is used to customize the default MIDI sample set.

Environment Presets

This is used to select, save or remove a listening environment.

5. **Environment**

This is used to setup a custom listening environment using digital audio effects.

Routing

This is used to customize the listening environment by adding and removing standard effect, changing the routing of the audio signal through the effects, and adjusting the relative volume levels between the effects. It shows how the various effects can be mapped to either the speaker output directly, or how they can be hooked (routed) together to create more complex effects. An example of this routing is shown below.
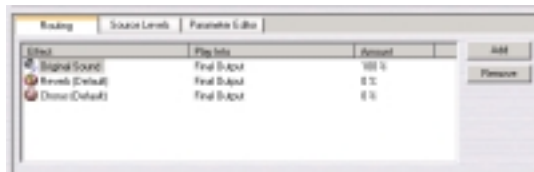

Here you can see two new effects, Compressor and ParamEQ, being routed into Reverb and Chorus. This allows the news effects to be applied into the mix of the two standard effects: creating a custom chain for the sound and a unique sound output for each effect. There is a slider to control the amount of each effect that will be applied to the sound.

Source Levels

This area allows you to decide on which sound the effects will be applied on. Think of this area as the traffic cop who directs which

sound effect get added to what type of sound. You can also set which MIDI controller triggers which effect. An example is shown below.
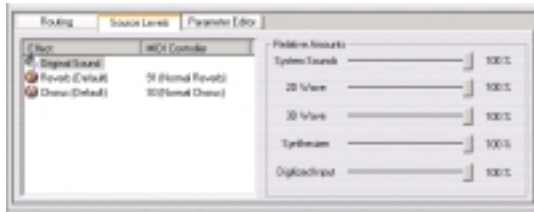
Parameter Editor

This area is really designed for the most experienced tweakers due to the terminology and settings used. Basically, this is as close as where the end user can get to tweaking the hardware registers, DSP settings, mixers, and memory routing on the APU without working for NVIDIA. Any changes to the sliders happen in realtime on both the GUI and the DSP underneath, giving the user the ability to immediately hear how it sounds to anything that might be playing. There are presets at this level too, not to be confused with the environmental presets mentioned earlier, as these apply only to a single effect (like reverb, echo, etc.) and not to the entire effects group. An example is shown below.
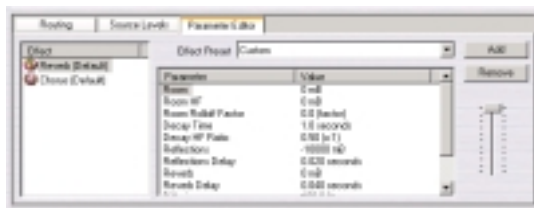
6. **Application**

This is used to add audio application shortcuts. It is a quick way of getting to your favorite audio applications from within the Control Panel. Applications can be added or removed by using the buttons in the lower right hand corner of the screen.

7. **Information**

This shows the details about the APU, hardware and software revisions, driver revisions, current DirectX version; and in "Advanced" mode, the DSP and voice utilization. This is the first place to look at if you want to verify the drivers that are currently running and the last place to look at if you want to know what is going on at the lower levels of the APU.
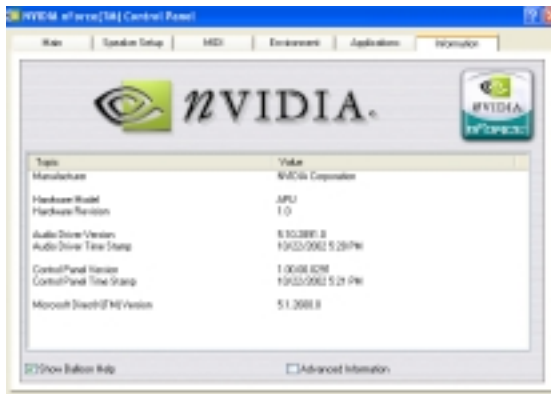
Show Balloon Help
This shows balloon help for all controls in the control panel.

Advanced Information
This shows advanced information about the audio device.

Appendix A

Replacing the EEPROM

Basically, you do not need to remove the BIOS EEPROM. But if in any case you need to replace it, please perform this under the guidance of a technician. Use a PLCC IC extractor tool (right photo below) to remove the EEPROM. Damage to the EEPROM socket or the EEPROM may occur if improper tools or method is applied in removing the EEPROM.
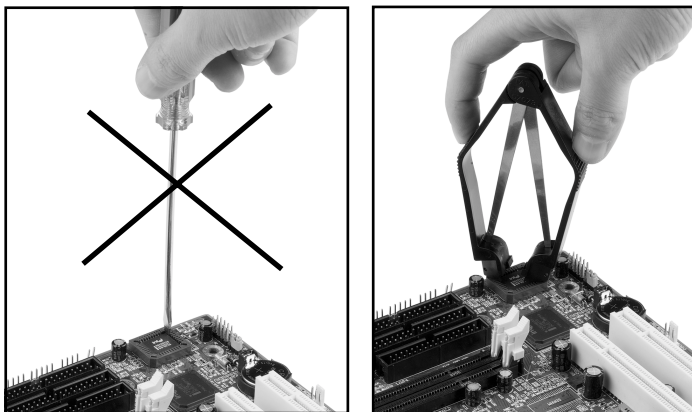
Appendix B

POST Codes

POST (hex)	DESCRIPTION
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: - Disable shadow RAM - Disable L2 cache (socket 7 or below) - Program basic chipset registers
C1h	Detect memory - 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.
0h1	Expand the Xgroup codes located in physical address 1000:0.
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	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 not specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_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	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 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	1. Program CPU internal MTRR (P6 & PII) 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	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	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	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 .

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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	1. Display PnP logo. 2. Early ISA PnP initialization. - 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	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_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	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	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	Reserved
79h	Reserved
7Ah	Detect & install co-processor.
7B-7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. - If errors occur, report errors & wait for keys. - If no errors occur or F1 key is pressed to continue: Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text font used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS.
84h	Initialize ISA PnP boot devices.

85h	1. USB final Initialization.
	2. NET PC: Build SYSID structure.
	3. Switch screen back to text mode.
	4. Set up ACPI table at top of memory.
	5. Invoke ISA adapter ROMs.
	6. Assign IRQs to PCI devices.
	7. Initialize APM.
	8. Clear noise of IRQs.
86-92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code.
94h	1. Enable L2 cache.
	2. Program boot up speed.
	3. Chipset final initialization.
	4. Power management final initialization.
	5. Clear screen & display summary table.
	6. Program K6 write allocation.
	7. Program P6 class write combining.
95h	1. Program daylight saving.
	2. Update keyboard LED & typematic rate.
96h	1. Build MP table.
	2. Build & update ESCD.
	3. Set CMOS century to 20h or 19h.
	4. Load CMOS time into DOS timer tick.
	5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)