$5.00

VANDERSTEEN QUATRO / CT

SIGNATURE LOUDSPEAKER OPERATIONS MANUAL

Thank you for choosing the Vandersteen Quatro Signature Loudspeaker System. Be careful handling the Quatro while unpacking or moving them. The top sixteen inches of the front grille should not be touched in any way. The tweeter and midrange are immediately behind the fabric and can be easily damaged by probing fingers. These drivers are very expensive and carefully matched. Use care. For a complete understanding of the Quatro's innovative technology and unique features we recommend that you review this entire manual before connecting or using your new speakers.

Vandersteen Audio

The Quatro combines the superior openness and realism of the legendary Vandersteen box less design with the powerful, extended bass of an amplified subwoofer in a compact and elegant loudspeaker. Unique features optimize the Quatro for a wide variety of placements, environments, and system configurations. It is available in several wood types to complement almost any décor.

The Quatro is factory upgradeable. Future advances in technology and/or materials may be incorporated into your speakers. Your Quatros will always be totally upgradeable to the latest version.

On the rear input plates are room compensation controls that a qualified technician uses to match the low frequencies to the listening room and level and contour controls that allow you to tailor your Quatros to your own personal taste.

The Vandersteen Quatro is designed and built in the United States of America.

Unless the high-pass crossover is built into the electronics, (See page 3.) the Quatro system requires a M5-HP crossover between the preamplifier and main power amplifier that is matched to the input impedance of the power amplifier. Using the speakers without a properly configured M5-HP in place will severely damage the mid-bass drivers. The drivers in your Quatro are critically paired to within one tenth of a dB. If one driver is damaged, the pair must be replaced. Physical damage (probing fingers) or damage due to a missing or improperly configured M5-HP crossover will require non-warranty replacement of two very expensive drivers. (Minimum $180.00 - $670 per pair for the tweeters alone.)

CONTENTS

SETTING-UP THE QUATROS

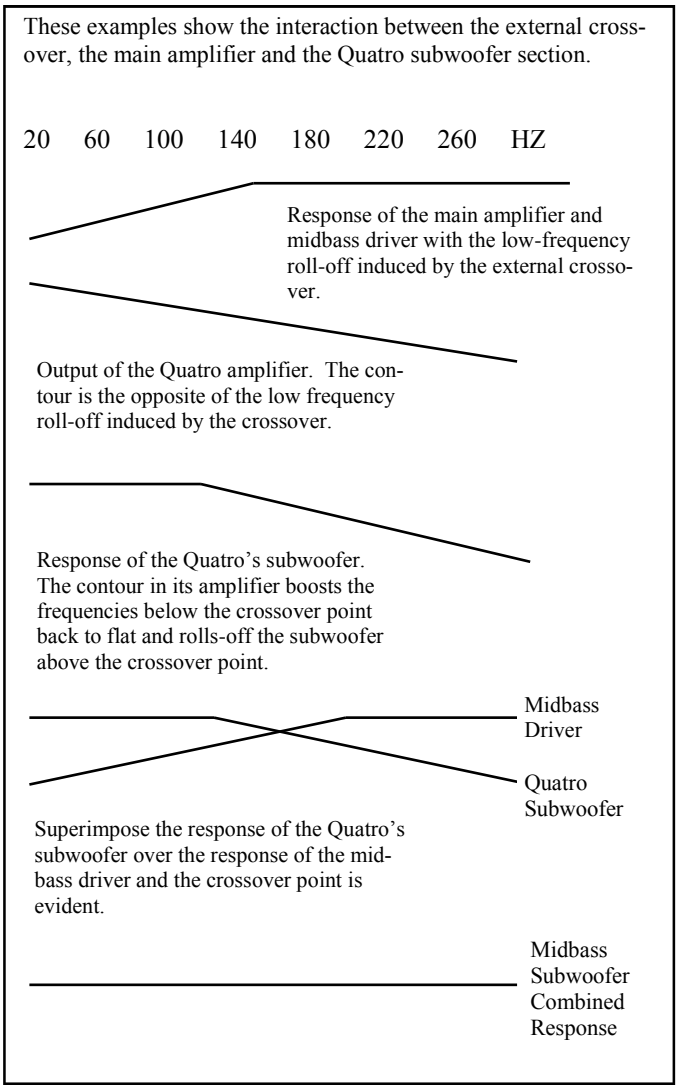
Unless the high-pass crossover is built into the electronics, (see page 3) the M5-HP crossover is required in all systems. Using the speakers without a properly configured M5-HP crossover in place will cause severe and costly non-warranty damage to the midbass drivers.

True balanced amplifiers will have the same impedance value on the positive and negative legs of the inputs. An amplifier with different impedance values on the positive and negative legs of the inputs is not truly balanced and is not compatible with the balanced version of the M5-HP crossover.

THE M5-HP CROSSOVER

The Quatro uses a unique crossover and subwoofer amplification configuration to provide the true benefits of bi-amplification and reduce the current demands on the main amplifier. By inserting a passive high-pass crossover between the preamplifier and the main amplifier then connecting the Quatros like conventional bi-wired speakers, the main amplifier remains in the signal path to the subwoofer, but its current demands are reduced. This insures sonic continuity as the main amplifier's characteristics that are evident through the upper frequencies are maintained to the deepest bass, but with the power and control of the Quatro's internal 300 watt amplifier.

The M5-HP is the high pass crossover for the mid-bass driver and must be installed in the system between the preamplifier and power amplifier before the Quatros are used. (The only exception is in systems with a high-pass amplifier as noted below.) Properly configured to match the input impedance of the amplifier, the M5-HP will roll off the low frequencies going to the amplifier so that they are -3db at 100Hz referenced to 1kHz. To compensate for the low-frequency roll-off induced by the crossover, the response of the Quatro's amplifier is contoured to restore the low frequencies to the proper level as shown in the illustrations to the left. The M5-HP is a totally mono design, two are required for a stereo pair of Quatros. M5-HPs are available in both balanced and single ended configurations to match any system.



CONFIGURING THE M5-HP CROSSOVER

Before you use the M5-HPs, each unit's internal set of dip switches must be set to match the input impedance of your main amplifier. Information on your amplifier's input impedance should be in its manual or available from its manufacturer. **If you do not have accurate information on your amplifier's input impedance, do not use your Quatro speakers until you get the information or have a competent technician determine the input impedance by the method described on the next page.** With balanced amplifiers, the M5-HP crossover must be set to match the sum of the positive and negative legs of the input. (The individual legs must each be exactly one half the impedance.) If the individual legs do not both have the same

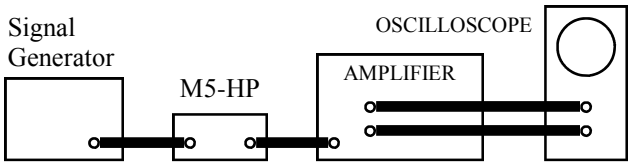
impedance, the amplifier must be used in single-ended mode or with a complex, custom crossover the amplifier's manufacturer may be able to provide.

To set the M5-HPs in either a balanced or single ended system, please follow these procedures.

