M3N78-AM

Motherboard

E4135

First Edition V1
August 2008

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

> The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical safety

- To prevent electric shock hazard, disconnect the power cable from the electric outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

- Ensure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, ensure that all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment, Mercury-containing button cell battery) should not be placed in municipal waste. Please check local regulations for disposal of electronic products.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**
  This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

- **Chapter 2: BIOS setup**
  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

- **Chapter 3: Software support**
  This chapter describes the contents of the support CD / DVD that comes with the motherboard package.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**
   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**
   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.
<Key1>+<Key2>+<Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: <Ctrl>+<Alt>+<D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. Example: At the DOS prompt, type the command line: **afudos /i[filename]** **afudos /iM3N78AM.ROM**

M3N78-AM specifications summary

CPU	AMD® Socket AM2+ / AM2 for AMD Phenom™FX / Phenom™ / Athlon™ / Sempron™ processors Supports AMD Cool 'n' Quiet™ Technology Supports CPU up to 125W AMD64 architecture enables simultaneous 32-bit and 64-bit computing
Chipset	NVIDIA® GeForce® 8200
System bus	Up to 5200 MT/s HyperTransport™ 3.0 interface for AM2+ CPU 2000 / 1600 MT/s for AM2 CPU

Memory	Dual-channel memory architecture
	  - 2 x 240-pin DIMM slots support unbuffered ECC and non-ECC DDR2 1066 / 800 / 667 / 533MHz memory modules
	  - Supports up to 8GB system memory
	* Due to AMD CPU limitation, DDR2 1066 is supported by AM2+ CPU for one DIMM per channel only. Refer to www.asus.com for the CPU models.
	** When you install a total memory of 4GB or more, Windows® 32-bit operation system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended if you are using a Windows 32-bit operation system.
	*** Refer to www.asus.com or this user manual for the Memory QVL (Qualified Vendors List)

Expansion slots	1 x PCI Express™ (Gen2.0) x16 slot 1 x PCI Express™ (Gen2.0) x 1 slot 2 x PCI slots

Graphics	Intergrated NVIDIA® GeForce Series DirectX10 graphics processor
	  - Supports maximum shared memory up to 512MB
	  - Supports Hybrid SLI (For Windows® Vista OS only)
	  - Supports D-Sub with max. resolution up to 1920 x 1440 @ 75Hz
	* The suggested system configuration when playing HD DVD and Blu-ray disc: DDR2 800 1GB x 2 / Althon 64 x 2 4400+ / Graphics shared memory 256MB / Purevideo HD support.

Storage	1 x UltraDMA 133 / 100 connector 4 x SATA 3 Gb/s connectors with RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD configuration support
LAN	NVIDIA nForce built-in Gigabit MAC with external Realtek8211CL-GR Phy
USB	12 x USB 2.0/1.1 ports (6 ports at mid-board, 6 ports at back panel)

(continued on the next page)

M3N78-AM specifications summary

ASUS unique features	ASUS Quiet Thermal Solution:
	  - ASUS Q-Fan
	ASUS EZ DIY:
	  - ASUS CrashFree BIOS 3
	  - ASUS EZ Flash 2

Audio	ALC662 High Definition Audio 6-channel CODEC - Supports S/PDIF out interface, Jack-detect, Multi-streaming, and Anti Pop Function
Other features	ASUS MyLogo2™
Internal I/O connectors	1 x High Definition front panel audio connector 1 x IDE connector 1 x Floppy disk drive connector 1 x CD audio-in connector 1 x S/PDIF Out connector 1 x Internal speaker connector 1 x CPU fan connector 4 x SATA connectors 3 x USB 2.0 connectors for 6 additional USB 2.0 ports 1 x 24-pin EATX 12V power connector 1 x 4-pin ATX 12V power connector 1 x System panel connector
Back panel I/O ports	1 x VGA port 1 x Parallel port 1 x COM port 1 x LAN (RJ-45) port 1 x PS/2 Keyboard/Mouse Combo port 6 x USB 2.0/1.1 ports 6-channel audio I/O ports
BIOS	8Mb Flash ROM, AMI BIOS, PnP, DMI 2.0, WfM 2.0, ACPI 2.0a, SM BIOS 2.5, CrashFree BIOS3, EZ Flash2
Accessories	1 x SATA cable 1 x SATA power cable 1 x UltraDMA 133 / 100 / 66 cable 1 x I/O shield User Manual
Support DVD	Drivers ASUS PC Probe II ASUS LiveUpdate Utility Anti-Virus software (OEM version)
Form factor	uATX form factor: 9.6 in x 8.6 in

*Specifications are subject to change without notice.

This chapter describes the motherboard
features and the new technologies
it supports.

Product introduction

1

1.1 Welcome!

Thank you for buying an ASUS® M3N78-AM motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS M3N78-AM motherboard
Cables	1 x Serial ATA signal cable 1 x Serial ATA power cable 1 x Ultra DMA 133 / 100 / 66 cable
Accessories	I/O shield
Application DVD	ASUS motherboard support DVD
Documentation	User Manual

If any of the above items is damaged or missing, contact your retailer.

1.3 Special features

1.3.1 Product highlights

AMD® Socket AM2+ Phenom™ FX / Phenom CPU support

This motherboard supports AMD® Socket AM2+ multi-core processors with unique L3 cache and delivers better overclocking capabilities with less power consumption. It features dual-channel DDR2 1066 memory support and accelerates data transfer rate up to 5200MT/s via HyperTransport™ 3.0 based system bus. See page 1-10 for details.

AMD Socket AM2 Athlon™ / Sempron™ CPU support

This motherboard supports AMD Socket AM2 Athlon / Sempron processors. It features 2000/1600MT/s HyperTransport system bus, dual-channel unbuffered DDR2 800 memory support, and AMD Cool 'n' Quiet Technology. See page 1-10 for details.

AMD Cool 'n' Quiet Technology

The motherboard supports the AMD Cool 'n' Quiet Technology, which monitors system operation and automatically adjusts CPU voltage and frequency for a cool and quiet operating environment. See page 2-25 for details.

64-bit CPU support

64-bit computing, the technology to replace 32-bit architecture, delivers advanced system performance, faster memory access, and increased productivity. This motherboard provides excellent compatibility and flexibility by supporting either 64-bit or 32-bit architecture.

NVIDIA® GeForce™ 8200 chipset

The NVIDIA® GeForce™ 8200 offers the lastest support of Hybrid SLI Technology, DirectX10 graphics features, HD video playback with HDMI / DVI output. It also supports HyperTransport™ 3.0 interface, PCI Express™ 2.0 bus architecture, Serial ATA 3Gb/s devices, and is optimized with AMD's latest AM2+ and multi-core CPUs to provide excellent system performance.

Native DDR2 1066 support

This motherboard supports native DDR2 1066. It provides faster data transfer rate and more bandwidth to increase memory computing efficiency, enhancing system performance in 3D graphics and other memory demanding applications. See pages 1-14 for details.

Due to AMD CPU limitation, DDR2 1066 is supported by AM2+ CPU for one DIMM per channel only. Refer to www.asus.com for the CPU models.

PCI Express™ interface

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 1-22 for details.

PCI Express 2.0 support

This motherboard supports the latest PCIe 2.0 devices for double speed and bandwidth which enhances system performance.

6-channel High definition audio

The onboard 6-channel ALC662 High Definition audio CODEC enables high-quality audio which automatically detects peripherals plugged into the audio I/O jacks. ALC662 also supports Windows® Vista Premium. See pages 2-29 for details.

HyperTransport 3.0 Support

HyperTransport™ 3.0 (HT3.0) technology provides 2.6 times more bandwidth than HT1.0 that radically improves system efficiency for a smoother, faster computing environment.

Hybrid SLI

Hybrid SLI™ technology, based on NVIDIA's industry-leading SLI technology, delivers multi-GPU benefits when an NVIDIA motherboard GPU is combined with an NVIDIA discrete GPU.

> Visit the ASUS website at www.asus.com to download the latest Hybrid SLI driver.

Gigabit LAN solution

The on-board LAN controller is a highly integrated Gb LAN controller. It is enhanced with an ACPI management function to provide efficient power management for advanced operating systems. See page 1-24 for details.

Serial ATA 3Gb/s technology and RAID support

This motherboard supports hard disk drives based on the Serial ATA (SATA) 3Gb/s storage specifications, delivering enhanced scalability and doubling the bus bandwidth for high-speed data retrieval and save. It also supports RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD configurations for Serial ATA drives.

USB 2.0 technology

USB 2.0 is the latest connectivity standard for next generation components and peripherals. Backwards compatible with current USB 1.1 peripherals, USB 2.0 delivers transfer speeds up to 40 times faster at 480Mb/s, for easy connectivity and ultra-fast data transfers.

1.3.2   Innovative ASUS features

ASUS Q-Fan technology

ASUS Q-Fan technology intelligently adjusts CPU fan speeds according to system loading to ensure quiet, cool, and efficient operation. See page 2-35 for details.

ASUS CrashFree BIOS 3

The ASUS CrashFree BIOS 3 allows users to restore corrupted BIOS data from a USB flash disk containing the BIOS file. This utility saves users the cost and hassle of buying a replacement BIOS chip. See page 2-7 for details.

ASUS EZ Flash 2

EZ Flash 2 is a user-friendly BIOS update utility. Simply launch this tool and update BIOS from a USB flash disk before entering the OS. You can update your BIOS only in a few clicks without preparing an additional floppy diskette or using an OS-based flash utility. See pages 2-3 and 2-40 for details.

ASUS MyLogo2™

Turn your favorite photos into 256-color boot logos to personalize your system. See page 2-37 for details.

CPU Parameter Recall (C.P.R)

When the system hangs due to overclocking failure, there is no need to open the case to clear CMOS data. Just simply restart the system, the BIOS would show the previous setting and then users can amend the CPU setting again.

Green ASUS

This motherboard and its packaging comply with the European Union's Restriction on the use of Hazardous Substances (RoHS). This is in line with the ASUS vision of creating environment-friendly and recyclable products/packaging to safeguard consumers' health while minimizing the impact on the environment.

1.4   Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

⚠️

- Unplug the power cord from a power source before touching any component.

- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.

- Hold components by the edges to avoid touching the ICs on them.

- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

Onboard LED

The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

SB_PWR

ON
Standy Power

OFF
Powered Off
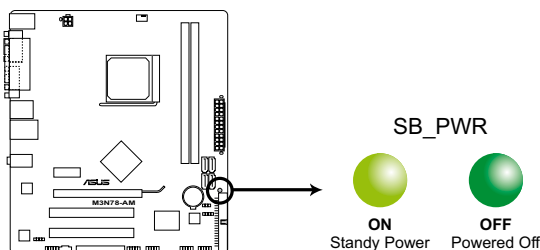
M3N78-AM Onboard LED

1.5 Motherboard overview

1.5.1 Motherboard layout

21.8cm(8.6in)

24.4cm(9.6in)

KB_USB56

ATX12V

CPU_FAN

COM

LPT

VGA

USB34

LAN1_USB12

AUDIO

PCIEX1_1

Realtek
8211CL

PCIEX16

M3N78-AM

PCI1

PCI2

ALC
662

SPDIF_OUT

AAFP

CD

FLOPPY

F_PANEL

USB910

USB78

USB1112

SOCKET AM2+

DDR2 DIMM_A1 (64bit, 240-pin module)

DDR2 DIMM_B1 (64bit, 240-pin module)

EATXPWR

NVIDIA®
GeForce 8200

SATA2 SATA4
SATA1 SATA3

SB_PWR

Lithium Cell
CMOS Power

CLRTC

Super
I/O

8Mb
BIOS

SPEAKER

PRI_IDE

1.5.2   Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the illustration below.

1.5.3   Screw holes

Place six screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not overtighten the screws! Doing so can damage the motherboard.

Place this side towards the rear of the chassis
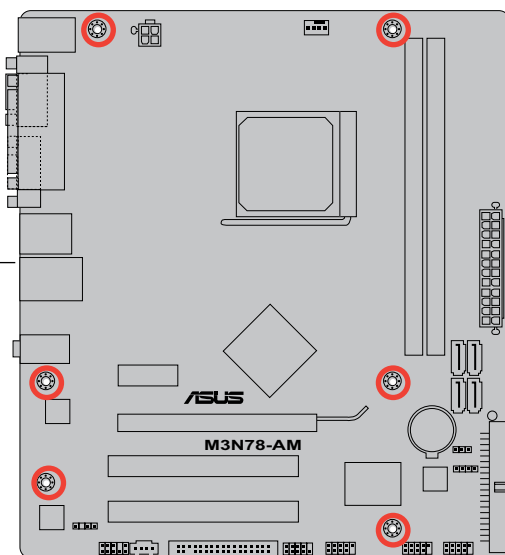
1.6 Central Processing Unit (CPU)

The motherboard comes with a 940-pin AM2+ socket designed for AMD®
Phenom™FX / Phenom™ / Athlon™ / Sempron™ processors.

The AM2+ socket has a different pinout from the 940-pin socket designed for
the AMD Opteron™ processor. Ensure that you use a CPU designed for the
AM2+ socket. The CPU fits in only one correct orientation. **DO NOT** force the
CPU into the socket to prevent bending the pins and damaging the CPU!

1.6.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.
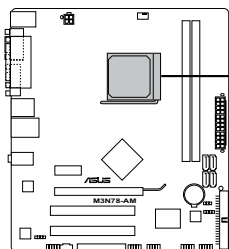
M3N78-AM CPU Socket AM2+

2. Unlock the socket by pressing the
    lever sideways, then lift it up to a
    90°-100° angle.
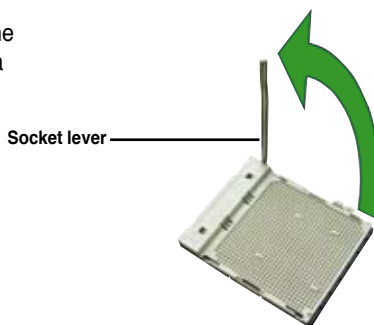
Socket lever

Ensure that the socket lever is lifted up to 90°-100° angle, otherwise the CPU
does not fit in completely.

3. Position the CPU above the socket such that the CPU corner with the gold triangle matches the socket corner with a small triangle.

