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Chapter 1 Specification

Introduction

This series features an integration of the powerful AMD processors Athlon/Athlon XP/Duron and the North Bridge nVIDIA nFORCE2 Ultra 400 plus South Bridge nFORCE2 MCP-Gigabit/RAID.

nVIDIA nFORCE2 Ultra 400 supports on-board AMD processors to implement the 400/333/266/200 MB/s Front Side Bus, the AGP 8X/4X interface, the LPC Super I/O, the Dual Channel DDR 400/333/266 MHz SDRAM, the 6-channel AC'97 Audio interface, and the USB 2.0 interface.

For SL-75FRN3-GR, South Bridge nForce2 MCP-Gigabit is built on board, supporting Gigabit Ethernet LAN and Parallel ATA 133 data transfer rate RAID.

For SL-75FRN3-RL, South Bridge nForce2 MCP-RAID is built on board, supporting 10/100Mb/s Ethernet LAN and Parallel ATA 133 data transfer rate RAID.

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

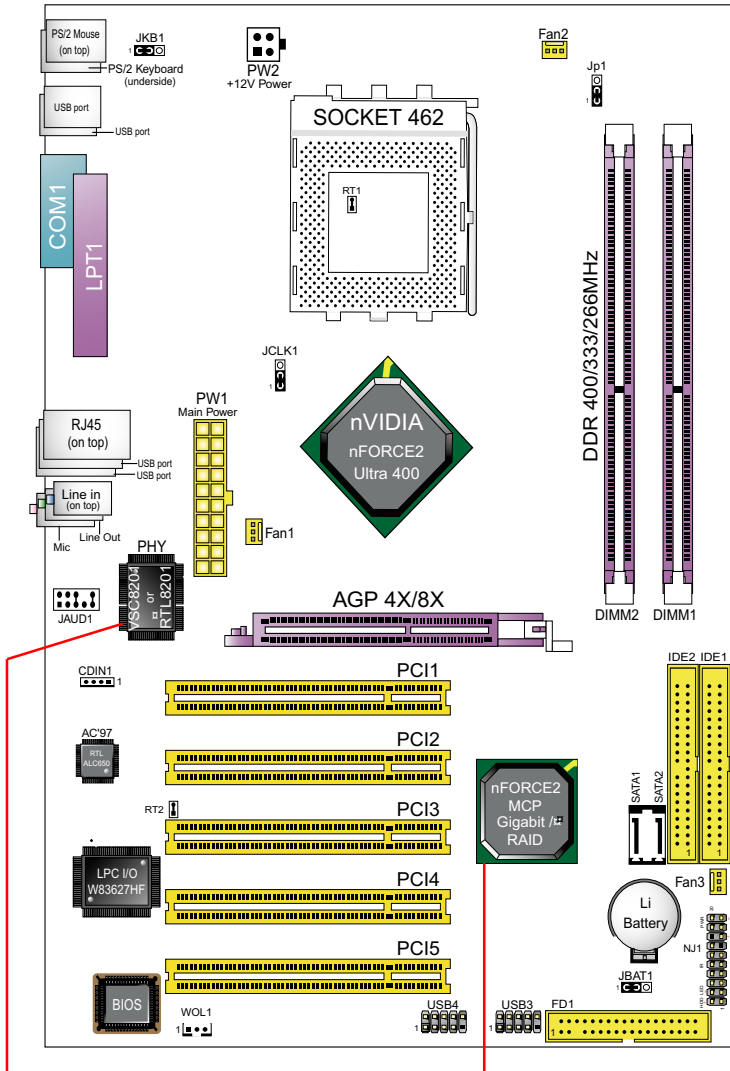
1-2 Mainboard Specifications**

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 ERRATA/UPDATE Slip 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 SL-75FRN3-GR / 75FRN3-RL Layout



*nForce2 MCP-Gigabit plus VSC8201RX is for SL-75FRN3-GR with Gigabit LAN.

*nForce2 MCP-RAID plus RTL8201CL is for SL-75FRN3-RL with 10/100Mb/s LAN.

1-2 Mainboard Specifications

1-2.1 CPU Socket

CPU Socket 462 (Socket A) on board, supporting AMD Athlon, Athlon XP, and Duron processors and implementing 400/333/266/200MB/s system bus

1-2.2 System Chipsets

- North Bridge nVIDIA nFORCE2 Ultra 400 for managing and supporting 400/333/266/200MB/s system Bus, AGP 8X/4X interface and Dual Channel DDR 400/333/266MHz Memory Interface.

- South Bridge:

SL-75FRN3-GR: South Bridge nVIDIA nFORCE2 MCP-Gigabit working with North Bridge nFORCE2 Ultra 400 supporting the HyperTransport, LPC Super I/O, PCI interface, SATA/SATA RAID, PATA RAID 133 interface, USB V2.0 interface, AC'97 Audio 6-channel interface, as well as Gigabit LAN.

SL-75FRN3-RL: South Bridge nVIDIA nFORCE2 MCP-RAID working with North Bridge nFORCE2 Ultra 400 supporting the HyperTransport, LPC Super I/O, PCI interface, SATA/SATA RAID, PATA RAID 133 interface, USB V2.0 interface, AC'97 Audio 6-channel interface, as well as 10/100Mb/s LAN.

1-2.3 Memory

2 DDR DIMM 184-pin slots on board :

- Supporting unregistered, non-ECC Dual Channel DDR 400/333/266/200 SDRAM up to 2GB
- Supporting installation of identical DDR SDRAM modules for Dual Channel transfer.

1-2.4 BIOS

Flash Memory for easy upgrade, supporting BIOS Writing Protection, 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.)

1-2.5 Accelerated Graphics Port (AGP) Interface

AGP Controller embedded on board, supporting:

- 1.5V(8X/4X) power mode only, 1 AGP Slot supported
- 8X66MHz AD and SBA signaling; AGP pipelined split-transaction long burst transfers up to 2GB/sec.
- AGP 8X/4X supported, AGP V3.0 compliant

1-2.6 Advanced System Power Management

Advanced Configuration and Power Interface incorporated in BIOS for reducing power consumption :

- ACPI 1.0B compliant (Advanced Configuration and Power Interface), including ACPI Suspend mode support (See Power management of BIOS Setup)
- APM V1.2 compliant (Legacy Power Management)
- Keyboard & Mouse Wake Up
- Real Time Clock (RTC) with date alarm, month alarm, and century field

1-2.7 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, supporting Windows 2K / XP
 - 4 built-in USB connectors and 2 more USB pin-headers which should be connected to 2 additional USB cables to provide 4 more USB ports
- PS/2 Keyboard and PS/2 Mouse
- UARTs (Universal Asynchronous Receiver / Transmitter):
 - 1 serial port (COM1) on board

1-2.8 Expansion Slots

- 5 PCI Bus Master slots
- 1 AGP 8X/4X slot
- 2 DDR DIMM slots

1-2.9 AC'97 Audio Codec on board

AC'97 Audio Codec on board, 6-channel interface compliant

- Supporting up to 6 channels of PCM audio output
- 6 channel audio consisting of Front Left, Front Right, Back Left, Back Right, Center and Sub-woofer for complete surround sound effect
- AC'97 Audio Codec Driver enclosed in Support CD for user's installation

1-2.10 Hardware Monitor on board

- Hardware Monitor supported by LPC I/O 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.

1-2.11 Gigabit LAN on board for SL-75FRN3-GR

Gigabit Fast Ethernet Controller integrated in nFORCE2 MCP-Gigabit :

- Supporting 10/100/1000Mb/s Fast Ethernet Base T LAN
- LAN Driver enclosed in Support CD for user's installation

1-2.12 10/100Mb/s LAN on board for SL-75FRN3-RL

10/100 Fast Ethernet Controller integrated in nFORCE2 MCP-RAID :

- Supporting 10/100Mb/s Fast Ethernet Base T LAN
- LAN Driver enclosed in Support CD for user's installation

1-2.13 SATA/SATA RAID Interface

SATA /SATA RAID Interface supported by nForce2 MCP-Gigabit/RAID:

- Supporting 2 Serial ATA connectors for 2 SATA/SATA RAID Hard Disks Array configuration with 150Mb/s transfer rate
- Serial ATA RAID Drivers enclosed in Support CD/Floppy Diskette for user's installation

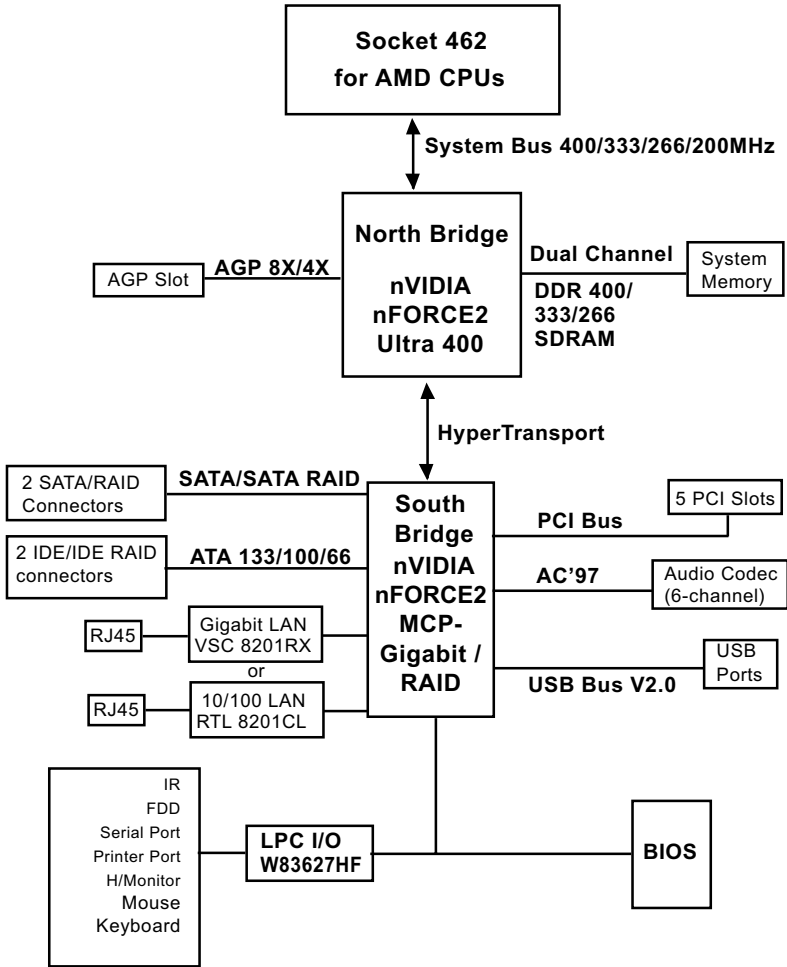
1-2.14 Form Factor

- ATX Form Factor, ATX Power Supply
- Mainboard size: 305mm x 210mm

1-3 Mainboard Specification Table

75FRN3-GR/75FRN3-RL Specifications and Features		
CPU	Socket 462 for AMD Athlon, Athlon XP, and Duron Processors	
North Bridge	nFORCE2 Ultra 400, supporting 400/333/266/200 MHz FSB	
South Bridge	nFORCE2 MCP-Gigabit/RAID	
Memory	Dual Channel DDR 400/333/266 SDRAM, up to 2GB in 2 DDR DIMM slots	
I/O Chip	Winbond W83627HF with Soltek HM	
AGP interface	AGP 8X/4X mode only	
Audio	AC'97 Audio Codec, 6-channel output	
IDE Interface	2 ATA 133/100/66 IDE / 133 IDE RAID Connectors	
VGA	Not integrated on board	
PCI Slots	5 PCI Master slots on board	
I/O Connectors	8 USB V2.0, 1 FDD port, 1 COM port, 1 LPT, 1 IrDA, 1 PS/2 K/B, 1 PS/2 Mouse	
Networking	Gigabit LAN/10/100 LAN and Connector RJ45	
SATA / RAID & PATA RAID	2 SATA connectors for 2 SATA/SATA RAID HDD configuration; 2 PATA connectors for 4 IDE RAID HDDs	
Other Common Feature	Keyboard/Mouse Wake Up	
Optional Features	75FRN3-GR	75FRN3-RL
LAN Controller on board	Gigabit LAN	10/100 LAN

