Contents

Chapter 1 Specification

Introduction

This mainboard features an integration of the powerful AMD Athlon 64 CPU and the single chip nVIDIA nForce3 250Gb, with which the whole system performance supports HyperTransport Bus up to 800MHz.

nVIDIA nForce3 250Gb supports on-board AMD Athlon 64 processor to implement HyperTransport 800MHz, the AGP 8X/4X interface, PCI interface, IEEE 802.3 nVIDIA MAC, the LPC Super I/O, the USB 2.0 interface, ATA 133/100/66 data transfer rate, and Serial ATA RAID interface. This chapter is to introduce to users every advanced function of this high performance integration.

Topics included in this chapter are:
1-1 Mainboard Layout
1-2 Mainboard Specifications**
1-3 Mainboard Specification Table
1-4 Chipset System Block Diagram

** If any difference is found between this manual and the Mainboard you are using, please look up the <u>ERRATA/UPDATE Slip</u> enclosed inside for the correction or updated information, or else contact the Mainboard Dealer or visit our Web Site for the latest manual update.

1-1 B9A-FGR Layout

1-2 Chipset System Block Diagram

```
                    ┌─────────────────┐  DDR 400/333/266  ┌──────────┐
                    │   Socket 754    │──────────────────│ System   │
                    │  AMD Athlon64   │                  │ Memory   │
                    └─────────────────┘                  └──────────┘
                             ↕
                    Hyper Transport 800MHz

   PATA RAID                                    AGP 8X/4X
┌──────────┐ ATA 133/100/66  ┌─────────────┐              ┌──────────┐
│ 4 IDE    │─────────────────│             │──────────────│ AGP Slot │
│ Devices  │                 │             │              └──────────┘
└──────────┘                 │             │
              SATA RAID      │             │   PCI Bus     ┌──────────┐
┌──────────┐                 │   nVIDIA    │──────────────│1 PCI Slot│
│2 SATA    │─────────────────│             │              └──────────┘
│ports     │                 │nForce3 250Gb│
└──────────┘                 │             │  ┌──────────┐ ┌──────────┐
             USB Bus V2.0     │             │──│ C-MEDIA  │ │8-channel │
┌──────────┐                 │             │  │ CMI 8768 │ │Audio     │
│8 USB     │─────────────────│             │  └──────────┘ │output    │
│Ports     │                 │             │              └──────────┘
└──────────┘                 │             │
             nVIDIA MAC      │             │              ┌────────────────┐
┌──────────┐                 │             │──────────────│ LPC Super I/O  │
│CICADA    │ Gigabit Ethernet│             │              └────────────────┘
│CIS8201   │─────────────────│             │              ┌────────────────┐
└──────────┘                 └─────────────┘              │ Keyboard       │
┌──────────────────────────┐       │                      │ Mouse          │
│RJ45 10/100/1000 base-T LAN│      │                      │ Serial / IR    │
└──────────────────────────┘       │                      │ Parallel       │
                              ┌──────────┐                 │ Floppy Disk    │
                              │   BIOS   │                 └────────────────┘
                              └──────────┘
```
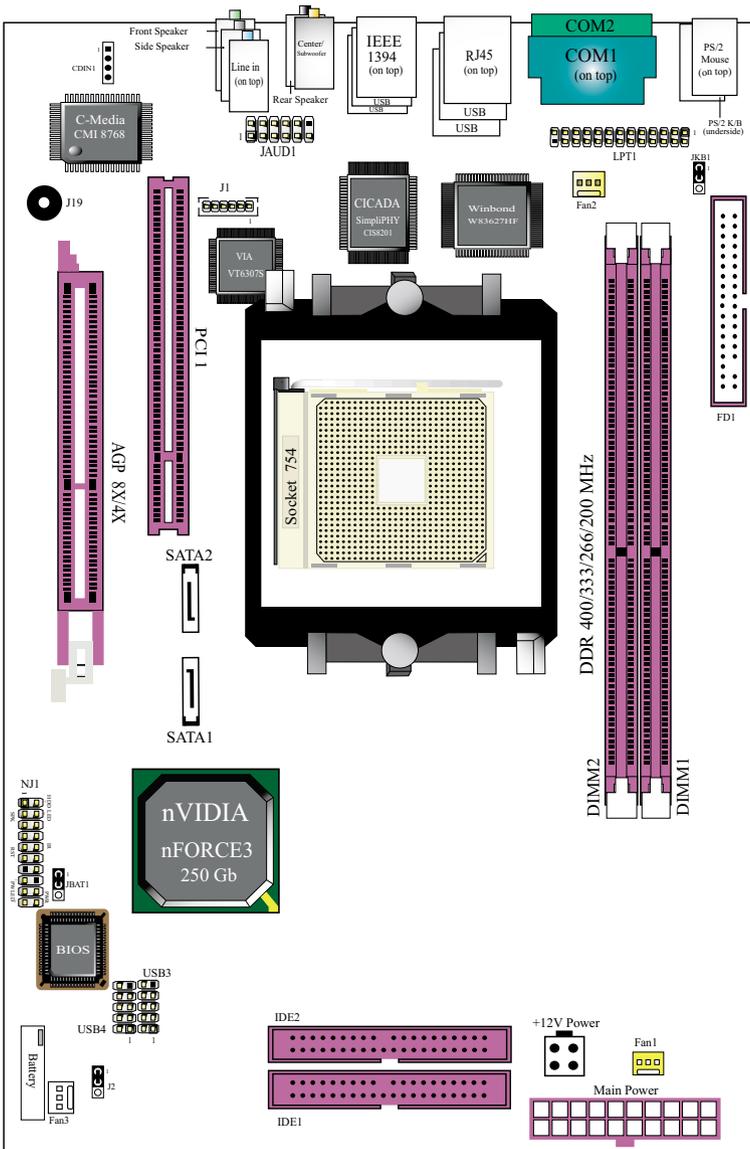
Socket 754 + nVIDIA nForce3 250 Gb Diagram

1-3 Mainboard Specification Table

SL-B9A-FGR Specifications and Features	
CPU	Socket 754 for AMD Athlon 64 CPUs
System chipset	nVIDIA nForce3 250 Gb
BIOS	Award BIOS
Memory	DDR 400/333/266 SDRAM, up to 2GB in 2 DDR DIMM slots
AGP interface	AGP 8X/4X mode only; 1 AGP Slot on board
I/O Chip	Winbond W83627HF
VGA	Not integrated
Audio	Single Chip C-Media CMI8768 on board supporting 8 channel output
IDE Interface	2 ATA 133/100/66 IDE/IDE RAID Connector
PCI Slots	1 PCI Master slot on board
I/O Connectors	8 USB V2.0, 1 FDD port, 2 COM port, 1 LPT (optional), 1 IrDA, 1 PS/2 K/B, 1 PS/2 Mouse, 2 1394a ports
IEEE 1394 Interface	VIA VT6307 IEEE1394 Controller on board supporting 2 IEEE1394 ports.
Networking	Gigabit Ethernet 10/100/1000 Base-T LAN; 1xRJ45 on board
SATA RAID Interface	2 Serial ATA connectors supporting 2 SATA Hard Disks for SATA/SATA RAID setup
Other Common Features	USB Keyboard/ Mouse Wake up; STR supported

1-4 Mainboard Specifications

1-4.1 CPU

CPU Socket 754 on board, supporting AMD Athlon 64 processors, implementing up to 800MHz Hyper Transport Speed (System Bus) designed to be capable of operating up to 1600MT/s with a resulting bandwidth of up to 6.4 Gbytes/s and integrated Memory Controller which supports up to DDR SDRAM at 200MHz

1-4.2 System Chipsets

Media and Communication Processor nVIDIA nForce3 250 Gb:
* HyperTranspot 800MHz to the AMD Athlon 64 processor
* AGP 3.0 8X interface at 533 MT/s (million transfers per second)
* PCI 2.3 interface
* Integrated SATA controllers supporting SATA and SATA RAID interface
* IEEE 802.3 nVIDIA MAC for Gigabit Ethernet through CICADA CIS8201 controller
* USB 2.0 interface supporting up to eight ports
* Dual Fast ATA-133 IDE controllers

1-4.3 Memory

2 DDR DIMM 184-pin slots on board :
* Supporting unregistered, non-ECC DDR 400/333/266 SDRAM up to 2GB
* Supporting installation of mixed volumes yet same type of DDR SDRAM modules
* SPD (Serial Presence Detect) Scheme for DIMM Detection supported

1-4.4 BIOS

Flash Memory for easy upgrade, Year 2000 compliant, and supporting various hardware configuration during booting system (See Chapter 4 BIOS Setup):
* Standard CMOS Features (Times, Date, Hard Disk Type etc,)
* Advanced BIOS Features (Virus Protection, Boot Sequence etc.)
* Advanced Chipset Features (AT Clock, DRAM Timing etc.)
* Power Management Features (Sleep timer, Suspend Timer etc.)
* PNP/PCI Configurations (IRQ Settings, Latency Timers etc.)
* Integrated Peripherals (Onboard I/O, IRQ, DMA Assign. etc.)
* SmartDoc Anti-Burn Shield (CPU/System Temp., Fan speed etc.)
* CPU Ratio/Voltage Control (Voltage of CPU, DIMM, AGP etc.)

1-4.5 AGP (Accelerated Graphics Port) interface

AGP Controller is embedded on board, supporting:
- 1.5V (8x/4x) power mode
- 8X 66MHz AD and SBA signaling; AGP pipelined split-transaction longburst transfers up to 2GB/sec.
- One AGP Slot on board, AGP v3.0 compliant

1-4.6 Multi-I/O Functions
- PCI EIDE Controller, supporting:
  -- 2 ATA 133 / 100 / 66 IDE connectors supporting up to 4 IDE devices
- Dedicated IR Functions:
  -- 1x5 IR connector dedicated to IR function with Infrared-IrDA (HPSIR) and ASK (Amplitude Shift Keyed) IR
- Multi-mode parallel data transfer:
  -- Standard mode, high speed mode ECP and enhanced mode EPP
- Floppy Drive Connector:
  -- 1 FDD connector supporting 2 floppy drives with drive swap support
- Universal Serial Bus Transfer Mode:
  -- USB V2.0 compliant, 480 MB/s USB Bus, in Windows 2000 / XP.
  -- 4 built-in USB connectors and 2 more USB pin-headers which require 2 additional USB cables to provide 4 more USB ports
- PS/2 Keyboard and PS/2 Mouse
- UARTs (Universal Asynchronous Receiver / Transmitter):
  -- 2 complete serial ports on board

1-4.7 SATA and SATA RAID Interface

SATA and SATA RAID Interface supported by nVIDIA nForce3 250 Gb:
- Supporting 2 Serial ATA connectors for 2 Serial ATA Hard Disks with 150Mb/s transfer rate
- Supporting RAID 0, 1, 0+1, JBOD configuration
- Serial ATA / Serial ATA RAID Drivers enclosed in Support CD/Floppy Diskette for user's installation

1-4.8 Advanced System Power Management

Advanced Configuration and Power Interface incorporated in BIOS for reducing power consumption :
• PowerNow! compliant
• ACPI V2.0 compliant (Advanced Configuration and Power Interface)
• PCI PM 1.1 specifications
• Thermal event detection (alarm)
• Power On Suspend (POS) or ACPI S1 support
• Suspend to RAM (STR) or ACPI S3 support
• Suspend to Disk (STD) or ACPI S4/S5 support

1-4.9 CMI8768 8-channel Audio controller on board

Single chip C-Media CMI8768 audio controller on board:
• Supporting 8-channel output capability with the newest Dolby Digital EX and DTS ES DVD audio format
• Full-duplex 8CH DAC & 2CH ADC with high quility
• Sensaura CRL3D HRTF 3D positional sound enhancement
• Support most industry standards of PC 3D sound for gaming, including EAX 2.0, DirectSound 3D HW/SW and A3D 1.0
• C-Media Xear 3D 7.1 Virtual Speaker SHIFTER technology

1-4.10 Hardware Monitor on board

• Hardware Monitor supported by LPC I/O Winbond W83627HF, providing monitoring functions on hardware voltage, temperatures and fan speeds.
• Utility Software Soltek Hardware Monitor for displaying monitor status is enclosed in Support CD for user's installation.

1-4.11 IEEE 1394 Interface

The IEEE 1394 Controller, VIA VT6307 chipset on board, providing enhanced PC connectivity for a wide range of devices, including consumer audio/video components, storage periperals, and other portable devices.
• PCI-bus based open host controller, compliant with IEEE 1394A-2000 standard for high performance serial bus
• Supporting two fully compliant ports with Plug and Play-compatible expansion interface. The IEEE 1394 controller provides up to 400MB/ sec transfer rate to fulfill various requirments of any multimedia devices.

1-4.12 Gigabit Ethernet Controller on board

Gigabit Ethernet Controller CICADA CIS8201 on board:
• Supporting 10/100/1000Mb data transfer
• Supporting Wake On LAN function through the on-board RJ45 LAN
  Connector
• LAN Driver enclosed in Support CD for user's installation.

1-4.13 Front Panel Connector

• 1 S/PDIF out Port
• 1 Earphone & 1 MIC IN Port
• 2 USB 2.0/1.1 Ports
• 1 IEEE1394a Ports

1-4.14 Form Factor

• Micro-ATX Form Factor, ATX Power Supply
• Mainboard size: 180mm x 270mm

Chapter 2 Hardware Setup

To Get Things Ready for Hardware Setup !

1. We recommend to install your CPU before any other components. For detailed installation instructions of processor, you can also refer to the pamphlet enclosed in your CPU package.
2. Installing a cooling fan with a good heatsink is a must for proper heat dissipation for your CPU. Get ready an appropriate fan with heatsink for proper installation. Improper fan and installation will damage your CPU.
3. In case CPU Vcore, CPU clock or Frequency Ratio is adjustable on board, please follow the instructions described in the User Manual for proper setup. Incorrect setting will cause damage to your CPU.

The following topics are included in this chapter:

2-1 CPU Installation with Socket 754

This series is built with CPU Socket 754 supporting the AMD CPUs Athlon 64:

• Follow the steps described in this section to install CPU into the on-board Socket 754.

• After installation of CPU, you must also install a proper cooling fan on top of the CPU and connect the Fan cable to the CPU fan connector.