4. Insert the CPU into the socket until it fits in place.

Small triangle

Gold triangle
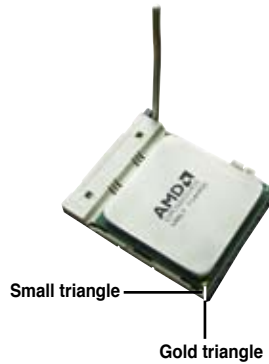
The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

6. Install a CPU heatsink and fan following the instructions that came with the heatsink package.

7. Connect the CPU fan cable to the CPU_FAN connector on the motherboard.

CPU_FAN

GND
CPU FAN PWR
CPU FAN IN
CPU FAN PWM
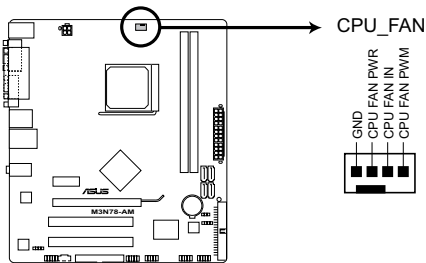
M3N78-AM CPU fan connector

Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

1.6.2 Installing the heatsink and fan

The AMD Phenom™FX / Phenom™ / Athlon™ / Sempron™ processors require a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

Ensure that you use only qualified heatsink and fan assembly.

To install the CPU heatsink and fan.

1. Place the heatsink on top of the installed CPU, ensuring that the heatsink fits properly on the retention module base.

• The retention module base is already installed on the motherboard upon purchase.

• You do not have to remove the retention module base when installing the CPU or installing other motherboard components.

• If you purchased a separate CPU heatsink and fan assembly, ensure that Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

CPU Fan

CPU Heatsink

Retention Module Base

Retention bracket   **Retention bracket lock**
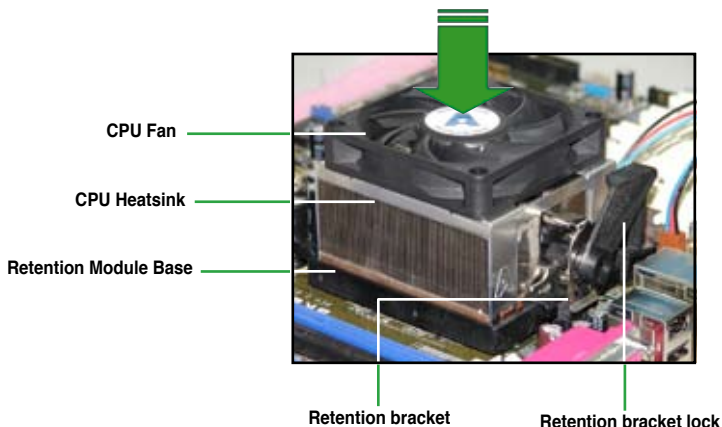
Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU heatsink and fan assembly documentation, follow the latter.

2. Attach one end of the retention bracket to the retention module base.
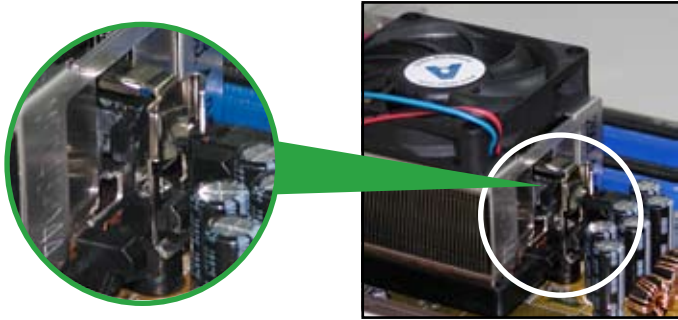
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base. A clicking sound denotes that the retention bracket is in place.

Ensure that the fan and heatsink assembly perfectly fits the retention mechanism module base. Otherwise, you cannot snap the retention bracket in place.

4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.
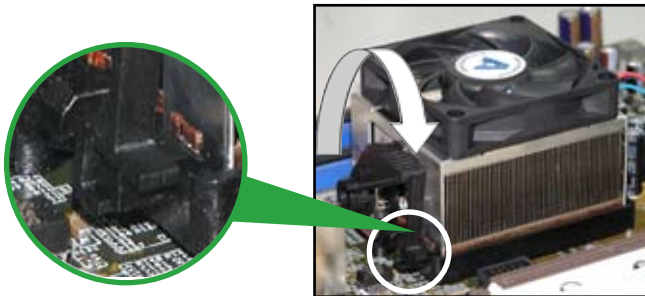
1.7 System memory

1.7.1 Overview

The motherboard comes with two Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 DIMM has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:
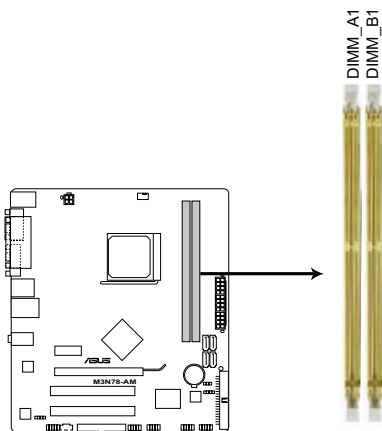
M3N78-AM 240-pin DDR2 DIMM sockets

Channel	Sockets
Channel A	DIMM_A1
Channel B	DIMM_B1

1.7.2 Memory configurations

You may install 256MB, 512MB, 1GB, 2GB, and 4GB unbuffered ECC and non-ECC DDR2 DIMMs into the DIMM sockets.

- For dual-channel configuration, install identical DIMMs in DIMM_A1 and DIMM_B1.

- Always use identical DDR2 DIMM pairs for dual channel mode. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.

- When you install a total memory of 4GB or more, a Windows® 32-bit operation system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended if you are using a Windows 32-bit operation system.

The motherboard can support 8GB physical memory on the operating system listed below. You may install a maximum of 4GB DIMM on each slot.

64-bit
Windows® XP Professional x64 Edition
Windows® Vista x64 Edition

M3N78-AM Motherboard Qualified Vendors Lists (QVL)

DDR2-533MHz capability

Vendor	Part No.	Size	SS/DS	CL	Chip No.	Chip Brand	DIMM support	
							A*	B*
Kingston	KVR533D2N4/1G	1G	DS	N/A	HY5PS12821EFP-Y5	Hynix	•	•
HY	HYMP512U64CP8-C4 AB	1G	DS	4	HY5PS12821CFP-C4	Hynix	•	•
Corsair	VS1GB533D2	1G	DS	N/A	64M8CFEGQIB0900718	Corsair	•	•
Elpida	EBE51UD8ABFA-5C-E	512MB	SS	N/A	E5108AB-5C-E	Elpida	•	•

DDR2-667MHz capability

Vendor	Part No.	Size	SS/DS	CL	Chip No.	Chip Brand	DIMM support	
							A*	B*
Kingston	KVR667D2N5/512	512MB	SS	N/A	SO1237650821 SBP D6408TR4CGL25 USL074905PECNB	Kingston	•	•
Qimonda	HYS64T64000EU-3S-B2	512MB	SS	5	HYB18T512B00B2F3SFSS28171	Qimonda	•	•
Micron	MT8HTF12864AY-667E1	1G	SS	5	D9HNL 7ZE17	Micron	•	•
HY	HYMP512U64CP8-Y5 AB	1G	DS	5	HY5PS12521CFP-Y5	Hynix	•	•
Apacer	AU512E667C5KBGC	512MB	SS	5	AM4B5708GQJS7E06332F	Apacer	•	•
Transcend	506010-4894	1G	DS	5	E5108AJBG-6E-E	Elpida	•	•
ADATA	M2OAD5G3H3160Q1C52	512MB	SS	N/A	AD29608A8A-3EG20813	ADATA	•	•
ADATA	M2OAD5G314170Q1C58	1G	DS	N/A	AD29608A8A-3EG80814	ADATA	•	•
ADATA	M2OAD5H3J4170I1C53	2G	DS	N/A	AD20908A8A-3EG 30724	ADATA	•	•
PSC	AL6E8E63J-6E1	512MB	SS	5	A3R12E3JFF717B9A00	PSC	•	•
PSC	AL7E8E63J-6E1	1G	DS	5	A3R12E3JFF717B9A01	PSC	•	•
GEIL	GX21GB5300SX	1G	DS	3	Heat-Sink Package	GEIL	•	•
G.SKILL	F2-5400PHU2-2GBNT	2G(kit of 2)	DS	5-5-5-15	D2 64M8CCF 0815 C7173S	G.SKILL	•	•
Twinmos	8D-A3JK5MPETP	512MB	SS	5	A3R12E3GEF633ACAOY	PSC	•	•
ELIXIR	M2Y1G64TU8HA2B-3C	1G	DS	5	M2TU51280AE-3C717095R28F	ELIXIR	•	•
Leadmax	LRMP512U64A8-Y5	1G	DS	N/A	HY5PS12821CFP-Y5 C 702AA	Hynix	•	•

DDR2-800MHz capability

Vendor	Part No.	Size	SS/DS	CL	Chip No.	Chip Brand	DIMM support	
							A*	B*
Kingston	KHX6400D2LLK2/1GN	512MB	SS	N/A	Heat-Sink Package	Kingston	•	•
Kingston	KVR800D2N5/1G	1G	DS	N/A	E5108AJBG-8E-E	Elpida	•	•
Samsung	M378T2863QZS-CF7	1G	SS	6	K4T1G084QQ-HCF7	Samsung	•	•
Samsung	M391T2863QZ3-CF7	1G	SS	6	K4T1G084QQ-HCF7(ECC)	Samsung	•	•
Samsung	M378T5263AZ3-CF7	4G	DS	N/A	K4T2G084QA-HCF7	Samsung	•	•
Qimonda	HYS64T64000EU-2.5-B2	512MB	SS	6	HYB18T512800B2F25FSS28380	Qimonda	•	•
Corsair	CM2X2048-6400C5DHX	2G(Kit of 2)	DS	5	Heat-Sink Package	Corsair	•	•
Crucial	BL12864AA804.8FE5	2G(Kit of 2)(EPP)	SS	N/A	Heat-Sink Package	N/A	•	•
HY	HYMP564U64CP8-S5 AB	512MB	SS	5	HY5PS12821CFP-S5	Hynix	•	•
Kingmax	KLDC28F-A8KI5	512MB	SS	N/A	KKA8FF1XF-JFS-25A	Kingmax	•	•
Apacer	78.91G91.9K5	512MB	SS	5	AM4B5708JQJS8E0751C	Apacer	•	•
Apacer	78.A1GA0.9K4	2G	DS	5	AM4B5808CQJS8E0747D	Apacer	•	•
VDATA	M2GVD6G3H3160Q1E52	512MB	SS	N/A	VD29608A8A-25EG20813	VDATA	•	•
ADATA	M2OAD6G314170Q1E58	1G	DS	N/A	AD29608A8A-25EG80810	ADATA	•	•
PSC	AL7E8E63H-10E1K	2G	DS	5	A3R1GE3CFF750RABBP(ECC)	PSC	•	•
GEIL	GX22GB6400LX	2G	DS	5	Heat-Sink Package	GEIL	•	•
G.SKILL	F2-6400CL4D-2GBHK	1G	DS	4	Heat-Sink Package	G.SKILL	•	•
G.SKILL	F2-6400CL4D-4GBPK	2G	DS	4	Heat-Sink Package	G.SKILL	•	•
OCZ	OCZ2VU8004GK	1G	DS	6	Heat-Sink Package	OCZ	•	•
Century	28V0H8	1G	DS	5	HY5PS12821CFP-S5	Hynix	•	•

DDR2-1066MHz capability

Vendor	Part No.	Size	SS/DS	CL	Chip No.	Chip Brand	DIMM support	
							A*	B*
Corsair	CM2X1024-8500C5	1G	DS	N/A	Heat-Sink Package	N/A	•	•
OCZ	OCZ2N1066SR2DK	2G(kit of 2)	DS	5-5-5-15	Heat-Sink Package(EPP) SN:00482080600160-1	OCZ	•	•
GEIL	GB24GB8500C5QC	1G	SS	5	GL2L128M88BA25AB	GEIL	•	•

SS - Single-sided / DS - Double-sided
DIMM support:
- **A*:** Supports one module inserted into either slot as Single-channel memory configuration.
- **B*:** Supports one pair of modules inserted into both the yellow slots as one pair of Dual-channel memory configuration.

Due to AMD CPU limitation, DDR2 1066 is supported by AM2+ CPU for one DIMM per channel only. Refer to www.asus.com for the CPU models.

Visit the ASUS website at www.asus.com for the latest DDR2 533/667/800/1066MHz QVL.

1.7.3 Installing a DIMM

Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

DDR2 DIMM notch

Unlocked retaining clip
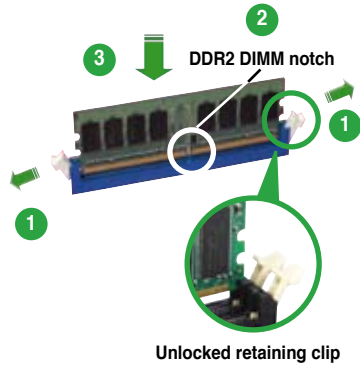
- A DDR2 DIMM is keyed with a notch so that it fits in only one direction. **DO NOT** force a DIMM into a socket to avoid damaging the DIMM.

- The DDR2 DIMM sockets do not support DDR DIMMs. Do not install DDR DIMMs into the DDR2 DIMM sockets.

1.7.4 Removing a DIMM

To remove a DIMM:

1. Simultaneously press the retaining clips outward to unlock the DIMM.

DDR2 DIMM notch
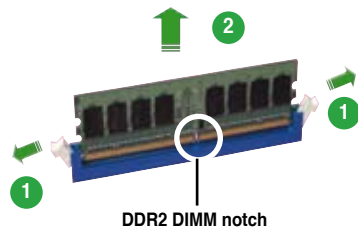
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

1.8 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

⚠️ Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.8.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.8.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

Interrupt assignments

IRQ	Standard function
1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
2	High precision event timer
4	Communications Port (COM1)
6	Standard floppy disk controller
8	High precision event timer
9	Microsoft ACPI-Compliant System
13	Numeric data processor
11	NVIDIA nForce PCI System Management
17	PCI standard PCI-to-PCI bridge
18	PCI standard PCI-to-PCI bridge
20	NVIDIA GeForce 8200
20	Standard Enhanced PCI to USB Host Controller
21	NVIDIA nForce System Management Controller
21	Standard Enhanced PCI to USB Host controller
22	Standard OpenHCD USB Host Controller
22	Standard OpenHCD USB Host Controller
23	Microsoft UAA Bus Driver for High Definition Audio
23	NVIDIA Network Bus Enumerator
23	Standard Dual Channel PCI IDE Controller

* These IRQs are usually available for ISA or PCI devices.

