JANSZEN
ELECTROSTATIC SPEAKERS

Valentina/zA2.1 Electrostatic Hybrid Loudspeaker
Passive Version

OWNER'S MANUAL

Valentina/zA2.1 Owner's Manual

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This Owner's Guide is published only in PDF form in order to save trees and not burden people with even more paper than they are already barraged with. If you'd like a printed copy and do not have a color printer, there are FedEx Office and Staples stores nearly everywhere that can do the printing job at low cost; you can email them the file or bring it to them on a disk or thumb drive. We hope this is alright with everyone.

Table of Contents

1

Safety Information

WARNING: DO NOT EXPOSE THESE SPEAKERS TO RAIN OR WETNESS, WHICH MAY CREATE A DANGEROUS SHOCK HAZARD, AND MAY DEGRADE OR RUIN THE SPEAKERS.

WARNING: DANGEROUS HIGH VOLTAGES MAY BE PRESENT INSIDE THE SPEAKERS. TO AVOID THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE REAR PANELS OR GRILLS OR OTHERWISE DISASSEMBLE THE SPEAKERS. THERE ARE NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

WARNING: CHANGES OR MODIFICATIONS TO THESE SPEAKERS NOT AUTHORIZED BY JANSZEN LOUDSPEAKER, LTD. MAY INVALIDATE REGULATORY COMPLIANCE AND THUS RENDER THE SPEAKERS UNSUITABLE FOR HOME USE. THIS INCLUDES KEEPING THE GRILLS INTACT.

WARNING: JANSZEN SHALL NOT BE RESPONSIBLE FOR ANY PHYSICAL DAMAGES OR INJURY THAT OCCURS AS A RESULT OF MISUSE, DISASSEMBLY, OR UNAUTHORIZED CHANGES OR MODIFICATIONS MADE TO THESE SPEAKERS.

WARNING: CONTINUOUS EXPOSURE TO LOUD SOUND CAUSES HEARING DAMAGE.

WARNING: AMPLIFIERS CAN DELIVER HIGH VOLTAGES TO THE INPUT TERMINALS TO THE SPEAKERS. TO AVOID THE RISK OF ELECTRIC SHOCK, DO NOT ALLOW CHILDREN OR ANIMALS ACCESS TO THE BINDING POSTS.

Caution:

1. **Read these instructions** – All safety and operating instructions should be read before the speakers are operated.
2. **Save these instructions** – keep the safety and operating instructions for future reference.

3. **Heed the warnings** – All warnings about these speakers should be followed.
4. **Follow the instructions** – All operating and use instructions about these speakers should be followed.
5. **Condensation** – When moving the speakers from a cold to warm location, such as during delivery on a cold winter day, moisture may condense on components within. If this should occur, the speakers might not operate properly. Consequently, after bringing the speakers in from the cold, we advise leaving them idle for a day *before connecting or powering them*.
6. **Water and moisture** – The speakers should not be used near water – for example, they should not be placed near a bathtub, pool, sink, lawn sprinkler, etc., and generally should not be placed outdoors.
7. **Heat and flames** – The speakers should be located well away from strong sources of heat or flames, such as fireplaces, propane heaters, stoves, etc..
8. **Particulates** – Smoke from tobacco or cooking, aerosol or splattered grease from cooking, and air pollution over a long period of time can have a deleterious effect on any speakers, including these. In particular, avoid spraying anything anywhere near the speakers.
9. **Power cords** – As with any power cords, they should be routed so that they are not likely to be walked on or pinched by heavy objects. It is also important to prevent access from animals or children that may chew or otherwise damage the power cords.
10. **Liquids** – Care should be taken not to spill liquids onto the speakers.
11. **Foreign objects** – Care should be taken not to press, poke or otherwise push foreign objects into the cloth grills, such as pencils, fingers, toy airplanes, cat claws, etc..
12. **Cleaning** – Do not use abrasive cleaners. Do not spray or let anyone else spray any sort of cleaner, polish, conditioner, or anything else on or near the grills.

    Paint: For removing dirt and finger marks, the paint can withstand glass cleaner, lighter fluid, alcohol, kerosene, or naptha. Avoid getting any of these substances on the wood or grills. Apply any of these to a *soft cloth*. Wipe *gently*, because wiping hard can polish away the matte finish and leave a shiny area.

    Wood: The wooden surfaces should be wiped with nothing more than a soft cloth dampened with plain water. Do not use cleaners, polishes, conditioners, or any other chemical preparation. The final coat of wax finish on the wood will be removed by most of these.

    Grill cloth: The grill cloth can be vacuumed.

13. **Overload** – It is best not to connect the speaker to an amplifier that can deliver more than 400W/channel into 8 Ohms. The speakers are protected from continuous play at high amplitude with higher power amplifiers, but we cannot guarantee against the possibility that transients delivered by such amplifiers will cause serious damage that requires service.

    If the amplifier is capable of delivering excessive voltage, then any brief transient can ruin the electrostatic elements. In other words, if the amplifier can ruin the elements, then it probably will at some point, even when always playing "not loud". This can happen from a power-on or power-off transient, a cable pulled or inserted while the amplifier is on, scraping across even just one groove on an LP, jarring a microphonic component or cable, switching the preamp to a louder source while it is playing, performing tests that involve sine wave sweeps or impulse signals, etc.

    We can detect this type of damage easily, and it will void the warranty.

14. **YOUR EARS** – Distortion and compression are what make ordinary speakers seem loud when the volume goes up, but electrostatic speakers do not do this.

    Because your Valentina/zA2.1's are capable of producing high sound pressure levels (SPL) without distortion or compression, it is easy to exceed safe loudness without noticing. As a general rule, if you can feel the bass in your belly, or if you have to shout to be heard by a person sitting next to you, it might be too loud.