1-4 Chipset System Block Diagram



Socket 462 + nVIDIA nFORCE2 Ultra 400 + nVIDIA nFORCE2 MCP-Gigabit/RAID Diagram

Memo

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 a 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 Identification and Installation

2-2 Memory Installation

2-3 AGP Slot Installation

2-4 IDE Connector Installation

2-5 Floppy Drive Connector (FDC) Installation

2-6 SATA/SATA RAID/IDE RAID connectors Setup

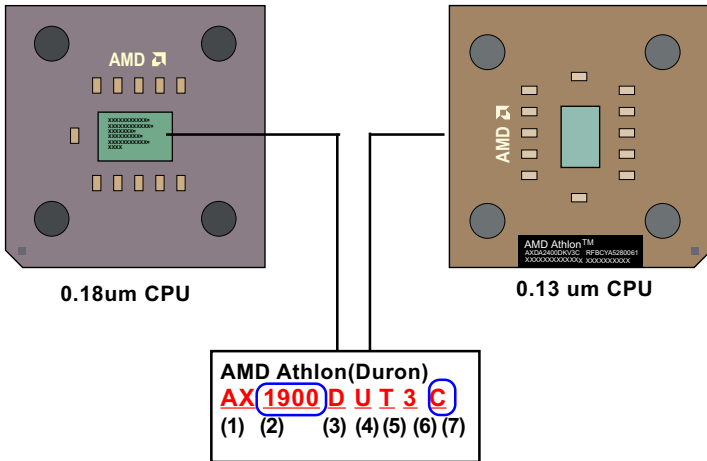
2-7 ATX Power Supply Installation

2-8 Jumper Settings

2-9 Other Connectors Configuration

2-1 CPU Identification and Installation

2-1.1 CPU Identification Legends



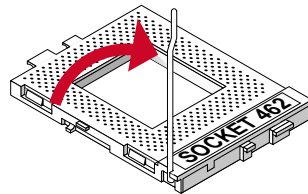
- | | |
|-----|---|
| (1) | Family / Architecture:
A, AX, AXDA=AMD Athlon Processor
D, DHD, DHM, DHL=AMD Duron Processor |
| (2) | Speed: 1000=1000MHz, 1600=1400MHz, 1700=1467MHz,
1800=1533MHz, 1900=1600MHz, 2000=1667MHz,
2100=1733MHz, 2200=1800MHz, 2400=2000MHz,
2600=2133MHz, 2700=2167MHz, 2500=1833MHz(Barton),
2800=2083MHz(Barton), 3000=2250MHz(Barton),
3200=2332MHz(Barton) |
| (3) | Package Type: A=CPGA, D=OPGA |
| (4) | Voltage: L=1.5V, U=1.6V, K=1.65V, P=1.7V, M=1.75V, N=1.8V |
| (5) | Maximum Temperature: R=70°C, Y=75°C, V=85°C
T=90°C, S=95°C, Q=100°C |
| (6) | Size of L2 Cache: 1=64Kb, 2=128Kb, 3=256Kb, 4=512Kb |
| (7) | Max FSB: A=B=200MHz, C=266MHz, D=333MHz, E=400MHz
Note: Get the Host CPU Clock by dividing FSB by 2. |

2-1.2 CPU Installation with Socket 462

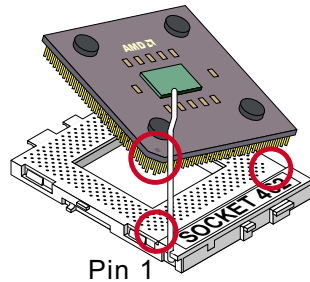
This mainboard is built with CPU Socket 462 supporting the AMD CPUs Athlon, Athlon XP and Duron:

- Follow the steps described in this section to install CPU into the on-board Socket 462.
- 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.

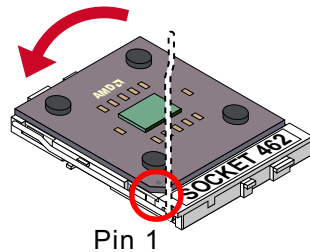
1. First pull sideways the lever of Socket 462, and then turn it up 90° so as to raise the upper layer of the socket from the lower platform.



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.



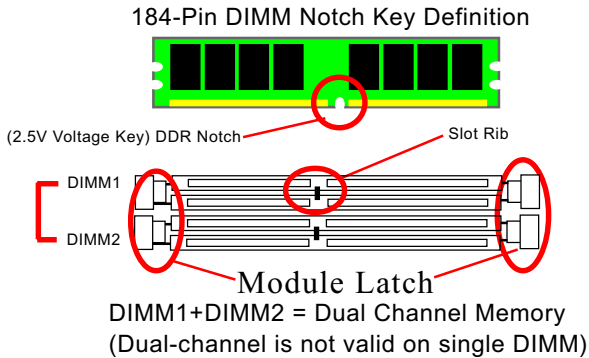
3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.



2-2 Memory Installation

2-2.1 To Install DDR SDRAM Module

- To enable Dual-channel memory function, users should insert totally identical (size and frequency) DDR module pair into the bank-pair.
- 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.



2.2.2 Dual Channel Memory Setup

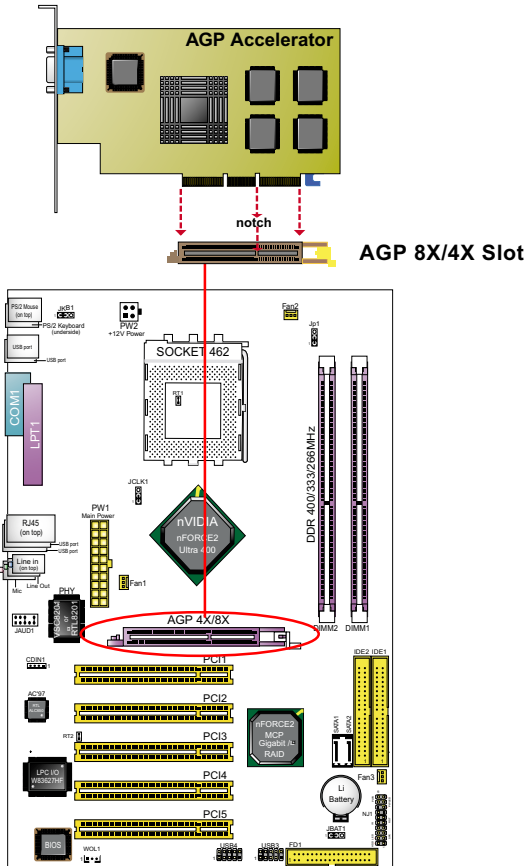
- This Mainboard / Series supports Dual-channel DDR Modules setup.
- Dual Channel Memory Configuration is formed by couple of identical DDR SDRAMs.
- Dual Channel memory configuration provides higher performance than Single Channel configurations.
- Matched DIMMs need to have identical density, DRAM technology, DRAM bus width, and equal number of memory banks.
- This series supports up to 2GB unbuffered Dual-channel DDR 400/333/266 SDRAM, with 2 DDR DIMM slots on board. Do not insert other type of modules into these slots.
- The dual memory controller can double the DDR memory bandwidth up to 6.4GB/s with couple of DDR400, 5.4GB/s with couple of DDR333 and 4.2GB/s with couple of DDR266.

2-2.3 To Remove a DIMM

Power off the system first, and then press down the holding latches on both sides of slot to release the module from the DIMM slot.

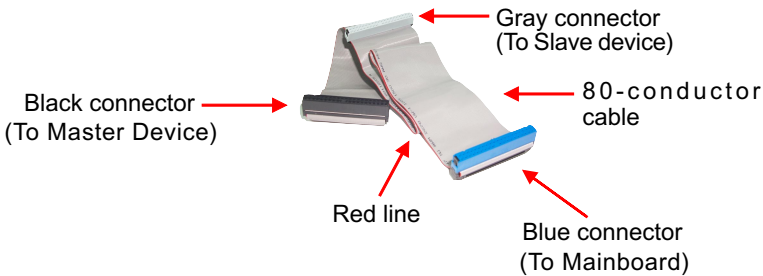
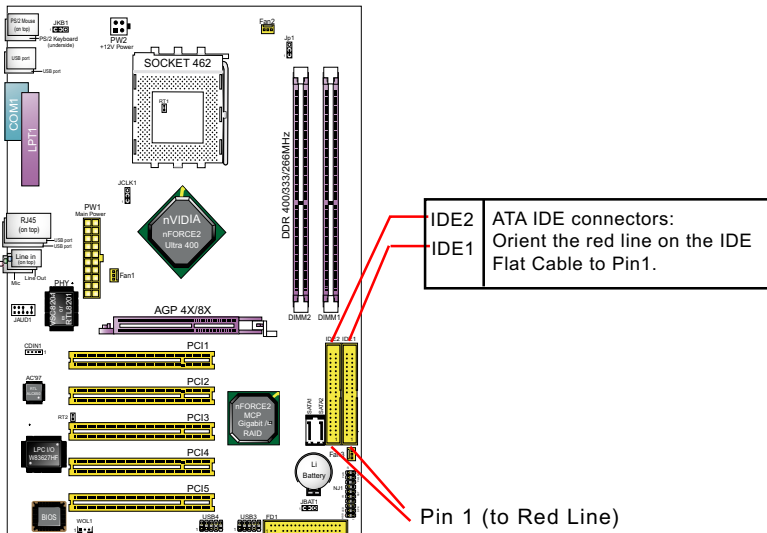
2-3 AGP Slot Installation

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.



2-4 IDE Connector Installation

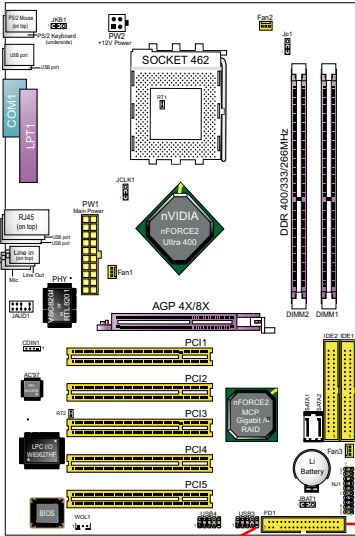
To install IDE Connector, you may connect the blue connector of IDE cable to the primary (IDE1) or secondary (IDE2) connector on board, and then connect the gray connector to your slave device and the black connector to your master device. If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers correctly. Please refer to your hard disk documentation for the jumper settings.



