M2R32-MVP

ASUS®

Motherboard

E2717

First Edition V1
July 2006

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Chapter 3:   Powering up

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 guide contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

  This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: Powering up**

  This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

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: **afudos /i[filename]** **afudos /iM2R32-MVP.ROM**

M2R32-MVP specifications summary

CPU	Socket AM2 for AMD Athlon™ 64 X2/Athlon™ 64 FX/ Athlon™ 64/Sempron™ processor AMD64 architecture enables simultaneous 32- and 64-bit computing Supports AMD Cool 'n' Quiet™ Technology Supports AMD HyperTransport™ Technology Supports AMD Live!™ Ready
Chipset	ATI™ CrossFire™ Xpress 3200/ATI™ SB600
System bus	2000/1600 MT/s
Memory	Dual-channel memory architecture 4 x 240-pin DIMM sockets support up to 8 GB unbufferred ECC/non-ECC 800/667/533 MHz DDR2 memory modules
Expansion slots	2 x PCI Express™ x16 slots with CrossFire support at full x16, x16 mode 2 x PCI Express™ x1 slots 2 x PCI slots
CrossFire™	Supports ATI CrossFire™ graphics cards (both at x16 mode)
Storage	ATI SB600 Southbridge supports: - 1 x IDE connector for two Ultra DMA 133/100/66/33 hard disks - 4 x Serial ATA I/II 3.0 Gb/s hard disks with RAID 0, RAID 1, and RAID 0+1 JMicron® 360 SATA controller supports: - 1 x External Serial ATA 3.0Gb/s hard disk (SATA On-the-Go)
High Definition Audio	SoundMAX® ADI 1988A 8-channel High Definition Audio CODEC Supports Multi-streaming and Universal Audio Jack Coaxial S/PDIF Out port on the rear panel
LAN	Marvell® 88E8001 Gigabit LAN controller, featuring AI NET2
IEEE 1394a	VIA VT6308P controller supports: - 1 x IEEE 1394a connector at mid-board - 1 x IEEE 1394a connector at rear-board
USB	Supports up to 10 USB 2.0/1.1 ports
BIOS features	8 Mb Flash ROM, AMI BIOS, PnP, DMI2.0, SM BIOS 2.3, WfM2.0

M2R32-MVP specifications summary

ASUS special features	Stack Cool 2
	ASUS SATA On-the-Go (External Serial ATA port on the rear panel)
	Noise Filter
	ASUS EZ DIY:
	  - ASUS CrashFree BIOS 3
	  - ASUS EZ Flash 2
	  - ASUS Q-Connector
	ASUS MyLogo2
	ASUS Q-Fan2 Technology

Overclocking	Intelligent overclocking tools:
	  - AI NOS™ (Non-delay Overclocking System)
	  - AI Overclocking (intelligent CPU frequency tuner)
	  - ASUS PEG Link (automatic performance tuning for single/dual graphics cards)
	  - AI Clock Skew
	ASUS O.C. Profile: overclocking configuration-sharing tool
	Precision Tweaker supports:
	  - DIMM voltage: 12-step DRAM voltage control
	  - Core voltage: Adjustable CPU voltage at 0.025 V increment
	Stepless Frequency Selection(SFS) allows:
	  - FSB tuning from 200 MHz to 400 MHz at 1 MHz increment
	  - PCI Express frequency tuning from 100 MHz to 150 MHz at 1 MHz increment
	Overclocking protection:
	  - ASUS C.P.R. (CPU Parameter Recall)

Rear panel	1 x PS/2 mouse port 1 x PS/2 keyboard port 1 x LAN (RJ-45) port 4 x USB 2.0/1.1 ports 1 x IEEE1394a port 1 x Coaxial S/PDIF Out port 1 x External Serial ATA port 1 x Serial (COM) port 8-Channel audio ports
Manageabiity	WfM 2.0, DMI 2.0, WOL by PME, WOR by PME, Chassis Intrusion, PXE, and RPL

M2R32-MVP specifications summary

Internal connectors	3 x USB 2.0 connectors for six additional USB 2.0 ports 1 x Floppy disk drive connector 1 x IDE connector 4 x SATA connectors 1 x IEEE1394a connector 1 x CD audio in connector 1 x S/PDIF Out connector 1x CPU/2 x Chassis/1 x Power fan connectors 1 x 24-pin EATX power connector 1 x 4-pin ATX 12 V power connector Chassis intrusion connector Front panel High Definition Audio connector System panel connector
Support CD contents	Drivers ASUS PC Probe II ASUS Update Anti-virus software (OEM version)
Form factor	ATX form factor: 12 in x 9.6 in (30.5 cm x 24.5 cm)

*Specifications are subject to change without notice.

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

Product information 1

Chapter summary

1.1 Welcome!

Thank you for buying an ASUS® M2R32-MVP 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 M2R32-MVP motherboard
Cables	1 x Floppy disk drive signal cable 1 x Ultra DMA cable 133/100/66 cable 2 x Serial ATA cables 1 x 2-port Serial ATA power cable 1 x 2-port USB 2.0 module
Accessories	I/O shield 1 x ASUS Q-Connector set (USB, IEEE1394a, system panel; retail version only)
Application CDs	ASUS motherboard support CD
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

Latest processor technology

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 2-6 for
details.

ATI CrossFire™ Xpress 3200

The motherboard features ATI CrossFire™ Xpress 3200 support, delivering
improved overclocking and optimal PCI Express device performance. The
combined multi-GPU power boosts image quality and rendering speed for
the highest quality images. With its optimized peer-to-peer and general link
performance GPU sharing, you are a step ahead in graphics and gaming
effects. The chipset allows higher antialiasing, anisotropic filtering, sharing,
and texture settings. The ATI CrossFire™ Xpress 3200 also comes with the
ATI Catalyst™ Control Center that allows you to get real-time 3D-rendered
previews of adjustments to your display configurations and advanced 3D
settings.

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 2-18 for details.

Gigabit LAN solution
The motherboard comes with the Marvell® 88E8001 Gigabit LAN controller
to provide the total solution for your networking needs, LAN, and file
sharing requirements. See page 2-23 for details.

Serial ATA 3.0 Gb/s technology and SATA-On-The-Go

The motherboard fully supports the Serial ATA II 3.0 Gb/s technology through the Serial ATA interfaces and the ATI® SB 600 chipset. The Serial ATA 3.0 Gb/s specification provides twice the bandwidth of the current Serial ATA products with a host of new features, including Power Management (PM) Implementation Algorithm. Serial ATA allows for thinner, more flexible cables with lower pin count and reduced voltage required. Leveraging these Serial ATA 3.0 Gb/s features is the SATA-On-The-Go. Supported by the JMicron® Serial ATA controller, the Serial ATA 3.0 Gb/s connector (on the rear panel) provides smart setup and hot-plug function. See pages 2-24 and 2-26 for details.

8-channel high definition audio

Onboard is the ADI® AD1988A High Definition Audio 8-channel audio CODEC. This CODEC is fully-compliant with Intel® High Definition Audio standard (192 KHz, 24-bit audio). With the CODEC, 8-channel audio ports, and S/PDIF interfaces, you can connect your computer to home theater decoders to produce crystal-clear digital audio.

IEEE 1394a support

The IEEE 1394a interface provides high-speed and flexible PC connectivity to a wide range of peripherals and devices compliant to IEEE 1394a standards. The IEEE 1394a interface allows up to 400 Mbps transfer rates through simple, low-cost, high-bandwidth asynchronous (real-time) data interfacing between computers, peripherals, and consumer electronic devices such as camcorders, VCRs, printers,TVs, and digital cameras. See page 2-30 for details.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See pages 2-24 and 2-29 for details.

1.3.2 Innovative ASUS features

ASUS Stack Cool 2

ASUS Stack Cool 2 is a fan-less and zero-noise cooling solution that lowers the temperature of critical heat generating components. The motherboard uses a special design on the printed circuit board (PCB) to dissipate heat that critical components generate.

