

**RAA1000**

Reference Series Mono Amplifier

REFERENCE

**Installation & Operation**  
**Installation et fonctionnement**  
**Instalación y funcionamiento**  
**Einbau und Betrieb**  
**Installazione e funzionamento**  
**Установка и эксплуатация**

## INTRODUCTION

Dear Customer,

Congratulations on your purchase of the world's finest brand of car audio equipment. At MB Quart, we are pleased you chose our product. Through years of engineering expertise, hand craftsmanship and critical testing procedures, we have created a wide range of products that reproduce music with all the clarity and richness you deserve.

For maximum performance we recommend you have your new MB Quart product installed by an Authorized MB Quart Dealer. Please read your warranty and retain your receipt and original carton for possible future use.

Great product and competent installations are only a piece of the puzzle when it comes to your system. Make sure that your installer is using quality installation accessories in your installation. Poor quality RCA cables and speaker wire can effect the performance and sound quality of your system. MB Quart offers a variety of accessories to meet this need. When installing, or having your system installed, use the best. Insist on it! After all, your new system deserves nothing but the best.

To get a free brochure on MB Quart products and accessories, in the U.S. call 1-800-962-7757 or FAX 1-800-327-3777. For all other countries, call +49 6261 638-0 or FAX +49 6261 638-129.

### PRACTICE SAFE SOUND™

Continuous exposure to sound pressure levels over 100dB may cause permanent hearing loss. High powered auto sound systems may produce sound pressure levels well over 130dB. Use common sense and practice safe sound.

If, after reading your manual, you still have questions regarding this product, we recommend that you see your MB Quart dealer. If you need further assistance, you can call us direct at 1-800-962-4412. Be sure to have your serial number, model number and date of purchase available when you call.

The serial number can be found on the outside of the box. Please record it in the space provided below as your permanent record. This will serve as verification of your factory warranty and may become useful in recovering your amplifier if it is ever stolen.

Serial Number: \_\_\_\_\_

Model Number: \_\_\_\_\_

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NOTE: Review each section for more detailed information.

## GETTING STARTED

Welcome to MB Quart! This manual is designed to provide information for the owner, salesperson and installer. For those of you who want quick information on how to install this product, please turn to the Installation Section of this manual. Other information can be located by using the Table of Contents. We, at MB Quart, have worked very hard to make sure all the information in this manual is current. But, as we are constantly finding new ways to improve our product, this information is subject to change without notice.




### SAFETY INSTRUCTIONS

#### WARNING

This symbol with "WARNING" is intended to alert the user to the presence of important instructions. Failure to heed the instructions will result in severe injury or death.

#### CAUTION

This symbol with "CAUTION" is intended to alert the user to the presence of important instructions. Failure to heed the instructions can result in injury or unit damage.

-  CAUTION: To prevent injury and damage to the unit, please read and follow the instructions in this manual. We want you to enjoy this system, not get a headache.
-  CAUTION If you feel unsure about installing this system yourself, have it installed by a qualified MB Quart technician.
-  CAUTION Before installation, disconnect the battery negative (-) terminal to prevent damage to the unit, fire and/or possible injury.