1. Locate the value closest to the input impedance of your amplifier in the chart located on the top cover of the M5-HP. If you amplifier's input impedance is between values, use the lower value. Note which switches to turn on to match the input impedance value.
2. Remove the cover from an M5-HP and locate the internal set of dip switches.
3. Turn on the switches listed for the value you found. The numbered side is "ON". A switch is on when it is depressed on the side of the numbers.
4. Repeat the procedure for the second M5-HP. Reinstall the covers.

If you are unable to find the amplifier's input impedance or if you are not completely sure you have the correct input impedance, you should have a competent technician at your dealer determine the proper setting for the M5-HPs by the following method.

1. Connect a signal generator to the input of an M5-HP crossover, the output of the M5-HP to the input of your main amplifier and the output of the amplifier to an oscilloscope as shown in the diagram below.



2. Set the M5-HP's internal dip switches for 50k impedance value as noted on the chart. If the -3db down point is above 100Hz, try a lower setting. If the -3db down point is below 100Hz, try a higher setting. When the -3db down point is at 100Hz, the M5-HP is set to match your amplifier. (If the oscilloscope is not calibrated in db, find the setting where the voltage at 100Hz is .707 of the voltage at 1kHz.) This setting is the input impedance of your amplifier. It is a good idea to write it down for future reference.
3. Set the second M5-HP to the same setting.

The M5-HP contains a battery that continuously biases some of its components. The battery is mounted on the PC board and has a life expectancy of 7+ years. Please do not attempt to measure the output of the battery as the measurement process will drain the battery more than several months of normal use. Written on each battery is the year that it should be replaced to insure continuous optimum performance.

INSERTING THE M5-HP INTO THE SYSTEM

1. Connect the outputs from the properly configured M5-HPs to the inputs of the main amplifier.
2. With a high-quality cable, connect the left channel preamplifier output to the input of the M5-HP that is connected to the left channel of the main amplifier.
3. With a high-quality cable, connect the right channel preamplifier output to the input of the M5-HP that is connected to the right channel of the main amplifier.
4. In multi-channel systems, insert the M5-HP between the processor L&R outputs and the amplifier inputs.

HIGH-PASS PREAMPLIFIERS, AMPLIFIERS AND MULTI-CHANNEL PROCESSORS

Some preamplifiers, power amplifiers, integrated amplifiers and multi-channel processors can be configured by the user or the manufacturer to provide the low-frequency roll-off required by the Quatros. Incorporating the high-pass crossover into the system electronics eliminates the need for M5-HP crossovers. The high-pass section of the applicable unit must be configured to these specifications:

Frequency Response: -3db at 100Hz
6db per octave (First order)

As you set up your Quatros, you will be prompted several times to evaluate some aspects of their performance with reference quality music recordings. We find that natural instrument jazz recordings generally offer the most realistic and accurate sonic reproductions. They are usually of a small group yet cover a wide frequency range. Most are straight through recordings with a minimum of processing or acoustical manipulation. If you are not really familiar with these types of recordings, try Ray Brown Soular Energy. Once you have established your reference recordings, you can maintain consistency by using these recordings to evaluate all component, wire and placement changes. Without reference recordings, it is easy to fall into the trap of trying to retune the system for every different recording.

CONNECTING THE SPEAKER CABLES

SELECTING SPEAKER CABLES

Research has demonstrated that the speaker cables must be considered an integral part of the music system. Each brand and model of cable has its own sonic characteristics and contributes to the overall presentation of the music as much as any active component. The Quatro easily passes the amount of information required to hear these differences between cables.

There is no one best cable to use with the Quatros. To assure that they were sonically neutral, the Quatros were developed using a direct-coupled laboratory amplifier connection loaded by precision resistors to simulate cable resistance. With neutral speakers, the factors that determine the best cables for your system are your personal taste, the characteristics of your listening room, and the associated equipment. The only person familiar enough with your taste and room characteristics to assist you in selecting cables is someone from your local dealer who has visited your room and sat through listening sessions with you. No one else can adequately evaluate two of the three factors (taste and room).

If you wait to select the cables until the other components in the system are set, you can fine-tune the system with your cable choice. As you evaluate different cables in your system, remember that the dielectric in most quality cables takes several hours to fully form. These cables may not reach their full potential or exhibit their true sonic characteristics until they have been in the system for a week or more.

It is very important to keep the speaker cables as short as possible. In repeated trials, short runs of inexpensive to moderately priced cable consistently outperformed long runs of the same cable as well as much more expensive cables. If you must place your speakers a long distance from your electronics, you should consider positioning the amplifier between the speakers and using long interconnect cables with short speaker cables. With comparable lengths and quality, long interconnect cables seem to compromise the sound of a system less than long speaker cables. An additional advantage is that a given length of interconnect cable will usually cost less than the same length of bi-wired speaker cable. An amplifier placed between the speakers can easily be concealed by a plant or placed in a decorative piece of furniture.

BI-WIRING

The Quatros are optimized for true bi-wiring using two separate speaker cables to connect each speaker to the amplifier. The speaker's internal crossover presents different electrical characteristics to each cable so that one cable carries the signal going to the woofers while the other cable carries the signal going to the midrange and tweeter. The improvements offered by bi-wiring versus a conventional single run of cable are substantial. Often, a bi-wire set of moderately priced cables will sound better than a single run of far more expensive cables.

All the speaker cables in a bi-wire set should be the same type. While it is tempting to use a cable known for good bass response on the low frequencies and a different cable known for good treble response on the midrange and tweeter, the differing sonic characteristics of the two cables can affect the blending between the midbass and midrange drivers and compromise imaging, transparency, and detail. Different cables should only be used after you audition them in your system and verify that they do not affect the midbass to midrange blending and that you like their sonic characteristics.

Our research revealed that much of bi-wiring's benefit comes from the physical separation of the low frequency cable from the midrange/tweeter cable. Internal bi-wire cables that combine all the wires together in one sheath do not offer all the advantages of true bi-wiring. These multiple conductor cables are the only recommended method of mono-wiring the speakers, but should not be considered the equivalent of dual cable bi-wiring.

BI-AMPLIFICATION

Note: Because of the powered subwoofer section of the Quatro and the use of a high pass filter this system is bi-amped. We do not recommend what would then be tri-amping for the following reasons:

1. The major sonic improvement achieved by tri-amping a speaker is the removal of the bass current demand from the main amplifier, which has already been accomplished by the powered subwoofer and high pass filter.

2. In all scenarios a set of mono amplifiers of equivalent value will achieve higher performance than tri-amping with stereo amplifiers half the cost.

3. Many solid state amplifiers are unstable into a load with no D.C. return path, which could cause the channel driving the mid-tweeter to ring. Note: Tube amplifiers can be used because they do not have stability problems in this scenario.

4. Many of you would like to use one type of amplifier for the mid-bass and another for the mid-tweeter. We do not recommend this because the Quatro's crossover is at 600Hz, a frequency where the ear is extremely sensitive, exactly where you do not want two different sounds mixing. The result may be better bass and/or highs but coherency will be compromised.