AI NET2

The AI NET2 is a BIOS-based diagnostic tool that detects and reports Ethernet cable faults and shorts. With this utility, you can easily monitor the condition of the Ethernet cable(s) connected to the LAN (RJ-45) port(s). During the bootup process, AI NET2 immediately diagnoses the LAN cable(s) and reports shorts and faults up to 100 meters at 1 meter accuracy.

Precision Tweaker

This feature allows you to fine tune the CPU/memory/Northbridge voltage and gradually increase the memory Front Side Bus (FSB) and PCI Express frequency at 1MHz increment to achieve maximum system performance.

AI NOS™ (Non-Delay Overclocking System)

ASUS Non-delay Overclocking System™ (NOS) is a technology that auto-detects the CPU loading and dynamically overclocks the CPU speed only when needed. See page 4-19 for details.

Noise Filter

This feature detects repetitive and stationary noises (non-voice signals) like computer fans, air conditioners, and other background noises then eliminates it in the incoming audio stream while recording.

PEG Link Mode for two graphics cards

This feature enhances your PCI Express graphics card performance, allowing the motherboard to automatically adjust the PCI Express graphics link mode to the correct frequency based on the system configuration. Four additional settings are available for overclocking the PEG Link Mode.

ASUS Q-Fan 2 technology

The ASUS Q-Fan 2 technology smartly adjusts the CPU and chassis fans speed according to the system loading to ensure quiet, cool, and efficient operation.

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.

ASUS EZ Flash 2

EZ Flash 2 is a user-friendly BIOS update utility. Simply press the predefined hotkey to launch the utility and update the BIOS without entering the OS. Update your BIOS easily without preparing a bootable diskette or using an OS-based flash utility.

Q-Connector

The ASUS Q-Connector allows you to connect or disconnect chassis front panel cables in one easy step with one complete module. This unique adapter eliminates the trouble of plugging in one cable at a time, making connection quick and accurate.

ASUS O.C. Profile

The motherboard features the ASUS BIOS Profile that allows users to conveniently store or load multiple BIOS settings. The BIOS settings can be stored in the CMOS or a separate file, giving users freedom to share and distribute their favorite settings.

ASUS Multi-language BIOS

The multi-language BIOS allows you to select the language of your choice from the available options. The localized BIOS menus allow easier and faster configuration.

ASUS MyLogo2™

ASUS My Logo2™ is the new feature present in the motherboard that allows you to personalize and add style to your system with customizable and animated boot logos.

C.P.R. (CPU Parameter Recall)

The C.P.R. feature of the motherboard BIOS allows automatic re-setting to the BIOS default settings in case the system hangs due to overclocking. When the system hangs due to overclocking, C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and the BIOS automatically restores the CPU default setting for each parameter.

This chapter 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.

Hardware information

2

Chapter summary

2

2.1   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.

SB_PWR

ON
Standby
Power

OFF
Powered
Off

M2R32-MVP Onboard LED
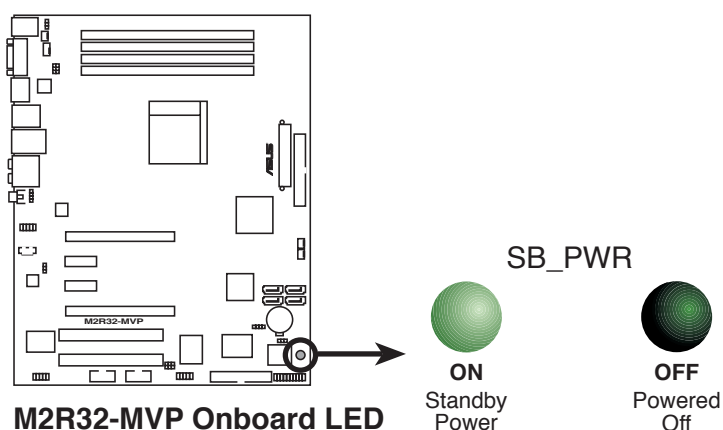
2.2   Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.

> Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

2.2.1   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.
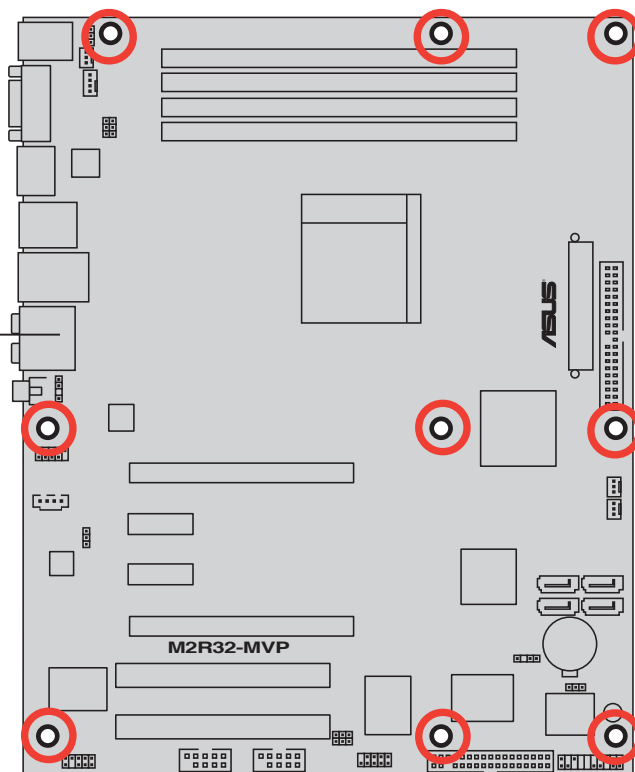
2.2.2   Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

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

Place this side towards the rear of the chassis

M2R32-MVP

2.2.3 Motherboard layout

24.5cm (9.6in)

30.5cm (12.0in)

PS/2KBMS
T: Mouse
B: Keyboard

KBPWR1

CHA_FAN2

CPU_FAN

COM1

DDR2 DIMM_B2 (64 bit,240-pin module)

DDR2 DIMM_A2 (64 bit,240-pin module)

DDR2 DIMM_B1 (64 bit,240-pin module)

DDR2 DIMM_A1 (64 bit,240-pin module)

USBPW12
USBPW34

ESATA

JMB360

Socket AM2

PRI_IDE

EATXPWR

F_USB12

LAN_USB34

AUDIO

SPDIF_OUT

SPDIF_O1

PWR_FAN

ATX12V

USB910

PCIEX16_1

CHA_FAN1

CD

PCIEX1_1

USBPW910

PCIEX1_2

SATA2 SATA1
SATA4 SATA3

AD1988A

PCIEX16_2

M2R32-MVP

CR2032 3V
Lithium Cell
CMOS Power

CHASSIS

Marvell
88E8001

PCI1

USBPW56
USBPW78

VIA
VT6308P

iTE
IT8726F-S

CLRTC

SB_PWR

PCI2

8Mb
BIOS

AAFP

USB56

FLOPPY

PANEL

IE1394_2

USB78

ASUS M2R32-MVP

2-3

2.2.4 Layout Contents

Slots	Page
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3. PCI Express x1 slots	2-17
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Jumper	Page
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2. USB device wake-up (3-pin USBPW12, USBPW34, USBPW56, USBPW78, USBPW910)	2-20
3. Keyboard power (3-pin KBPWR1)	2-21

Rear panel connectors	Page
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4. Rear Speaker Out port (black)	2-22
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10. Side Speaker Out port (gray)	2-23
11. USB 2.0 ports 3 and 4	2-23
12. USB 2.0 ports 1 and 2	2-23
13. External SATA port	2-23
14. Serial (COM) port	2-23
15. PS/2 keyboard port (purple)	2-23

Internal connectors	Page
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2. IDE connectors (40-1 pin PRI_IDE)	2-24
3. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)	2-25
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8. Chassis intrusion connector (4-1 pin CHASSIS)	2-30
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11. Audio connector (4-pin CD [black])	2-31
12. System panel connector 　- System Power LED 　- Hard Disk activity 　- System warning speaker 　- Power/Soft-off button 　- Reset switch	2-32
13. Q-Connector (System panel)	2-33

2.3 Central Processing Unit (CPU)

The motherboard comes with a 940-pin AM2 socket designed for the AMD Athlon™ 64 X2/Athlon™ 64/Athlon™ FX/Sempron™ processor.