### CONTENTS OF CARTON

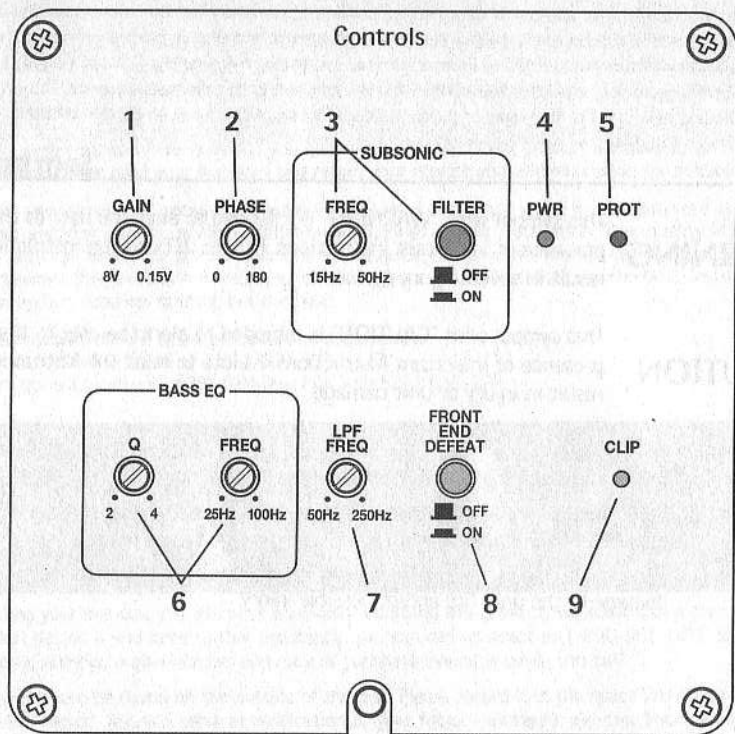
Model RAA1000 Mono Amplifier	(2) Speaker Plug Connectors
Installation & Operation Manual	(1) Power Plug Connector
Mounting Hardware Kit	(1) 8/32" Allen Wrench
Remote Bass Boost and Frequency Controller with cord	

The hardware kit included with each amplifier contains the mounting hardware necessary to secure the amplifier to the vehicle.

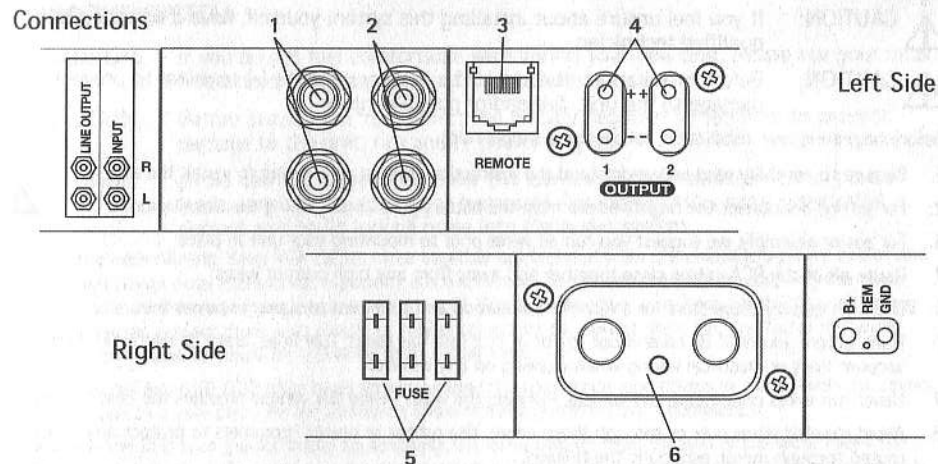
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[www.mbquart.com](http://www.mbquart.com)





- Gain Adjuster** – These can be adjusted to match output levels from a variety of source units individually for the left and right inputs.
- Phase Switch** – The phase is a variable control used to adjust the phase of the output signal relative to the phase of the input signal. The phase warp is most noticeable when the system is playing a sine wave (test tone). When used with the proper test equipment, this feature can increase the relative SPL (Sound Pressure Level) in a system. Adjustable phase from 0 to 180°.
- Subsonic Filter** – A variable, 15Hz to 50Hz, High Pass filter designed to prevent frequencies below the audio range from being applied to the subwoofer from the amplifier. Consequently improving subwoofer performance and power handling, particularly in vented enclosures.
- Power LED** – This Green LED illuminates when the unit is turned on.
- Protect LED** – This Red LED illuminates if a short circuit or too low of an impedance is detected at the speaker connections or if the amplifier reaches thermal protection. The amplifier will automatically shut down if this occurs.
- Bass EQ - Q** = Quality Factor. Q changes the effective bandwidth of the boost control at the selected frequency. Higher Q values reduce the effective bandwidth, lower Q values, increase the effective bandwidth with an adjustable frequency control variable from 25Hz to 100 Hz.
- LPF Frequency Crossover** – Is a built-in 12dB/octave Butterworth Low Pass filter with a crossover point variable from 50Hz to 250Hz.
- Front End Defeat** – Used to reroute the input signal around the signal processing circuitry within the amplifier. While in the ON position, all gain, bass eq and crossover functions are bypassed.
- Clipping LED Indicator** – This Yellow LED illuminates if clipping is detected for either speaker output.