1. First pull sideways the lever of Socket 754, and then turn it up 90^0 so as to raise the upper layer of the socket from the lower platform.
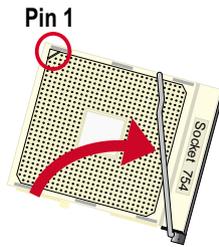
2. Configure Pin 1 of CPU to Pin 1 of the Socket, just as the way shown in the diagram on the right. Adjust the position of CPU until you can feel all CPU pins get into the pin holes of the socket.
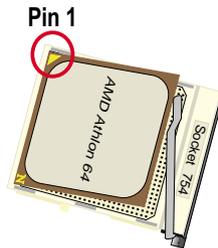
3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.
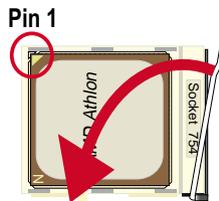
2-2 Socket 754 Athlon 64 Fan Installation

When setting up Socket 754 cooling fan on B9A-FGR, the Heat Glue should first be applied to the Heat Sink. Then locate the Fan Latch with a Lever to the Back Panel side.

1. Note that the Socket 754 Cooling Fan is equipped with two metal latches.
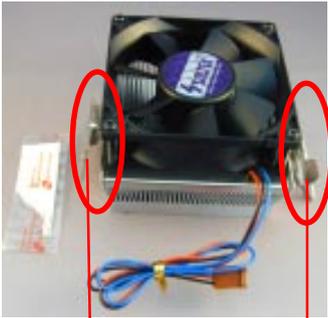
Metal Latch without Lever.   Metal Latch with Lever.

2. Turn over the Fan to the Heat Sink side. Tear away the protective plastic foil and then apply Heat Glue to Heat Sink.
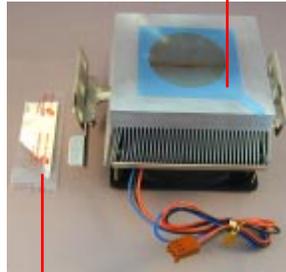
The Heat Glue can help disperse heat much better.

3. Insert 754 CPU into Socket 754 before settling down cooling Fan.
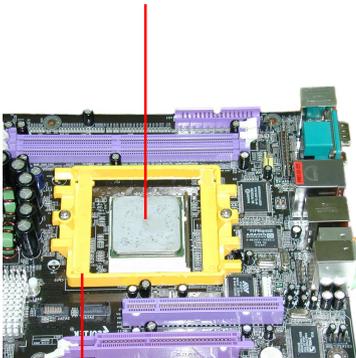
The 754 Fan Base

4. Settle down 754 cooling fan with the Lever side facing the Back Panel side.
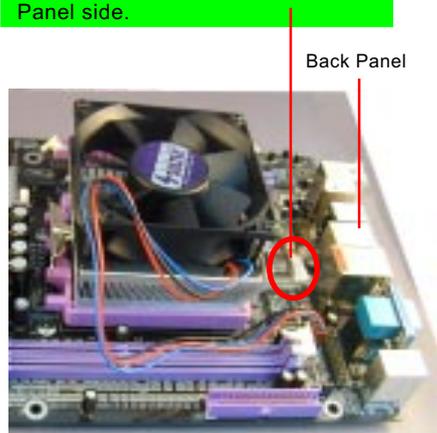
Back Panel

5. Fix the Metal Latch without Lever to Fan Base.
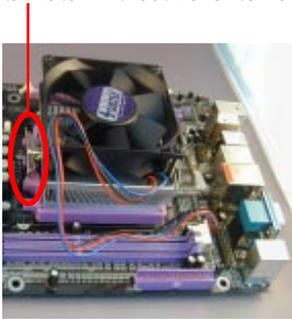
6. Fix the Metal Latch with Lever to Fan Base.
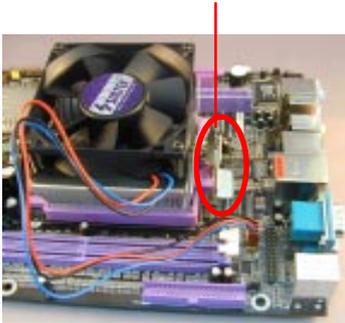
7. Now pull over the Metal Lever to other side and press it down so as to lock the cooling Fan to the socket base.
   Finally connect the Fan Power connector to the onboard CPU Fan connector.

Pull over the Metal Lever to lock the fan to Fan Base.
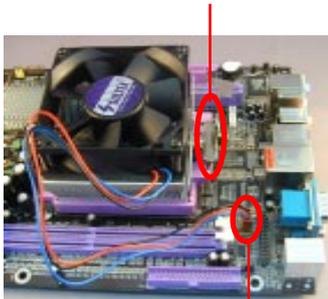
CPU Fan Connector

2-3 Memory Installation

2-3.1 How to tackle the memory Modules:

• Make sure to unplug your power supply before adding or removing memory module. Failure to do so may cause severe damage to both your mainboard and the memory module.
• Pay attention to the orientation of the DIMM slots. Forcing a DIMM into a slot improperly will damage the memory module and slot itself.
• Make sure you have the right type of memory module for your mainboard.

2-3.2 To Install DDR SDRAM Module

• This mainboard supports up to 2GB unbuffered DDR 400/333/266/ 200 SDRAM, with 2 DDR DIMM slots on board. Do not insert other type of modules into these slots.

• DDR DIMM slot has 184-pins and one notch. Insert a DDR SDRAM vertically into the 184-pin slot with the notch-to-rib matching. Press the Module down in a gradual way until it surely reaches the bottom and clicks straight up the two latches on the left and right of the slot. If any one of the latches has not turned up completely, you should unplug the module and press it down a bit more firmly.

184-Pin DIMM Notch Key Definitions

DRAM Key Position   Voltage Key Position

(2.5V Voltage Key)DDR Notch

DDR Rib

Module Latch
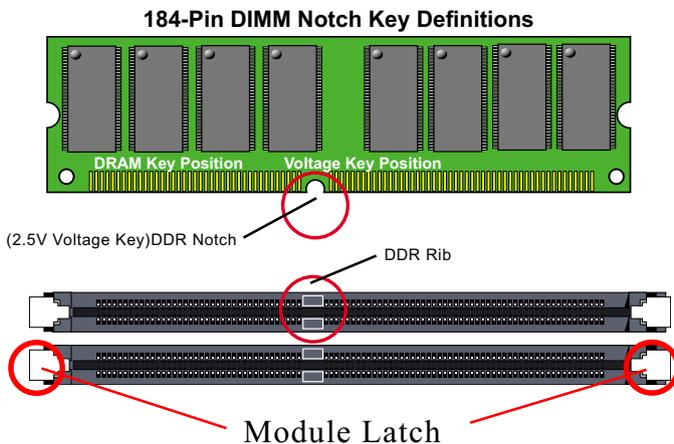
2-4 ATX Power Supply Installation

To set up Power Supply on this mainboard:
Both main Power Connector and the +12V Power Connector should all be connected to a V2.03 ATX Power Supply so as to boot system with sufficient power.

+12V Power Connector

+12V	GND
3	1
4	2
+12V	GND

+12V		+5V
5SB		+5V
PWR OK		-5V
GND		GND
+5V		GND
GND		GND
+5V		PS ON#
GND		GND
+3.3V		-12V
+3.3V		+3.3V

Pin1   Pin11

Main Power Connector
(20-pin)
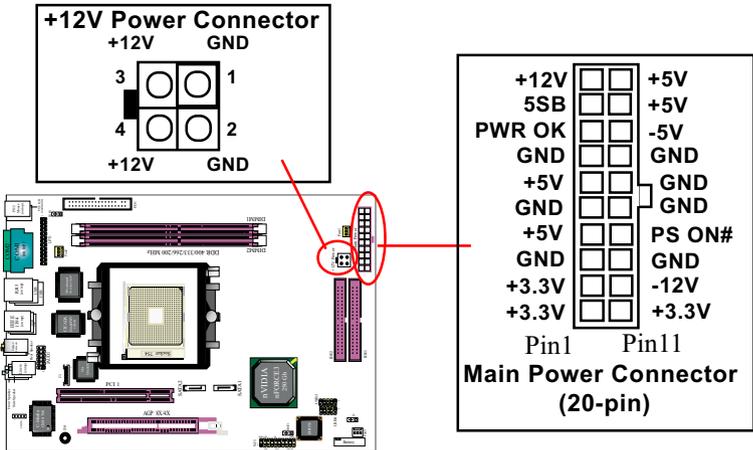
2-5 AGP Slot Installation

The AGP slot on board supports 1.5V AGP 8X/4X card only. A Rib is specifically added to the 8X/4X slot so as to match the AGP 8X/4X card. To insert a 3.3V AGP 2X card into the AGP 4X slot will damage the system chip and burn the 1.5V circuitry.
An AGP 8X card will support a data transfer rate up to 2GB/sec., while an AGP 4X card will provide 1GB/sec transfer rate.

AGP Accelerator

notch

AGP 8X/4X Slot
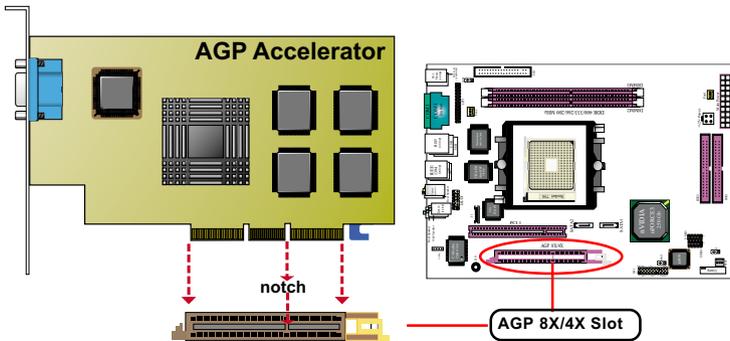
2-6 IDE Connector Installation

IDE1 and IDE2 are 2 IDE connectors supporting 4 IDE devices for up to 133MB/s data transfer. IDE1 and IDE2 are also supported by nForce3 to support IDE RAID system setup with 4 IDE hard disks.

nVidia nForce3 chipset supports IDE1 and IDE2 for 4 IDE hard disks to set up IDE RAID system.

Hard Disk Drive Connector

Orient the red line on the IDE Flat Cable to Pin1.

Pin 1 (to Red Line)
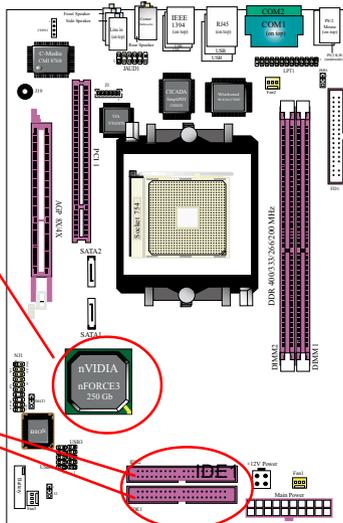
**80-conductor IDE Cable
(for 2 IDE devices)**

This kind of cable is dedicated for Mini-barebone system because the ribbon is bundled up and will not block the air flow in the barebone cabinet.

Gray connector
(To slave device)

Red line

Black connector
(To Master Device)

Blue connector
(To Mainboard)

**80-conductor IDE Cable
(dedicated for 1 IDE device)**

This kind of cable is dedicated for Mini-barebone system because the ribbon is bundled up and will not block the air flow in the barebone cabinet.

Bundle Strap

Red line

80-conductor IDE cable

Blue connector
(To Mainboard)

Black connector
(To Master Device)

2-7 Floppy Drive Connector Installation

To install FDC, you should connect the end of FDC cable with single connector to the board, and connect the other end with two connectors to the floppy drives.

Floppy Drive Connector:

Orient the red line of the Floppy Flat Cable to Pin1.

Pin 1 (to Red Line)
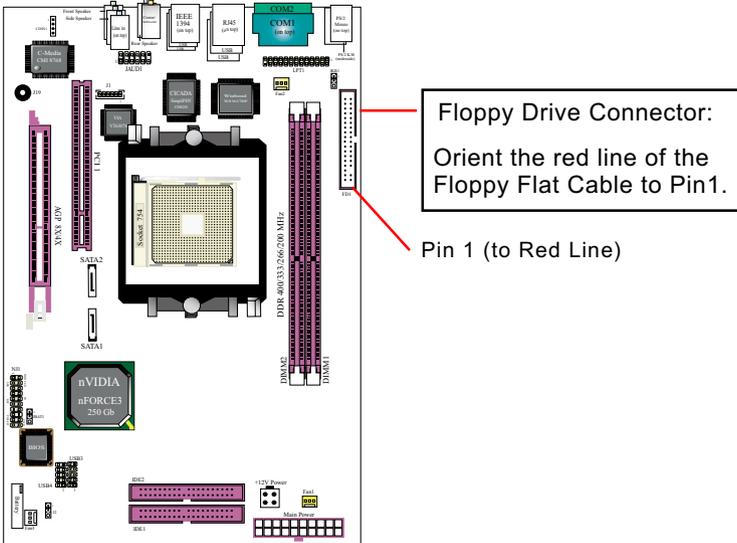
34-pin FDC cable
(Dedicated for Barebone)

This kind of cable is dedicated for Mini-barebone system because the ribbon can be bundled up and will not block the air flow in the barebone cabinet. A dedicated cable with 2nd connector for 2nd floppy drive is an optional item in the Mini-barebone System.

Signal Swap End   Red line

To 1st Floppy Drive   To mainboard

23
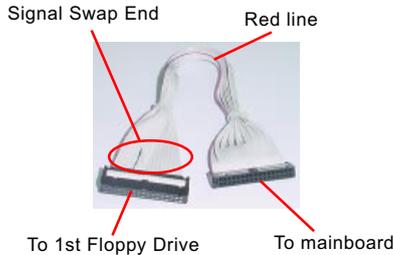
2-8 Serial ATA Connectors Installation

The Serial ATA is designed to improve the Parallel ATA with the capability of Hot Plug and offer a data bandwidth of 150Mbytes/second. It also reduce voltage and pin count and can be implemented with thin cables which improve the inner ventilaton of PC cases.

2 Serial ATA connectors are built on board, supported by nVidia nForce3 chipset for 2 SATA hard disks to set up RAID system.
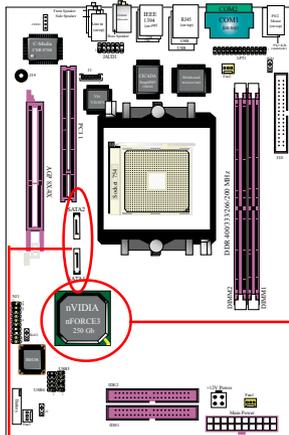
nVidia nForce3 supports 2 SATA connectors for 2 SATA hard disks to set up RAID system.

