



## **XR653-CS**

6.50-inch (160 mm) 3-Way Component Speaker System

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### owner's manual

*Thank you for choosing JL Audio Evolution XR Coaxials for your automotive sound system. With proper installation, your new speakers will deliver years of listening pleasure.*

*We strongly recommend that you have your new Evolution speakers installed by your authorized JL Audio dealer. The installation professionals employed by your dealer have the necessary tools and experience to disassemble your interior panels, install your new speakers and reassemble your vehicle properly. Also, keep in mind that your warranty coverage extends to 1 year if your system is installed or approved by your authorized JL Audio dealer. If you prefer to perform your own installation, please read this instruction manual completely before beginning the process.*



### **XR653-CS SPECIFICATIONS:**

**Woofers:** Mineral-filled polypropylene cone body, 1-inch (25mm) voice coil, low-profile/symmetrical-roll spider; butyl rubber surround.

**Midrange Drivers:** Treated pulp cone body, 1-inch (25mm) voice coil, low-profile/symmetrical-roll spider; butyl rubber surround.

**Tweeters:** 1-inch (25 mm) aluminum dome tweeter with soft, rubber suspension, neodymium magnet, ferrofluid cooled and damped. Variable mounting system with swivel/rotation capability.

**Crossover Networks:** 3-way network with 2nd Order low-pass, 2nd Order bandpass and 2nd order high-pass circuit. Premium capacitors and inductors. 4-position adjustable tweeter output level. Polyswitch tweeter protection.

#### **Continuous Power Handling:**

70 Watts (RMS Method)  
Frequency Response: 48 Hz - 25 KHz ( $\pm 3$  dB)  
Efficiency @ 1W/1m: 90.5 dB

**Nominal Impedance:** 4 ohms

### **INCLUDED COMPONENTS AND PARTS:**

- Two XR650-CW 6.50-inch (160 mm) woofers
- Two XR400-CM 4-inch (100 mm) midrange drivers
- Two XR100-CT 1-inch (25 mm) tweeters
- Two XR653-CSxo 3-Way Crossover networks

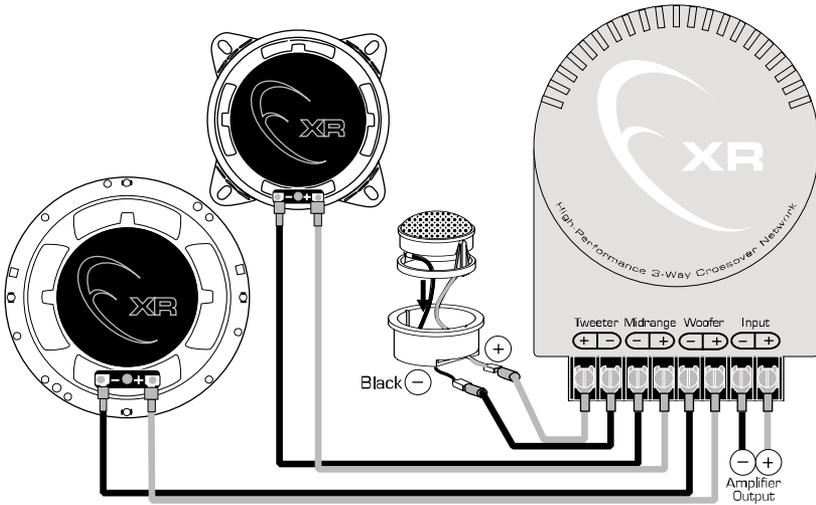
### **INCLUDED HARDWARE:**

- Two Flush-Mount tweeter fixtures with metal spring clips and optional trim rings
- Two Surface-Mount tweeter fixtures
- Two 6.5-inch Metal Grilles and Grille Trays
- Two 4-inch Metal Grilles and Grille Trays
- Two 4-inch Frame Adaptors and Flush-Mount Rings
- Butyl adhesive putty for grilles
- Twenty #8 x 1 1/4-inch (30 mm) sheet metal screws
- Sixteen #8 Mounting Clips
- Eight #6 x 1 1/4-inch (30 mm) sheet metal screws
- Four #6 x 5/8-inch (16 mm) sheet metal screws
- Eight #6 Mounting Clips
- Two 1-inch (25 mm) machine screws
- Four 6.4 mm female crimpable connectors
- Four 4.7 mm female crimpable connectors
- Four 2.8 mm male crimpable connectors
- Sixteen crimpable spade connectors
- Four black nylon wire ties
- Two tweeter extraction tools