IDE Flat Cable

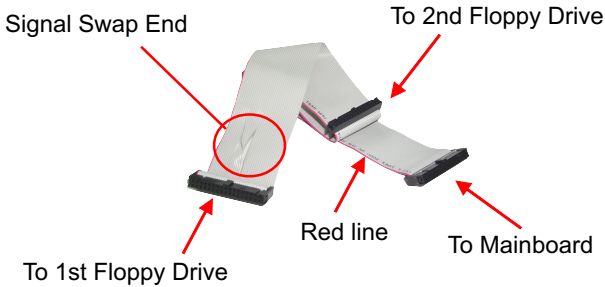
2-5 Floppy Drive Connector Installation

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.



Pin 1 (to Red Line)

Floppy Drive Connector:
Orient the red line of the Floppy Flat Cable to Pin1.

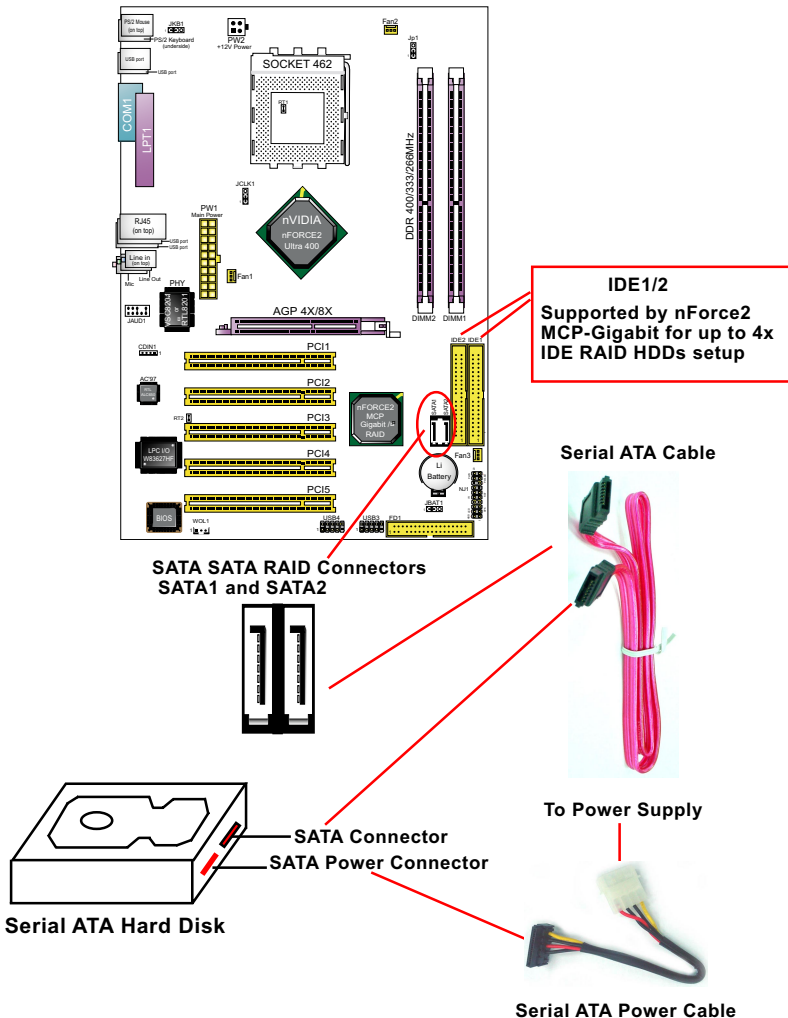


FDD Cable

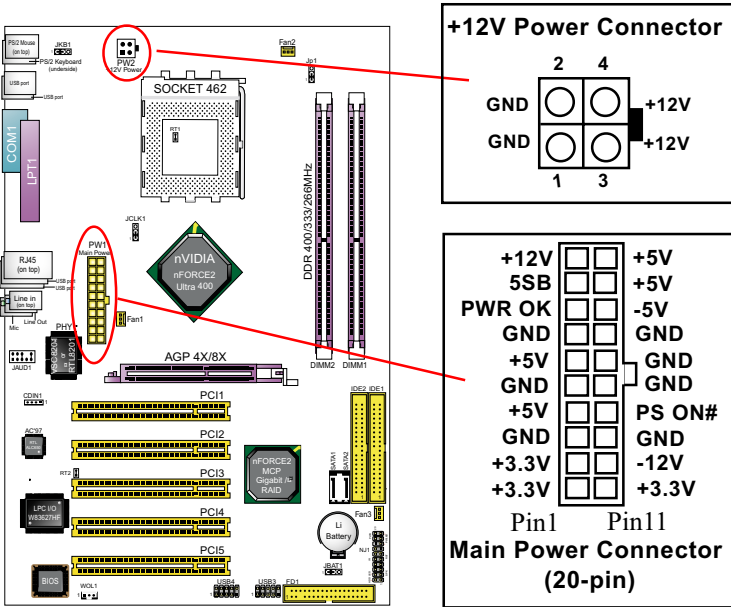
2-6 SATA/SATA RAID/IDE RAID connectors Setup

2 Serial ATA connectors are built on board, supported by the South Bridge nForce2 MCP-Gigabit/RAID with SATA/SATA RAID interface. We can connect these two connectors to SATA Hard Disks and then configure these Hard Disks as SATA/SATA RAID Disks.

IDE1 and 2 are also supported by nForce2 MCP-Gigabit/RAID for up to 4x IDE RAID HDDs setup.



2-7 ATX Power Supply Installation





ATX V2.03 Power Supply is strongly recommended running with the nFORCE2-chipset mainboard.



To set up Power Supply on this mainboard:



1. Get ready a V2.03 ATX Power Supply which provides a square-shaped +12V Power Connector in addition to the 20-pin Main Power Connector and other peripheral power connectors.
2. Connect the on-board square-shaped +12V Power Connector to the square-shaped +12V Power Connector of the Power Supply.
3. Connect the on-board 20-pin Main Power Connector to the 20-pin Main Power Connector of the Power Supply. Please note that both the +12V Power Connector and the 20-pin Main Power Connector should be connected to Power Supply to power on the system.

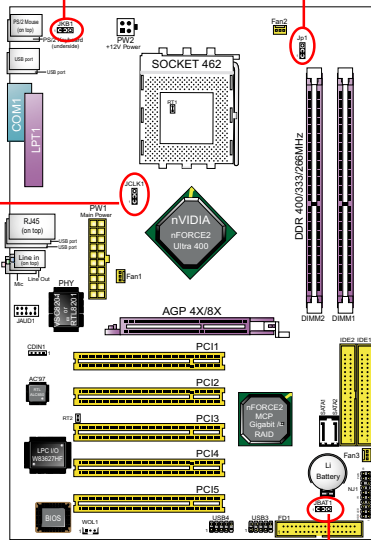
2-8 Jumper Settings



The following diagrams show the locations and settings of jumper blocks on the mainboard.

JKB1: Keyboard/Mouse Wake Up	
	1-2 closed (default) Keyboard/Mouse Wake Up Disabled
	2-3 closed Keyboard/Mouse Wake Up Enabled

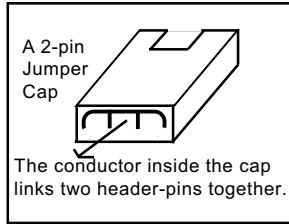
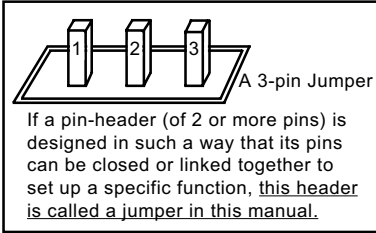
Jp1: Anti-burn Shield (ABSII) (Overheated CPU Shutdown) (only for Athlon XP/ Duron Morgan)	
	1-2 closed (default) To enable overheated CPU (75°C) shutdown function
	2-3 closed To disable overheated CPU shutdown function

JCLK1: CPU Clock Select	
(default)	
	1-2 closed For 100MHz or 133MHz CPU
	2-3 closed For 166MHz or 200MHz CPU



JBAT1: Clear CMOS	
	1-2 closed (default) To hold data
	2-3 closed To clear CMOS

2-8.1 How to tackle the Jumpers:



- A Jumper is usually but not necessarily given a “JpX” legend.
- In the Jumper setting diagram, all jumper pins covered with black marks stand for closed pins with jumper cap.



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

2-8.2 JCLK1: CPU Clock Select

1. Before setting the CPU clock by JCLK1, read the Identification Legend on the CPU, find the Max FSB and divide it by two. The result is the default CPU clock.
2. Setting JCLK1 1-2 closed is for 100MHz or 133MHz CPU.
3. Setting JCLK1 2-3 closed is for 166MHz or 200MHz CPU, 100MHz or 133MHz CPU will fail to boot herewith.
4. If 100MHz or 133MHz CPU fails to boot system, you should excute the nVIDIA-Boot-Failure-Restart Procedure to reboot system.

JCLK1: CPU Clock Select	
(default)	
	1-2 closed For 100MHz or 133MHz CPU
	2-3 closed For 166MHz or 200MHz CPU

nVIDIA Boot-Failure-Reboot Procedures:

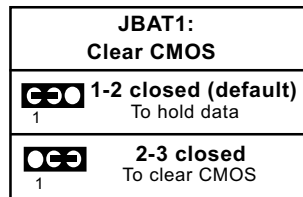
Whenever nVIDIA system fails to boot (including overclock and non-overclock cases), it requires a more guaranteed Reboot Procedure to restart system.

- (1) To reboot nVIDIA system, users should first power off the system.
- (2) If a “CPU Clock Select” Jumper is on board, restore this jumper setting to default setting.
- (3) Execute the “Clear CMOS” procedures with “Clear CMOS” Jumper.
- (4) Then press down “Insert” key of the keyboard before pressing down Power Button to start system. Do not release Insert Key until you can see the initial bootup screen appear.
- (5) In some “overclocking cases by BIOS Setup”, if system still cannot boot up with the above 4 steps, please remove the on-board battery from the battery-socket and unplug the power cord as well. Keep the battery and power cord away from system in 10 to 20 seconds so as to make sure all power residue has faded away.
- (6) After restoring the power cord and battery to system, make sure the “CPU Clock Select” Jumper is at “Default Setting” and then press the Power Button to restart system again. Please note that Step (5) will take the place of Step (3) and (4).
- (7) After starting system, users should also enter “Advanced Chipset Features” of BIOS Setup and set the “FSB Frequency” to “CPU Default” value for a guaranteed bootup. However, user can also select a higher CPU clock to try overclocking again.

2-8.3 JBAT1: nVIDIA 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 J6, please follow the steps below:

1. Power off system.
2. Set JBAT1 to Pin 2-3 closed.
3. After 3 or 5 seconds(allowing residue power to fade away), return the JBA11 setting to Pin1-2 closed.
4. To reboot the system, press down “Insert” key before pressing down Power Button. Do not release Insert key until you see the initial bootup screen.



2-8.4 Jp1: Anti-burn Shield (ABSII)

Jp1 is designed to enable the overheat safeguard for some CPUs which are incorporated with a protective thermal diode. The latest AMD Athlon XP and Duron Morgan CPUs are incorporated with such thermal diode and can be protected by this JUMPER SETTING. Setting Jp1 1-2 closed (default setting) will get system shutdown when the above-mentioned CPUs get to 75°C (the default protection temperature.) Only when CPU returns to a cooler state can you restart your system.



