

**Thank-you for choosing the Vandersteen Model 2Wq Subwoofer System. With proper care, your new subwoofer will provide many years of trouble free, high quality performance.**

**We recommend that you read this entire manual prior to connecting or using your Model 2Wq Subwoofer System.**

Vandersteen Audio

The Model 2Wq Subwoofer System is the product of extensive research into the qualities required for realistic music and film sound reproduction. The engineering, construction and materials of the 2Wq far exceed conventional industry standards and result in superior performance and reliability.

The Model 2Wq Subwoofer System consists of one or two 2Wq subwoofers and the appropriate crossover. The 2Wq uses three eight inch drivers, each with a massive 1.5 inch, four layer voice coil and a forty ounce magnet structure. The integral 300 watt amplifier does not current limit and has ample power for the most demanding situations. The amplifier's feed forward error correction eliminates response and phase variations that would

compromise the subwoofer's performance.

The 2Wq Subwoofer System will interface with a wide variety of electronics, main speakers and environments. With the proper crossover and sensitivity settings, the 2Wq can be optimized for the input specifications of the main amplifier, the efficiency of the main speakers and the requirements of the listening room. The innovative Q control then allows you to tailor the character of the bass response to best suit your tastes and the room characteristics. The 2Wq's pleasing appearance allows it to visually complement your main speakers and the decor of your home.

The Vandersteen Model 2Wq Subwoofer System is designed and built in the United States of America.

## How THE 2Wq WORKS

Conventional powered subwoofers receive their input signal directly from their crossover before the main amplifier. The sonic signature of the main amplifier that is an important part of the sound you hear from the full-range speakers is missing from the subwoofer. This causes blending problems as the sonic characteristics of the system are different above and below the subwoofer crossover point. The 2Wq Subwoofer System uses a unique connection method that reduces the current demands on the main amplifier, but leaves the main amplifier in the signal path to the subwoofer. This insures

sonic continuity as the main amplifier's characteristics that are evident through the full-range speakers are maintained to the deepest bass, but with the power and control of the 2Wq's internal 300 watt amplifier.

Like conventional subwoofers, the high-pass portion of the 2Wq's crossover is inserted into the signal path just before the main power amplifier to roll-off the low frequency response of the main amplifier and speakers. The difference is that the 2Wq does not take its input from its crossover, but from the main amplifier in parallel with the main speakers. To compensate for the low frequency roll-