### **GETTING STARTED:**

- Turn off the audio system. It is also advisable to disconnect the negative (-) terminal of your vehicle's battery whenever performing installation work.
- Before cutting, drilling or inserting any screw, check clearances on both sides of the planned mounting surface. Also check for any potential obstacles, such as window tracks and motors, wiring harnesses, etc. Check both sides of the car; many cars are not symmetrical!
- Always wear protective eyewear.

## WIRING DIAGRAM:



### WARNING!

It is absolutely vital that your component system is connected as shown in the diagram on the preceding page. Failure to connect the system as shown will result in damage to your speakers which is NOT covered under warranty. Do not substitute different crossover networks into your XR653-CS System. Only use crossover networks clearly marked "XR653-CSxo".

### BUILT-IN TWEETER PROTECTION CIRCUITRY:

The XR Crossover networks are equipped with an advanced electronic tweeter protection circuit designed to minimize the possibility of tweeter failure. This electronic device monitors current going to the tweeter and will disconnect the tweeter from the signal when it senses overload. Should this occur while listening to the audio system, simply reduce the volume for a few seconds and the protection circuit will reset itself automatically.

### ADJUSTABLE TWEETER LEVEL:

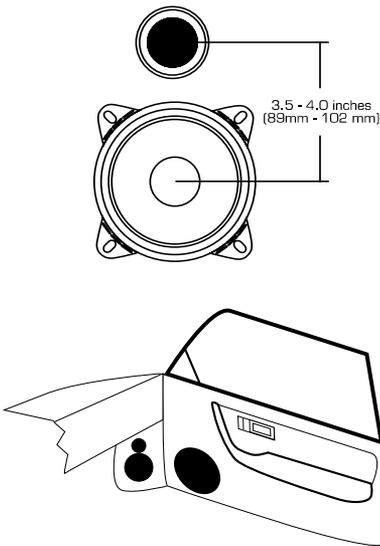
The XR653-CSxo Crossover networks provide four levels of tweeter level adjustability designed to compensate for different mounting locations, vehicle interiors and personal taste. These levels are selectable via a switch located under the clear cover of each crossover case. We recommend that you begin listening at the "REF" (Reference) position. If the sound seems too bright or aggressive, experiment with either of the lower tweeter level settings (-1.5 dB or - 3 dB). If the sound is too dull, switch to the +1.5 dB setting. For quick A/B comparison, it is safe to operate the switches while the system is playing.

## SPEAKER PLACEMENT

### CONSIDERATIONS:

A component system gives you the ability to place the woofer, midrange and tweeter separately in your vehicle interior. This can be good or bad, depending on how it's done.

The XR653-CS system has been optimized for installations in which the midrange and tweeter drivers for each channel are mounted as close together as possible on the same mounting plane (such as a kick panel installation). This type of mounting will result in the best tonal balance and most coherent imaging. The center to center separation of the midrange and tweeter should be between 3.5 inches (89mm) and 4 inches (102mm). Any separation greater than 4 inches (102mm) from center to center of each driver is likely to result in degraded sound quality. We do not recommend mounting the tweeters in a different location than the midrange driver (for example: tweeters on the dash, midrange in the door).



Avoid placing tweeters where they will be blocked by objects in the interior of the car (including seated occupants). When selecting a mounting location, look at both sides of the car to make sure that this location is clear on both sides.

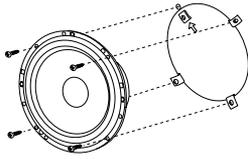
The 6.5 inch (160mm) woofers will usually be placed into factory speaker locations and can be separated from the midrange and tweeter by as much as 18 inches (46 cm), without degrading sound quality. For proper low-frequency performance, the woofers need a fairly large air space behind them (like the air inside of a door). Enclosing the XR650-CW woofers in spaces smaller than 1 cu.ft (28 liters) is not recommended if optimum low-frequency and midbass performance is desired.