IRQ assignments for this motherboard

	LNKA	LNKB	LN0A	LN2A	LATA	UB12	UB11	LUB2	LUB0	LPMU	LSMB	LMAC	LSA0	LAZA	SGRU
PCI slot1	shared	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCI slot2	-	shared	-	-	-	-	-	-	-	-	-	-	-	-	-
PCI EX1 Slot	-	-	-	shared	-	-	-	-	-	-	-	-	-	-	-
PCI EX16 slot	-	-	shared	-	-	-	-	-	-	-	-	-	-	-	-
Onboard USB1.1 (OHCI)	-	-	-	-	-	-	-	-	shared	-	-	-	-	-	-
Onboard USB 1.1 (OHCI)	-	-	-	-	-	-	shared	-	-	-	-	-	-	-	-
Onboard USB2.0 (EHCI)	-	-	-	-	-	shared	-	-	-	-	-	-	-	-	-
Onboard USB2.0 (EHCI)	-	-	-	-	-	-	-	shared	-	-	-	-	-	-	-
Onboard IDE controller	-	-	-	-	shared	-	-	-	-	-	-	-	-	-	-
Onboard SATA controller	-	-	-	-	-	-	-	-	-	-	-	-	shared	-	-
Onboard SMBus controller	-	-	-	-	-	-	-	-	-	-	shared	-	-	-	-
Onboard Azalia controller	-	-	-	-	-	-	-	-	-	-	-	-	-	shared	-
Onboard LAN 8111B	-	-	-	-	-	-	-	-	-	-	-	shared	-	-	-
Onboard PMU device	-	-	-	-	-	-	-	-	-	shared	-	-	-	-	-
IXVE Bus Bridge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	shared
Onboard VGA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	shared

When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

1.8.3 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The photo shows a LAN card installed on a PCI slot.
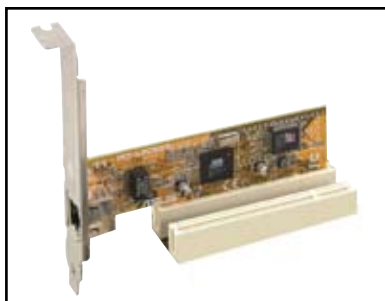
1.8.4 PCI Express x1 slot

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications. The photo shows a network card installed on a PCI Express x1 slot.

1.8.5 PCI Express x16 slot

This motherboard has supports PCI Express x16 graphic cards that comply with PCI Express specifications. The photo shows a graphics card installed on a PCI Express x16 slot.

- Currently, only NVIDIA® **GeForce**® **8500 GT** and **GeForce 8400 GS** graphics cards support GeForce Boost function under Hybrid SLI™ mode.

- Currently, only NVIDIA® **GeForce**® **9800 GX2** and **GeForce 9800 GTX** graphics cards support Hybrid Power function under Hybrid SLI™ mode.

1.9 Jumper

1. **Clear RTC RAM (CLRTC)**

   This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

   To erase the RTC RAM:

   1. Turn OFF the computer and unplug the power cord.
   2. Remove the onboard battery.
   3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
   4. Reinstall the battery.
   5. Plug the power cord and turn ON the computer.
   6. Hold down the **<Del>** key during the boot process and enter BIOS setup to re-enter data.

   > Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!
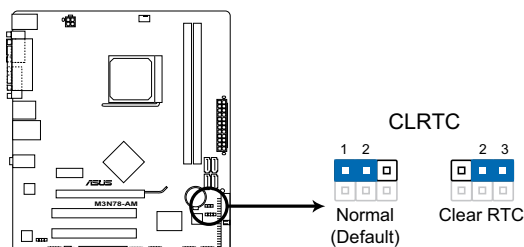
   M3N78-AM Clear RTC RAM

   > You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R.) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

1.10 Connectors

1.10.1 Rear panel connectors
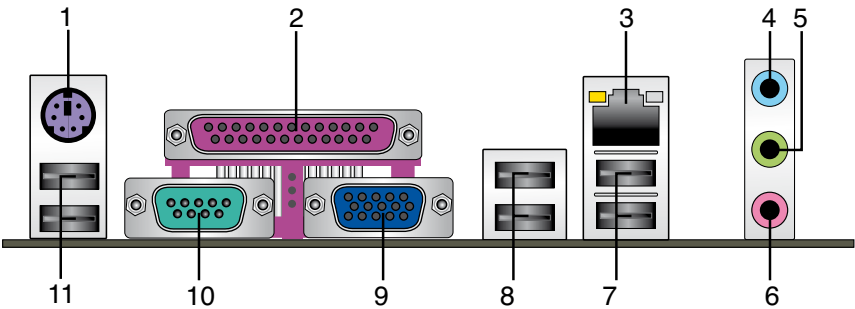
1. **PS/2 Keyboard/Mouse Combo port (purple).** This port is for a PS/2 keyboard or mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
3. **LAN (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

ACT/Link LED		Speed LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10Mbps connection
ORANGE	Linked	ORANGE	100Mbps connection
BLINKING	Data activity	GREEN	1Gbps connection

ACT/LINK SPEED LED LED

LAN port
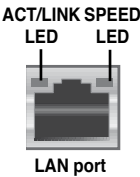
4. **Line In port (light blue)**. This port connects the tape, CD, DVD player, or other audio sources.

5. **Line Out port (lime)**. This port connects a headphone or a speaker. In 4-channel and 6-channel configuration, the function of this port becomes Front Speaker Out.

6. **Microphone port (pink).** This port connects a microphone.

> Refer to the audio configuration table on the next page for the function of the audio ports in 2, 4, or 6-channel configuration.

Audio 2, 4, or 6-channel configuration

Port	2-channel	4-channel	6-channel
Light Blue	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In

7. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

8. **USB 2.0 ports 3 and 4**. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

9. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.

10. **Serial port.** This 9-pin COM1 port is for pointing devices or other serial devices.

11. **USB 2.0 ports 5 and 6.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

1.10.2 Internal connectors

1.   Floppy disk drive connector (34-1 pin FLOPPY)
This connector is for the floppy disk drive (FDD) signal cable. Connect one end of the cable to this connector and the other end to the signal connector at the back of the floppy disk drive.

> •   Pin 5 on the connector is removed to prevent incorrect cable connection when using an FDD cable with a covered Pin 5.
>
> •   The FDD cable is purchased separately.

FLOPPY

PIN1

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

M3N78-AM Floppy disk drive connector
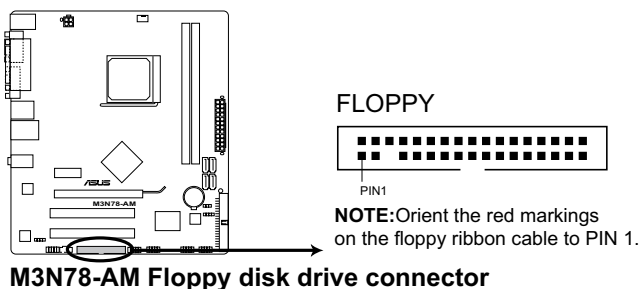
2.   Digital audio connector (4-1 pin SPDIF_OUT)
This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF module cable to this connector, then install the module to a slot opening at the back of the system chassis.

+5V   SPDIFOUT   GND

SPDIF_OUT

M3N78-AM Digital audio connector
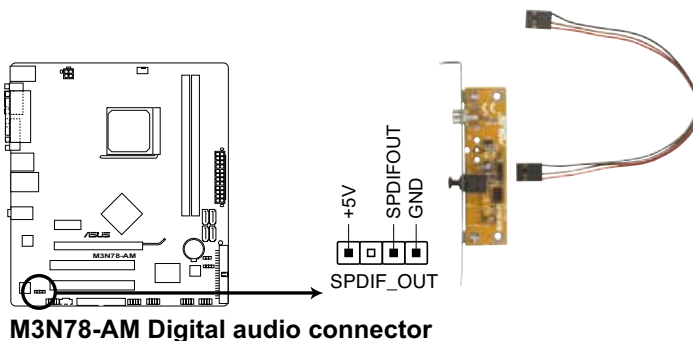
> The S/PDIF module is purchased separately.

3. **Serial ATA connectors (7-pin SATA1, SATA2, SATA3, and SATA4)**
   These connectors are for the Serial ATA signal cables for Serial ATA
   3Gb/s hard disk and optical disk drives. The Serial ATA 3Gb/s is backward
   compatible with Serial ATA 1.5Gb/s specification. The data transfer rate of the
   Serial ATA 3Gb/s is faster than the standard parallel ATA with 133 MB/s (Ultra
   DMA133).

   If you install Serial ATA hard disk drives, you can create RAID 0, RAID 1,
   RAID 5, RAID 0+1, and JBOD configuration.

SATA4
- GND
- RSATA_RXN4
- RSATA_RXP4
- GND
- RSATA_TXN4
- RSATA_TXP4
- GND

SATA3
- GND
- RSATA_RXN3
- RSATA_RXP3
- GND
- RSATA_TXN3
- RSATA_TXP3
- GND

SATA2
- GND
- RSATA_RXN2
- RSATA_RXP2
- GND
- RSATA_TXN2
- RSATA_TXP2
- GND

SATA1
- GND
- RSATA_RXN1
- RSATA_RXP1
- GND
- RSATA_TXN1
- RSATA_TXP1
- GND
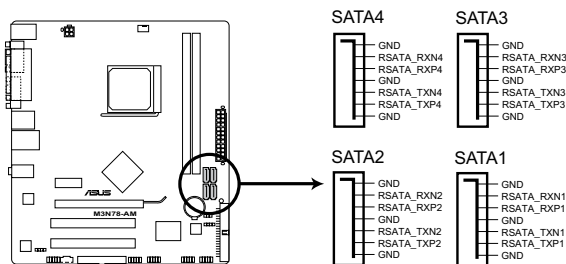
M3N78-AM SATA connectors

- Install the Windows® XP Service Pack 1 before using Serial ATA.

- If you intend to create a Serial ATA RAID set using these connectors, set
  the **SATA Mode Select** item in the BIOS to **[RAID Mode]**. See page 2-18
  for details.

For detailed instructions on how to configure RAID 0, RAID 1, RAID 5,
RAID 0+1, and JBOD, refer to the RAID manual in the support DVD.

4. **CPU fan connector (4-pin CPU_FAN)**

The fan connector supports cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cable to the fan connector on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

> Do not forget to connect the CPU fan cable to the CPU fan connector. Insufficient air flow inside the system may damage the motherboard components. It is not a jumper! **DO NOT** place a jumper cap on the CPU fan connector.

> Only the CPU fan supports Q-Fan.
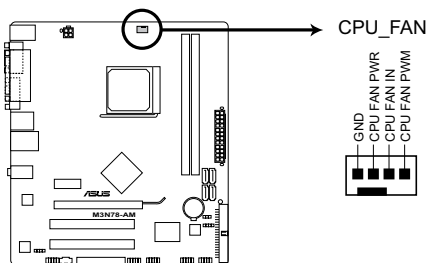
M3N78-AM CPU fan connector

5. **Optical drive audio in connector (4-pin CD)**

This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.
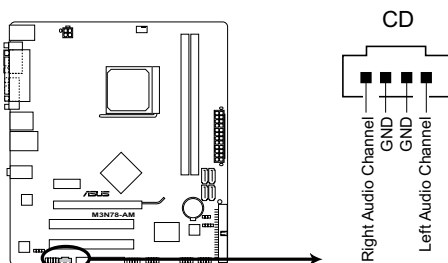
M3N78-AM Internal audio connector

6. **USB connectors (10-1 pin USB78, USB910, USB1112)**

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480Mbps connection speed.

M3N78-AM USB2.0 connectors

USB910
- USB+5V
- USB_P10-
- USB_P10+
- GND
- NC
- USB+5V
- USB_P9-
- USB_P9+
- GND

USB78
- USB+5V
- USB_P8-
- USB_P8+
- GND
- NC
- USB+5V
- USB_P7-
- USB_P7+
- GND

USB1112
- USB+5V
- USB_P12-
- USB_P12+
- GND
- NC
- USB+5V
- USB_P11-
- USB_P11+
- GND

PIN 1
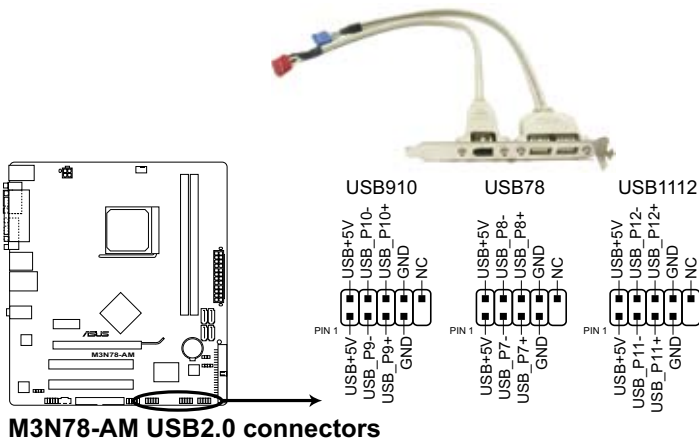
Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard!

The USB 2.0 module is purchased separately.

7. **IDE connector (40-1 pin PRI_IDE)**

    The onboard IDE connector is for an Ultra DMA 133/100/66 signal cable.
    There are three connectors on each Ultra DMA 133/100/66 signal cable:
    blue, black, and gray. Connect the blue connector to the motherboard's IDE
    connector, then select one of the following modes to configure your device(s).

	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	

Pin 20 on the IDE connector is removed to match the covered hole on the Ultra
DMA cable connector. This prevents incorrect insertion when you connect the
IDE cable.

- If any device jumper is set as "Cable-Select," ensure that all other device
  jumpers have the same setting.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

PRI_IDE

M3N78-AM IDE connector

PIN1

NOTE: Orient the red markings
on the IDE ribbon cable to PIN 1.
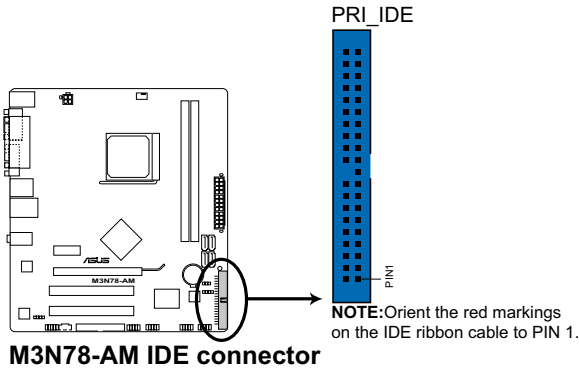
8. Front panel audio connector (10-1 pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports either High Definition Audio or AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.