SATA2

SATA Connectors

SATA1

Serial ATA Cable

To Power Supply

SATA Power Connectors

Serial ATA Hard Disk

Serial ATA Power Cable (optional)
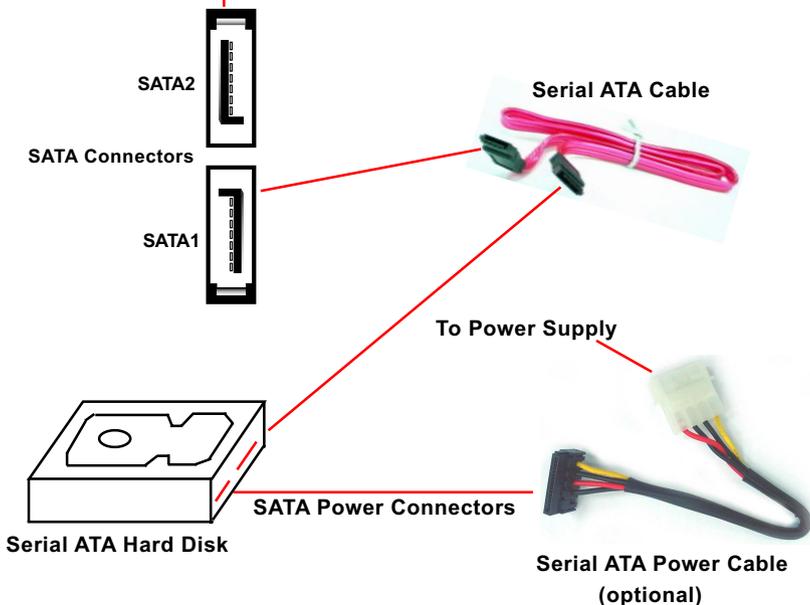
2-9 Jumper Setting

The following diagram show the location and setting of jumper block on the mainboard.

JKB1 + J2 :
USB Keyboard / Mouse Wake Up

1   1   **1-2 closed** (default)
        Disabled
J2   JKB1

1   1   **2-3 closed**
        Enabled
J2   JKB1

JBAT1:
Clear CMOS

1   **1-2 closed**
    (default)
    To hold data

1   **2-3 closed**
    To clear CMOS
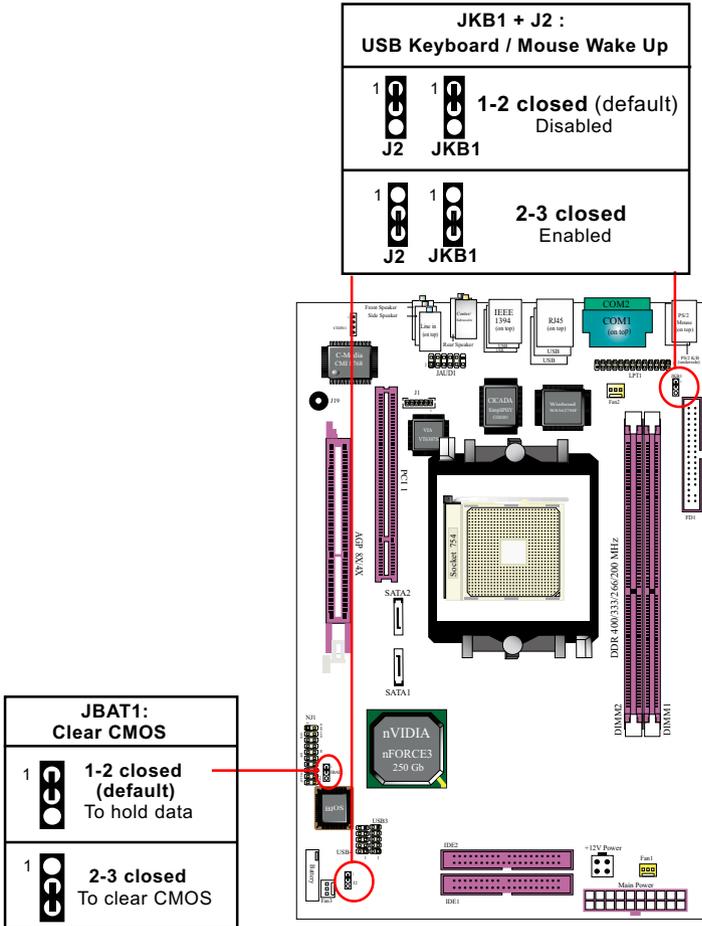
2.9.0 How to tackle the Jumpers:

A 3-pin Jumper

If a pin-header (of 2 or more pins) is designed in such a way that its pins can be closed or linked together to set up a specific function, this header is called a jumper in this manual.

A 2-pin Jumper Cap

The conductor inside the cap links two header-pins together.
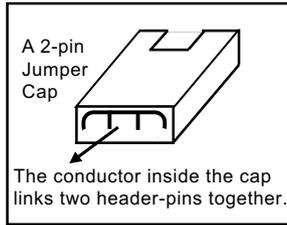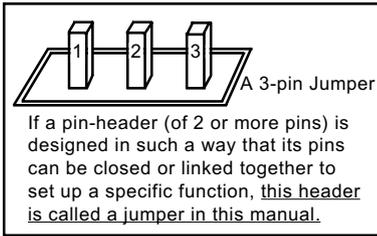
• A Jumper is usually but not necessarily given a "JpX" legend.
• In the Jumper setting diagram, the jumper pins covered with black marks stand for closed pins with jumper cap.

Jp X

1 ● ● ● 3
Jumper with Pin 2-3 closed

1 ● ● ● 3
Jumper with all pins opened

1 ● ● ● 3
Jumper with Pin 1-2 closed

• Do not remove any jumper cap when power is on. Always make sure the power is off before changing any jumper settings. Otherwise, the mainboard will be damaged.

2-9.1 JBAT1: Clear CMOS

When you have problem with rebooting your system, you can clear CMOS data and restore it to default value. To clear CMOS with Jumper JBAT1, please follow the steps below:
1. Power off system.
2. Set JBAT1 to Pin 2-3 closed.
3. After 2 or 3 seconds, restore the JBAT1 setting to Pin1-2 closed.
4. CMOS data are restored to default now. Remember never clear CMOS when system power is on.

JBAT1: Clear CMOS	
1	**1-2 closed (default)** To hold data
1	**2-3 closed** To clear CMOS
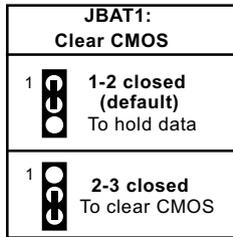
2-9.2 JKB1 + J2 : USB Keyboard / Mouse Wake Up

JKB1 is designed on board as a jumper to enable/disable the USB keyboard/mouse Wake Up from suspend mode.

JKB1 + J2 : USB Keyboard / Mouse Wake Up	
1 J2 1 JKB1	**1-2 closed** (default) Disabled
1 J2 1 JKB1	**2-3 closed** Enabled
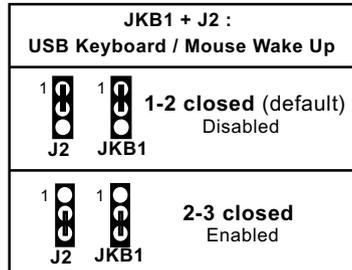
2-10 Other Connectors Configuration

This section lists out all connectors configurations for users' reference.

2-10.1 Onboard FAN Connectors
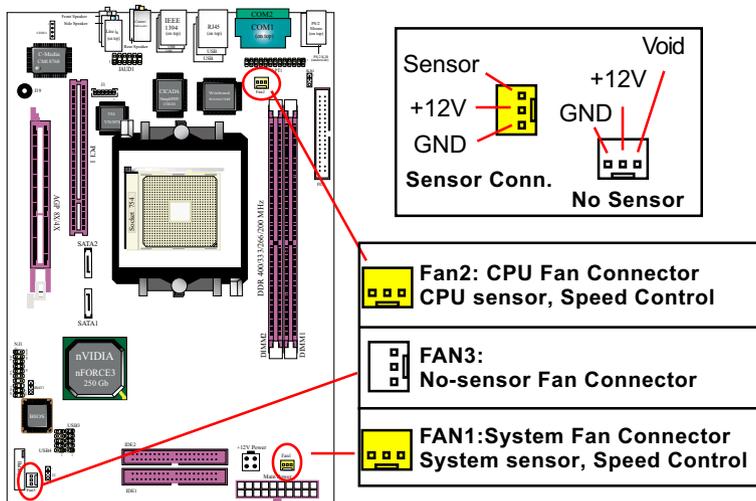
Please populate the cooling fans as illustrated above.

FAN2: FAN2 should be connected to CPU cooling FAN only for CPU temperature detection and CPU Fan speed control.

FAN1: FAN1 should be connected to System cooling Fan for system temperature detection and system Fan speed control.

FAN3 is a non-sensor Fan connector, not supporting speed control.

Wrong application will cause mal-functioning of the fan connectors.

2-10.2 USB Ports and USB Pin-headers

This mainboard provides 4 USB ports on board supporting various USB devices. In addition, 2 USB pin-header are added on board to provide expansion of four more optional USB ports by using two additional USB Cables.

When plugging the USB cable to USB Header, users must make sure the red wire is connected to Pin 1.

All 8 USB ports are compliant with 1.0 / 2.0 USB Bus. USB 2.0 supports Windows 2000 and above. Please see Chapter 3 for USB2.0 Installation.

USB(4 ports)
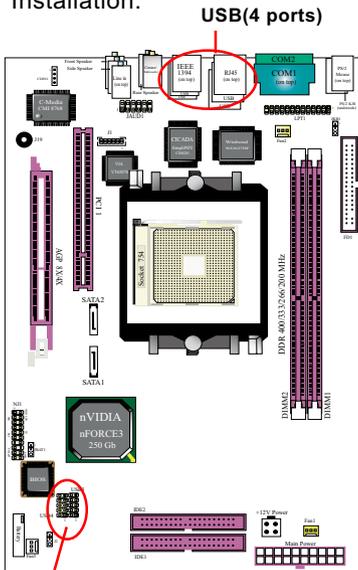
USB3/4

USB Cable (Optional)

Connect USB Pin-header 3/4 to Front panel USB connectors

First USB Port Wiring for Front USB

Red	White	Green	black
+5V	D1-	D1+	GND

USB Header Pin Assignment

10

1

+5V	D2-	D2+	GND
Red	White	Green	black

Second USB Port Wiring for Front USB
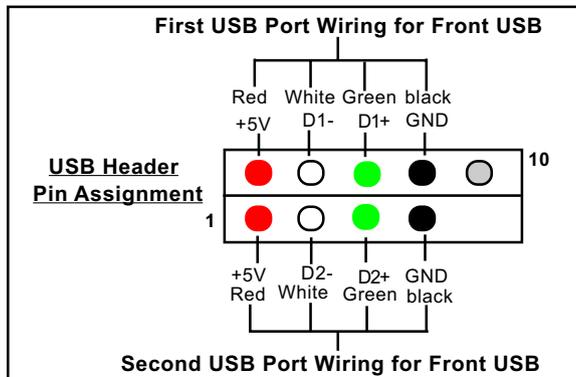
2-10.3 Chassis Panel Connectors

A : PS/2 Mouse
B : COM1 Port
C : LAN Port RJ45 (Top)
D : IEEE1394 Connector
E : Center/ Subwoofer Speaker Out
F : PS/2 Keyboard
G : COM2 Port
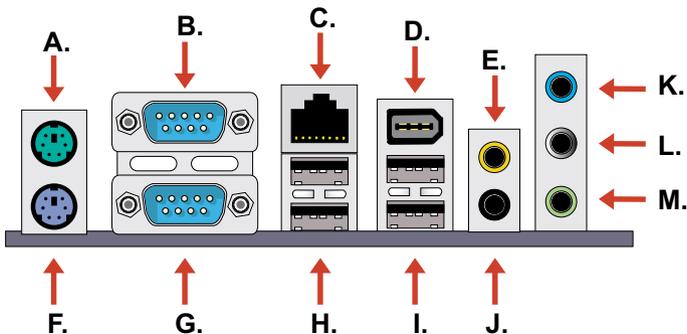
H : USB 0 (middle)
  USB 1 (underside)
I : USB 2 (middle)
  USB 3 (underside)
J : Rear Speaker Out
K : Line In
L : Side Speaker Out
M : Front Speaker Out

2-10.4 PS/2 Mouse And PS/2 Keyboard

PS/2 Mouse Connector (green, on top)

6 Void   5 Mouse Clock

4 VCC   3 GND

2 Void   1 Mouse Data

6 Void   5 Keyboard Clock

4 VCC   3 GND

2 Void   1 Keyboard Data
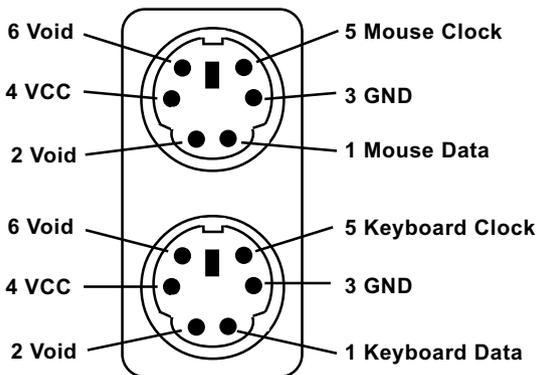
PS/2 Keyboard Connector   (purple, underside)

2-10.5 CD-ROM Audio Connectors

CDIN1 is an audio connector connecting CD-ROM audio to mainboard.
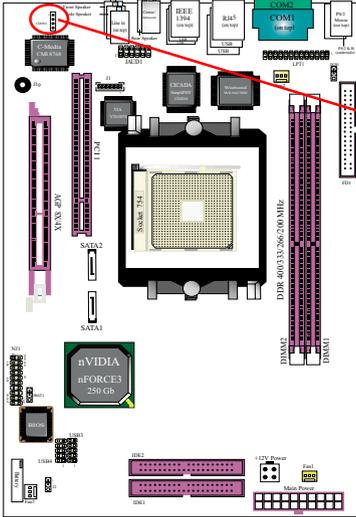
CD-ROM Audio Connector	
CDIN1	Pin Signal
Pin 1	Left Channel
Pin 2	GND
Pin 3	GND
Pin 4	Right Channel

2-10.6 JAUD1: External Audio Out Connector

External Audio Out Connector supports Front Panel S/PDIF Output, Front Panel Mic-In and Front Panel Line-out.

This External Audio-out Connector requires an S/PDIF Audio Cable to connect itself to Front Panel Audio Connectors.