    A pair of Valentina/zA2.1 speakers can produce a peak SPL of over 108 dB, even in a fairly large room, 114 dB in a small room, and with some kinds of music, a steady level **over 100 dB** is possible. **This can damage your ears permanently, and fairly quickly**.

    If you hear ringing in your ears soon after or within a day or so of listening to loud music, you have damaged your ears, perhaps slightly, but permanently. It is also possible to damage your ears even without hearing ringing.

    It is important to know --

    No one notices the usual bits of hearing loss right away after each overexposure. It adds up over time. If you don't avoid exposure to loud sound, then at a relatively young age, music will sound dull, or certain notes will be missing, or you will hear constant noise in your ears, and you will have trouble understanding what people are saying, first in noisy places like restaurants, and then everywhere. If you think you may already have hearing loss, it's never too late to stop making it worse.

    15 minutes is the NIOSH and CDC 2002 recommended **maximum exposure time to a steady SPL of 100 dB**. The time limit is 4 hours at 85 dB. This 4 hour time limit is cut in half for each additional 3 dB in loudness: 2 hours at 88 dB, 1 hour at 91 dB, and so on.

SO PLEASE BE CAREFUL and you will not hurt your ears and thus your future enjoyment of music.

You can measure loudness with a simple sound level meter. If you wish to check your exposure, JansZen can supply a good quality sound level meter such as we use ourselves at modest cost. Radio Shack also offers one. There are also apps for smart phones that work as sound level meters and spectrum analyzers, although they will probably miss the high frequency extremes due to microphone quality. Follow the instructions for the device or app to make sure your readings are valid.

2

Welcome

You have chosen JansZen loudspeakers!

Your Valentina/zA2.1 will bring you the utmost in music listening enjoyment through its exceptional purity and naturalness in sound reproduction. While these speakers include esoteric technology, you can rest assured that they are designed and built with the best of advanced materials and techniques, and are ready to bring you consistent, unwavering performance for decades to come.

Please feel free to keep in touch with us, letting us know anything you'd like to tell about your listening experiences, or about great amplifiers, source gear, or music that you have found suit you and the speakers particularly well. We're also here to help with any setup challenges or other questions.

Happy listening.

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3

Unpacking

Do not allow the delivery person to leave until you are satisfied that there has been no shipping damage.

If there is damage, please refuse the shipment, and it will automatically come back to us for repair/replacement. The situation will be harder to handle if you notice damage after the delivery person has left.

Carton contents

Each of the two cartons should contain one speaker and one power cord, and one of these should also contain one bag of shim washers. If you have ordered carpet spikes for self-installation, one carton will have both packages of spikes.

Unpacking

The following steps will get your new speakers out of the cartons and onto your floor without mishap:

1) Move the carton onto a carpeted area, or lay a blanket, bath towel, or other soft material down onto the floor to use as an unpacking surface.
2) Set the carton on its long side with the flaps up, which matches the "this side up" markings on the sides of the carton, and slice through the tape to free the flaps. We'll call this side the top.
3) Remove the power cord, the bag of shim washers, and if applicable, the boxes of carpet spikes.
4) Bend the flaps back as far as possible. If you are working alone, the next steps will be easier if you tape the flaps down against the sides of the carton.
5) Roll the carton completely over so that the top has now become the bottom.
6) Lift the carton away and set it aside.
7) Lift the blue foam insert away from the speaker.
8) Grasp the top end of the speaker, pressing the remaining blue foam insert against the speaker so that the two do not separate.

9) Gently tilt the speaker up until it is vertical, then further until the feet to the side with no insert touch the floor.
10) While continuing to support the speaker, remove the remaining blue foam insert, and let the speaker down onto all its feet.
11) Tilt the speaker forward and clip the tie that holds the bag shut, then slip the bag up and off.
12) Remove the protective film from the enclosure.
13) We advise that you retain all packing materials in case you want to sell or return the speakers. The cartons can be folded flat, and the inserts can be interleaved to occupy less space.

Feet

If the speakers were fitted with rubber feet, and you wish to switch over to carpet spikes:

1) Lay the speaker onto its face on a carpeted or other soft surface.
2) Using a #3 Philips screwdriver, remove the screws holding the feet in place.
3) Locate the studs in the package of spikes.
4) Screw the studs into the inserts in the speaker base. The studs have a slot at one end to facilitate this.
5) Screw the spikes onto the studs.
6) If the spikes have been ordered for use on carpeting, as we would advise to make firm contact with the floor, ensure that the adjustable tips are screwed in tightly.
7) If the spikes are for use on hard floors, metal pads are included to avoid damage to the floor, and the adjustable tips can be used to accommodate uneven surfaces.

Grills

The speakers are designed to offer optimal sound reproduction with the grills in place, and they also help protect the electrostatic elements, both from mechanical damage and from collecting particulates from the air.

The grills are permanently installed. Removal or an attempt at removal will cause irreparable damage.

4

Moving

The speakers weigh about 28 kg [62 pounds], so they can be hard to move for someone working alone. If you are unpacking these alone, here are a few suggestions.

Large movements

The easiest way to pick one up is:

1) Ensure that your clothing presents no exposed hardware, such as a belt buckle, snaps, rivets, buttons, etc., that could come into contact with the speaker and scratch the paint or wood.
2) Standing to one side, tilt the speaker forward, allowing it to rest on one hand.
3) Grasp the far upper foot on the base with your other hand.
4) Lift *using your knees*. Do not strain your back by lifting with your back.
5) To get through doorways, rotate the speaker onto your hip or up onto the hand that is grasping the foot.

