ASUS

M3A78-EMH HDMI

Motherboard

E3610

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Contents

Notices ..... **vi**
Safety information ..... **vii**
M3A78-EMH HDMI specifications summary ..... **x**

Chapter 1: Product introduction

1.1 Welcome! **1-2**
1.2 Package contents **1-2**
1.3 Special features **1-2**
1.3.1 Product highlights 1-2
1.3.2 Innovative ASUS features 1-6
1.4 Before you proceed **1-7**
1.5 Motherboard overview **1-8**
1.5.1 Motherboard layout 1-8
1.5.2 Placement direction 1-9
1.5.3 Screw holes 1-9
1.6 Central Processing Unit (CPU) **1-10**
1.6.1 Installing the CPU 1-10
1.6.2 Installing the heatsink and fan 1-12
1.7 System memory **1-14**
1.7.1 Overview 1-14
1.7.2 Memory configurations 1-14
1.7.3 Installing a DIMM 1-21
1.7.4 Removing a DIMM 1-21
1.8 Expansion slots **1-22**
1.8.1 Installing an expansion card 1-22
1.8.2 Configuring an expansion card 1-22
1.8.3 PCI slots 1-25
1.8.4 PCI Express x1 slot 1-25
1.8.5 PCI Express x16 slot 1-25
1.9 Jumpers **1-26**
1.10 Connectors **1-29**
1.10.1 Rear panel connectors 1-29
1.10.2 Internal connectors 1-32

Contents

Chapter 2: BIOS setup

2.1 Managing and updating your BIOS 2-2

2.1.1 Creating a bootable floppy disk..... 2-2

2.1.2 AFUDOS utility..... 2-3

2.1.3 ASUS CrashFree BIOS 3 utility 2-6

2.1.4 ASUS EZ Flash 2 utility..... 2-8

2.1.5 ASUS Update utility 2-9

2.2 BIOS setup program 2-12

2.2.1 BIOS menu screen..... 2-13

2.2.2 Menu bar..... 2-13

2.2.3 Navigation keys..... 2-14

2.2.4 Menu items 2-14

2.2.5 Sub-menu items..... 2-14

2.2.6 Configuration fields 2-14

2.2.7 General help 2-14

2.2.8 Pop-up window 2-15

2.3 Main menu 2-16

2.3.1 System Time 2-16

2.3.2 System Date 2-16

2.3.3 Legacy Diskette A 2-16

2.3.4 Primary IDE Master/Slave..... 2-17

2.3.5 SATA 1-6 2-18

2.3.6 SATA Configuration..... 2-19

2.3.7 System Information..... 2-20

2.4 Advanced menu 2-21

2.4.1 JumperFree Configuration 2-21

2.4.2 Hyper Transport Configuration..... 2-22

2.4.3 CPU Configuration..... 2-22

2.4.4 Chipset..... 2-23

2.4.5 Onboard Device Configuration..... 2-27

2.4.6 PCIPnP 2-28

2.4.7 USB Configuration 2-29

Contents

2.5 Power menu 2-30
2.5.1 Suspend Mode 2-30
2.5.2 ACPI Support 2-30
2.5.3 ACPI APIC Support 2-30
2.5.4 APM Configuration 2-31
2.5.5 Hardware Monitor 2-32
2.6 Boot menu 2-33
2.6.1 Boot Device Priority 2-33
2.6.2 Boot Settings Configuration 2-34
2.6.3 Security 2-35
2.7 Tools menu 2-38
2.7.1 ASUS EZ Flash 2 2-38
2.8 Exit menu 2-39

Chapter 3: Software support

3.1 Installing an operating system 3-2
3.2 Support CD/DVD information 3-2
3.2.1 Running the support DVD 3-2
3.2.2 Drivers menu 3-3
3.2.3 Utilities menu 3-4
3.2.4 Make Disk menu 3-5
3.2.5 Manual menu 3-5
3.2.6 ASUS Contact information 3-6
3.2.7 Other information 3-6

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 electrical shock hazard, disconnect the power cable from the electrical 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.
- Make sure 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, make sure 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) 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 make sure 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: **`format A:/S`**

M3A78-EMH HDMI specifications summary

CPU	AMD® Socket AM2+ Phenom™FX / Phenom / Athlon™ 64 / Sempron™ processor AMD Socket AM2 Athlon 64 x2 / Athlon 64 FX / Athlon 64 / Sempron processor AMD Cool 'n' Quiet™ Technology AMD64 architecture enables simultaneous 32-bit and 64-bit computing AMD Live!™ Ready
Chipset	AMD 780G / SB700
Front side 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 4 x 240-pin DIMM slots support unbuffered ECC and non-ECC DDR2 1066*/800/667/533 MHz memory modules Supports up to 8GB system memory * DDR2 1066 is supported by AM2+ CPU only * Refer to www.asus.com or user manual for Memory QVL (Qualified Vendors List)
Expansion slots	1 x PCI Express™ x16 slot 1 x PCI Express™ x1 slot 2 x PCI 2.2 slots Support PCI Express™ 2.0 / 1.0 Architecture
Graphics	Integrated ATI RV610-based Direct x 10.1 graphics Supports max. shared memory up to 256MB Supports HDMI™ Technology with HDCP compliant with max. resolution 1920 x 1080p * To play back the HD-DVD and Blu ray Disc, we recommend system configuration above Graphic shared memory 256MB/Dual-Core CPU Minimum/ Minimum 1GB memory of Dual-channel DDR2 667 or Single-channel DDR2 800. Supports DVI-D with max. resolution 2560 x 1600 (@60Hz Dual-link) Supports RGB with max. resolution 2048 x 1536 (@85Hz Dual link) Dual VGA output support: RGB & DVI / HDMI Hybrid CrossFireX Support
Storage / RAID	1 x UltraDMA 133/100 connector 6 x Serial ATA 3Gb/s connectors support RAID 0, RAID 1 and RAID 10 configuration

(continued on the next page)

