

# CROSSFIRE

## CQ20.2L Equalizer/ Crossover

Installation Manual



Dual 20 Band Equalizer /  
Variable Two Way Crossover



Congratulations and thank you on your purchase of the Crossfire CQ20.2L. You have selected possibly the most flexible, easy to use equalizer/crossover available on the market today. Amongst its flexibility and ease of use, the CQ20.2L equalizer/crossover features all latest in audio technology to assure the best sonic reproduction possible.

Providing you with sophisticated signal processors isn't what Crossfire has accomplished. Check out our full line of amplifiers, signal processors, dynamic component systems and coaxial speakers, and of course our wide selection of high performance subwoofers. Explore the potential of Crossfire Car Audio, and most of all, enjoy the music!

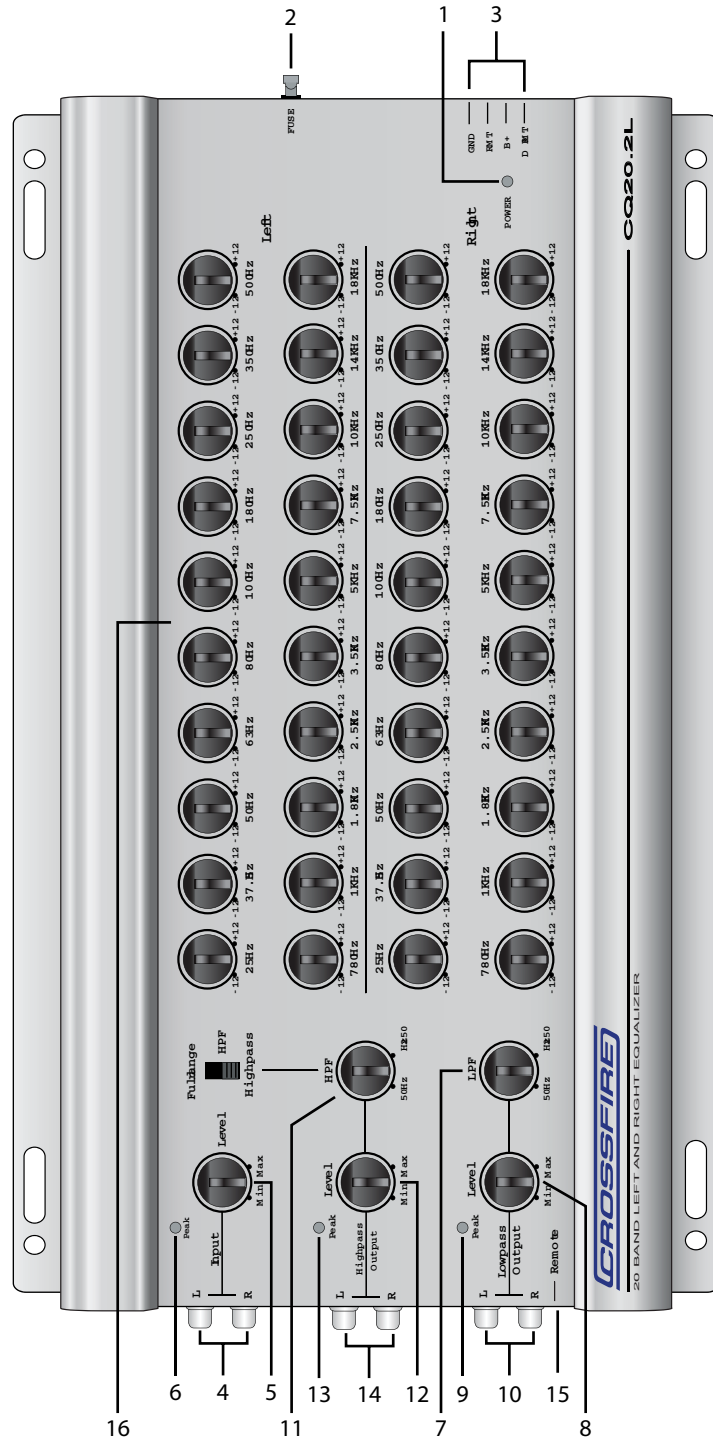
## IMPORTANT

### PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION!!!

The quality of installation may affect the performance and reliability of your Crossfire signal processor. Please take a few minutes to read the manual carefully. The time you spend on installation will prove to be worthwhile when it's time to listen to your investment. If you have any doubts or questions regarding installation or use, you may wish to contact your authorized Crossfire Car Audio dealer or call Crossfire at 562-906-0800 for further assistance.

