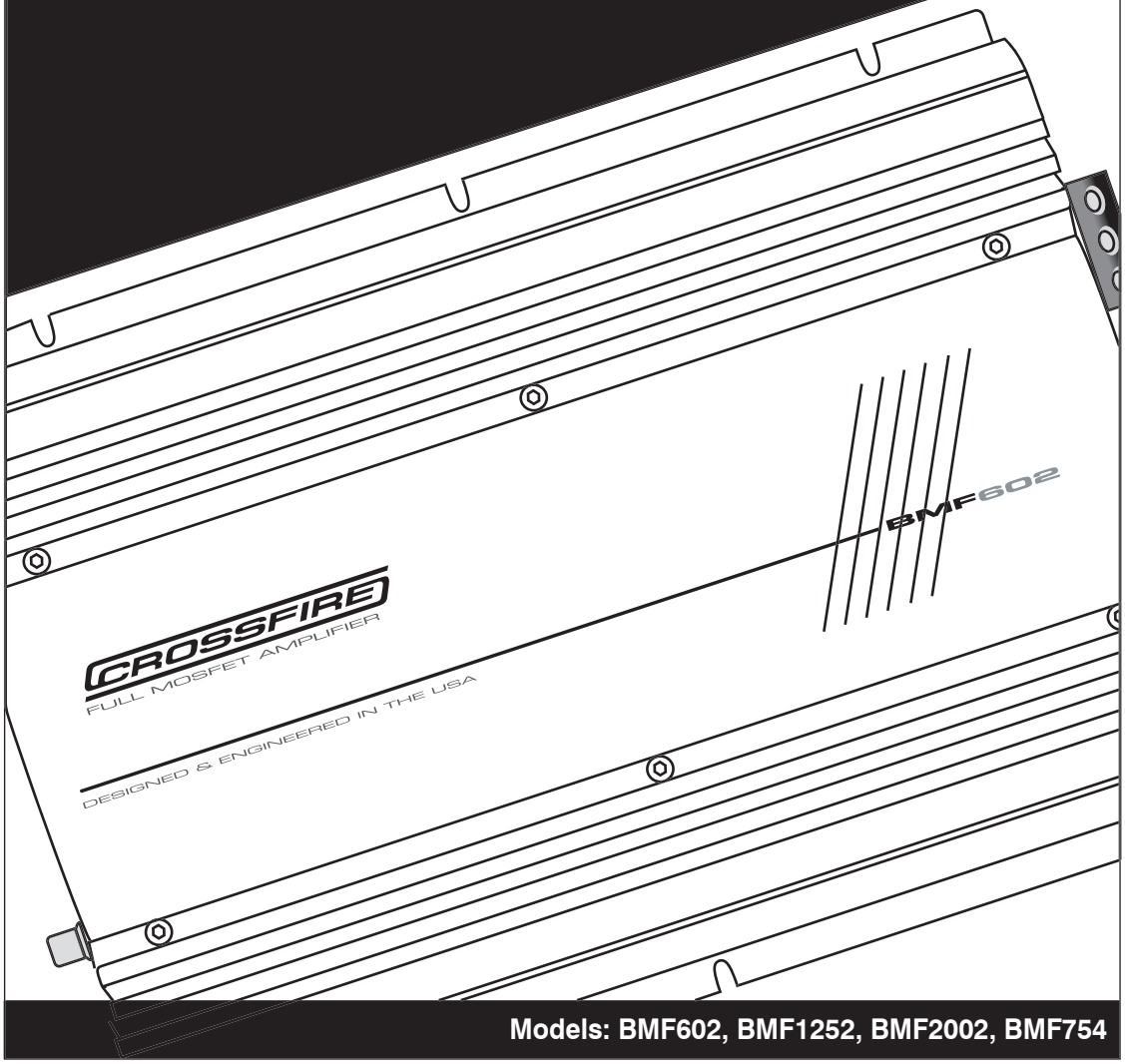
CROSSFIRE

VR Amplifier
Installation Manual



Models: BMF602, BMF1252, BMF2002, BMF754

For your records, Crossfire recommends keeping the model and serial number of your new Crossfire ampifier. This could possibly help you recover your ampifier in the event of a theft. Use the following spaces to do so and make sure to keep you manual in a safe place.

Model: _____

Serial Number: _____

Date of Purchase: _____

Place of Purchase: _____

Thank you once again for choosing Crossfire! Enjoy!

Thank you and congratulations for choosing Crossfire Car Audio for your amplification needs. Crossfire amplifiers have been significantly improved throughout the years to assure quality and reliability. Our goal is to incorporate the latest technology into every Crossfire product providing you with incredible power and unparalleled sound quality. Low distortion and high efficiency are the result of our precision engineered circuitry. We are confident that your new Crossfire amplifier will provide you with a sound value you will enjoy for years to come.