Bare wires or connectors should never come into contact with the aluminum dress plate while the amplifier is on. Amplifier damage could result.

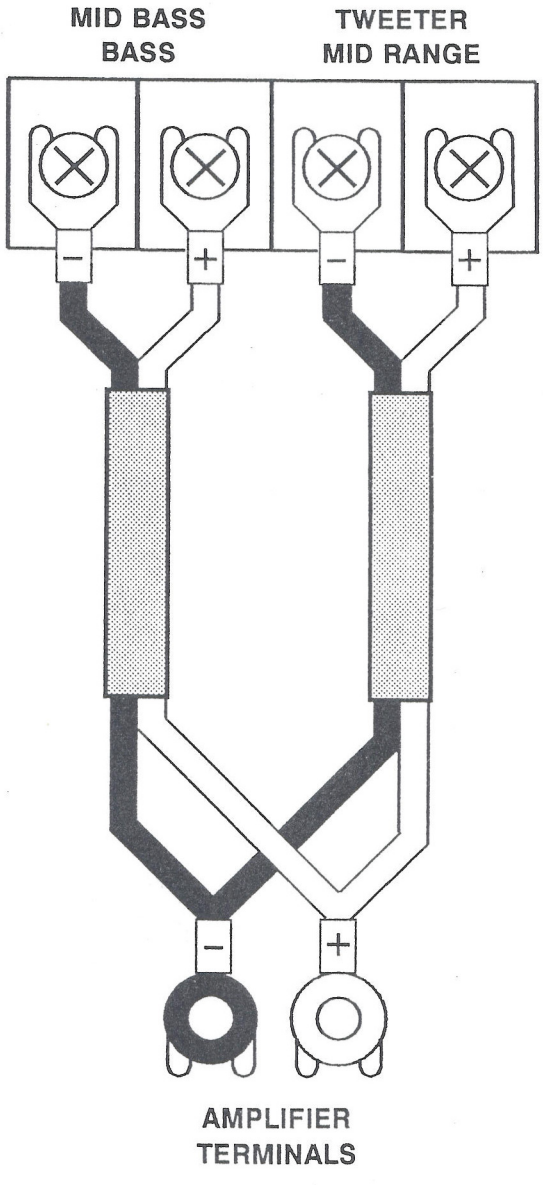
The input screws should be snug, but should not be over tightened.

TRUE BI-WIRE CONNECTIONS

True bi-wiring is recommended for all systems using a single stereo amplifier or two mono amplifiers. Four identical runs of equal length speaker cables are required. (Two per speaker.)

Please review the information on page 4 regarding cable selection and connection techniques before you connect your speakers.

1. Crimp and solder spade lugs to the speaker ends of the cables being used to connect the Quatros.
2. Choose one of the cables as the tweeter/midrange cable. Connect this cable to the two terminals on the right, carefully observing proper polarity.
3. Connect the remaining cable to the two left terminals, carefully observing proper polarity.
4. Connect both cables in proper polarity to the same set of outputs on your amplifier. If possible, use a single spade lug to connect both positive wires and a single spade lug to connect both negative wires to the amplifier as shown in the diagram to the right.



WE RECOMMEND TRUE BI-WIRING

a. All four speaker cables should be the same type and length. While certain different cable types may work well together, using identical cables on both inputs insures perfect blending.

b. Use high quality cables and spade lugs. Crimp and solder the spade lugs to the cables.

c. If your amplifier has "A" and "B" outputs, use the "A" outputs for both cables. The two sets of outputs may not be electrically identical.

d. If your amplifier has multiple impedance taps, try the 4 ohm taps and 8 ohm taps to see which sound better. (They will sound different.) The Quatro is an easy load and always stays between 4 and 8 ohms so there is no danger of damaging your amplifier or the speakers by using either set of taps. Both cables must be connected to the same rated taps on the amplifier.

Bare wires should never come into contact with the aluminum dress plate while the amplifier is on. Amplifier damage could result.

The input screws should be snug, but should not be over tightened.

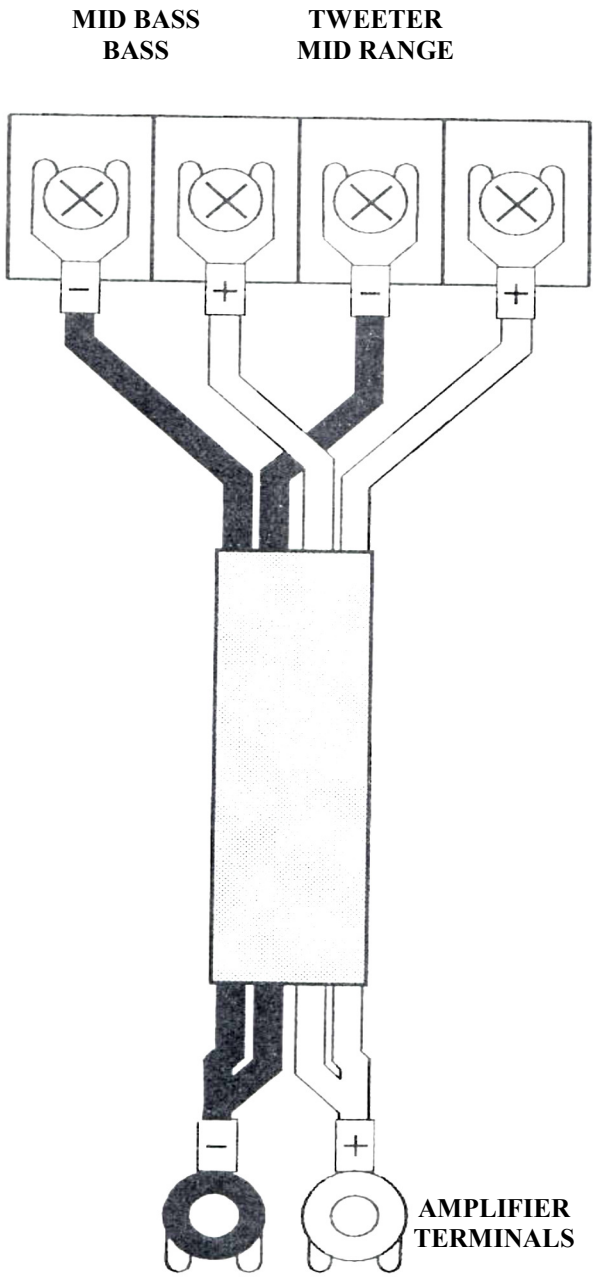
While single-cable internal bi-wiring is the only recommended method of mono-wiring the Quatro, it does not offer all the performance advantages of true bi-wiring.

INTERNAL BI-WIRE CONNECTIONS

If your domestic situation dictates the use of a single cable per speaker, you should use a multiple conductor single-sheath cable to internally bi-wire the speakers. Some of these cables use different types of wire for the upper and lower ranges of the speaker and may affect the blend between the midbass and mid-range drivers. They should only be used after you audition them in your system and verify that they do not affect the midbass to midrange blending and that you like their sonic characteristics.

