



# INSTRUCTION MANUAL

## VC60RIM / VC60SIM

### IMPEDANCE-MULTIPLYING

### VOLUME CONTROLS

#### INTRODUCTION

The VC60RIM and VC60SIM are impedance-multiplying stereo volume controls that feature 12 control positions, soft-touch action and silent switching capability. The VC60RIM incorporates a rotary control; the VC60SIM incorporates a slider control. Both volume controls can be safely used with amplifiers that deliver up to 60 watts RMS per channel.

When properly implemented, Sonance VC60RIM and VC60SIM allow the safe use of multiple pairs of speakers with amplifiers not specifically-designed to run the low-impedance loads presented by multiple speakers. Adjustable impedance jumpers allow as many as 8 pairs of 8-ohm speakers (or 4 pairs of 4-ohm speakers) to be driven by a single 8-ohm capable amplifier.

#### APPLICATIONS

The VC60RIM and VC60SIM are designed to have a single pair of speakers connected to a single volume control. Their impedance-multiplying feature allows multiple volume control/speaker sets to be safely used with a single amplifier. The included adjustable impedance jumpers can be set to accommodate different total numbers of speaker/volume control sets.

**Important Note:** These volume controls are intended for use primarily in background music systems. The impedance jumpers increase the impedance seen by the amplifier, *which reduces the amount of power reaching each pair of speakers*, reducing the speaker's overall output capability. The more speakers being driven by a single amplifier through VC60RIM/SIM controls, the higher the impedance jumpers must be set and the lower the amount of power that will reach each speaker. Operating multiple sets of speakers through VC60RIM/SIM controls with jumpers set lower than recommended in order to increase the system's output capability can severely damage the amplifier.

If the system will include a pair of speakers intended for dedicated higher-volume music listening, we strongly recommend that those speakers be powered directly by a dedicated amplifier through a VC60R or VC60S standard volume control.

#### CONNECTIONS

**WARNING:** Turn the amplifier's power OFF until you have completed all of the connections and have determined that they are correct. (If the amp's AC plug is accessible we recommend that you unplug it from the wall outlet to avoid accidental turn-on and possible damage to the amplifier or speakers.)

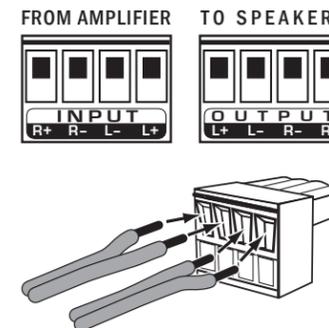
The VC60RIM and VC60SIM have removable 4-pin screw connectors that simplify connecting the speakers and amplifier.

1. Bring the wires from the speakers and amp through a backless J-box.
2. Insert the speaker wires as shown into the holes in the 4-pin screw connectors. Make sure to insert the '+' and '-' leads into the correct holes (see illustration, below).

**Important:** Make sure there are no stray wires that can touch each other. Touching wires can cause a short-circuit that can damage the amplifier.

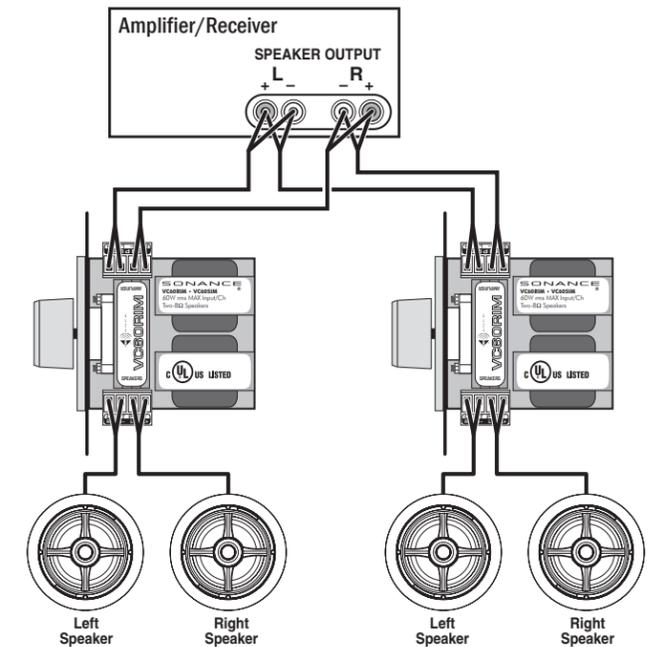
**Note:** The connectors can accommodate wire as large as 14 gauge.