AAFP

HD-audio-compliant pin definition

Legacy AC`97 compliant definition

M3N78-AM Analog front panel connector
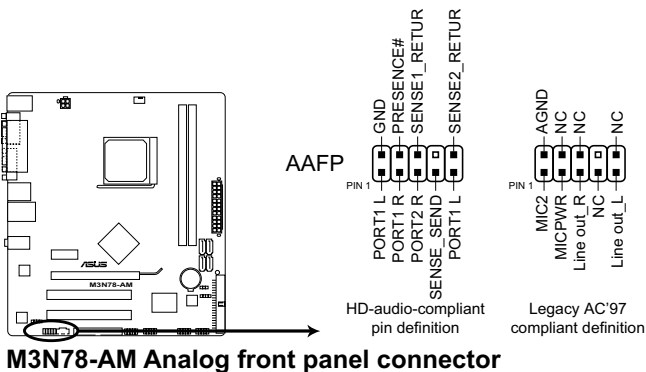
We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard high-definition audio capability.

If you want to connect a high-definition front panel audio module to this connector, ensure that the **Front Panel Select** item in the BIOS is set to **[HD Audio]**. If you want to connect an AC`97 front panel audio module to this connector, set the item to **[AC97]**. See page 2-29 for details.

9. Speaker connector (4-pin SPEAKER)

This 4-pin connector is for the chasis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

SPEAKER

+5V
GND
GND
Speaker Out

PIN 1

M3N78-AM Speaker Out Connector
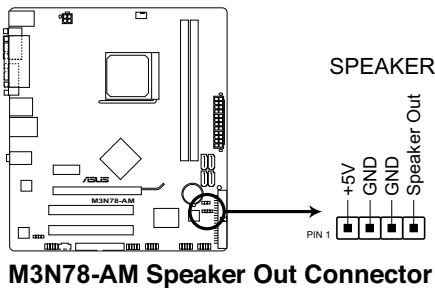
10. ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

These connectors are for an ATX power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

ATX12V   EATXPWR

+3 Volts	GND
+12 Volts	+5 Volts
+12 Volts	+5 Volts
+5V Standby	+5 Volts
Power OK	-5 Volts
GND	GND
+5 Volts	GND
GND	GND
+5 Volts	PSON#
GND	GND
+3 Volts	-12 Volts
+3 Volts	+3 Volts

+12V DC +12V DC

GND GND

PIN 1

PIN 1
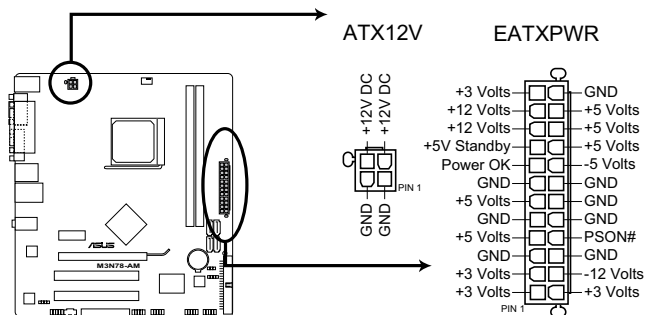
M3N78-AM ATX power connectors

- We recommend that you use an ATX 12 V Specification 2.0-compliant power supply unit (PSU) with a minimum of 300 W power rating. This PSU type has 24-pin and 4-pin power plugs.

- If you intend to use a PSU with 20-pin and 4-pin power plugs, ensure that the 20-pin power plug can provide at least 15 A on +12 V and that the PSU has a minimum power rating of 300 W. The system may become unstable or may not boot up if the power is inadequate.

- Do not forget to connect the 4-pin ATX +12 V power plug. Otherwise, the system will not boot up.

- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

- If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at http://support.asus.com/PowerSupplyCalculator/PSCalculator. aspx?SLanguage=en-us for details.

- You must install a PSU with a higher power rating if you intend to install additional devices.

11. System panel connector (10-1 pin PANEL)

This connector supports several chassis-mounted functions.
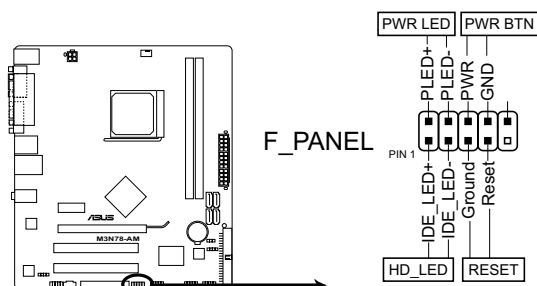
M3N78-AM System panel connector

- **System power LED (2-pin PLED)**
  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin +IDE_LED)**
  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **Power/Soft-off button (2-pin PWRSW)**
  This 2-pin connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin Reset)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

This chapter tells how to change
the system settings through the BIOS
Setup menus. Detailed descriptions
of the BIOS parameters are also
provided.

BIOS setup 2

2.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS EZ Flash 2:** Updates the BIOS using a floppy disk or USB flash disk.
2. **ASUS AFUDOS:** Updates the BIOS in DOS mode using a bootable floppy disk.
3. **ASUS CrashFree BIOS 3:** Updates the BIOS using a bootable floppy disk, USB flash disk, or the motherboard support DVD when the BIOS file fails or gets corrupted.
4. **ASUS Update:** Updates the BIOS in Windows® environment.

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

2.1.1 Creating a bootable floppy disk

1.   Do any of the following to create a bootable floppy disk.

   DOS environment

   a.   Insert a 1.44MB floppy disk into the floppy disk drive.
   b.   At the DOS prompt, type `format A:/S`. Press **<Enter>**.

   Windows® XP environment

   a.   Insert a 1.44MB floppy disk into the floppy disk drive.
   b.   Click **Start** from the Windows® desktop, then select **My Computer**.
   c.   Right-click the 3 1/2 Floppy Drive icon, then select **Format**.
   d.   Select the **Create an MS-DOS startup disk** checkbox.
   e.   Click **Start**.

Windows® Vista environment

a. Insert a formatted, high density 1.44MB floppy disk to the floppy disk drive.

b. Click [icon] from the Windows® desktop, then select **Computer**.

c. Right-click **Floppy Disk Drive**, then click **Format** to display the **Format 3 1/2 Floppy** dialog box.

d. Select the **Create an MS-DOS startup disk** checkbox.

e. Click **Start**.

2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

2.1.2   ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash 2 utility is built in the BIOS chip so it is accessible by pressing **<Alt> + <F2>** during the Power-On Self-Test (POST).

To update the BIOS using EZ Flash 2:

1. Visit the ASUS website at www.asus.com to download the latest BIOS file for the motherboard.

2. Save the BIOS file to a floppy disk or USB flash disk, then restart the system.

3. Launch EZ Flash 2 using either of the following methods.

    (1) Insert the floppy disk / USB flash disk that contains the BIOS file to the floppy disk drive or a USB port. Press **<Alt> + <F2>** during POST to display the following.

```
              ASUSTek EZ Flash 2 BIOS ROM Utility V3.21
 FLASH TYPE: MXIC 25L8005
 ┌────── Current ROM ──────┐        ┌───── Update ROM ─────┐
 │  BOARD: M3N78-AM         │        │  BOARD: Unknown       │
 │  VER: 0312 (H:00 B:07)   │        │  VER: Unknown         │
 │  DATE: 08/21/2008        │        │  DATE: Unknown        │
 └──────────────────────────┘        └───────────────────────┘
 PATH: A:\
 ┌──────────┐ ┌───────────────────────────────────────┐
 │ A:       │ │                                       │
 │          │ │                                       │
 │          │ │                                       │
 │          │ │                                       │
 │          │ │                                       │
 │          │ │                                       │
 │          │ │                                       │
 └──────────┘ └───────────────────────────────────────┘
 ┌─ Note ──────────────────────────────────────────────┐
 │   [Enter] Select or Load  [Tab] Switch    [V] Drive Info │
 │   [Up/Down/Home/End] Move [B] Backup      [Esc] Exit     │
 └──────────────────────────────────────────────────────┘
```
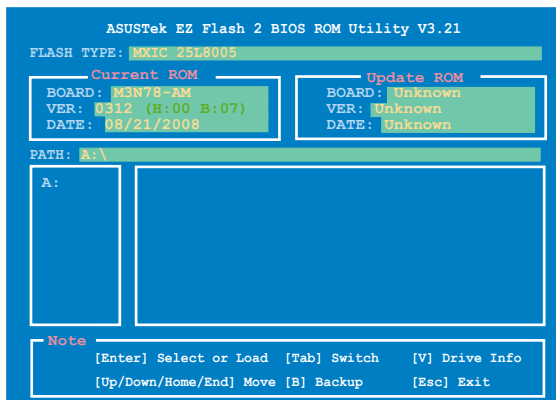
(2) Enter the BIOS Setup utility, and then go to the **Tools** menu. Select **EZ Flash 2** and press **<Enter>** to enable it.

You can switch between drives by pressing **<Tab>** before the correct file is found. Then press **<Enter>**.

4. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.

> • This function can support devices such as USB flash disks and floppy disks with **FAT 32/16** format and single partition only.
>
> • Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

2.1.3 AFUDOS utility

The AFUDOS utility allows you to update the BIOS in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:

> • Ensure that the floppy disk is not write-protected and has at least 1024KB free space to save the file.
>
> • The BIOS screens in this section are for reference only. The actual BIOS screen displays may not be the same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support DVD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

   afudos /o[filename]

   The [filename] is any user-assigned filename which consists of no more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

```
A:\>afudos /oOLDBIOS1.rom
```

        Main filename
            Extension name

3. Press **<Enter>**. The utility copies the current BIOS file to the floppy disk.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.38(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
    Reading flash ..... done
    Write to file...... ok
A:\>
```

The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website at www.asus.com and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

    Write down the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support DVD to the bootable floppy disk you created earlier.
3. Boot the system in DOS mode, then at the prompt type:

    afudos /i[filename]

    The [filename] is the latest or the original BIOS file on the bootable floppy disk.

```
A:\>afudos /iM3N78AM.ROM
```

4. The utility verifies the file and starts updating the BIOS.

```
A:\>afudos /iM3N78AM.ROM
AMI Firmware Update Utility - Version 1.19(ASUS V2.38(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

    WARNING!! Do not turn off power during flash BIOS
    Reading file ....... done
    Reading flash ...... done

    Advance Check ......
    Erasing flash ...... done
    Writing flash ...... 0x0008CC00 (9%)
```

Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iM3N78AM.ROM
AMI Firmware Update Utility - Version 1.19(ASUS V2.38(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

    WARNING!! Do not turn off power during flash BIOS
    Reading file ....... done
    Reading flash ...... done

    Advance Check ......
    Erasing flash ...... done
    Writing flash ...... done
    Verifying flash .... done

    Please restart your computer

A:\>
```

2.1.4 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 utility is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support DVD, a floppy disk, or USB flash disk that contains the updated BIOS file.

> • Prepare the motherboard support DVD, a floppy disk or USB flash disk containing the updated motherboard BIOS file before using this utility.
>
> • Ensure that you rename the original or updated BIOS file in the floppy disk or USB flash disk to **M3N78AM.ROM.**

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When the original or updated BIOS file is found, the utility reads it and starts updating the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "M3N78AM.ROM". Completed.
Start flashing...
```

> **DO NOT** shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the support DVD

To recover the BIOS from the support DVD:

1.   Remove any floppy disk from the floppy disk drive, then turn on the system.
2.   Insert the support DVD into the optical drive.
3.   The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for DVD-ROM...
DVD-ROM found!
Reading file "M3N78AM.ROM". Completed.
Start flashing...
```

4.   Restart the system after the utility completes the updating process.

> The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website at www.asus.com to download the latest BIOS file.

Recovering the BIOS from a USB flash disk

To recover the BIOS from a USB flash disk:

1.   Insert the USB flash disk that contains the original or updated BIOS file to a USB port.
2.   Turn on the system.
3.   The utility automatically checks the devices for the original or updated BIOS file. When the BIOS file is found, the utility reads it and starts updating the corrupted BIOS file.
4.   Restart the system after the utility completes the updating process.

> • Only the USB flash disk with FAT 32/16 format and single partition supports ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.
>
> • **DO NOT** shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

2.1.5 ASUS Update utility

The ASUS Update utility allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- · Save the current BIOS file
- · Download the latest BIOS file from the Internet
- · Update the BIOS from an updated BIOS file
- · Update the BIOS directly from the Internet, and
- · View the BIOS version information.

This utility is available in the support DVD that comes with the motherboard package.

ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:

1. Place the support DVD into the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update**.

Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
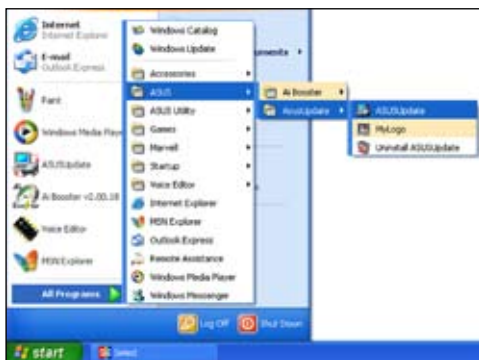
2. Select **Update BIOS from the Internet** option from the dropdown menu, then click **Next**.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click **Next**.

5. Follow the screen instructions to complete the update process.

> The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.

2. Select **Update BIOS from a file** option from the dropdown menu, then click **Next**.

3. Locate the BIOS file from the **Open** window, then click **Open**.

4. Follow the screen instructions to complete the update process.

2.2 BIOS setup program

This motherboard supports a programmable Serial Peripheral Interface (SPI) chip that you can update using the provided utility described in section **2.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to run BIOS Setup. This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the SPI chip.

The SPI chip on the motherboard stores the Setup utility. When you start the computer, the system provides you with the opportunity to run this program. Press **<Del>** during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, reboot the system by doing any of the following procedures:

- Restart using the OS standard shut-down procedure.
- Press <**Ctrl>+<Alt>+<Del>** simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on.