## SPECIFICATIONS

Frequency Response	10K TO 30KHz +1dB
T.H.D..	02%
S/N Ratio	>100dB
Channel Separation	>80dB
Input Level	400mV to 600mV
Input Impedance	12Kohms
Maximum Output Level	7.5VRMS
Output Impedance	990ohms
Crossover Frequencies	
-Highpass Output	50-250Hz or full
-Lowpass Output	50-250Hz
Crossover Slope	12dB/Oct.
Dimensions	187(W) x 319(L) x 41(H) MM 7.38"(W) x 12.55"(L) x 1.61"(H) IN



**1. L.E.D. POWER INDICATOR**

This indicator lights up when the CQ20.2L is properly connected and the source unit is turned on.

**2. FUSE**

The one amp fuse will help protect the CQ20.2L from damage in case of a short.

**3. POWER TERMINALS**

B+: connect to the vehicles positive 12 volt power supply.

B-: connect to the vehicles chassis (GND)

Remote turn-on: connect to the remote turn-on leads of the source unit.

Delayed remote turn-on: connect to the remote turn-on leads of all signal processors and amplifiers following the CQ20.2L. This will delay the turn on of these units by 2 seconds after the source unit is powered up.

**4. INPUTS**

Accepts signal from the output of the source unit via patch cables.

**5. INPUT LEVEL CONTROLS**

This gain control is used to adjust the input sensitivity of the CQ20.2L to match the radios output.

**6. INPUT PEAK L.E.D.**

This indicator will illuminate when the input level is too high.

**7. LOWPASS FREQUENCY ADJUSTMENT**

Rotating this control allows the selection of the crossover point from 50Hz to 250Hz for the lowpass (subwoofer) output.

**8. LOWPASS OUTPUT LEVEL CONTROL**

Allows for the adjustment of the lowpass output to match both the input level of the amplifier and the relative level to the highpass output.

**9. LOWPASS OUTPUT PEAK L.E.D.**

This indicator will illuminate when output voltage reaches or surpasses the 7 volt RMS maximum for the lowpass output.

**10. LOWPASS OUTPUT**

Connect this output to the subwoofer amp via RCA patch cables.

**11. HIGHPASS FREQUENCY ADJUSTMENT**

Rotating this control allows the selection of the crossover point from 50Hz to 250Hz for the highpass output.

**12. HIGHPASS OUTPUT LEVEL CONTROL**

Allows for the adjustment of the highpass output to match both the input level of the amplifier and the relative level to the highpass output.

**13. HIGHPASS OUTPUT PEAK L.E.D.**

This indicator will illuminate when output voltage reaches or surpasses the 7 volt RMS maximum for the highpass output.

**14. HIGHPASS OUTPUT**

Connect this output to the highpass amp, or alternative crossover, via RCA patch cables.

**15. REMOTE LOWPASS LEVEL CONTROL**

Use this jack with the CFR-1 remote level control for optimum bass control.

**16. EQUALIZER CONTROLS**

These KNOBS allow you to boost or cut the given frequencies up to 12dB.

## POWER CONNECTIONS

**Before connecting anything, be sure to disconnect the ground from your battery to prevent any damage to the audio components. All components should be hooked up before the battery is reconnected.**

### **B+ (BATTERY +12VOLTS)**

Connect to this terminal a positive 12 volt lead using the same source of power used to power your amplifiers. This should eliminate any chance of picking up noise due to voltage differences. If you decide to run the power wire for the crossover directly to the battery, be sure to add an inline fuse holder containing a 1 amp fuse at the battery in case of a short. Use a minimum of 16 awg stranded copper wire and be sure to apply grommets whenever the power wire is run through any metal wall.