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## MODEL 2Wq

### ADJUSTABLE Q POWERED SUBWOOFER SYSTEM

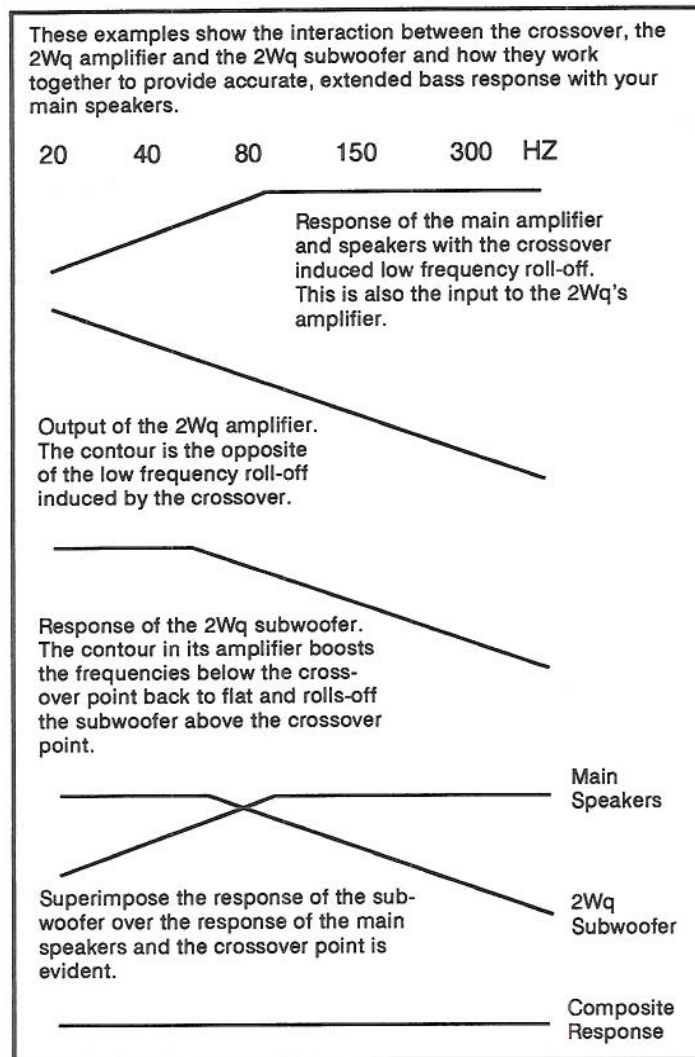
## OPERATION MANUAL



off induced by the crossover, the response of the 2Wq's amplifier is contoured to restore the low frequencies to the proper level. The 2Wq's input impedance is high enough (over 100k ohms) that it has no discernible effect on the output of the main amplifier.

### THE 2Wq CROSSOVERS

A WX-2 variable crossover is included with each 2Wq subwoofer. The WX-2 is a temporary crossover to



use until you acquire the proper fixed value crossover for your system. The optional fixed value crossovers are available both in single ended (X-2) and balanced (X-2B) configurations and provide superior performance throughout the frequency spectrum compared to the temporary WX-2 variable crossover. If you purchased two 2Wq subwoofers, you will have two WX-2 variable crossovers, but will only need to use one in the system.

### MONO OR STEREO BASS

There are significant advantages to using two subwoofers. Summing the channels into a single subwoofer reduces or cancels all the low frequency information containing phase differences between the channels. Stereo subwoofers reproduce all of the bass information complete with the phase differences that help provide the imaging and location clues we use to place people and things at distinct points in the sound field. Stereo subwoofers also lend themselves to natural placement near the corners where the low frequency room gain is more linear and often desirable.

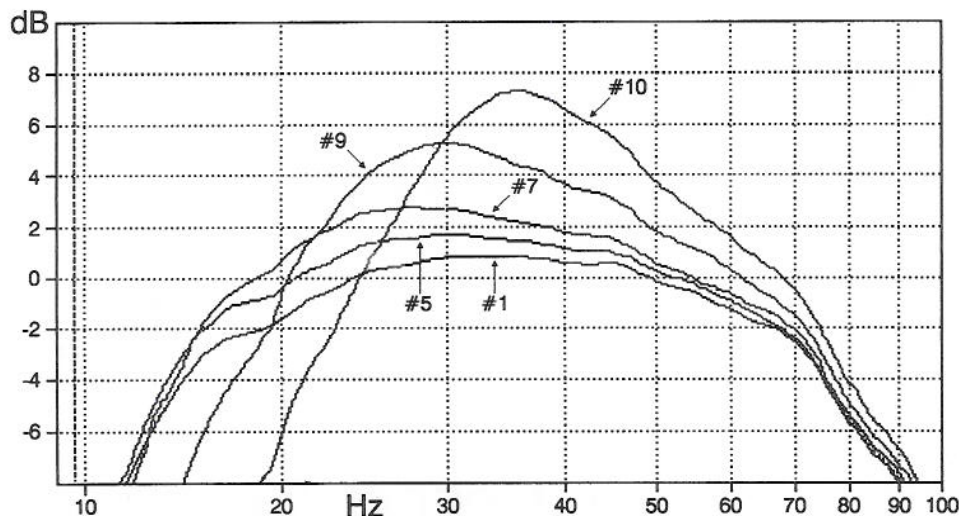
### ADJUSTABLE SENSITIVITY AND Q

The sensitivity and Q controls on the 2Wq's input plate allow you to match the bass level to the full-range speakers and tailor the character of the low frequencies. The sensitivity control is labeled in dB so it can initially be set to match the efficiency of the main speakers then fine-tuned. With the Q control set to "1", adjusting the sensitivity control where the low frequencies are the most linear on a clean jazz recording with a stand-up bass scaling up and down will quickly and accurately establish the optimum setting for your system.