Audio-out Pin Assignment

Pin 1 Reserved
Pin 3 GND
Pin 5 +5V
Pin 7 MIC IN
Pin 9 LINE IN R
Pin11 LINE IN L

Pin 2 GND
Pin 4 +5V
Pin 6 SPDIF OUT
Pin 8 +5VA
Pin10 GNDA
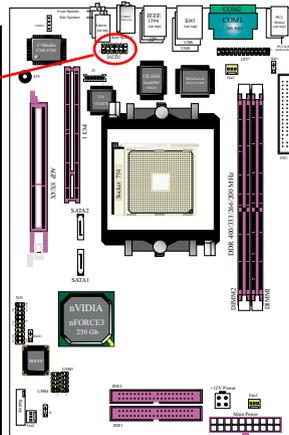
2-10.7 LAN Connector

One RJ45 connector is on board for LAN connection, supporting GiGabit Ethernet 10/100/1000Mb data transfer.

Red/Orange LED blinks to indicate that data transmission is undergoing in 1000 Base T mode.

Yellow LED "On" to indicate Network hub is in connection with the system.

Green LED blinks to indicate that data transmission is undergoing in 10/100 Base T mode.
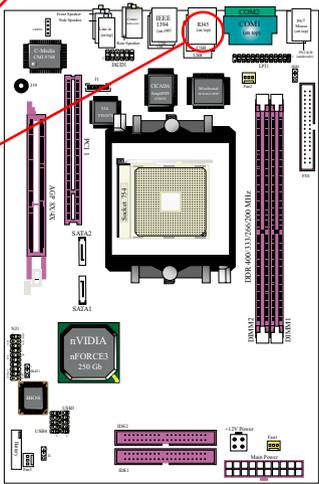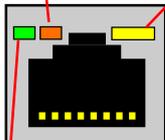
2-10.8 System Buzzer: J19

A buzzer J19 is designed on board for sending a beep at starting system as well as warning of CPU temperature problems.

J19: System Buzzer
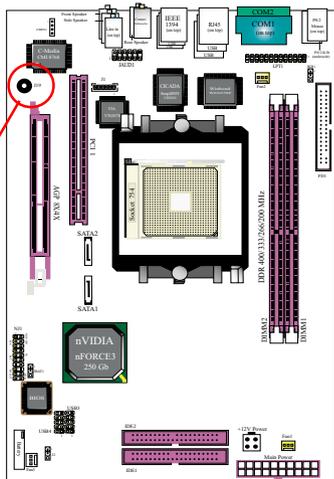
2-10.9 Front Panel Connectors

This Front Panel Connector consists of the following connectors for various front panel supports. When you have fixed the mainboard to the case, join the connectors of this Front Panel Connector to the case Front Panel.

Speaker (6)
- SPVCC
- SP3
- NC
- SP1

Reset Switch(5)
- RST1
- RSTGND

Power LED (4)
- PLED+
- NC
- PLED-

(3)HDD LED
- HDLED+
- HDLED-

(2)Infrared(IR)
- IRTX
- IRGND
- IRRX
- NC
- IR_VCC

(1)Power Switch
- PWRBT
- PWRBT#
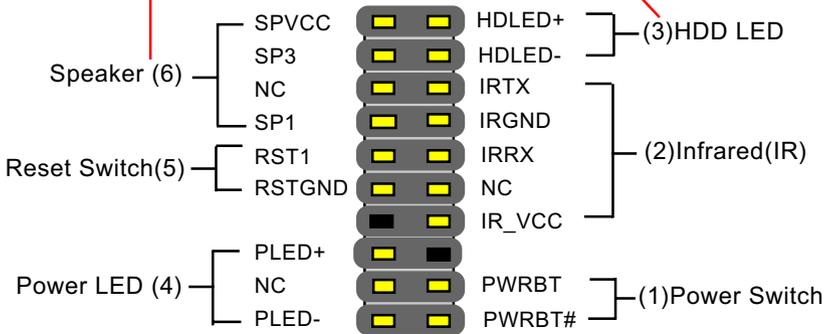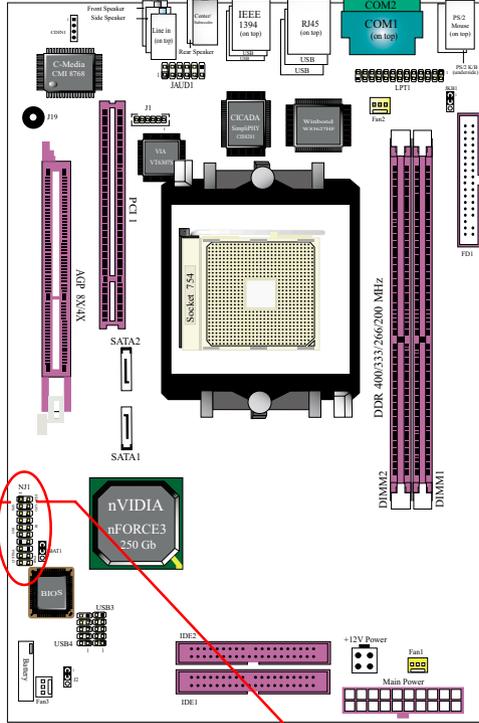
2-10.10 IEEE 1394a Port/Pin-header

1 IEEE1394a Portis built on board for Digital Video Cameras and other devices with 1394a interface. Another IEEE 1394a Pin-header is built on board providing one more 1394a channel on the front Panel.

IEEE 1394a Port

J1	
Pin Assignment	
Pin 1	BPWR(+12V)
Pin 2	GND
Pin 3	TPB(0/1/2)-
Pin 4	TPB(0/1/2)+
Pin 5	TPA (0/1/2)-
Pin 6	TPA (0/1/2)+

6   1
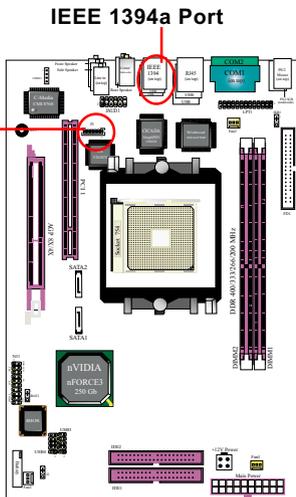
IEEE1394 Cable (optional)

To Barebone-system Front Panel 1394 connector

2-10.11 Printer Port: LPT1

LPT1 is a parallel printer port.

LPT1: Printer Port
Pin Assignment

Pin 1	STROBE#	Pin 14	AUTOFD#
Pin 2	LPTDD0	Pin 15	ERROR#
Pin 3	LPTDD1	Pin 16	INITA#
Pin 4	LPTDD2	Pin 17	SLCTIN#
Pin 5	LPTDD3	Pin 18	GND
Pin 6	LPTDD4	Pin 19	GND
Pin 7	LPTDD5	Pin 20	GND
Pin 8	LPTDD6	Pin 21	GND
Pin 9	LPTDD7	Pin 22	GND
Pin 10	ACK#	Pin 23	GND
Pin 11	BUSY	Pin 24	GND
Pin 12	PE	Pin 25	GND
Pin 13	SLCT	Pin 26	Key

13 1
26 14
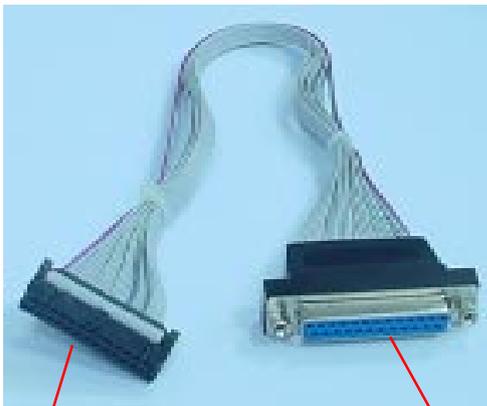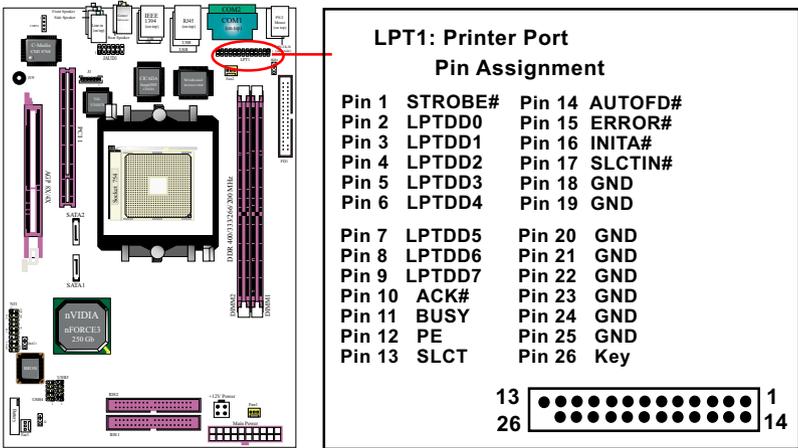
To Printer Connector on board

To Printer

Printer Cable (optional)

Chapter 3 Software Setup

Drivers, Utilities and Software Installation

• Support CD:
This series of mainboards will be shipped with a Support CD which contains those necessary driver files, Application Softwares and some helpful utilities. It is a user-friendly, auto-run CD which will open itself up in a CD-ROM automatically.

This chapter is devoted to describing the installations of all these essential drivers and utilities on Windows 9X, Windows ME, Windows 2000 and Windows XP. And installation on Windows XP as the general illustration example hereby.

The priority of drivers to be installed should also be noted. Users are recommended to take the following installation orders :

3-1 To Open up the Support CD

1. Please put the Support CD enclosed in your mainboard package into
   the CD-ROM drive. In a few seconds, the Main Menu will automatic-
   ally appear, displaying the contents to be installed for this series:

2. In case your system does not open the Support CD automatically,
   please click to the following path to enter the Main Installation Menu:

   D:\ Autorun.exe (assuming that your CD-ROM Drive is Drive D)

3. Drivers will be updated from time to time in our web site. If you are
   installing a newer driver than the one illustrated in this chapter, please
   be aware that the illustration pictures might be different.

3-2 To Install "nVIDIA nForce3 All-in-1 Driver"

1. Before opening the Support CD, please update Windows 2000 or Windows XP with the latest Service Pack. Otherwise, the installation of USB2.0 driver will not take effect. Following the procedures of opening the Support CD, click to " Install nVIDIA nForce3 All-in-1 Driver" to proceed.

2. When the screen of "nVIDIA Windows nForce Drivers" appears, please press "Next" button to continue.

3. The nVIDIA InstallShield Wizard will pop up to guide you to set up nForce3 Drivers. Click "Next" to begin installing the driver.
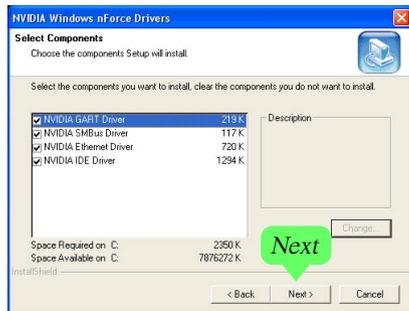
4. A dialog window appears to ask if the IDE SW Driver should be installed, click "Next" to continue.
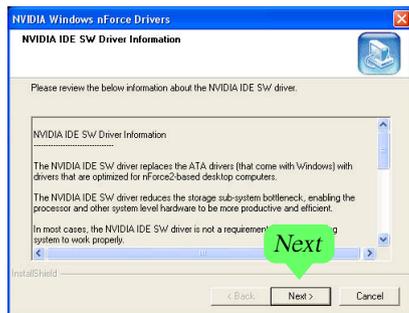
4. Select "Yes" to install nVIDIA IDE SW driver.

Install NVIDIA IDE SW driver?

❓ Do you want to install the NVIDIA IDE SW driver?

Yes   No
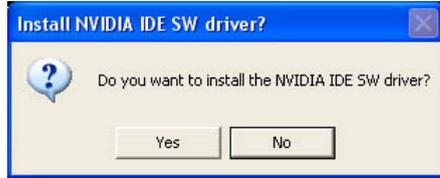
9. After all the setup processes are finished, please restart your computer by clicking on "Finish" so as to take the Utility into effect.

NVIDIA Windows nForce Drivers

InstallShield Wizard Complete

The InstallShield Wizard has successfully installed NVIDIA Windows nForce Drivers. Before you can use the program, you must restart your computer.

⦿ Yes, I want to restart my computer now.

○ No, I will restart my computer later.

Finish

< Back   Finish   Cancel

3-3 DirectX 9 Installation

Following the installation of nFORCE3 All in 1 Driver, you have to re-start system so that your system can be reconfigured with the driver just installed. When thr restarting procedures finish, please open the Support CD with your CD-ROM to enter the Main Installation Menu. Then click to "Install DirectX9".

1. When the screen of "Installing Microsoft DirectX " appears, please select " I accept the agreement" and press "Next" button to continue.

2. Click "Next" to start DirectX 9.0 Runtime Installation.
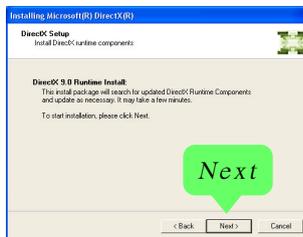
3. After all the setup procedures have completed, click to "Finish" button to exit the Installation program and re-start your system.

3-4 To Install CMI8768 Audio Driver

Single chip C-Media CMI8768 audio controller on board, supporting up to 8 channel audio output for PC multimedia systems. CMI8768 Audio Driver is provided in Support CD for user's installation.

3-4.1 Installation

1. Following the procedures of opening the Support CD, click to " Audio Driver" to proceed. Then an introduction screen appears and press "Next" button to continue.

2. Instantly, the "C-Media 3D Audio Setup Program"screen appears to guide you through the "CMI8768 Audio Driver" Setup, please press "Next" button to continue.

3. On "Destination Folder" screen, press **"Next"** to continue.
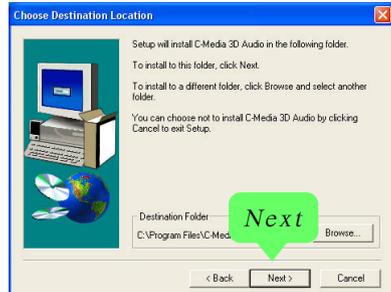
4. On "Program Folder" screen, press **"Next"** to continue.

5. Press **"Next"** to continue.

6. After the setup process is finished, please check the radial button "Yes, I want to restart my computer now." And click "OK" to restart your system.

3-4.2 To verify 6/8-channel Audio on Volume Control

After installation of CMI8768 Audio Driver, you must configure the 5.1 (7.1) Speaker connection to enable the 6/8-channel audio.