M3A78-EMH HDMI specifications summary

Audio	ALC883 High Definition Audio 8-channel CODEC Supports Jack-Detect and Multistreaming Technologies Supports S/PDIF out interface
USB	Supports up to 12 USB 2.0/1.1 ports (8 ports at mid-board, 4 ports at back panel)
LAN	PCIe Gigabit LAN
ASUS overclocking features	SFS (Stepless Frequency Selection) from 200MHz to 300MHz at 1MHz increment Ajustable CPU Voltage at 0.025V increment ASUS C.P.R. (CPU Parameter Recall)
ASUS special features	ASUS Q-Fan ASUS CrashFree BIOS3 ASUS EZ Flash2 ASUS MyLogo2
Back panel I/O ports	1 x PS/2 Mouse port 1 x PS/2 Keyboard port 1 x HDMI port 1 x DVI port 1 x VGA port 1 x RJ45 port 4 x USB 2.0/1.1 port 8-channel Audio I/O ports
BIOS	8Mb Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, ACPI2.0, SMBIOS 2.4
Internal I/O connectors	4 x USB 2.0 connectors support additional 8 USB 2.0 ports 1 x LPT connector 1 x Floppy disk drive connector 1 x IDE connector 1 x COM connector 6 x SATA connectors High definition front panel audio connector 1 x 10-pin system panel connector CD audio-in connector 1 x S/PDIF output connector CPU/Chassis Fan connectors 1 x HDJ1 connector 24-pin EATX power connector 4-pin ATX 12V power connector

(continued on the next page)

M3A78-EMH HDMI specifications summary

Accessories	User manual 3 x Serial ATA cables 3 x SATA power cables (include one 2 in 1 power cable) 1 x UltraDMA 133/100/66 cable 1 x FDD cable 1 x I/O shield
Form Factor	uATX Form factor: 9.6” x 9.0” (24.5cm x 22.9cm)
Support DVD	Drivers ASUS PC Probe II ASUS LiveUpdate Utility Anti-Virus software (OEM version)

***Specifications are subject to change without notice.**

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

1 Product introduction

1.1 Welcome!

Thank you for buying an ASUS® M3A78-EMH HDMI 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 M3A78-EMH HDMI motherboard
Cables	3 x Serial ATA signal cables 3 x Serial ATA power cables (includes one 2 in 1 power cable) 1 x Ultra DMA 133/100/66 cable 1 x FDD cable
Accessories	1 x I/O shield
Application CD	ASUS motherboard support DVD
Documentation	User guide

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 / Athlon™ / Sempron™ 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 64 X2 / Athlon 64 FX / Athlon 64 / Sempron CPU support

The motherboard supports AMD socket AM2 single-core Athlon 64/ Sempron and dual-core Athlon 64 X2/ Athlon 64 FX processors with 2MB / 1MB / 512KB L2 cache, which is based on 64-bit architecture. It features 2000 / 1600 MT/s HyperTransport Bus, dual-channel un-buffered 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 2-23 for details.

AMD® 780G and ATI SB700 chipsets

AMD 780G Northbridge is the latest AMD chipset designed for both HT1.0 and 5200MT/s HyperTransport™ 3.0 (HT 3.0) interface speed and external graphics in PCI Express™ 2.0/1.1 standard ,.It features the integrated DX10 compliant ATI RV610-based graphics ,which supports dual VGA outputs including DVI/HDMI interface with HDCP compliant ,and incorporates AMD's UVD with hardware acceleration of H.264, VC1 and Mpeg2 used in HD DVD and BluRay disks. Meanwhile it can also support the future mainstream Hybrid CrossFire Technology that significantly optimizes your 3D performance. See page 2-23 for details.

Surroundview

The Surroundview function provides four independent monitors display with an additional ATI VGA card for multi-tasking. See 1-25 and 2-26 for details.

HDMI Interface

HDMI (High-Definition Multimedia Interface) is the first and only industry-supported, uncompressed, all digital audio and video interface via a single cable and is HDCP compliant allowing playback of HD DVD, Blu-Ray Disc and other protected content. See page 1-31 for details.

DVI Interface

DVI (Digital Visual Interface) provides high visual quality of digital display devices such as LCD monitor. The interface of this motherboard supports dual VGA output both DVI and RGB and is HDCP compliant allowing playback of HD DVD and Blu-Ray Disc. See page 1-30 for details.

Hybrid CrossFireX

AMD new technology Hybrid CrossFireX which marries the integrated graphics processors and one entry-level discrete graphics card can increase your performance up to 70% and supports up to 4 monitors with efficient power consumption.

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 1-25 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.

DDR2 memory support

This motherboard is an AMD® platform with DDR2 1066 support. It provides faster data transfer rate and more bandwidth to increase memory data transfer rate and computing efficiency, enhancing system performance in 3D graphics and other memory demanding applications.

DDR2 1066 is supported by some of the AM2+ CPUs only. Refer to www.asus.com for the supported CPU models.

Serial ATA 3Gb/s technology

The motherboard supports next-generation SATA hard drives based on the new SATA 3Gb/s storage specification. The onboard ATI® SB700 allows RAID 0, RAID 1 and RAID 10 configurations for four SATA connectors. See pages 1-34 and 2-19 for details

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.

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.

8-channel high definition audio

Enjoy high-quality sound system on your PC! The onboard 8-channel HD audio (High Definition Audio, previously codenamed Azalia) CODEC enables high-quality 192KHz/24-bit audio output, jack-detect feature, which automatically detects and identifies what types of peripherals are plugged into the audio I/O jacks and notifies users of inappropriate connection, meaning there will be no more confusion of Line-in, Line-out and Mic jacks. See pages 1-29, 1-37 and 2-27 for details.

1.3.2 Innovative ASUS features

ASUS Q-Fan technology

The ASUS Q-Fan technology smartly adjusts the CPU fan speeds according to the system loading to ensure quiet, cool, and efficient operation.
See page 2-32 for details.

ASUS MyLogo2™

Turn your favorite photos into 256-color boot logos to personalize your system.
See page 2-34 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 2-6 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 2-8 and 2-38 for details.

C.P.R. (CPU Parameter Recall)

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. See page 1-26 for details.

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 the wall socket 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.

M3A78-EMH HDMI Onboard LED

1.5 Motherboard overview

1.5.1 Motherboard layout

1.5.2 Placement direction

When installing the motherboard, make sure 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 image below.

1.5.3 Screw holes

Place six (6) 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.

1.6 Central Processing Unit (CPU)

The motherboard comes with an AM2+/AM2 socket designed for AMD® Socket AM2+ Phenom™ FX / Phenom / Athlon™ 64 / Sempron™ processor or for Socket AM2 Athlon 64 X2 / Athlon 64 FX / Athlon 64 / Sempron processor.

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

1.6.1 Installing the CPU

To install a CPU.