> ⚠ The AM2 socket has a different pinout from the 939-pin socket designed for the AMD Opteron™ processor. Make sure you use a CPU is designed for the AM2 socket. The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!
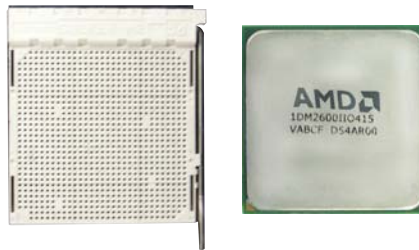
2.3.1 Installing the CPU

To install a CPU.

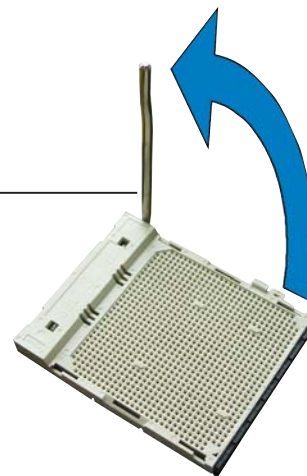1. Locate the CPU socket on the motherboard.
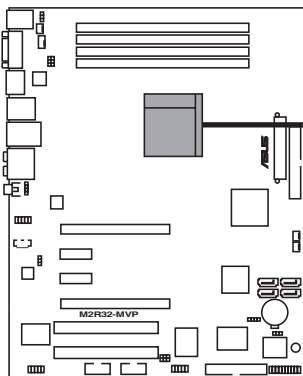
**M2R32-MVP CPU Socket AM2**

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

Socket lever

> ✎ 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.

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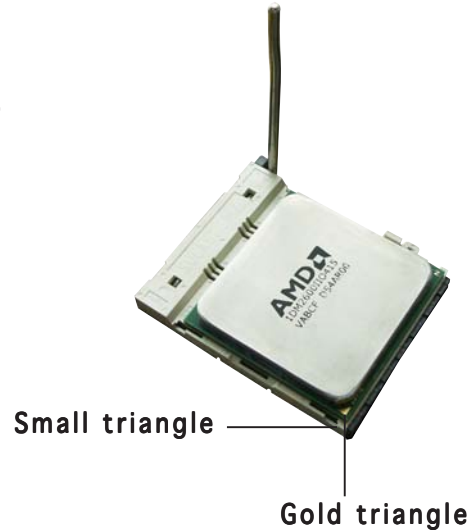
> ⚠ The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

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

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

2.3.2 Installing the heatsink and fan

The AMD Athlon™ 64 X2/Athlon™ 64 FX/Athlon™ 64/Sempron™ processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

> Make sure that you use only AMD-certified heatsink and fan assembly.

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.

CPU fan

CPU heatsink

Retention module base

Retention bracket

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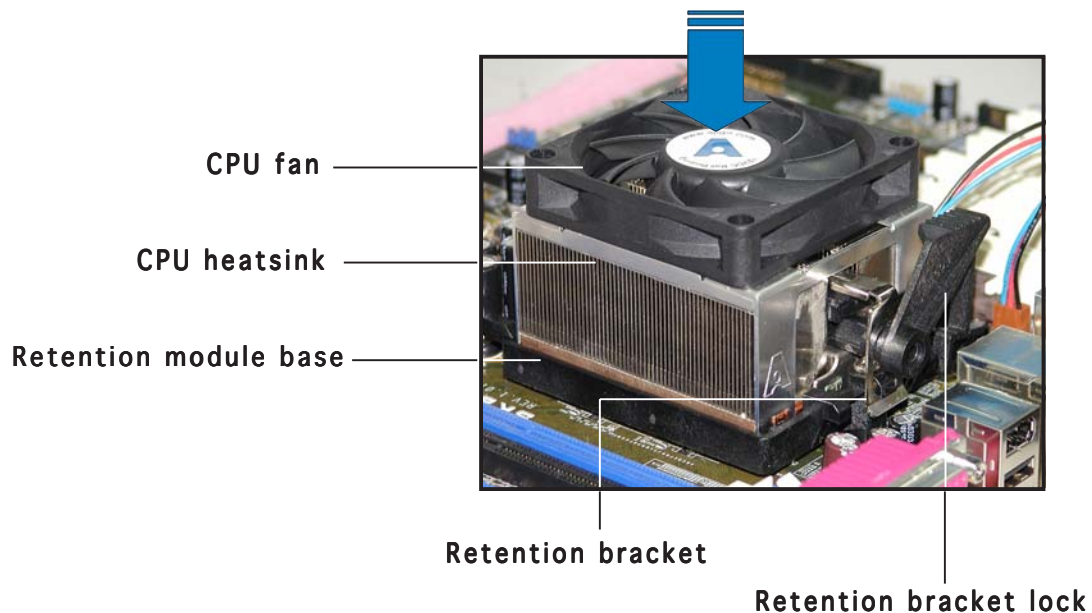
> Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

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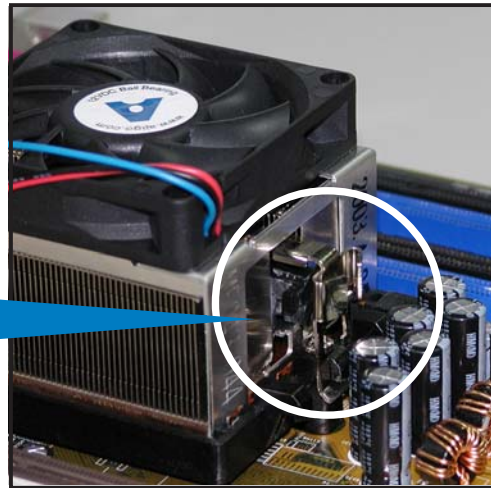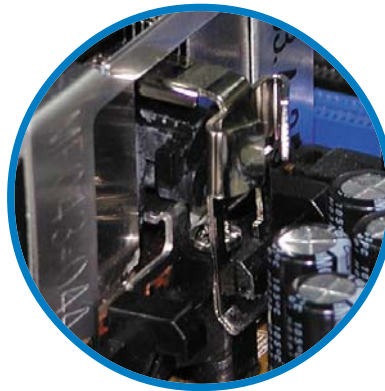
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base. A clicking sound denotes that the retention bracket is in place.

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.
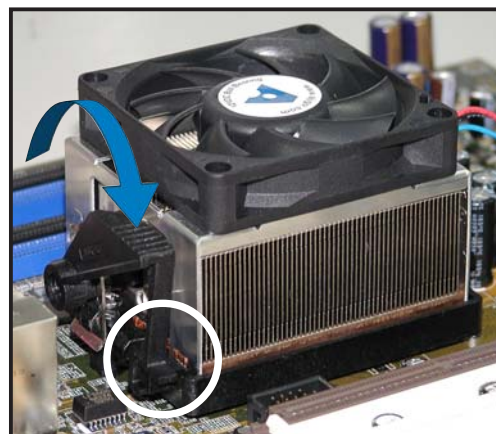
5. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.