1. Connect your on-board Audio Connector to your 6/8-channel speakers as depicted in the figure below:

Center/ Subwoofer Speaker Out

To Rear Speaker Out

To Side Speaker Out

To Front Speaker Out
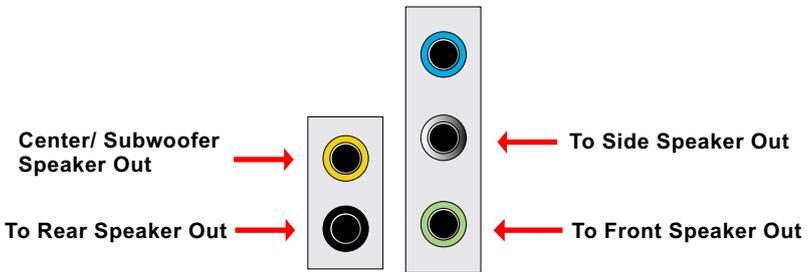
2. After Connection is done, start your Windows and double click the "Xear 3D" icon in the taskbar to enter volume configuration:

double click

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4. Instantly, the "C-Media PCI 3D Audio Configuration" screen will pop out. Select 6 Speakers or 8 Speakers at the Main Setting and then click ''OK'' to finish configuration.
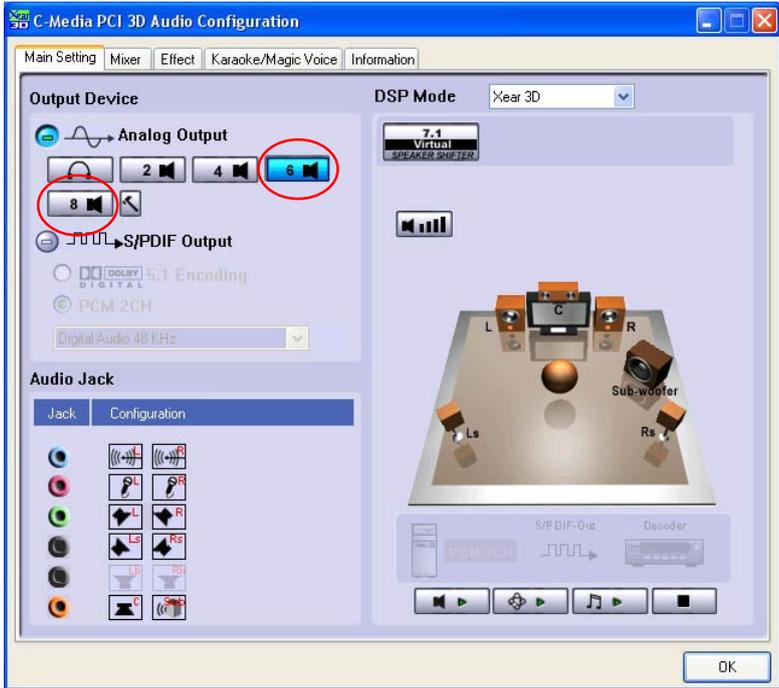
3-5 To Install Hardware Monitor Utility

3-5.1 Installation

Hardware Monitor is built on this mainboard. Its installation is pro-grammed to a fully automated mode on Windows 9X/Me/2000/XP. Users can follow the model installation below for its installation on various Windows System.

1. Following the procedures of opening the Support CD, click to " Hardware Monitor Utility" to proceed.

2. The Soltek Hardware Monitor InstallShield Wizard will pop up to guide you to the Intel Service pack installation. Press **"Next"** button to continue.

3. The **InstallShield Wizard** screen will show the current setting, please click the **"Install"** button to continue.

4. After all the setup process is finished, click "Finish" to exit the Wizard.

3-5.2 Verification

1. After installing Soltek Hardware Monitor, double click "SoltekHM" icon on the desktop to open the main window of the Soltek Hardware Doctor.

2. Then the pop-up screen will show all information about CPU Temperature, Fan Speed and various Voltages.

Showing the Fan Speed(s) that is supported by the mainboard.

Showing the temperature(s), the function of which is supported by the mainboard.

Click on "Soltek" button to display the function menu.

Showing the Voltage(s) that is supported by the mainboard.

Status Warning LED

*Note: Not all items or functions showing in the above picture will show up. Only those items or functions that are supported by the mainboard will reveal themselves in the above screen.

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3-6 To Install USB 2.0 Driver for Windows 2000/XP

USB V2.0 with its 480Mb/s transfer rate supports operating system Windows 2000 and Windows XP via the Windows 2000 and Windows XP Service Pack. <u>Users should install the latest Service Pack for Windows 2000 or Windows XP.</u>

1. After installation of nVIDIA nFORCE3 All-in-1 Driver in Windows 2000 or Windows XP, start to install the latest Service Pack version into the operating system. The installation of the latest Service Pack will support USB2.0 in Windows 2000 or Windows XP now.(The latest Service Pack can be found in Microsoft Web Site.)

2. To verify USB2.0 installation, please enter "Device Manager" of "My Computer". On the "Device Manager" screen, you should be able to see the item "Standard Enhanced PCI to USB Host Controller", verifying USB2.0 Driver is installed successfully.
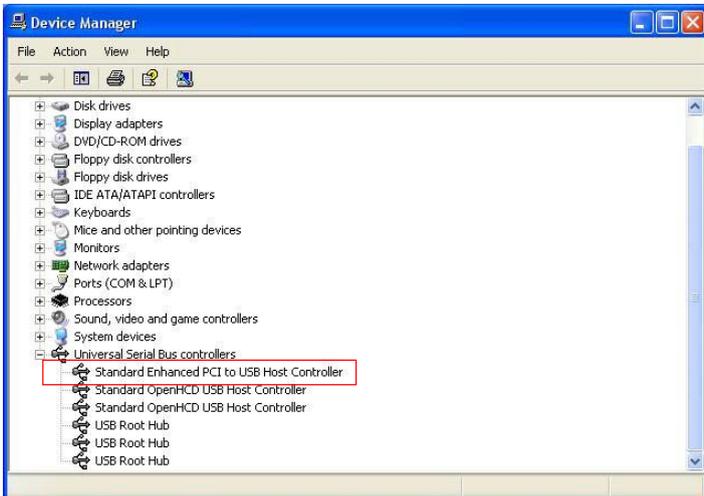
Chapter 4 BIOS Setup

THE BIOS

BIOS stands for Basic Input and Output System. It was once called ROM BIOS when it was stored in a Read-Only Memory(ROM) chip Now manufacturers would like to store BIOS in EEPROM which means Electrically Erasable Programmable Memory. BIOS used in this series of mainboard is stored in EEPROM, and is the first program to run when you turn on your computer.

BIOS performs the following functions:
1. Initializing and testing hardware in your computer (a process called "POST", for Power On Self Test).
2. Loading and running your operating system.
3. Helping your operating system and application programs manage your PC hardware by means of a set of routines called BIOS Run-Time Service.

This Chapter includes the following topics :
4-1 About BIOS Setup
4-2 To run BIOS Setup
4-3 About CMOS
4-4 The POST (Power On Self Test)
4-5 To upgrade BIOS
4-6 BIOS Setup

Attention: The BIOS Setup is subject to constant update without further notice to users. It is necessary for users to update the onboard BIOS by the latest BIOS version provided in our web site: www.soltek.com.tw

4-1 About BIOS Setup

BIOS setup is an interactive BIOS program that you need to run when:

1. Changing the hardware of your system. (For example: installing a new Hard Disk etc.)
2. Modifying the behavior of your computer. (For example: changing the system time or date, or turning special features on or off etc.)
3. Enhancing your computer's behavior. (For example: speeding up performance by turning on shadowing or cache)

4-2 To Run BIOS Setup

First access BIOS setup menu by pressing < DEL > key after "POST" is complete (before OS is loaded). BIOS will then display the following message:

```
Press "DEL" to enter "SETUP"
```

4-3 About CMOS

CMOS is the memory maintained by a battery. CMOS is used to store the BIOS settings you have selected in BIOS Setup. CMOS also maintains the internal clock. Every time you turn on your computer, the BIOS Looks into CMOS for the settings you have selected and configures your computer accordingly. If the battery runs out of power, the CMOS data will be lost and POST will issue a "CMOS invalid" or "CMOS checksum invalid" message. If this happens, you have to replace the battery and do some proper settings in BIOS Setup.

4-4 The POST (Power On Self Test)

POST is an acronym for Power On Self Test. This program will test all things the BIOS does before the operating system is started. Each of POST routines is assigned a POST code, a unique number which is sent to I/O port 080h before the routine is executed.

4-5 To Upgrade BIOS

- System BIOS is incorporated into a Flash memory component. Flash BIOS allows user to upgrade BIOS without the need to replace an EPROM component.
- The Upgrade Utility can be loaded on a floppy diskette to execute saving, verifying, and updating the system BIOS. The Upgrade Utility can also be run from a hard disk drive or a network drive.

4-5.1 Before Upgrading BIOS

- It is highly recommended that you save a copy of the original mainboard BIOS along with a Flash EPROM Programming utility (AWDFLASH.EXE) to a bootable floppy disk so that you can reinstall the BIOS when needed.

4-5.2 Upgrade Process

- Normally, to upgrade BIOS is unnecessary if the system is working fine Users should only upgrade the BIOS when you experience incompatible problems or need to create new features.

- "AWDFLASH.EXE" is a Flash EPROM Programming utility that up dates the BIOS by uploading a new BIOS file to the programmable flash ROM on the mainboard. This program only works in *DOS environment, the utility can not be executed in Windows 95/98, ME, NT, WINDOWS 2000 or Windows XP environment.*

- Please follow the steps below for upgrading the system BIOS:

Step 1. Please visit the board maker's website, download the zip file which contains the latest BIOS file and Award Flash Utility "AWDFLASH. EXE". After unzipping, the BIOS file format will be *.bin, of which " * " stands for the specific BIOS file name.

Step 2. Create a bootable diskette. Then copy the BIOS file and Award Flash Utility "AWDFLASH.EXE" into the diskette.

Step 3. Insert the diskette into drive A, reboot your system and boot from the diskette.

Step 4. Type **awdflash *.bin /sn/py/cc** and then press <Enter> to run BIOS upgrade program. (*.bin depends on your mainboard model and version code. Instead of typing "*", you should type specific file name for   your specific mainboard).

Step 5. Please press <F1> or <F10> to exit or reset your system.

Warning ! If the message *" Write Fail "* appears while Award "FLASH MEMORY WRITER" is verifying Flash memory, just repeat the process. Please DO NOT reset or turn off the system. If the award memory flash utility is not able to update the BIOS successfully, your system may not be able to boot up.

Step 6. You will need a message "CMOS checksum error-Default loaded" during booting the system. Press <Del> to run CMOS setup utility, then reload "LOAD SETUP DEFAULTS" or **"Load Optimized Defaults"** and save this change.

The parameters of AWDFLASH.EXE

/sn: No original BIOS backup
/py: Program flash memory
/cc: Clear CMOS data (and update data automatically) after pro-
     gramming

NOTE: Users can type AWDFLASH /? to get further details about the parameters. Incorrect usage of the parameter will dam-age the BIOS information, so we strongly recommend users to leave parameters alone unless you fully understand their function.

BIOS Update Illustration:

(1) Executing the "awdflash.exe pt880.bin" in DOS system, Award Flash Memory Writer Start Screen appears: To input BIOS file name.

AwardBIOS Flash Utility V8.24F (C)Phoenix Technologies Ltd. All Rights Reserved
For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003 File Name to Program : PT880.BIN
Message: Input the (BIOS) file name

(2) Press Y if you want to back up your old BIOS. Otherwise, press N to go on without saving.

AwardBIOS Flash Utility V8.24F (C)Phoenix Technologies Ltd. All Rights Reserved
For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003 File Name to Program : PT880.BIN
Message: Do You Want To Save BIOS (Y/N)

(3) Press Y to write the latest BIOS into system.

AwardBIOS Flash Utility V8.24F (C)Phoenix Technologies Ltd. All Rights Reserved
For PT880-8237-6A7L2SN9C-00   Date: 09/18/2003 File Name to Program : PT880.BIN
Message: Press "Y" to Program or "N" to Exit

(4) Updating is in progress. Do not turn off power at this moment.

```
┌─────────────────────────────────────────────────────┐
│            AwardBIOS Flash Utility V8.24F             │
│  (C)Phoenix Technologies Ltd. All Rights Reserved     │
├─────────────────────────────────────────────────────┤
│  For PT880-8237-6A7L2SN9C-00      Date: 09/18/2003    │
│  Flash Type - SST 39SF020 /5V                         │
│                                                       │
│  File Name to Program : pt880.bin                     │
│        Writing Flash Memory - 0FE00 OK                │
│        ███████████░░░░░░░░░░░                          │
│  ▯ Write OK      ▮ No Update    ▮ Write Fail          │
├─────────────────────────────────────────────────────┤
│  Warning: Don't Turn Off Power Or Reset System !      │
└─────────────────────────────────────────────────────┘
```

(5) When the process is complete, remove the Floppy Diskette and press
    F1 to restart the system to put the new BIOS into effect.

```
┌─────────────────────────────────────────────────────┐
│            AwardBIOS Flash Utility V8.24F             │
│  (C)Phoenix Technologies Ltd. All Rights Reserved     │
├─────────────────────────────────────────────────────┤
│  For PT880-8237-6A7L2SN9C-00      Date: 09/18/2003    │
│  Flash Type - SST 39SF020 /5V                         │
│                                                       │
│  File Name to Program : pt880.bin                     │
│              Flashing Complete                         │
│   Remove Floppy Diskette & Hit <F1> to Continue       │
│   ████████████████████████████████                    │
│   ████████████████████████░░░░░░░░                    │
│  ▯ Write OK      ▮ No Update    ▮ Write Fail          │
├─────────────────────────────────────────────────────┤
│  F1 Reset                                             │
└─────────────────────────────────────────────────────┘
```

4-6 BIOS SETUP --- CMOS Setup Utility

Warning and Tips: If changing CMOS Configuration causes difficulty in rebooting system, you can take the following measures:
1. At pressing the power button to reboot, press the "Insert" key at the same time. As soon as the screen displays the booting message, release the "Insert" key and press "Delete" key to enter CMOS Setup Utility . Then choose the "Load Optimized (Optimal) Defaults" menu to restore the default values for a new start. Or,
2. Open your machine cabinet and clear CMOS with jumper setting. Please refer to the Jumper Setting Section of this User manual.

4-6.1 CMOS Setup Utility

1. Power on your system.
2. At the initial screen, enter CMOS Setup Utility by pressing < Del > key before POST(Power on Self Test) is complete and the main pro-gram screen will appear as follows.