Small movements

When fitted with rubber feet, the easiest way to move a speaker by small amounts is to tilt it onto two feet and walk it along by rocking it back and forth onto one foot at a time while rotating it each time it's on one foot.

When fitted with carpet spikes, damage to the carpet is likely when attempting to walk the speakers. In this case, you would do well to place a pair of wooden or plastic slats under pairs of feet and slide the speaker along on these like a sled.

5

Cleaning

Wooden baffles

The final wood finish coat is wax, which will be removed by most cleaners. Wipe only with a soft, damp cloth.

Painted and metal surfaces

These surfaces can withstand strong cleaners as well as alcohol, but **do not spray anything directly onto the speakers**. Dampen a soft cloth with your solvent or solution of choice, and wipe gently with that.

Grill cloth

The grill cloth can be vacuumed directly with a brush attachment.

Warnings

- **Do not spray anything near the grill cloth. Any sort of cleaner or water mist can harm the speakers if it gets through the grill cloth.**
- **The grills cannot be removed. Any attempt to remove them will cause irreparable harm.**

6

Quick Start

At mid and high frequencies, the Valentina/zA2.1's directivity keeps the stereo image from being affected by room placement in all but the most reflective rooms. As with any non-dipole speakers, though, the bass is practically omnidirectional, so nearby walls will reinforce it.

A good starting setup:

- The speaker with the even serial number should be placed to the right, and the odd to the left. The speakers are acoustical mirror images of each other, and optimal sound occurs inboard when so arranged. If you have the airLayer option, you'll not have to read the serial number, because each should be aimed at its near side wall, that is, in the outboard direction, not toward the center.
- Arranged into an equilateral triangle setup, that is, an equal distance between the speakers and each other, and between each speaker and you. Of course, some will prefer or be practically limited to a smaller angle between the speakers, which is perfectly fine. It can be argued that an equilateral triangle setup is an artifice cooked up in the early days of hi-fi in an attempt to standardize things. In reality, it makes little difference, other than the obvious, namely affecting the stage width.
- Aimed directly at your listening position or slightly toed out from there so that their axes cross a foot or two behind you.
- Positioned close to the front wall, with the rearmost corner between 24 and 32 inches [60 to 80 cm] out. Correct proximity to the front wall is very important for bass reproduction, because these speakers are designed to rely on wall reinforcement, but not too much or too little. When the speakers are also close to the side walls, however, better bass might be had with a bit more distance from the front wall. Also, changes to the distance from the walls can be used to decrease excitation of a problematic room mode.
- Positioned a different distance from the side walls as from the front wall, to prevent overlap of the reinforcement spectra. For smoothest bass, the side wall distances should be asymmetrical, with the pair shifted a foot or so to one side, and for best imaging, symmetrical.

- Tilted back the right amount for facing upward directly at each of your shoulders. They ship set up for a listening distance of 2.5 to 4 meters [8 to 13 feet] at a 1 meter [39 inch] height.
- Tweeter control set at maximum (0 dB) and the woofer at 0 dB.
- 200W/ch/8 Ohm solid state amps are a good place to start. Aside from that, one should use at least a 40W/ch/8 Ohm amplifier; 90W to 120W will provide maximum steady state SPL, but 250W will give the headroom needed for full transient reproduction; 400W max. If driving with a tube amplifier, use the 4 Ohm output taps for best woofing (highest damping factor), or the 8 Ohm tap for highest SPL.

  That said, an 18W parallel 300B SET will somewhat surprisingly produce adequate volume levels for small ensemble music in a large room, so if what you own now is a tube amplifier with relatively low power, it's worth waiting until you hear it with these speakers before shopping for a new amplifier.

Tips:

- The tweeter level changes quickly with control increases but *very* slowly to decreases. For decreases, the speed will be increased by switching the speaker supply off for a while, such as five or ten minutes, before repowering and listening at the new setting. The quickest approach is to start low, and increase the level to what you like, so each change you make happens quickly.
- Too much bass? First make sure the tweeter control is all the way up (set at zero). Then try setting the woofer switch to a lower position, or moving the speakers away from walls, and particularly out of corners.
- Not enough bass? Try moving them closer to walls or corners or setting the woofer switch to a higher position.
- Lumpy bass? Try making the side to side position asymmetrical, e.g., moving the pair together off-center. In extreme cases, such as square rooms, adding wide-bandwidth bass absorption or even tuned traps may be necessary.
- Imaging problems?
    - If your back wall is closer than about 10 feet [3 meters] behind you, try adding some absorption (if your room is lively) or diffusion (if you room is already well damped) to that wall.
    - If your listening seat has a high back, change to a seat with a back that does not come higher than your shoulders.
    - Try moving them farther from the front wall, while realizing that the trade-off will be less bass.
    - Experiment the amount of back-tilt.
    - Add absorption or diffusion at the side wall first reflection points.
    - Make the side to side position symmetrical