CPU_FAN

CPU FAN PWM
CPU FAN IN
CPU FAN PWR
GND
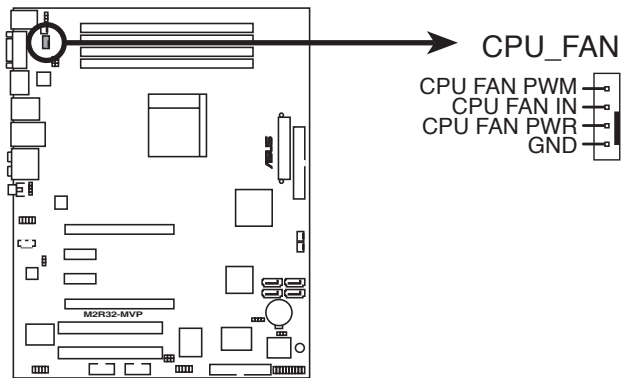
M2R32-MVP CPU fan connector

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

2.4   System memory

2.4.1 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:

DIMM_B2
DIMM_A2
DIMM_B1
DIMM_A1
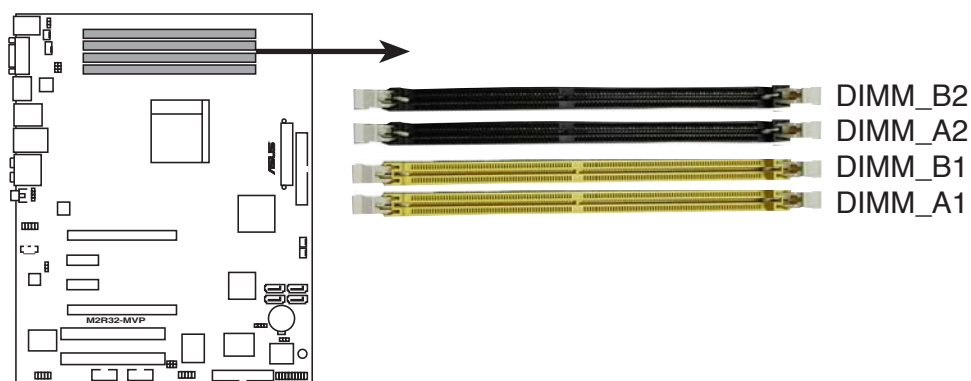
M2R32-MVP 240-pin DDR2 DIMM sockets

Channel	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

In dual-channel configurations, installing `identical` (the same type and size) DDR2 DIMM pairs for each channel provides optimum performance.

2.4.2 Memory configurations

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

- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same (DIMM_A1+ DIMM_B1 = DIMM_A2+ DIMM_B2)

- Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor. Refer to the DDR2 Qualified Vendors List below for details.

- Due to chipset resource allocation, the system may detect less than 8 GB system memory when you installed four 2 GB DDR2 memory modules.

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

* Use only identical DDR2 DIMM pairs.
* 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)*

DDR2 (800 MHz) Qualified Vendors List

Size	Vendor	Chip No.	Brand	Side/s*	Part No.	DIMM support A	B	C
512MB	KINGSTON	K4T51083QC	N/A	SS	KVR800D2N5/512	•	•	•
512 MB	Qimonda	HYB18T256800AF25F	N/A	DS	HYS64T64020HU-25F-A	•	•	
256 MB	Qimonda	HYB18T512160BF-25F	N/A	SS	HYS64T32000HU-25F-B	•	•	•
512 MB	Qimonda	HYB18T512800BF25F	N/A	SS	HYS64T64000HU-25F-B	•	•	
1024MB	Qimonda	HYB18T512800BF25F	N/A	DS	HYS64T128020HU-25F-B	•	•	
512 MB	SAMSUNG	EDD339XX	N/A	SS	M378T6553CZ3-CE7	•	•	
256 MB	SAMSUNG	K4T51163QC-ZCE7	N/A	SS	M378T3354CZ3-CE7	•	•	
512 MB	Hynix	HY5PS12821BFP-S5	N/A	SS	HYMP564U64BP8-S5	•	•	•
1024 MB	Hynix	HY5PS12821BFP-S5	N/A	DS	HYMP512U64BP8-S5	•	•	
512 MB	MICRON	5JAIIZ9DQQ	N/A	SS	MT8HTF6464AY-80EA3	•	•	•
1024 MB	MICRON	5JAIIZ9DQQ	N/A	DS	MT16HTF12864AY-80EA3	•	•	
512 MB	MICRON	5ZD22D9GKX	N/A	SS	MT8HTF6464AY-80ED4	•	•	
1024 MB	MICRON	5ZD22D9GKX	N/A	DS	MT16HTF12864AY-80ED4	•	•	
512 MB	MICRON	6CD22D9GKX	N/A	SS	MT8HTF6464AY-80ED4	•	•	•
1024 MB	MICRON	6CD22D9GKX	N/A	DS	MT16HTF12864AY-80ED4	•	•	
1024 MB	CORSAIR	Heat-Sink Package	N/A	DS	CM2X1024-6400C4	•	•	
1024 MB	ELPIDA	E1108AB-8E-E(ECC)	N/A	SS	EBE10EE8ABFA-8E-E	•	•	
512 MB	A-DATA	N/A	N/A	SS	M2OAD6G3H3160J1E52	•	•	•
512 MB	A-DATA	AD29608A8A-25EG	N/A	SS	M20AD6G3H3160I1E5E	•	•	
512 MB	Crucial	Heat-Sink Package	N/A	SS	BL6464AA804.8FD	•	•	
1024 MB	Crucial	Heat-Sink Package	N/A	DS	BL12864AA804.16FD	•	•	
512 MB	Apacer	E2508AB-GE-E	N/A	DS	78.91091.420	•	•	

Legend:

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 4 modules inserted into the yellow and black slots as two pairs of Dual-channel memory configuration

SS - Single-sided

DS - Double-sided

Visit the ASUS website (www.asus.com) for the latest Qualified Vendors List.

2.4.3 Installing a DDR2 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.

DDR2 DIMM notch

Unlocked retaining clip
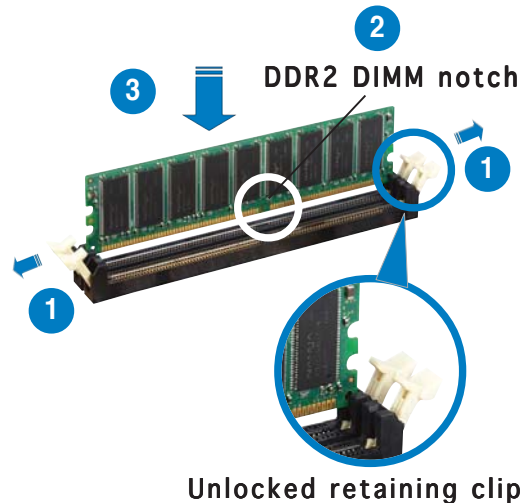
⚠ • A DDR2 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.
• The DDR2 DIMM sockets do not support DDR DIMMs. Do not install DDR DIMMs to the DDR2 DIMM sockets.

2.4.4 Removing a DDR2 DIMM

To remove a DIMM:

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

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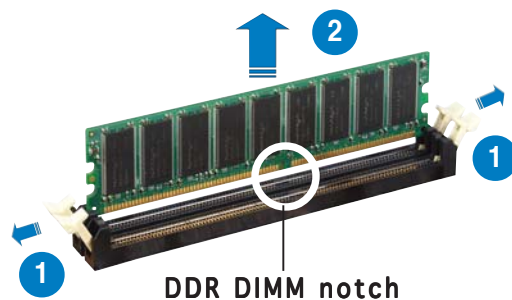
⚠ Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.5 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.

2.5.1 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.

2.5.2 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 4 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.