The Q control can then be used to tailor the 2W's low frequency response to compensate for room characteristics and best suit your personal tastes. The Q control is labeled from 1 to 10. Position #1 provides the tightest bass and best transient response while position #10 emulates the peaked response of a typical home theater subwoofer. The effect of the Q control on the 2Wq's frequency response is illustrated in the graph below. For clarity, only positions 1, 5, 7, 9 and 10 are shown. (The

graph does not include the effects of low frequency room gain.)

When you want more of a conventional home theater sound, turning up the system's bass tone control will provide the extra low frequency emphasis that is desirable on many movies. If your system does not have tone controls, setting the 2Wq's Q control to a higher number will yield similar results. The Q control can later be reset when the low frequency peaking is no longer needed.





# 2Wq SYSTEM SETUP

## PACKING LIST

The following components, accessories and documents are included with each 2Wq subwoofer:

- (1) 2Wq subwoofer with integral amplifier.
- (1) WX-2 variable crossover.
- (2) 20 foot lengths of speaker cable.
- (2) Dual banana plugs.
- (3) Spikes with jam nuts. ( $\frac{3}{8}$  x 16 thread)
- (1) Operation manual.
- (1) Five year warranty registration form.

**When the WX-2 variable crossover is replaced with optional X-2 fixed crossovers, one less pair of interconnect cables will be needed. Since the connection with the WX-2 is only temporary, you should not buy an expensive pair of cables to complete the wiring.**

## SETTING THE WX-2 FOR YOUR SYSTEM

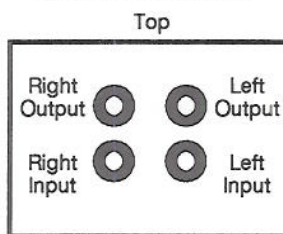
A WX-2 variable temporary crossover is included with each 2Wq to use until you acquire the optional X-2 or X-2B that matches your system. Only one WX-2 crossover is needed in a system even if you have two 2Wq subwoofers. The WX-2 has no trade in value and should be retained after you purchase the optional X-2 fixed crossovers in case you change your main amplifier.

To set the WX-2 crossover, you need to know the input impedance of your main amplifier. This information should be in the amplifier's manual or available from the amplifier's manufacturer or dealer. On integrated amplifier and receiver based systems, the crossover will be inserted between the "Pre Out" and "Main In" jacks. You will need to know the input impedance of the "Main In" jacks.

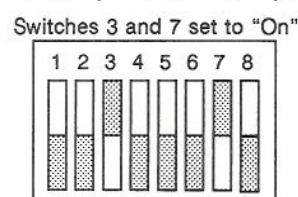
1. Remove the WX-2's cover and locate the internal set of 8 dip switches. The exact type of switch used may vary.
2. Using the chart on the bottom of the WX-2, locate the value one setting below the actual input impedance of your main amplifier. (For example, if your amplifier had an input impedance of 100k, you would select the 50k value.)

3. Turn on the switches listed for the value you found. The numbered side is "ON". Slide and toggle type switches are on when they are pushed toward the numbers and a rocker type switch is on when it is depressed on the side of the numbers. Some switches are labeled "OPEN" and "CLOSED". OPEN is OFF and CLOSED is ON.
4. Install the WX-2 into the signal path just before the main amplifier. On receivers and integrated amplifiers, install the WX-2 between the "Pre Out" and "Main In" jacks.