- Upper treble response can be rolled off to taste by reducing toe-in.
- Experimenting with the back-tilt can also tailor the response, but will produce changes that are more radical than from changing the toe-in; in particular, a treble dip will be created when significantly off the ideal tilt angle. Also, changing the back-tilt away from a straight-facing aim will degrade time-alignment.
- The back-tilt adjustment can be accomplished in a few ways:
    - Best: Hang a small mirror from the top of the speaker using tape or tape and string, so that it rests against the rectangular grill. Its center should be about 6" [15 cm] from the bottom edge of the grill. Make a mark or stick a small bit of tape on the mirror at 6" [15 cm] from the bottom of the grill and centered side-to-side. Sit at your listening position, with your head facing forward. When you can see your right eye or ear at the mark on the mirror, the tilt is correct.
    - Shine a flashlight toward the speakers from about 4" [10 cm] above the head while seated at your listening position (or shoulder height for pre-2014 models) and watch for a reflection halfway up the speakers from the baffle next to the rectangular grillcloth.
    - Affix a laser level to the center of the side of one speaker, and make the beam strike a piece of paper suspended at the height mentioned just above.
- When there is too much deep bass, and the only solution is to deviate from an equilateral triangle to get the speakers away from side walls, this will obviously narrow the soundstage, but could be worth it.
- For recordings made using a Blumlein microphone arrangement, a 90° angle between the speakers is best, although this is hard to arrange in most rooms without sitting very close to the speakers, which not everyone will want to do, and where the drivers do not converge as well in time. In many cases, a very wide arrangement is just more enjoyable for the extra soundstage width, and the image is always crisp enough to support this without degrading focus.
- For the most holographic effect, try two-microphone recordings, especially binaural!

For details about optimizing the back-tilt, please see page 17. Also, there's a tilt solving spreadsheet on the web site under the TECHNICAL menu.

7

Connecting and Powering

Binding Posts

The standard binding posts accept spades or bare wire, but not banana plugs, although they can be clamped into the posts in a pinch, so to speak. We have nothing against banana plugs, but came to appreciate the design of the Cardas Patented post assembly, with its handy, single knob clamping mechanism, solid copper posts, and rhodium plating. (Rhodium has the corrosion resistance of gold, but is much harder.) A proper connection is well assured in all environments without periodic tightening.

We also offer 5-way posts on special order that will accept banana plugs.

Cables

We recommend 12 gauge, stranded, pure copper wire, well terminated to high quality spade lugs for any length run up to 50 feet [15 meters]. Heavier wire can be used, of course. Note that the resistance, inductance and capacitance of zip cord of these gauges are at least ten times better than needed to avoid influence on the sound.

We offer well-made cables at a reasonable price. These are 12 gauge, heavy-jacketed cables terminated to high grade connectors, made to last, and available with a choice of several outer braid colors. They are amazingly flexible, as if from a much lighter gauge, due to the fineness of the strands and the suppleness of the jacketing. No other cable will produce better results with our speakers.

Power Cords

The power cord is for the bias supply that charges the electrostatic panel membrane. Note that the supply in each speaker draws mains current of only 0.008 to 0.08 Ampere, depending on the mains voltage. The supply circuit is unrelated to the signal path. The speakers have no susceptibility to airborne or power line borne electrical interference.

There is consequently no benefit to using a special power cord.

The bias supply will work correctly with any mains voltage, and if the speakers are moved internationally, suitable power cords for any wall socket arrangement can be obtained worldwide and used without concern for converting/adapting the voltage.

Powering

As implied in the previous section, the speakers must be powered to obtain sound from the electrostatic elements. You may note that there is an on/off power switch. The speakers may be left powered on at all times without harm, but if they will be left idle for an extended time, or if the air often contains smoke or other contaminants, it is best to power them off.

The speakers can be powered on at any time relative to the other equipment.

8

airLayer Option

The Valentina/zA2.1 speakers are very directive in the vertical, and rather directive in the horizontal. This serves to minimize the involvement of the room, thereby making setup easier, and maximally conserving the recorded ambiance and the precision of the image. With recordings that do not have realistically recorded ambiance with well conserved phase information, a potential drawback is the perception of a closed in soundstage, extending only from one speaker to the other.

The airLayer option comprises a high grade ring dome tweeter mounted outboard on each speaker, firing sideways toward its near side wall. The purpose of bouncing some sound off the side walls is to widen the soundstage and provide a sense of spaciousness that can be missing from directive speakers such as the Valentina/zA2.1.

These tweeters are wired in phase with the sound coming directly from the front of the speaker, and the point source sound that reflects from the side walls is not strongly correlated with the line source direct sound. They are also set up to produce sound mainly from about 2 kHz to 6 kHz. As a result, their top end is more like what will be reflected from the side walls of a concert hall, and the sonic reflections from the side wall do not smear the image noticeably, as would the off-axis sound from a dipole or the more usual wide dispersion cone/dome speaker. The benefit is the same sort of airiness as with these more dispersive speakers, but without the drawbacks.

Setup

The airLayer tweeters are continuously adjustable with a rotary control knob between off and way too loud. In the usual setup, with the side walls a few feet away, a setting of -10 dB is a good place to start. Their sound should not be obvious. The effect is meant to be subtle and not call attention to the side tweeters, but help prevent attention from being called to the main drivers.

If the side walls are different distances from the speakers, or have different types of materials, it is best to turn off the ESL bias supply and wait until there is no output from that portion of each speaker. At this point, you can adjust the airLayer tweeters for good center balance. Once that is done, you can turn the bias supplies back on again, and test

for overall effect. You can turn them up or down and the balance will remain okay as long as you keep the difference in dB between the two settings the same.

Controls

Unfortunately, our supplier for the usual control fascia (marked in dB) sometimes runs out of stock. This means we sometimes ship airLayers with knobs that are not calibrated in dB, but simply marked linearly from 1 to 10 or worse, from 0 to 11. In the following image, you can see the correspondence between two of the types of dial plate.

Fig. 2 Dial plates

Here's a translation table showing dB of attenuation with the linearly numbered dial plate:

Linear	dB	Linear	dB
1	-16	6	-3.5
2	-9	7	.2.8
3	-7	8	-1.8
4	-5.5	9	-1
5	-4.5	10	0

8

Setup Details

Backward Tilt

The Valentina/zA2.1 speakers are very directive in the vertical. There is thus about a 22 cm [9”] range of ear height that will experience full spectrum sound. In addition, the backward tilt serves to present the sound from all the drivers in phase (“time aligned”) at your ears, which improves the smoothness of the frequency response by minimizing the effects of interference between the drivers, and creates a high degree of phase coherence.