1. Locate the CPU socket on the motherboard.

M3A78-EMH HDMI CPU Socket AM2/AM2+

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

Make sure 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. Carefully insert the CPU into the socket until it fits in place.

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.

M3A78-EMH HDMI 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™ 64 / Sempron™ / Athlon 64X2 / Athlon 64 FX processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

Make sure that you use only qualified heatsink and fan assembly.

Follow these steps to install the CPU heatsink and fan.

1. Place the heatsink on top of the installed CPU, making sure 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, make sure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

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 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.

Make sure 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 four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module 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:

M3A78-EMH HDMI 240-pin DDR2 DIMM Sockets

Channel	Sockets
Channel 1	DIMM_A1 and DIMM_A2
Channel 2	DIMM_B1 and DIMM_B2

1.7.2 Memory configurations

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

Recommended memory configurations

	Sockets			
Mode	DIMM_A1	DIMM_B1	DIMM_A2	DIMM_B2
Single-Channel	–	Populated	–	–
	Populated	–	–	–
Dual-channel (1)	Populated	Populated	–	–
Dual-channel (2)	Populated	Populated	Populated	Populated

- When using only one memory module, start installing the DDR2 DIMM from slot DIMM_A1 or DIMM_B1 for better overclocking capability.
- For dual-channel configuration (2), you may:
  - install identical DIMMs in all four sockets OR
  - install identical DIMM pair in DIMM_A1 and DIMM_B1 (yellow sockets) and another identical DIMM pair in DIMM_A2 and DIMM_B2 (black sockets)
- Always use identical DDR2 DIMM pairs for dual channel mode. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.

Important notice on installing Windows® Vista / XP 32-bit version

- If you are using a Windows 32-bit version operating system (e.g. 32-bit Windows XP, 32-bit Vista) without the Physical Address Extension (PAE) support, the system will allocate a certain amount of memory space for system devices.
- We recommend that you install only a maximum of 3GB system memory when using a Windows 32-bit version operating system without the PAE. The excess over 3GB of installed memory will not cause any problem; however, the system can not use this excess memory space and the system will display less than the total size of physical memory installed.

The motherboard can support 8 GB physical memory on the operating system listed below. You may install a maximum of 2 GB DIMMs on each slot.

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

M3A78-EMH HDMI Motherboard Qualified Vendors Lists (QVL)
DDR2-1066 MHz capability

Size	Vendor	Model	CL	Brand	SS/ DS	Component	DIMM support		
							A*	B*	C*
512MB	Kingston	KHX8500D2/512	N/A	Kingston	SS	Heat-Sink Package	.	.	.
1G	Kingston	KHX8500D2K2/2GN	N/A	Kingston	DS	Heat-Sink Package	.	.	.
1G	ADATA	M2OMIDG314720INC5Z	5	ADATA	DS	Heat-Sink Package	.	.	.
1G	OCZ	OCZ2N1066SR2DK	N/A	OCZ	DS	Heat-Sink Package	.	.	.
1G	OCZ	OCZ2N10662GK	N/A	OCZ	DS	Heat-Sink Package	.	.	.
512MB	Kingbox	EP512D21066PS	N/A	Micron	SS	6QD22D9GCT	.	.	.

DDR2-800 MHz capability

Size	Vendor	Model	CL	Brand	SS/ DS	Component	DIMM Support		
							A*	B*	C*
1G	Kingston	KVR800D2N5/1G	N/A	Samsung	DS	K4T51083QC-ZCE7	.	.	.
1G	Kingston	KHX6400D2LL/1G	N/A	Kingston	DS	Heat-Sink Package	.	.	.
512MB	Kingston	KHX6400D2LLK2/1GN	N/A	Kingston	SS	Heat-Sink Package	.	.	.
512MB	Kingston	KVR800D2N5/512	N/A	Promos	SS	V59C1512804QCF25SY032406PECPA	.	.	.
512MB	Samsung	KR M378T6553CZ3-CE7	N/A	Samsung	SS	K4T51083QC-ZCE7	.	.	.
1G	Samsung	KR M378T2953CZ3-CE7	N/A	Samsung	DS	K4T51083QC-ZCE7	.	.	.
512MB	Samsung	KR M391T6553CZ3-CE7	N/A	Samsung	SS	K4T51083QC-ZCE7(ECC)	.	.	.
1G	Samsung	KR M391T2953CZ3-CE7	N/A	Samsung	DS	K4T51083QC-ZCE7(ECC)	.	.	.
512MB	Qimonda	HYS64T64000EU-2.5-B2	6	Qimonda	SS	HYB18T512800B2F25FSS28380	.	.	.
1G	Qimonda	HYS64T128020EU-2.5-B2	6	Qimonda	DS	HYB18T512800B2F25FSS28380	.	.	.
512MB	Micron	MT9HTF6472AY-80ED4	5	Micron	SS	6ED22D9GKX(ECC)	.	.	.
1G	Micron	MT18HTF12872AY-80ED4	5	Micron	DS	6TD22D9GKX(ECC)	.	.	.
1G	Corsair	XMS2-6400	4	Corsair	DS	Heat-Sink Package	.	.	.
1G	Corsair	XMS2-6400	5	Corsair	DS	Heat-Sink Package	.	.	.
512MB	HY	HYMP564U64AP8-S6 AA	N/A	Hynix	SS	HY5PS12821AFP-S6	.	.	.
512MB	HY	HYMP564U64BP8-S5 AB	N/A	Hynix	SS	HY5PS12821BFP-S5	.	.	.
512MB	HY	HYMP564U64CP8-S5 AB	5	Hynix	SS	HY5PS12821CFP-S5	.	.	.
1G	HY	HYMP512U64AP8-S6 AA	N/A	Hynix	DS	HY5PS12821AFP-S6	.	.	.
1G	HY	HYMP512U64BP8-S5 AB	5	Hynix	DS	HY5PS12821BFP-S5	.	.	.
1G	HY	HYMP512U64CP8-S5 AB	5	Hynix	DS	HY5PS12821CFPS5	.	.	.
2G	Apacer	78.A1GA0.9K4	5	Apacer	DS	AM4B5808CQJS8E0740E	.	.	.
512MB	ADATA	M20AD6G3H3160I1E58	N/A	ADATA	SS	AD29608A8A-25EG80720	.	.	.
512MB	VDATA	M2GVD6G3H3160I1E53	N/A	VDATA	SS	VD29608A8A-25EG30648	.	.	.
1G	VDATA	M2GVD6G3I4170I1E53	N/A	VDATA	DS	VD29608A8A-25EG30647	.	.	.
1G	PSC	AL7E8F73C-8E1	5	PSC	SS	A3R1GE3CFF734MAA0E	.	.	.
2G	PSC	AL8E8F73C-8E1	5	PSC	DS	A3R1GE3CFF734MAA0E	.	.	.