WX-2 Connections



WX-2 Dip Switch Example



**The 2Wq subwoofer needs at least 50 hours of use before it performs up to its potential.**

## PLACEMENT AND CONNECTION

Do not install the spikes at this time. Without the spikes, the 2Wq can easily be pushed across the carpet to try different locations. The 2Wq(s) should be placed on the same wall as the main speakers with just a couple of inches of clearance for amplifier ventilation.

Two 20 foot lengths of speaker cable and two dual banana plugs are provided with each 2Wq for connection to the main amplifier. Attach a dual banana plug to one end of each cable to plug into the 2Wq. Leave the cables full length so you can try different positions for the

2Wq(s) once the break-in period has elapsed. With the WX-2 crossover installed in the signal path just before the main amplifier, connect the 2Wq(s) in parallel with the main speakers as shown in the illustrations on the next page. With stereo subwoofers, only one input on each subwoofer is connected.

In bi-wired systems, three sets of wires must be attached to the main amplifier. Use spade lugs on the amplifier end of the wires going to the main speakers and banana plugs on the amplifier end of the subwoofer



wires. After the main speaker wires are connected, insert the subwoofer's banana plugs into the amplifier's binding posts.

If your amplifier has connections for two sets of speakers (ie. A & B), do not connect the main speakers to one and the subwoofer to the other. Often there are differences between the two sets of outputs. Some systems may also benefit from connecting the 2Wq with the same type of cable as the main speakers.

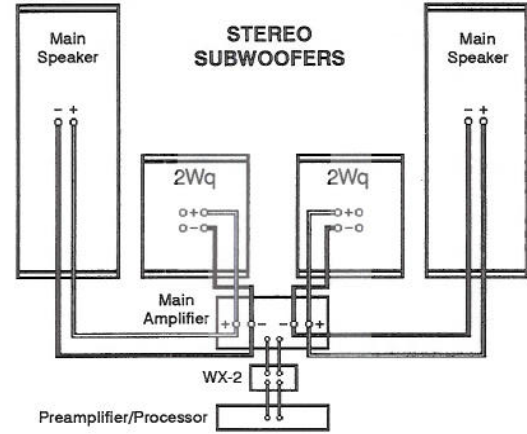
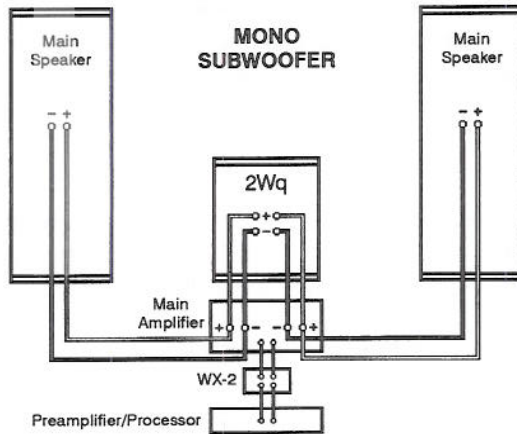
It is important that all connections be in the proper polarity. If one of the 2Wq's inputs is connected out-of-phase from the other input in a mono subwoofer system, the inputs will cancel. With stereo subwoofers, connect-

ing one subwoofer out-of phase from the other one will seriously affect the amount and quality of bass.

Once the crossover and cables are properly installed in the system, the subwoofer should be plugged into a nonswitched AC outlet. As it is plugged in, the 2Wq may produce a low frequency thump.

### SPECIAL INSTRUCTIONS FOR BI-AMPED SYSTEMS

In horizontally bi-amped systems, install the WX-2 crossover before the bass amplifier. Connect the bass amplifier to the 2Wq(s). In vertically bi-amped systems, install the WX-2 before the channels being used for bass. Connect the bass channels to the 2Wq(s).



## AUDIO/VIDEO CONSIDERATIONS

When a 2Wq is used in an audio/video system, the basic configuration is similar to a music system. The crossover is inserted into the signal path just ahead of the main amplifier and the 2Wq is connected to the amplifier in parallel with the right and left main speakers.