Features

Ultra High Efficiency MOSFET Amplifier

Class AB Operation

Fully 2 Ohm Stereo & Stable Operation

Military Specification Audiophile Grade Components

High Efficiency Multi-Stranded Power Ground

MOSFET Input and Output Transistor

Oversized Capacitor Banks

Wire Free PCB Layout

Discrete Mounted Power and Speaker Terminals

Variable Highpass and Lowpass Electronic Crossover

RCA Preamp Output
-Variable HP/LP/Full Crossover

Anti Clip System

Internally Bridgeable

5 Way Protection Circuitry

Soft Remote On/Off Circuitry

Two Year Limited Warranty

Specifications

MODEL:	BMF602	BMF1252	BMF2002	BMF754
RMS Power/4 ohms	60w x 2	125w x 2	200w x 2	75w x 4
Bridge Power, Max	240w x 1	500w x 1	800w x 1	300 x 2
Efficiency, 4 ohms Stereo	68%	68%	69%	63%
THD	0.02%	0.02%	0.02%	0.02%
Bandwidth + 3dB	5Hz - 38KHz	5Hz- 38KHz	5Hz- 38KHz	5Hz- 38KHz
Signal to Noise	>100dB	>100dB	>100dB	>97dB
Damping Factor	>500	>500	>400	>250
Channel Separation	>72dB	>72dB	>72dB	>70dB
Input Sensitivity	310mV to 6V	310mV to 6V	310mV to 6V	310mV to 6V
Input Impedance	20Kohm	20Kohm	20Kohm	20Kohm
Power Fuse	25amp	(2) 25amp	(2) 30amp	(2) 30amp
Dimensions W x H x L 9	.3" x 2.1" x 10.6" 9	.3" x 2.1" x 15" 9	.3" x 2.1" x 16.8"	9.3" x 2.1" x 16.2"
CROSSOVER				
Variable Lowpass	50Hz - 6KHz	50Hz - 6KHz	50Hz - 6KHz	50Hz - 6KHz
Variable Highpass	50Hz - 6KHz	50Hz - 6KHz	50Hz - 6KHz	50Hz - 6KHz
X-Over Slope	18dB	18dB	18dB	18dB
Preamp Output Crossover	50Hz - 6KHz	50Hz - 6KHz	50Hz - 6KHz	N/A

All specifications are with 12.5 volts DC. Typical output with 14.4 volts DC is 20% higher.

IMPORTANT

Please read all instructions before installation !

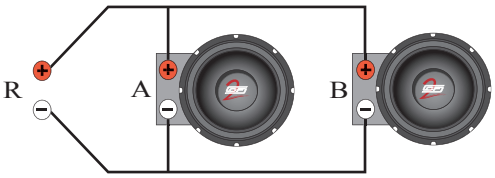
The quality of installation may affect the performance and reliability of your Crossfire product. If you have any doubts or questions regarding installation, you may wish to contact your authorized Crossfire dealer. Remember to follow all wire and fuse requirements suggested in this manual. Warranty may void if proper installation technique is not used (refer to warranty section in the rear of this manual).

Operation

The BMF MOSFET amplifiers will reach their potential output into either a 2 ohm stereo load or a 4 ohm bridged load. A lower impedance can send the amplifier into current protection and possibly damage the circuitry. To prevent damage, use the following formulas to help you calculate the load you are placing on the amplifier. If you have any difficulties, please contact your local Crossfire dealer of Crossfire's Technical Assistance at 562-906-0800.

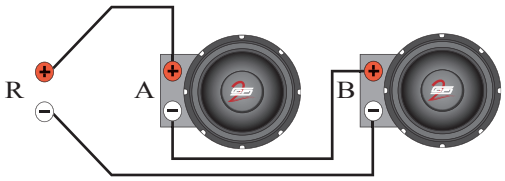
Impedance Equations

Parallel Wiring



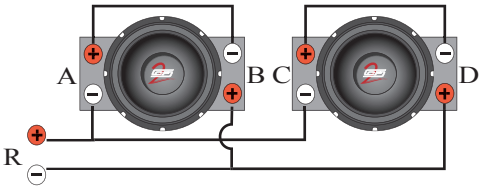
Equation $\frac{A \times B}{A + B} = R$

Series Wiring



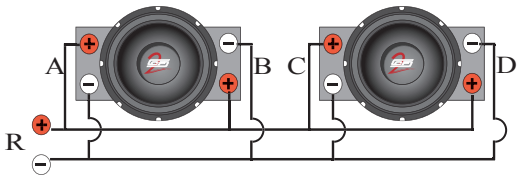
Equation $A + B = R$

Series/Parallel Wiring Dual Voice Coil



Equation $\frac{(A + B) \times (C + D)}{A + B + C + D} = R$

Parallel Wiring, Dual Voice Coil



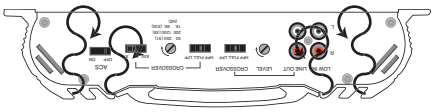
Equation $\frac{\sqrt{(A \times B)(C \times D)}}{(A + B) + (C + D)} = R$

Mounting

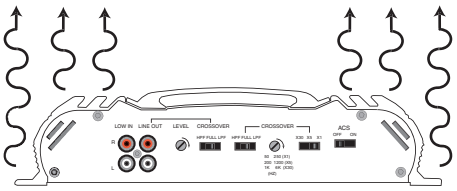
Appropriate mounting is very important for prolonged life expectancy of any amplifier. Select a location of applicable space that allows for sufficient airflow and provides protection from moisture. Keep in mind that an amplifier should never be mounted upside down. Upside down mounting will compromise heat dissipation through the heatsinks and will engage the thermal protection circuit much sooner. Excessive heat can shorten your amplifier's life. To maximize heat dissipation, be sure to leave at least 2.5 inches of clearance around the amplifier. Fans should be used in correspondence with an escape duct for the heat when mounting the amplifier in an enclosed or restricted area.

Avoid slipping and scratching your new Crossfire BMF amplifier by pre-drilling the mounting holes with either an 1/8" or 3mm diameter drill bit when using the screws supplied in the accessory kit. Always investigate the mounting area thoroughly for electrical wires, vacuum lines, and brake or fuel lines before you start to prevent any potentially expensive mistakes.

✕ **Incorrect Mounting**
Heat is trapped inside the amplifier, shortening the life of the electronic components.



○ **Correct Mounting**
Heat is lifted from the amplifier heatsink.



Power Connections

All Crossfire amplifiers are designed to work within 10.5 to 16 volts DC. Therefore, as a precaution the vehicle's electrical system should be checked for correct voltage supply with the help of a voltmeter. First, connect the test leads of the voltmeter to the battery terminals with the ignition of the vehicle in the off position. The voltmeter should read no less than 12 volts. Next check the voltage of the battery with the engine running between 1500 and 2000 rpms. The voltmeter should now read between 13.5 and 14.5 volts. If your vehicle's electrical is not up to these specifications, we recommend having it checked by an automotive mechanic before you further the installation.

POWER WIRE & FUSE

The proper wire size is very important for an amplifier capable of these power levels. The following are the recommended fuse values and wire gauge for lengths up to 20ft.