DDR2-667MHz capability

Size	Vendor	Model	CL	Brand	SS/ DS	Component	DIMM support		
							A*	B*	C*
256MB	Kingston	KVR667D2N5/256	N/A	Kingston	SS	D3216TLSAKL3U	.	.	.
256MB	Kingston	KVR667D2N5/256	N/A	Infineon	SS	HYB18T256800AF3SW65 33154	.	.	.
512MB	Kingston	KVR667D2N5/512	N/A	Elpida	SS	E5108AGBG-6E-E	.	.	.
1G	Kingston	KVR667D2N5/1G	N/A	Kingston	DS	D6408TEBGGL3U	.	.	.
1G	Kingston	KVR667D2N5/1G	N/A	Elpida	DS	E5108AGBG-6E-E	.	.	.
2G	Kingston	KVR667D2N5/2G	N/A	Micron	DS	7RE22 D9HNL	.	.	.
512MB	Samsung	KR M378T6553CZ0-CE6	N/A	Samsung	SS	K4T51083QC	.	.	.
512MB	Samsung	M378T6553CZ3-CE6	N/A	Samsung	SS	K4T51083QC-ZCE6	.	.	.
1G	Samsung	M378T2953CZ3-CE6	N/A	Samsung	DS	K4T51083QC-ZCE6	.	.	.
512MB	Qimonda	HYS64T64000EU-3S-B2	5	Qimonda	SS	HYB18T512B00B2F3SFSS28171	.	.	.
2G	Qimonda	HYS64T256020EU-3S-B	5	Qimonda	DS	HTB18T1G800BF-3S3VV10907	.	.	.
512MB	Corsair	VS512MB667D2	N/A	Corsair	SS	64M8CFEGPS0900647	.	.	.
1G	Corsair	VS1GB667D2	N/A	Corsair	DS	MID095D62864M8CEC	.	.	.
1G	Corsair	XMS2-5400	4	Corsair	DS	Heat-Sink Package	.	.	.
256MB	HY	HYMP532U64CP6-Y5 AB	5	Hynix	SS	HY5PS121621CFP-Y5	.	.	.
512MB	HY	HYMP564U64AP8-Y4 AA	N/A	Hynix	SS	HY5PS12821AFP-Y4	.	.	.
512MB	HY	HYMP564U64AP8-Y5 AA	N/A	Hynix	SS	HY5PS12821AFP-Y5	.	.	.
512MB	HY	HYMP564U72AP8-Y4	N/A	Hynix	SS	HY5PS12821AFP-Y4(ECC)	.	.	.
512MB	HY	HYMP564U72AP8-Y5	N/A	Hynix	SS	HY5PS12821AFP-Y5(ECC)	.	.	.
1G	HY	HYMP512U72AP8-Y5	N/A	Hynix	DS	HY5PS12821AFP-Y5(ECC)	.	.	.
1G	HY	HYMP512U64CP8-Y5 AB	5	Hynix	DS	HY5PS12521CFP-Y5	.	.	.
512MB	Kingmax	KLCC28F-A8KB5	N/A	Kingmax	SS	KKEA88B4LAUG-29DX	.	.	.
1G	Kingmax	KLCD48F-A8KB5	N/A	Kingmax	DS	KKEA88B4LAUG-29DX	.	.	.
512MB	Apacer	78.91092.420	N/A	Elpida	SS	E5108AE-6E-E	.	.	.
512MB	Apacer	AU512E667C5KBGC	5	Apacer	SS	AM4B5708MIJS7E0627B	.	.	.
512MB	Apacer	AU512E667C5KBGC	5	Apacer	SS	AM4B5708GQJS7E06332F	.	.	.
512MB	Apacer	78.91G92.9KC	5	Apacer	SS	AM4B5708GQJS7E0706F	.	.	.
1G	Apacer	AU01GE667C5KBGC	N/A	Apacer	DS	AM4B5708GQJS7E0636B	.	.	.
1G	Apacer	78.01092.420	5	Elpida	DS	E5108AE-6E-E	.	.	.
1G	Apacer	AU01GE667C5KBGC	5	Apacer	DS	AM4B5708MIJS7E0627B	.	.	.

(continued on the next page)

Size	Vendor	Model	CL	Brand	SS/ DS	Component	DIMM support		
							A*	B*	C*
512MB	ADATA	M20EL5G3H3160B1C0Z	N/A	Elpida	SS	E5108AE-6E-E	•	•	•
512MB	ADATA	M20AD5G3H3166I1C52	N/A	ADATA	SS	AD29608A8A-3EG20648	•	•	•
512MB	ADATA	M20AD5G3H3166I1C52	N/A	ADATA	SS	AD29608A8A-3EG20718	•	•	•
1G	ADATA	M2OAD5G3I4176I1C52	N/A	ADATA	DS	AD29608A8A-3EG20645	•	•	•
2G	ADATA	M2OAD5H3J4170I1C53	N/A	ADATA	DS	AD20908A8A-3EG 30724	•	•	•
512MB	VDATA	M2GVD5G3H31A4I1C52	N/A	VDATA	SS	VD29608A8A-3EC20615	•	•	•
512MB	VDATA	M2GVD5G3H166I1C52	N/A	VDATA	SS	VD29608A8A-3EG20637	•	•	•
1G	VDATA	M2GVD5G3I41P6I1C52	N/A	VDATA	DS	VD29608A8A-3EG20627	•	•	•
1G	VDATA	M2GVD5G3I41C4I1C52	N/A	VDATA	DS	VD29608A8A-3EC20620	•	•	•
512MB	PSC	AL6E8E63B-6E1K	5	PSC	SS	A3R12E3GEF637BLC5N	•	•	•
512MB	PSC	AL6E8E63J-6E1	5	PSC	SS	A3R12E3JFF717B9A00	.	.	.
1G	PSC	AL7E8E63B-6E1K	5	PSC	DS	A3R12E3GEF637BLC5N	.	.	.
1G	PSC	AL7E8E63J-6E1	5	PSC	DS	A3R12E3JFF717B9A01	.	.	.
1G	PSC	AL7E8F73C-6E1	5	PSC	SS	A3R1GE3CFF734MAA0J	.	.	.
2G	PSC	AL8E8F73C-6E1	5	PSC	DS	A3R1GE3CFF733MAA00	.	.	.
256MB	Nanya	NT256T64UH4A1FY-3C	N/A	Nanya	SS	NT5TU32M16AG-3C	.	.	.
512MB	Nanya	NT512T64U88A1BY-3C	N/A	Nanya	SS	NT5TU64M8AE-3C	.	.	.
1G	Kingtiger	E0736001024667	N/A	Kingtiger	DS	KTG667PS6408NST-C6 GDBTX	.	.	.
1G	ELIXIR	M2Y1G64TU8HA2B-3C	5	ELIXIR	DS	M2TU51280AE-3C717095R28F	.	.	.
1G	Leadmaax	LRMP512U64A8-Y5	N/A	Hynix	DS	HY5PS12821CFP-Y5 C 702AA	.	.	.