- RCA Line Output Jacks** – These outputs provide a convenient source for daisy-chaining an additional amplifier without running an extra set of RCA cables from the front of the vehicle. These are pass-thru only and are not effected by crossover or gain adjustments.
- RCA Input Jacks** – The industry standard RCA jacks provide an easy connection for line level input. They are plated to resist the signal degradation caused by corrosion.
- Remote** – This RJ-45 cable connection is used for connecting the remote Level and Frequency Boost controller that can be installed in a variety of ways for easy control access. One control attenuates Gain set on the amplifier from 0 to -20dB. The other control is used for boosting the set frequency on the amplifier from 0 to +12dB. The remote also has Power and Protect LED indicators for the amplifier.
- Speaker Plug Receptacle** – Receptacle for the speaker plug connector. These connectors (+ and -) will accept wire sizes from 12 AWG to 18 AWG. Speaker outputs are wired in parallel internally.
- Fuses** – These ATC fuses are easily accessible in case of failure. Always replace fuses with same type and rating. See Specifications for fuse ratings.
- Power Plug Receptacle** – Receptacle for the power plug connector. The power (+12V DC) and ground wire connectors will accommodate up to a 2 AWG wire. The Remote wire connector will accommodate sizes from 12 AWG to 18 AWG. The Remote terminal is used to remotely turn-on and turn-off the amplifier when +12V DC is applied.

INSTALLATION

INSTALLATION CONSIDERATIONS

The following is a list of tools needed for installation:

- |                         |                                      |
|-------------------------|--------------------------------------|
| Volt/Ohm Meter          | Hand held drill w/assorted bits      |
| Wire strippers          | 1/8" diameter heatshrink tubing      |
| Wire crimpers           | Assorted connectors                  |
| Wire cutters            | Adequate Length—Red Power Wire       |
| #2 Phillips screwdriver | Adequate Length—Remote Turn-on Wire  |
| Battery post wrench     | Adequate Length—Black Grounding Wire |

This section focuses on some of the vehicle considerations for installing your new amplifier. Pre-planning your system layout and best wiring routes will save installation time. When deciding on the layout of your new system, be sure that each component will be easily accessible for making adjustments.

**CAUTION:** If you feel unsure about installing this system yourself, have it installed by a qualified technician.

**CAUTION:** Before installation, disconnect the battery negative (-) terminal to prevent damage to the unit, fire and/or possible injury.

Before beginning any installation, follow these simple rules:

1. Be sure to carefully read and understand the instructions before attempting to install the unit.
2. For safety, disconnect the negative lead from the battery prior to beginning the installation.
3. For easier assembly, we suggest you run all wires prior to mounting your unit in place.
4. Route all of the RCA cables close together and away from any high current wires.
5. Use high quality connectors for a reliable installation and to minimize signal or power loss.
6. Think before you drill! Be careful not to cut or drill into gas tanks, fuel lines, brake or hydraulic lines, vacuum lines or electrical wiring when working on any vehicle.
7. Never run wires underneath the vehicle. Running the wires inside the vehicle provides the best protection.
8. Avoid running wires over or through sharp edges. Use rubber or plastic grommets to protect any wires routed through metal, especially the firewall.
9. ALWAYS protect the battery and electrical system from damage with proper fusing. Install the appropriate fuse holder and fuse on the +12V power wire within 18" (45.7 cm) of the battery terminal.
10. When grounding to the chassis of the vehicle, scrape all paint from the metal to ensure a good, clean ground connection. Grounding connections should be as short as possible and always be connected to metal that is welded to the main body, or chassis, of the vehicle.

**MOUNTING LOCATIONS**

**Engine Compartment**

Never mount this unit in the engine compartment. Mounting the unit in the engine compartment will void your warranty.

**Trunk Mounting**

Mounting the amplifier vertically will provide adequate cooling of the amplifier.

Mounting the amplifier on the floor of the trunk will provide the best cooling of the amplifier.

Mounting the amplifier upside down to the rear deck of the trunk will not provide proper cooling and will severely affect the performance of the amplifier and is strongly not recommended.