Model	Wire	Fuse
BMF602	10awg.	25amp
BMF1252	8awg.	50amp
BMF2002	4awg	60amp
BMF754	4awg	60amp

POWER

Power wire needs be connected directly to the battery using the wire requirements listed above. Never use the fuse box or any other wire as a source for the power for an amplifier. Before you start, choose the easiest path to run the wire from the battery to the amplifier. Generally, try to keep the power wire on the driver's side of the vehicle (See Signal Inputs & Outputs for explanation). Use the following rules for running the power cable through the vehicle:

1. Use grommets when passing the power wire through any metal wall of the vehicle.
2. Avoid sharp corners or sharp body parts that may easily cut through the insulation on the wire.
3. Avoid running the power wire over engine components and near heater cores.
4. Avoid the gas, brake and clutch pedals and their mechanisms.
5. Use an inline fuse to eliminate the risk of a fire caused by a short in your power wire.
6. Connect the fuse holder as close to the battery positive as possible.

Once the wire has been run, connect the wire to the battery terminal. As a precaution, leave the fuse out until all other wire connections are made.

GROUND

The wire used for ground should be of the same gauge as the power wire. Make sure that you choose a different color (generally black) so that you don't reverse the polarity at the amplifier terminals. Follow the rules below for connecting the ground wire properly:

1. Avoid using seat bolts, seatbelt bolts, and fender wells for ground.
2. Choose a metal area close to the amplifier that appears to be a good of ground, such as the floor.
3. Investigate the area you wish to use for electrical wires, vacuum lines, and brake or fuel lines.

Please note that if you are installing multiple high power amplifiers into the vehicle, you must upgrade the ground strap from the battery to the frame and the frame to the body of the vehicle. Use the following directions to help aid with the ground connections.

1. Find a nut and bolt to fit the ring terminal you have chosen.
2. Drill a hole just large enough for the bolt to fit through at the source of ground.
3. Use either a wire brush or sandpaper to eliminate unwanted paint around the hole you have drilled as to supply a better contact for your ground.
4. Terminate the ground wire to the ring terminal and attach it to the bare metal using the nut and bolt. It is very important for this connection to be solid.
5. Spread silicon over the screw and bare metal to prevent rust and moisture from entering the vehicle.

REMOTE TURN-ON

In between the power and ground of the amplifier is a remote turn-on terminal. This terminal must be connected to a switched +12 volt source to make the amplifier operational. Typically, remote turn-on leads are provided at the head unit that will turn on and off the amplifier in correspondence with the source. This means you will most likely have to remove the head unit from the dash to find the source +12V output wire.

Once the head unit is pulled from the dash, locate the remote turn on wire. The majority of vehicles will be using an after market head unit when using an amplifier. These after market head units generally use a blue or a blue with white wire as the remote turn on for the amplifiers. However, when using a factory radio, the power antenna wire should be used as a turn on lead if applicable (colors will vary from make/model). Only if a lead is not available at the source, a switched +12 volt supply, such as a toggle switch, should be applied.

Use a minimum of 18-gauge wire, preferably blue, to connect the amplifier to the head unit. If possible, route this wire along side of the power wire using the same precautions. Connect the remote output of the head unit to the wire using a barrel connector or a mating terminal as required by the source unit. You can solder these wires together, but be sure to use heat-shrink over the connection. Do not place the radio back into the dash yet.

Speaker Outputs

WIRING

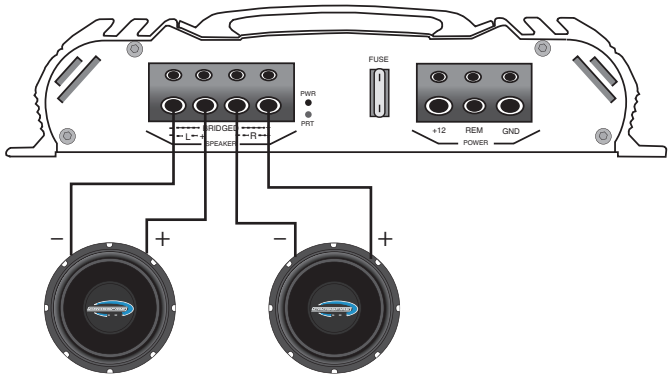
Always choose speaker wire carefully. Make sure that the wire is appropriate for the speaker you are applying it to. It is highly recommended not to use anything smaller than 16awg. Consult your dealer.

As with the power wires, use caution around sharp corners or body parts that may easily cut through the insulation on the wire. If running wire into the doors, it is important to use a protective boot in the door jam to protect the wire from being pinched as well as keeping dust and moisture from entering the vehicle. Use the factory boots when possible. And always make sure that the wire is out of the way of the window mechanism.

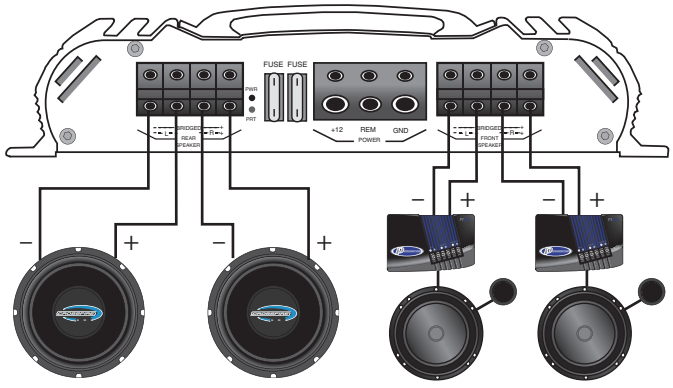
To connect the wire to the speaker, strip off approximately ½" (12mm) of the insulation and terminate the wires using insulated speaker terminals (not supplied) or by soldering the connection to the loudspeaker. Be sure that the polarity at the loudspeaker is correct.