### **B- (GND)**

When grounding your Crossfire CQ20.2L, locate a metal area close to the unit that is a good source of ground (preferably the floor). Investigate the area you wish to use for electrical wires, vacuum lines, and brake or fuel lines. Using either a wire brush or sandpaper, eliminate unwanted paint to supply a better contact when grounding. Use the same gauge wire for ground as you did for the power. Terminate your ground wire using the correct size ring terminal and attach it to the bare metal using a #8 sheet metal screw. It is important for this connection to be solid. To complete the job, spread silicon over the screw and bare metal to prevent rust.

### **R (REMOTE TURN-ON)**

Between the power and ground is a remote turn-on terminal. This terminal must be connected to a switched +12 volt source. Typically, remote turn-on leads are provided by the source unit which will turn on and off the amplifier in correspondence with the source. If a radio does not have a remote turn-on, then a power antenna wire may be used. Yet, if neither of these leads are available at the source, a switched +12 volt supply must be used. Run a minimum of 18 awg wire from the amplifier location to the source of the switched +12 volt lead. Remember, it's best to keep all +12 volt wire ran on one side of the vehicle and away from the RCA cable. Avoid running the wire near sharp edges that may easily cut through the insulation. Connect the source to the wire. Check your connections by turning on the source. The green light will illuminate if your connections are correct.

### **DR (DELAYED REMOTE)**

This is to be connected to all other signal processors and amplifiers remote turn-on input terminals. This will provide a 2 second delay to help eliminate pop or thump noises when the unit is turned off.

## SIGNAL CONNECTIONS

Review the system diagrams and choose the best variation for your vehicle. This should give you a good idea of how many RCA patch cables you will need.

Choose the correct length and style of RCA patch cables for your needs. Better RCA's have either multiple layers of shielding or twisted pair wiring and gold plated terminals for better noise rejection and outstanding contact (consult your dealer).

Be extra careful when running your RCA patch cables. 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. As a precaution, avoid placing your RCA's near large wire looms and electric fans whenever possible.

Starting at the source, connect the patch cables to the RCA output. Run the cables to the location of the CQ20.2L. Connect your patch cables to the corresponding inputs. Be sure to check for correct balance (red is right and black or white is left) on both the radio and the crossover.

Now it's time to do the final connections, the outputs. Be careful you link the outputs, via RCA patch cables, to the proper amplifier(s). Use the diagrams on the following pages to determine the correct system layout. Avoid entanglement between the RCA's and the power wires. Once again, check for correct balance between the CQ20.2L and the corresponding amplifier.

You may now reconnect your battery and install the correct size fuse into the fuse holder.

## CROSSOVER

Determining the proper crossover point/points for your speaker is very important. The size of the speaker, its power handling characteristics, frequency range, and location of the speaker need to be taken into consideration in order to choose the correct crossover point. Consult your dealer if you are unsure of the correct crossover setting, or contact the Crossfire Technical department at (562) 906-0800.

## INPUT SENSITIVITY

### PRELIMINARY ADJUSTMENTS

1. Adjust the input level of the CQ20.2L to 2/3 maximum.
2. Preset the highpass and lowpass output levels of the CQ20.2L to slightly above minimum gain.
3. Set the input levels of all amplifiers to 1/4 maximum.
4. Turn on the head unit, set the tone, balance, and fader controls to the center or flat position.

You will now need to use some very dynamic tracks from a cassette or CD.