**Passenger Compartment Mounting**

Mounting the amplifier in the passenger compartment will work as long as you provide a sufficient amount of air for the amplifier to cool itself. If you are going to mount the amplifier under the seat of the vehicle, you must have at least 1" (2.54cm) of air gap around the amplifier's vents.

Mounting the amplifier with less than 1" (2.54cm) of air gap around the amplifier in the passenger compartment will not provide proper cooling and will severely affect the performance of the amplifier and is strongly not recommended.

**BATTERY AND CHARGING**

Amplifiers will put an increased load on the vehicle's battery and charging system. We recommend checking your alternator and battery condition to ensure that the electrical system has enough capacity to handle the increased load of your stereo system. Stock electrical systems which are in good condition should be able to handle the extra load of any MB Quart amplifier without problems, although battery and alternator life can be reduced slightly. To maximize the performance of your amplifier, we suggest the use of a heavy duty battery and an energy storage capacitor.

**WIRING THE SYSTEM**

**CAUTION:** If you do not feel comfortable with wiring your new unit, please see your local Authorized MB Quart Dealer for installation.

**CAUTION:** Before installation, disconnect the battery negative (-) terminal to prevent damage to the unit, fire and/or possible injury.

**CAUTION:** Avoid running power wires near the low level input cables, antenna, power leads, sensitive equipment or harnesses. The power wires carry substantial current and could induce noise into the audio system.

1. Plan the wire routing. Keep RCA cables close together but isolated from the amplifier's power cables and any high power auto accessories, especially electric motors. This is done to prevent coupling the noise from radiated electrical fields into the audio signal. When feeding the wires through the firewall or any metal barrier, protect them with plastic or rubber grommets to prevent short circuits. Leave the wires long at this point to adjust for a precise fit at a later time.
2. Remove the eight (8) 8/32 allen head screws holding the connection end covers in place. Keep the covers and screws in a safe place for reinstallation when mounting and wiring is complete.
3. Prepare the RED wire (power cable) by stripping 1/2" of insulation from the end of the wire. Insert the bared wire into the "+" terminal on the plug connector. Tighten the set screw with a 3/32" allen wrench to secure the cable in place.

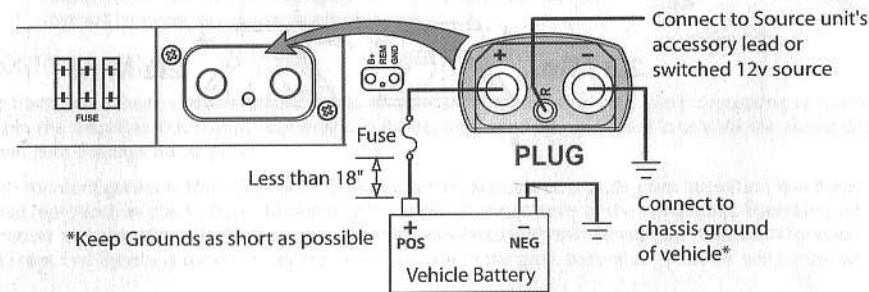
**NOTE:** The "+" (positive) cable **MUST** be fused 18" or less from the vehicle's battery. Install the fuseholder under the hood and ensure connections are water tight.

4. Trim the RED wire (power cable) within 18" of the battery and splice in a inline fuse holder. See Specifications for the rating of the fuse to be used. **DO NOT install the fuse at this time.**
5. Strip 1/2" from the battery end of the power cable and crimp a large ring terminal to the cable. Use the ring terminal to connect to the battery positive terminal.
6. Prepare the BLACK wire (Ground cable) by stripping 1/2" of insulation from the end of the wire. Insert the bared wire into the "-" terminal on the plug connector. Tighten the set screw with a 3/32" allen wrench to secure the cable in place. Prepare the vehicle chassis ground by scraping any paint from the metal surface and thoroughly clean the area of all dirt and grease. Strip the other end of the wire and attach a ring connector. Fasten the cable to the chassis using a non-anodized screw and a star washer.