> Using the power button, reset button, or the **<Ctrl>+<Alt>+<Del>** keys to force reset from a running operating system can cause damage to your data or system. We recommend that you shut down the system from the operating system.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

> - The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the **Exit** menu. See section **2.8 Exit menu**.
>
> - The BIOS setup screens shown in this section are for reference only, and may not exactly match what you see on your screen.
>
> - Visit the ASUS website at www.asus.com to download the latest BIOS file for this motherboard.

2.2.1 BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Tools    Exit

  System Time                [19:34:30]              Use [ENTER], [TAB]
  System Date                [Mon 11/19/2007]        or [SHIFT-TAB] to
  Legacy Diskette A          [1.44M, 3.5 in.]        select a field.

                                                     Use [+] or [-] to
  ▶  Primary IDE Master       :[Not Detected]        configure system
  ▶  Primary IDE Slave        :[Not Detected]        Time.
  ▶  SATA1                    :[Not Detected]
  ▶  SATA2                    :[Not Detected]
  ▶  SATA3                    :[Not Detected]
  ▶  SATA4                    :[Not Detected]
  ▶  Storage Configuration                           ▶◀  Select Screen
                                                     ▲▼  Select Item
  ▶  System Information                              +-  Change Field
                                                     Tab   Select Field
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit

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```

Sub-menu items   Navigation keys

2.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main   For changing the basic system configuration

Advanced   For changing the advanced system settings

Power   For changing the advanced power management (APM) configuration

Boot   For changing the system boot configuration

Tools   For setting EZ Flash 2

Exit   For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

> • The BIOS setup screens shown in this chapter are for reference only, and may not exactly match what you see on your screen.
>
> • Visit the ASUS website at www.asus.com to download the latest BIOS information.

2.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

2.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.

2.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the item has a sub-menu. To display the sub-menu, select the item and press **<Enter>**.

2.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press **<Enter>** to display a list of options.

2.2.7 Pop-up window

Select a menu item then press **<Enter>** to display a pop-up window with the configuration options for that item.

2.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the **Up/Down** arrow keys or **<Page Up> /<Page Down>** keys to display the other items on the screen.
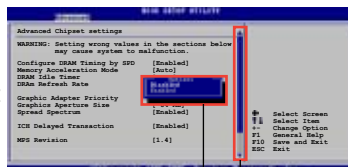
Pop-up window

Scroll bar

2.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

2.3 Main menu

When you enter the BIOS Setup program, the **Main** menu screen appears, giving you an overview of the basic system information.

Refer to section **2.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

```
                              BIOS SETUP UTILITY
  Main     Advanced      Power      Boot    Tools      Exit

                                                          Use [ENTER], [TAB]
  System Time                   [19:34:30]               or [SHIFT-TAB] to
  System Date                   [Mon 11/19/2007]         select a field.
  Legacy Diskette A             [1.44M, 3.5 in.]
                                                          Use [+] or [-] to
                                                          configure system
  ▶  Primary IDE Master         :[Not Detected]          Time.
  ▶  Primary IDE Slave          :[Not Detected]
  ▶  SATA1                      :[Not Detected]
  ▶  SATA2                      :[Not Detected]
  ▶  SATA3                      :[Not Detected]
  ▶  SATA4                      :[Not Detected]
  ▶  Storage Configuration                               ←→    Select Screen
                                                          ↑↓    Select Item
  ▶  System Information                                  +-    Change Field
                                                          Tab   Select Field
                                                          F1    General Help
                                                          F10   Save and Exit
                                                          ESC   Exit

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```

2.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

2.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

2.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled]
[360K, 5.25 in.] [1.2M, 5.25 in.] [720K, 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

2.3.4 Primary IDE Master/Slave, SATA1~4

While entering Setup, the BIOS automatically detects the presence of IDE devices. There is a separate sub-menu for each IDE device. Select a device item then press **<Enter>** to display the IDE device information.

```
                        BIOS SETUP UTILITY
  Main

  Primary IDE Master                            Select the type of
                                                device connected to the
                                                system.
  Device      : Not Detected


  Type                            [Auto]
  LBA/Large Mode                  [Auto]
  Block (Multi-Sector Transfer) M [Auto]
  PIO Mode                        [Auto]
  DMA Mode                        [Auto]
  SMART Monitoring                [Auto]        ←    Select Screen
  32Bit Data Transfer             [Enabled]     ↑↓   Select Item
                                                +-   Change Option
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit

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```

The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show **N/A** if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to **Auto** allows automatic selection of the appropriate IDE device type. Select **CDROM** if you are specifically configuring a CD-ROM drive. Select **ARMD** (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive. Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

> This item does not appear when you select **SATA1/SATA2/SATA3/SATA4** devices.

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to **Auto** enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-Sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to **[Auto]**, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to **[Disabled]**, the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode. Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode. Configuration options: [Auto]

SMART Monitoring [Auto]

Enables or disables the S.M.A.R.T. (Self Monitoring and Reporting Technology) capability of your hard drive. This features allows your system to report read/write errors of the hard drive and to issue warnings when a third party hardware monitor utility is installed. Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer. Configuration options: [Disabled] [Enabled]

2.3.5 Storage Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press **<Enter>** if you wish to configure the item.

```
                          BIOS SETUP UTILITY
  Main

  Storage Configuration                                    Disabled: disables
                                                           the integrated IDE
  Onboard PCI IDE Controller        [Enabled]              Controller.
  OnChip S-ATA Controller           [Enabled]              Enabled: enable
  SATA Mode Select                  [SATA Mode]            the integrated IDE
                                                           Controller.
```
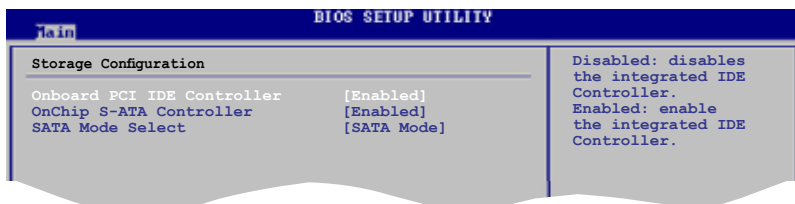
Onboard PCI IDE Controller [Enabled]

Allows you to enable or disable the onboard PCI IDE controller.
Configuration options: [Enabled] [Disabled]

OnChip S-ATA Controller [Enabled]

Allows you to disable or set the OnChip S-ATA devices.
Configuration options: [Enabled] [Disabled]

SATA Mode Select [SATA Mode]

Allows you to select the SATA mode. Configuration options: [SATA Mode] [RAID Mode] [AHCI Mode]

2.3.6   System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.

```
                        BIOS SETUP UTILITY
 Main

  BIOS Information

  Version    : 0312
  Build Date : 08/21/08

  Processor

  Type      : AMD Sempron(tm) Processor 3200+
  Speed     : 1800MHz
  Count     : 1

  System Memory                              ↔    Select Screen
                                             ↑↓   Select Item
  Installed Size : 512MB                      ←   Change Option
  Usable Size   : 384MB                      F1   General Help
                                             F10  Save and Exit
                                             ESC  Exit
```
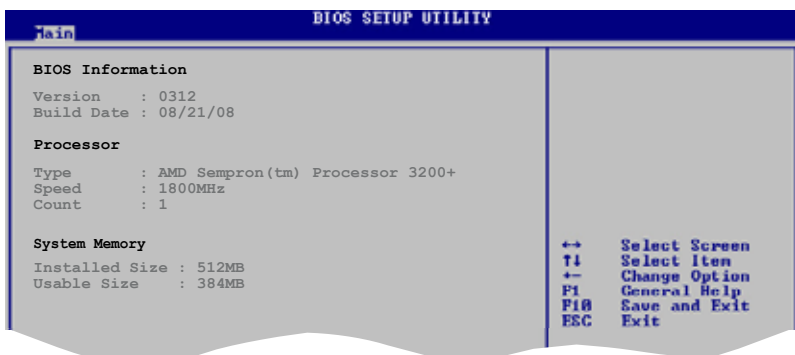
BIOS Information

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

Displays the auto-detected system memory.

2.4 Advanced menu

The **Advanced** menu items allow you to change the settings for the CPU and other system devices.

⚠️ Take caution when changing the settings of the **Advanced** menu items. Incorrect field values can cause the system to malfunction.

```
                          BIOS SETUP UTILITY
 Main    Advanced    Power    Boot    Tools    Exit

 ▶  JumperFree Configuration                          Adjust System
 ▶  CPU Configuration                                 Frequency/Voltage
 ▶  Chipset                                           etc.
 ▶  Onboard Devices Configuration
 ▶  PCIPnP
 ▶  USB Configuration




                                                 ←→   Select Screen
                                                 ↑↓   Select Item
                                                 Enter Go to Sub Screen
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit

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```

2.4.1 JumperFree Configuration

```
                          BIOS SETUP UTILITY
 Main    Advanced    Power    Boot    Tools    Exit

 Configure System Frequency/Voltage              Select the target
                                                 CPU frequency,
 CPU Overclocking            [Auto]              and the relevant
 GPU Overclocking            [Auto]              parameters will
 PCIE Overclocking           [Auto]              be auto-adjusted.
                                                 Frequencies higher
 CPU Ratio and Voltage                           than CPU manufacturer
 Processor Frequency Multiplier  [Auto]          recomends are not
 Processor Voltage           [Standard]          guaranteed to be
                                                 stable. If the system
 Hyper Transport Configuration                   becomes unstable,
 Hyper Transport Speed       [Auto]              return to the
 Hyper Transport Width       [16 ↓ 16 ↑]         default.
                                                 ←→   Select Screen
 Memory Timing and Voltage                       ↑↓   Select Item
 Memory Clock Mode           [Auto]              +-   Change Field
 DRAM Timing Mode            [Auto]              F1   General Help
 Memory OverVoltage          [Auto]              F10  Save and Exit
                                                 ESC  Exit
 Chipset Voltage

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```

Scroll down to display the following items:

```
 Chipset Voltage             [Auto]




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```

CPU Overclocking [Auto]

Allows selection of CPU overclocking options to achieve desired CPU internal frequency. Select either one of the preset overclocking configuration options:

[Auto] - allows you to set overclocking parameters automatically.

[Manual] - allows you to manually set overclocking parameters.

[Overclock Profile] - loads overclocking profiles with optimal parameters for stability when overclocking.

The following item appears only when the **CPU Overclocking** item is set to **[Manual]**.

CPU Frequency [200]
Allows you to enter an integer value to over clock for CPU.
Configuration options: [Min.=200] [Max.=550]

The following item appears only when the **CPU Overclocking** item is set to **[Overclock Profile]**.

Overclock Options [Auto]
Allows you to select the overclock options. Configuration options: [Auto] [Overclock 3%] [Overclock 5%] [Overclock 7%] [Test mode]

GPU OverClocking [Auto]

Allows selection of GPU overclocking options to achieve desired GPU frequency. Select either one of the preset overclocking configuration options:

[Auto] - allows you to set overclocking parameters automatically.

[Manual] - allows you to manually set overclocking parameters.

The following two items appear only when the **GPU Overclocking** item is set to **[Manual]**.

GPU Frequency [500]
Allows you to enter an integer value from 500MHz to 999MHz to overclock for GPU. Configuration options: [Min.=500] [Max.=999]

Shader Frequency [1200]
Allows you to enter an integer value from 1000MHz to 2000MHz to overclock for shader. Configuration options: [Min.=1000] [Max.=2000]

PCIE Overclocking [Auto]

Allows selection of PCIE overclocking options to achieve desired PCIE frequency. Select either one of the preset overclocking configuration options:

[Auto] - allows you to set overclocking parameters automatically.

[Manual] - allows you to manually set overclocking parameters.

> The following item appears only when the **PCIE Overclocking** item is set to **[Manual]**.

PCIE Frequency [100]
Allows you to enter an integer value from 100MHz to 150MHz to overclock for PCIE. Configuration options: [Min.=100] [Max.=150]

Processor Frequency Multiplier [Auto]

Allows you to select the processor frequency multiplier. Configuration options: [Auto] [x4.0, 800MHz] [x5.0, 1000MHz] [x6.0, 1200MHz] [x7.0, 1400MHz] [x8.0, 1600MHz] [x9.0, 1800MHz]

Processor Voltage [Standard]

Allows you to select the processor voltage. Configuration options: [Power Saving Mode] [Standard] [+50mv] [+100mv]

Hyper Transport Speed [Auto]

Allows you to select the Hyper Transport speed. Configuration options: [200 MHz] [400 MHz] [600 MHz] [800 MHz] [1 GHz] [Auto]

Hyper Transport Width [16 ↓ 16 ↑]

Allows you to select the Hyper Transport width. Configuration options: [8 ↓ 8 ↑] [16 ↓ 16 ↑]

Memory Clock Mode [Auto]

Allows you to select the Memory Clock mode. Configuration options: [Auto] [Manual]

The following item appears only when the **Memory Clock Mode** item is set to **[Manual]**.

Memclock Value [266 MHz]
Allows you to select the memclock value. Configuration options: [266 MHz] [333MHz] [400 MHz] [533 MHz]

DRAM Timing Mode [Auto]

Allows you to set the DRAM timing mode. Configuration options: [Auto] [DCT 0]

The following items appear only when the **DRAM Timing Mode** item is set to **[DCT 0]**.

CAS Latency (CL) [Auto]
Allows you to set CAS# latency. Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK] [7 CLK DH_Only]

TRCD [Auto]
Allows you to set TRCD. Configuration options: [3 CLK] [4 CLK] [5 CLK] [6 CLK] [Auto]

TRP [Auto]
Allows you to set TRP. Configuration options: [3 CLK] [4 CLK] [5 CLK] [6 CLK] [Auto]

tRTP [Auto]
Allows you to specify the read CAS# to percharge time.
Configuration options: [Auto] [2-4 CLK] [3-5 CLK]

TRAS [Auto]
Allows you to set TRAS. Configuration options: [5 CLK] ~ [18 CLK] [Auto]

TRC [Auto]
Allows you to set TRC. Configuration options: [11 CLK] ~ [19 CLK] [Auto]

tWR [Auto]
Allows you to specify when the last write is registered by the DRAM.
Configuration options: [Auto] [3 CLK] [4 CLK] [5 CLK] [6 CLK]

TRRD [Auto]
Allows you to set TRRD. Configuration options: [2 CLK] [3 CLK] [4 CLK] [5 CLK] [Auto]

tRWTTO [Auto]
Allows you to set tRWTTO. Configuration options: [Auto] [2 CLK] [3 CLK]
[4 CLK] [5 CLK] [6 CLK] [7 CLK] [8 CLK] [9 CLK]

tWRRD [Auto]
Allows you to specify the write to read delay when accessing different
DRAMs. Configuration options: [Auto] [0 CLK] [1 CLK] [2 CLK] [3 CLK]

tWTR [Auto]
Allows you to specify the write to read delay when accessing the same
DRAM. Configuration options: [1 CLK] [2 CLK] [3 CLK] [Auto]

tWRWR [Auto]
Allows you to specify the Twrwr time. Configuration options: [Auto] [1 CLK]
[2 CLK] [3 CLK]

tRDRD [Auto]
Allows you to specify the Trdrd time. Configuration options: [Auto] [2 CLK]
[3 CLK] [4 CLK] [5 CLK]

tRFC 0/1/2/3 [Auto]
Allows you to specify the Trfc0/1/2/3 time. Configuration options: [Auto] [75ns]
[105ns] [127.5ns] [195ns] [327.5ns]

Memory OverVoltage [Auto]

Allows you to set the Memory Over Voltage. Use +/- to adjust the voltage. The
increment is 0.00625V. The standard value is 1.85000V. Configuration options:
[Auto] [Min. = 1.85000V] [Max. = 2.24375V]

Chipset Voltage [Auto]

Allows you to set the Chipset Voltage.
Configuration options: [Auto] [+50mv] [+100mv] [+150mv]

2.4.2 CPU Configuration