Please review the information on page 4 regarding cable selection and connection techniques before you connect your speakers.

1. Crimp and solder spade lugs to the speaker ends of the cable from the amplifier.
2. Connect one positive and one negative wire to the tweeter/ midrange terminals on the right carefully observing proper polarity.
3. Connect the remaining positive and negative wires to the two left terminals carefully observing proper polarity.
4. Connect the wires in proper polarity to the same set of outputs on your amplifier. If possible, use a single spade lug to connect both positive wires and a single spade lug to connect both negative wires to the amplifier as shown in the diagram to the right.



WE RECOMMEND

a. The speaker cables should be as short as possible and the same length. Consider putting the amplifier between the speakers rather than off to one side.

b. If your amplifier has multiple impedance taps, try the 4 ohm taps and 8 ohm taps to see which sound better. (They will sound different.) The Quatro is an easy load and always stays between 4 and 8 ohms so there is no danger of damaging your amplifier or the speakers by using either set of taps. Both cables must be connected to the same rated taps on the amplifier.

c. True bi-wire for optimum performance.

With their extensive subwoofer controls and room compensation adjustments, the Quatros low frequency response can be optimized for any placement. The speakers' positioning will affect the midbass, midrange, and treble performance with some positions offering better imaging and superior frequency balance and detail. With the tremendous variables in room construction and layout, there are no magical formulas for determining the best speaker placement in every room. We recommend that you try the speakers in every domestically acceptable location to find their best midbass to treble performance in your particular listening environment. The odd dimensions placement method covered in the following sections is a tool that can help you find an acceptable placement, but to find the optimum placement, you will need to invest the time and effort to try all the possible placements in the room.

Before you begin your positioning experiments, verify that the speakers are connected to the amplifier in proper polarity and that the M5-HP crossover is in place and properly set for the input impedance of the amplifier. The cones should not be installed. Set the speakers on flat cookie sheets so that they will easily slide on the carpet from position to position. To insure that the bass performance of different placements does not bias your judgment of the midbass, midrange, and treble, all placement experiments should be performed with the subwoofer amplifier unplugged.

Carefully listen to the imaging and midbass to treble performance of each possible placement with your reference quality music recordings. Without the subwoofer sections, the speakers will have the frequency balance of high-quality mini-monitors and should be evaluated as such. Listen for detail, clarity, naturalness, and the overall presentation of the music. Keep notes on the different placements to help track where the speakers sound the best.

SPEAKER PLACEMENT

When you place a given loudspeaker, either front radiating or dipole, into a typical domestic environment, the room effects the performance of the speaker. Some of these effects are due to the speakers relationship to the physical dimensions of the room and can be significantly affected by placement. Every distance from the source of sound (drivers) to a boundary (wall) has an effect. Odd dimensions placement assures that no two boundary effects build on each other.

ODD DIMENSIONS PLACEMENT

A method that helps find possible placements in many rooms is positioning the loudspeakers on the odd dimensional intersections of the room. The odd dimensional intersections are where lines representing the length and width of your room divided by odd numbers would cross.

As an example, we will use a rectangular room measuring 14 feet wide by 18 feet long. We'll assume that you want to set the speakers on one of the short walls, although this method works equally well for long wall placement.

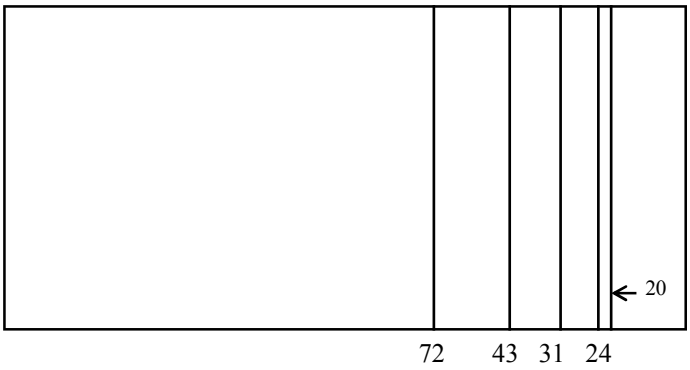
The first step is to take the length of the room, (18 feet in our example) convert it from feet to inches, (18 X 12 = 216) and divide the result by odd numbers.

216 divided by 3 is 72 (all to the nearest inch)
216 divided by 5 is 43
216 divided by 7 is 31
216 divided by 9 is 24
216 divided by 11 is 20
(and so on; eventually the lines pile on top of each other or the speaker gets too close to the wall to access the rear connections and controls.)

The results are the distances in inches that the top front

center of the speaker's wood top should be away from the wall behind the speaker.

Now we can graph these odd dimension distances on a drawing of the room. We only need to graph them for the wall where we intend to place the speakers.

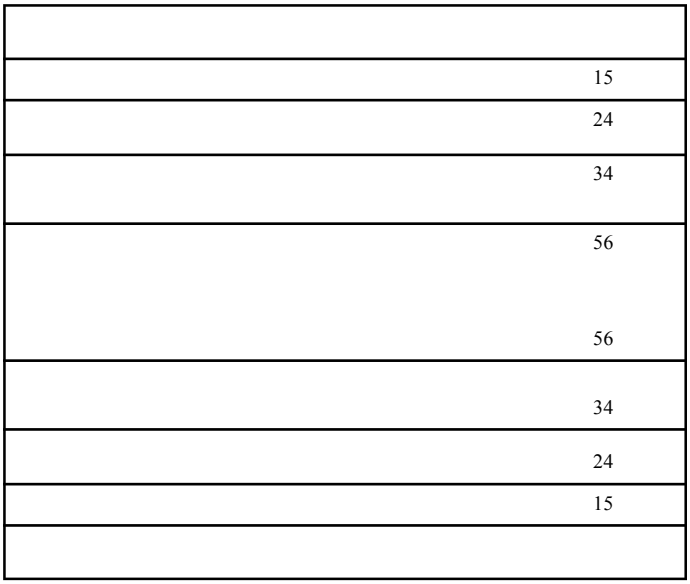


We use the same method to figure how far the front center of the speaker's wood top should be from the side walls. We take the width of the room, (14 feet) convert it from feet to inches, (14 x 12 = 168) and divide the result by odd numbers.

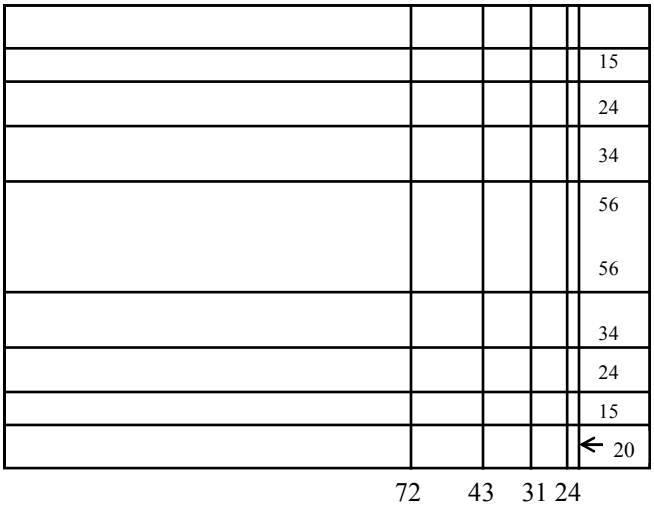
168 divided by 3 is 56 (all to the nearest inch)
168 divided by 5 is 34
168 divided by 7 is 24
168 divided by 9 is 19
168 divided by 11 is 15

The results of these odd number divisions are the distances in inches that the front center of each speaker's wood top should be away from the side wall.