Jp1: Anti-burn Shield (ABSII) (Overheated CPU Shutdown) (only for Athlon XP/ Duron Morgan)	
 1	1-2 closed (default) To enable overheated CPU (75°C) shutdown function
 1	2-3 closed To disable overheated CPU shutdown function

For other CPUs that are not incorporated with a protective thermal diode, please set Jp1 2-3 closed to disable the function because it is vain now.

Reminder: If a sudden shutdown happens to your system which has been running well for a while with an AMD Athlon XP/ Duron Morgan CPU, this might be caused by the “Overheated CPU Shutdown” design. Please use a better CPU cooling fan and restart your system.

2-8.5 JKB1: KB/Mouse Wake Up

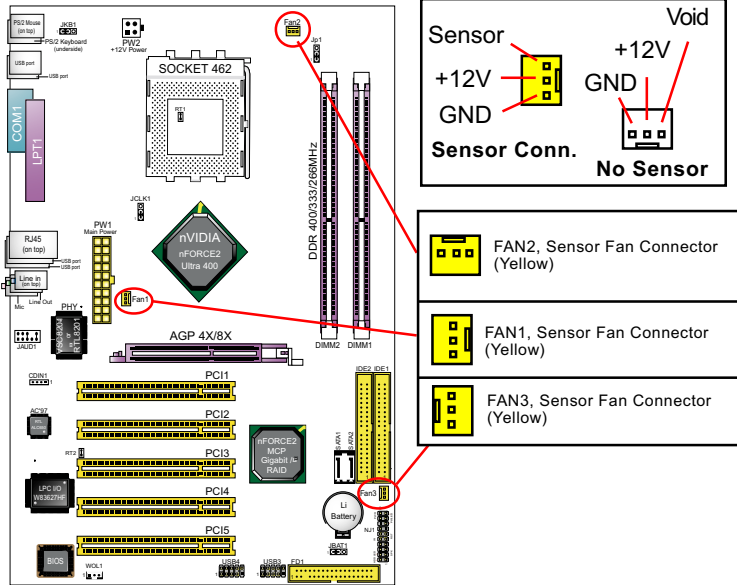
JKB1 is designed on board as a jumper to enable/disable the PS/2 keyboard/mouse Wake Up from system off or suspend mode. Yet users should still enter BIOS setup to choose the Wake Up/ Power On mode. USB keyboard/mouse Wake Up function is not supported in this board.

JKB1: Keyboard/Mouse Wake Up	
 1	1-2 closed (default) Keyboard/Mouse Wake Up Disabled
 1	2-3 closed Keyboard/Mouse Wake Up Enabled

2-9 Other Connectors Configuration

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

2-9.1 Onboard FAN Connectors



Both Sensor and No-sensor Fan Connectors support CPU/AGP/System/Case cooling fan with +12V mode. When connecting the wire to any Fan Connector, user should make sure that the red wire is for the positive current and should be connected to pin +12V, and the black wire is Ground and should be connected to pin GND. A Hardware Monitor chipset is on board, with which user can install a Hardware Monitor Utility and read the fan speed transmitted from the sensor fan connector. Otherwise, user can read the fan speed from the “SmartDoc Anti-Burn shield” in CMOS BIOS.

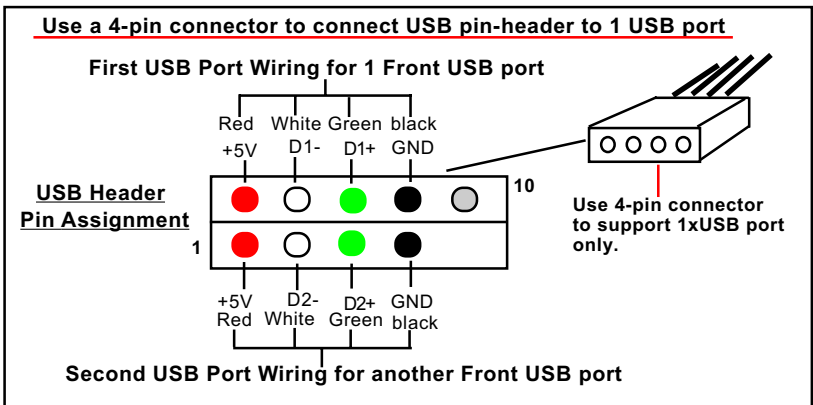
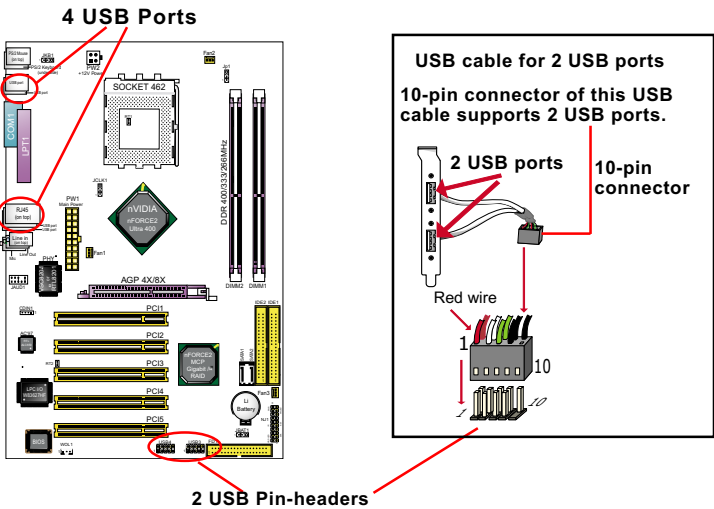
A running fan will send out 2 electric pulses per rotation of its fan blade to a Sensor Fan Connector which in turn will count the electric pulses and send the information to the System Hardware Monitor. The hardware Monitor Program will work out the fan rotation speed and display it on screen.

2-9.2 USB Ports and USB Pin-headers

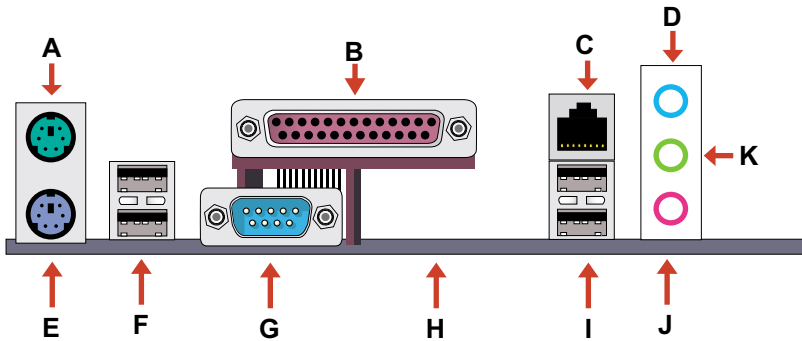
This series provides four USB ports USB0 to USB3 on board supporting various USB devices. In addition, two USB pin-headers are added on board to provide expansion of four more optional USB ports by using two additional USB Cables. Users can order the optional USB cables from your mainboard dealer or vender.

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 98 and up . USB 1.0 / 2.0 drivers are provided in Support CD for user's installation.



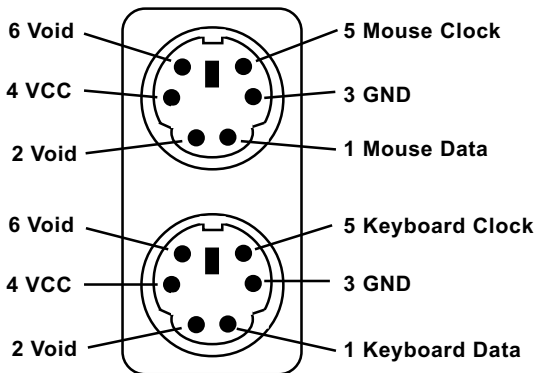
2-9.3 Back Panel Connectors



- | | |
|---|---|
| A : PS/2 Mouse | G : COM1 Connector |
| B : LPT1 Port | H : Not available |
| C : RJ45 | I : 2 USB ports |
| D : Line in/
Rear Speaker Out | J : Microphone Input /
Center Subwoofer Out |
| E : PS/2 Keyboard | K : Line Out /
Front Speaker Out |
| F : 2 USB ports | |

2-9.4 PS/2 Mouse And PS/2 Keyboard

PS/2 Mouse Connector (green, on top)



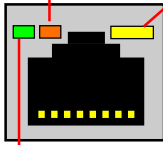
PS/2 Keyboard Connector (purple, underside)

2-9.5 LAN Connector

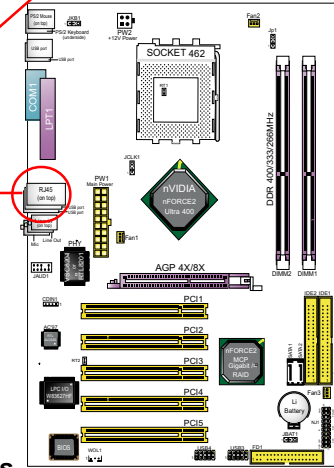
One RJ45 connector is on board for network connection.

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.

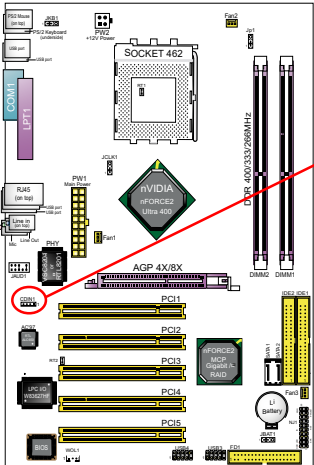



Green LED blinks to indicate that data transmission is undergoing in 10/100 Base T mode.



2-9.6 CD-ROM Audio Connectors

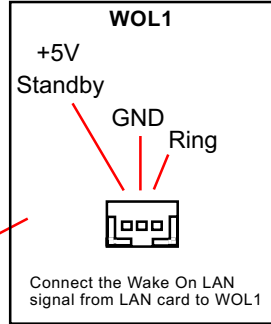
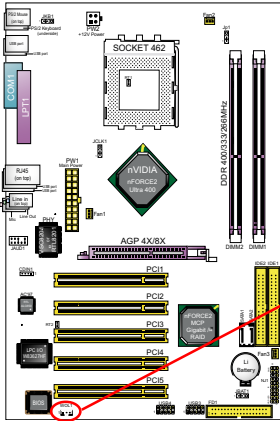
CDIN1 is an audio connector connecting CD-ROM audio to mainboard.



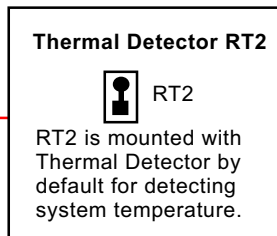
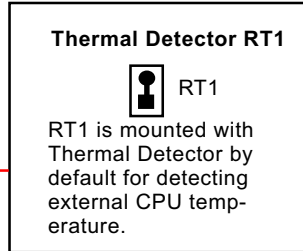
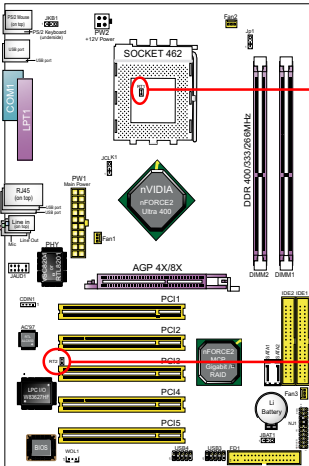
CD-ROM Audio Connector	
CDIN1 	Pin Signal
Pin 1	Left Channel
Pin 2	GND
Pin 3	GND
Pin 4	Right Channel

2-9.7 Wake On LAN Connector:

1. This connector connects to a PCI LAN card with a Ring signal output. The connector powers up the system when it receives a wake-up packet or signal through the LAN card.
2. This feature requires that Resume On Ring feature is enabled in the BIOS setting “Power Management Setup” and that your system must be on ATX power supply with at least 720mA / +5V standby power.