### WITH SEPARATES (EXTERNAL PROCESSOR)

The crossover is inserted into the signal path after the processor and just ahead of the main front left and right amplifier. The surround processor must be programmed to blend all the low frequencies into the main front left and right channels rather than routing them to the center channel or to the processor's subwoofer output. Information on configuring your processor for these parameters is available in the processor's manual or from its manufacturer.

### WITH AN A/V RECEIVER

The crossover is inserted into the signal path between the "Pre Out" and "Main In" jacks. The receiver must be programmed to blend the low frequencies into the main front left and right channels rather than routing them to the center channel or to the receiver's subwoofer output. Information on configuring your receiver for these parameters is available in the receiver's manual or from its manufacturer.

### DISCRETE MULTI-CHANNEL

Discrete multi-channel audio formats can use up to

four subwoofers. The best way to integrate subwoofers into the system depends on how many you use.

*All discrete multi-channel formats have a Low Frequency Effects channel. Experience and research have convinced us that these formats sound much better when the processor is programmed to redistribute the LFE information to the right and left front channels at a -6dB level. You should check with your processor's manufacturer as to its capabilities in this regard.*

*The following recommendations assume that the LFE information is redistributed to the right and left front channels at a -6dB level.*

### Number of subwoofers in the system:

#### 1 Subwoofer:

Connect the subwoofer to the left front and right front channels.

#### 2 Subwoofers:

Connect one subwoofer to the left front channel and the other subwoofer to the right front channel. Two subwoofers are a quantum improvement over a single unit and are the preferred configuration in high-quality multi-channel systems.

*Systems that have reached the level where there are no significant advantages to improving the electronics or speakers can benefit from the addition of two more subwoofers for the surround channels.*



#### 4 subs:

Left front, right front, left surround and right surround. Like the main amplifier, the surround amplifier will need a crossover one setting below its input impedance.

*(When 2Wqs are used with Vandersteen VSM surround speakers, the crossover should be set two settings below the surround amplifier's input impedance.)*

This will avoid an interaction with the VSM series speaker's integral high-pass filter.)

We do not recommend using a subwoofer with the center speaker. Research has demonstrated that full-range reproduction in the center position actually compromises the naturalness and intelligibility of dialog.

## 2Wq SYSTEM OPTIMIZATION

**The following information assumes that the break-in period has elapsed. Finalizing the 2Wq's placement, sensitivity or Q setting before the it is fully broken-in could compromise the ultimate performance level.**

### SETTINGS

#### POLARITY

The 2Wq's polarity may need to be reversed with some main speakers to provide the best integration. To reverse the 2Wq's polarity, simply turn the banana plug(s) up-side-down to connect the main amplifier positive to the subwoofer negative and the main amplifier negative to the subwoofer positive.

#### SENSITIVITY

The 2Wq's sensitivity control should initially be set to match the approximate sensitivity of your main

speakers and then be fine tuned per the instructions on page 2. Adjustments to the Q control or polarity may be needed when the sensitivity is changed.

#### Q CONTROL

The Q control allows you to tailor the character of the bass to your particular tastes and room characteristics. (See the chart on page 2.) When you make sensitivity or polarity changes, you may also need to readjust the Q setting.

### PLACEMENT

While the 2Wq(s) should be on the same wall as the main speakers and close to the wall, the exact placement will probably depend as much on practical as acoustic considerations. Placement affects the subwoofer's sound so you should try all the placements that will work in your domestic situation. Be flexible, it is only important that a single subwoofer be centered when it is mated with small, limited range main speakers. With full-range main speakers, the subwoofer may work better in the corner. In general, a subwoofer will sound fuller and more powerful when it is in a corner and leaner when it is away from walls. The 2Wq's adjustable Q allows some compensation for these effects and expands the placement options in most rooms.

As you try different placements, you may also have to readjust the 2Wq's sensitivity and/or Q setting to maintain the best balance with the main speakers.