**NOTE:** Keep the length of the BLACK wire (Ground) as short as possible. Always less than 30"(76.2cm).

7. Prepare the Remote turn-on wire by stripping 1/2" of insulation from the end of the wire. Insert the bared wire into the "R" terminal on the plug connector. Tighten the set screw with a 3/16" allen wrench to secure the cable in place. Connect the other end of the Remote wire to a switched 12 volt positive source. The switched voltage is usually taken from the source unit's accessory lead. If the source unit does not have this output available, the recommended solution is to wire a mechanical switch in line with a 12 volt source to activate the amplifier manually.

**Power Connection**



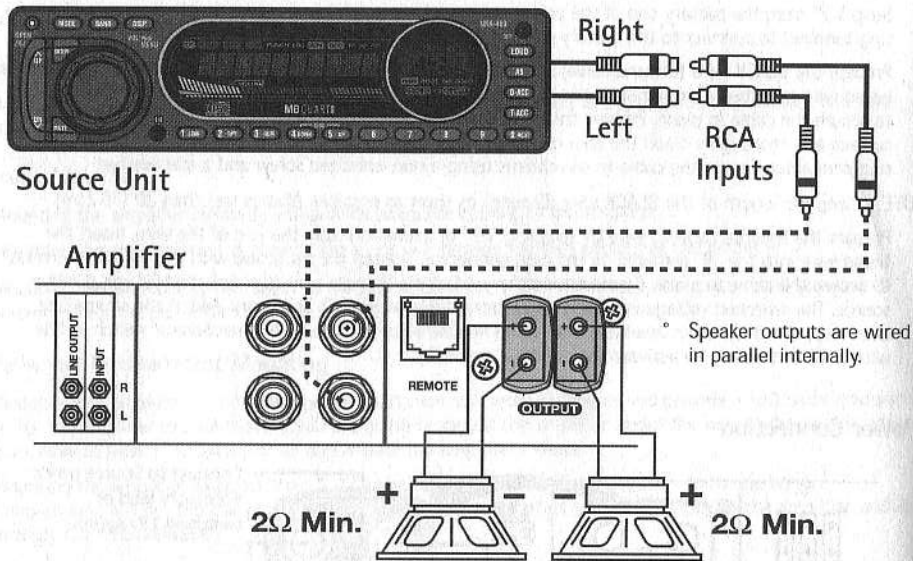


8. Securely mount the amplifier to the vehicle or amp rack. Be careful not to mount the amplifier on cardboard or plastic panels. Doing so may enable the screws to pull out from the panel due to road vibration or sudden vehicle stops.
  9. Connect source signal by plugging the RCA cables into the input jacks at the amplifier.
- CAUTION:** Always ensure power is off or disconnected at the amplifier before connecting RCA cables. Failure to do so may cause injury, damage to the amplifier and/or connected components.
10. Connect the speakers. Strip the speaker wires 1/2" and insert into the speaker plug connector and tighten the set screw to secure into place. Be sure to maintain proper speaker polarity. DO NOT chassis ground any of the speaker leads as unstable operation may result.
  11. Perform a final check of the completed system wiring to ensure that all connections are accurate. Check all power and ground connections for frayed wires and loose connections which could cause problems.
  12. Ensure the amplifier is mounted securely and reinstall the end covers. Install an inline fuse near the battery connection.

NOTE: Follow the diagrams for proper signal polarity.

**CAUTION:** These amplifiers are not recommended for impedance loads below 1  $\Omega$ .

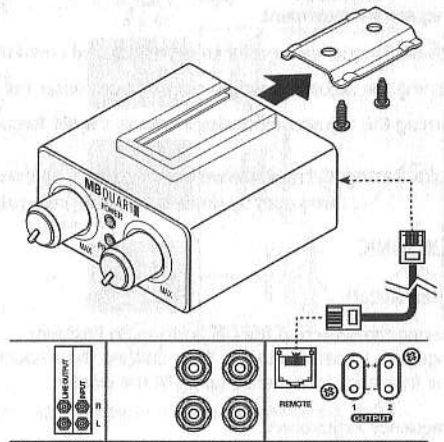
**CAUTION:** Do not attempt to connect the source unit speaker leads directly to the RCA connections of this amplifier, as damage to the source unit and/or the amplifier may result.