5. Adjust the volume of your radio to 3/4 of maximum volume. Listen carefully to make sure the output is not clipping. Continue playing the tracks you chose throughout the rest of the adjustment period.
6. Check the input peak light on the CQ20.2L, make sure this L.E.D. is not illuminating. Adjust the input level until the L.E.D. starts to flash. Back off the gain slightly. In some cases the input peak light will not illuminate, even at maximum. This is ok, as your radio may not have a high voltage line output.
7. Start the output level adjustments by adjust the weakest part of your system first. This may be the highpass or the subwoofers depending on the system. Turn the level control up until the onset of audible distortion. Make sure the peak output indicator is not illuminating at this point. Now lower the level down slightly until the distortion is no longer noticeable and/ or the peak output indicator L.E.D. is no longer flickering. If more gain is needed at this point, adjust the gain control of the amplifiers.  
NOTE: Most amplifiers will not accept 9 volts of signal input, so the output levels should seldom be over 3/4 maximum. The peak indicators should never illuminate.
8. Match the level of the more dominating of the two outputs to the weaker one. Be sure the peak output L.E.D. is not illuminating. If the L.E.D. is illuminating, lower the level control slightly until the light turns off. Again if more gain is needed at this point, adjust the level control on the amplifier.
9. Listen to the system to determine if the settings are satisfactory. Adjust the volume knob to several different levels and fine tune your settings if needed. Do this with music you know well.

## EQUALIZATION

### ***How does an equalizer work?***

Simply put, an equalizer corrects deviations over a given bandwidth. The knobs on the CQ20.2L are each numbered with the center of the frequency "Q" they adjust. By rotating these knobs clockwise or counter clockwise you can boost or cut a particular frequency to smooth the response of your system and acquire a desired sound.

### ***Adjusting your equalizer-***

Adjusting your CQ20.2L is not an easy task. For this reason we recommend the use of an RTA, or Real Time Analyzer. If you are not using an RTA it will be hard to distinguish frequency dips and peaks, making it harder to know how much to adjust each. Although we highly recommend using a Real Time Analyzer, you may adjust the CQ20.2L to your own taste by ear. However you go about tuning your system, please follow the basic steps on the next page.

1. Always start with the frequencies that need to be cut or reduced. reason: boosting frequencies by 3, 6, or 12dB is often accompanied by system noise boosted an equal amount. Cutting frequencies will cut noise.
2. Remember to adjust no more than two frequencies at one time. This makes it easier to distinguish whether the changes make an improvement or not. Since the CQ20.2L is typically mounted in the trunk it's important to listen to the changes in the response after each setting.
3. Always use extreme caution when boosting frequencies. For every 3dB or boost, twice the power is demanded from the amplifier at that particular frequency. For example, if your amplifier is 25 watts at 0 dB at a particular frequency, then at 3 dB of boost it will need to supply 50 watts, and at 6 dB of boost it requires 100 watts or 4 times the power. If too much boost is applied, the chances are your amplifier will clip at these frequencies and possibly damage your speakers and/or amplifier.
4. Avoid equalizing more than +/- 6 dB. If you have this size of a deviation the chances are you have a phase problem. This could be in part due to the location of the speaker or as simple as a polarity problem at one or more speakers.

### ***Checking the Level Settings***

Now that you're done equalizing, you should check the output levels of the CQ20.2L once again. Every time you made an adjustment the output level was adversely affected. Simply insert the compact disc or cassette tape used to make your initial settings. Turn the volume to 3/4 if distortion is heard or the peak indicator LED is illuminating, turn the outputs down; if volume is lost you may wish to increase the output as long as the peak indicator lights are not illuminating. Be careful not to overdrive your amplifiers.