Stereo Operation

MODELS
BMF602
BMF1252
BMF2002

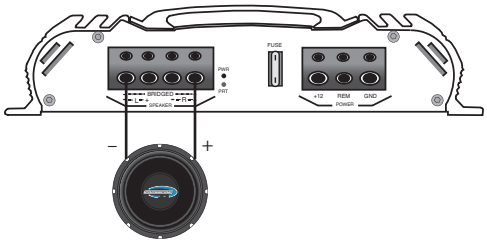


MODEL
BMF754

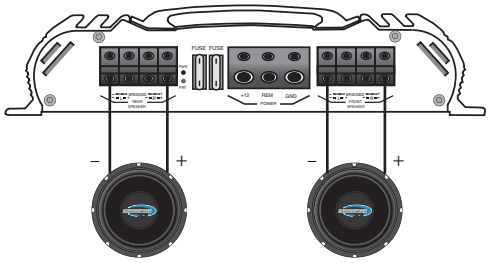


Bridged Operation

MODELS
BMF602
BMF1252
BMF2002

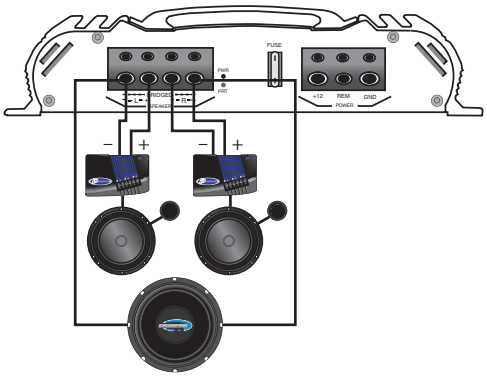


MODEL
BMF754

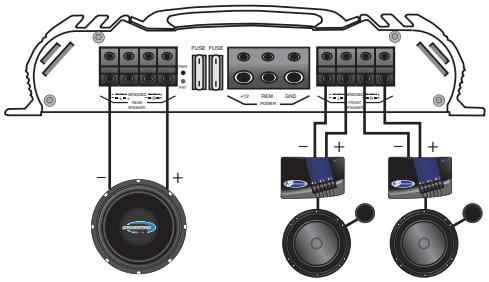


Stereo/Mono Operation

MODELS
BMF602
BMF1252
BMF2002



MODEL
BMF754



Connecting the Wires

At this point, the power, ground and remote wires should be run to the general location of where the amplifier is to be mounted. If the wires are to be hidden under the carpet, you now need to cut a slit for them to come through. To do this, place the amplifier in the location it is to be mounted to verify where the cuts need to be made. Make sure that there will be not be a conflict with the mounting of the amplifier and the wires. Pull the wires through the slit to the terminals leaving approximately 6" (150mm) of slack and cut the wires to an equal length. Strip off approximately ½" (12mm) of insulation from each wire. Insert the wires directly into the terminal and tighten the set screw using a 3mm allen key. Make sure you have the polarity correct on both the power wires and the speaker wires. Check your connections by giving the wires a slight tug.

Signal Inputs

Getting a clear signal from the head unit to the amplifier is very important. To achieve this, the proper signal cables must be used. Estimate the length of the cables necessary. Take note that the cables will probably not be the exact length necessary for your vehicle. If you are between sizes, purchase the longer cable. You can always hide the extra wire.

Be aware of the differences in cable. Better RCA's usually have multiple layers of shielding and/or twisted pair wiring for better noise rejection. Consult your local dealer for their recommendations.

LINE LEVEL INPUTS

Car environments are notorious for poorly insulated wires. This means that hiss, engine noise, and fan noise can easily be picked up through RCA cables if ran incorrectly. To avoid picking up noise, run the RCA's away from large wire looms and electric fans if possible. Always make sure to position your patch cables away from the power wire, preferably on the opposite side of the vehicle. As with the power wire, use caution around sharp corners of body parts that may easily cut through the cables.

Located on the opposite side of the power terminals are two sets of line level (RCA) receptacles. Marked "LOW IN", these receptacles accept signal from the outputs of the source unit via RCA patch cables. When connecting the signal cables, be sure the balance (left and right) stays consistent between the amplifier and head unit. The cables should be marked for easy installation: red is right and black or white is left.

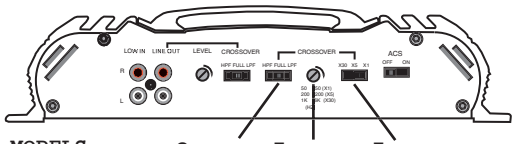
Once you have finished connecting the signal cables to the source unit, slide the head unit back into the dash location. Make sure that the head unit is in securely.

Preamp Features

The Crossfire BMF MOSFET amplifiers have a powerful preamp section located on the panel opposite the power terminals. Included in this preamp section is a fully adjustable Two Way Crossover for the amplifier, Preamp Output, and the ACS circuit. These features can be used to improve your system quality as well as make the amplifiers easier to use on a day to day basis. Please read the following instructions carefully.

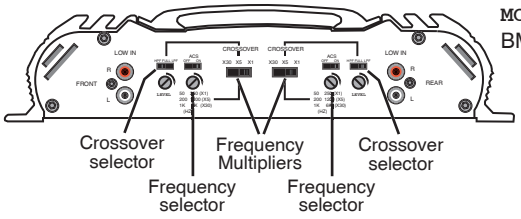
CROSSOVER

On the preamp side of the amplifier there are two selectable crossovers. The crossover section indicated in the drawing below is allocated to the amplifier itself. This includes the (highpass filter) HPF/FULL/LPF (lowpass filter), the crossover frequency selector, and the frequency multiplier. This crossover is flexible enough so that it can be used for just about any speaker application.



MODELS
BMF602
BMF1252
BMF2002

Crossover selector
Frequency selector
Frequency Multiplier

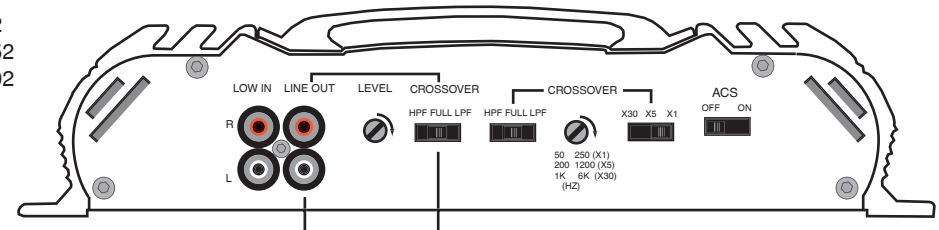


MODEL
BMF754

Crossover selector
Frequency Multipliers
Crossover selector
Frequency selector
Frequency selector

On the two channel amplifiers only is another crossover section with a selector switch marked HPF/FULL/LPF. This crossover section is designated to the preamp output. The crossover frequency is selected by the crossover allocated for the amplifier itself, however can be used in Highpass, Lowpass, or Fullrange independently of that crossover. This allows for multiple system configurations to be made.