Now we can graph these odd dimensions distances on a drawing of the room.



By overlaying the width and length graphs, we can see the intersection points of the lines. These points represent where the front centers of the speakers' wood tops should be.



As you can see, we now have quite a few intersections to choose from in our example room. In your room, some of the intersections will be impossible to try or eliminated due to domestic considerations.

As you try different placements for your speakers, always place both speakers on the same length line. For example, both speakers would be placed on 43 inch line or both speakers would be placed on the 24 inch line. The speakers can be placed on different width lines, for example one on the 34 inch line and the other on the 56 inch line. Placing the speakers on different rather than matching width lines will require that the listening position be offset to center it between the speakers. Often the imaging will be better with the speakers placed on matching width lines.

After listening to the speakers centered on the charted intersections, you should listen with the speakers a few inches away from the intersection points in each direction. In some cases, the speakers will sound better slightly off the intersections due to the particular characteristics of your room or a slight error in your original room measurements. Both speakers should be moved the same amount forward or backward to maintain a consistent listener to speaker distance when fine-tuning placement.

Several factors influence how speakers interface with a room other than the room's basic dimensions so it is possible that none of the placement options on the wall you initially place the speakers on will sound quite right. The sound may be too forward or too withdrawn or the imaging may not be to your liking. If you are unable to achieve satisfactory sound with the speakers placed on one wall, try placing the speakers on a different wall of the room. Even in a rectangular room, the speakers will interface differently with the room depending upon which of the four walls they are placed. In some rooms the speakers will sound best placed on a short wall, while in other rooms the speakers will work better on a long wall.

Acoustical Center

The Quatro's acoustical center is at the front center of the wood top. In a perfectly rectangular room with absolutely rigid walls and no doors or windows, the acoustical center of the loudspeaker would be placed exactly at the point where the two dimensions intersect to realize the full benefits of odd dimensions placement. In a real room, the actual best placement may vary from the intersection by several inches. Fine-tuning the placement by moving the speakers a few inches off the calculated intersections takes these real world conditions into account.

You should not use any placements that put the acoustical center of the loudspeaker the same approximate distance from the rear and side walls or where one distance is a multiple of the other. In our example room, this would eliminate the intersection of the 24 inch width and length lines since they are both the same distances from their respective walls. It would also eliminate the intersection of the 24 inch width line and 72 inch length line because 72 is a multiple of 24. (3 x 24 = 72) If any of the odd dimension intersections in your room are within a few inches of being the same distance from the side and rear walls or multiples of each other, you should not use them.

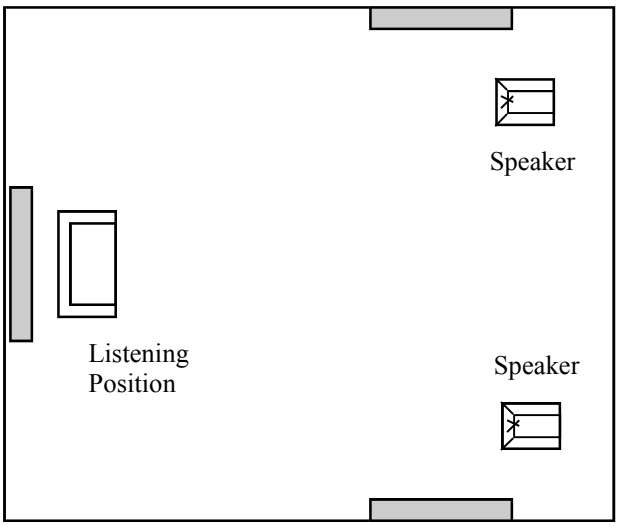
Speaker Toe-In

The degree of toe-in can affect the imaging and response characteristics of the speakers. In most rooms, the speakers will work well facing straight ahead or with a slight to moderate toe-in. Speakers that are placed close to the side walls or in rooms with very reflective side walls may require additional toe-in to avoid a confused image and/or a forward midrange and treble. Although rare, in some rooms the speakers may actually perform better with a slight amount of toe-out.

Acoustic Treatments

If the speakers are close to the side walls and you hear a brightness in the midrange/treble or a problem with the imaging that toeing-in the speakers does not help, some sound absorbent material should be mounted on the side walls to control reflections.

To determine where the sound absorbent material should be placed, imagine that the walls are mirrors and mount the material on the walls where you would see the reflections of the speakers when you are sitting in your normal listening position. Before you actually mount anything on the side walls, experiment with folded natural-fiber blankets to verify that you will get the results you desire.



If your listening position is close to the wall behind you, mount some sound absorbent material, such as a hanging tapestry, directly behind your head. As with the material for the side walls, experiment with a pillow or a folded natural-fiber blanket to verify the results before you acquire or mount the material.

Helpful Hints

A. To try the speakers on different walls, set your equipment in the middle of the room so the speaker cables can reach each possible location.
B. When you change the placement of the speakers, listen to several different reference quality music recordings before judging the results of the change.
C. If you set the speakers on a wood floor, consult your dealer about how to protect the floor from damage.
D. Don't over-analyze the sound of each placement. When the sound is right, it will be obvious.
E. Keep notes on the sound of different placements you try. It is easy to get mixed-up and forget which placement sounded the best.

The Quatros break-in and significantly improve during the first 100 hours of use. Until this period has elapsed, the speakers exhibit some sonic aberrations as the parameters of the Quatro were established with completely broken-in drivers.

INSTALLING THE CONES & LISTENING HEIGHT ADJUSTMENTS

The Quatro is supported by two cones, one in each front corner and one spike in the rear center. The cones and spike thread directly into the bottom of the speaker and provide stability and proper coupling to the floor. Two people are required to safely install the cones and spike. Do not attempt to install them by yourself.