```
                        BIOS SETUP UTILITY
    Advanced
 CPU Configuration                               This option should
 Module Version: 13.29                           remain disabled for
 AGESA Version: 3.1.8.0                           the normal operation.
 Physical Count: 1                               The driver developer
 Logical Count: 1                                may enable it for
                                                 testing purpose.
 AMD Sempron(tm) Processor 3200+
 Revision: F2
 Cache L1: 128 KB
 Cache L2: 128 KB
 Cache L3: N/A
 Speed   : 1800MHz
 HT Frequency: 800MHz
 Current FSB Multiplier: 9x
 Maximum FSB Multiplier: 9x
 Able to change Freq.  : Yes              ←→    Select Screen
 uCode Patch Level    : 0x62             ↑↓    Select Item
 GART Error Reporting         [Disabled]  +-    Change Option
 Microcode Updation           [Enabled]   F1    General Help
 Secure Virtual Machine Mode  [Enabled]   F10   Save and Exit
 Cool 'n' Quiet               [Enabled]   ESC   Exit

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```

GART Error Reporting [Disabled]

This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose. Configuration options: [Disabled] [Enabled]

Microcode Updation [Enabled]

Allows you to enable or disable the microcode updation.
Configuration options: [Disabled] [Enabled]

Secure Virtual Machine Mode [Enabled]

Allows you to enable or disable the AMD Secure Virtual Machine mode.
Configuration options: [Disabled] [Enabled]

Cool 'n' Quiet [Enabled]

Allows you to enable or disable the generation of ACPI_PPC, _PSS, and _PCT objects. Configuration options: [Disabled] [Enabled]

2.4.3 Chipset

The **Chipset** menu allows you to change the advanced chipset settings. Select an item then press **<Enter>** to display the sub-menu.

```
                    BIOS SETUP UTILITY
        Advanced

 Advanced Chipset Settings                          Options for NB

 WARNING: Setting wrong values in below sections
          may cause system to malfunction.
  ▶  NorthBridge Configuration
  ▶  Southbridge Configuration
```

NorthBridge Configuration

```
                    BIOS SETUP UTILITY
        Advanced

 NorthBridge Chipset Configuration

  ▶  Memory Configuration
  ▶  ECC Configuration
```
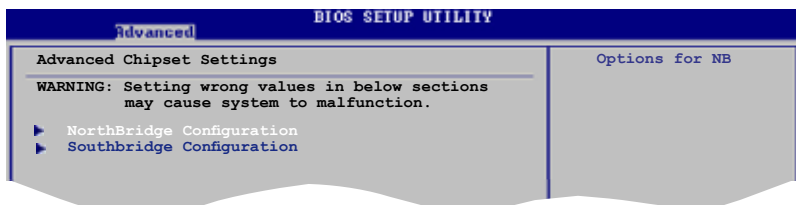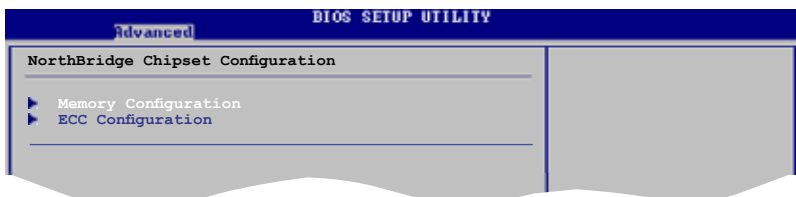
Memory Configuration

```
              Advanced
  ┌─────────────────────────────────────────────────┬────────────────────┐
  │ Memory Configuration                             │ Enable Bank Memory │
  │                                                  │ Interleaving       │
  │ Bank Interleaving           [Auto]               │                    │
  │ Channel Interleaving        [Disabled]           │                    │
  │ Enable Clock to All DIMMs   [Disabled]           │                    │
  │ MemClk Tristate C3/ATLVID   [Disabled]           │                    │
  │ Memory Hole Remapping       [Enabled]            │                    │
  │ DCT Unganged Mode           [Auto]               │                    │
  │ Power Down Enable           [Enabled]            │                    │
  └─────────────────────────────────────────────────┴────────────────────┘
```

Bank Interleaving [Auto]
Allows you to enable the bank memory interleaving.
Configuration options: [Disabled] [Auto]

Channel Interleaving [Disabled]
Allows you to enable the channel memory interleaving.
Configuration options: [Disabled] [Address bits 6] [Address bits 12]
[XOR of Address bits [20:16,6]] [XOR of Address bits [20:16,9]]

Enable Clock to All DIMMs [Disabled]
Enables or disables clock to all DIMMs. Configuration options: [Disabled]
[Enabled]

MemClk Tristate C3/ATLVID [Disabled]
Enables or disables the MemClk Tristate C3/ALTVID.
Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]
Enables or disables the memory remapping around memory hole.
Configuration options: [Disabled] [Enabled]

DCT Unganged Mode [Auto]
Allow you to enable or disable Unganed mode.
Configuration options: [Auto] [Always]

Power Down Enable [Enabled]
Enables or disables the DDR power down mode.
Configuration options: [Disabled] [Enabled]

ECC Configuration

```
                         BIOS SETUP UTILITY
    Advanced

  ECC Configuration                                    Set the level of ECC
                                                       protection. Note:
  ECC Mode                      [Disabled]             The 'Super' ECC mode
    DRAM ECC Enable             [Disabled]             dynamically sets the
    DRAM SCRUB REDIRECT         [Disabled]             DRAM scrub rate so all
    4-Bit ECC Mode             [Disabled]              of memory is scrubbed
    DRAM BG Scrub              [Disabled]              in 8 hours.
    Data Cache BG Scrub        [Disabled]
    L2 Cache BG Scrub          [Disabled]
    L3 Cache BG Scrub          [Disabled]
```

ECC Mode [Disabled]
Enables or disables the DRAM ECC that allows the hardware to report and correct memory errors automatically. Configuration options: [Disabled] [Basic] [Good] [Super] [Max] [User]

SouthBridge Configuration

```
                         BIOS SETUP UTILITY
        Advanced

    SouthBridge chipset Configuration
    ─────────────────────────────────────────────────
    Primary Graphics Adapter      [PCIE VGA Card First]
    Hybrid SLI Mode               [mGPU Auto]             PCI VGA Card First
    iGPU Frame Buffer Size        [128MB]                 Internal VGA First
                                                          PCIE VGA Card First
    PCIE 2.0 Support              [Auto]

    AZALIA AUDIO                  [Enabled]
    Front Panel Select            [HD Audio]

    Onboard LAN                   [Enabled]
      OnBoard LAN Boot ROM        [Disabled]        ←→   Select Screen
    SouthBridge ACPI HPET TABLE   [Enabled]         ↑↓   Select Item
                                                    +-   Change Option
                                                    F1   General Help
                                                    F10  Save and Exit
```

Primary Graphics Adapter [PCIE VGA Card First]

Display Device Priority, from high to low. Configuration options: [PCI VGA Card
First] [Internal VGA First] [PCIE VGA Card First]

Hybrid SLI Mode [mGPU Auto]

Allows you to set the Hybrid SLI mode.
Configuration options: [mGPU Auto] [mGPU always enable]

iGPU Frame Buffer Size [128MB]

Allows you to set the iGPU Frame Buffer Size.
Configuration options: [32MB] [64MB] [128MB] [256MB]

PCIE 2.0 Support [Auto]

Allows you to enable or disable the PCIE 2.0 support.
Configuration options: [Disabled] [Auto]

AZALIA AUDIO [Enabled]

Allows you to set HD Audio mode. Configuration options: [Disabled] [Enabled]

Front Panel Select [HD Audio]

Allows you to set HD Audio mode. Configuration options: [AC97] [HD Audio]

Onboard LAN [Enabled]

Allows you to set or disable the Onboard LAN. Configuration options: [Enabled]
[Disabled]

OnBoard LAN Boot ROM [Disabled]
Allows you to enable or disable the OnBoard LAN Boot ROM.
Configuration options: [Enabled] [Disabled]

SouthBridge ACPI HPET TABLE [Enabled]

Allows you to enable or disable SouthBridge ACPI HPET TABLE.
Configuration options: [Disabled] [Enabled]

2.4.4   Onboard Devices Configuration

```
                        BIOS SETUP UTILITY
      Advanced

  Onboard Devices Configuration                    Allows BIOS to select
                                                   Serial Port1 Base
  Serial Port1 Address          [3F8/IRQ4]         Addresses.
  Parallel Port Address         [378]
  Parallel Port Mode            [Normal]
```
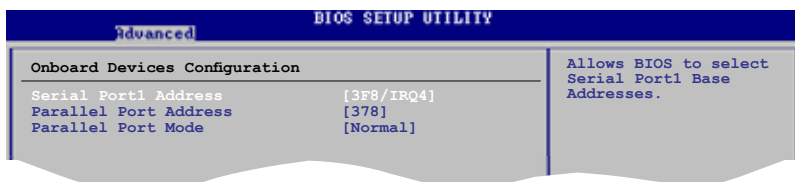
Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4][2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [Normal]

Allows you to select the Parallel Port mode. Configuration options: [Normal] [EPP]
[ECP] [EPP+ECP]

2.4.5   PCI PnP

The **PCI PnP** menu items allow you to change the advanced settings for PCI/PnP
devices. The menu includes setting IRQ and DMA channel resources for either
PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA
devices.

> Take caution when changing the settings of the PCI PnP menu items. Incorrect
> field values can cause the system to malfunction.

```
                              BIOS SETUP UTILITY
         Advanced
   Advanced PCI/PnP Settings                          No: lets the BIOS
                                                      configure all the
   WARNING: Setting wrong values in below sections    devices in the
            may cause system to malfunction.          system.
                                                      Yes: lets the
   Plug And Play O/S             [No]                  operating system
   PCI Latency Timer             [64]                  configure Plug and
   Allocate IRQ to PCI VGA       [Yes]                 Play (PnP) devices
   Palette Snooping              [Disabled]            not required for
                                                       boot if your system
   IRQ-3 assigned to             [PCI Device]          has a Plug and Play
   IRQ-4 assigned to             [PCI Device]          operating system.
   IRQ-5 assigned to             [PCI Device]
   IRQ-7 assigned to             [PCI Device]          ←→   Select Screen
   IRQ-9 assigned to             [PCI Device]          ↑↓   Select Item
   IRQ-10 assigned to            [PCI Device]          +-   Change Option
   IRQ-11 assigned to            [PCI Device]          F1   General Help
   IRQ-14 assigned to            [PCI Device]          F10  Save and Exit
   IRQ-15 assigned to            [PCI Device]          ESC  Exit

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```

Plug and Play O/S [No]

When set to **[No]**, BIOS configures all the devices in the system. When set to
[Yes] and if you install a Plug and Play operating system, the operating system
configures the Plug and Play devices not required for boot.
Configuration options: [No] [Yes]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency
timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

When set to **[Yes]**, BIOS assigns an IRQ to PCI VGA card if the card requests for
an IRQ. When set to **[No]**, BIOS does not assign an IRQ to the PCI VGA card even
if requested. Configuration options: [Yes] [No]

Palette Snooping [Disabled]

When set to **[Enabled]**, the palette snooping feature informs the PCI devices that
an ISA graphics device is installed in the system so that the latter can function
correctly. Configuration options: [Disabled] [Enabled]

IRQ-xx assigned to [PCI Device]

When set to **[PCI Device]**, the specific IRQ is free for use of PCI/PnP devices.
When set to **[Reserved]**, the IRQ is reserved for legacy ISA devices.
Configuration options: [PCI Device] [Reserved]

2.4.6   USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press **<Enter>** to display the configuration options.

```
                          BIOS SETUP UTILITY
      Advanced

   USB Configuration                                       Options

   Module Version - 2.24.3-13.4
                                                     Disabled
                                                     Enabled
   USB Devices Enabled:
           None

   USB Functions              [Enabled]
   USB 2.0 Controller         [Enabled]
   Legacy USB Support         [Auto]
   USB 2.0 Controller Mode    [HiSpeed]
                                                ←→   Select Screen
                                                ↑↓   Select Item
                                                +-   Change Option
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit

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```
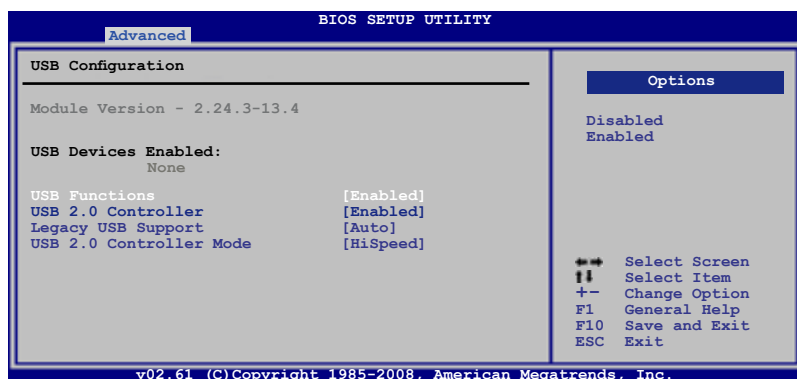
> The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the item shows **None**.