DDR-533MHz capability

Size	Vendor	Model	CL	Brand	SS/ DS	Component	DIMM support		
							A*	B*	C*
256MB	Kingston	KVR533D2N4/256	N/A	Elpida	SS	E5116AF-5C-E	.	.	.
512MB	Kingston	KVR533D2N4/512	N/A	Infineon	SS	HYB18T512800AF3733336550	.	.	.
1G	Kingston	KVR533D2N4/1G	N/A	Kingston	DS	D6408TLRAGL37U	.	.	.
256MB	Samsung	M378T3253FG0-CD5	N/A	Samsung	SS	K4T56083QF-GCD5	.	.	.
512MB	Samsung	M378T6553BG0-CD5	4	Samsung	SS	K4T51083QB-GCD5	.	.	.
256MB	HY	HYMP532U64CP6-C4 AB	4	Hynix	SS	HY5PS121621CFP-C4	.	.	.
1G	HY	HYMP512U64CP8-C4 AB	4	Hynix	DS	HY5PS12821CFP-C4	.	.	.
512MB	Micron	MT 16HTF6464AG-53EB2	4	Micron	DS	D9BOM	.	.	.
1G	Micron	MT 16HTF12864AY-53EA1	4	Micron	DS	D9CRZ	.	.	.
1G	Corsair	VS1GB533D2	N/A	Corsair	DS	64M8CFEGQIB0900718	.	.	.
512MB	Elpida	EBE51UD8ABFA-5C-E	N/A	Elpida	SS	E5108AB-5C-E	.	.	.
512MB	Transcend	512MB DDR2 533 ECC	N/A	Micron	SS	6ND22D9GCT(ECC)	.	.	.
512MB	Kingmax	KLBC28F-A8KB4	N/A	Kingmax	SS	KKEA88B4IAK-37	.	.	.
256MB	Kingmax	KLBB68F-36EP4	N/A	Elpida	SS	E5116AB-5C-E	.	.	.
512MB	Kingmax	KLBC28F-A8EB4	N/A	Elpida	SS	E5108AE-5C-E	.	.	.
512MB	ADATA	M2OAD2G3H3166I1B52	N/A	ADATA	SS	AD29608A8A-37DG20719	.	.	.

SS - Single-sided / DS - Double-sided

DIMM support:

A*: Supports one module inserted in any slot as Single-channel memory configuration

B*: Supports one pair of modules inserted into either the yellow slots or the black slots as one pair of Dual-channel memory configuration

C*: Supports four modules inserted into both the yellow slots and the black slots as two pairs of Dual-channel memory configuration

Visit the ASUS website for the latest DDR2 DIMM modules for this motherboard.

1.7.3 Installing a DIMM

Make sure 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.

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 to 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.

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.

Make sure 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
0	System timer
1	Standard 101/102-Key or Microsoft Natural Keyboard
2	Programmable interrupt controller
3	Standard OpenHCI USB Host Controller
4	Communications Port (COM 1)
5	ACPI IRQ Holder for PCI IRQ Steering
6	(free)
7	(free)
8	System CMOS / Real Time Clock
9	SCI IRQ used by ACPI bus
10	Standard PCI Graphics Adapter (VGA)
11	(free)
12	Microsoft PS/2 Port Mouse
13	Numeric data processor
14	Primary IDE controller (single fifo)
15	Secondary IDE controller (single fifo)

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H	I
PCIEX1 Slot	shared	–	–	–	–	–	–	–	–
PCIEX16 Slot	–	–	shared	–	–	–	–	–	–
Onboard USB1.1 Controller 1	shared	–	–	–	–	–	–	–	–
Onboard USB1.1 Controller 2	–	–	–	–	–	–	–	–	–
Onboard USB1.1 Controller 3	–	–	shared	–	–	–	–	–	–
Onboard USB1.1 Controller 4	–	–	–	–	–	–	–	–	–
Onboard USB1.1 Controller 5	–	–	shared	–	–	–	–	–	–
Onboard USB2.0 Controller 1	–	–	–	–	–	–	–	–	–
Onboard USB2.0 Controller 2	–	–	–	–	–	–	–	–	–
Onboard ATI RS780G AZALIA	–	–	shared	–	–	–	–	–	–
Onboard IDE PORT	shared	–	–	–	–	–	–	–	–
Onboard HD Audio	shared	–	–	–	–	–	–	–	–
Onboard LAN	–	–	shared	–	–	–	–	–	–
Onboard VGA	–	–	shared	–	–	–	–	–	–
Onchip SATA	–	–	–	–	–	–	–	shared	–
PCI Card1	–	–	–	–	shared	–	–	–	–
PCI Card2	–	–	–	–	–	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 figure 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 following figure shows a network card installed on the PCI Express x1 slot.

1.8.5 PCI Express x16 slot

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

- The Surroundview function works only when you install an ATI graphics card on the PCI Express x16 slot and enable the **Surroundview** item in the BIOS. See page 2-26 for details.
- The Surroundview function supports up to four monitors, two from the onboard VGA and DVI-D/HDMI out ports, with the other two from the VGA and DVI-D/HDMI out ports on an ATI graphics card.

1.9 Jumpers

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 date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include 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!

M3A78-EMH HDMI 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 C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

2. **USB device wake-up (3-pin USBPW1-4, USBPW5-8, USBPW9-12)**

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes.