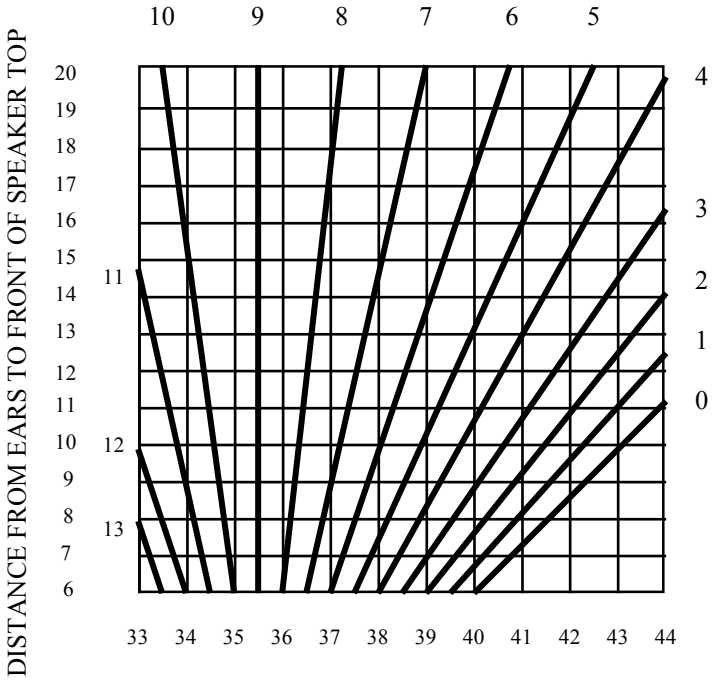
All properly aligned loudspeakers have a vertical listening window where their sound is optimized. The Quatro's six inch high optimum listening window is centered at 35 1/2 inches when the speaker is vertical. If your ear height is above or below 35 1/2 inches at your normal listening position, the speakers should be tilted to center the optimum listening window at your ear height. The chart to the right shows how many spacers should be inserted between the rear spike and the speaker to tilt the speaker for different ear heights and listening distances.

1. Measure the distance from the listening position to the speakers and the height of your ears when you are seated at your listening position. (Ear height is roughly equal to the height of the tip of your nose).
2. Find the values closest to your actual measurements on the chart to the right.
3. Follow the horizontal line across from your listening distance and the vertical line up from your ear height to the point where they intersect. The heavy lines are numbered to indicate how many spacers should be inserted between the rear spike and the bottom of the Quatro to center the listening window at your listening height and distance.
4. Lean the speaker to one side as one person supports the main body of the speaker. Do not touch the front grille to support the speaker.
5. Install two cones into the threaded holes on each front corner. Be careful not to cross-thread the cone, it should go in easily. By hand, tighten the cone snug up against the bottom of the speaker. Do not adjust right or left tilt on a uneven floor without some kind of shim. The weight of the speaker must not be on the threads of the cone.
6. Place the number of washers indicated for the rear spike on a cone and tread it into the rear center of the speaker. Hand tighten it against the bottom of the speaker.
7. Set the speaker up-right.
8. Sight across the front of the speaker's woofer boxes and verify they are both tilting at the same angle. Some adjustments of the washers on one speaker may be needed. It is important that both speakers are perfectly parallel with each other.
9. The two small holes (1/4 - 20) at the rear flanking the center spike are for stability. Install the small spikes but do not allow them to touch the floor. If the tilt chart calls for significant tilt, the outrigger spikes are not required.

Improper listening height can cause the speakers to sound extremely bright or dull.

Two people are required to safely install the cones and spike. Do not attempt to install the cones by yourself.

Be careful not to cross thread the cones as you install them into the bottom of the Quatro. The cones should turn easily by hand. Damaged threads can be repaired with a 1/4-20 thread tap. A stuck cone can be removed by turning it with a nail or small screwdriver inserted through the cross hole.



AN EXAMPLE

In a room where the listening position was 15 1/2 feet away from the speakers and your ear height was 39 1/2 inches, the lines would intersect as shown by the dashed lines on the graph. Since the intersection is closest to the 6 line, you would place 6 spacers on the rear spike.

PLUGGING-IN THE SUBWOOFER AMPLIFER

With the speaker cables connected, the M5-HP cross-over in place, the placement established, and the cones installed, the Quatro's subwoofer amplifier should be plugged-in. The amplifier uses a removable power cord that should be securely inserted into the amplifier and then plugged into a non-switched outlet that is known to be operating properly. If an extension cord is required, it should be as short as possible and constructed of 14 gauge or larger wires. As the amplifier is plugged-in, it will usually produce a thump or pop from the sub-woofer driver.

During electrical storms or when the system will not be used for a long period of time, (i.e. vacations) the Quatro amplifier should be unplugged along with the other components in the system.

LOW-FREQUENCY ROOM OPTIMIZATION AND LEVEL

The eleven room compensation controls located on the rear input plate help counter the amplitude and phase effects of room nodes and anti-nodes and provide the most linear low frequency response at the listening position. This disk is calibrated for the Radio Shack analog S.P.L. meter. Once the controls have been set for a particular room, they should not need to be readjusted unless the speaker placement and/or listening position are significantly changed.

The low-frequency level and contour can be set by the user using a specific type of music as detailed on page 12.

TECHNICIAN'S ADJUSTMENT SECTION (Owners with patience.)

Only a qualified technician or owner with a Radio Shack S.P.L. Meter and matching test disc should adjust the room compensation controls. This procedure can take several hours.

The steady state test signal can cause the Quatro amplifier to run warm. This disk is calibrated to the Radio Shack analog S.P.L. Meter. Owners take your time, its possible.

TECHNICIAN'S GUIDE TO ADJUSTING THE ROOM COMPENSATION AND LOW-FREQUENCY LEVEL CONTROLS.

1. Set the S.P.L Meter at the listening position at ear height. Turn on the S.P.L. Meter to the 70dB scale, "C" weighting, "Slow" response.
2. Insert test disc into a CD Player, set the volume on the preamp to a low level. CD automatically does left first.
3. On the Quatro Amplifier set the low frequency contour control to minimum (#1) and verify that all eleven room compensation band are set straight up (slot vertical). Set low frequency level to 0dB.
4. Play tracks nine through eleven and note on paper the meter readings for all three tracks. Adjust the preamp volume up or down until these tracks average 70dB. Example: track nine 69dB, track ten 72dB and track eleven 68dB. **This is your reference volume do not adjust until this entire calibration is complete for both speakers.**
5. Play track one through eleven and adjust each band to 25 to 30% of the meter reading noted in step # 4.

Play tracks:	1	2	3	4	5	6	7	8	9	10	11
Meter Reading: Noted Step # 4:	+4	+6	–3	+8	+10	–6	+3	–3	+2	+1	+3
Adjust Bands To APX 25%	+1	+2	–1	+2.5	+3	–2	+1	-1	+.5	0	+1

Note: Do not try to adjust every peak or dip all the way to 0 dB. Our studies have shown that adjusting all the peak and dips to 0dB can cause a non-musical sound with audible equalization effects. Your left speaker is now properly compensated for the room.

6. Play tracks twenty four through twenty six and note on paper the meter readings for these tracks. Adjust the right **Quatro Low Frequency Level Control** up oe down until these three track average 70dB like the left channel. Save this last set of reading for use in step# 7.
7. Play tracks sixteen through twenty six and adjust the right speaker bands as in step# 5. Note: Occasionally full adjustment of one or more of the bands will not adjust to the target value for the right or left speaker, get it as close as possible. If one or more of the bands turned maximum up or down makes little or no difference on the meter, leave it adjusted straight up (slot vertical). Your speakers are now calibrated to the room.

Note: The eleven bands correspond to the frequencies below:

	# 1	2	3	4	5	6	7	8	9	10	11	Left Chan.
Frq:	20	24	30	36	42	50	60	72	84	100	120	
	# 16	1	18	19	20	21	22	23	24	25	26	Right Chan.