REMOTE LEVEL AND FREQUENCY BOOST CONTROLLER

Mounting and installation

1. Find a location, either under the dash or near the center console, that gives easy access to the remote.
2. Using the screws supplied, install the mounting clip.
3. Route the cable for the remote and connect to both the remote and amplifier.
4. Slip the remote onto the mounting clip until it snaps into place.



Operation

5. Left Knob-Level Control: Turn counter-clockwise to attenuate the gain level set on the amplifier from 0 to -20dB.

**CAUTION:** Overexcursion and subsequent damage may occur at high levels of boost.

6. Right Knob-Frequency Boost: Turn counter-clockwise to boost the Bass Eq frequency set on the amplifier from 0 to +12dB.

SET-UP FEATURES

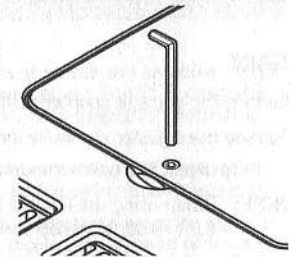
The MB Quart R Series amplifier offers a wide range of selections for the user to create a listening environment that meets your personal preference.

Before making final adjustments, read through the descriptions for each feature to get the best results.

ADJUSTMENTS

Loosen the allen screw holding the small cover in place over the controls. Tilt the cover up and away from the amplifier. After making adjustments, always ensure the cover is in place to prevent accidental changes to the settings.

NOTE: Failure to follow these instructions may result in a loss of sonic quality. This is caused by premature activation of the protection circuitry to maintain the integrity of the amplifiers sensitive components. The performance specifications listed in this manual cannot be guaranteed under such conditions.



FRONT END DEFEAT

The front-end defeat switch is responsible for rerouting the signal around the signal processing circuitry within the amplifier. This feature was designed for use with external processors to provide the purest possible signal path through the amplifier.

With this configuration, the MB Quart R Series amplifiers are able to provide lower distortion and better signal reproduction due to the reduction in the number of components in the signal path. Bypassing the crossover will also eliminate the typical phase shift associated with the analog filter transform function. While the Front End Bypass is turned on, all adjustments made to the gain, bass eq or crossover will be bypassed.

## CROSSOVER

## Frequency Adjustment

Use the Frequency Adjuster to set the desired Low-Pass Filter cut-off point.

Turning the adjuster counter-clockwise decreases the set frequency.

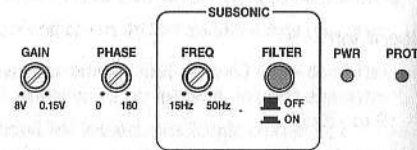
Turning the adjuster clockwise increases the set frequency.

**Quick Setting:** Decrease the crossover frequency all the way down. With the system playing, increase the crossover frequency up slowly until the desired crossover point is achieved.

## SUBSONIC

## Filter Switch

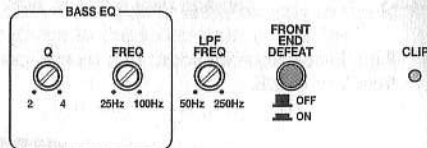
Placing the switch in the ON position (In Position) engages a variable subsonic filter limiting the amount of low frequency information going to the woofer.



## Frequency Adjustment

After turning the subsonic filter on, use the Frequency Adjuster to set this to your personal preference while listening to the system. Variable from 15Hz to 50Hz.

**NOTE:** We recommend using the subsonic filter when using vented enclosures with this amplifier.



## BASS EQ

## Q Adjustment

Q = Quality Factor. Changes the effective bandwidth of the boost control at the selected frequency. Higher Q values reduce the effective bandwidth, lower Q values, increase the effective bandwidth.

## Frequency Adjustment

Use to set the desired bass eq frequency. Variable from 25Hz to 100Hz.

## GAIN

Turning the adjuster counter-clockwise decreases the set gain.

Turning the adjuster clockwise increases the set gain.

1. To adjust the gain setting, turn the amplifier gains all the way down (counter-clockwise).

**NOTE:** When using the Remote Level and Frequency Boost controller with this unit, ensure the Level control (Left Knob) is turned down to minimum before preceeding with the adjustments.