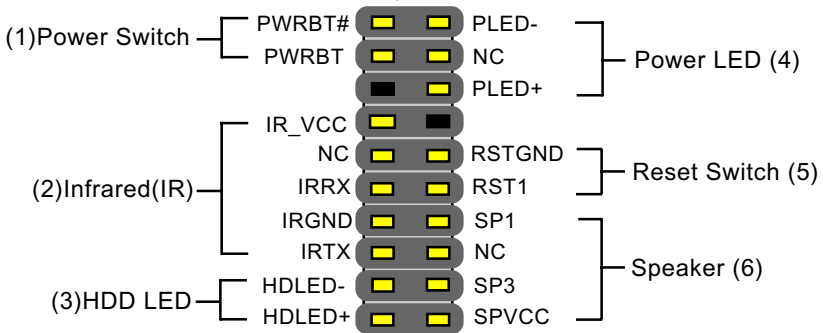
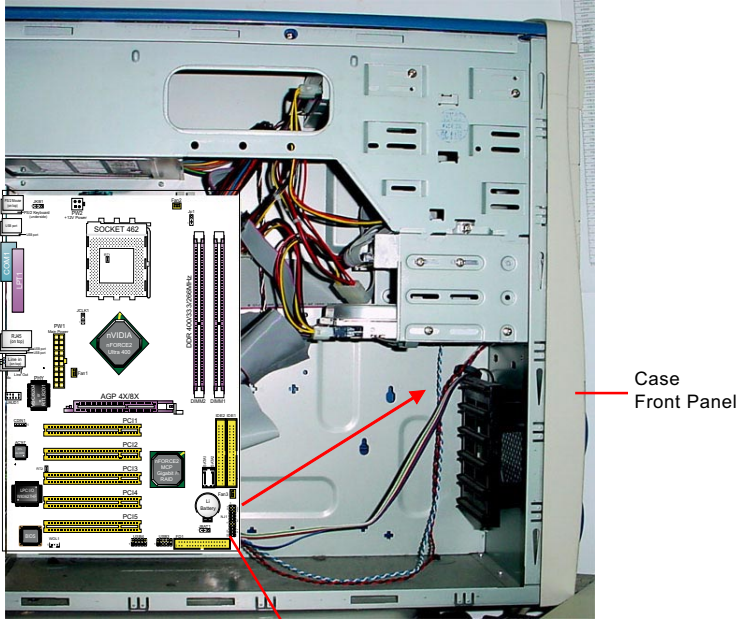


2-9.8 Thermal Detectors



2-9.9 Complex Pin-header (Front Panel Connectors)

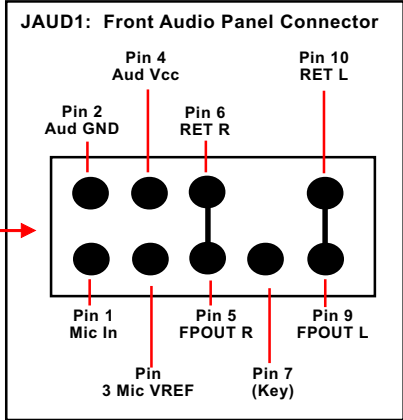
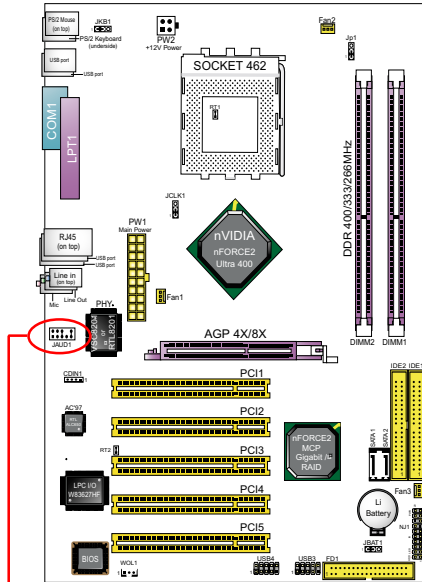
This complex Pin-header consists of the following connectors for various front panel supports. When you have fixed the mainboard to the case, join the connectors of this Complex Pin-header to the case Front Panel.



2-9.10 Front Panel Audio Connector

This Mainboard is designed with a Front Panel Audio connector “JAUD1” which provides connection to your chassis.

1. When JAUD1 is set to 5-6 closed and 9-10 closed, this default setting disables this connector and leaves the Back Panel Audio enabled.
2. To use this Front Panel Audio Connector, please open all pins of JAUD1 and connect it to your PC Front Panel.



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 98SE, Windows ME, Windows 2000 and Windows XP. And installation on Windows XP as the general illustration example hereby.

3-1 To Open up the Support CD	37
3-2 To Install DirectX9	38
3-3 To Install “nVIDIA nForce2 All-in-1 Driver”	39
3-4 To Verify 6-channel Audio Configuration	40
3-5 To Install Hardware Monitor Utility	42
3-5.1 Installation	42
3-5.2 Verification	43
3-6 To Install USB 2.0 Driver for Windows 2000 or XP	44
3-7 RAID Driver Installation	45

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 automatically 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. We should take “nVIDIA nForce3 All in 1 Driver” as first installation priority to optimize the Intel system.
From next section, we provide detailed descriptions of all these installations with graphical illustrations.

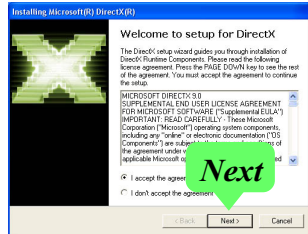
4. Drivers will be updated from time to time in our web site. If you are installing a newer driver than the one illustrated in this chapter, please be aware that the illustration pictures might be different.

3-2 To Install DirectX9

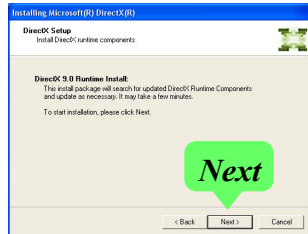
Please open the Support CD with your CD-ROM to enter the Main Installation Menu.

Then click to “Install DirectX9”. DirectX 9 should be installed before installing other drivers.

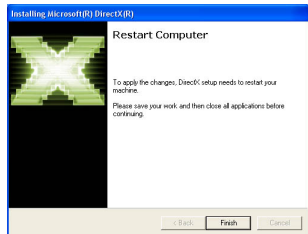
1. When the screen of “Installing Microsoft DirectX ” appears, please select “ I accept the agreement” and press “Next” button to continue.



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 restart your system.

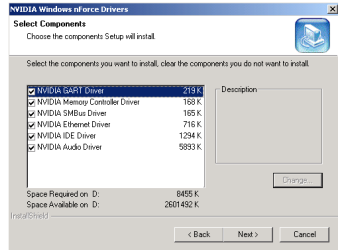


3-3 To Install “nVIDIA nForce2 All-in-1 Driver”

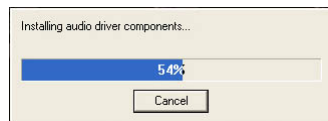
1. Before opening the Support CD, please update Windows 2000 or Windows XP with the latest Service Pack. Otherwise, the installation of USB2.0 driver will not take effect.
2. Following the procedures of opening the Support CD, click to “Install nVIDIA nForce2 All-in-1 Driver” to proceed.



3. The nVIDIA InstallShield Wizard will pop up to guide you to set up nForce2 Drivers. This All-in-1 Driver will first start to install (1) GART Driver, and then (2) Memory Controller, (3) System management Bus driver, (4) LAN driver, (5) IDE Driver and (6) Audio driver.



4. In a few seconds, Audio Driver is in setup progress.



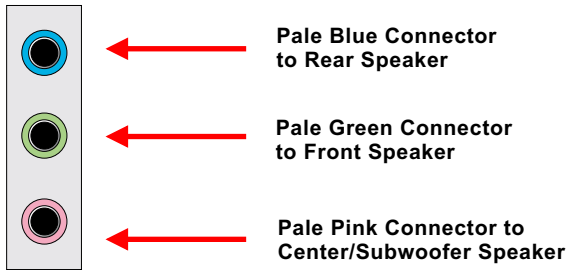
5. After all the setup processes are finished, please restart your computer by clicking on “Finish” so as to put the just installed drivers into effect.



3-4 To Verify 6-channel Audio Configuration

After installation of AC'97 6-channel Codec, you must configure the 5.1 Speaker connection to enable the 6-channel audio.

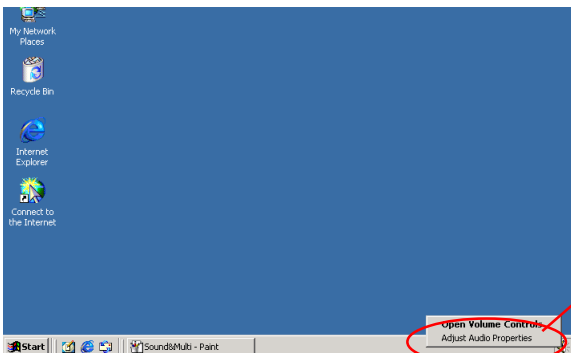
1. Connect your on-board Audio Connector to your 6-channel speakers as depicted in the figure below:



2. After Connection is done, start your Windows system and right click the Speaker icon to enter nVidia 6-channel configuration:

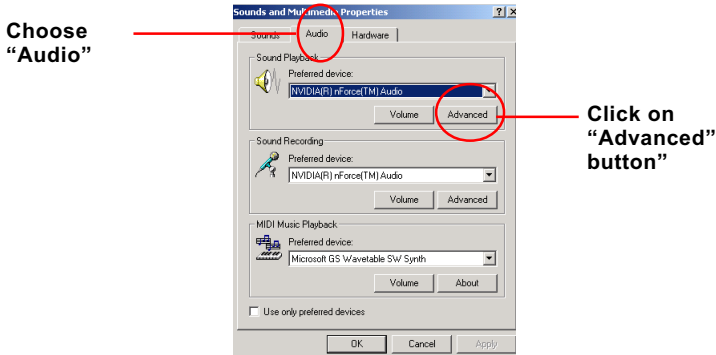


Right Click

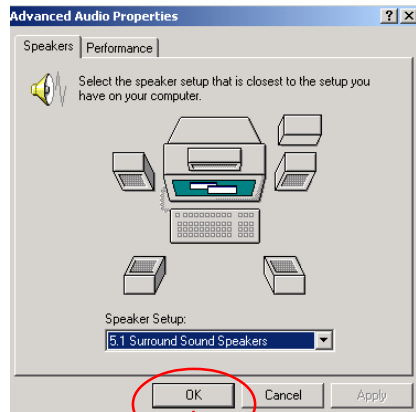
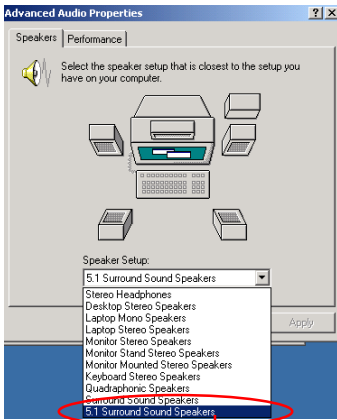


Click on "Adjust Audio Properties"

3. Again click “Advanced” button to enter 6 channel configuration.



4. Instantly, the “Advanced Audio Properties” screen will pop out. Pick the items “5.1 Surround Sound Speakers” and then click on “OK” button to enable the 6-channel speakers configuration.