#### INSTALLING THE SPIKES

When the best location for the 2Wq(s) has been found, turn the 2Wq(s) over and install the spikes with the jam nuts tightened against the bottom of the subwoofer. If the 2Wq(s) will be on a hardwood floor, place a coin under each spike to reduce the likelihood of damage to the floor. With the spikes installed and the placement finalized, the cables from the main amplifier to the 2Wq(s) can be shortened as needed.

### CROSSOVER AND GROUNDING

Once the subwoofer(s) is broken-in, you should use a jazz recording with a stand-up bass to evaluate the blend between the 2Wq(s) and the main speakers with the WX-2 crossover set one setting above, one setting below and at the nominal setting determined on page 3. (Some adjustments to the level and Q controls may be necessary.) When you determine the best crossover setting for your system, you should purchase the matching,

higher performance X-2 fixed crossovers from your Vandersteen dealer. The X-2 crossovers are 3-inch long cable extensions that fit on the amplifier ends of your preamplifier to power amplifier interconnect cables. X-2 crossovers are available in the same values as the WX-2 crossover settings and maintain a more direct connection between the preamplifier and power amplifier. Only one set is needed for one or two subwoofers.



## CROSSOVER AND GROUNDING

Once you have determined the crossover setting that is one value below the input impedance of your main amplifier, you should purchase the matching, higher performance X-2 fixed crossovers from your Vandersteen dealer. The X-2 fixed crossovers are 3 inch long cable extensions with a female RCA jack on one end and a male RCA jack on the other end. They are available in the

same values that can be selected on the WX-2 variable crossover and accomplish the required subwoofer crossover while maintaining a more direct connection between the preamplifier and power amplifier. The X-2s fit on the ends of your preamplifier to power amplifier interconnect cables and then plug into the amplifier inputs. Only one set is needed for one or two subwoofers.

## SERVICE

In the unlikely event that your 2Wq Subwoofer System requires service, please follow these procedures

1. Verify that the 2Wq has been set-up and connected according to the instructions in this manual. Review the troubleshooting guide on the next page.
2. Contact Vandersteen Audio with your 2Wq's serial number, information on your associated components a description of the problem and the steps you have taken to isolate it to the 2Wq and correct it.
3. The 2Wq is a modular system to reduce the cost of shipping. Should Vandersteen Audio determine that a module of the 2Wq needs to be returned to the factory for repair, you will be instructed on how to remove that module and a Return Authorization Form will be sent to you.
4. Return the damaged or defective module and the completed Return Authorization Form to Vandersteen Audio. Any shipment of a complete 2Wq to the factory will be refused.

## MAINTENANCE

All system connections should be cleaned periodically with alcohol or a solution made specifically for cleaning electrical contacts. The wood veneers are oiled at the factory and can be maintained with a light application of Pledge or a similar product. The grille can be

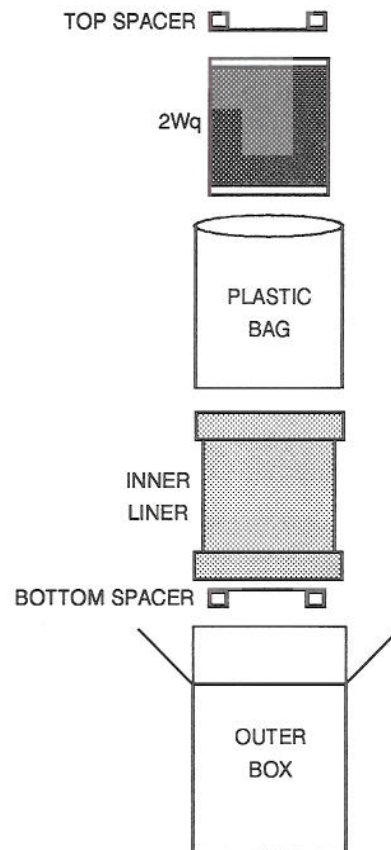
vacuumed using a brush attachment that will not snag the cloth. Care should be taken that objects that could mar the finish are not placed on top of the 2Wq. The subwoofer should not be exposed to excessive sunlight or heat which can damage the fit and finish of the veneer.