We do not recommend mounting the woofer and midrange into the same enclosed environment, as this will cause energy from the woofer to modulate the midrange driver, resulting in distortion and coloration of the sound. If you are mounting the mids and woofers into the same environment, you will need to sub-enclose the midrange speakers in an enclosure with a minimum of 0.08 cu.ft. (2.3 liters). This guideline also applies to any other enclosed application of the midrange driver:

Enclosures smaller than 0.08 cu.ft (2.3 liters) will alter the frequency response of the midrange driver and result in degraded sound quality.

### INSTALLING THE WOOFERS IN FACTORY LOCATIONS:

If you will be using the factory speaker wires, it may be necessary to change the terminations. This may be accomplished by using an adaptor plug or simply by cutting the factory connector off and using the supplied crimp connectors to terminate the speaker wires. The large connector is for the positive terminal and the small connector is for the negative terminal of each woofer. Keep in mind that the woofer wires must be connected to the woofer outputs of the crossovers supplied with your system as shown in the diagram on page 3. You may also choose to run new speaker wires...refer to the custom installation section for details. Whichever method you choose, observe correct polarity in your connections. If you are unsure about any of these issues, contact your authorized JL AUDIO dealer for installation assistance.



The XR650-CW woofers have been designed to install, without modifications, into most vehicles that accept a 6.50-inch (160 mm) speaker. Most factory 6.50-inch speakers use four mounting screws which will line up with the mounting holes on your woofers. Multiple sets of mounting holes are available to accommodate different vehicles' factory hole patterns/orientations.

It is absolutely vital that the speaker frame fits into the mounting hole cleanly. This must be checked prior to tightening the screws. Do not force the frame into a hole that is too small! Do not tighten the speaker onto an uneven surface! This will damage your speakers. The speaker should also fit so that no air leaks around the mounting flange. Air leaks will cause a severe degradation in sound quality. Seal any air leaks with silicone, rope caulk or similar sealant material.

Install as shown in the diagram above.

Use the supplied mounting clips unless the factory holes already feature threaded inserts.

Hand-tighten the screws evenly to avoid bending the speaker frame!

### INSTALLING THE WOOFERS IN CUSTOM LOCATIONS:

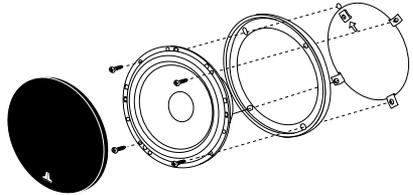
Run speaker wire to the desired mounting location. If you are running wires into a door, use existing factory wiring boots whenever possible. If you are drilling new holes, file their edges and install rubber grommets into each hole. Then, cover the wires with a protective PVC sleeve and run them through the door jamb. Make sure that the wires will clear door hinges and other structures in the door. If you are unsure about any part of this process, please contact your authorized JL AUDIO dealer for installation help.

Double check the clearance for both speakers before proceeding.

Use the supplied template on the bottom of the product packaging to mark the desired mounting location. Mark the center and the outline of the mounting hole as well as the mounting screw positions. Before drilling or cutting, use a utility knife to cut any fabric, vinyl or leather from hole locations. These materials can easily be snagged by a drill or a saw, causing damage to the panel and possible bodily injury.

Drill four 1/8" (3 mm) holes for the speaker's mounting screws at the positions you have marked. Also drill a pilot hole in the center of the speaker mounting hole at this time. Then, using a saber saw, hole saw or nibbler, make the circular cut out for the speaker. File any rough edges.

Insert the mounting clips with the flat side towards the speaker as shown in the diagram.



It is absolutely vital that the speaker frame fits into the mounting hole cleanly. This must be checked prior to tightening the screws. Do not force the frame into a hole that is too small! Do not tighten the speaker onto an uneven surface! This will damage your speakers. The speaker should also fit so that no air leaks around the mounting flange. Air leaks will cause a severe degradation in sound quality. Seal any air leaks with silicone, rope caulk or similar sealant material.

Connect the speaker wires, observing correct polarity, and install the speaker and grille tray as shown.

Hand-tighten the screws evenly to avoid bending the speaker frame!