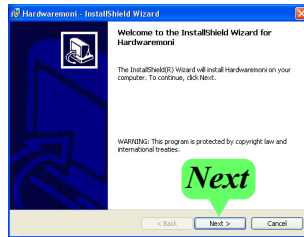
3-5 To Install Hardware Monitor Utility

3-5.1 Installation

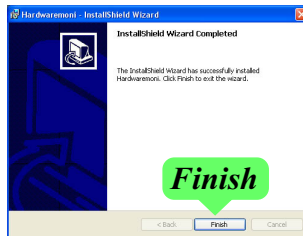
Hardware Monitor is built on this mainboard. Its installation is programmed to a fully automated mode on Windows 9X/Me/2000/XP. Users can follow the model installation below for its installation on various Windows System.

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

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

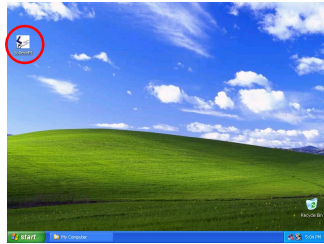


3. In a few seconds, installation completes. After all the setup process is finished, click “Finish” to exit the wizard.



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.

The screenshot shows the Soltek Hardware Monitor software interface, which is designed to look like a futuristic handheld device. It displays various system metrics:

- TEMPERATURE:** CPU Die (40), ABS II (47), RT2 (29).
- FAN TACHOMETER:** Fan 1 (not found), Fan 2 (6730), Fan 3 (not found).
- VOLTAGE:** CPU Voltage (1.712), DRAM Voltage (2.512), 3.3V (1.298), 5V (4.919), 12V (12.098), -12V (-11.944), 5VSB (4.914), Battery (7.080).
- Buttons:** About SoltekHM, Hide, Exit.
- LED:** Status-Warning LED.

Callout boxes provide additional information:

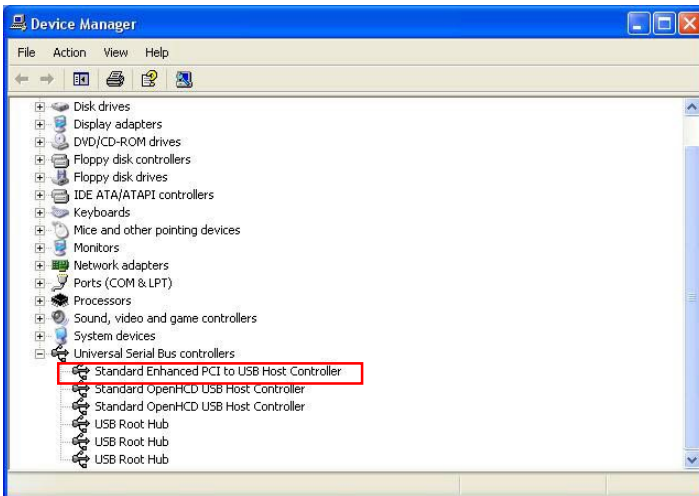
- Showing the temperature(s), the function of which is supported by the mainboard.
- Showing the Fan Speed(s) that is supported by the mainboard.
- Click on “Soltek” button to display the function menu.
- Showing the Voltage(s) that is supported by the mainboard.
- Status-Warning LED

*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.

3-6 To Install USB 2.0 Driver for Windows 2000 or 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 . Users should install the latest Service Pack for Windows 2000 or Windows XP. Please note that USB2.0 does not support windows 9X on nVidia mainboard.

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.



3-7 RAID Driver Installation

1. RAID Driver should be installed into a RAID system. That is, user should first configure a RAID system and then install the RAID driver into it.
2. Chapter 5 of this User Manual introduces the configuration of RAID system and then the installation of RAID Driver. Please refer to Chapter 5 for the RAID Driver installation.

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 updates 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 **awdf flash *.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, please retry the process. Please DO NOT turn off the system before updating the BIOS successfully.

Step 6. At rebooting system, press 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 programming

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

BIOS Update Illustration:

- (1) Executing the “awdf flash.exe k8AV2008.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 K8T800-8237-6A7L0SAAC-00 Date: 09/18/2003 File Name to Program : K8AV2008.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 K8T800-8237-6A7L0SAAC-00 Date: 09/18/2003 File Name to Program : K8AV2008.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 K8T800-8237-6A7L0SAAC-00 Date: 09/18/2003 File Name to Program : K8AV2008.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 K8T800-8237-6A7L0SAAC-00 Date: 09/18/2003 Flash Type - SST 39SF020 /5V File Name to Program : k8av2008.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 K8T800-8237-6A7L0SAAC-00 Date: 09/18/2003 Flash Type - SST 39SF020 /5V File Name to Program : k8av2008.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

This mainboard comes with the AWARD BIOS from AWARD Software Inc. Enter the CMOS Setup Utility Main Menu by:

1. Turn on or reboot your system. After a series of diagnostic checks, the following message will appear:

PRESS TO ENTER SETUP

2. Press key and the main program screen will appear as follows.

Phoenix - AwardBIOS CMOS Setup Utility

<ul style="list-style-type: none">▶ Standard CMOS Features▶ Advanced BIOS Features▶ Advanced Chipset Features▶ Integrated Peripherals▶ Power Management Setup▶ PnP/PCI Configurations▶ SmartDoc Anti-Burn Shield	<ul style="list-style-type: none">▶ CPU Ratio/Voltage ControlLoad Optimized DefaultsSet Supervisor PasswordSet User PasswordSave & Exit SetupExit Without Saving
Esc: Quit	
F10: Save & Exit Setup	
↑↓←→ : Select Item	
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. A screen with a list of options will appear:

**Phoenix - AwardBIOS CMOS Setup Utility
 Standard CMOS Features**

Date (mm:dd:yy)	Fri, Sep 5 2003	Item Help
Time (hh:mm:ss)	9 : 41 : 11	
▶ IDE Channel 0 Master	None	Menu Level ▶
▶ IDE Channel 0 Slave	None	
▶ IDE Channel 1 Master	None	Change the day, month, year and century
▶ IDE Channel 1 Slave	None	
▶ 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, But Keyboard	
Base Memory	640K	
Extended Memory	252928K	
Total Memory	253952K	

↑↓ ← → : 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.
 Press the left or right arrow key to move to the desired field (date, month, year). Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

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 0/1/2/3 Master / Slave This field records the specifications for all non-SCSI hard disk drives installed in your system. Refer to the respective documentation on how to install the drives.

**Phoenix - AwardBIOS CMOS Setup Utility
 IDE Primary Master**

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

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

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

▶ Removable Device Priority	Presss Enter	Item Help
▶ Hard Disk Boot Priority	Press Enter	
Virus Warning	Disabled	Menu Level ▶
CPU Internal Cache	Enabled	
External Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Removable	
Second Boot Device	Hard Disk	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
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

Removable Device Priority Press <Enter> to reveal all the Removable Device installed in system. Then press Up/Down Arrow key to select a device, and then press<+>/<-> key to move it up or down the list so as to set up the priority.

Hard Disk Boot Priority Press <Enter> to reveal the hard disk list. Then press Up/Down Arrow key to select a hard disk, and then press<+>/<-> key to move it up or down the list so as to set up the boot priority.

Virus Warning To enable/disable the virus warning feature for IDE Hard Disk boot sector. If enabled, BIOS will show a warning message on screen whenever writing data to this area is detected.

- 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.
- 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 Boot Device** To select a device from the device list installed in system as the first boot device.
- Second/Third/Boot Other Device** The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The choices: Floppy; LS120; ZIP100; HDD; CDROM; USB-FDD; USB-ZIP; USB-CDROM; 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.

- Gate A20 Option** Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to *Fast*, the system chipset controls Gate A20. When set to *Normal*, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to *Fast* improves system speed, particularly with OS/2 and Windows.
- 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.
- X 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.
- X 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(default)
- APIC Mode** 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.
Choices: Non-OS2; OS2

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
System Performance	Optimal	
FSB Frequency	133 MHz	
x CPU Interface	optimal	
Memory Frequency	By SPD	
Resulting Frequency	200MHz	
x Memory Timings	optimal	
x T(RAS)	8	
x T(RCD)	3	
x T(RP)	3	
x CAS Latency	3.0	
Memory Auto Precharge	Enabled	
FSB Spread Spectrum	Disabled	
AGP Spread Spectrum	Disabled	
AGP Aperture Size (MB)	64M	
AGP Frequency	Auto	
AGP 8X Support	Enabled	
AGP Fast Write Capability	Enabled	
System BIOS Cacheable	Disabled	
Video RAM Cacheable	Disabled	
Special I/O for PCI Card	Disabled	
x Base I/O Address	0000	
x I/O Length	2 Byte	
USB2.0 HDD	Disabled	
		Menu Level ►

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

System Performance

Allows you to select a system performance mode.
Choices: Optimal; Aggressive; Turbo; Expert

Optimal: Using the most stable settings

Aggressive: Using the overclocked settings for higher performance but with higher risk of stability

Turbo: Using the overclocked settings for higher performance but with still higher risk of stability.

Expert: Using full customization of performance options, advanced users only.

FSB Frequency

To select an FSB for the CPU on board in accordance with the System Performance setting.
Choices: 100MHz; 133MHz;
166MHz (for 166MHz CPU only);
200MHz (for 200MHz CPU only)

X CPU Interface

This option appears when "System Performance" is set at "Expert".
Choices: Optimal; Aggressive

Memory Frequency

This item allows you to set the Memory Frequency mode.
Choices: By SPD; Auto

Resulting Frequency

This item is to show the current DRAM Frequency.

X Memory Timing

This value will change when the setting of "System Performance" is at Expert.
Choices: Optimal; Aggressive; Turbo; Expert

X T(RAS)

This value appears when "Memory Timing" is set at "Expert".
Choices: 1~15

X T(RCD)

This value appears when "Memory Timing" is set at "Expert".
Choices: 1~7

X T(RP)

This value appears when "Memory Timing" is set at "Expert".
Choices: 1~7

X CAS Latency

This value appears when "Memory Timing" is set at "Expert".
Choices: 2.5; 3.0

Memory Auto Precharge Allows you to enable / disable the Memory Auto-precharge function.

FSB Spread Spectrum Allows you to enable / disable FSB Spread Spectrum.

AGP Spread Spectrum Allows you to enable / disable AGP Spread Spectrum.