Phoenix - AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features	▶ Frequency/Voltage Control
▶ Advanced BIOS Features	Load Optimized Defaults
▶ Advanced Chipset Features	Set Supervisor Password
▶ Integrated Peripherals	Set User Password
▶ Power Management Setup	Save & Exit Setup
▶ PnP/PCI Configurations	Exit Without Saving
▶ SmartDoc Anti-Burn Shield	

Esc: Quit   ↑↓←→ : Select Item
F10: Save & Exit Setup

Time, Date, Hard Disk Type...
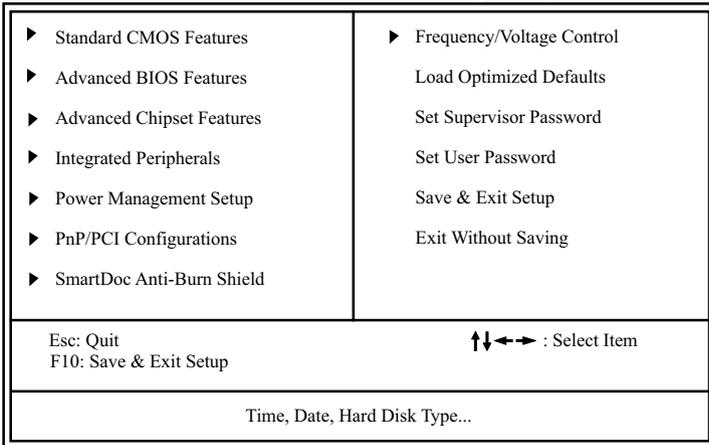
3. When one main item of the Main Menu is chosen and clicked on, its submenu will appear to display the related items and options. On the other hand, a list of operation guide will appear at the end of the submenu as below:

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

(1) Use the arrow keys on your keyboard to select an option, and press <Enter>. Modify the system parameters to reflect the options installed in your system.

(2) Press <Enter> to select item or option.

(3) +/- /PU/PD: To adjust or select value.

(4) F10: Save configuration.

(5) Esc: Press <Esc> key to get out of the menu on screen.

(6) F1: Press F1 to display General Help List.

(7) F5: Press F5 to restore the Previous Value.

(8) F6: Press F6 to load the Fail-Safe default values.

(9) F7: Press F7 to load the Optimized Default Values.

4. You may return to the Main Menu anytime by pressing <ESC>.
5. In the Main Menu, "SAVE AND EXIT SETUP" saves your changes and reboots the system, and "EXIT WITHOUT SAVING" ignores your changes and exits the program.

Attention: The BIOS Setup is subject to constant update without further notice to users. It is necessary for users to update the onboard BIOS by the latest BIOS version provided in our web site: www.soltek.com.tw

4-6.2 Standard CMOS Setup

Standard CMOS Setup records some basic system hardware configuration and sets the system clock and error handling. You only need to modify the configuration values of this option if you want to change your system hardware configuration or when the data stored in the CMOS memory gets lost or damaged.

Run the Standard CMOS Setup as follows:
Choose "Standard CMOS Setup" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

		Item Help
Date (mm:dd:yy)	Mon, Dec 14 2003	
Time (hh:mm:ss)	9 : 41 : 11	Menu Level ▶
IDE Channel 0 Master	WDC WD400BB-00DEA0	
IDE Channel 0 Slave	None	Change the day,
IDE Channel 1 Master	None	month, year and
IDE Channel 1 Slave	None	century
IDE Channel 2 Master	None	
IDE Channel 3 Master	None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	261120K	
Total Memory	262144K	

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

Date (mm:dd:yy) The BIOS determines the day of the week from the other date information. This field is for information only.

Time (hh:mm:ss) The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the left or right arrow key to move to desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Channel 0-3 This field records the specifications for all non-SCSI
Master / Slave hard disk drives installed in your system.

Phoenix - AwardBIOS CMOS Setup Utility
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	Menu Level ▶
Access Mode	Auto	
		To auto-detect the
Capacity	40022MB	HDD's size, head... on this channel
Cylinder	19158	
Head	16	
Precomp	0	
Landing Zone	19157	
Sector	255	

↑↓◄► :Move   Enter: Select   +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
　　　F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Drive A / Drive B Select this field to the type(s) of floppy disk drive(s) installed in your system. The choices are:
360KB, 5.25 in.
1.2MB, 5.25 in.
720KB, 3.5 in.
1.44MB, 3.5 in.
2.88MB, 3.5 in.
None

Video Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in setup.

Halt On During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process.

Base Memory Typically 640KB. Also called conventional memory. The DOS operating system and conventional applications use this area.

Extended Memory Above the 1MB boundary. Early IBM personal computers could not use memory above 1MB, but current PCs and their software can use extended memory.

Total Memory This option shows system memory capacity.

4-6.3 Advanced BIOS Features

Advanced BIOS Features improves your system performance or sets up system features according to your preference.

Run the Advanced BIOS Features as follows:

Choose "Advanced BIOS Features" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

		Item Help
▶ Hard Disk Boot Priority	Press Enter	
Virus Warning	Disabled	Menu Level ▶
CPU Internal Cache	Enabled	
External Cache	Enabled	Allows you to choose
Hyper Threading Technology	Enabled	the VIRUS warning
Quick Power On Self Test	Enabled	feature for IDE Hard
First Boot Device	Floppy	Disk boot sector
Second Boot Device	HDD-0	protection. If this
Third Boot Device	CDROM	functions is enabled
Boot Other Device	Enabled	and someone attempt
Swap Floppy Drive	Disabled	to write data into this
Boot Up Floppy Seek	Disabled	area, BIOS will show a
Boot Up NumLock Status	On	warning message on
Typematic Rate Setting	Disabled	screen and alarm beep
x Typematic Rate (Chars/Sec)	6	
x Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
OS Select For DRAM > 64MB	Non-OS2	

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

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Hard Disk Boot Priority This item allows you to decide the priority of Bootable Hard Disks. Press enter to get into the submenu to choose the prior bootable Hard Disk.

Virus Warning When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive.
You should then run an antivirus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

> NOTE: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you disable the virus warning.

CPU Internal & External Cache Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type up contain internal cache memory (L1), and most, but not all, modern PCs have additional (external) cache memory (L2). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for faster access by the CPU.

Hyper Threading Technology If a P4 CPU with Hyper Threading technology is installed on board, this item will appear and allow you to enable/disable the function. If not, this item will not appear.

Quick Power On Self Test Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally enable quick POST.

First/Second/Third/ Boot Other Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items. Choices: Floppy; LS/ZIP; HDD; SCSI; CDROM; USB; LAN; Disabled

Swap Floppy Drive When enabled, floppy drives A and B will be exchanging without any physical connection and modification on the cables.

Boot Up Floppy Seek When enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 270KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to disabled to save time.

Boot Up NumLock Status Toggle between On or Off to control the state of the NumLock key when the system boots. If On, the numeric keypad is in numeric mode. If off, the numeric keypad is in cursor control mode.

Typematic Rate Setting When *Disabled*, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystroke repeats at a rate determined by the keyboard controller in your system.
When *Enabled*, you can select a typematic rate and typematic delay.

Typematic Rate (Chars / Sec) When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24, or 30 characters per second.

Typematic Delay (Msec) Choices: 250; 500; 750; 1000. This option sets the time interval for displaying the first and the second characters. If enabled, the time interval is optional.

Security Option If you have set a password, select whether the password is required every time the System boots, or only when you enter setup.
Choices: System; Setup

APIC Mode Allows you to enable/disable APIC mode.

OS Select For DRAM > 64MB Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on your system.

4-6.4 Advanced Chipset Features

Choose "Advanced Chipset Features" from the Main Menu and a list of option will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		Item Help
▶ DRAM Clock/Drive Control	Press Enter	
CPU OverClock in MHz	200	Menu Level ▶
AGP OverClock in MHz	66	
AGP Aperture Size (MB)	64MB	
AGP 3.0 Speed	Auto	
x AGP 2.0 Speed	Auto	
AGP Fast Write	Auto	
AGP Sideband Address	Auto	
HT Frequency	4x	
Special I/O for PCI Card	Disabled	
x Base I/O Address	0000	
x I/O Length	1 Byte	
System BIOS Cacheable	Enabled	

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

4-6.4.1 DRAM Configuration

Choose "DRAM Configuration" in "Advanced Chipset Features" and press <Enter>. The following sub-screen will appear for DRAM Control configuration:

DRAM Configuration

		Item Help
Max MemClock (Mhz)	200	
CAS# Latency	2,5	Menu Level ▶ ▶
RAS# to CAS# delay (tRCD)	Auto	
Min RAS# active time (tRAS)	Auto	
Row precharge Time (tRP)	Auto	

Max MemClock (Mhz) This item allows you to set the DRAM Clock if "DRAM Timing Setting by" is set to Manual.
Choices: 100MHz; 133MHz; 166MHz; 200MHz

CAS# Latency With "DRAM Timing Setting by" setting to Manual, you can select the SDRAM CAS# (Column Address Strode) latency manually.
Choices: Auto; 2.0; 2.5; 3.0

RAS# to CAS# delay (tRCD) This value appears when "DRAM Timing Setting by" is set at "Manual". Choices: Auto; 2~7 Bus Clocks

Min RAS# active time (tRAS) This value appears when "DRAM Timing Setting by" is set at "Manual". Choices: Auto; 5~15 Bus Clocks

Precharge to Active (Trp) This value appears when "DRAM Timing Setting by" is set at "Manual". Choices: Auto; 2~6 Bus Clocks

CPU Over Clock in MHz Allows you to set CPU clock manually
Choices; 200~250MHz

AGP Over Clock in MHz Allows you to set AGP clock manually
Choices; 66~100MHz

AGP Aperture Size Series of options are available: 32, 64, 128, 256 or 512MB. Memory mapped and graphics data structures can reside in a Graphics Aperture. This area is like a linear buffer. BIOS will automatically report the starting address of this buffer to the O.S.

AGP 3.0 Speed This item allows you to select AGP 3.0 Speed for AGP 8X card.
Choices: Auto; 4x; 4x8x

X AGP 2.0 Speed This item allows you to select AGP 2.0 Speed for AGP 4X card.
Choices: Auto; 1x; 1x2x; 1x2x4x

AGP Fast Write This item will enable the AGP model into fast write mode.

AGP Sideband Address This item will enable/disable AGP Sideband Address

HT Frequency Allows you to set the ratio of HyperTransport.
Choices: 1X; 2X; 3X; 4X; 5X

Special I/O for PCI Card This item allows you to enable/disable the particular I/O address for PCI cards.

X Base I/O Address This item allows you to set the desired I/O address for PCI cards.
Choices: Min=0000 ~ Max=FFFF

X I/O Length This item allows you to set the I/O length.
Choices: 1 Byte; 4 Bytes; 8 Bytes; 16 Bytes; 32 Bytes; 64 Bytes; 128 Bytes; 256 Bytes

System BIOS Cacheable Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance.

4-6.5 Integrated Peripherals

Integrated Peripherals option allows you to get some information inside
your system when it is working.

Run the Integrated Peripherals as follows:

Choose "Integrated peripherals" from the Main Menu and a list of options
will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

		Item Help
▶ IDE Function Setup	Press Enter	
OnChip IDE Channel0	Enabled	
Primary Master PIO	Auto	
Primary Slave PIO	Auto	
Primary Master UDMA	Auto	
Primary Slave UDMA	Auto	
OnChip IDE Channel1	Enabled	
Secondary Master PIO	Auto	
Secondary Slave PIO	Auto	
Secondary Master UDMA	Auto	
Secondary Slave UDMA	Auto	
IDE Prefetch Mode	Enabled	
Init Display First	AGP	
OnChip USB	V1.1+V2.0	
USB KB/Storage Support	Disabled	
USB Mouse Support	Disabled	
Serial-ATA (internal PHY)	Enabled	
MAC Lan (nVIDIA)	Auto	
IDE DMA transfer access	Enabled	
IDE HDD Block Mode	Enabled	
POWER ON Function	BUTTON ONLY	
x KB Power ON Password	Enter	
x Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	Auto	
Onboard Serial Port 2	Auto	
UART Mode Select	Normal	
x RxD , TxD Active	Hi,Lo	
x IR Transmission Delay	Enabled	
x UR2 Duplex Mode	Half	
x Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
x EPP Mode Select	EPP 1.9	
x ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	

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

4-6.5.1 IDE Function Setup

Choose "IDE Function Setup" in "Integrated Peripherals" and press <Enter>. The following sub-screen will appear for RAID device configuration:

Phoenix - AwardBIOS CMOS Setup Utility
IDE Function Setup

		Item Help
IDE RAID	Disabled	
x IDE Channel0 Master RAID	Disabled	
x IDE Channel0 Slave RAID	Disabled	
x IDE Channel1 Master RAID	Disabled	
x IDE Channel1 Slave RAID	Disabled	
x SATA Primary Master RAID	Disabled	
x SATA Secondary Master RAID	Disabled	

IDE RAID This item allows you to enable/disable onboard RAID function.

IDE Channel 0/1 Master/Slave RAID If IDE RAID is enabled, users can choose which IDE device to enable RAID function. nForce3 250 Gb supports RAID 0, 1, and 0+1 funciton.

SATA Primary/Secondary Master/Slave RAID If IDE RAID is enabled, users can choose which SATA device to enable RAID function. nForce3 250 Gb supports RAID 0, 1, and 0+1 funciton.

On-Chip IDE Channel 0/1 The chipset contains a PCI IDE interface with support from two IDE channels. Select Enabled to activate the first and/or the second IDE interface. Select Disabled to inactivate an interface if you install a primary and/or second add-on IDE interface.

Primary Master / Slave PIO Secondary Master / Slave PIO Choose Auto or Mode 0~4. The BIOS will detect the HDD mode type automatically when you choose Auto. You need to set to a lower mode than Auto when your hard disk becomes unstable.

Primary Master / Slave UDMA Secondary Master / Slave UDMA Ultra DMA33/66/100/133 implementation is possible only if your IDE hard drive supports it, if the operating environment includes a DMA drive, and if your system software supports Ultra DMA33/66/100/133. Select "Auto" to enable BIOS support.

IDE Prefetch Mode The on-board IDE drive supports IDE prefetching for faster drive accesses. If the IDE device doesn't support prefetching, set this field to Disabled.

Init Display First Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display.
Choices: PCI Slot; AGP

OnChip USB Allows you to enable/disable the Onchip USB controller.
Choices: Disabled; V1.1+V2.0; V1.1

USB Keyboard/Storage Support Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

USB Mouse Support Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB mouse.

Serial-ATA (Internal PHY) Allows you to enable/disable onboard SATA / SATA RAID function.

MAC Lan(nVIDIA) Allows you to enable/disable onboard LAN function.