The USBPW1-4 jumpers are for the rear USB ports. The USBPW5-8 and USBPW9-12 jumpers are for the internal USB connectors that you can connect to additional USB ports.

M3A78-EMH HDMI USB Device Wake Up

- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system will not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

3. HDJ1 Setting

This jumper allows you to twitch between the HDMI and the DVI features. Set this jumper to pins 1-2 (HDMI) to enable the HDMI feature. Set this jumper to pins 2-3 to enable the DVI feature.

M3A78-EMH HDMI HDJ1 Setting

If you want to use HDMI feature, set the **VBIOS TYPE** item in the BIOS to **[HDMI]**. See page 2-26 for details.

1.10 Connectors

1.10.1 Rear panel connectors

1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible 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

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

4. **Rear Speaker Out port (black).** This port connects the rear speakers in a 4-channel, 6-channel, or 8-channel audio configuration.
5. **Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.
6. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.
7. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.
8. **Microphone port (pink).** This port connects a microphone.

9. **Side Speaker Out port (gray).** This port connects the side speakers in an 8-channel audio configuration.

Refer to the audio configuration table for the function of the audio ports in 2, 4, 6, or 8-channel configuration.

Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Ou	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

Ensure the audio device of Sound playback is **Realtek High Definition Audio (the name may be different based on the OS)**. Go to **Start > Control Panel > Sounds and Audio Devices > Sound Playback** to configure the setting.

10. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
11. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
12. **DVI-D Out port.** This port is for any DVI-D compatible device and is HDCP compliant allowing playback of HD DVD, Blu-Ray and other protected content.

13. **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-Ray and other protected content

- This motherboard comes with dual-VGA output that features different display on 2 monitors at the same time if you connect 2 monitors to both the onboard VGA and DVI-D/HDMI out ports.
- DVI-D can't be converted to output RGB Signal to CRT and isn't compatible with DVI-I.
- To play HD DVD or Blu-Ray Disc, make sure to use an HDCP compliant monitor.

Playback of HD DVD and Blu-Ray Discs

The speed and bandwidth of the CPU/Memory, DVD player, and drivers will affect the playback quality. Using the CPU/Memory of higher speed and bandwidth with the higher-version DVD player and drivers will upgrade the playback quality.

14. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

1.10.2 Internal connectors

1. Floppy disk drive connector (34-1 pin FLOPPY)

This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect 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.

M3A78-EMH HDMI Floppy Disk Drive Connector

2. LPT connector

The LPT (Line Printing Terminal) connector supports devices such as a printer. LPT standardizes as IEEE 1284, which is the parallel port interface on IBM PC-compatible computers.

M3A78-EMH HDMI Parallel Port Connector

3. 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.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

If any device jumper is set as "Cable-Select," make sure all other device jumpers have the same setting.

M3A78-EMH HDMI IDE Connector

4. **Serial ATA connectors**
(7-pin SATA1, SATA2, SATA3, SATA4, SATA5, SATA6)

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 a RAID 0, RAID 1, and RAID 10 configuration through the onboard SB700 controller.

M3A78-EMH HDMI SATA Connectors

Important note on Serial ATA

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

- For detailed instructions on how to configure RAID 0, RAID 1, and RAID 10, refer to the RAID manual in the support CD.
- If you intend to create a Serial ATA RAID set using these connectors, set the **OnChip SATA Type** item in the BIOS to **[RAID]**. See page 2-20 for details.
- If you change the **OnChip SATA Type** item in the BIOS to **[RAID]** or **[AHCI]**, set the **SATA IDE Combined Mode** to **[Disabled]** to make sure SATA5 and SATA6 (the black ports) work normally.
- If you want to do the task as GHOST, we suggest you connect the original disk to the SATA5 or SATA6.

5. **CPU and Chassis Fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1)**

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

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.

Only CPU Fan supports Q-Fan.

M3A78-EMH HDMI Fan Connectors

6. **Serial port connector (10-1 pin COM1)**

The connector is for a serial (COM) port. Connect the serial port module cable to the connector, then install the module to a slot opening at the back of the system chassis.

The serial port bracket (COM1) is purchased separately.

M3A78-EMH HDMI COM Port Connector

7. USB connectors (10-1 pin USB56, 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 480 Mbps connection speed.

M3A78-EMH HDMI USB 2.0 Connectors

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

The USB 2.0 module is purchased separately.

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

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

M3A78-EMH HDMI Internal Audio Connector

9. Digital audio connector (4-1 pin SPDIF_OUT)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the HDMI module cable to this connector, then install the module to a slot opening at the back of the system chassis.

M3A78-EMH HDMI Digital Audio Connector

Ensure the audio device of Sound playback is **Realtek High Definition Audio (the name may be different based on the OS)**. Go to **Start > Control Panel > Sounds and Audio Devices > Sound Playback** to configure the setting.

10. 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.

M3A78-EMH HDMI Azalia 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 **Azalia Front Panel** 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 2-27 for details.
- Make sure the audio device of Sound playback is **Realtek High Definition Audio (the name may be different based on the OS)**. Go to **Start > Control Panel > Sounds and Audio Devices > Sound Playback** to configure the setting.

11. 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.

M3A78-EMH HDMI ATX Power Connector

- 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, make sure 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.

12. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.

M3A78-EMH HDMI System Panel Connector

- System power LED
  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
  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.
- System warning speaker
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
- Power/Soft-off button
  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
  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.

2 BIOS setup

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 AFUDOS (Updates the BIOS in DOS mode using a bootable floppy disk or a USB flash disk.)
2. ASUS CrashFree BIOS 3 (Updates the BIOS using a bootable floppy disk, a USB flash disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
3. ASUS EZ Flash 2 (Updates the BIOS using a floppy disk or a USB flash disk during POST.)
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 either one of the following to create a bootable floppy disk.

   DOS environment

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

   Windows® XP environment

   a. Insert a 1.44 MB floppy disk to the floppy disk drive.
   b. Click **Start** from the Windows® desktop, then select My Computer.
   c. Select the 3 1/2 Floppy Drive icon.
   d. Click File from the menu, then select Format. A Format 3 1/2 Floppy Disk window appears.
   e. Windows® XP users: Select Create an MS-DOS startup disk from the format options field, then click **Start**.

Windows® 2000 environment

To create a set of boot disks for Windows® 2000:

a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
b. Insert the Windows® 2000 CD to the optical drive.
c. Click **Start**, then select Run.
d. In the Open field, type **`D:\bootdisk\makeboot a:`**
   assuming that D is your optical drive letter.
e. Press <Enter>, then follow screen instructions to continue.