3. Using a small flat-blade screwdriver, tighten the screws to secure the wires in the connector.
4. Press the 4-pin screw connectors into the corresponding speaker terminals on the volume control until they lock into place.



**IMPORTANT:** Do not reverse the "Input" and "Output" connectors or the volume control will not operate properly.

5. Connect only 1 pair of speakers to each volume control. Connect multiple volume controls to the amplifier's speaker terminals in parallel (see illustration, below. VC60RIM shown).

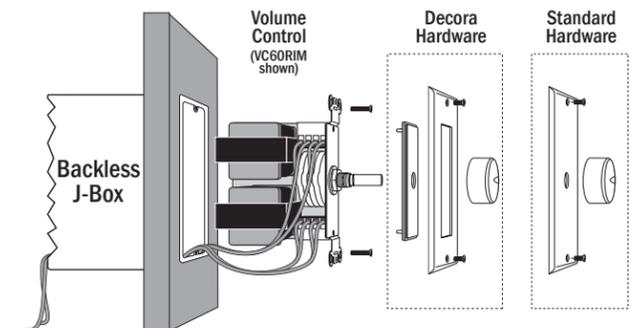


#### MOUNTING

**IMPORTANT:** Do NOT install the volume control in the same electrical box as AC house wiring, a light switch or any other high-voltage device or control. The volume control can share gang boxes with other low-voltage controls such as A/B speaker switches, infrared receivers, and line-level audio or video devices if these other devices are rated as Class 2 devices according to the National Electrical Code.

Use the included hardware to mount the volume control in a single or double J-box as shown below. (Do not over-tighten the screws.) Attach your choice of the included Decora® (VC60RIM/S) or standard (VC60RIM only) hardware.

**Note:** If you are installing the volume control into a typical plastic J-box you will have to remove the J-box's back panel to accommodate the control.



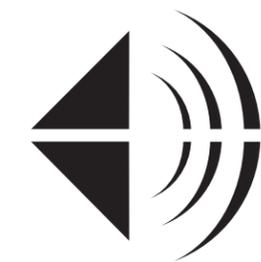
SONANCE®

Sonance • 212 Avenida Fabricante • San Clemente, CA 92672-7531, USA  
 (800) 582-7777 or (949) 492-7777 • FAX: (949) 361-5151  
 Technical Support: (800) 582-0772

www.sonance.com

©2005 Dana Innovations, Inc. All rights reserved.  
 Sonance is a trademark of Dana Innovations, Inc.  
 Decora is a registered trademark of Leviton Manufacturing Co., Inc.

33-3825 05/05



SONANCE®

VC60RIM  
 VC60SIM  
 IMPEDANCE-MULTIPLYING  
 VOLUME CONTROLS

# INSTRUCTION MANUAL



# INSTRUCTION MANUAL

## VC60RIM / VC60SIM

### IMPEDANCE - MULTIPLYING

### VOLUME CONTROLS

## SETTING THE IMPEDANCE JUMPERS 1:

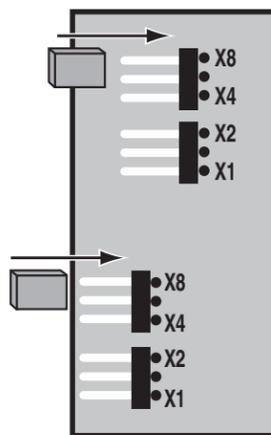
### Typical Installations (Speakers with Identical Impedance)

The VC60RIM/VC60SIM's impedance adjustments protect the power amplifier by maintaining an overall impedance that's high enough for the amplifier to operate safely into.

The impedance jumper position indicates how much the speaker's original impedance is increased by the volume control. (The X2 position increases the speaker's impedance 2 times, the X4 position increases a speaker's impedance 4 times, etc.)

For example, a single 8-ohm speaker connected to an amplifier through a VC60RIM with the jumpers set in the X4 position would present a 32-ohm load to the amplifier. If four pairs of 8-ohm speakers were connected to an amplifier in parallel through four VC60RIM/SIMs set to the X4 position, the amplifier would see a safe overall impedance of 8 ohms ( $8 \times 4 = 32$ ;  $32/4 = 8$ ).