IDE DMA transfer access This item is to improved the whole system performance with DMA mode of IDE devices enabled.

IDE HDD Block Mode Block mode is also called block transfer, multiple commands, or multiple sector read/write.Select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support.

POWER ON Function Allows you to set the way to boot up the system.
Choices: Password; Hot KEY; Mouse Left; Mouse Right; Any KEY; BUTTON ONLY; Keyboard 98

KB Power On Pass-word If Keyboard Power-on function is set at "Password", this item shows up to allow you to type a password for the power-On function.
Choices: N/A; Password

Hot Key Power ON Allows you to set the hot key to boot up the system.

Onboard FDC Controller Select Enabled if your system has a floppy drive controller (FDC) installing in the system board and you want to use it. If you install add-in FDC or the system has no floppy drive, select Disabled in this field.
Choices: Enabled; Disabled

Onboard Serial Port 1 / Port 2 Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.
Choices: Disabled; Auto;
3F8/IRQ4; 2F8/IRQ3;
3E8/IRQ4; 2E8/IRQ3

UART Mode Select The serial port 2 on your system may offer a variety of infrared port modes. Click here for a description of various modes.
The choices: Normal(default); IrDA; ASKIR

RxD , TxD Active The option controls the speed between receiving and transmitting of IrDA or ASKIR when using.
Choices: Hi,Hi; Hi,Lo; Lo,Hi; Lo,Lo

IR Transmission Delay When UART Mode is selected in IrDA or ASKIR mode, it allows you to enable / disable IR Transmission Delay.

UR2 Duplex Mode This options controls the operating mode between receiving and transmitting of IrDA or ASKIR. The operating mode will be synchronous bi-directional transmission and reception when Full mode is selected. Nevertheless, the operating mode will be asynchronous bi-directional transmission and reception when Half mode is selected.
Choices: Half; Full

Use IR Pins	When UART Mode is selected in IrDA or ASKIR mode, this item allows you to select the IR Pins signal selection. The choices: IR-Rx2Tx2; RxD2, TxD2
Onboard Parallel Port	This item allows you to determine onboard parallel port controller I/O address setting. The choices: 378H/IRQ7(default); 278H/IRQ5; 3BC/IRQ7; Disabled
Parallel Port Mode	Select an operating mode for the on-board parallel (printer) port. Select Normal, Compatible, or SPP unless you are sure your hardware and software both support one of the other available modes. Choices: SPP(default); EPP; ECP; ECP+EPP; Normal
EPP Mode Select	Select EPP Mode when you choose EPP or ECP+EPP mode in the Parallel Port Mode. Choices: EPP1.7; EPP1.9
ECP mode Use DMA	Select a DMA channel for the port when you choose ECP or ECP+EPP mode for the Parallel Port Mode. Choices: 1; 3
PWRON After PWR-Fail	This item is to set the mode to power on when power resumes after power fails. Choices: Off(default) ; On; Former-Sts

4-6.6 Power Management Setup

Power Management Setup allows you to set the system's power saving functions.

Run the Power Management Setup as follows:

Choose "Power Management Setup" from the Main Menu and a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI function	Enabled	Item Help
ACPI Suspend Type	S1(POS)	
Power Management	User Define	
Video Off Method	DPMS Support	
HDD Power Down	Disabled	
HDD Down In Suspend	Disabled	
Soft-off by PBTN	Instant-off	
WOL(PME#) From Soft-off	Disabled	
WOR(RI#) From Soft-off	Disabled	
USB Device Wake Up	Disabled	
Power-On by Alarm	Disabled	
x Day of Month Alarm	0	
x Time(hh:mm:ss) of Alarm	0 : 0 : 0	
AMD K8 Cool'n'Quiet control	Auto	

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

ACPI Function Select Enabled(default) only if your computer's operating system supports the Advanced Configuration and Power Interface (ACPI) specification. Currently, Windows 98SE/ME, Windows 2000 and Windows XP supports ACPI.

ACPI Suspend Type This item allows you to select the ACPI Suspend type. You can select S3(STR)(Optional) for Suspending To RAM if your system supports this mode. Or you can select S1(POS) for Power On Suspend under ACPI mode.

Power Management This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. Choices:

User Define: To set the Suspend mode time by user.

Max Saving: Maximum power savings. Inactivity period is 1 minute in each mode.

Min Saving: Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

Video Off Method This determines the manner by which the monitor is blanked.
V/H SYNC+Blank: To turn off the vertical and horizontal snchronization ports and write blanks to the video buffer.
Blank Screen: To write blanks to the video buffer.
DPMS Support: Select this option if your monitor supports the Display Power Management Singaling (DPMS) standard of the Video Electronics Standards to select video power management values.

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.
Choices: Disabled; 1~7 Min. in 1 min. stepping

HDD Down In Suspend Allows you to enable / disable(default) to power down HDD when suspend.

Soft-Off by PBTN When Enabled, turning the system off by pressing the on/off button places the system in a very low-power-usage state.
Choices: Delay 4 Sec.; Instant-off

WOL(PME#) From Soft-Off Allows you to enable / disable(default) the Wake on Lan(PME#) function.

WOR(RI#) From Soft-Off Allows you to enable / disable(default) the Wake on Ring Signal function.
An input signal on the serial Ring Indicator (RI) Line (in other words, an incoming call on the modem) awakens the system from a soft off state.

USB Device Wake Up	Allows you to enable / disable USB Device Wake Up function.
Power-On by Alarm	Allows you to enable / disable(default) the Power-On by Alarm function.
Day of Month Alarm	If Resume On Power-On by Alarm is enabled, this field allows you to set the Alarm Day of Month. Day Choices: 00 ~ 31
Time of Alarm (Hour / Minute / Second)	If Resume On Power-On by Alarm is enabled, this field allows you to set the Alarm Hour, Minute and Second. Hour Choices: 00 ~ 23 Minute Choices: 00 ~ 59 Second Choices: 00 ~ 59
AMD K8 Cool'n'Quiet control	This function intends to low down CPU temperature and save the power.

4-6.7 PnP / PCI Configuration

PnP/PCI Configuration allows you to modify the system's power saving functions.

Run the PnP/PCI Configuration as follows:

Choose "PnP/PCI Configuration" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
PnP PCI Configurations

		Item Help
Reset Configuration Data	Disabled	
Resources Controlled by	Auto(ESCD)	
x IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

⬆⬇⬅➡ : Move   Enter: Select   +/-/PU/PD: Value   F10: Save   Esc: Exit   F1: General Help
F5: Previous Values   F6: Fail-Safe Defaults   F7: Optimized Defaults

Reset Configuration Data Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflilct that the OS cannot boot.

Resource Controlled By The Plug and Play Award BIOS can automatically configure all the boot and Plug and Play compatible devices. If you select *Auto*(default), all the interrupt request (IRQ) and DMA assignment fields will not appear, as the BIOS automatically assigns them. If you select Manual, the IRQ Resources item will appear for your configuration (see below).

IRQ Resources Press Enter. Please refer to the list below:

		Item Help
IRQ-3 assigned to	PCI Device	
IRQ-4 assigned to	PCI Device	
IRQ-5 assigned to	PCI Device	
IRQ-7 assigned to	PCI Device	
IRQ-9 assigned to	PCI Device	
IRQ-10 assigned to	PCI Device	
IRQ-11 assigned to	PCI Device	
IRQ-12 assigned to	PCI Device	
IRQ-14 assigned to	PCI Device	
IRQ-15 assigned to	PCI Device	

PCI/VGA Palette Snoop This option allows the BIOS to preview VGA status, and to modify the information delivered from the feature Connector of the VGA card to MPEG card. This option can solve the display inversion to black after you have used a MPEG card.

4-6.8 SmartDoc Anti-Burn Shield

This section helps you to get more information about your system including CPU temperature, FAN speed and voltage. It is recommended that you contact your mainboard supplier to get proper values about the setting of the CPU temperature.

Choose "SmartDoc Anti-Burn Shield" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
SmartDoc Anti-Burn Shield

		Item Help
CPU Temperature	62˚C/143˚F	
System Temperature	46˚C/144˚F	
CPU Fan Speed	1130 RPM	
System Fan Speed	0 RPM	
Vcore	1.45V	
VDimm	2.57V	
12V	11.64V	
VCC	5.21V	
5VSB	5.08V	
VBAT	3.26V	
CPU Target Temperature	60˚C/140˚F	
CPU Temp Tolerance Value	5	
System Target Temperature	40˚C/104˚F	
System Temp Tolerance Valu	5	

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

CPU Temperature Shows current CPU temperature.

System Temperature Shows current system temperature.

CPU/System Fan Speed These fields display the current speed of the CPU / System fan.

VcoreA Shows actual CPU core actual voltage value.

VDimm, 12V, VCC, +5VSB, VBAT Shows actual voltage value of all these default voltage value on board.

CPU/System Target Temperature Allows user to set target CPU temperature so that the system will increase FAN speed accordingly.
System: disabled; 40˚C/104˚F; 35˚C/95˚F; 30˚C/86˚F;
CPU: disabled; 60˚C/140˚F; 55˚C/131˚F; 50˚C/122˚F

CPU/System Temp Tolerance Value Allows user to set the CPU/System temperature tolerance value.
Choices: Min: 1; Max: 5

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4-6.9 Frequency/Voltage Control

Run the "Frequency/Voltage Control" as following:

Choose "Frequency/Voltage Control" from the Main Menu and a screen with a list of options will appear:

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

		Item Help
CPU Ratio	StartUp	
CPU Voltage Select	Default	
AGP Voltage Select	1.5V	
DIMM Voltage Select	2.6V	
VDD Voltage Select	1.6V	

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

CPU Ratio If CPU onboard is one with an adjustable or un-locked CPU ratio, this item allows you user to ad-just the CPU Ratio. If your CPU is one with the CPU Ratio locked, this item will be invalid.

CPU Voltage Select Allows you to configure the CPU Voltage. Usually, to raise CPU voltage will raise the chance of CPU overclocking and yet risk damage of CPU.
Choices: Default; 0.800V ~1.550V in 0.025V step-ping

AGP Voltage Select Allows you to configure the AGP Voltage.
Choices: 1.5V; 1.6V; 1.7V; 1.8V

DIMM Voltage Select Allows you to configure the DIMM Voltage.
Choices: 2.6V; 2.7V; 2.8V

VDD Voltage Select Allows you to configure the VDD Voltage.
Choices: 1.6V; 1.7V; 1.8V; 1.9V

4-6.10 Load Optimized Defaults

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

" **Load Optimized Defaults (Y / N) ? N** "

Phoenix - AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features	▶ Frequency/Voltage Control
▶ Advanced BIOS Features	Load Optimized Defaults
▶ Advanced Chipset Features	Set Supervisor Password
▶ Integrated Peripherals	Set User Password
▶ Power management	Load Optimized Defaults [Y/N] Y
▶ PnP/PCI Configurat	t Saving
▶ SmartDoc Anti-Burn Shield	

Esc: Quit	↑↓→← : Select Item
F10: Save & Exit Setup	

Change CPU Clock & Voltage

"Y" is for "Yes", and "N" is for "No".

Pressing "Y" loads the BIOS Optimized default values to restore the BIOS to its original status.

4-6.11 SET SUPERVISOR / USER PASSWORD

These two options allow you to set your system passwords. Normally, the supervisor has a higher priority to change the CMOS setup option than the users. The way to set up the passwords for both Supervisor and Users are as follows:

1. Choose "Change Password" in the Main Menu and press <Enter>. Then following message appears:

"**Enter Password :** "

2. The first time you run this option, enter your password up to 8 characters and press <Enter>. (The screen does not display the entered characters.)

3. After you enter the password, the following message appears prompting you to confirm the password:

"Confirm Password : "

4. Enter the same password "exactly" the same as you have just typed to confirm the password and press <Enter>.
5. Move the cursor to Save & Exit Setup to save the password.
6. If you need to delete the password entered before, choose the Supervisor Password and press <Enter>. It will delete the password that you have entered before.
7. Move the cursor to Save & Exit Setup to save the option you have just configured; otherwise the old password will still be there the next time you turn your system on.
8. Press <Enter> to exit to the Main Menu.

> **NOTE:** If you forget or lose the password, the only way to access the system is to clear the CMOS RAM. All setup information will be lost and you need to run the BIOS setup program again.

4-6.12 SAVE & EXIT SETUP
SAVE & EXIT SETUP allows you to save all modifications you have specified into the CMOS memory. Highlight this option on the Main Menu and the following message appears:

"SAVE to CMOS and EXIT (Y/N) ? Y "

"Y" is for "Yes", and "N" is for "No".
Press <Enter> key to save the configuration changes.

4-6.13 EXIT WITHOUT SAVING
EXIT WITHOUT SAVING option allows you to exit the Setup Utility without saving the modifications that you have specified. Highlight this option on the Main Menu and the following message appears:

"Quit Without Saving (Y/N) ? N "

"Y" is for "Yes", and "N" is for "No".
You may change the prompt to "Y" and press <Enter> key to leave this option .

Chapter 5 nVIDIA RAID Setup

nVIDIA RAID Controller nForce3 250Gb & RAID Driver

nVIDIA RAID (Redundant Array of Independent Disks) Controller nForce3 250Gb is built in this series of mainboards to provide RAID configuration of RAID 0, RAID 1, RAID 0+1 and JBOD modes. RAID Drivers are enclosed in a Driver CD as well as a Floppy diskette to support various RAID systems (Windows 2000/XP) setup.

This Chapter is to introduce the SATA RAID / SATA + PATA RAID Configurations :

5-0 About Disk Array

5-0-1 Disk Array Interpretation

A "Disk Array" is formed from a group of 2 or more disk drives with the RAID (Redundent Array of Independent Disks) technology. The aim of a Disk Array is to provide better performance and/or data fault tolerance.

5-0-2 Disk Array Member

The individual disk drive in an array is called a "member". Each member of a specific disk array is coded in their "reserved sector" with configuration information that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the system.

5-0-3 Disk Array Types Supported by nForce3 250Gb

nForce3 250Gb on this mainboard supports four types of Disk Arrays: RAID 0, RAID 1, RAID 0+1, and JBOD modes.

1. RAID 0 (or Striping mode):
   RAID 0 is a group of 2 to 4 Disk Drives configured together with RAID technology to provide better data transfer performance than a single drive since the workload is balanced between the array members. Reads and Writes of RAID 0 data are interleaved between multiple drives. When any disk member fails, it affects the entire array. The disk array size is equal to the number of drive members times the smallest member capacity. For example, one 1GB and three 1. 2GB drives will form a 4GB (4x1GB) disk array.