Windows® Vista environment

a. Insert a formatted, high density 1.44 MB floppy disk to the floppy disk drive.
b. Click 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** check box.
e. Click **Start**.

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

2.1.2 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file 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:

- Make sure that the floppy disk is not write-protected and has at least 1.2 MB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

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

   afudos /o[filename]

   where the [filename] is any user-assigned filename 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 V2.07(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 (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

Write 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 CD to the bootable floppy disk you created earlier or a USB flash disk.
3. Boot the system in DOS mode, then at the prompt type:

   afudos /i[filename]

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

```
A:\>afudos /iM3A78EMH.rom
```

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

```
A:\>afudos /iM3A78EMH.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(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 /iM3A78EMH.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(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:\>
```

2.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 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 CD , the floppy disk or the USB flash disk that contains the updated BIOS file.

- Prepare the motherboard support CD, the floppy disk or the USB flash disk containing the updated motherboard BIOS before using this utility.
- Ensure that you rename the original or updated BIOS file in the floppy disk or the USB flash disk to **M3A78EMH.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 found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "M3A78EMH.ROM". Completed.
Start flashing...
```

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

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to 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 CD-ROM...
CD-ROM found!
Reading file "M3A78EMH.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 (www.asus.com) to download the latest BIOS file.

Recovering the BIOS from the USB flash disk

To recover the BIOS from the USB flash disk:

1. Insert the USB flash disk that contains BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file When found, the utility reads the BIOS file and starts flashing 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 can support 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!

2.1.4 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 Tests (POST).

To update the BIOS using EZ Flash 2:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard.
2. Save the BIOS file to a floppy disk or a USB flash disk, then restart the system.
3. You can launch the EZ Flash 2 by two methods.
   (1) Insert the floppy disk / USB flash disk that contains the BIOS file to the floppy disk drive or the USB port.

   Press <Alt> + <F2> during POST to display the following.

(2) Enter BIOS setup program. Go to the **Tools** menu then select **EZ Flash2** and press <Enter>.

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 disk, or floppy disk 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!

2.1.5 ASUS Update utility

The ASUS Update is a utility that 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 CD in the optical drive. The Drivers menu appears.
2. Click the Utilities tab, then click Install ASUS Update VX.XX.XX. See page 3-4 for the Utilities screen menu.
3. The ASUS Update utility is copied to your system.

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 drop-down 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 drop-down 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 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 up 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 to always shut-down the system properly 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 Default Settings** item under the Exit Menu. See section “2.8 Exit Menu.”
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

2.2.1 BIOS menu screen

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 changing the system tools configuration
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 purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website (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, Tools, 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 iteam 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. Refer to “2.2.8 Pop-up window.”

2.2.7 General help

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

2.2.8 Pop-up window

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

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

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.

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 Not Detected 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]

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]

Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Disabled]

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

2.3.5 SATA 1-6

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

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.

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] [SWDMAO] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5] [UDMA6]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Disabled]

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

2.3.6 SATA Configuration

The Storage Configuration menu allows you to configure your storage device(s). Select an item then press <Enter> to display the sub-menu.

OnChip SATA Channel [Enabled]

Enables or disables OnChip SATA Channel.
Configuration options: [Disabled] [Enabled]

OnChip SATA Type [SATA]

This item appears only when you set the OnChip SATA Channel item to [Enabled]. Allows you to set the OnChip SATA Type.
Configuration options: [SATA] [RAID] [AHCI]

SATA IDE Combined Mode [Enabled]

Enables or disables SATA IDE Combined Mode
Configuration options: [Disabled] [Enabled]

If you set the **SATA IDE Combined Mode** as Disabled, PORT 1-4 works well in all the three modes, while PORT 5-6 only works at **[RAID]** or **[AHCI]**.

2.3.7 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

AMIBIOS                                                  ←→   Select Screen
Version     :0107                                        ↑↓   Select Item
Build Date  :12/23/07                                    F1   General Help
                                                         F10  Save and Exit
Processor                                                ESC  Exit
Type        :AMD Sempron(tm) Processor 3200+
Speed       :1800MHz
Count       :1

System Memory
Installed Size: 512MB
Usable Size   : 448MB

v02.61 (C)Copyright 1985-2007, American Megatrends, Inc.
```

AMI BIOS

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.

2.4.1 JumperFree Configuration

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 individually set overclocking parameters.

[Standard] - loads the standard settings for the system.

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

Spread Spectrum [Enable]

Allows you to disable or set to Auto the clock generator spread spectrum. Configuration options: [Disabled] [Enable]

2.4.2 Hyper Transport Configuration

Link Speed [Auto]

Allows you to set the HyperTransport link speed.

Configuration options:[200MHz] [400MHz] [600MHz] [800 MHZ] [1 GHz] [Auto]

Link Width [Auto]

Allows you to set the HyperTransport link width.

Configuration options: [Auto] [4 Bit] [8 Bit] [16 Bit]

2.4.3 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

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]

Enables or disables Microcode Updation.
Configuration options: [Disabled] [Enabled]

Secure Virtual Machine Mode [Enabled]

Enables or disables Secure Virtual Machine Mode (SVM)
Configuration options: [Disabled] [Enabled]

Cool 'n' Quiet [Enabled]

Enables or disables the AMD Cool 'n' Quiet technology.
Configuration options: [Enabled] [Disabled]

2.4.4 Chipset

NorthBridge Configuration

Memory Configuration

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] [Reserved] [Address bits 12] [Reserved] [XOR of Address bits [20:16, 6]] [Reserved] [XOR of Address bits [20:16, 9]]

MemClk Tristate C3/ATLVID [Disabled]

Allows you to enable or disable MemClk Tri-Stating during C3 and Alt VID.
Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]

Allows you to enable or disable memory remapping around memory hole.
Configuration options: [Disabled] [Enabled]

DCT Unganged Mode

Allows you to select unganged DRAM mode (64-bit width).
Configuration options: [Auto] [Always]

Power Down Enable [Enabled]

Allows you to enable or disable DDR power down mode.
Configuration options: [Disabled] [Enabled]

Power Down Mode [Channel]

Appears only when you enable the Power Down Enable item.
Configuration options: [Channel] [Chip Select]

DRAM Timing Configuration

Memory Clock Mode [Auto]