- AGP Aperture Size** Series of options are available: 32, 64, 128, 256 or 512 MB. 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. The default setting is 64MB.
- AGP Frequency** Allows you to adjust the working frequency of an AGP card. The default AGP Frequency is 66MHz. Choices: Auto, 50MHz ~ 100Mhz
- AGP 8X Support** Allows you to enable(default) / disable AGP 8X mode.
- AGP Fast Write Capability** This item will enable the AGP mode into fast write mode. If your graphics card does not support this function, please do not enable this function.
- System BIOS Cacheable** Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFFh, resulting in better system performance.
- Video RAM Cacheable** Selecting Enabled allows caching of the video memory (RAM) at A0000h-AFFFFh, resulting in better video performance. However, check your AGP manual to find out if any compatibility problem exists.
- Special I/O for PCI Card** To enable/disable the Special I/O for PCI card.
- x Base I/O Address** If Special I/O is enabled, use this item to set the Base I/O address between 0000 and FFFF (by keying in a Hex. number).
- X I/O LENGTH** IF Special I/O is enabled, use this item to set the I/O length.
Choices: 2byte; 4 Bytes; 8 Bytes; 16 Bytes
- USB20 HDD** Allows you to enable/ disable USB 2.0 Hard Disk.

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**

	Press Enter	Item Help
▶ IDE Function Setup	Enabled	
OnChip IDE Channel0	Auto	
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	Enabled	
SATA Spread Spectrum	Disabled	
AC97 Audio	Auto	
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 Rx/D , Tx/D 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	EPP1.9	
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

► IDE Function Setup

IDE RAID	Disabled	Item Help
IDE Channel 0 Master RAID	Disabled	Menu Level ► To auto-detect the HDD's size, head... on this channel
IDE Channel 0 Slave RAID	Disabled	
IDE Channel 1 Master RAID	Disabled	
IDE Channel 1 Slave RAID	Disabled	
SATA Primary Master RAID	Disabled	
SATA Secondary Master RAID	Disabled	

IDE Function Setup:

To press< Enter > on this option will reveal the following items.

IDE RAID To enable / disable IDE RAID feature.

IDE Channel 0 / 1 Master/Slave RAID If IDE RAID is enabled, to enable/disable IDE channel 0/1 RAID setup.

SATA Primary/Secondary Master RAID If IDE RAID is enabled, to enable/disable SATA Primary/Secondary Master RAID setup.

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.

The choices: Enabled(default); Disabled

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.

The choices: Auto(default); Mode 0; Mode 1; Mode 2; Mode 3; Mode 4

- Primary 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.
The choices: Auto; Disabled
- 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.
The choices: Auto; Disabled
- 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.
The choices: Enabled; 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.
- OnChip USB** Allows you to select the USB transfer rate mode. Usually USB2.0 is up to 480Mb/s, while USB1.1 is up to 12Mb/s.
Choices: Disabled, V1.1+V2.0, V1.1
- USB KB Storage Support** To enable/disable the USB Keyboard/Storage device support.
- USB Mouse Support** To enable/disable the USB Mousesupport.
- Serial-ATA** To enable/disable the Serial ATA support.
- SATA Spread Spectrum** To enable/disable the Serial ATA Spread Spectrum.
- AC97 Audio** Select "Enabled" to use the on-chip audio capability of your system. Most of the field do not appear when this field is "Disabled", for user who wants to use add-on sound card, this item must be disabled.
- MAC LAN(nVIDIA)** This option allows you to enable/disable the Onboard LAN Controller.
The choices: Auto; Disabled

- IDE DMA transfer access** To enable/disable the IDE DMA transfer access function.
- IDE HDD Block Mode** Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support.
Choices: Enabled; Disabled
- 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
- X KB Power On Password** 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
- X 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.
The 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; IrDA; ASKIR

- X 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
- X IR Transmission Delay** When UART Mode is selected in IrDA or ASKIR mode, it allows you to enable / disable IR Transmission Delay.
- X 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.
The choices: Half; Full
- X 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; Rx2, Tx2
- 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; EPP; ECP; ECP+EPP; Normal
- X EPP Mode Select** Select EPP Mode when you choose EPP or ECP+EPP mode in the Parallel Port Mode.
Choices: EPP1.7; EPP1.9
- X 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; On

4-6.6 Power Management Setup

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

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

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

	Item Help
ACPI function	Enabled
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
Power-On by Alarm	Disabled
x Day of Month Alarm	0
x Time(hh:mm:ss) of Alarm	0 : 0 : 0

↑↓↔← : 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 NT 5.0 (Windows 2000) supports ACPI.

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

Power Management Option To select the type (or degree) of power saving for Doze, Standby, and Suspend modes.
Choices: User Define:- Time length defined by user;
Min Saving:- Minimum power saving mode;
Max Saving: Maximum power saving mode;

Video Off Method To set the manner by which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes 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.

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.

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.

Power-On by Alarm Allows you to enable / disable(default) the Power-On by Alarm function.

X 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: 1 ~ 31

X Time of Alarm (Hour / Minute / Second) If Resume On Power-On by Alarm is enabled, this field allows you to set Alarm Hour, Minute and Second.
Hour Choices: 00 ~ 23
Minute Choices: 00 ~ 59
Second Choices: 00 ~ 59

4-6.7 PnP / PCI Configuration

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

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

Reset Configuration Data	Disabled	Item Help
Resources Controlled by x IRQ Resources	Auto(ESCD) Press Enter	
PCI/VGA Palette Snoop	Disabled	
PCI SLOT1/5 IRQ Assigned	Auto	
PCI SLOT2 IRQ Assigned	Auto	
PCI SLOT3 IRQ Assigned	Auto	
PCI SLOT4 IRQ Assigned	Auto	

↑↓←→: 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 Normally, you leave this Disabled(default). 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 conflict that the operating system 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*, 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).

X IRQ Resources If Resources Controlled by "Manual", press Enter to set up the IRQ Resources mode
 Choices: PCI Device; Reserved

IRQ Resources

IRQ Resources		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.

PCI Slot1/5 IRQ Assigned Typically for Slot1/5 assigned to typical IRQ.
 Choices: Auto; 5; 7; 9; 10; 11; 12; 14; 15

PCI Slot 2/3/4 IRQ Assigned Typically for PCI 2/3/4 assigned to typical IRQ.
 Choices: Auto; 3; 4; 5; 7; 9; 10; 11; 12; 14; 15

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**

Shutdown by ABSII 75°C / 167°F System Temp. 25°C / 75°F CPU External Temp. 46°C / 114°F FAN1 Speed 5232 RPM FAN2 Speed 0 RPM FAN3 Speed 0 RPM CPU Vcore 1.79 V 3.3V 3.26 V +5V 5.02V +12V 11.75V -12V -11.74V -5V -5.25V VBAT(V) 3.0V 5VSB(V) 5.05V	Item Help
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↑↓←→: Move Enter: Select +/-/PU/PD: Value F10: Save Esc: Exit F1: General Help
 F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Shutdown By ABS II (for AMD XP/Duron Morgan) This item will appear if AMD XP or Duron Morgan CPU is running on board. ABS II (Anti-burn Shield II) allows user to set up the shutdown temperature for the CPU. Usually, a jumper is also designed on board for enabling/disabling ABS II function.
 Choices: 75°C / 167°F(default); 80°C / 176°F
 85°C / 185°F; 90°C / 194°F
 95°C / 203°F; 100°C / 212°F

System Temp. Shows current system temperature.

CPU External Temp. Shows current CPU external temperature.

FAN 1/2/3 Speed These fields display the current speed of the CPU / System fan.

CPU Vcore Shows CPU core actual voltage value.

3.3V, +5V, +12V, -12V, -5V, 5VSB Shows actual voltage value of all these default voltage value on board.

VBAT Shows voltage value of the battery on board.

4-6.9 CPU Ratio/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	Default
CPU Vcore Select	Default
AGP Voltage Select	1.5V
DIMM Voltage Select	2.5V
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 To choose CPU frequency ratio.
 Choices: Startup; X4 ~ X20 with 200MHz

CPU Vcore 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; 1.100V ~ 1.850V in 0.025V stepping

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

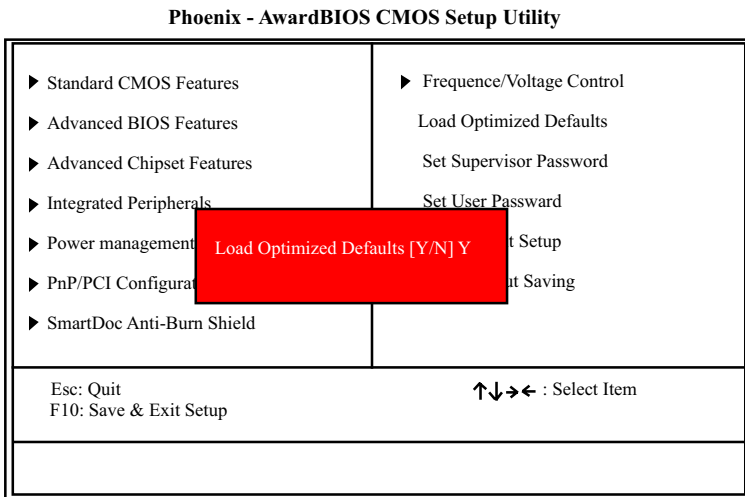
DIMM Voltage Select Allows you to configure the DIMM Voltage.
 Choices: 2.6V; 2.7V; 2.8V

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

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 "`



"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.

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.

EPP Mode Select Select EPP Mode when you choose EPP or ECP+EPP mode in the Parallel Port Mode.
Choices: EPP1.7; EPP1.9

4-6.12 Save and 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 .

Memo

Chapter 5 RAID Setup

THE nVIDIA SATA RAID Controller & RAID Driver

RAID (Redundant Array of Independent Disks) Controller is built in the South Bridge nForce2 MCP-Gigabit/RAID. With this RAID Controller, the SATA RAID BIOS is built into the system to help configure the Redundant Disk Array.

This Chapter is to introduce RAID Configurations :

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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 Supported by nForce2 MCP-Gigabit/RAID

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.

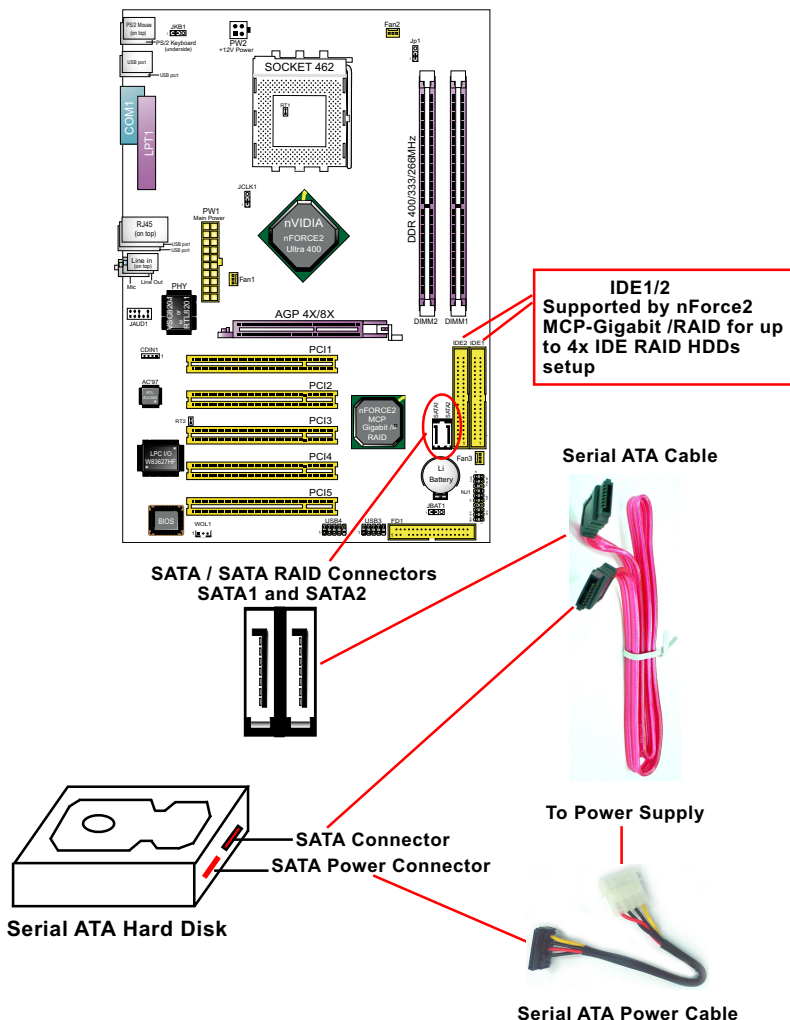
3. RAID 0+1 (Stripe Mirroring):

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 drive to set up the RAID 0+1 configuration.