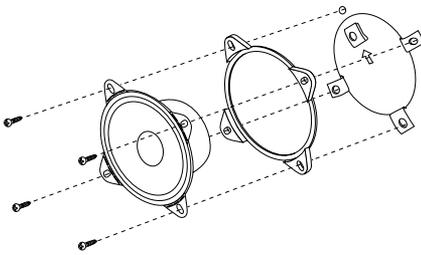
Break off small pieces of the supplied butyl adhesive putty and place them on the inside of each grille tray. This adhesive will hold the grille in place firmly and prevent rattling. Then insert the metal grille into the grille tray, squeezing gently around its edge until it seats firmly into the tray.

## INSTALLING THE MIDRANGE DRIVERS IN FACTORY LOCATIONS:

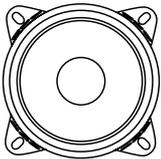
Follow the same wiring procedures outlined for the woofer installation.

The XR400-CM midrange drivers have been designed to install, without modifications, into most vehicles that accept a 4-inch (100 mm) speaker. Most factory 4-inch speakers use four mounting screws which will line up with the mounting holes on your woofers. **In most factory locations, it will be necessary to use the supplied Flush Mount Adaptor Rings as shown in the diagram.**

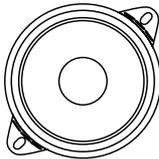
Install as shown in the diagram below. Use the supplied mounting clips unless the factory holes already feature threaded inserts. Hand-tighten the screws evenly to avoid bending the speaker frame!



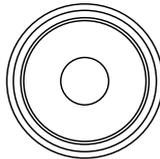
Some vehicles which accept a 4-inch (100 mm) speaker use a two-hole mounting system. This can be easily accommodated by breaking off two of the tabs as shown in the diagram at the top of this page. All four mounting tabs are perforated to permit their removal. Bend each unneeded tab back and forth until it breaks off. Please be careful in handling the speaker after breaking off the tabs as there may be sharp edges.



Four-Hole Mount



Two-Hole Mount



Custom Mount

## INSTALLING THE MIDRANGE DRIVERS IN CUSTOM LOCATIONS:

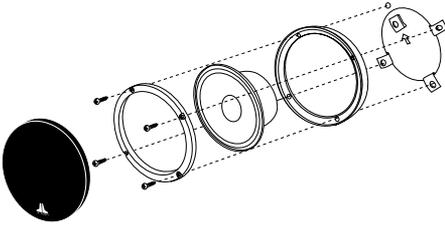
For custom-mounted applications, break off all four mounting tabs and use the supplied Frame Adaptors as shown in the diagrams on page 8. These Frame Adaptors permit for a smaller overall diameter when custom mounting the speakers and must be used in order to install the supplied grilles.

Run the supplied speaker wires to the desired mounting location. If you are running wires into a door, use existing factory wiring boots whenever possible. If you are drilling new holes, file their edges and install rubber grommets into each hole. Then, cover the wires with a protective PVC sleeve and run them through the door jamb. Make sure that the wires will clear door hinges and other structures in the door. If you are unsure about any part of this process, please contact your JL AUDIO dealer for installation help.

Double check the clearance for both speakers before proceeding.

Use the template supplied in the product packaging to mark the desired mounting location. Mark the center and the outline of the mounting hole as well as the mounting screw positions. Before drilling or cutting, use a utility knife to cut any fabric, vinyl or leather from hole locations. These materials can easily be snagged by a drill or a saw, causing damage to the panel and possible bodily injury.

Drill four 1/8" (3 mm) holes for the speaker's mounting screws at the positions you have marked. Also drill a pilot hole in the center of the speaker mounting hole at this time. Then, using a saber saw, hole saw or nibbler, make the circular cut out for the speaker. File any rough edges.



Insert the mounting clips with the flat side towards the speaker as shown in the diagram above.

Connect the speaker wires to both sets of terminals on each speaker; observing correct polarity and making sure that the tweeter and woofer wires correspond to the correct terminals on both the speaker and crossover.

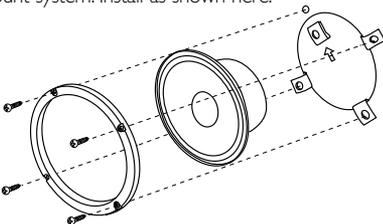
Install the Frame Adaptors, Speaker and Grille Tray as shown in the diagram above.

Make sure that the speaker frame fits into the hole without force.