2.5.3 Interrupt assignments

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	—	Re-direct to IRQ #9
3	11	Reserved
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI steering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT1)*
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI steering*
10	5	IRQ holder for PCI steering*
11	6	IRQ holder for PCI steering*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE/SATA Channel
15	10	Secondary IDE/SATA Channel

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	—	—	—	—	shared	shared	shared	shared
PCI slot 2	—	—	—	—	shared	shared	shared	shared
IEEE 1394a	—	—	—	—	—	—	shared	—
LAN (88E8001)	—	—	—	—	—	shared	—	—
PCI-E x1_1	shared	shared	shared	shared	—	—	—	—
PCI-E x1_2	shared	shared	shared	shared	—	—	—	—
PCI-E x16_1	shared	shared	shared	shared	—	—	—	—
PCI-E x16_2	shared	shared	shared	shared	—	—	—	—
USB 1.0 controller 1	—	—	—	shared	—	—	—	—
USB 1.0 controller 2	—	—	—	shared	—	—	—	—
USB 1.0 controller 3	—	—	—	shared	—	—	—	—
USB 1.0 controller 4	—	—	—	shared	—	—	—	—
USB 2.0 controller	—	—	—	shared	—	—	—	—
HD audio	shared	—	—	—	—	—	—	—
SATA JMB360	shared	shared	shared	shared	—	—	—	—
On-board SATA	—	—	—	—	—	shared	—	—

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

2.5.4 Two 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.
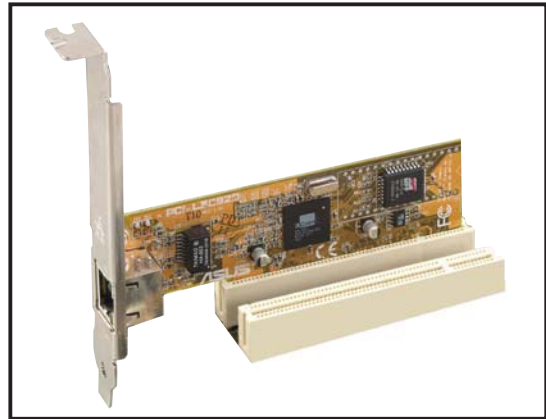

2.5.5 Two PCI Express x1 slots

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

2.5.6 Two PCI Express x16 slots

This motherboard supports two ATI CrossFire™ PCI Express x16 graphics cards that comply with the PCI Express specifications. The figure shows two graphics cards installed on the PCI Express x16 slots.

See Chapter 6 for details on the CrossFire™ technology feature.
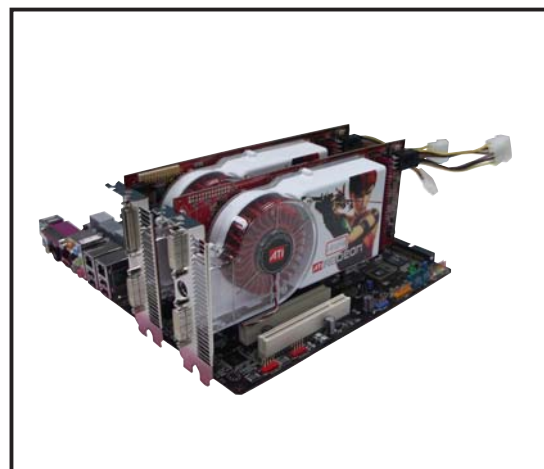
- We recommend that you install a VGA card on the primary (blue) PCI Express slot and install any other PCI Express device on the secondary (black) PCI Express slot.

- **In CrossFire™ mode, install the ATI CrossFire™ Edition (Master) graphics card on the primary (blue) PCI Express slot; otherwise, the system will not boot.**

- If you do not configure the PCI Express device (s) according to the table below, the system may have a failed or delayed power-on self test (POST).

- Refer to the table below for possible PCI Express Card configurations.

PCI Express x16 slot configurations

	PCIEX16_1 (blue) slot		PCIEX16_2 (black) slot	
	Card Type	Speed	Card Type	Speed
Single graphics card	PCIe x16 graphics card	x16		
	PCIe x16 graphics card	x16	PCIe devices (non-VGA)	x16
Dual graphics cards in CrossFire™ mode*	ATI CrossFire Edition graphics card	x16	ATI CrossFire-ready graphics card	x16
Dual graphics cards (Dual display)	Graphics card	x16	Graphics card	x16

*   In CrossFire™ mode, install two ATI graphics cards from the same GPU family.

2.6   Jumper

1. Clear RTC RAM (CLRTC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of 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!

CLRTC

1 2   2 3

Normal   Clear CMOS
(Default)
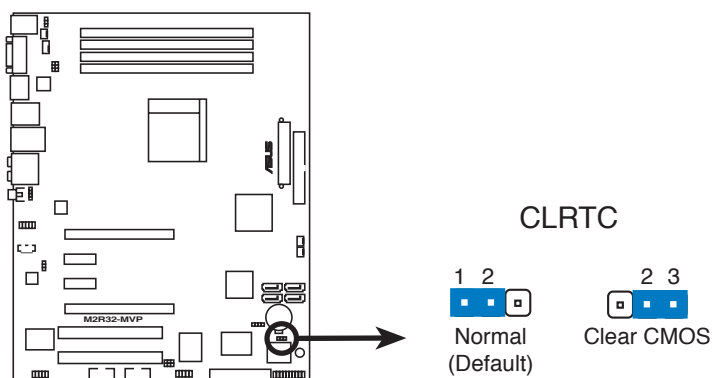
M2R32-MVP Clear RTC RAM

> 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 USBPW12, USBPW34, USBPW56, USBPW78, USBPW910)

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 USBPW12 and USBPW34 jumpers are for the rear USB ports. The USBPW56, USBPW78, and USBPW910 jumpers are for the internal USB connectors that you can connect to additional USB ports.

M2R32-MVP USB device wake up

USBPW12
USBPW34

+5V
(Default)

+5VSB

USBPW910

USBPW56
USBPW78

+5V
(Default)

+5VSB

+5V
(Default)
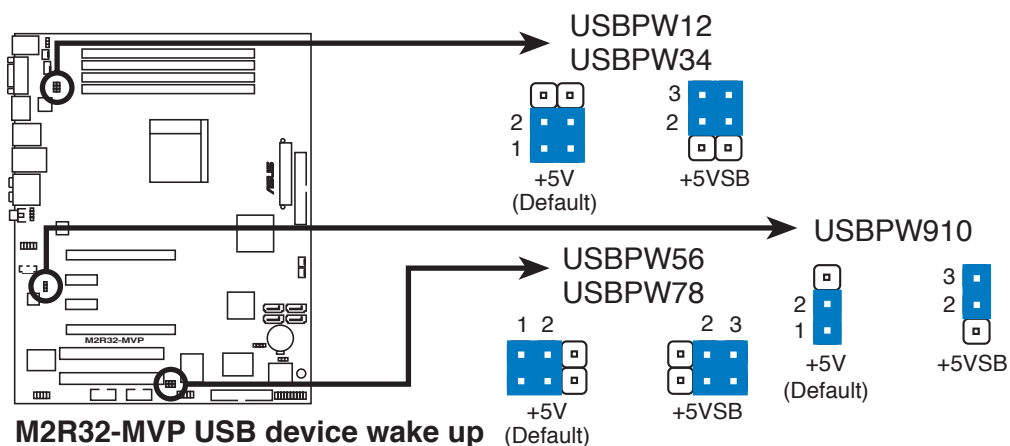
+5VSB

- • 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. Keyboard power (3-pin KBPWR1)

This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 500 mA on the +5VSB lead, and a corresponding setting in the BIOS.
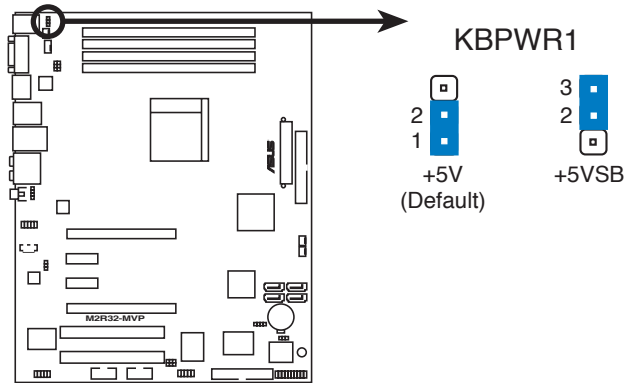
**M2R32-MVP Keyboard power setting**

2.7 Connectors

2.7.1 Rear panel connectors
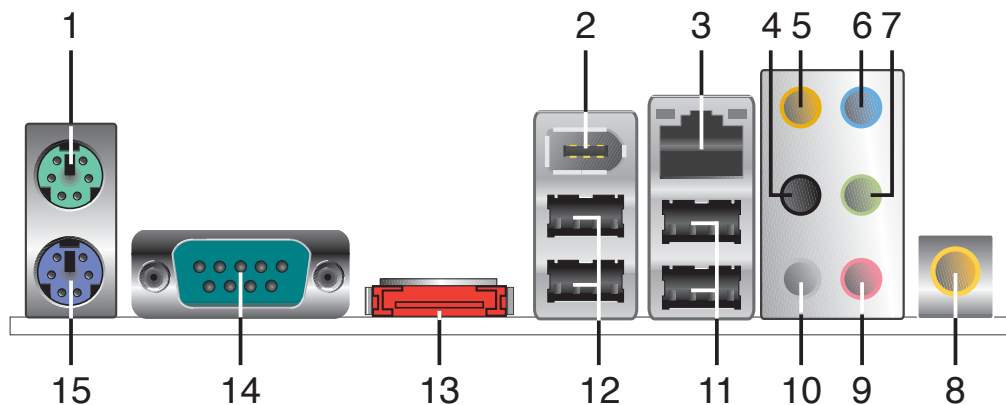
1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.