- Count the total number of speaker pairs the amplifier will be driving, and note their nominal impedance according to their manufacturer.
- Set the impedance jumpers (right) according to the tables below by slipping the jumper blocks over the appropriate pair of blades. (Be sure to set both jumpers.)



8-OHM CAPABLE AMPLIFIER		4-OHM CAPABLE AMPLIFIER	
Number of 8-Ohm Speakers	Jumper Position	Number of 8-Ohm Speakers	Jumper Position
1 Pair	X1	1 - 2 Pair	X1
2 Pair	X2	3 - 4 Pair	X2
3 - 4 Pair	X4	5 - 8 Pair	X4
5 - 8 Pair	X8	9 - 16 Pair	X8
More than 8 Pair	Not Recommended	More than 16 Pair	Not Recommended
Number of 4-Ohm Speakers	Jumper Position	Number of 4-Ohm Speakers	Jumper Position
1 Pair	X2	1 Pair	X1
2 Pair	X4	2 Pair	X2
3 - 4 Pair	X8	3 - 4 Pair	X4
More than 4 Pair	Not Recommended	5 - 8 Pair	X8
		More than 8 Pair	Not Recommended

**WARNING: Operating multiple sets of speakers through VC60RIM/SIM volume controls with impedance jumpers set to lower values than recommended in order to increase the system's volume capability can damage the volume controls and amplifier. If the system produces inadequate volume with the jumpers set properly, remove some of the speaker/volume control combinations from that amplifier and add an additional amplifier(s) to the system to power them.**

## SETTING THE IMPEDANCE JUMPERS 2:

### Advanced Installations (Speakers with Differing Impedances; Room Balancing)

In addition to protecting amplifiers, the VC60RIM/VC60SIM's impedance adjustments can also be used in installations to balance the audio levels in different-sized rooms, or where speakers of differing impedances are used.

As the impedance seen by the amplifier increases, the output from the amp into that load decreases. In other words, the impedance jumpers' X1 setting will allow the speakers to be louder than if the X8 setting is used.

Here's how to balance-out room levels using the VC60RIM and VC60SIM:

- Use the X1 setting for large rooms and outside areas where maximum volume is needed.
- Use the X2 and X4 settings for medium-sized rooms.
- Use the X8 setting for bathrooms and hallways that need much less overall volume.

With this technique, even though the amplifier will be delivering the same power to all zones, the speakers connected to the volume controls in the small rooms (X8 setting) will only achieve a maximum volume that is 9dB lower than the amplifier's full output. (That's equal to turning the volume control down three steps from full.)

- The speakers in medium-sized rooms will achieve a maximum output that is 3dB down (X2 setting) or 6dB down (X4 setting) from maximum.
- Speakers in large rooms and the outside zone (X1 setting) will still achieve a maximum output level that is equal to the amplifier's full output.

This allows greater output in needy zones while still providing great low level resolution in the smaller rooms.

**Important: All amplifiers need to see a certain minimum load to remain stable. (Sonamp® amplifiers can handle loads down to 2 ohms before going into protection.)**

When balancing rooms or using speakers with differing impedances, use the following equation to calculate the overall impedance as seen by the amplifier:

$$1 / [ (1 / (SPa \times VCa)) + (1 / (SPb \times VCb)) + (1 / (SPc \times VCc)) + \dots (1 / (SPn \times VCn)) ]$$

This equation may look scary but it really is easy to use. The nominal speaker impedance is represented by SP and the volume control impedance jumper multiplying factor is shown as VC.

For example, assume that all speakers are 6 ohms nominal. Assume that VCa (outdoors) is set at X1, VCb (kitchen) is set to X4 and VCc (bathroom) is set to X8. The equation would be:

$$1 / [ (1 / (6 \times 1)) + (1 / (6 \times 4)) + (1 / (6 \times 8)) ]$$

$$= 1 / [ (1 / 6) + (1 / 24) + (1 / 48) ]$$

$$= 1 / [ 0.166 + 0.042 + 0.021 ]$$

$$= 1 / 0.229$$

$$= 4.37 \text{ ohms}$$

The total impedance of this example is above 4 ohms and can be safely driven by any amp that is stable down to 4 ohms.