Allows you to set the memoery clock mode.
Configuration options: [Auto] [Limit] [Manual]

DRAM Timing Mode [Auto]

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

Alternate VID [Auto]

This option allows you to specify the alternate VID while in low power states.
Configuration options: [1.150 V] [1.125 V] [1.100 V] [1.075 V] [1.050 V] [1.025 V] [1.000 V] [0.975 V] [0.950 V] [0.925 V] [0.900 V] [0.875 V] [0.850 V] [0.825 V] [0.800 V] [Auto]

Internal Graphics

Primary Video Controller [GFX0-GPP-IGFX-PCI]

Configuration options: [GFX0-GPP-IGFX-PCI] [GPP-GFX0-IGFX-PCI] [PCI-GFX0-GPP-IGFX] [IGFX-GFX0-GPP-PCI]

GFX0:	VGA out port on a graphics card connected into a PCIE x16 slot
GPP:	VGA out port on a graphics card connected into a PCIE x1 slot
IGFX	Internal VGA out port
PCI:	VGA out port on a graphics card connected into a PCI slot

UMA Frame Buffer Size [Auto]

Configuration options: [Auto] [32MB] [64MB] [128MB] [256MB]

Surroundview [Disabled]

Allows you to disable or enable the surroundview function.
Configuration options: [Disabled] [Enabled]

This item becomes user-configurable when you install an ATI graphics card into the PCI Express x16 slot.

NB AZALIA [Enabled]

Allows you to set enable or disable NB AZALIA.
Configuration options: [Enabled] [Disabled]

VBIOS TYPE [DVI]

Allows you to set the VBIOS TYPE.
Configuration options: [DVI] [HDMI]

2.4.5 Onboard Device Configuration

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]

Serial Port1 Mode [Normal]
Configuration options: [Normal] [IrDA] [ASK IR]

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]

Parallel Port IRQ [IRQ7]
Configuration options: [IRQ5] [IRQ7]

HDAudio Controller [Enabled]

Enables or disables the high definition audio controller.
Configuration options: [Enabled] [Disabled]

Azalia Front Panel [HD Audio]

Configuration options: [HD Audio] [AC97]

Onboard LAN Controller [Enabled]

Configuration options: [Enabled] [Disabled]

OnBoard LAN Boot ROM [Disabled]

Configuration options: [Disabled] [Enabled]

2.4.6 PCIPnP

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: [No] [Yes]

Palette Snooping [Disabled]

When set to [Enabled], the palete 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]

2.4.7 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.

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

USB Controllers [Enabled]

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

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.

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]

2.5.2 ACPI Support [Disabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) 2.0 support. 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 Advanced Programmable Interrupt Controller (APIC). 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

Restore on AC Power Loss [Always 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: [Always Off] [Always On] [Last State]

Power on From S5 By PME# [Disabled]

Enables or disables PME wake from sleep states.
Configuration options: [Disabled] [Enabled]

Power on From S5 By Ring [Disabled]

Enables or disables ring to generate a wake event.
Configuration options: [Disabled] [Enabled]

Power on From S5 By PS/2 KB/MS [Disabled]

Enables or disables PS/2 Keyboard/Mouse to generate a wake event.
Configuration options: [Disabled] [Enabled]

Power on From S5 By RTC Alarm [Disabled]

Enables or disables RTC to generate a wake event.
Configuration options: [Disabled] [Enabled]

2.5.5 Hardware Monitor

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

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 Fan Speed [N/A] or [Ignored]

The onboard hardware monitor automatically detects and displays the chassis 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 [xx.xxxV] or [Ignored]

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 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.

2.6.1 Boot Device Priority

1st ~ xxth Boot Device [xxx 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

```
BIOS SETUP UTILITY
Boot

Boot Settings Configuration

Quick Boot                  [Enabled]
Full Screen Logo            [Enabled]
AddOn ROM Display Mode      [Force BIOS]
Bootup Num-Lock             [On]
PS/2 Mouse Support          [Auto]
Wait For 'F1' If Error      [Enabled]
Hit 'DEL' Message Display   [Enabled]
Interrupt 19 Capture        [Disabled]

Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

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

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```

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 MyLogo2™ feature.

AddOn 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]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. 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]

Allows you to enable or disable the Chassis Intrusion function.
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.

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 and press <Enter>.
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 as in setting a user password.

To clear the supervisor password, select the Change Supervisor Password then 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 **2.6 Jumper** 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.

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 and press <Enter>.
2. On the password box that appears, 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 as 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

The Tools menu items allow you to configure options for special functions. Select an item then press <Enter> to display the sub-menu.

2.7.1 ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice. Please see section 2.1.4 for details.

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.

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 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.

If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

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 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.

3 Software support

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.
- Make sure that you install the Windows® XP Service Pack 1 or later versions before installing the drivers for better compatibility and system stability.

3.2 Support DVD information

The support DVD that came 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(www.asus.com) for updates.

3.2.1 Running the support DVD

Place the support DVD to 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 - Drivers Installation Wizard

Launches the ASUS InstallAll - drivers installation wizard.

Realtek Audio Driver

Installs the Realtek audio driver.

AMD Cool'n'Quiet Driver

Installs the AMD Cool 'n' Quiet driver.

AMD Chipset Driver

Installs the AMD chipset driver.

Realtek RTL8111B/C 10/100/1000M LAN Driver

Installs the Realtek® RTL8111B/C 10/100/1000M LAN driver

ATI HDMI Driver

Installs the ATI HDMI driver.

The screen display and drivers option may not be the same for different operating system versions.

3.2.3 Utilities menu

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

ASUS InstAll - Installation Wizard for Utilities

Launches the ASUS InstAll - installation wizard for utilities.

ASUS Cool'n'Quiet Utility

This item guides you in installing the ASUS Cool'n'Quiet utility.

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.

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).

AMD RaidXpert

Installs the AMD RaidXpert.

3.2.4 Make Disk menu

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

Make ATI RAID/AHCI Vista32 Driver

Allows you to create an ATI® Serial ATA (SATA) RAID/AHCI Vista32 driver disk.

Make ATI RAID/AHCI Vista64 Driver

Allows you to create an ATI® Serial ATA (SATA) RAID/AHCI Vista64 driver disk.

Make ATI RAID/AHCI Driver for XP/XP 64bit

Allows you to create an ATI® Serial ATA (SATA) RAID/AHCI driver for XP/XP 64bit.

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 guide.

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.