USER ADJUSTMENTS

Do not try to set the Room Compensation Controls by ear. Due to the complex interactions of the controls, you will only succeed in compromising the inherent accuracy of the speakers. Unless adjusted by a qualified technician, the Room Compensation Controls should be left straight up.

LOW-FREQUENCY LEVEL

Set the low-frequency contour control to minimum (#1) . Select a clean jazz recording with a stand-up bass scaling up and down. Adjust the Low-Frequency Level controls on the speakers until the transition from the subwoofer to the upper part of the speaker is seamless and linear. If during the room compensation calibration, the Low-Frequency levels were different right from left by some dB amount, raise and lower the level as needed keeping the difference between the two.

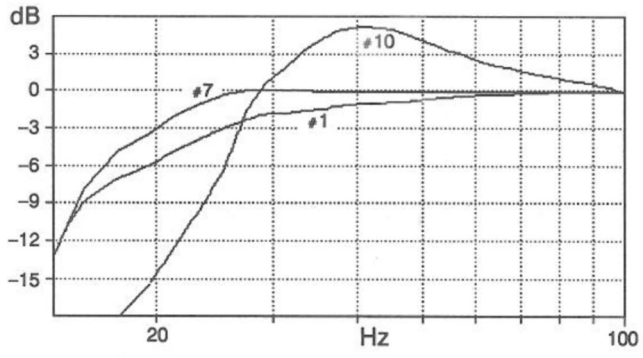
CONTOUR CONTROL (Q CONTROL)

The contour control on the Quatro input plate allows you to tailor the characteristics of the speaker's bass and to suit the listening environment and your personal taste. Since this control alters the performance of the speaker to match your personal taste, they should be adjusted by ear using well recorded, accurate recordings. All the instructions for adjusting this control assume that the Low-Frequency Level and Room Compensation controls have been set by a qualified technician and the Low-Frequency Level has been set using a jazz recording. It is also assumed that the speakers are positioned where they have the best imaging and performance on the mid-bass to upper frequencies, that the cones and spike are installed with the spacers required to set the speakers at your listening height and that the high-pass crossover is in place and properly configured.

Before we address this control and its use, we want to point out that they are not substitutes for tone controls. Preamplifier tone controls are designed to withstand thousands or even tens of thousands of adjustments and are the best way to compensate for your particular tastes and the peculiarities of individual recordings. The Quatro's controls were chosen solely for their sonic characteristics and have a life expectancy of hundreds rather than thousands of uses. This should be enough to cover several lifetimes worth of residence changes or room alterations.

The Low-Frequency Contour control adjusts the Q of the subwoofer to accommodate different rooms, listening tastes, or system modes. In subwoofer engineering terms, system Q is the product of a complex mathematical equation derived from driver, electrical, and enclosure parameters. In practical terms, it relates to the character of the bass response. A low Q subwoofer sounds very tight and controlled. A high Q subwoofer produces a warm, full bass with more energy in the most audible bass range.

The Quatro's Low-Frequency Contour control is leveled from 1 to 10. As shown in the graph below, position # 1 provides the tightest bass (Lean Audiophile Sound), position # 7 is maximally flat as measured at the driver cone, (Linear Anechoic Response) and position # 10 emulates the peaked response of a typical high Q home theater subwoofer (Big and Boomy.)



Our experience is that the bass in most rooms with concrete slabs sound the most linear on high-quality music recordings with the Low-Frequency Contour set in the # 3 to # 8 range. Rooms with wood floors (ie: Second Floor) sound most linear with the contour set in the #1 to #7 range. Please remember that every room and system are different and that the nominal position in your system may be higher or lower due to room characteristics or personal preferences.

Once you have established these settings for your system, using a reference recording (Soular Energy) your Quatros are properly adjusted for the room. Recordings vary so do not be tempted to readjust for different recordings, this is the function of the tone controls on the preamp.

AMPLIFER REQUIREMENTS

The Quatro is designed for use with amplifiers rated from 30 to 200 watts per channel into 8 ohms. These amplifiers will provide ample power for realistic listening levels in most situations. Amplifiers with less than 75 watts should be tested with the volume control half the way up (the point where most amplifiers clip) to verify that the system can achieve realistic listening levels without stress. Amplifiers with more than 200 watts must be used with caution due to the increased potential for speaker damage if they are misused or an accident occurs.

The Quatros are very revealing speakers and are easily capable of showing the subtle sonic differences between amplifiers. They will perform well with a tube, transistor, or hybrid amplifier, allowing each design to realize its full potential.

Fuses between the amplifier and the Quatro will degrade the performance of the entire system. No fuses are used in the Quatro and preference should be given to the use of an amplifier that does not use output fuses.

Preamplifiers and CD players should be left on except during electrical storms or extended absences. Amplifiers should be turned off when the system is not being used. Once broken in, modern power amplifiers sound good after only 20 minutes of warm -up. Leaving the amplifier on all the time exposes the speakers to possible damage from power line anomalies or electrical component failure while the system is unattended.

QUATRO MAINTENANCE

CLEANING

The appearance and performance of the Quatro can be enhanced by observing a few precautions and performing some simple maintenance.

The input terminals on the Quatro and the spade lugs on the speaker wire should be cleaned periodically with alcohol or a solution made specifically for cleaning electrical contacts. Other connection points in the system should be cleaned as per the equipment manufacturer's recommendations.

The grille cloth on the Quatro can be gently vacuumed using a brush attachment that will not snag the cloth. Be careful around the drivers on the front of the speaker. The brush attachment could damage the drivers. The wood should be treated as a piece of fine furniture. The wood veneers are covered with a polyurethane clear coat at the factory and can be maintained with a light application of Pledge or a similar product. Do not use Windex or any product with ammonia on the Quatro.

The speakers should not be exposed to excessive heat or direct sunlight which can damage the fit and finish of the fine wood veneer.

SERVICE

In the unlikely event that your Quatros require service, please follow these procedures.

1. Verify that your Quatros have been set-up and connected according to the instructions in this manual.
2. Verify that the problem you are hearing is in the speaker by switching the left and right speaker cables at the speakers. If the problem switches sides, it is in a component or cable rather than the speaker.
3. Play each bass input and the midrange/treble input of the suspect speaker separately to determine which section has a problem.
4. Contact Vandersteen Audio with your Quatro's serial number, information on your associated components, a description of the problem and the steps you have taken to isolate it to the Quatro.
5. The Quatro is a modular system. Should Vandersteen Audio determine that a subwoofer module needs to be returned to the factory for repair, a Return Authorization form is available on our website.
6. Return the damaged or defective module or driver and the completed Return Authorization Form to Vandersteen Audio.

VANDERSTEEN AUDIO
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Hanford, CA 93230
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www.vandersteen.com

TROUBLESHOOTING GUIDE

Problem: **If the subwoofer hums audible at the listening position.**
Solution: Install 20ga ground wire between the ground terminal of the Quatro Amplifier on the lower right next to the A.C. connector. Connect this wire to the chassis of the preamp or amplifier.