2. **EEE 1394a port.** This 6-pin IEEE 1394a port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable devices.

3. **LAN (RJ-45) port.** Supported by Marvell® Gigabit LAN controller, this port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

ACT/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
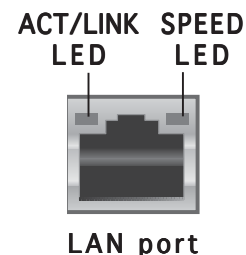
4. **Rear Speaker Out port (black).** This port connects the rear speakers on a 4-channel, 6-channel, or 8-channel audio configuration.

5. **Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.

6. **Line In port (light blue).** This port connects a 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.

Refer to the audio configuration table below for the function of the audio ports in 2, 4, or 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
Gray	•	•	•	Side Speaker Out
Black	•	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Orange	•	•	Center/Subwoofer	Center/Subwoofer

8. **Coaxial S/PDIF Out port.** This port connects an external audio output device via a coaxial S/PDIF cable.

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

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

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

13. **External SATA port.** This port connects to an external SATA box or a Serial ATA port multiplier.

The external SATA port supports external Serial ATA 1.5 and 3 Gb/s devices. Longer cables support higher power requirements to deliver signal up to two meters away, and enables improved hot-swap function.

Do not insert a different connector to this port.
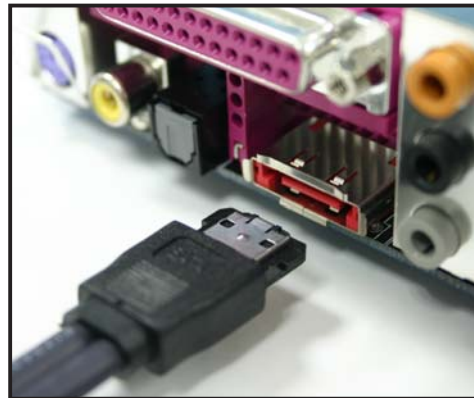
14. **Serial port.** This 9-pin COM1 port is for pointing devices or other serial devices.

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

2.7.2 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.
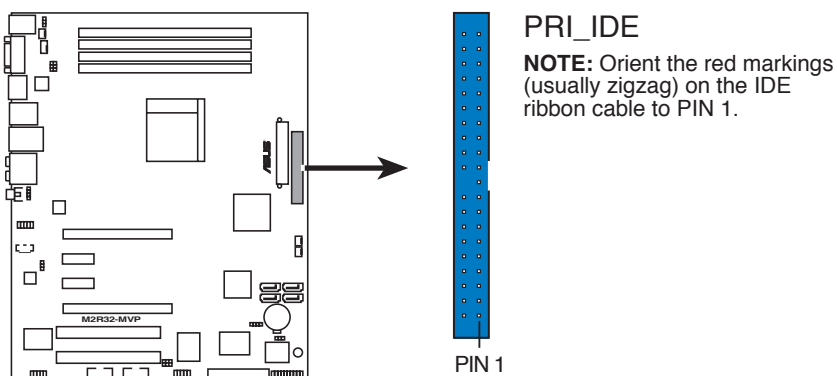
> Pin 5 on the connector is removed to prevent incorrect cable connection when using an FDD cable with a covered Pin 5.

FLOPPY

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

PIN 1
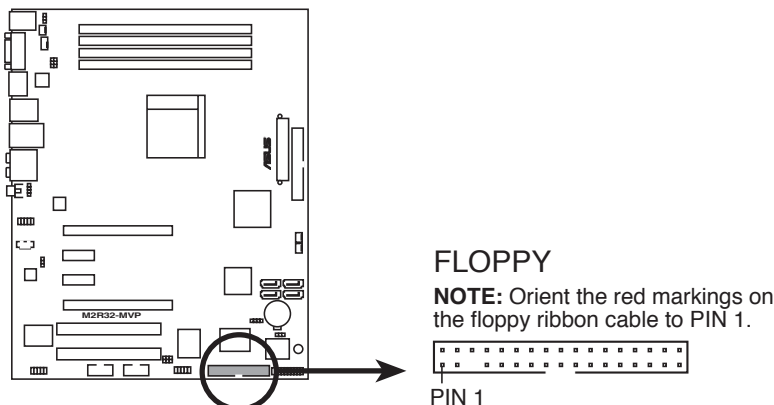
M2R32-MVP Floppy disk drive connector

2. IDE connectors (40-1 pin PRI_IDE)

The onboard IDE connector is for the 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.

PRI_IDE

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

PIN 1

M2R32-MVP IDE connector

> • 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 100/66 IDE devices.

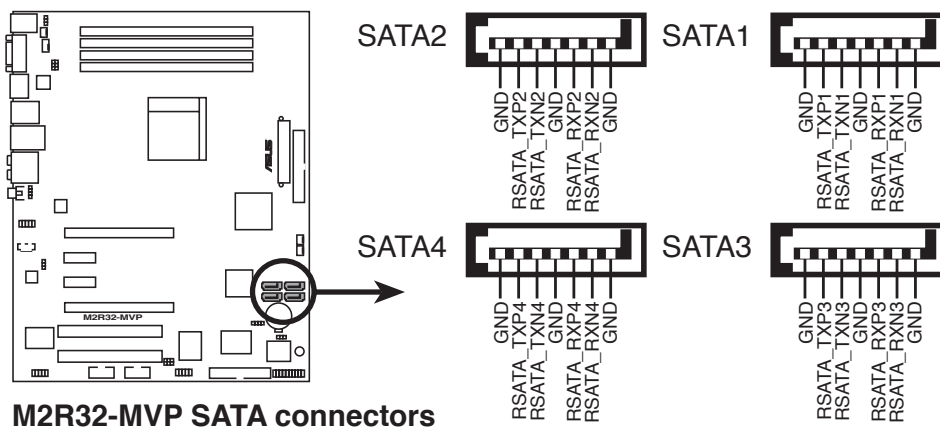|	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	

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

3. Serial ATA connectors (7-pin SATA, SATA2, SATA3, SATA4)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

If you installed Serial ATA hard disk drives, you can can create a RAID 0, RAID 1, and RAID 0+1 configuration. Refer to Chapter 5 for information on creating a RAID configuration.