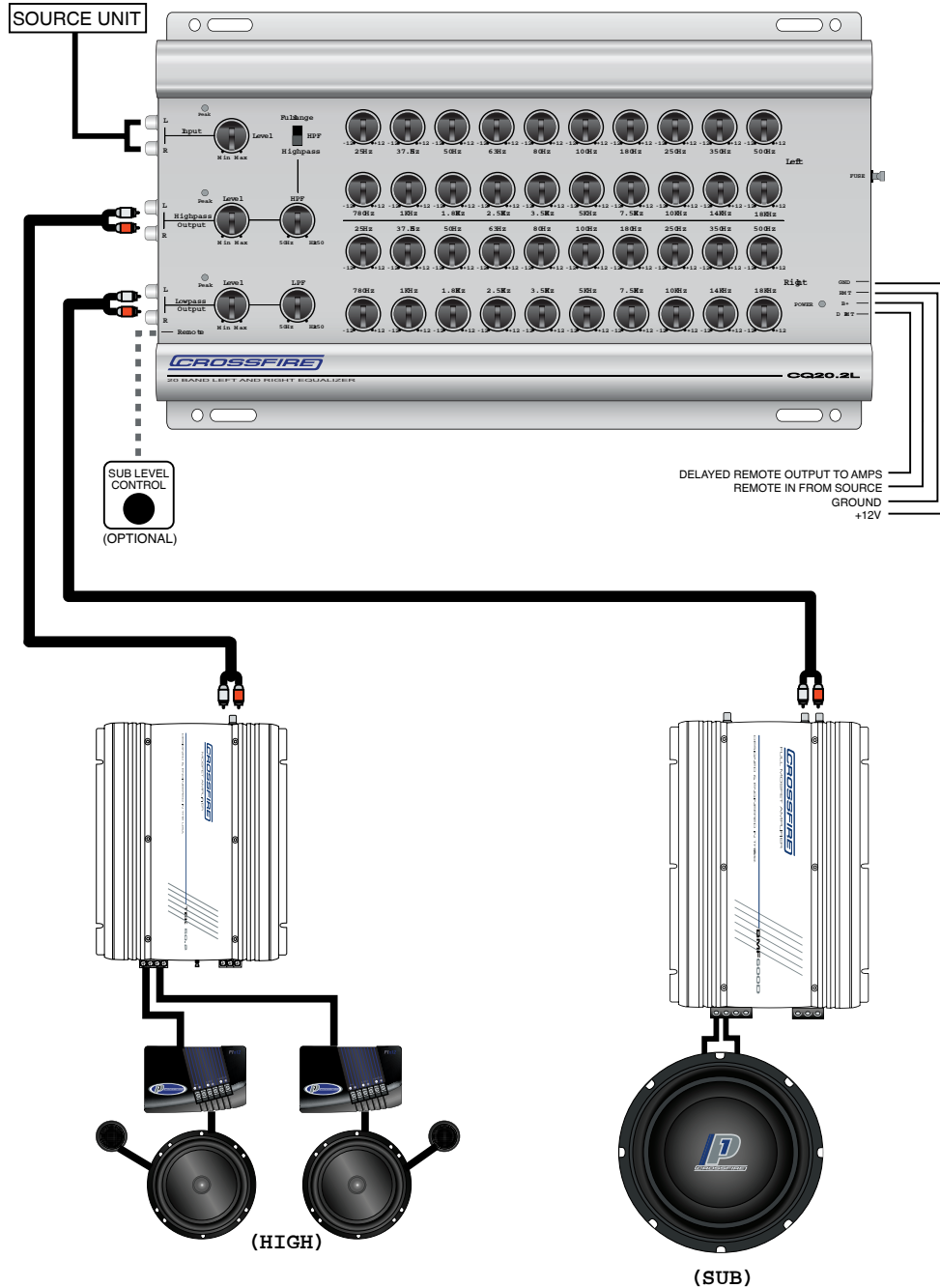
### ***The Remote Bass Level control***

The CFR-1 comes in a small metal casing and includes a 20ft. cable so you can easily mount the unit under the dash and have complete control over your subwoofers. The LED illuminates when the system is in the on position so it can easily be located at night.