**The 2Wq weighs over 90 pounds in its box. Please use the cut-out hand holds and proper lifting techniques to prevent strain or injury.**

## PACKING THE 2Wq

To prevent physical or cosmetic damage, always pack the 2Wq in its original box with complete inner packing prior to transportation or shipment. The proper method of packing the 2Wq is shown in the illustration to the right. When you pack the 2Wq, be sure that the top and bottom spacers are oriented as shown in the illustration.

A replacement box and packing is available from Vandersteen Audio.



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## TROUBLESHOOTING GUIDE

**Problem:** **Subwoofer hums. Audible at the listening position.**

**Solution:** Try different grounding methods. Run a ground wire from the 2Wq's ground terminal to either the preamplifier or main amplifier. If the ground wire does not help, try floating the ground connector on the 2Wq's or main amplifier's power cord.

**Problem:** **Still hums, grounding changes didn't help.**

**Solution:** Check your interconnect cables. Route cables away from the amplifier. Position the WX-2 crossover away from the amplifier. Verify that the top cover is installed on the WX-2. Try the system at a very low volume level without the WX-2 crossover installed. If the WX-2 is the source of the hum, it will have to be replaced before the system can be used.

**Problem:** **Still hums, cable and crossover changes didn't help.**

**Solution:** Disconnect the inputs from the 2Wq, if the hum is still evident at the listening position, please

contact Vandersteen Audio. (It is normal for the amplifier's high-voltage transformer to produce a slight hum, but it should not be audible more than a few feet away.)

**Problem:** **Low output level.**

**Solution:** Verify the actual input impedance of the main amplifier and that the crossover is set one value lower. (See page 3.) Check the sensitivity and Q control settings. (See pages 2 and 5.) Try different placements. Positioning the subwoofer near a corner will make the subwoofer sound fuller and more powerful. (See page 5.)

**Problem:** **No output.**

**Solution:** Verify that the 2Wq is plugged into a live AC outlet. (It should thump when you plug it in.) Verify polarity of the 2Wq's input wires. Unplug one channel's inputs from the 2Wq; if you then get output, the input wires are out-of-phase from each other and are cancelling. (See pages 3 and 4.)

## COMMON 2Wq QUESTIONS

**To make the connection of the 2Wq easier, can I connect the 2Wq's wire to the inputs on the main speakers along with the regular speaker wires instead of to the main amplifier?**

Although connecting the 2Wq to the main speakers may seem easier and on the surface would look like it should work, our tests have shown that the performance of the 2Wq is compromised when it is connected to the main speakers rather than directly to the main amplifier.

**Can the X-2 fixed crossovers be plugged into either the inputs of the main power amplifier or the outputs of the preamplifier?**

While it is physically possible to connect the X-2s either way, it is better to connect the X-2s to the inputs of the main power amplifier to minimize their interactions with the cables ahead of the power amplifier.

**Since I won't need the WX-2 variable crossover after I get the optional X-2 fixed crossovers, can I trade in the WX-2 on the X-2s?**

The WX-2 is intended only as a temporary device and has no intrinsic or trade-in value. It should be retained even after you purchase the optional X-2s in case you later change your main amplifier.

**Is the 2Wq designed for use only with Vandersteen main speakers?**

The 2Wq will work well with almost any quality loudspeaker. With its multiple, moderately sized drivers, superior pitch definition and adjustable sensitivity and Q, the 2Wq subwoofer is an excellent match for quality electrostatic, planar, ribbon and dynamic speakers. Our warranty records indicate that many different speakers

have been successfully mated with 2Wq subwoofers.