MODELS
BMF602
BMF1252
BMF2002

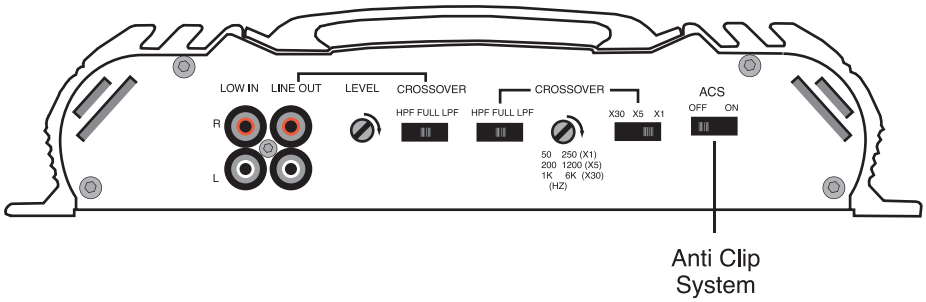


Preamp output
Crossover selector

ANTI CLIP SYSTEM

Located next to the crossover is an on/off switch marked ACS. This is the Anti Clip System. Placing this switch in the "ON" position will limit the amplifier outputs from producing a clipped signal. This is very important on speakers that are prone to burnt voice coils due to DC voltage produced by a clipped signal, such as tweeters and midrange. Subwoofers will also benefit from the ACS when high amounts of power are used.

*Note: This will not effect the sound quality of the amplifier nor will it reduce the RMS power of the amplifier.

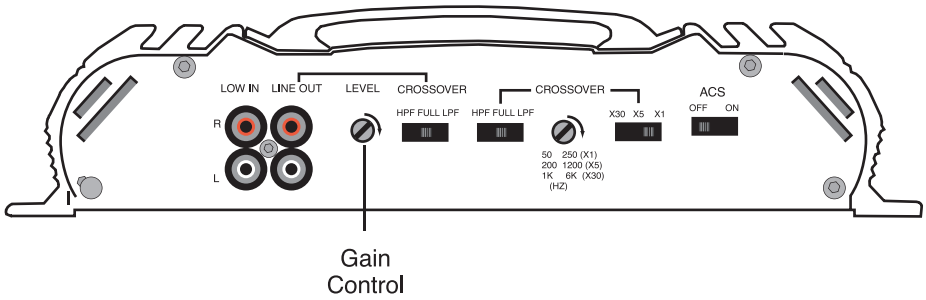


GAIN CONTROL

Located in the preamp section on the side panel of the amplifier is the gain control (marked "Level"). This control allows you to match the input level of the amplifier to the output level of your source unit or signal processor. Matching the input can be accomplished in three simple steps using your reference CD or cassette:

1. Turn gain control all the way down.
2. Turn on the source unit and adjust to 2/3 of max volume.
3. Adjust the gain control until desired volume is achieved without audible distortion

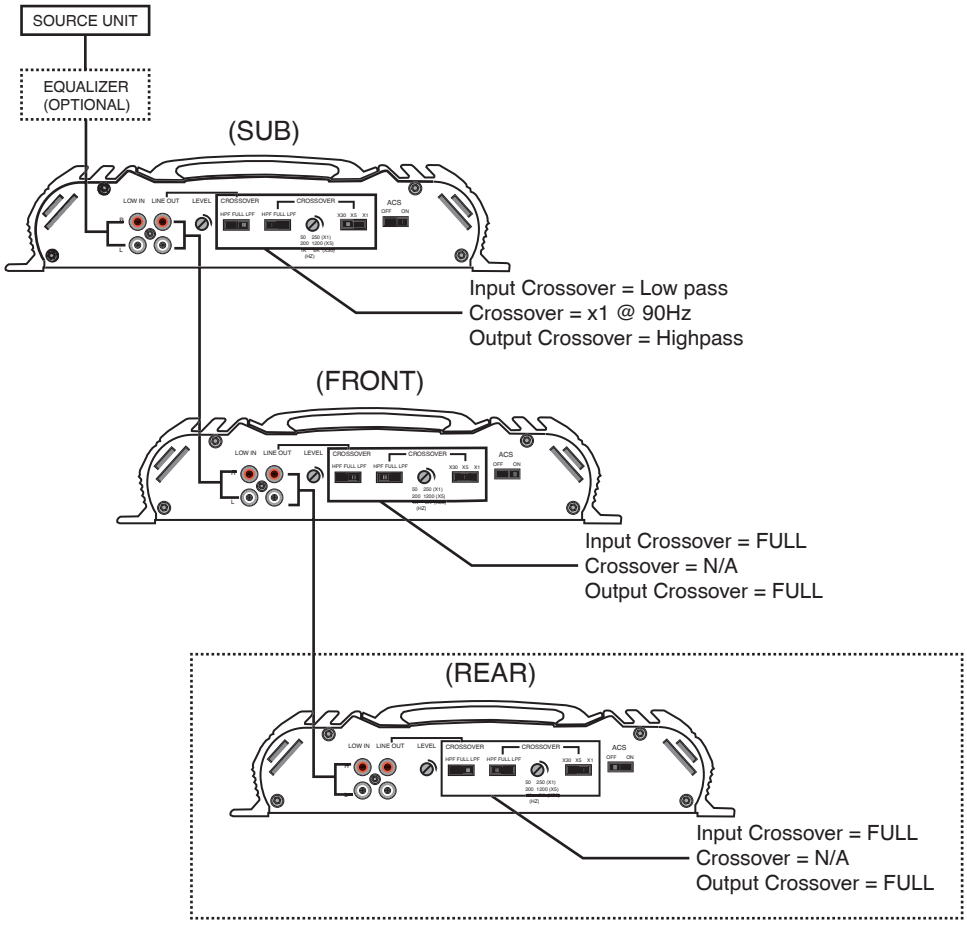
Remember that the gain control is not a volume knob. Ignoring the three steps above may leave you with damaged speakers and possibly a damaged amplifier.