**Note: If you were using a Sonamp 260 or SAT275 to drive the load in the above example, the amplifier's 2-ohm stability would allow you to add even more rooms. (The number would depend on the speaker impedance and Volume Control impedance jumper setting.)**



# INSTRUCTION MANUAL

## VC60RIM / VC60SIM

### IMPEDANCE - MULTIPLYING

### VOLUME CONTROLS

## OPERATION:

### Setting the Maximum System Volume

**Important: After you have set the impedance jumpers as shown on the previous page, you must set the maximum system volume before operating the system.**

- If the system has speaker/volume control combinations in more than one room, determine which room will be played the loudest.
- Turn the amplifier's volume control all the way down.
- Feed the system a strong music signal.
- Turn the volume control in the "loudest" room all the way up.
- Gradually advance the amplifier's volume control until the sound in the room is as loud as you're likely to ever want it.
  - If you hear audible distortion, lower the amplifier's volume until the distortion disappears.**
- Bring the volume control in each room up to the loudest listening level for that room.
  - Leave the volume controls already tested at their loudest listening level as you test new ones and listen for distortion. If you hear distortion, lower the amplifier's volume until the distortion disappears.**

Once the system has been set up in this way, use the volume control in each room to adjust the volume to that room's normal listening level. Do not change the amplifier's volume.

**WARNING: Operating the system at a volume that causes amplifier clipping will — besides producing inferior sound quality — saturate the volume control transformers and can damage the volume controls, the amplifier and the speakers. If you hear audible distortion, lower the amplifier's volume until the distortion disappears.**

**If the system produces inadequate volume with the amplifier's volume set to just below clipping, remove some of the speaker/volume control combinations from that amplifier and add an additional amplifier(s) to the system to power them.**

## TECHNICAL ASSISTANCE AND SERVICE

**If you have any questions about the operation or installation of this product, please call our Technical Assistance Department on any business day at (800) 582-0772 or (949) 492-7777; from 7 a.m. to 5 p.m., Pacific Time.**

If your product should need repair or service, contact your Sonance Authorized Dealer for help, or use the following procedure:

- Prior to calling, note the product's model number, serial number, purchase date, and the name and address of the dealer where you purchased the product.
  - Contact our Technical Assistance Department at the above number(s) and describe the problem the unit is experiencing. If applicable, they will issue a Return Authorization Number.
- IMPORTANT: YOU MUST HAVE PRIOR AUTHORIZATION TO RETURN YOUR PRODUCT TO SONANCE!**
- If you're directed to return the unit to Sonance for repair, pack the unit in its original shipping carton. If needed, you can obtain replacement packaging from us for a small charge. Please include a copy of the original bill of sale inside the package.
  - Contact United Parcel Service, Federal Express, or RPS to arrange pre-paid (not collect) shipping. Do not use the U.S. Mail Service.

**IMPORTANT: Freight collect shipments will be refused.**

- Write the Return Authorization Number on the outside of the shipping carton.
- Ship the packaged unit to:

Quality Assurance Department  
Sonance  
212 Avenida Fabricante  
San Clemente, CA 92672-7531

## WARRANTY COVERAGE (U.S. ONLY)

If the unit fails due to a defect in workmanship or material for a period of five (5) years, Sonance will, at its option and at no charge, repair or replace the components of such unit which prove to be defective.

For this warranty to be effective, the bill of sale must show that the unit was purchased from an "Authorized Sonance Dealer" and must list the price paid. This warranty shall apply exclusively to the original purchaser and shall not apply to units purchased for industrial or commercial use.

Furthermore, this warranty shall not apply if:

- Damage to the unit was caused by accident, abuse, or misuse;
- The unit was opened, modified, or repaired by unauthorized personnel; or
- The unit was not used as outlined in the operating instructions.

## EXCLUSIONS AND LIMITATIONS

The warranty set forth above is in lieu of all other warranties, express or implied, of merchantability, fitness for a particular purpose, or otherwise. The warranty is limited to Sonance products registered herein and specifically excludes any damage to loudspeakers and other allied or associated equipment which may result for any reason from use with this product. Sonance shall, in no event, be liable for incidental or consequential damages arising from any breach of this warranty or otherwise. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.