2. RAID 1 (or Mirroring mode):
   RAID 1 is a group of 2 Disk Drives configured together with RAID Technology to provide the fault tolerance function. Writes duplicate data on to RAID 1 while reads are performed in parallel. If one of the mirrored drives suffers a mechanical failure (e.g. spindle failure) or does not respond , the remaining drive will continue to function. This is called Fault Tolerance.
   The drive capacity of RAID 1 is half the total drive capacity of two equal-size drive.

3. RAID 0+1 (Mirror/Stripe):
   RAID 0+1 is formed by a RAID 0 member mirrored to another RAID member to establish a RAID 0+1 Array. RAID 0+1 requires at least 4 disk drives to set up the RAID 0+1 configuration.

4. JBOD (Spanning):
   JBOD stands for "just a Bunch of Disks". JBOD combines odd size drives into a single big drive. However, it will decrease performance because of the difficulty in using drives concurrently.

5-1. SATA / IDE connectors on B9A-FGR

SATA connectors SATA1 and SATA2 by nFORCE3 250Gb

Chipset nFORCE3 250Gb supporting SATA/PATA RAID Interfaces

IDE connectors IDE1 and IDE2 by nFORCE3 250Gb
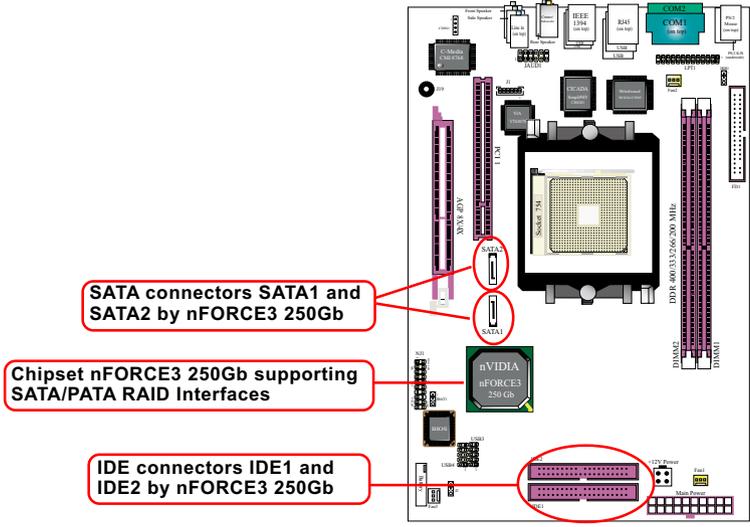
5-2. Enable RAID function in the BIOS

1. Start the system, press < Delete > key to enter BIOS Setup. Choose "Integrated Peripherals" and select "IDE function Setup", then press enter. The IDE function Setup windows appears.

Phoenix - AwardBIOS CMOS Setup Utility
IDE Function Setup

		Item Help
IDE RAID	Enabled	
x IDE Channel0 Master RAID	Enabled	
x IDE Channel0 Slave RAID	Enabled	
x IDE Channel1 Master RAID	Enabled	
x IDE Channel1 Slave RAID	Enabled	
x SATA Primary Master RAID	Enabled	
x SATA Secondary Master RAID	Enabled	

2. Enable "IDE RAID" and enable the disks that you want to set as RAID disks. (If RAID 0+1 mode is to be set, please enable SATA drives.)

3. Then press F10 to save the change and exit the BIOS. The PC reboots.

5-3. About the NVRAID BIOS

1. Enter the RAID BIOS by pressing F10 when prompted after rebooting the system.

2. The NVIDIA RAID Utility - Defind A New Array windows appears.

```
                NVIDIA RAID Utility    Jan 7 2004
                    - Define a New Array -

  RAID Mode : Striping            Striping Block : Optimal

  Free Disks                      Array Disks
  Loc    Disk Model   Name        Loc    Disk Model   Name

  1.1.M  ST3120026AS              [→] Add
  1.0.M  ST3120026AS


                                  [←] Del


 [F6] Back  [F7] Finish  [TAB] Navigate  [↑↓] Select   [ENTER] Popup
```
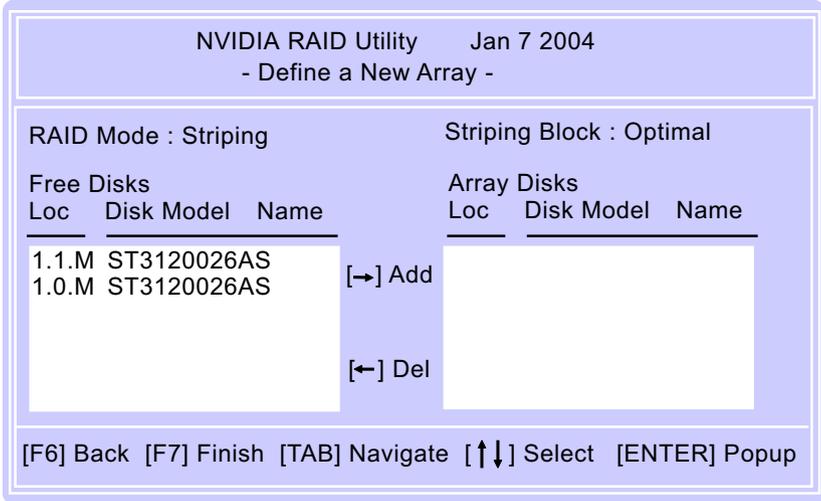
Definiton of New Array

Typically a system contains a controller and multiple channels, and each channel has a slave and a master except for SATA drives.

The status of the new array lists the information as below.

1.0.M

M: Master S: Slave

Controller

Channel - Channel 0 stands for Parallel ATA drives while Channel 1 stands for Serial ATA drives.

Parallel ATA

0.0.M Channel 0, Controller 0, Master
0.0.S Channel 0, Controller 0, Slave
0.1.M Channel 0, Controller 1, Master
0.1.S Channel 0, Controller 1, Slave

Serial ATA

1.0.M Channel 1, Controller 0, Master
1.1.M Channel 1, Controller 1, Master

5-4. Configure the RAID Setup

The RAID Mode Selection

There are four modes to choose - Striping (RAID 0), Mirroring (RAID 1), Stripe Mirroring (RAID 0+1), Spanning (JBOD). To change to a different RAID mode, press the arrow key up or down until the mode you want appears in the screen.

The Striping Block Size Selection

Striping Block Size affects how data is arranged on the disk. It is recommand to leave this value at default.

Create the New Array

1. Press tab key to Free Disks section.
2. Move the disks appearing in this block (the disks are enabled from the IDE Function Setup of BIOS) to the Array Disks block by pressing the right arrow key.

```
            NVIDIA RAID Utility     Jan 7 2004
                  - Define a New Array -

RAID Mode : Striping              Striping Block : Optimal

Free Disks                        Array Disks
Loc    Disk Model   Name          Loc    Disk Model   Name
____   _____   ____          ____   _____   ____

                                  1.1.M  ST3120026AS
                         [→] Add   1.0.M  ST3120026AS


                         [←] Del

[F6] Back  [F7] Finish  [TAB] Navigate  [↑↓] Select   [ENTER] Popup
```

5-5. Finish the RAID Setup

1. Press F7 after configuring the RAID array disks. A dialog windows appears.

NVIDIA RAID Utility   Jan 7 2004
- Define a New Array -

RAID Mode : Striping   Striping Block : Optimal

Free Disks   sks
Loc   Disk Mod   sk Model   Name

Clear Disk Data ?   T3120026AS
                                                   T3120026AS

[Y] YES   [N] NO

[F6] Back [F7] Finish [TAB] Navigate [↑↓] Select   [ENTER] Popup
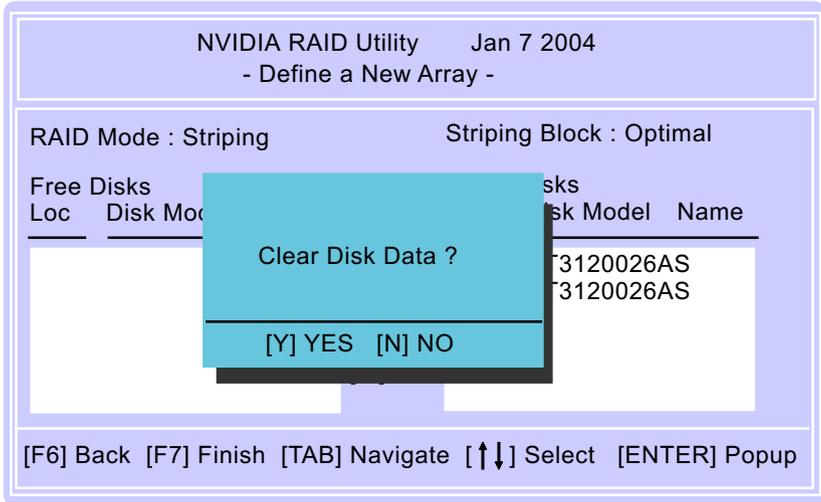
2. Press Y to delete all the disk data from the RAID array you have just built, otherwise press N. Then the Array List windows appears, from which you can view the information about the RAID arrays you have configured.

NVIDIA RAID Utility   Jan 7 2004
- Array List -

Boot	Id	Status	Vendor	Array Model Name	
No	2	Healthy	NVIDIA	Striping	223.58G

[Ctrl-X] Exit [↑↓] Select [B] Set Boot [N] New Array [ENTER] Detail

85
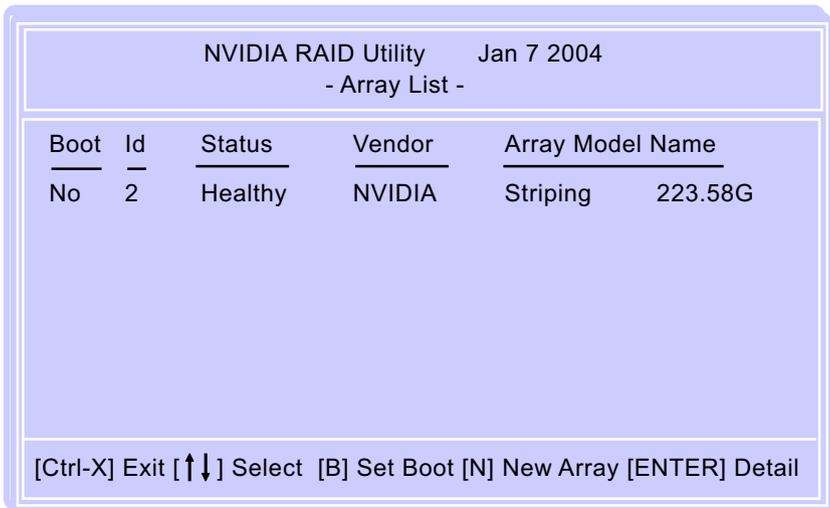
3. Press Enter to show the RAID array details from the respective disks such as RAID mode, Striping Block, Striping Width, Disk Model Name, and Disk Capacity.

4. Finally press Enter again to return the previous screen and press [Ctrl+X] to exit and reboot the system.

```
               Array 2 : NVIDIA STRIPE        223.58G
                         - Array Detail -

 RAID Mode : Striping
 Striping Width: 2                    Striping Block: 32K

 Adapt Channel   M/S       Index  Disk Model Name   Capacity

 1     1        Master    0       ST3120026AS       111.79GB
 1     0        Master    1       ST3120026AS       111.79GB




     [R] Rebuild   [D] Delete  [C] Clear Disk  [ENTER] Return
```

Note:

In the above screen, you can press [R] to rebuild the disk data if you have built the RAID array as Mirroring Mode. Also, you can press [D] to delete the RAID array or press [C] to clear disk data.

5-6 Install nVIDIA RAID Driver for Windows 2000/XP

nVIDIA RAID Driver is incorporated in Support CD/Floppy Diskette for user's installation. <u>This driver is intended for Windows 2000/XP.</u>

(1) Get ready the Floppy Diskette holding the RAID Driver.
   (This Driver Diskette should have been enclosed in the mainboard Package.)
(2) Check that Hard Disks are connected properly to the RAID conn-tors.
(3) Start your PC system and use RAID BIOS Setup Utility to configure RAID 0 / 1/ 0+1 to the hard disks.
(4) Restart System and apply the Windows 2000/XP CD to CD-ROM for operating system installation.
(5) On the Windows 2000/XP Setup screen, press "F6" key for RAID driver setup.

Windows Setup

Press F6 if you need to install a third party SCSI or RAID driver....

(6) On next screen press "S" to confirm the mass storage device setup.

Windows Setup

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices(s):

  <none>

  * To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.

  * If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.

S=Specify Additional Device   Enter=Continue   F3=Exit

(7) On next screen apearing, insert the RAID Driver Diskette to Drive "A" and then press <Enter>.

Windows Setup

  Please insert the disk labeled

  Manufacturer-supplied hardware support disk

  into Drive A:

  *   Press ENTER when ready.

Enter=Continue   ESC=Cancel   F3=Exit

(8) On the next screen, you are prompted to install the "NVIDIA RAID CLASS DRIVER" and "NVIDIA NForce Storage Controller". Please note that you should install both items. So, first press <Enter> on "NVIDIA RAID CLASS DRIVER" to continue.

Windows Setup

You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.

Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.

> **NVIDIA RAID CLASS DRIVER**
> **NVIDIA NForce Storage Controller**

S=Specify Additional Device   Enter=Continue   F3=Exit

(9) When the following screen appears , press S again to specify an additional device and press <Enter> to continue.

Windows Setup

Setup will load support for the following mass storage driver(s):
NVIDIA RAID CLASS DRIVER

> *** To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.**

> *** If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.**

S=Specify Additional Device   Enter=Continue   F3=Exit

(10) You will be promted to insert the driver disk into CD_ROM drive again. After you have inserted the driver disk, press Enter to continue.

(11) You will be promted to insert the driver disk into CD_ROM drive again. After you have inserted the driver disk, press Enter to continue.

(12) On the next screen, press Enter on the marked-up item to continue.

Windows Setup

You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.

Select the SCSI Adapter you want from the following list, or press ESC to return to the previous screen.

> **NVIDIA RAID CLASS DRIVER**
> **NVIDIA NForce Storage Controller**

S=Specify Additional Device   Enter=Continue   F3=Exit

(13) Next screen will show that you have chosen two device drivers to set up. Press Enter to continue, and the Installation Program will then guide you through the rest of system setup.

Windows Setup

Setup will load support for the following mass storage driver(s):
NVIDIA RAID CLASS DRIVER
NVIDIA NFORCE STORAGE CONTROLLER

** * To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.**

** * If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.**

S=Specify Additional Device   Enter=Continue   F3=Exit

(14) When the system is completely installed, the RAID driver will also be installed into the system.

Memo