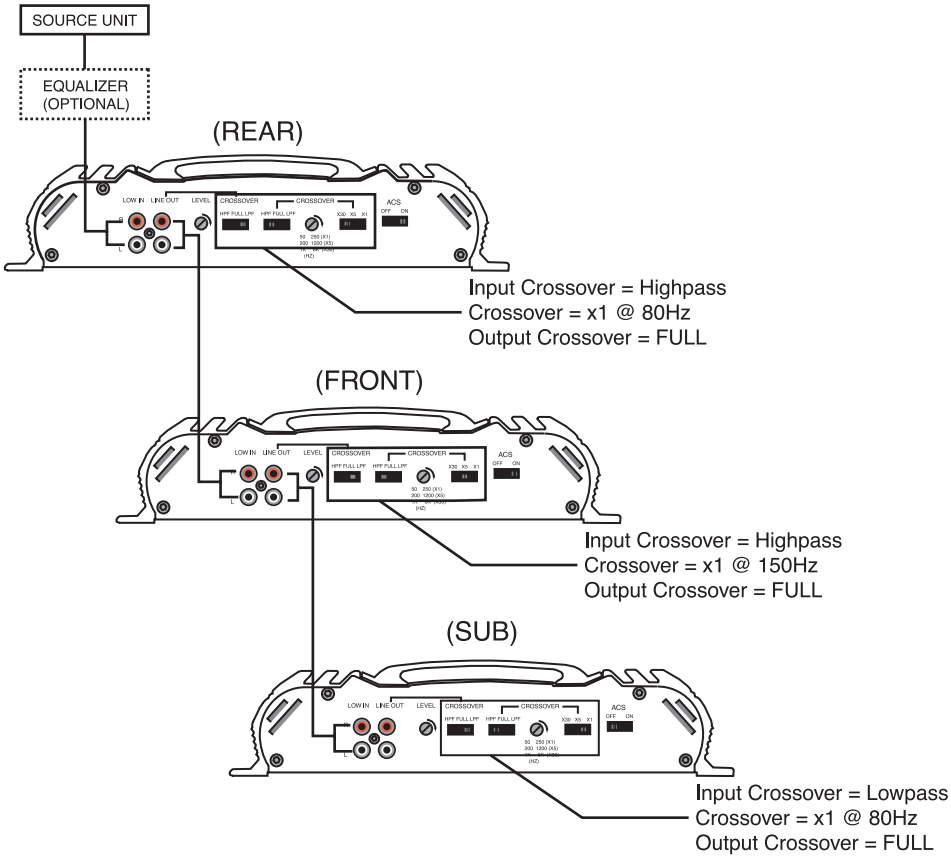
System Configurations

Use the diagrams on the following pages for system configuration. These diagrams are only samples and your system may vary greatly. Crossover points should be chosen per the speaker application. For further help, please contact your local Crossfire dealer or Crossfire's Technical assistance at 562-906-0800.

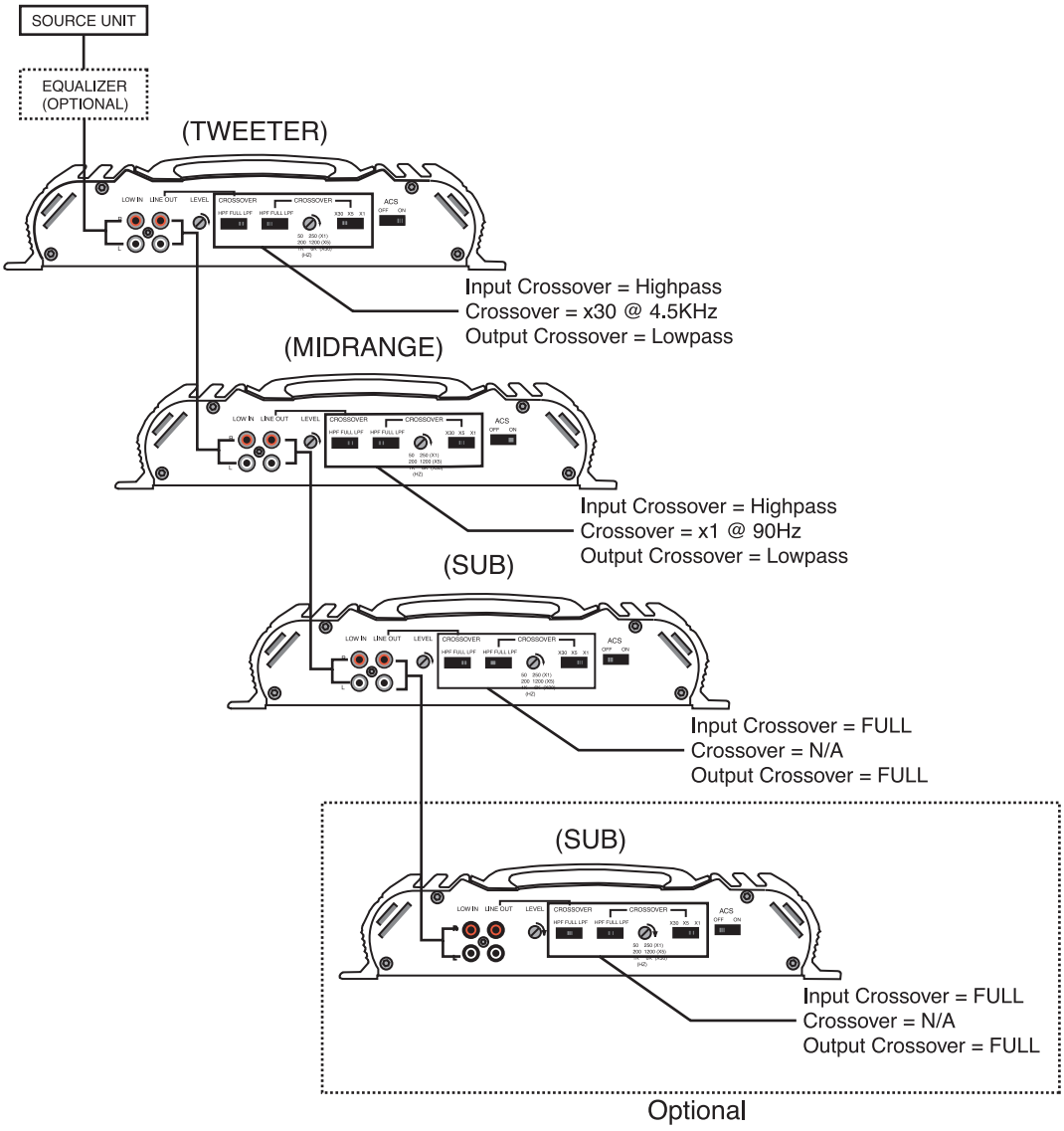
TWO WAY SYSTEM (optional rear amp)
2 Ch. amps