USB Functions [Enabled]

Enables or disables the USB functions. Configuration options: [Enabled] [Disabled]

USB 2.0 Controller [Enabled]

Enables or disables the USB 2.0 Controller. Configuration options: [Enabled] [Disabled]

Legacy USB Support [Auto]

Allows you to enable or disable support for Legacy USB storage devices, including USB flash drives and USB hard drives. Setting to **Auto** allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller Mode [HiSpeed]

Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps). Configuration options: [FullSpeed] [HiSpeed]

2.5 Power menu

The **Power** menu items allow you to change the settings for the Advanced Configuration and Power Interface (ACPI) and the Advanced Power Management (APM). Select an item then press **<Enter>** to display the configuration options.

```
                        BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Tools    Exit

   Suspend Mode                [Auto]                  Select the ACPI state
   ACPI 2.0 Support            [Disabled]              used for System
   ACPI APIC Support           [Enabled]               Suspend.

►    APM Configuration
►    Hardware Monitor
```
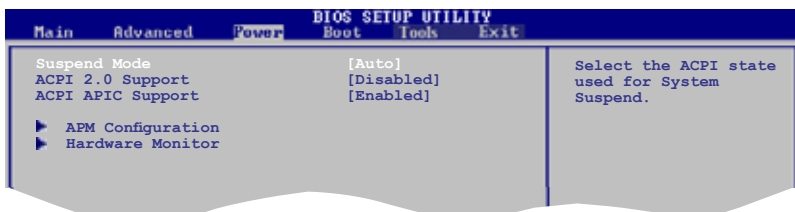
2.5.1   Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Configuration options: [S1 (POS) Only] [S3 Only] [Auto]

[S1 (POS) only] - Enables the system to enter the ACPI S1 (Power on Suspend) sleep state. In S1 sleep state, the system appears suspended and stays in a low power mode. The system can be resumed at any time.

[S3 only] - Enables the system to enter the ACPI S3 (Suspend to RAM) sleep state (default). In S3 sleep state, the system appears to be off and consumes less power than in the S1 state. When signaled by a wake-up device or event, the system resumes to its working state exactly where it was left off.

[Auto] - Detected by OS.

2.5.2   ACPI 2.0 Support [Disabled]

Allows you to add additional tables as per Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [Disabled] [Enabled]

2.5.3   ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to **[Enabled]**, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

2.5.4 APM Configuration

```
                         BIOS SETUP UTILITY
                  Power

  APM Configuration
                                                    ┌──────────────┐
  Restore on AC Power Loss       [Power Off]        └──────────────┘
                                                    Power On
  Power On By PCI Device         [Disabled]         Power Off
  Power On By Ring               [Disabled]
  Power On By PS/2 KB/MS         [Disabled]
  Power On By RTC Alarm          [Disabled]
```
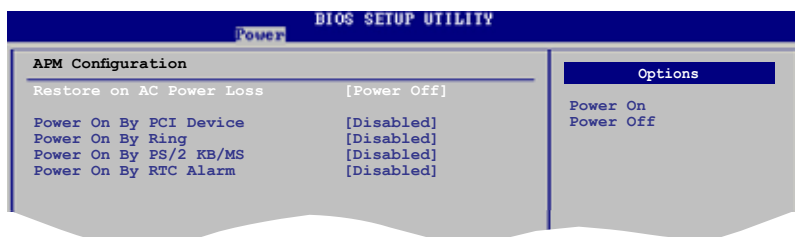
Restore on AC Power Loss [Power Off]

When set to **[Power Off]**, the system goes into off state after an AC power loss. When set to **[Power On]**, the system goes on after an AC power loss. Configuration options: [Power On] [Power Off]

Power On By PCI Device [Disabled]

When set to **[Enabled]**, this parameter allows you to turn on the system through a PCI/PCIE/Onboard LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power On By Ring [Disabled]

Allows you to enable or disable RI to generate a wake event. Configuration options: [Disabled] [Enabled]

Power On By PS/2 KB/MS [Disabled]

Allows you to enable or disable PS/2 Keyboard/Mouse to generate a wake event. Configuration options: [Disabled] [Enabled]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to **Enabled**, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values. Configuration options: [Disabled] [Enabled]

2.5.5   Hardware Monitor

```
                           BIOS SETUP UTILITY
                  Power

   Hardware Monitor                                    CPU Temperature

   CPU Temperature                  [23°C/73°F]
   MB Temperature                   [30°C/86°F]

   CPU Fan Speed                    [4891RPM]
   Chassis Fan Speed                [N/A]
   Power Fan Speed                  [N/A]

   VCORE Voltage                    [ 1.344V]
   3.3V Voltage                     [ 3.152V]
   5V Voltage                       [ 4.838V]
   12V Voltage                      [11.712V]                    Select Screen
                                                                 Select Item
   Smart Q-FAN Function             [Disabled]          +-       Change Field
                                                        F1       General Help
                                                        F10      Save and Exit
                                                        ESC      Exit

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```

CPU Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select Ignored if you do not wish to display the detected temperatures.

CPU Fan Speed [xxxxRPM] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows **N/A**. Select **[Ignored]** if you do not wish to display the detected speed.

Chassis/Power Fan Speed [xxxxRPM] or [N/A] or [Ignored]

The onboard hardware monitor automatically detects and displays the chassis/power fan speed in rotations per minute (RPM). If the fan is not connected to the chassis, the specific field shows **N/A**. Select **[Ignored]** if you do not wish to display the detected speed.

VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

Smart Q-Fan Function [Disabled]

Allows you to enable or disable the ASUS Q-Fan feature that smartly adjusts the CPU fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]

2.6 Boot menu

The **Boot** menu items allow you to change the system boot options. Select an item then press **<Enter>** to display the sub-menu.

```
                           BIOS SETUP UTILITY
    Main    Advanced    Power    Boot    Tools    Exit
  ┌─────────────────────────────────────────────┬──────────────────────────┐
  │ Boot Settings                                │ Specifies the Boot       │
  │ ──────────────────────                       │ Device Priority          │
  │ ▶ Boot Device Priority                       │ sequence.                │
  │                                              │                          │
  │ ▶ Boot Settings Configuration                │ A virtual floppy disk    │
  │ ▶ Security                                   │ drive (Floppy Drive B:)  │
  │                                              │ may appear when you set  │
  │                                              │ the CD-ROM drive as the  │
  │                                              │ first boot device.       │
  │                                              │                          │
  │                                              │                          │
  │                                              │ ⬄    Select Screen       │
  │                                              │ ↑↓    Select Item        │
  │                                              │ Enter Go to Sub Screen   │
  │                                              │ F1    General Help       │
  │                                              │ F10   Save and Exit      │
  │                                              │ ESC   Exit               │
  ├──────────────────────────────────────────────┴──────────────────────────┤
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  └─────────────────────────────────────────────────────────────────────────┘
```

2.6.1 Boot Device Priority

```
                           BIOS SETUP UTILITY
                              Boot
  ┌─────────────────────────────────────────────┬──────────────────────────┐
  │ Boot Device Priority                         │ Specifies the boot       │
  │ ──────────────────────                       │ sequence from the        │
  │ 1st Boot Device          [1st FLOPPY DRIVE]  │ available devices.       │
  │ 2nd Boot Device          [Hard Drive]        │                          │
  │ 3rd Boot Device          [ATAPI CD-ROM]      │ A device enclosed        │
  │                                              │ in parenthesis has       │
  │                                              │ been disabled in         │
  │                                              │ the corresponding        │
  │                                              │ type menu.               │
  │                                              │                          │
  │                                              │                          │
  │                                              │ ⬄    Select Screen       │
  │                                              │ ↑↓    Select Item        │
  │                                              │ +-    Change Option      │
  │                                              │ F1    General Help       │
  │                                              │ F10   Save and Exit      │
  │                                              │ ESC   Exit               │
  ├──────────────────────────────────────────────┴──────────────────────────┤
  │    v02.61 (C)Copyright 1985-2008, American Megatrends, Inc.              │
  └─────────────────────────────────────────────────────────────────────────┘
```

1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system. Configuration options: [1st FLOPPY DRIVE] [Hard Drive] [ATAPI CD-ROM] [Disabled]

2.6.2 Boot Settings Configuration

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to **[Disabled]**, BIOS performs all the POST items. Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature. Configuration options: [Disabled] [Enabled]

> Set this item to **[Enabled]** to use the ASUS MyLogo 2™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM. Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock. Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse. Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to **[Enabled]**, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]
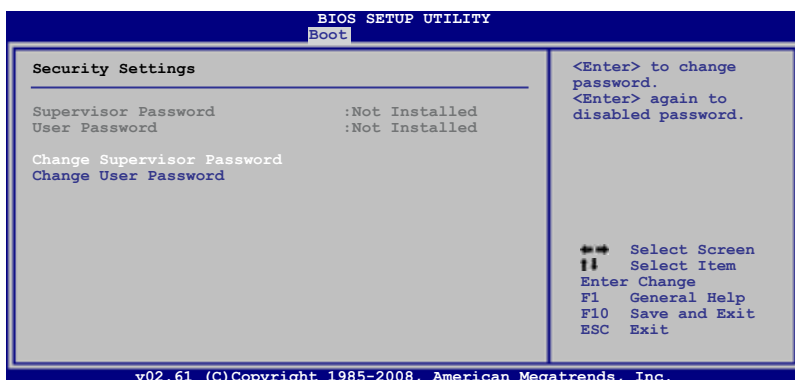
Hit 'DEL' Message Display [Enabled]

When set to **[Enabled]**, the system displays the message **Press DEL to run Setup** during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to **[Enabled]**, this function allows the option ROMs to trap Interrupt 19.
Configuration options: [Disabled] [Enabled]

2.6.3   Security

The **Security** menu items allow you to change the system security settings. Select
an item then press **<Enter>** to display the configuration options.

```
                              BIOS SETUP UTILITY
                         Boot

    Security Settings                                      <Enter> to change
    _____              password.
                                                           <Enter> again to
    Supervisor Password             :Not Installed         disabled password.
    User Password                   :Not Installed

    Change Supervisor Password
    Change User Password




                                                              Select Screen
                                                              Select Item
                                                           Enter Change
                                                           F1   General Help
                                                           F10  Save and Exit
                                                           ESC  Exit

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```

Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor
Password item on top of the screen shows the default **Not Installed**. After you set
a password, this item shows **Installed**.

To set a Supervisor Password:

1.   Select the **Change Supervisor Password** item.
2.   From the password box, type a password composed of at least six letters
      and/or numbers, then press **<Enter>**.
3.   Confirm the password when prompted.

The message **Password Installed** appears after you successfully set your
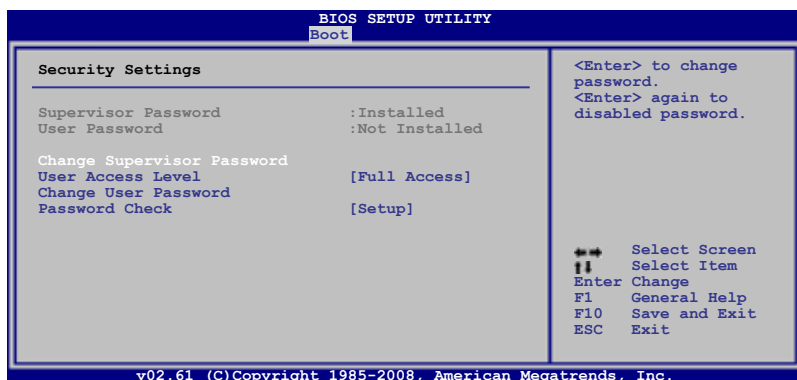password.

To change the supervisor password, follow the same steps in setting a supervisor
password.

To clear the supervisor password, select the **Change Supervisor Password** item
and press **<Enter>**. The message **Password Uninstalled** appears.

> If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section **1.9 Jumpers** for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.

```
                        BIOS SETUP UTILITY
                  Boot

  Security Settings                                    <Enter> to change
                                                       password.
                                                       <Enter> again to
  Supervisor Password        :Installed                disabled password.
  User Password              :Not Installed

  Change Supervisor Password
  User Access Level          [Full Access]
  Change User Password
  Password Check             [Setup]

                                                    ←→    Select Screen
                                                    ↑↓    Select Item
                                                    Enter Change
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```

User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

> **[No Access] -** prevents user access to the Setup utility.

> **[View Only] -** allows access but does not allow change to any field.

> **[Limited] -** allows changes only to selected fields, such as Date and Time.

> **[Full Access] -** allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a User Password:

1. Select the **Change User Password** item.
2. From the password box, type a password composed of at least six letters and/or numbers, then press **<Enter>**.
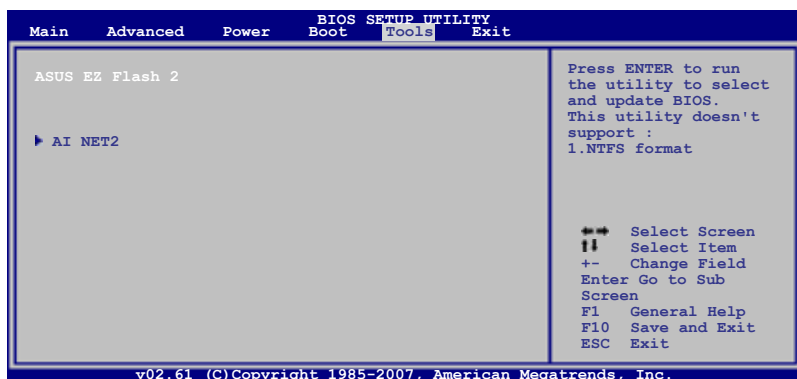3. Confirm the password when prompted.

The message **Password Installed** appears after you set your password successfully.

To change the user password, follow the same steps in setting a user password.
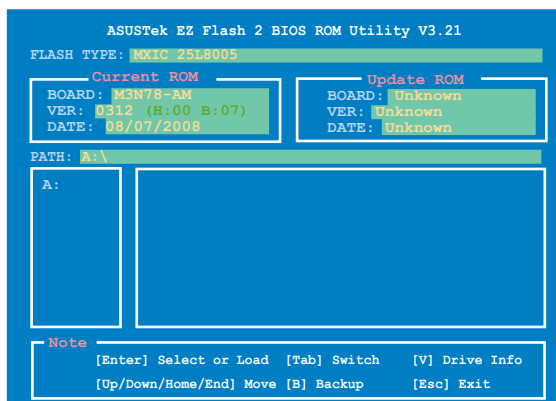
Password Check [Setup]

When set to **[Setup]**, BIOS checks for user password when accessing the Setup utility. When set to **[Always]**, BIOS checks for user password both when accessing Setup and booting the system. Configuration options: [Setup] [Always]

2.7   Tools menu