5-1 First Step to Set Up SATA RAID/PATA RAID

2 Serial ATA connectors are built on board, supported by the South Bridge nForce2 MCP-Gigabit/RAID with SATA RAID interface. We can connect these two connectors to SATA Hard Disks and then configure these Hard Disks as SATA RAID Disks.

IDE1 and 2 are also supported by nForce2 MCP-Gigabit/RAID for up to 4x IDE RAID HDDs setup.



5-2 Enable SATA-RAID Interface with System BIOS

(1) As soon as you boot SL-75FRN3-GR/RL system, please press Delete key to enter BIOS Setup. Choose “Integrated Peripheral” and “IDE Function Setup”. As soon as you click on the “IDE Function Setup”, a list of events appears for you to configure their values. Choose “Enabled” for the “IDE RAID” so as to enable the SATA RAID interface and then follow the guidelines shown given below to configure the RAID mode you need:

1. If you want to configure a RAID system with 2 IDE channels, so ENABLE the “IDE Channel 0/1”.
2. If you want to configure a RAID system with SATA interface, so ENABLE the SATA Primary/Secondary Master RAID”.
3. If you want to configure a RAID system with both IDE RAID and SATA RAID, so ENABLE all the IDE channels and SATA channels.

IDE Function Setup (in Integrated Peripherals)

IDE RAID	Disabled	Item Help
x IDE Channel 0 Master RAID	Disabled	
x IDE Channel 0 Slave RAID	Disabled	
x IDE Channel 1 Master RAID	Disabled	
x IDE Channel 1 Slave RAID	Disabled	
x SATA Primary Master RAID	Disabled	
x SATA Secondary Master RAID	Disabled	

Enable these items for RAID mode selection..

First Enable this item for RAID system configuration.

(2) After BIOS Setup, restart system to enter the RAID Setup Utility. As soon as you see the following screen during restarting system, press F10 hot key to enter RAID Setup Utility.

NVIDIA RAID IDE ROM BIOS 4.40
Copyright (C) 2003 NVIDIA Corp.

Detecting Array

Press F10 to enter RAID Setup utility

5-3 To Configure RAID with nVidia RAID Setup Utility

As soon as you press the F10 hot key, nVidia RAID Utility appears:

NVIDIA RAID Utility Apr 27 2004
 - Define a New Array -

RAID Mode: Mirroring		Striping Block: optimal		
Free Disks		Array Disks		
<u>Loc</u>	<u>Disks Model Name</u>	<u>Loc</u>	<u>Disks Model Name</u>	
0. 0. M	ST380023AS			
0. 0. S	Maxtor 9834002			[-->] Add
1.0.M	ST380023AS			
1.1.M	Maxtor 9834002			[<--] Del
<div style="background-color: #90EE90; padding: 5px; border: 1px solid black; display: inline-block;"> These Hard Disks are detected by RAID BIOS. </div>				
[F6] Back [F7] Finish [Tab] Navigate [↓ ↑] Select [ENTER] Popup				

5-4 To Select RAID Mode in RAID Setup Utility

Press the Right Arrow key to move the free HardDisks for configuration. Then press Enter to pop out the Mode menu. Now select a mode for your RAID Array.

NVIDIA RAID Utility Apr 27 2004
 - Define a New Array -

RAID Mode: Mirroring		Striping Block: optimal	
Free Disks		Array Disks	
<u>Loc</u>	<u>Disks</u>	<u>Loc</u>	<u>Disks Model Name</u>
		0. 0. M	ST380023AS
		0. 0. S	Maxtor 9834002
		1.0.M	ST380023AS
		1.1.M	Maxtor 9834002
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Mirroring Striping Stripe Mirroring Spanning RAID 3 RAID 5 </div>			
[F6] Back [F7] Finish [Tab] Navigate [↓ ↑] Select [ENTER] Popup			

5-5 After Selecting RAID Mode, Clear disk Data?

After selecting RAID mode, press F7 to finish mode-selection. Then a dialog box appears. Press Y to clear data in the RAID hard disks, or press N to hold data.

NVIDIA RAID Utility Apr 27 2004
- Define a New Array -

RAID Mode: Stripe Mirroring Striping Block: optimal

Free Disks		Array Disks	
Loc	Disks Model Name	Loc	Disks Model Name
			ST380023AS
			Maxtor 9834002
			ST380023AS
			Maxtor 9834002

Clear Disk Data?

[Y] Yes [N] No

[<-] Del

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

5-6 Finishing RAID Mode Setup

After pressing Y or N, the just-configured Array List pops out. You can now press [Ctrl-X] to exit.

NVIDIA RAID Utility Apr 27 2004
- Array List -

Boot	Id	Status	Vendor	Array Model Name	
BBS	4	Healthy	nVidia	RAID 0+1	6.33G

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

5-7 Install nVIDIA RAID Driver for Windows 2000/XP

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

When installing Win2K/XP, you will be prompted to insert the RAID Driver Diskette into Drive A. If you cannot find the RAID diskette provided by the Mainboard dealer, please make one by yourself. The path to find out the RAID Drivers for the floppy diskette is:

Driver Support CD/Utility/RAID Diskette

Load all the files of "RAID Diskette" folder into the floppy diskette and you make a RAID Driver Diskette by yourself now.

(Of course, if you do not have a PC system at hand to copy files into a floppy diskette, you should then first install a PC system without RAID for the subsequent floppy diskette operation.)

Now let us start to install the OS with RAID:

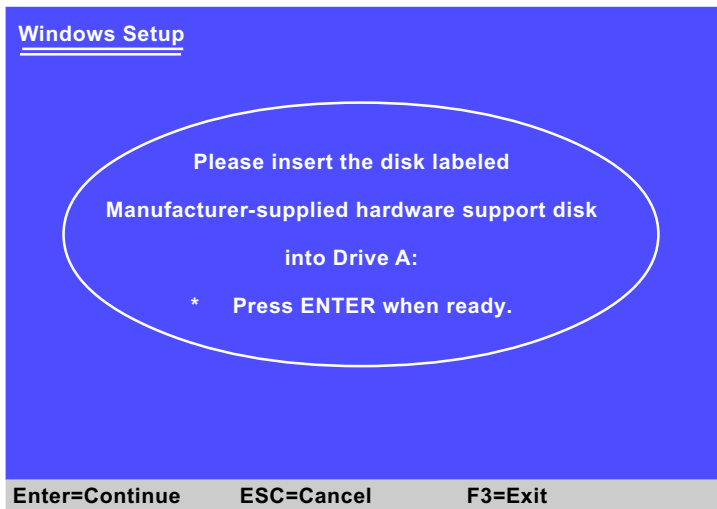
- (1) Get ready the Floppy Diskette holding the RAID Driver.
- (2) Check that Hard Disks are connected properly to RAID connectors.
- (3) Power on your PC and use RAID BIOS Setup Utility to configure RAID 0 / 1/ 0+1 to the hard disks.
- (4) Restart PC and apply the Windows 2000/XP CD to CD-ROM for operating system installation.
- (5) On the following Windows 2000/XP Setup screen, press "F6" key for RAID driver setup.



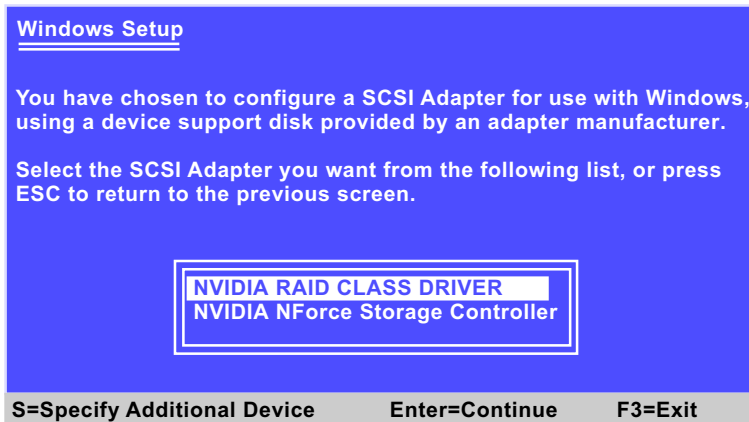
(6) On next screen press "S" to confirm the mass storage device setup.



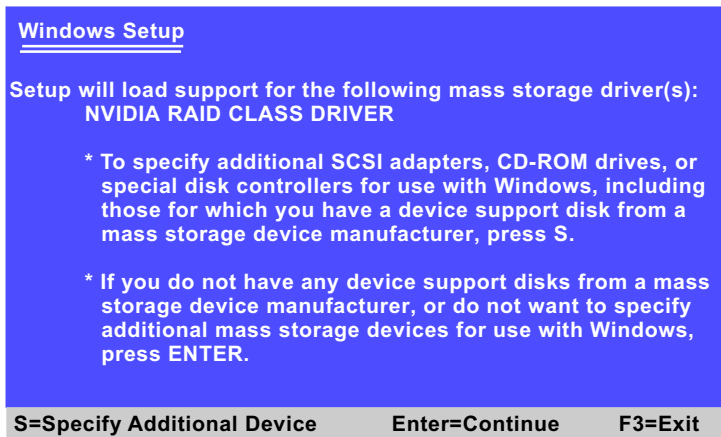
(7) On next screen appearing, insert the RAID Driver Diskette to Drive "A" and then press <Enter>.



- (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.

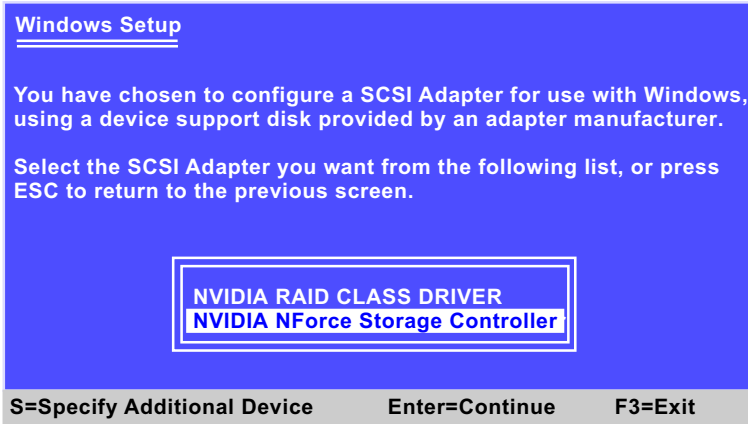


- (9) When the following screen appears , press S again to specify an additional device and press <Enter> to continue.



- (10) You will be prompted 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 prompted 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.



- (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.



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