2. Turn the source unit volume up until distortion is audible and then turn it down a bit until the distortion is inaudible. This will be about all the way up on most source units.
3. Increase the amplifier gain setting until adequate volume is achieved or clipping is noted by the LED indicator. Turn the gain down slightly if clipping is indicated.

Most quality source units do not distort, so the volume can be used at maximum setting.

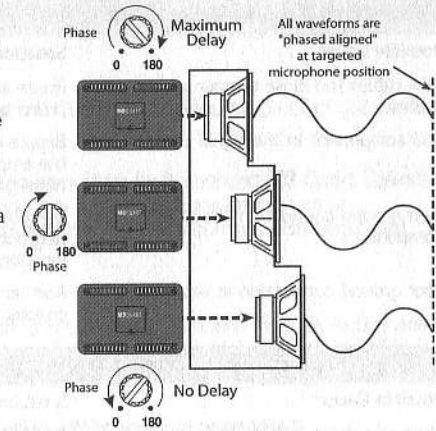
**NOTE:** Best signal to noise and dynamic range are realized with the gain at minimum. Most users find adequate gain and volume is achieved at about halfway in the adjustment range.

**CAUTION:** Avoid setting the amplifier gain very high as noise and distortion will increase significantly.

**NOTE:** For a more in depth setting procedure, contact MB Quart Technical Support.

## PHASE

The Phase is a variable control used to adjust the phase of the output signal relative to the phase of the input signal. This "phase alignment" is most noticeable when used with an array of woofers whose vertical or horizontal planes are staggered (not emanating from the same point.) Adjusting the Phase can electrically realign the signal fed to each woofer as if all woofers were aligned on a common ZDP (Zero Delay Plane). In SPL (Sound Pressure Level) systems, a desired ZDP is the point source where all speaker's voice coils are aligned on the same imaginary plane, thus allowing the signals to arrive at the microphone at the same time.



The phase is most noticeable when the system is playing a sine wave (test tone), not music. When used with the proper test equipment, this feature can increase the relative SPL in a system.

If the Phase is not used (like with a competitive SPL vehicle,) each amplifier's Phase should be set to (0) or (No Delay).

## TROUBLESHOOTING

## Amplifier Does Not Turn On

Possible Cause	Solution
The in-line fuse on battery positive cable is blown.	Check in-line fuse on battery positive cable. Replace if necessary.
Poor ground connection	Verify that Ground connection is connected to clean metal on the vehicle's chassis. Repair/replace if necessary.
Poor power connection or power outside acceptable range.	Verify there is 10.5 - 15.5 Volts present at the positive battery and remote turn-on cable. Verify quality connections for both cables at amplifier, stereo, and battery/fuseholder. Repair/replace if necessary.

## No Sound Coming From Amplifier

Possible Cause	Solution
Poor RCA connections.	Verify good RCA input connections at source and amplifier. Check entire length of cables for kinks, splices, etc. Test RCA inputs for AC voltage with the source unit on. Repair/replace if necessary
Poor speaker connections	Use an ohm meter to check speaker wire integrity. Check entire length of wires for kinks, splices, etc. Repair/replace if necessary.
Bad source unit	Connect RCA input from test source directly to amplifier input. If this solves the problem, have the source unit repaired or replaced. If not, have the amplifier checked by a qualified technician.

## Speaker "Pop" When Amplifier Turns On

Possible Cause	Solution
Remote from source unit comes on too quickly.	Disconnect input signal to amplifier and turn amplifier on and off. If the noise is eliminated, connect the REM lead of amplifier to source unit with a delay turn-on module
Poor remote power signal from source	Use a different 12 Volt source for REM lead of amplifier (i.e. battery direct). If the noise is eliminated, use a relay to isolate the amplifier from noisy turn-on output.



## Excessive Engine Noise

Possible Cause	Solution
RCA cables too close to main power cables.	Route all signal carrying wires (RCA, Speaker cables) away from power and ground wires.
Bad component in the signal chain	Bypass any and all electrical components between the source and the amplifier(s). Connect source directly to input of amplifier. If noise goes away the unit being bypassed is the cause of the noise.
Poor ground connection at system components	Remove existing ground wires for all electrical components. Reground wires to different locations. Verify that grounding location is clean, shiny metal free of paint, rust etc
Poor ground connection at battery	Add secondary ground cable from negative battery terminal to the chassis metal or engine block of vehicle.

## PROT (Protect) LED Comes On, Amplifier shuts down

Possible Cause	Solution
There is a short in the system	Turn the system off. Check connection to all components for possible shorts. Check all wires and cables for kinks, splices, poor insulation, etc. Repair/replace if necessary.
Amplifier has exceeded normal operating temperature due to improper ventilation.	Turn the system off and allow to cool. Verify adequate ventilation around amplifier. Move the amplifier to a spot with better ventilation if needed.
Speaker impedance too low	Check for proper speaker impedance, replace if needed.
Low battery voltage	Check that the vehicle charging system is maintaining proper voltage.

## SPECIFICATIONS

MODEL- R Series		RAA1000
Continuous Power Rating (RMS) - Measured at 14.4 Battery Volts		
4 $\Omega$ Load Per Channel		250 Watts x 1Ch and $\leq$ 1% THD+N
2 $\Omega$ Load Per Channel		500 Watts x 1Ch and $\leq$ 1% THD+N
1 $\Omega$ Load Per Channel		1000 Watts x 1Ch and $\leq$ 1% THD+N
Dimensions:	Height	2.375" (6cm)
	Width	11.5" (29.2cm)
	Length	16.75" (42.5cm)
Amplifier Fuse Rating (Amp/Type)		(3) 40A / ATC
Battery Fuse Rating (Amp) External (Not Supplied)		120A
Signal-to-Noise Ratio		>80dB A-weighted (reference: 0dB = 2Vrms)
Crossover Slope		12dB/octave Butterworth
Crossover Frequency		LPF (low Pass Filter) variable from 50Hz to 250Hz
Frequency Response		0.25Hz to 250kHz (-3dB, 1watt)
Rated Bandwidth		20Hz to 20kHz
Signal Voltage Adjustment Range (RCA Input)		Variable from 0.15V to 8V
Protection		Shorted output, DC offset, thermal, power supply over-current
Input Impedance		20k ohms

These specifications are Amplifier Power Standard CEA-2006 Compliant

Specifications subject to change without notice

MB Quart Corporation offers a limited warranty on MB Quart products on the following terms:

## Length of Warranty

R Series Amplifiers – 1 Year  
Or, two (2) years warranty if installed by a Authorized MB Quart Dealer. Requires proof of purchase.

## What is Covered

This warranty applies only to MB Quart products sold to consumers by Authorized MB Quart Dealers in the United States of America or its possessions. Product purchased by consumers from an Authorized MB Quart Dealer in another country are covered only by that country's Distributor and not by MB Quart.

## Who is Covered

This warranty covers only the original purchaser of MB Quart product purchased from an Authorized MB Quart Dealer in the United States. In order to receive service, the purchaser must provide MB Quart with a copy of the receipt stating the customer name, dealer name, product purchased and date of purchase.

Products found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at MB Quart's discretion.

## What is Not Covered

1. Damage caused by accident, abuse, improper operations, water, theft, shipping
2. Any cost or expense related to the removal or reinstallation of product
3. Service performed by anyone other than MB Quart or an Authorized MB Quart Service Center
4. Any product which has had the serial number defaced, altered, or removed
5. Subsequent damage to other components
6. Any product purchased outside the U.S.
7. Any product not purchased from an Authorized MB Quart Dealer

## Limit on Implied Warranties

Any implied warranties including warranties of fitness for use and merchantability are limited in duration to the period of the express warranty set forth above. Some states do not allow limitations on the length of an implied warranty, so this limitation may not apply. No person is authorized to assume for MB Quart any other liability in connection with the sale of the product.

## How to Obtain Service

Contact the Authorized MB Quart Dealer you purchased this product from.

If you need further assistance, call 1-800-962-4412 for MB Quart Customer Service. You must obtain an RA# (Return Authorization number) to return any product to MB Quart. You are responsible for shipment of product to MB Quart.

## EU Warranty

This product meets the current EU warranty requirements, see your Authorized dealer for details.

Ship to: Electronics

MB Quart

Warranty Repair Department

2055 E. 5th Street

Tempe, AZ 85281

RA#: \_\_\_\_\_

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