Hand-tighten the screws evenly to avoid bending the speaker frame.

Break off small pieces of the supplied butyl adhesive putty and place them on the inside of each grille tray. This adhesive will hold the grille in place firmly and prevent rattling. Then insert the metal grille into the grille tray, squeezing gently around its edge until it seats firmly into the tray.

You may also choose to install the midrange drivers using the Frame Adaptors with no grille tray. This can be useful for applications where a custom grille is being fabricated and will result in a smaller overall mounting diameter than the standard tab-mount system. Install as shown here:



## CROSSOVER NETWORK

### INSTALLATION:

The crossover networks supplied with your XR653-CS System should be installed in a dry location of your vehicle. **DO NOT INSTALL THEM INSIDE OF A DOOR!** Doors often get wet on the inside, which can damage your crossover networks and could potentially damage your entire sound system.

The crossovers can be screwed into a solid surface via two holes located under the protective cover of the case. To access these holes, simply squeeze the sides of the cover while gently pulling the cover away from the base. Make sure that your mounting location will not cause damage to wiring, fuel lines, brake lines or any other vital component of your vehicle. Once you have screwed the case in, snap the protective cover back into place.

If screwing the crossover networks in is not possible, you can also run the supplied nylon wire ties through the mounting holes to attach the crossovers to a structure in your car. To do so, take the covers off, attach the wire ties, and then snap the covers back into place, lining the wire ties up with the slots on the sides of the protective cover. Make sure that you do not attach the crossovers to a moving part or to any part that may interfere with pedal operation, gear shift operation, steering, or airbag deployment.

For wiring instructions, refer to the diagram on page 3 of this manual.

## **TWEETER INSTALLATION:**

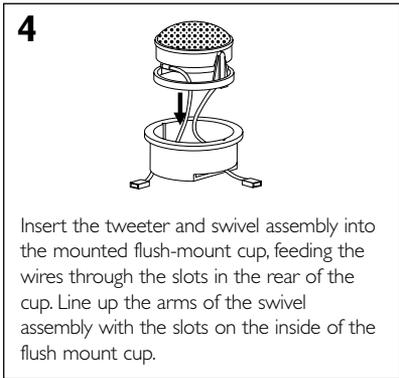
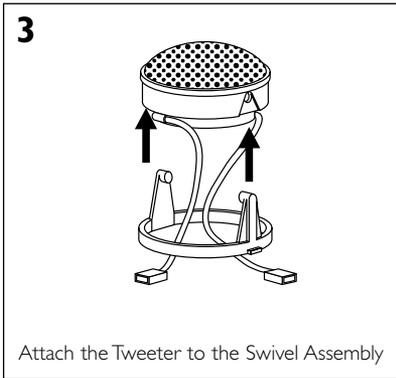
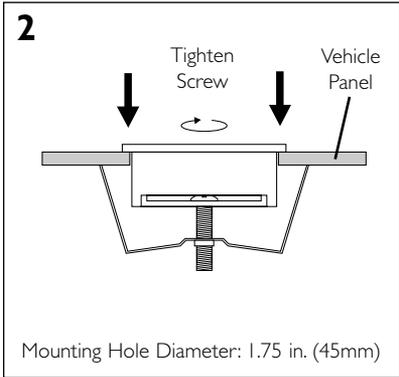
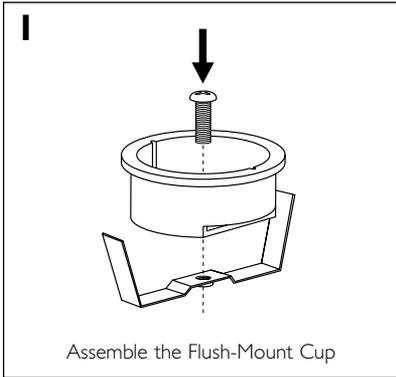
The dome tweeters supplied with your XR653-CS system have been designed for maximum mounting versatility. There are two primary methods by which the tweeters can be mounted into your vehicle:

**1) Flush Mounted**, using the supplied flush-mount cup and hardware. This application will yield a custom-installed appearance, but will require at least 3/4" (19 mm) of clearance behind the mounting surface of the tweeter:

**2) Surface Mounted**, using the supplied surface mount kit and hardware. In this application, you will not need to cut holes in your vehicle's panels for the tweeters. You will only need to drill a hole for the wires and for the two mounting screws. This application is useful when mounting the tweeters to a panel that has insufficient clearance behind it for the tweeter's magnet structure.