It is thus important to ensure that your speakers are tilted so that they are both equally well aimed upward at your ears when you are in your usual listening position.

The speakers are shipped with the angle set for listening distances of 2.5 to 4 meters [8 – 13 feet] with a nominal ear height of 1m [38 inches]. Since listening heights and distances vary, you might benefit from some experimentation with the angle.

You can prop the front or rear of the speakers with books, tableware, whatever, until the vertical centers of the speakers are fairly close to being aimed directly at your ears.

Shim washers are provided in a small zip-lock style bag, and you can make your new angle permanent by removing the feet at the front or rear of the speakers and inserting enough shims to match the amount you shimmed in your test.

To remove the feet, set the speaker on its face. The rubber feet are held on with screws that take a #3 Phillips screwdriver. The carpet spikes are screwed onto studs, and are turned counterclockwise to remove them.

Tilt explained

After the following brief explanation is a series of diagrams that indicate what is going on with tilt:

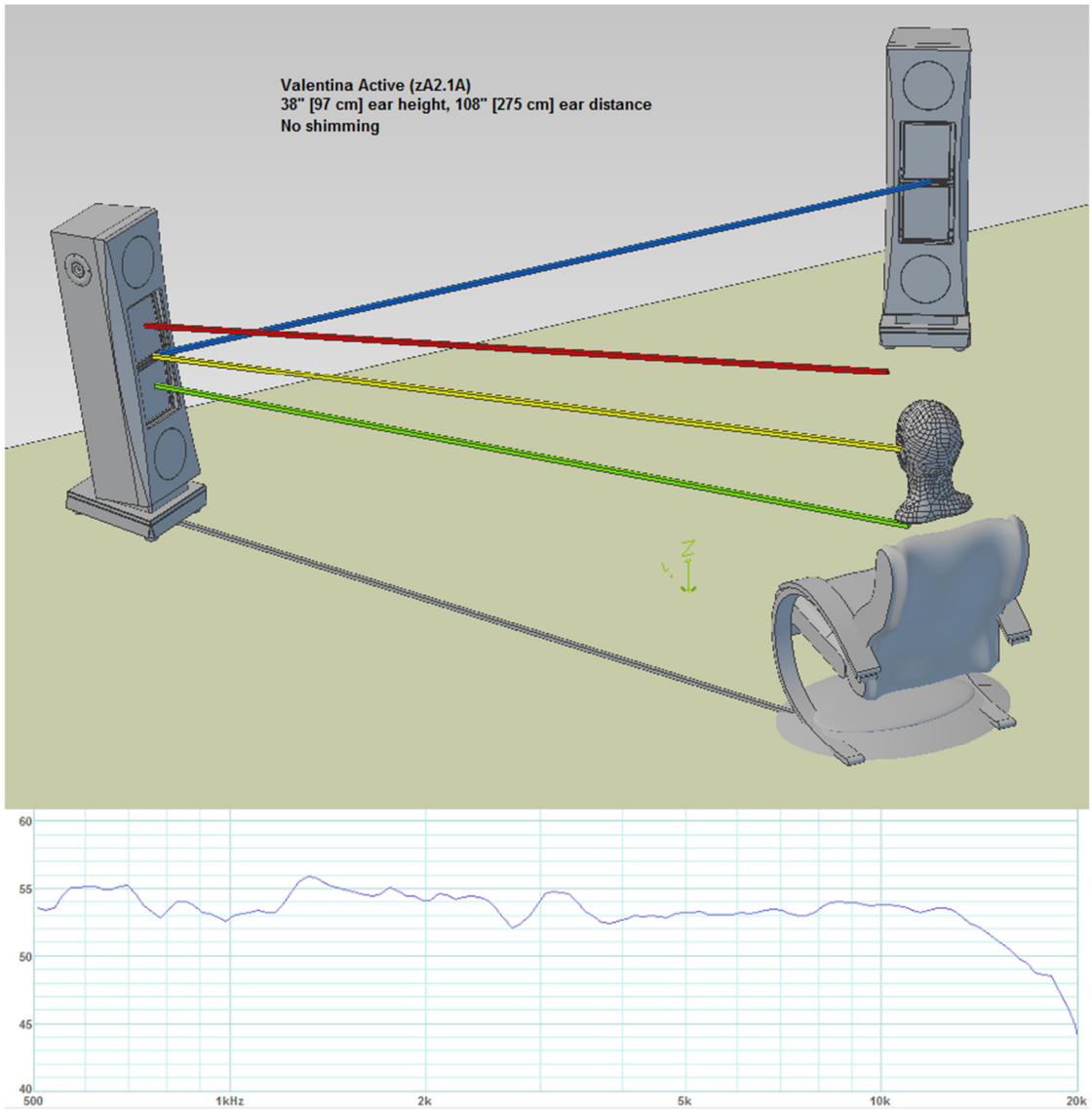
There are two electrostatic transducer panels, one above the other. They are tilted back from where they meet with a 6° angle between them. This is to spread the sound into a taller listening window than would otherwise occur. Without this angle, the tall height of the pair of panels would create about a 1" [2.5 cm] tall listening window. A wider angle creates too much treble droop on axis.

The red line is the axis of the upper panel, the green line is the axis of the lower panel, and the yellow line is the central axis, e.g., perpendicular to the middle of the baffle. (The blue and gray lines have to do with making an equilateral triangle, which is beside the point, here.) The response plots were taken in my office, so please excuse the minor ripples.

Not enough tilt

The first diagram illustrates the situation when the speaker is aimed exactly at the ears. In this case, each panel is aimed 3° above or below straight at the ears. This causes some response droop in the top octave, but otherwise the curve is pretty flat.

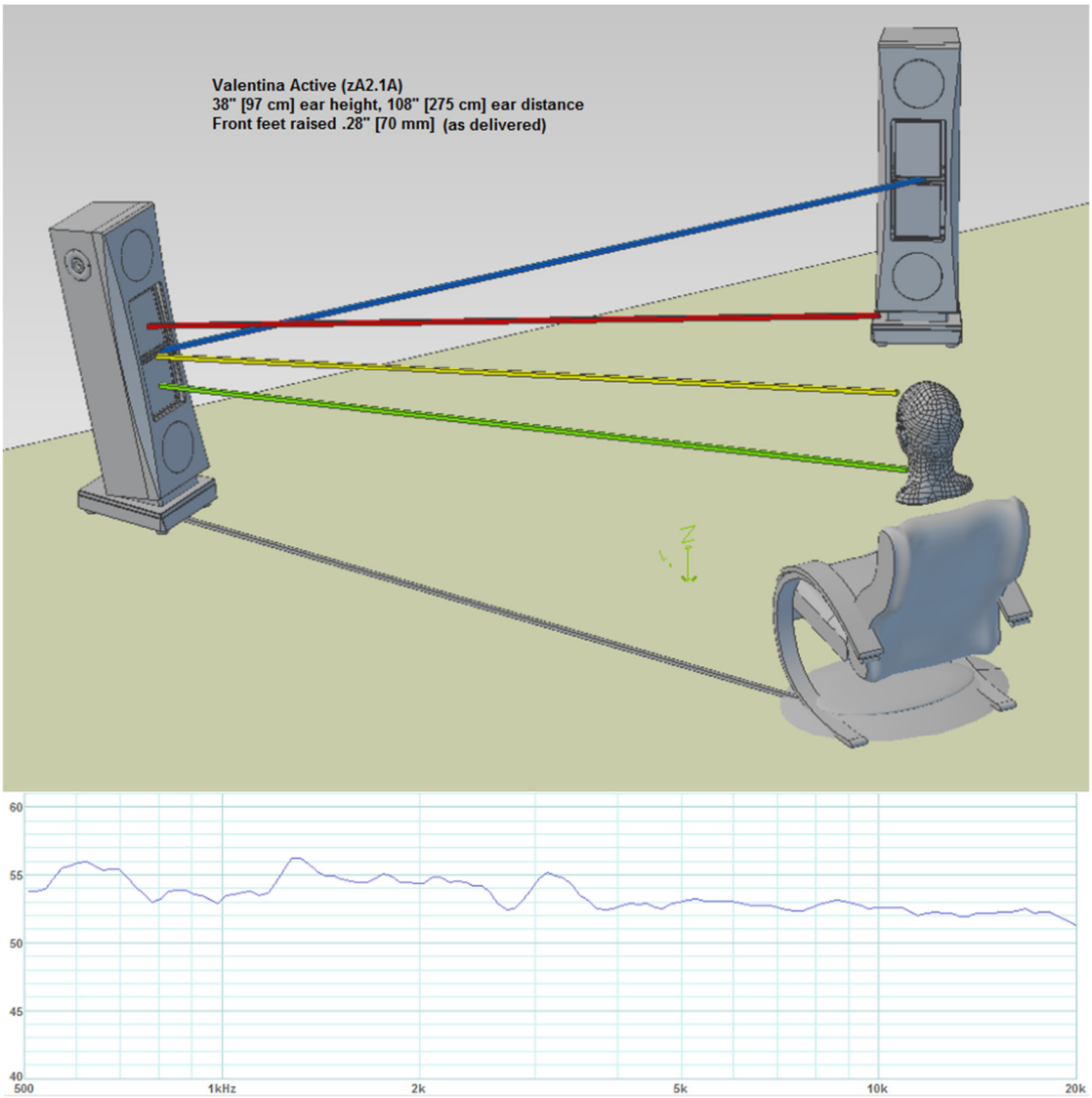
Because the droop is simply due to aperture effect, there is no impact on phase, so if you are someone without much hearing sensitivity above 15 kHz, there would be little point in further adjustment if the speakers arrived this way, which they generally won't, because we ship them with a typically ideal amount of front foot elevation.



Ideal tilt

The next diagram illustrates the ideal tilt angle for the 38" [97 cm] ear height at 9' [275 cm] distance shown. This is where the aim is midway between having either the central axis or the lower panel aimed directly at the ears, which is how the speakers are shipped.

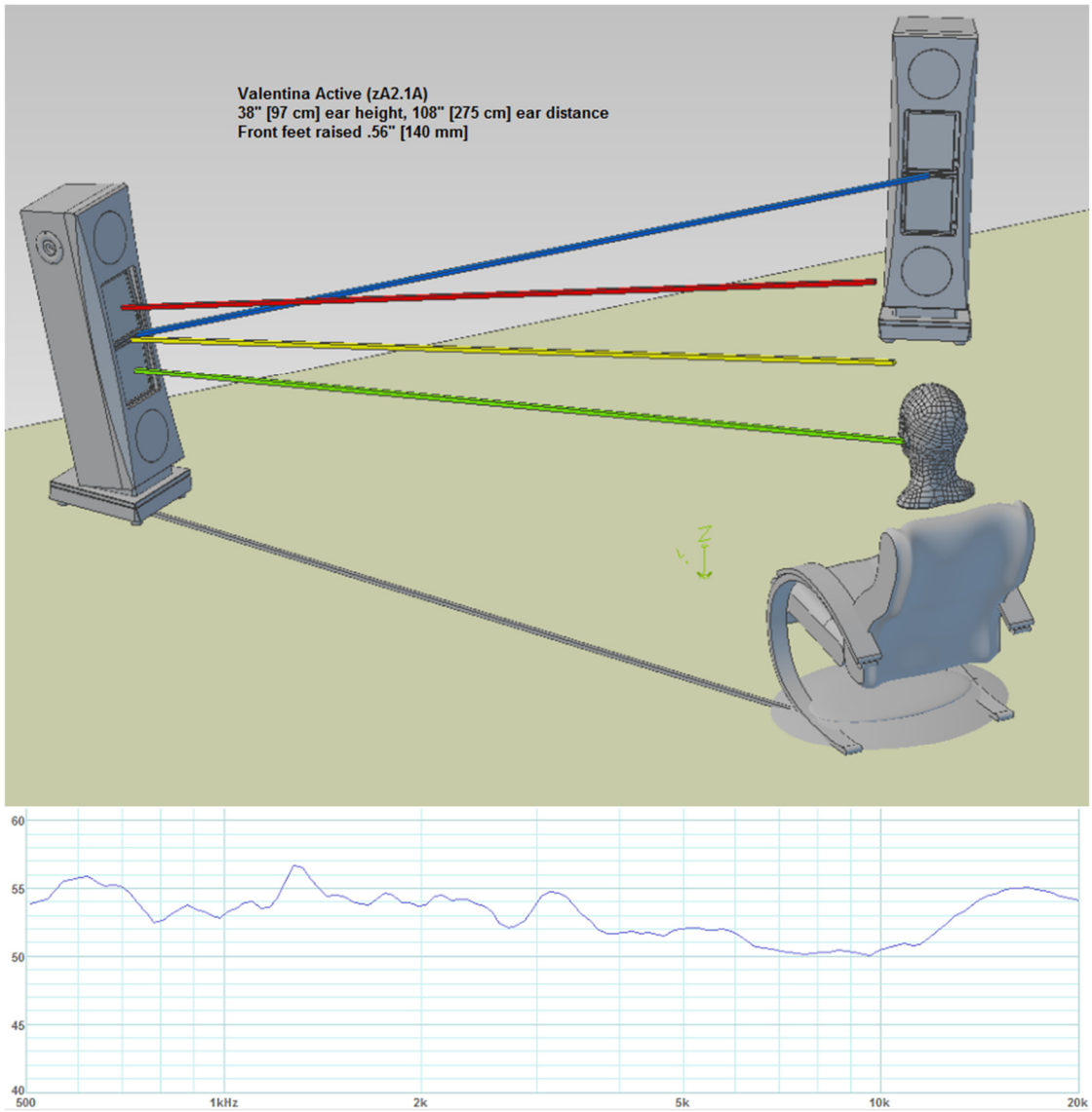
The gentle roll-off in the treble response is a deliberate feature of the active version's equalization. It creates a more natural presentation than an absolutely flat response, considering the usual microphone placements when making recordings. The passive version rolls up a bit in the treble, which is corrected by reducing the toe-in.



Too much tilt

The last diagram illustrates what happens when the lower panel is aimed directly at the ears. Interference effects between the two panels causes a mid-treble dip, and the on-axis response of the lower panel causes an upper treble rise.

Of course, these deviations are still well within what is generally accepted as an adequate ±3 dB response flatness, and the narrow bandwidth smoothness remains impeccable (no peakiness). While the effect of this degree of tilt will be undetectable to most people, just possibly making the speakers sound slightly dark, I consider it worth avoiding, nonetheless.



Stereo Image

The stereo image will be usually best when an equilateral triangle is created by the speakers and the listening position. On the other hand, there is a strong argument that this angle was simply made up for no good reason other than memorability, and everyone should use whatever they want.

It is very important to avoid the use of a high backed chair that will reflect unwanted sound into your ears with practically no delay, even when the headrest appears to be made of soft, sound absorbent material. This has a disastrous effect on realism as well as the stereo image.

Lastly, if the back wall less than a few meters [ten feet] behind the listening position, it is helpful to add absorbent material there, such as heavy curtains or a decorative carpet. If you are not averse to the appearance of diffusors, adding those instead of absorption to that area will help, and do so without decreasing "air".

Room Compensation

In a moderately lively, fairly large room, you will probably get the best sound when the speakers are toed in so that they face directly toward you or toward a position a couple of feet behind you. This will also give the widest seating area with uniform sound from both speakers.

Exaggerated Treble

The upper treble might be exaggerated by reflections from the wall behind the listening position, or by a generally lively room, that is, one with lots of hard surfaces and not many soft ones. This can be counteracted by reducing the amount of toe-in.

If the mid-treble is exaggerated, it will probably be best to increase the woofer setting to the +3 position, if it is not already set that way, or if it is, then reduce the tweeter level.

Exaggerated Bass

If you find that it is necessary to place the speakers near walls or into corners, the bass will be reinforced by the nearby surfaces. If your equipment has a bass knob or low frequency equalization control, or your file player has some DSP capabilities, that will be the best way to handle the situation. Otherwise, if the tweeter level is not all the way up, set it so, or if it already is, then set the woofer switch into its middle position.

Note that there is no file player software at this time that can perform DSP directly on DSD files, i.e., your player EQ will only work on PCM files. If you need your player to EQ DSD files, you'll need to set it to convert the streams to PCM.

Room Boom and Suck Out

Room resonant modes can cause certain bass notes to be greatly exaggerated and others to be nearly missing. Properly tuned and positioned bass traps are the ultimate solution, but no one will blame you if you don't want to bother.

You can make some headway against these effects with no additional hardware by decreasing the setup symmetry. This is done by placing each speaker a different distance from each side wall and rotating your entire listening triangle 10 or 15 degrees relative to the walls. Fore and aft adjustment of the listening triangle will also have an effect.