```
                            BIOS SETUP UTILITY
    Main     Advanced    Power    Boot    Tools    Exit

    ASUS EZ Flash 2                                    Press ENTER to run
                                                       the utility to select
                                                       and update BIOS.
    ▶ AI NET2                                          This utility doesn't
                                                       support :
                                                       1.NTFS format


                                                       ↔    Select Screen
                                                       ↕    Select Item
                                                       +-   Change Field
                                                       Enter Go to Sub
                                                       Screen
                                                       F1   General Help
                                                       F10  Save and Exit
                                                       ESC  Exit

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```
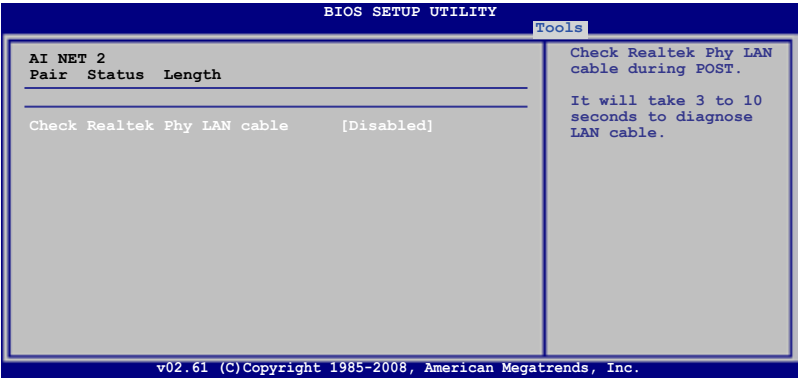
2.7.1   ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press **<Ok>**, a confirmation message appears. Use the left/right arrow key to select between **[Yes]** or **[No]**, then press **<Ok>** to confirm your choice.

```
            ASUSTek EZ Flash 2 BIOS ROM Utility V3.21
    FLASH TYPE: MXIC 25L8005
        ┌── Current ROM ──┐              ┌── Update ROM ──┐
        BOARD: M3N78-AM                  BOARD: Unknown
        VER:  0312 (H:00 B:07)           VER:  Unknown
        DATE: 08/07/2008                 DATE: Unknown
    PATH: A:\

    A:



        ┌─ Note ─────────────────────────────────────────┐
            [Enter] Select or Load  [Tab] Switch    [V] Drive Info

            [Up/Down/Home/End] Move [B] Backup      [Esc] Exit
```

2.7.2 AI NET 2

```
                          BIOS SETUP UTILITY
                                              Tools
 AI NET 2                                     Check Realtek Phy LAN
 Pair  Status  Length                         cable during POST.

                                              It will take 3 to 10
 Check Realtek Phy LAN cable      [Disabled]  seconds to diagnose
                                              LAN cable.




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```

Check Realtek Phy LAN cable [Disabled]

Enables or disables checking of the Realtek Phy LAN cable during the Power-On Self-Test (POST).
Configuration options: [Disabled] [Enabled]

2.8   Exit menu

The **Exit** menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.

```
                         BIOS SETUP UTILITY
  Main     Advanced     Power     Boot     Tools     Exit

  Exit Options                                    Exit system setup
  ─────────────────────────────                   after saving the
  Exit & Save Changes                             changes.
  Exit & Discard Changes
  Discard Changes                                 F10 key can be used
                                                  for this operation.
  Load Setup Defaults


                                                  ◄►    Select Screen
                                                  ↑↓    Select Item
                                                  Enter Go to Sub Screen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

Pressing **<Esc>** does not immediately exit this menu. Select one of the options from this menu or **<F10>** from the legend bar to exit.

Exit & Save Changes

Once you are finished making your selections, choose this option from the **Exit** menu to ensure that the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **OK** to save changes and exit.

Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation window appears. Select **OK** to discard any changes and load the previously saved values.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press **<F5>**, a confirmation window appears. Select **OK** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

This chapter describes the contents of the support DVD that comes with the motherboard package.

Software

support

3

3.1 Installing an operating system

This motherboard supports Windows® XP/Vista operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

> • Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.
>
> • Ensure that you install the Windows® XP Service Pack 2 or later versions before installing the drivers for better compatibility and system stability.

3.2 Support DVD information

The support DVD that comes with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

> The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website at www.asus.com for updates.

3.2.1 Running the support DVD

Place the support DVD into the optical drive. The DVD automatically displays the Drivers menu if Autorun is enabled in your computer.
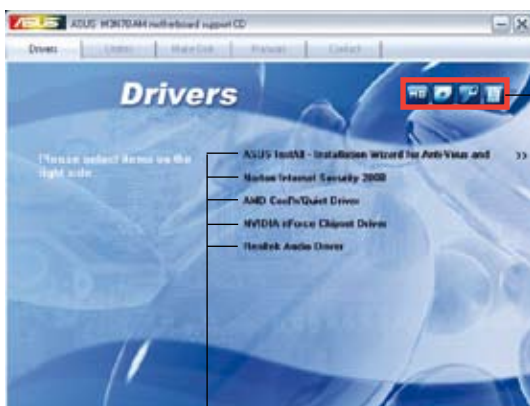
Click an icon to display support DVD/ motherboard information

Click an item to install

> If Autorun is NOT enabled in your computer, browse the contents of the support DVD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the DVD.

3.2.2 Drivers menu

The **Drivers** menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.

ASUS InstAll - Installation Wizard for Anti-Virus and Drivers

Installs all of the drivers using the installation wizard.

Norton Internet Security 2008

Installs Norton Internet Security 2008.

AMD Cool 'n' Quiet Driver

Installs the AMD Cool 'n' Quiet driver.

NVIDIA nForce Chipset Driver

Installs the NVIDIA nForce chipset driver.

Realtek Audio Driver

Installs the Realtek audio driver.

The screen display and driver options may vary depending on the operating system version.

3.2.3 Utilities menu

The **Utilities** menu shows the applications and other software that the motherboard supports.

Click to display the next page

Click to return to the previous page

ASUS InstAll - Installation Wizard for Utilities

Installs all of the utilities using the installation wizard.

ASUS Update

The ASUS Update utility allows you to update the motherboard BIOS in a Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP).

ASUS PC Probe II

This smart utility monitors the fan speed, CPU temperature, and system voltages, and alerts you of any detected problems. This utility helps you keep your computer in healthy operating condition.

Adobe Acrobat Reader 8

Installs the Adobe® Acrobat® Reader that allows you to open, view, and print documents in Portable Document Format (PDF).

Microsoft DirectX 9.0c

Installs the Microsoft® DirectX® 9.0c driver. The Microsoft DirectX® 9.0c is a multimedia technology that enhances computer graphics and sound. DirectX® improves the multimedia features of you computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer. Visit the Microsoft website at www.microsoft.com for updates.

Corel MediaOne Starter

Installs the Corel MediaOne Starter application to easily manage, edit, share and protect your multimedia data.

CyberLink PowerBackup

Installs the CyberLink PowerBackup to back up and restore your data easily.

WinZip 11

Installs the WinZip utility for easy file-compression and protection.

Ulead Burn. Now

Installs the Ulead Burn.Now application for Audio DVD, CD and data disc creation.

Ulead PhotoImpact 12 SE

Installs the PhotoImpact image editing software.

ASUS Cool 'n' Quiet Utility

Installs the ASUS Cool 'n' Quiet utility.

3.2.4 Make disk menu

The **Make disk** menu allows you to make a RAID driver disk.

Click to display the next page

Click to return to the previous page

NVIDIA 32/64bit XP SATA RAID Driver (Disk1/2)

Allows you to create the NVIDIA 32/64-bit XP SATA RAID driver disks for Windows® XP Operating System (OS).

NVIDIA 32/64bit Vista SATA RAID Driver

Allows you to create the NVIDIA 32/64-bit Vista SATA RAID driver disk for Windows® Vista Operating System (OS).

NVIDIA 32/64bit XP AHCI Driver (Disk1/2)

Allows you to create the NVIDIA 32/64-bit XP AHCI driver disk for Windows® XP Operating System (OS).

NVIDIA 32/64bit Vista AHCI Driver

Allows you to create the NVIDIA 32/64-bit Vista AHCI driver disk for Windows® Vista Operating System (OS).

Due to floppy disk capacity limitation, when creating a RAID configuration under Windows® Vista, install the AHCI / RAID driver through the motherboard support DVD or a USB device.

Find RAID driver in the support DVD through the path below:
Drivers\Chipset\Disk\RAID
Find AHCI driver in the support DVD through the path below:
Drivers\Chipset\Disk\AHCI

3.2.5   Manual menu

The **Manual** menu contains a list of supplementary user manuals. Click an item to open the folder of the user manual.

> Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the Utilities menu before opening a user manual file.

3.2.6   ASUS Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user manual.

3.2.7   Other information

The icons on the top right corner of the screen give additional information on the motherboard and the contents of the support DVD. Click an icon to display the specified information.
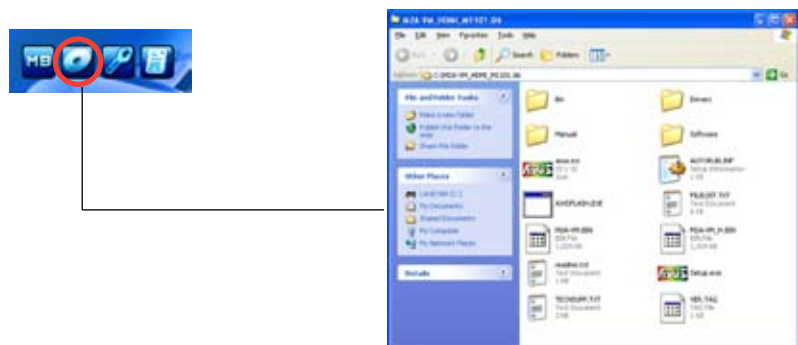
Motherboard Info

Displays the general specifications of the motherboard.

Browse this DVD

Displays the support DVD contents in graphical format.

Technical support Form

Displays the ASUS Technical Support Request Form that you have to fill out when requesting technical support.

Filelist

Displays the contents of the support DVD and a brief description of each in text format.

3.3 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® XP operating system on a hard disk drive that is included in a RAID set. For Windows® Vista™ operating system, use either the motherboard support DVD or a USB device with the RAID driver.

3.3.1 Creating a RAID driver disk without entering the OS

To create a RAID driver disk without entering the OS:

1. Boot your computer.
2. Press **<Del>** during POST to enter the BIOS setup utility.
3. Set the optical drive as the primary boot device.
4. Insert the support DVD into the optical drive.
5. Save changes and exit BIOS.
6. Press any key when the system prompts **Press any key to boot from the optical drive**.
7. When the menu appears, press **<1>** to create a RAID driver disk.
8. Insert a formatted floppy disk into the floppy drive, then press **<Enter>**.
9. Follow the succeeding onscreen instructions to complete the process.

3.3.2 Creating a RAID driver disk in Windows® environment

To create a RAID driver disk in Windows® environment:

1. Turn on the system.
2. Place the motherboard support DVD into the optical drive.
3. Go to the **Make disk** menu, then click **NVIDIA 32/64bit XP SATA RAID Driver** to create a NVIDIA® 32/64bit XP SATA RAID driver disk.
4. Insert a floppy disk/USB device into the floppy disk drive/USB port.
5. Follow the the succeeding onscreen instructions to complete the process.

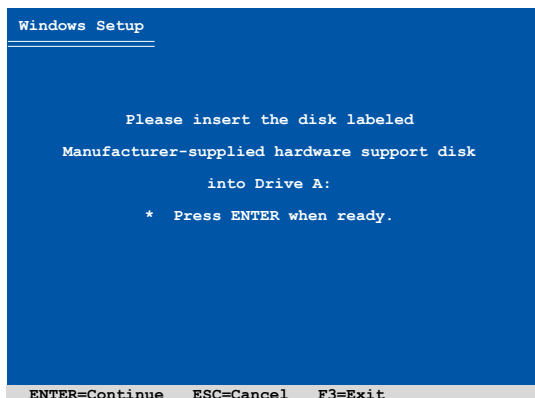> Write-protect the floppy disk to avoid computer virus infection.

To install the RAID driver in Windows® XP operating system:

1. During the OS installation, press the **F6** key when prompted to install third-party SCSI or RAID driver.
2. Insert the floppy disk with the RAID driver into the floppy disk drive.
3. Follow the succeeding onscreen instructions to complete the installation.
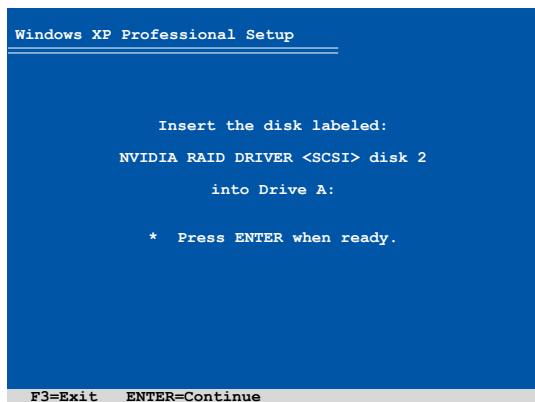
Using the driver disks you created:

• Insert Disk1 when you see the following instruction in Windows Setup. **DO NOT** remove Disk1 until you are asked to insert Disk2.

```
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
```

• Remove Disk1, and insert Disk2 when you see the following instruction in Windows XP Setup.

```
Windows XP Professional Setup




                      Insert the disk labeled:

               NVIDIA RAID DRIVER <SCSI> disk 2

                        into Drive A:


                *   Press ENTER when ready.






    F3=Exit    ENTER=Continue
```

• Follow the succeeding onscreen instructions to complete the setup.

To install the RAID driver in Windows® Vista operating system:

1.   Insert the motherboard support DVD or a USB device with the RAID driver into the optical drive/USB port.

      Find RAID driver in the support DVD through the path below:

      Drivers\Chipset\Disk\RAID

      Find AHCI driver in the support DVD through the path below:

      Drivers\Chipset\Disk\AHCI

2.   Follow the succeeding onscreen instructions to complete the installation.

Due to chipset limitation, the Serial ATA ports supported by the NVIDIA chipset does not support Serial Optical Disk Drives (Serial ODD) under DOS.