Problem: **Subwoofer driver hums. Audible at the listening position.**
Solution: Try different grounding methods. Try floating the ground connector on the Quatro or main amplifier's power cord. Only one component in the system should be grounded. If floating the ground on the Quatro Amplifier, connect a separate ground wire between the ground terminals of each amplifier.

Problem: **Still hums, grounding changes didn't help.**
Solution: Check your interconnect cables. Route cables away from the amplifier. Position the M5-HP crossover away from the amplifier. Verify that the M5-HP is properly installed in the system. Try the system at a very low volume level without the M5-HP. If the M5-HP 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 Quatro, 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 from the speaker.)

Problem: **No subwoofer output.**
Solution: Verify that the Quatro subwoofer amplifier is plugged into a live AC outlet. (It should thump or pop when you plug it in.) Verify that the AC cord is securely inserted into the Quatro amplifier.

Problem: **High or low subwoofer output level.**
Solution: Verify the actual input impedance of the main amplifier and that the M5-HP is correctly matched to it. Check the low-frequency level and contour control settings.

Problem: **Quatro amplifier excessively hot.**
Solution: If the amplifier does not cool down after playing music, remove the amplifier and return it to Vandersteen Audio for service.

Problem: **Distortion in the midrange or tweeter.**
Solution: Check to see that the metal connectors on the speaker wires are not touching the aluminum input panel. Wire terminals should be bent to exit at approximately 45 degrees.

COMMON QUATRO QUESTIONS

Can a subwoofer or subwoofers be added to a system with Quatros?

The Quatros contain integral subwoofers and there would be no benefit or advantage to adding separate subwoofers. When the Quatros are used in a home theater system, program the processor to redirect the Low Frequency Effects (LFE) and subwoofer information to the front channels where it will be reproduced by the Quatro subwoofers. Vandersteen 2Wq subwoofers can be added if more bass is needed to accommodate a large room. Please contact Vandersteen Audio about using parallel woofers.

What speaker cables sound best with the Quatros?

The cables that sound best with your Quatros are the cables that are most complementary to you particular associated equipment, the characteristics of your room and your personal taste. There is no way for us to adequately evaluate two of the three deciding factors (room and taste) so there is no way for us to accurately predict what cables will sound best with your Quatros.

SUPPORT

This manual has dealt with the installation, use and capabilities of Vandersteen Quatro loudspeakers. You should review this manual with anyone who will use the audio system.

How will I know when an update is available for my Quatros?

Vandersteen dealers will be notified when Quatro updates are available. In most cases, the update will be performed at the factory.

Should you have any questions regarding your Quatro, you should contact Vandersteen Audio by phone M-F 8:00am to 5:00pm Pacific Time. We will do our best to answer your questions and address your concerns.

UNPACKING AND REPACKING THE QUATRO

At least two people are required to unpack or pack a pair of Quatros. Each speaker is shipped on its own pallet and has a gross weight over 120 pounds. Please use the handholds in the boxes and proper lifting techniques to lift and move the speakers.

There could be grease or dirt on the bottom of the cartons. Cover carpet with several layers of newspaper or an old blanket before you set the cartons down.

The speaker must remain up-right as it is unpacked. Be careful about any fingers contacting the top front 18" of the grill in anyway.

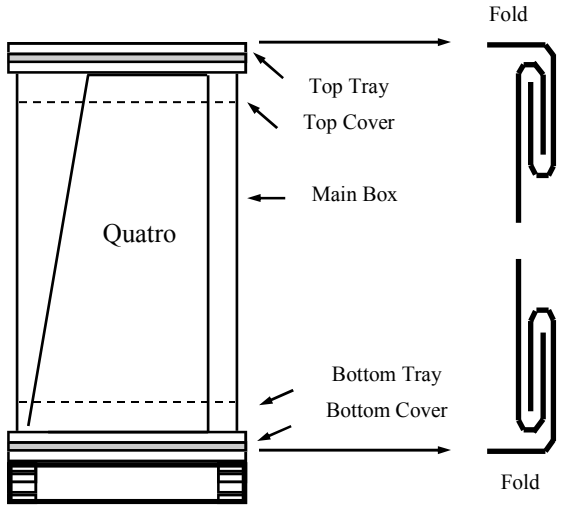
UNPACKING INSTURCTIONS

1. Cut the tape around the top of the box at all four corners.
2. Lift up each of the top flaps to release the main box flaps that were anchoring the top in place and lift the top off.
3. Lift the cardboard up and off the speaker.
4. Cut the tape around the bottom of the box at all four corners.
5. Pull out the bottom flaps to release the main box flaps that were holding the bottom and the main box together and lift the main box up and off the speaker.
6. Lift the plastic bag up and off the speaker.
7. With one person standing on one side and another person on the other side, lift the speaker by tilting it back so that each can get a hand under the bottom of the Quatro. Each person should place their fingers into the recesses for the cones under the front of the speaker for grip, and place their remaining hand 3/4 of the way up the back of the Quatro still tilted approximately 30%. With bent knees, lift the Quatro up and out of the cardboard tray and set it carefully on the floor. Be careful not to drop the speaker even a small distance as this will result in damage to the bottom.

REPACKING INSTURCTIONS

1. Remove all cones and spikes.
2. Place the cardboard tray large recess up on the folded bottom cover.
3. Place the plastic sheet into recess.
4. With another person helping, lift the Quatro and place it into recess using the procedure in # 7 above.
5. Place plastic bag over the Quatro.
6. Place the main box over and secure the flaps with the bottom.
7. Tape the bottom flaps.
8. Place the top tray over the Quatro.
9. Place the top cover over the top tray and secure the flap to the main box.
10. Tape the top cover and main box flap. Use filament tape for both top and bottom flaps.
11. Place both packed Quatros on master pallet and secure them with straps. Shrink wrap the whole assembly. **Do not ship Quatros without strapping them to the master pallet.**

Please keep the boxes, pallets and hardware. Replacement boxes and pallets must be shipped by truck and will cost at least $250.00



LIMITED ONE YEAR WARRANTY

VANDERSTEEN AUDIO loudspeakers are warranted to the original purchaser to 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 driver voice coils or burned crossover components.
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. Suffered physical damage to the structure or components due to accident, neglect, or transportation.

IF A VANDERSTEEN AUDIO LOUDSPEAKER FAILS TO MEET THE ABOVE WARRANTY AND THE ABOVE CONDITIONS HAVE BEEN MET, THEN THE CUSTOMER'S SOLE REMEDY SHALL BE TO RETURN THE PRODUCT TO VANDERSTEEN AUDIO WHERE THE DEFECT WILL BE REPAIRED WITHOUT CHARGE FOR PARTS OR LABOR. THIS WARRANTY APPLIES ONLY TO PRODUCTS RETURNED TO VANDERSTEEN AUDIO IN HANFORD, CA USA.
(Returning the product to Vandersteen Audio from some countries other than the United States may involve considerable time and expense. The customer is responsible for all fees and duties and for providing instructions and all the paperwork required to return the product after it is serviced.)

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.

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

Richard Vandersteen