SATA2   SATA1

SATA2 pins: GND, RSATA_TXP2, RSATA_TXN2, GND, RSATA_RXP2, RSATA_RXN2, GND

SATA1 pins: GND, RSATA_TXP1, RSATA_TXN1, GND, RSATA_RXP1, RSATA_RXN1, GND

SATA4   SATA3

SATA4 pins: GND, RSATA_TXP4, RSATA_TXN4, GND, RSATA_RXP4, RSATA_RXN4, GND

SATA3 pins: GND, RSATA_TXP3, RSATA_TXN3, GND, RSATA_RXP3, RSATA_RXN3, GND

M2R32-MVP SATA connectors

Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.
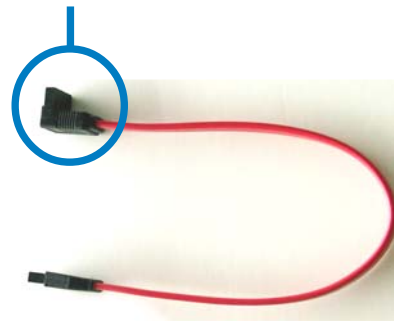
- Plug your Serial ATA boot disk on the master port (SATA1/2 to support S3 function).

- Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 or later when using Serial ATA.

Serial ATA hard disk drive connection

Connector	Color	Setting	Use
SATA1/SATA3	Red	Master	Boot disk
SATA2/SATA4	Black	Slave	Data Disk

4. CPU, Chassis, and Power fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1, 3-pin CHA_FAN2, 3-pin PWR_FAN)

The fan connectors support cooling fans of 350 mA ~ 2000 mA (24 W max.) or a total of 1 A ~ 3.48 A (41.76 W max.) at +12 V. 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.
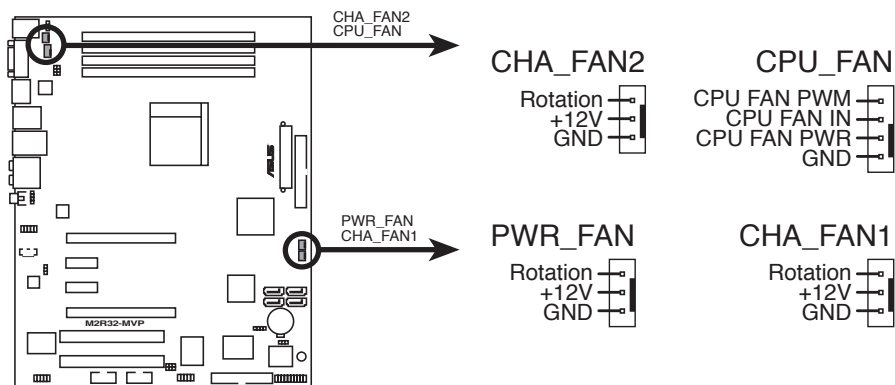

M2R32-MVP Fan connectors

> ✎ Only the CPU_FAN, CHA_FAN1, and CHA_FAN2 connectors support the ASUS Q-Fan 2 feature.

## 5. USB connectors (10-1 pin USB56, USB78, USB910)

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.

M2R32-MVP USB 2.0 connectors
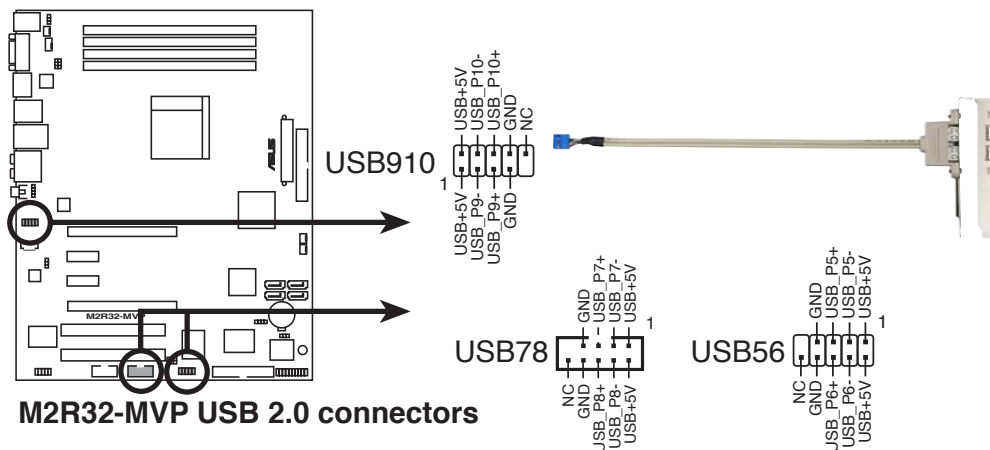
Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

6. 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.


M2R32-MVP ATX power connectors
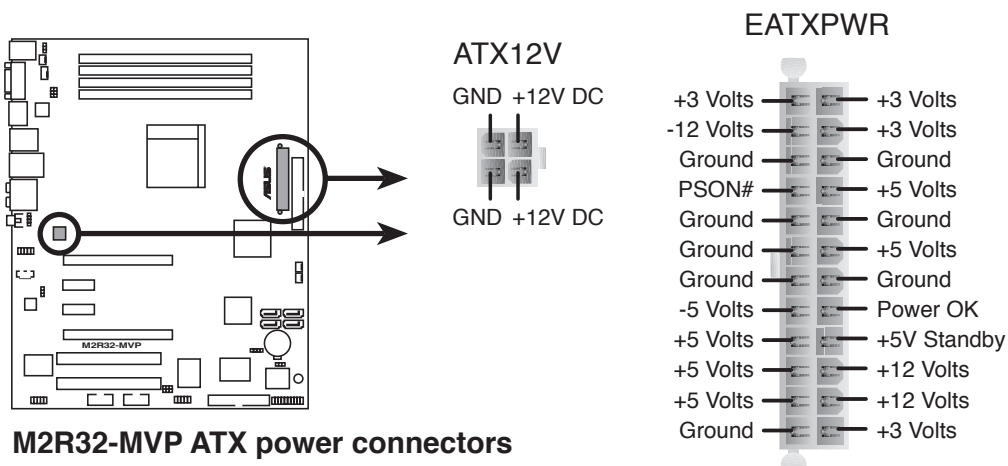
- For a fully-configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.

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

- The ATX 12 V Specification 2.0 compliant (500 W) PSU has been tested to support the below configuration:

CPU:	AMD FX-62
Memory:	512 MB DDR (x4)
Graphics card:	PCI Express x16 ATI X850
Hard disk:	SATA HD (x2)
ATAPI:	CD-ROM (x1)

- Use of a PSU with a higher power output is recommended 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 want to use the ATI CrossFire™ Graphics solution, use a PSU with 500 ~ 600 W power to ensure system stability.

7. IEEE 1394a connector (10-1 pin IE1394_2)

This connector is for the IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.

M2R32-MVP IEEE 1394 connector

IE1394_2

| +12V | TPB2+ | GND | TPA2+ |
| GND | +12V | TPB2- | GND | TPA2- |
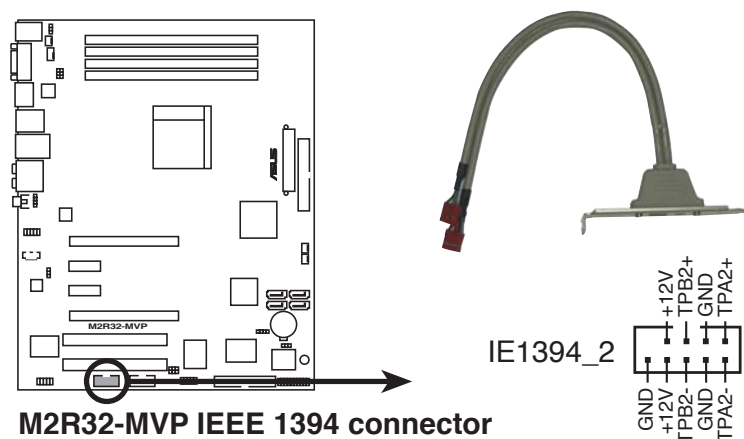
NEVER connect a **USB cable** to the IEEE 1394a connector. Doing so will damage the motherboard!

The IEEE 1394a module cable is purchased separately.

8. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

By default, the pins labeled "Chassis Signal" and "Ground" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.
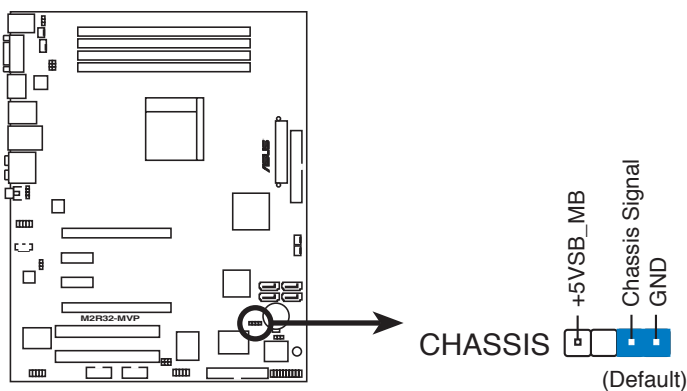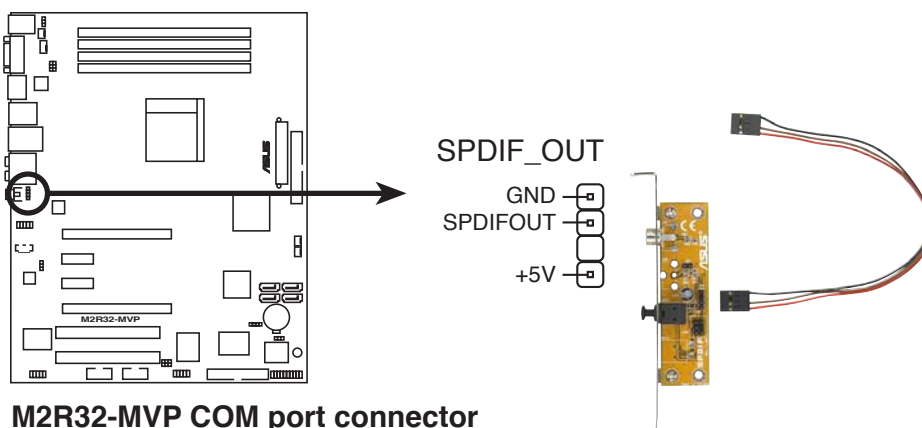

M2R32-MVP Chassis intrusion connector

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 S/PDIF module cable to this connector, then install the module to a slot opening at the back of the system chassis.
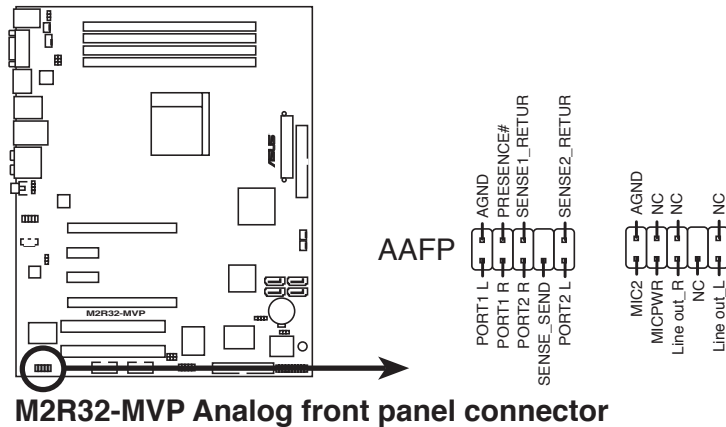
> The S/PDIF module is purchased separately.

M2R32-MVP COM port connector

## 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 HD Audio or legacy AC '97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.

M2R32-MVP Analog front panel connector

- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.
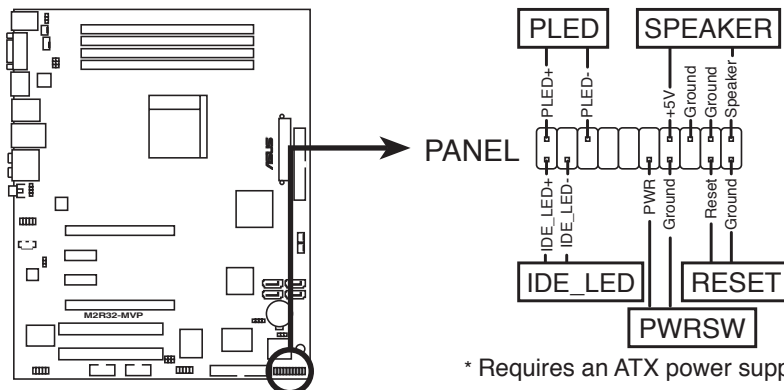
11. Audio connector (4-pin CD [black])

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

M2R32-MVP Internal audio connector
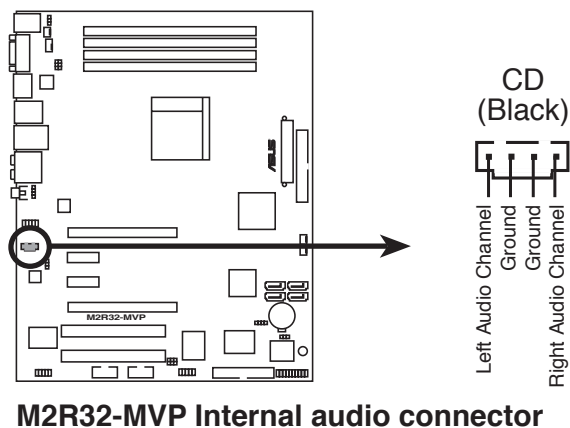
12. System panel connector (20-8 pin PANEL)

This connector supports several chassis-mounted functions.
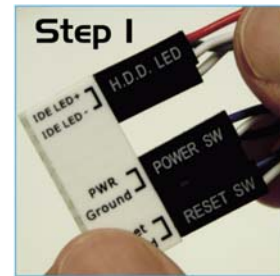

M2R32-MVP System panel connector

* **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**

  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.

13. Q-Connector (System panel)

ASUS Q-Connector allows you to easily connect the chassis front panel cables to the motherboard. Perform these steps to install ASUS Q-Connector.

step1.
Connect the front panel cables to their respective connectors on the ASUS Q-Connector. Refer to the labels on the Q-Connector for proper connection and pin definition.
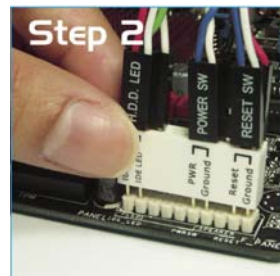
step2.
Carefully connect the ASUS Q-Connector to the System panel connector.

The ASUS Q-Connector fits only in one orientation; if it doesn't fit, try reversing it.

step3.
When installed, the Q-Connector appears as shown.

This chapter describes the power up
sequence, the vocal POST messages,
and ways of shutting down the
system.

Powering up 3

Chapter summary

3

3.1   Starting up for the first time

1.   After making all the connections, replace the system case cover.

2.   Be sure that all switches are off.

3.   Connect the power cord to the power connector at the back of the system chassis.

4.   Connect the power cord to a power outlet that is equipped with a surge protector.

5.   Turn on the devices in the following order:

    a. Monitor

    b. External SCSI devices (starting with the last device on the chain)

    c. System power

6.   After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with "green" standards or if it has a "power standby" feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

    The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (see BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

AMI BIOS beep codes

Beep Description	Error
One beep	Keyboard controller error Refresh Time error No master drive detected
Two continuous beeps followed by two short beeps	Floppy controller failure
Two continuous beeps followed by four short beeps	Hardware component failure

7.   At power on, hold down the <Delete> key to enter the BIOS Setup.

3.2　Powering off the computer

3.2.1　Using the OS shut down function

If you are using Windows® 2000:

1.　Click the **Start** button then click **Shut Down...**
2.　Make sure that the **Shut Down** option button is selected, then click the **OK** button to shut down the computer.
3.　The power supply should turn off after Windows® shuts down.

If you are using Windows® XP:

1.　Click the **Start** button then select **Turn Off Computer.**
2.　Click the **Turn Off** button to shut down the computer.
3.　The power supply should turn off after Windows® shuts down.

3.2.2　Using the dual function power switch

While the system is ON, pressing the power switch for less than four seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting.