MB QUART

ONYX

Installation Manual

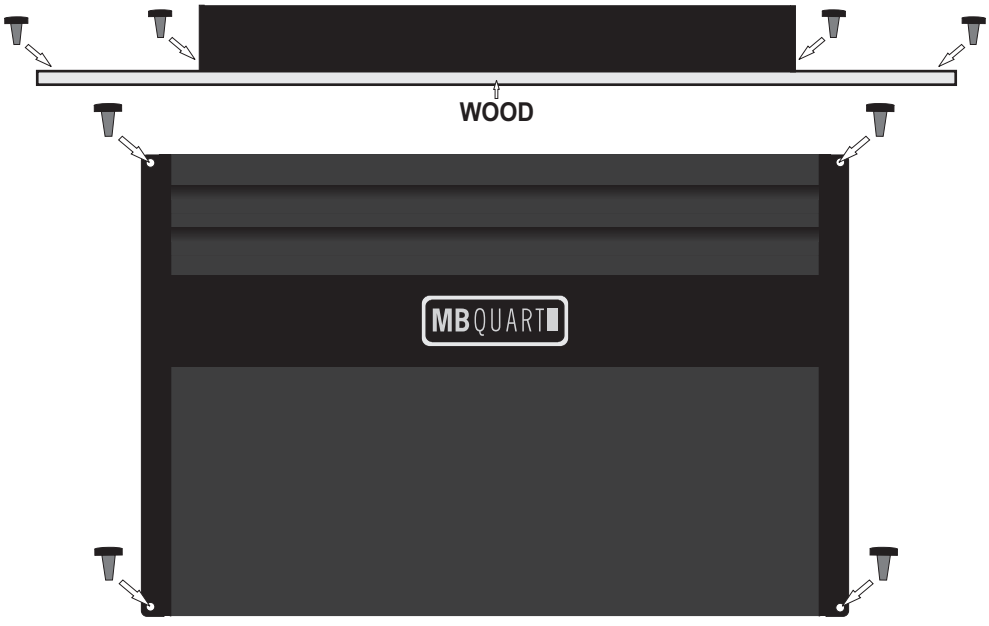
Congratulations!
By purchasing an amplifier from MB Quart, you have decided on a product of the highest technical quality. MB Quart wishes you great enjoyment with your amplifier. Should you have any questions about this system or other MB Quart products, please email us at info@maxxsonics.com

System Design
The success of any car stereo system relies on several factors, such as the system design, execution of the installation, and system setup. Please remember that any system is only as good as its weakest link.
Please remember that higher power systems are not necessarily useful purely for high sound pressure levels, but also to establish a headroom capability, to reproduce musical peaks cleanly without distortion.

Lower power amplifiers will clip earlier than their more powerful cousins, and cause loudspeaker failure when overdriven, due to the harmonics generated by a clipped signal, thus overheating voice coils.

Amplifiers should be mounted with the fins running horizontally for best convection cooling, to minimize overheating. Purchase the best quality RCA cables you can afford, for reliability and less engine noise interference in the audio system.

It is highly recommended that the amplifier be mounted to a board of MDF or other solid structure using the 4 mounting screws provided. Avoid mounting the amplifier to metal as this can introduce noise and other unwanted issues. When mounting the amplifier, ensure that it is mounted HORIZONTALLY, as shown in the diagram above, for optimal heat dissipation. Mounting amplifiers to speaker enclosures is not recommended as this can cause damage to the amplifier components. When choosing a location for mounting the amplifier, ensure that you check for clearance from wires, gas tank, electrical devices and brake lines etc.



General Instructions

General:
Run the wiring so that RCA cables are at least 18“ away from power and speaker cables. Keep RCA cables away from electrical devices in the vehicle that can cause electrical noise, such as electric fuel pumps, emission control modules and other on-board electronic modules.

Power and ground connections:(See table below)
Use a sufficient gauge power cable and ground cable using the chart below as reference to what size wire you require. Onyx series amplifiers require at least 4 gauge power wire. In a multi amplifier system, add the total value of the manufacture recommended fusing to get your total system amperage. Some applications may require multiple runs of power wire to meet the system requirements. In multi amplifier systems it is advisable to mount a large enough fuse right at the battery, and run one or multiple +12 volt power cables to a fused distribution block near the amplifiers. It is then a simple matter to connect the +12 volt terminal of each amplifier to the distribution block. During this process, please ensure that the main power fuse is removed to avoid shorting the electrical system. The main fuse must be within 12” of the vehicles battery.

Ground each amplifier with as short a ground lead as possible directly to the vehicle chassis using at least 4 gauge wire or equivalent to the size of the amplifiers’ power wire. Use a ground distribution block, if you wish, but it is extremely important to keep the main ground lead from this distribution block to the chassis as short as possible , not more than 12“. The ground connection integrity to the chassis is very important, and the best way to achieve a good, solid electrical and mechanical contact is to use a large round crimp lug, crimped and soldered to the ground cable. The next step is to scrape the paint off the vehicle chassis , slightly larger than the ground lug, at the connection point. Drill a clearance hole in the chassis, the same size as the lug hole, and use a bolt, spring washer and nut to securely fasten the ground lug. Use petroleum jelly to coat the bolt/lug connection, to prevent oxidization with time.

TIP: Use the same approach when installing head units, equalizers or any audio equipment for that matter - run short individual grounds from each piece directly to the vehicle chassis, to minimize ground loops and system noise. All power, ground and speaker connections should be crimped and soldered for reliability. Make sure that none of the cable insulation can chafe against exposed metal in the vehicle, causing short circuits to the chassis.

Safe connection sequence:
After all cables are run, connect speaker wires to the speakers and amplifiers, then run and plug in RCA cables. Next, connect all power, ground, and remote turn on leads. Now connect all +12 volt cables to the amplifier/s and distribution blocks and fuse holders. Finally, connect the main +12 volt cable to the battery, with the main fuse removed, and we are almost ready to power up the system.

Power up the system:
The following procedure may seem like overkill, but there is nothing more frustrating when turning on a system for the first time, and it does not work properly immediately.
First, make sure the head unit is off, and turn all level controls to minimum (counterclockwise), including the head unit volume control. Set all equalizers to 0 dB (no boost), and all crossover frequency controls at approximate frequencies, as recommended by the loudspeaker manufacturer. Set all input selector and crossover switches as required for the application. Remove all amplifier fuses, and insert the main fuse at the battery. If the fuse does not blow, you can insert the fuse in one of the amplifiers, and we are ready to turn on the system. Turn the head unit on, insert a CD, or select a radio station, and increase the head unit volume control. If the system sounds fine, turn off the head unit, and install fuses in the remaining amplifiers, one by one, till the complete system is powered up and functioning properly.

WIRE LENGTH

SYSTEM AMPERAGE	7-10 ft.	10-13 ft.	13-16 ft.	16-19 ft.	19-22 ft.	22-28 ft.
35-50	8	6	4	4	4	4
50-65	6	4	4	4	4	2
68-85	4	4	2	2	2	0
85-105	4	2	2	2	2	0
105-125	4	2	0	0	0	0
125-150	2	0	0	0	0	0

WIRE GAUGE

Settings for Best Performance

OA240.2 / OA400.4 / OA600.4 / OA800.4 / OA1100.5

General:
At this point you are ready to get more specific on the settings for your amplifier.

High Pass:
-When in Hi Pass operation, this setting acts as a low frequency cut off for your system reproduction. The point that you set it at cuts off any frequencies from reproduction beyond this point. The 12 o'clock position is a great starting point. EXAMPLE: If you adjust the High Pass to 100Hz, the amplifier will not play frequencies below 100Hz but will play frequencies from 100Hz to the highest frequency the amplifier is capable of reproducing.
-When in Low Pass/Bandpass operation, this setting acts as a low frequency cut off for your system reproduction aka Subsonic Filter. The point that you set it at cuts off any frequencies from reproduction beyond this point. The 12 o'clock position is a great starting point. EXAMPLE: If you adjust the High Pass to 60Hz, the amplifier will not play frequencies below 60Hz but will play frequencies from 60Hz to the chosen Low Pass frequency.
-When in Flat/Full operation, the Low Pass crossover is bypassed.

Bass EQ:
This setting is a fixed bass boost at 45Hz that is variable. OA240.2 is 0-12dB, OA400.4/OA600.4/OA800.4 are 0-9dB and the OA1100.5 is 0-10dB on the 5th channel. This feature provides impact to your bass, but if not adjusted correctly, it can be over used and cause damage to your speakers and amplifiers. It is best to slowly turn this setting clockwise until the desired punch is felt. It is not recommended to exceed the 12 o'clock position unless listening at a low volume or a low recording quality as this can result in high distortion and possibly clipping.

Low Pass:
The Low Pass control acts as a ceiling and doesn't allow frequencies to the right of the desired setting to be reproduced. Turning the potentiometer all the way to the right is a great starting point. EXAMPLE: If you adjust the Low Pass to 120Hz, the amplifier will not play frequencies above 120Hz but will play frequencies from 120Hz to the chosen Hi Pass or Subsonic frequency.
-When in Hi Pass operation, this setting is bypassed.

Level Control Setup:
Ensure that the Level is turned completely to the left prior to turning the system on. Next you should insert a CD or cassette that you are familiar with to use as a reference, and turn the head unit volume control to about 80% of its full setting. The system sound level will of course be very low, and the following procedures will help you to match the amplifier input sensitivities properly to the head unit output signal level.
It is important to match the amplifier **LEVEL** input sensitivity to the Radio/CD output sensitivity. This can be located in the Radio/CD manual.
If the Radio/CD output sensitivity is 2 volts, then adjust the amplifier **LEVEL** input to 2 volts.

If you are not sure what the Radio output sensitivity is, follow these general guide lines:
Turn the level control up slowly, till you hear distortion, then back off a few degrees on the control. If at any point your amplifier goes into protection, you will need to turn the Level to the left a bit and then try again. If you reach a point where the output does not increase, stop turning the Level control to the right as the amplifier/speaker combo has reached its maxx

OA500.1 / OA750.1 / OA1000.1

General:
At this point you are ready to get more specific on the settings for your amplifier.

Subsonic:
This setting acts as a low frequency cut off for your system bass reproduction. The point that you set it at cuts off any frequencies from reproduction beyond this point. The 12 o'clock position is a great starting point. EXAMPLE: If you adjust the Subsonic to 25Hz, the amplifier will not play frequencies below 25Hz but will play frequencies from 25Hz to the chosen Low Pass frequency.

Bass EQ:
This setting is a fixed bass boost at 45Hz that is variable from 0-12dB. This feature provides impact to your bass, but if not adjusted correctly, it can be over used and cause damage to your subwoofers and amplifiers. It is best to slowly turn this setting clockwise until the desired punch is felt. It is not recommended to exceed the 12 o'clock position unless listening at a low volume or a low recording quality as this can result in high distortion and possibly clipping.

Low Pass:
The Low Pass control acts as a ceiling and doesn't allow frequencies to the right of the desired setting to be reproduced. The 12 o'clock position is a great starting point. EXAMPLE: If you adjust the Low Pass to 80Hz, the amplifier will not play frequencies above 80Hz but will play frequencies from 80Hz to the chosen Subsonic frequency.

Level Control Setup:
Ensure that the Level is turned completely to the left prior to turning the system on. Next you should insert a CD or cassette that you are familiar with to use as a reference, and turn the head unit volume control to about 80% of its full setting. The system sound level will of course be very low, and the following procedures will help you to match the amplifier input sensitivities properly to the head unit output signal level.
It is important to match the amplifier **LEVEL** input sensitivity to the Radio/CD output sensitivity. This can be located in the Radio/CD manual.
If the Radio/CD output sensitivity is 2 volts, then adjust the amplifier **LEVEL** input to 2 volts.

If you are not sure what the Radio output sensitivity is, follow these general guide lines:
Turn the level control up slowly, till you hear distortion, then back off a few degrees on the control. If at any point your amplifier goes into protection, you will need to turn the Level to the left a bit and then try again. If you reach a point where the output does not increase, stop turning the Level control to the right as the amplifier/subwoofer combo has reached its maxx output in this application.

TROUBLE SHOOTING

The key to finding the problem in a misbehaving sound system is to isolate parts of that system in a logical fashion to track down the fault.

Description of the Diagnostic system built into all MB Quart amplifiers
The diagnostic system will shut down the amplifier, until reset by turning the head unit off, and back on. This state of affairs will be indicated by the front panel PROTECT LED lighting up under the following conditions:
1 - A short circuit on the loudspeaker leads.
2 - An internal amplifier fault that causes a DC offset on the loudspeaker output.

Should the amplifier go into diagnostic mode, simply disconnect all RCA and speaker leads, while keeping +12 volt, power ground and remote leads connected.
1. Now turn the amplifier back on, and if the diagnostic LED lights, the amplifier has an internal fault.
2. If not, plug the RCA cables back, and reset the amplifier. If it goes into diagnostic now, the fault lies in the input, either with bad cables or source unit.
3. If the amplifier seems fine with RCA cables plugged in, connect the speakers, one at a time, and if one of the speakers or its wiring is faulty, it will activate the diagnostic system.

Amplifier heatsink overheating
The amplifiers will shut down when the heatsink temperature reaches 80 degrees centigrade, and turn back on once the unit has cooled down below that point.
Causes of overheating:
1 - Inadequate cooling - relocate or remount to provide better natural airflow over the fins.
2 - Driving high power levels into low impedances - back off on the volume control, and/or make sure you are not loading the amplifier with less than the recommended loudspeaker impedance.

Low output power
1 - Check that level controls have been set up properly.
2 - Make sure that the battery voltage, as measured at the amplifier's +12 volt and ground terminals, is 11 volts or more.
3 - Check all +12 volt and ground connections.

Fuses blowing
1 - The use of loudspeaker impedances below the recommended minimums will draw more current - check.
2 - A short on the main +12 volt cable from the battery to the vehicle chassis will cause the main fuse to blow.

System does not turn on
1 - Check all fuses.
2 - Check all connections.
3 - Measure the +12 volt and remote turn on voltages at the amplifier terminals. If these are non existent or low, take voltage measurements at fuse holders, distribution blocks, the head unit's +12 volt and remote leads to localize the problem.

Noise problems
System noise can be divided into two categories, hiss, and electrical interference.

Hiss, or white noise
1 - High levels of white noise usually occurs when amplifier level controls are turned up too high - readjust according to the procedures in section *"Setting up systems after installation for best performance"*
2 - Another major problem that can cause excessive hiss, is a noisy head unit - unplug the amplifier input RCA cables, and if the hiss level reduces, the source unit is at fault.

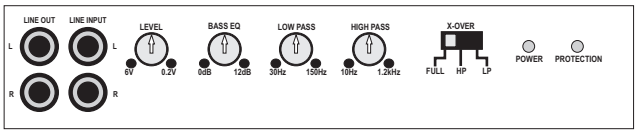
Electrical interference
The inside of an automobile is a very hostile electrical environment. The multitude of electrical systems, such as the ignition system, alternator, fuel pumps, air conditioners, to mention just a few, create radiated electrical fields, as well as noise on the +12 volt supply and ground. Remember to isolate the problem - first unplug amplifier input RCA cables, if the noise is still present, check the speaker leads, if not, plug the RCA's back, and investigate the source driving the amplifier, one component at a time.

A ticking or whine that changes with engine RPM:
1 - This problem could be caused by radiation pickup of RCA cables too near to a fuel pump or a distributor, for instance, - relocate cables.
2 - Check that the head unit ground is connected straight to the vehicle chassis, and does not use factory wiring for ground.
3 - Try to supply the head unit with a clean +12 volt supply directly from the battery +, instead of using a supply from the in dash wiring/fusebox.

A constant whine:
This type of noise can be more difficult to pinpoint, but is usually caused by some kind of instability, causing oscillations in the system.
1 - Check all connections, especially for good grounds.
2 - Make sure that no speaker leads are shorting to exposed metal on the vehicle chassis.
3 -RCA cables are notorious for their problematic nature, so check that these are good, in particular the shield connections.

OA240.2

2-Channel Amplifier



FEATURES:
- **1** Set of RCA inputs
- **LEVEL:** Variable sensitivity from **0.2V to 6V**
- **BASS EQ:** Adjustable 45Hz bass boost from **0dB to 12dB**
- **X-OVER:** Selects internal crossover functions
  - **FULL:** Bypasses all crossovers for full frequency operation
  - **LP:** Selects the built in **LOW PASS** filter, variable from **30Hz to 150Hz**
  - **HP:** Selects the built in **HIGH PASS** filter, variable from 1**0Hz to 1.2KHz**

- **POWER** LED**:** Indicates the powered up and turned on condition
- **PROTECTION** LED**:** Indicates a high voltage, low voltage, short circuit, hard clip, over heating or DC fault condition.
- **LINE OUTPUT:** Full range RCA pass through.

2 Channel Full Range Stereo:

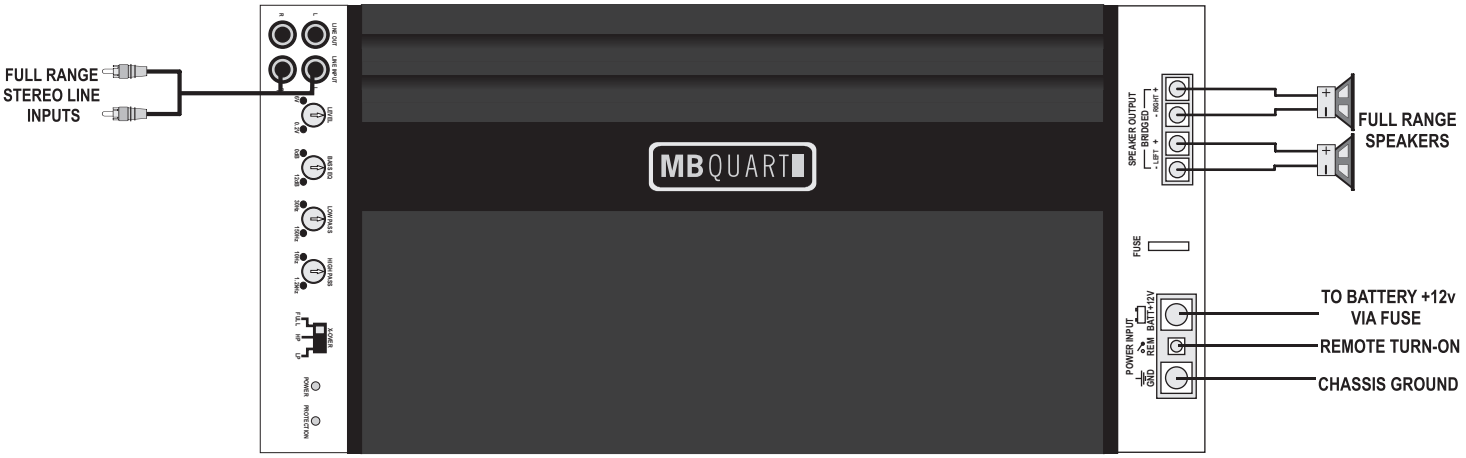
Interconnect cable checklist:
- Connect the two inputs of the amplifier to a Radio/CD with quality RCA cables.

Switch setting checklist:
- 1/2CH X-OVER: FULL

MODE: STEREO

Control checklist:
- Refer to the section "Settings for Best Performance"

Minimum final loudspeaker impedances:
- 2 ohm per channel.



Bridged for Subwoofer Application:

Here we show how to use the 2 channel amplifiers to power a subwoofer by taking advantage of the mono bridging capability of all MB Quart amplifiers.

Interconnect cable checklist:
- A MONO signal source is required to bridge channels 1/2, such as would be available from the mono sub bass output of an active crossover, whether standalone, or built into a head unit or equalizer. If you only have 1 set of RCA outputs from your headunit, you can simply connect those to the inputs for ch ½ the amplifier will auto sum the signal and provide mono output.

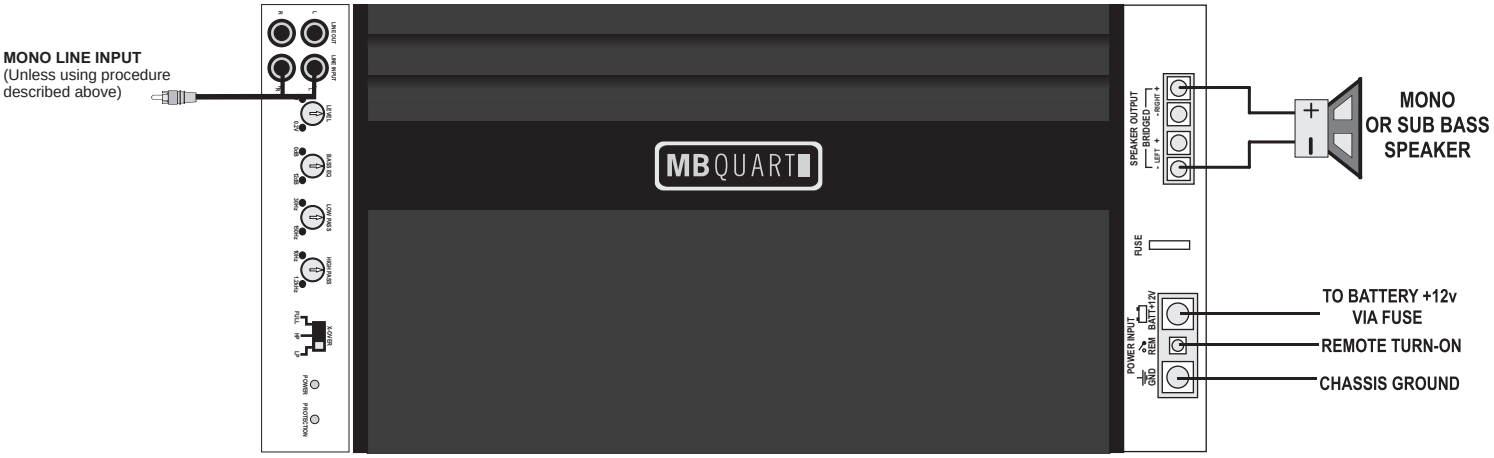
Important: Do not be tempted to connect the hot, or positive outputs, from any source together to obtain a mono signal, as this could very well damage the output stage of that source.

- Connect the mono speaker positive terminal to the LEFT +, and its negative terminal to RIGHT
- as shown.

Switch setting checklist:
- **X-OVER:** LP

Control checklist:
- Refer to the section *"Settings for Best Performance"*

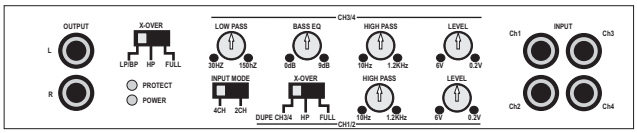
Minimum final loudspeaker impedances:
- **2 ohm per channel in stereo mode.**
- **4 ohm mono bridged.**



OA400.4 / OA600.4 / OA800.4

MB QUART

4-Channel Amplifiers



FEATURES:
- 2 Sets of RCA inputs
- **LEVEL:** Variable sensitivity from **0.2V to 6V**
- **X-OVER:** Selects internal crossover functions
  - **FULL:** Bypasses all crossovers for full frequency operation
  - **LP/BP:** Selects the built in **LOW PASS** filter, variable from **30Hz to 150Hz**
  - **HP:** Selects the built in **HIGH PASS** filter, variable from **10Hz to 1.2KHz**
  - **DUPE 3/4:** Allows CH1/2 to Duplicate the settings on CH3/4
- **BASS EQ:** Adjustable 45Hz bass boost from **0dB to 9dB**
- **POWER** LED**:** Indicates the powered up and turned on condition
- **PROTECTION** LED**:** Indicates a high voltage, low voltage, short circuit, hard clip, over heating or DC fault condition.
- **MODE:** "2" indicates one set of RCA's are being used. This will also pass signal to channels 3/4 through 1/2 inputs. "4" indicates connecting 2 sets of RCA's to 1/2 and 3/4 inputs.
- **LINE OUTPUT:** Full range RCA pass through.

4 Channel Full Range Stereo:

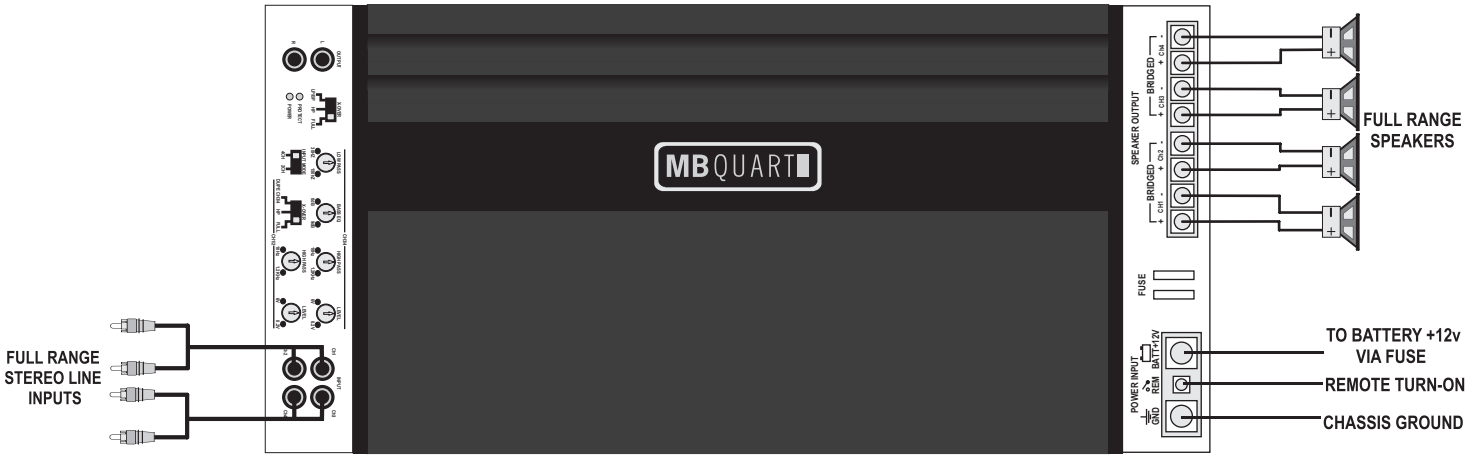
Interconnect cable checklist:
- Connect the four inputs of the amplifier to a Radio/CD with quality RCA cables.

Switch setting checklist:
- 1/2CH X-OVER: FULL
- 3/4CH X-OVER: FULL

MODE: "4" since 2 sets of RCA's are connected.

Control checklist:
- Refer to the section "Settings for Best Performance"

Minimum final loudspeaker impedances:
- 2 ohm per channel.



2 or 3 Channel System:

Here we show how to use the 4 channel amplifiers as a 3 channel unit by taking advantage of the mono bridging capability of all MB Quart amplifiers. In order to create a 2 channel system, simply follow the example to also mono bridge channel pair 1/2.

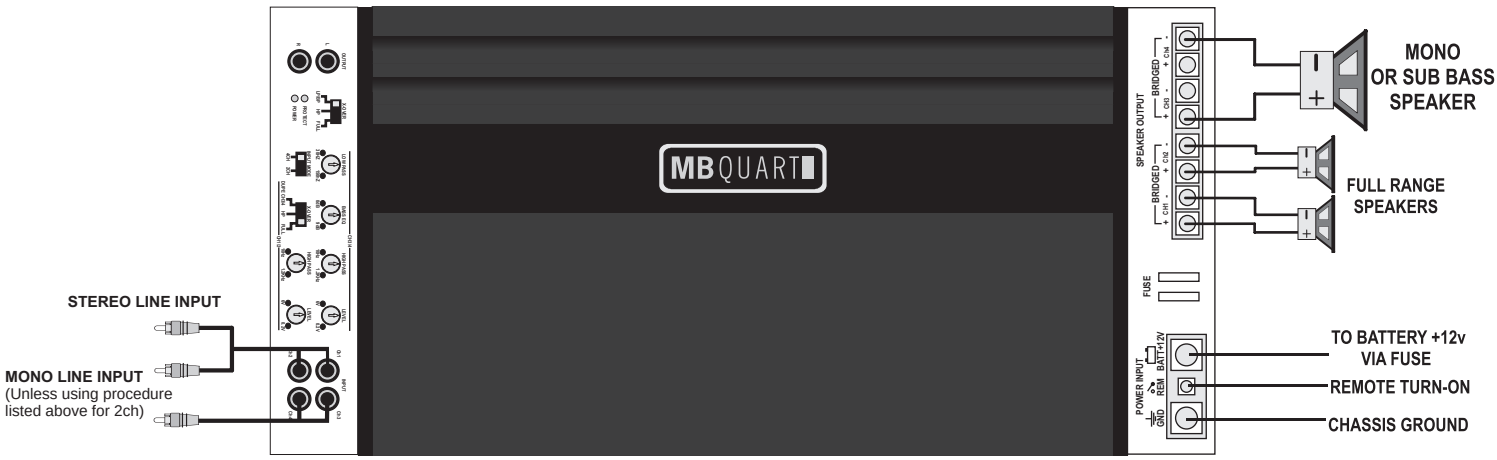
Interconnect cable checklist:
- Connect the inputs of channel pair 1/2 to a suitable stereo source, e.g. a head unit with good quality RCA cables.
- A MONO signal source is required to bridge channel pair 3/4, such as would be available from the mono sub bass output of an active crossover, whether standalone, or built into a head unit or equalizer. If you only have 1 set of RCA outputs from your headunit, you can simply connect those to the inputs for ch 1/2 and switch the **MODE** to 2ch. The amplifier will auto sum the signal and provide mono output for bridged channels 3/4.

Important: Do not be tempted to connect the hot, or positive outputs, from any source together to obtain a mono signal, as this could very well damage the output stage of that source.
- It is necessary to feed the SAME signal to both left and right inputs via a Y-adapter RCA cable.
- Connect the mono speaker positive terminal to the RIGHT +, and its negative terminal to LEFT
- as shown.

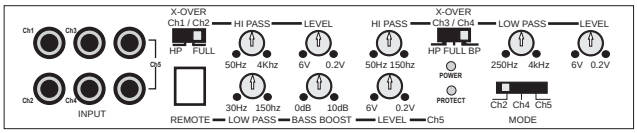
Switch setting checklist:
- **1/2CH X-OVER:** FULL
- **3/4CH X-OVER:** LP/BP

Control checklist:
- Refer to the section *"Settings for Best Performance"*

Minimum final loudspeaker impedances:
- **2 ohm per channel in stereo mode.**
- **4 ohm mono bridged.**



5-Channel Amplifiers



FEATURES:
- **3** Sets of RCA inputs
- **LEVEL:** Variable sensitivity from **0.2V to 6V**
- **BASS BOOST:** Adjustable 45Hz bass boost from **0dB to 10dB**
- **X-OVER:** Selects internal crossover functions
  - **FULL:** Bypasses all crossovers for full frequency operation
  - **BP:** Selects the built in HI PASS and LOW PASS filters to created a BAND PASS crossover.
  - **HP:** Selects the built in **HI PASS** filter, variable from **50Hz to 4KHz. LOW PASS** is bypassed.

- **POWER** LED**:** Indicates the powered up and turned on condition
- **PROTECTION** LED**:** Indicates a high voltage, low voltage, short circuit, hard clip, over heating or DC fault condition.
- **MODE:** "2" indicates one set of RCA's are being used. This will also pass signal to channels 3/4 and 5 through 1/2 inputs. "4" indicates connecting 2 sets of RCA's to 1/2 and 3/4 inputs. "5" indicates connecting 3 sets of RCA's to channels 1/2, 3/4 and mono signal to channel 5 inputs.

5 Channel Discrete Operation:

You can use this configuration simply as 4 discrete full range channels, with a 5th low pass channel. All of the crossovers are bypassed , except the LOW PASS on channel 5.

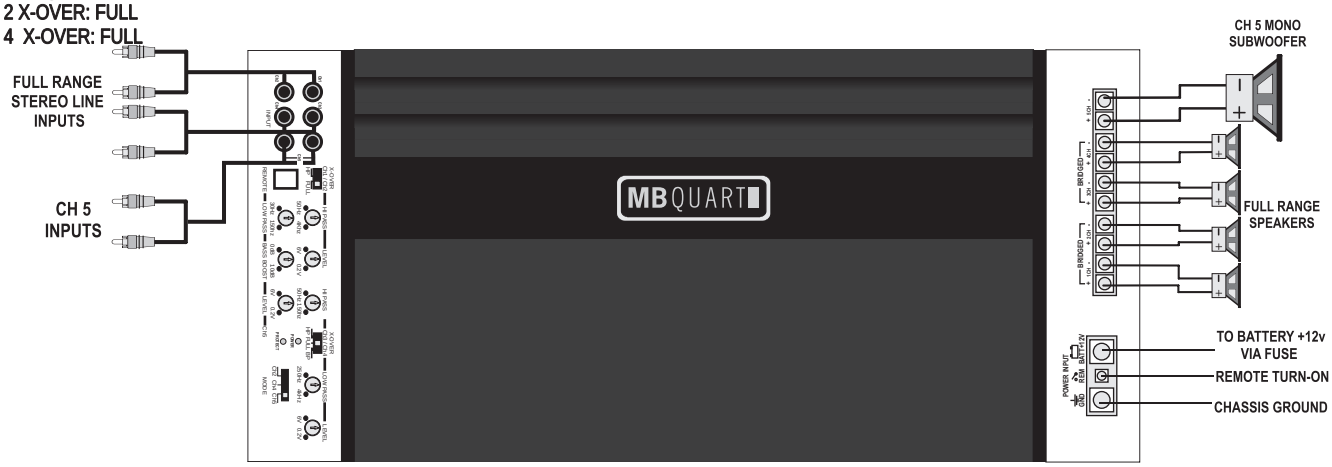
Interconnect cable checklist:
Connect channel 1&2 inputs to the front output, channels 3&4 to the rear output, and channel 5 to the mono subwoofer output of a head unit or in dash equalizer.

Switch setting checklist:
- CH 1 / 2 X-OVER: FULL
- CH 3 / 4 X-OVER: FULL

MODE: "5" since 3 sets of RCA's are connected.

Control checklist:
- Refer to the section *"Settings for Best Performance"*

Minimum final loudspeaker impedances:
- **2 Ohms per channel for channels 1-4**
- **1 Ohm on channel 5**



Single Set of Stereo RCA's

We will use the same basic setup on the speaker and subwoofer connections as above to illustrate an installation that only has 1 set of stereo RCA's to connect to this amplifier. By switching the amplifier to 2CH on the INPUT MODE, you now provide signal to all channels on the amplifier. You sacrifice the ability to fade front to rear though.

Interconnect cable checklist:
Connect Stereo Left and Right RCA's from headunit to CH1&2 RCA Inputs.

Switch setting checklist:
- CH 1 / 2 X-OVER: FULL
- CH 3 / 4 X-OVER: FULL

MODE: "2" since 1 set of RCA's are connected.

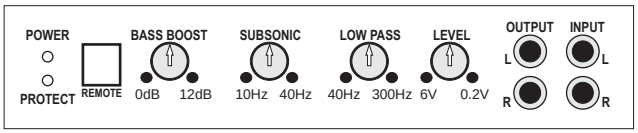
Control checklist:
- Refer to the section *"Settings for Best Performance"*

Minimum final loudspeaker impedances:
- **2 Ohms per channel for channels 1-4**
- **1 Ohm on channel 5**



OA500.1 / OA750.1 / OA1000.1

Mono Amplifiers



FEATURES:
- 1 Set of RCA inputs
- **LEVEL:** Variable sensitivity from **0.2V to 6V**
- **BASS BOOST:** Adjustable 45Hz bass boost from **0dB to 12dB**
- **SUBSONIC:** Variable from **10Hz to 40Hz** *(OA500.1 & OA1000.1)* and **15Hz to 55Hz** *(OA750.1)*
- **LOW PASS:** Variable from **40Hz to 300Hz** *(OA500.1 & OA1000.1)* and **40Hz to 150Hz** *(OA750.1)*

- **POWER** LED: Indicates the powered up and turned on condition
- **PROTECTION** LED: Indicates a high voltage, low voltage, short circuit, hard clip, over heating or DC fault condition.
- **LINE OUTPUT:** Full range RCA pass through.

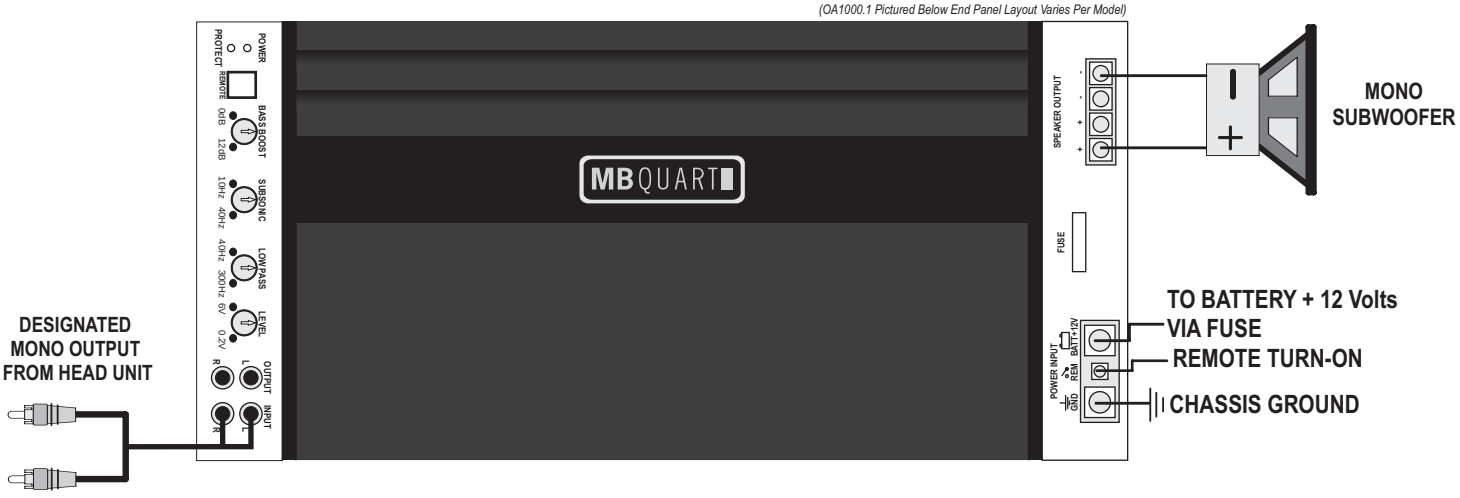
Interconnect cable checklist:
Connect the inputs to a suitable source, e.g. a head unit with good quality RCA cables.

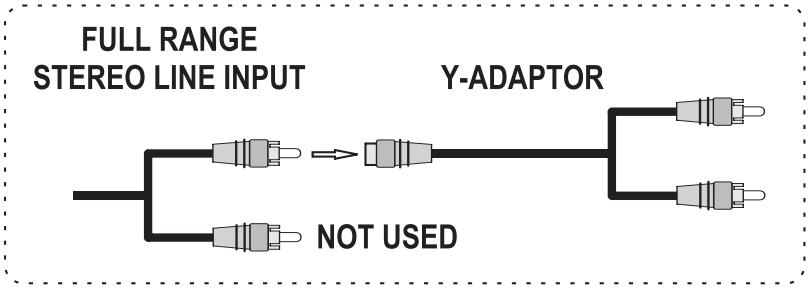
Use at least #12 gauge speaker wiring. The amps have dual speaker terminals, simplifying the hookup of multiple speakers. These amps are mono, 1 channel, amplifiers which have multiple positive and negative connections for ease of wiring. The 2 positives are the same internally and the 2 negatives are the same internally.

Control checklist:
Refer to the section *"Settings for Best Performance"*

Minimum final loudspeaker impedance:
-OA500.1 = 2-Ohms
-OA750.1 & OA1000.1 = 1-Ohm

(OA1000.1 Pictured Below End Panel Layout Varies Per Model)





✱**Note: You can use the Radio/CD designated mono line output or a full range stereo line output. For full range stereo line output, you will need an optional "Y-Adaptor" as shown**

FEATURES	2-CHANNEL	4-CHANNEL			5-CHANNEL	1-CHANNEL MONO CLASS A/B		
	OA240.2	OA400.4	OA600.4	OA800.4	OA1100.5	OA500.1	OA750.1	OA1000.1
Output Power Rating (rms)								
4-Ohms	60 X 2	50 X 4	75 X 4	100 X 4	75 X 4 + 350	250 X 1	350 X 1	475 X 1
2-Ohms	120 X 2	100 X 4	150 X 4	200 X 4	150 X 4 + 500	500 X 1	600 X 1	750 X 1
1-Ohm	N/A	N/A	N/A	N/A	CH1-4: N/A CH5: 500 X 1	N/A	750 X 1	1000 X 1
Mono Bridge at 4-Ohms	240 X 1	200 X 2	300 X 2	400 X 2	300 X 2			
Power Supply	PWM	PWM	PWM	PWM	PWM	PWM	PWM	PWM
Output Power Circuit Configuration	Mosfet	Mosfet	Mosfet	Mosfet	Mosfet	Mosfet	Mosfet	Mosfet
Miscellaneous Specifications								
Soft Start Sound	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frequency Response-3dB	10Hz - 45kHz	10Hz - 45kHz	10Hz - 45kHz	10Hz - 45kHz	10Hz - 45KHz	10Hz - 300Hz	15Hz - 150Hz	10Hz - 300Hz
Damping Factor	>180	>180	>180	>180	>180	>180	>180	>180
S/N Ratio(A-Weight)	>92dB	>92dB	>92dB	>92dB	>92dB	>92dB	>92dB	>92dB
THD & Noise	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Channel Separation	>80dB	>80dB	>80dB	>80dB	>80dB			
Variable Input Level Control	0.2V-6.0V	0.2V-6.0V	0.2V-6.0V	0.2V-6.0V	0.2V-6.0V	0.2V-6.0V	0.2V-6.0V	0.2V-6.0V
Input Impedance	47kΩ	47kΩ	47kΩ	47kΩ	47kΩ	47kΩ	47kΩ	47kΩ
Diagnostic Indicator(power: green / protect: red)	Power/Protect	Power/Protect	Power/Protect	Power/Protect	Power/Protect	Power/Protect	Power/Protect	Power/Protect
Protection(DC, Short, Thermal, Overload)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Crossover Operation								
Crossover Switch for 1+2 channels	FULL / HP / LP	LP/BP / HP / FULL	LP/BP / HP / FULL	FULL / LPF / HPF	HP / FULL	N/A	N/A	N/A
Variable HPF (High Pass Filter)	10Hz - 1.2KHz	10Hz - 1.2KHz	10Hz - 1.2KHz	10Hz - 1.2KHz	50Hz - 4KHz	N/A	N/A	N/A
Variable LPF (Low Pass Filter)	30Hz - 150Hz	N/A	N/A	N/A	N/A	40Hz - 300Hz	40Hz - 150Hz	40Hz - 3000Hz
Variable Subsonic Filter	N/A	N/A	N/A	N/A	N/A	10Hz - 40Hz	15Hz - 55Hz	10Hz - 40Hz
Bass EQ (Bass Boost at 45Hz)	0dB - 12dB	N/A	N/A	N/A	N/A	0dB - 12dB	0dB - 12dB	0dB - 12dB
Crossover Switch for 3+4 channel	N/A	DUPE 3&4/ HP / FULL	DUPE 3&4/ HP / FULL	DUPE 3&4/ HP / FULL	HP / FULL / BP	N/A	N/A	N/A
Variable HPF (High Pass Filter)	N/A	10Hz - 1.2KHz	10Hz - 1.2KHz	10Hz - 1.2KHz	30Hz - 150Hz	N/A	N/A	N/A
Variable LPF (Low Pass Filter)	N/A	30Hz - 150Hz	30Hz - 150Hz	30Hz - 150Hz	50Hz - 4KHz	N/A	N/A	N/A
Bass EQ (Bass Boost at 45Hz)	N/A	0dB - 9dB	0dB - 9dB	0dB - 9dB	N/A	N/A	N/A	N/A
Crossovers for channel 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Variable HPF (High Pass Filter)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Variable LPF (Low Pass Filter)	N/A	N/A	N/A	N/A	30Hz - 150Hz	N/A	N/A	N/A
Bass EQ (Bass Boost at 45Hz)	N/A	N/A	N/A	N/A	0dB - 10dB	N/A	N/A	N/A
Line Output	Full Range	Full Range	Full Range	Full Range	N/A	Full Range	Full Range	Full Range
Unbalanced Input(RCA Jack)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Phone Jack for Remote Control	No	No	No	No	Yes CH5	Yes	Yes	Yes
Remote Level Control Module (MBQR-2)	No	No	No	No	Yes	Yes	Yes	Yes
Others								
Power Terminal	4-GA	4-GA	4-GA	4-GA	2-GA	4-GA	4-GA	2-GA
Speaker Terminal	16-GA	16-GA	16-GA	16-GA	CH1-4: 16-GA / CH5: 14-GA	14-GA	14-GA	12-GA
Fuse Size	20 AMPS X 1	20 AMPS X 2	30 AMPS X 2	40 AMPS X 2	50 AMPS X 2	25 AMPS X 2	60 AMPS X 1	50 AMPS X 2
Dimensions Length x Width x Height (inches)	6.3 X 9.45 X 2.23	10.24 X 9.45 X 2.23	11.02 X 9.45 X 2.23	14.17 X 9.45 X 2.23	15.98 X 9.45 X 2.23	11.81 X 9.45 X 2.23	15.75 X 9.45 X 2.23	17.72 X 9.45 X 2.23
Note: Features subject to change with out notice								