Run speaker wires from the tweeter output of the crossover to the desired tweeter mounting locations, observing the same precautions as mentioned in the woofer installation section. Terminate the wires with the supplied 2.8 mm male crimpable connectors.

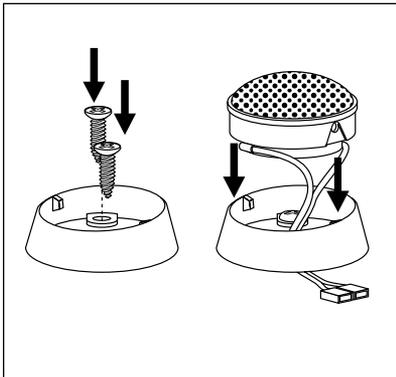
**FLUSH MOUNT INSTALLATION:**



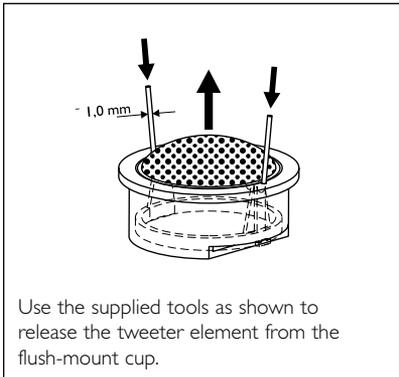
**SWIVEL/ROTATION MECHANISM:**

Once the tweeter has been mounted into the flush mount cup as shown above, it can be swiveled and rotated by hand to best enhance imaging using the swivel/rotation mechanism built into the flush mount system. Experiment with different angles until you arrive at the best solution. The swivel/rotation feature will not operate with the surface mount system.

**SURFACE MOUNT ASSEMBLY:**



**FLUSH-MOUNT DISASSEMBLY:**



**INSTALLATION NOTES:**



## **JL AUDIO LIMITED WARRANTY (USA)**

### **Evolution Speaker Systems**

JL AUDIO warrants these speakers (and crossover networks, where applicable) to be free of defects in materials and workmanship for a period of **ninety (90) days** from the original date of purchase. The warranty term is extended to **one (1) year** if installation is performed or approved by an authorized JL AUDIO dealer (proof of installation or approval required on purchase receipt).

This warranty is not transferrable and applies only to the original purchaser from an authorized JL AUDIO dealer. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction, JL AUDIO will, at its discretion, repair or replace the defective product with new or remanufactured product at no charge.

Damage caused by the following is not covered under warranty: accident, misuse, abuse, product modification or neglect, failure to follow installation instructions, unauthorized repair attempts, misrepresentations by the seller. This warranty does not cover incidental or consequential damages and does not cover the cost of removing or reinstalling the unit(s). Cosmetic damage due to accident or normal wear and tear is not covered under warranty.

Any applicable implied warranties are limited in duration to the period of the express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether express or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

#### **If you need service on your JL AUDIO product:**

All warranty returns should be sent to JL AUDIO freight prepaid through an authorized JL AUDIO dealer and must be accompanied by proof of purchase (a copy of the original sales receipt.) Direct returns from consumers or non-authorized dealers will be refused unless specifically authorized by JL AUDIO with a valid return authorization number. Warranty expiration on products returned without proof of purchase will be determined from the manufacturing date code. Coverage may be invalidated as this date is previous to purchase date. Return only defective components. If one speaker fails in a system, return only that speaker component, not the entire system. Non-defective items received will be returned freight-collect. Customer is responsible for shipping charges and insurance in sending the product to JL AUDIO. Freight damage on returns is not covered under warranty.

#### **For Service Information in the U.S.A. please call:**

**JL Audio customer service: (954)443-1100**  
**during normal business hours (Eastern Time)**

#### **JL Audio, Inc**

10369 North Commerce Pkwy.  
Miramar, FL 33025

(do not send product for repair to this address)

#### **International Warranties:**

Products purchased outside the United States of America are covered only by that country's distributor and not by JL Audio, Inc.