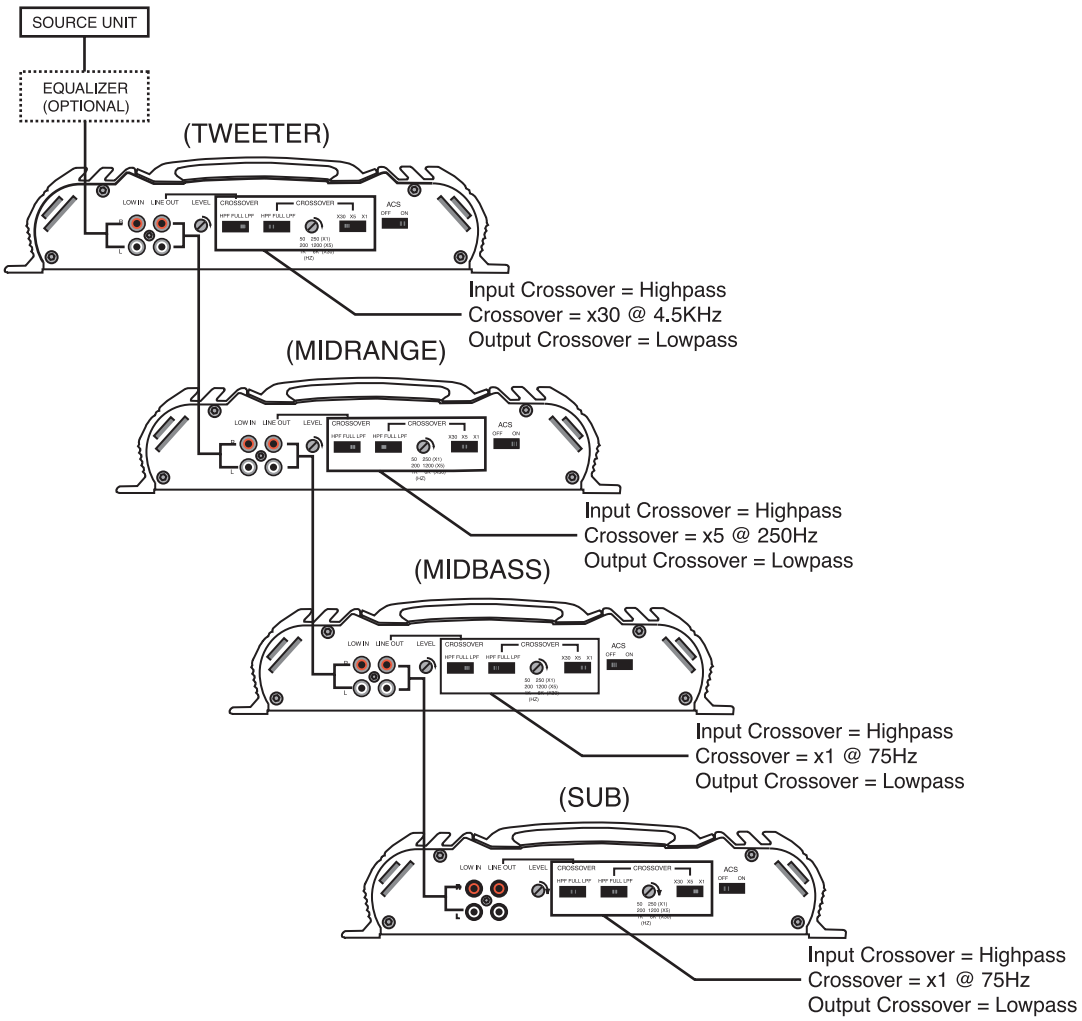
TWO WAY, FRONT AND REAR SYSTEM
Staggered Crossover, 2 Ch. amps



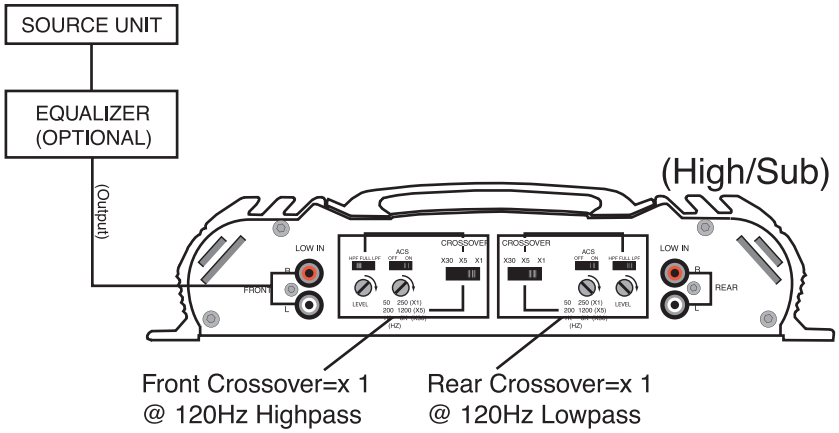
THREE WAY SYSTEM (multiple sub amp optional)
Two channel amplifiers