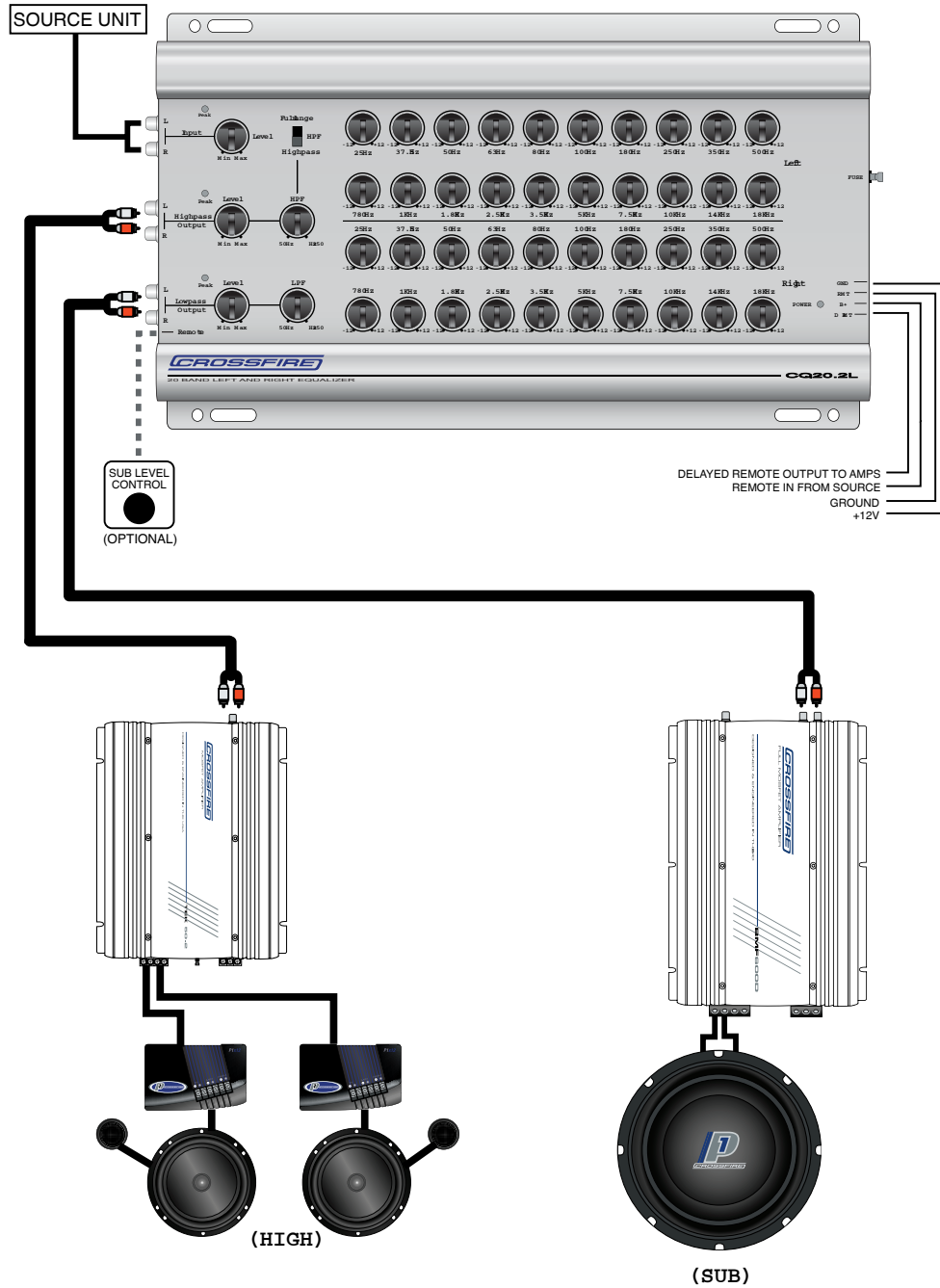
Connecting the Remote is easy. This kit is designed to be mounted under the dash, in the center console or the glove box. Use the CFR-1 as a template and drill two 1/8" holes for mounting. Use the screws supplied in the kit to mount the unit. After mounting the remote, run the cable to the CQ20.2L. Plug this end into the port labeled "Remote lowpass control".



# SYSTEM DIAGRAMS



## SYSTEM DIAGRAMS



## 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 our 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 our 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 (562 483-8111) or fax (562 483-8106) 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**

12737 Moore Street  
Cerritos, CA 90703



12737 Moore Street, Cerritos, CA 90703 ● Phone: 562-483-8111, Facsimile: 562-483-8106