**Since bass is omnidirectional, what are the advantages of using two subwoofers instead of one?**

Modern digital sources maintain full stereo separation down to the lowest frequencies. Bass with phase differences between the channels is canceled when the two channels are summed into a single subwoofer. Stereo subwoofers reproduce all of the bass information complete with the phase differences that help provide the imaging and location clues we use to place people and things at distinct points in the sound field. Stereo subwoofers also lend themselves to natural placement near the corners where the low frequency room gain is often desirable on spectacular film sound effects.

**The manual says to use a jazz recording with a stand-up bass to set the sensitivity control. Can I use a test disc with test tones?**

Single tones are not representative of the way we hear and can result in gross misadjustments. As a stand-up bass scales up and down, the notes pass directly through the crossover range. Simply adjust the sensitivity control so that the lower notes are the same loudness as the upper notes.

**Can a 2Wq and an older model 2W be used as a stereo pair of subwoofers?**

No, the performance differences between the models will prevent proper integration. If you have a 2W that you wish to use with a 2Wq, we recommend that you have the 2W updated to 2Wq status. Please contact Vandersteen Audio for 2Wq update program pricing and scheduling information.



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## LIMITED ONE YEAR WARRANTY

VANDERSTEEN AUDIO loudspeakers are warranted to the original purchaser be free from defects in materials or workmanship, SUBJECT TO THE FOLLOWING CONDITIONS, for one (1) year from the date of purchase from an authorized VANDERSTEEN AUDIO dealer.

### THIS WARRANTY IS SUBJECT TO THE FOLLOWING CONDITIONS AND LIMITATIONS:

This warranty is void and inapplicable if the loudspeaker has:

- a. not been used in accordance with the instructions contained in the operation manual.
- b. been subject to misuse or abuse, examples of which would be burned voice coils and/or burned crossover parts.
- c. been modified, repaired, or tampered with by anyone not specifically authorized to do so by Vandersteen Audio.
- d. been subject to inputs in excess of the maximum rating, or inputs from an unstable or clipped amplifier.
- e. been damaged by accident, neglect or transportation.

IF A VANDERSTEEN AUDIO LOUDSPEAKER FAILS TO MEET THE ABOVE WARRANTY AND THE ABOVE CONDITIONS HAVE BEEN MET, THEN THE PURCHASER'S SOLE REMEDY SHALL BE TO RETURN THE PRODUCT TO VANDERSTEEN AUDIO WHERE THE DEFECT WILL BE REPAIRED WITHOUT CHARGE FOR PARTS OR LABOR.

The speaker must be packed in the original packing and returned to VANDERSTEEN AUDIO via insured freight by the customer at his or her own expense. A returned product must be accompanied by a Return Authorization Form, (available from VANDERSTEEN AUDIO upon request) which includes a written description of the defect and return shipping information.

ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THE ABOVE WARRANTY. THIS WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO PURCHASER.

Some states do not allow limitations on how long an implied warranty lasts, or an exclusion of incidental or consequential damages so the above limitations or exclusions may not apply. This warranty gives you specific legal rights, you may also have other rights in your state.

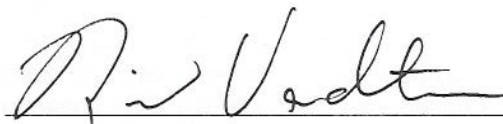
VANDERSTEEN AUDIO reserves the right to modify the design of any product without any obligation to previous purchasers and/or to change the prices or specifications without notice or obligation to anyone.

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## A PERSONAL NOTE

**I have been doing volunteer work for several years with elderly people with severe hearing losses, and I have seen the frustration and anger that are brought on by these losses. We now know that many of these people developed their hearing problems because of exposure to high noise levels when younger.**

**Many audio/video systems, as well as home, portable and auto stereo systems are capable of volume levels potentially damaging to your hearing. Please use common sense, and listen to your movies and music at safe levels now so you will still have the ability to hear and enjoy them in the future.**



Richard Vandersteen