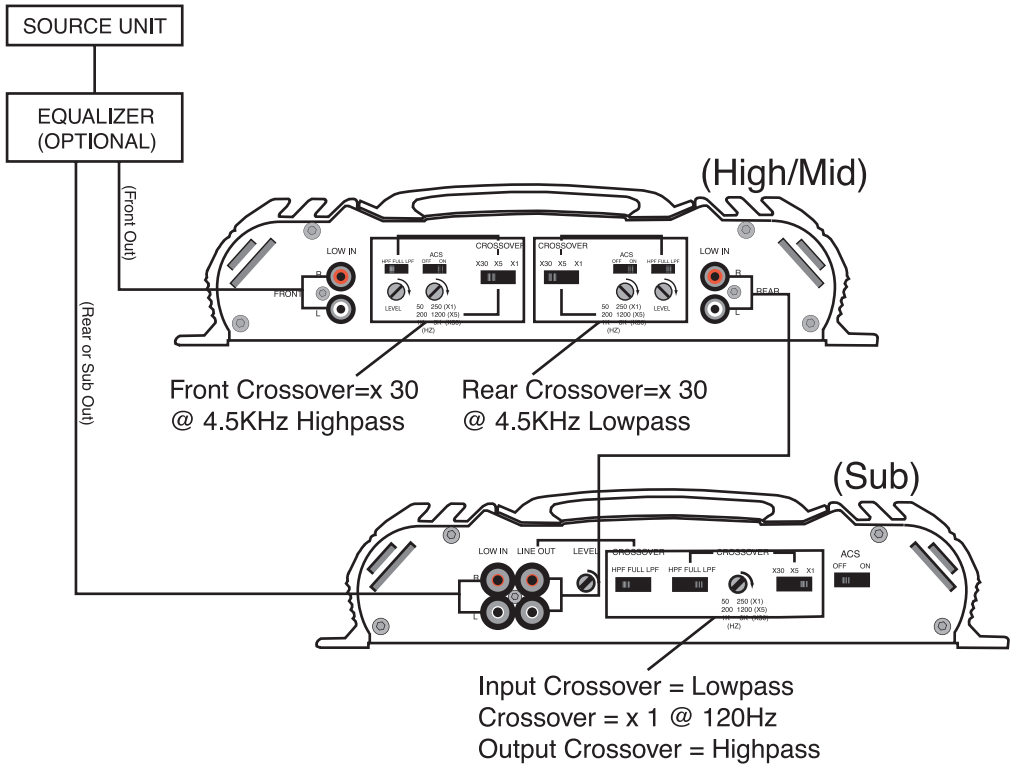
FOUR WAY SYSTEM (optional equalizer)
Two channel amplifiers



BMF754 TWO WAY SYSTEM



THREE WAY SYSTEM
BMF754 plus BMF 2 ch.



Crossfire Limited Warranty

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. This warranty is only valid on Crossfire products purchased in the U.S.A. from an authorized Crossfire dealer. All Crossfire amplifiers are warranted to be free from defects in materials and workmanship under normal use and serviced for a period of (2) years when the unit is installed by an authorized Crossfire dealer. Non-authorized dealer installed products carry a (1) year parts and labor limited warranty. The extent and conditions of Crossfire's limited warranty are as follows:

i. Crossfire will either repair or replace (at its option) any unit which Crossfire has examined and found to be defective and under warranty, to the original purchaser, provided the defect occurs within (2) years of the date of purchase when the unit is installed by an authorized Crossfire dealer. This warranty includes both parts and labor and applies to the original purchaser only.

ii. Crossfire will either repair or replace (at its option) any unit which Crossfire has examined and found to be defective and under warranty, to the original purchaser, provided the defect occurs within (1) year of the date of purchase when the unit is installed by a non-authorized Crossfire dealer. This (1) year warranty includes both parts and labor and applies to the original purchaser only.

iii. This warranty will be void to any unit found with the original factory serial number removed, altered or defaced. All units received by Crossfire for warranty with their original serial numbers removed will not be repaired and returned to sender freight collect.

iv. The provisions of this warranty shall not apply to products used for any industrial, professional or commercial purposes or any other uses for which it was not designed.

v. This warranty does not cover costs for removal of product for repair or reinstallation of the product after repair, nor does it cover the cost of returning the product to Crossfire's service center for repair.

vi. This warranty does not apply to repairs or replacements necessitated by any cause beyond the control of Crossfire. Including, but not limited to, any malfunction, defect or failure caused by or resulting from unauthorized service or parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, incorrect power line voltages, fire, flood or any other acts of nature, or normal wear and tear.

vii. The foregoing is in lieu of all other expressed warranties and Crossfire does not assume or authorize any party to assume for it any other obligation or liability. The duration of any warranties, which may be implied by law (including the warranties of merchantability and fitness), is limited to the term of this warranty. In no event shall Crossfire be liable for special, incidental or consequential damages arising from obligations under this warranty due to causes beyond its control.
Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusions or limitation of consequential damages, so the above limitations and exclusions may not apply to you.

viii. Return policy
Your unit will be serviced free of charges on an in-warranty basis only. If improper operation occurs, contact your authorized Crossfire dealer for assistance with the return and factory repair of your Crossfire product. If an authorized Crossfire dealer is not available, the following procedure must be followed: phone (562 906-0800) or fax (562 941-2284) in your name, address, telephone number and the model number of the item to be returned to receive a return authorization number. Your return authorization number must be clearly written on the outside of the packing box returned to Crossfire. All returned products must be accompanied by a dated purchase invoice or the product may be subject to costs of parts and labor. Return the unit, prepaid postage, in the original protective carton or a carton with ample protection. Please include a brief description of the problem and send your repair to:

CROSSFIRE
CAR AUDIO

12222 Bell Ranch Drive, Santa Fe Springs, Ca 90670