By changing one's seating height, one can get one's ears more or less away from where the floor/ceiling mode has its strongest effect.

9

Features and Specifications

- Frequency response -- 30 Hz - 20 kHz +/- 3 dB on axis (in room)
- Sensitivity -- 87 dB/1W/1m minimum
- Power handling -- 40W - 400W RMS/ch/8 Ohm recommended; higher than 400W risks damage; 120W nominal for max steady state SPL; 240W for full headroom for transients
- Impedance -- 6 Ohms nominal, 4 Ohms minimum
- Peak SPL -- 108 dB (pair playing music at 4 m [13'] in mid-sized room -- 4.5 m x 7.3 m x 3.0 m (15' x 24' x 10')
- Fully enclosed, not dipoles, makes placement easy
- Listening area
    - Full spectrum 2 m wide @ 4 m (6.5' wide @ 13')
    - Very tight vertical dispersion and relatively narrow horizontal dispersion conserves recorded ambience, reduces interaction with the room, and sharpens the soundstage, yet is wide enough to avoid a headphone effect
- Crossover -- 1st order @ 500 Hz -- far below the disturbance-sensitive hearing region of 1 kHz - 3 kHz; entire midrange and treble carried by the electrostatic elements; minimum phase operation through crossover region
- Secondary partial crossover -- 1st order at 5 kHz -- limits upper treble from half width of ESL panel -- controls dispersion and flattens response without an electrical rolloff network
- airLayer rolls off 2nd order below 2 kHz, 1st order above 6 kHz
- 2.5 way, WTW (Woofer - Tweeter - Woofer) quasi-line configuration
    - Woofers mounted above and below ESL array; ESL panels employ half-split-response (1.5 way ESL)
    - Woofer radiation pattern mates better to ESL array
    - Reduces room mode coupling and eases placement
    - Excellent phase alignment for soundstage focus
    - Vertical image stability
    - Minimal floor bounce effect
    - Image raised above speakers
- Woofer level -- three settings - autoformer maintains damping factor and cone control -- no resistive divider
    - Intimate Mode -- on-axis seating

            - Intimate A: +3 dB -- compensates for when speakers are placed far from front wall (or boosts bass near front wall)
            - Intimate B: 0 dB -- for speaker placement near back wall or more relaxed bass response
        - Audience Mode: -3 dB -- for off-axis listening; matches woofer level to room diffusion of highs
- Tweeter/midrange level setting from normal to -6 dB
- ESL panels
    - Two identical panels in each speaker, mounted in a barometrically isolated sub-enclosure
    - Vertical array; 18 cm wide x 40 cm high (7"W x 16"H)
    - Protected by an integral barrier
    - 520 square cm [80 square inch] forward radiating area per array
    - Tough, stable, injection molded, ABS stator frames
    - 66-element, parallel wire, stator electrodes (total of 132 electrode elements per panel)
    - Unique panel construction and materials are immune to the effects of wide and rapid temperature and humidity swings
    - Optimal sonic membrane material
        - Thickness less than 1/15th of a sheet of 20 lb paper -- lighter than the air it is driving
        - Acts as a virtual air driver with force applied evenly over its whole surface -- no breakup, no colroation
        - Properly damped, unlike see-through electrostatics
        - Introduces absolutely no midrange or treble coloration, and distortion is far below audibility
        - Will not lose its tension or degrade over time
    - 1.5 way tweeter/mid design controls horizontal dispersion and eliminates electrical EQ network
- Woofers
    - Two identical, 18 cm [7"], low mass, alloy cone, extra low distortion, low inductance, high resolution drivers with dual short circuit paths and heavy cast aluminum basket
    - Operate far below their breakup frequencies and their Xmax for practically no cone coloration
    - Seamless acoustical integration with the ESL
    - Strong, accurate bass, not boomy dance club bass
    - Exceptionally low series resistance in crossover conserves damping factor and maximizes cone control
- Enclosure
    - Sealed (acoustic suspension) for best woofer transient response, minimal group delay, and best integration with ESL array
    - High mass, 25 mm [1”] thick, well damped, well braced walls for negligible enclosure radiation

    - 63 mm [2.5"] thick, solid hardwood baffle is maximally stable and rigid, yet free of resonances
    - Baffle step is reduced with front edge scoops, which are also visually interesting
    - Modest backward tilt maintains time alignment between drivers and sharpens image
- Plinth
    - 63 mm [2.5"] thick
    - Solid hardwood standard
    - Choice of high durometer rubber feet or carpet spikes
- Input
    - Single pair of binding posts, not for bi-amping
    - Bi-amping option available
    - Rhodium plated, solid copper Cardas Patented binding posts for spades or bare wire with a convenient, single clamping knob
    - 5-way post option available
- Diaphragm polarization supply
    - Mains power -- 0.1 Watts to 1.0 Watts, depending on mains voltage -- very green
    - Works from any mains worldwide without adjustment
    - Built-in surge protection
    - IEC cord inlet with power switch -- uses standard power cords worldwide
    - No transformer or oscillator -- high reliability, and no radiated or conducted noise to affect your other components
- Weight -- 28 kg [62 lbs] each with standard plinth
- Dimensions
    - Speaker enclosure -- 91 cm tall x 26 cm wide x 22.6 cm deep [35.9"H x 10.2"W x 8.9"D]
    - Plinth -- 30 cm wide x 35 cm deep x 6 cm high [12"W x 14"D x 2.5"H]
- Heirloom quality materials and finishes used throughout for lifetime operation, yet all are recyclable
- Designed, engineered and made in the USA
- Warranty -- 5 years on all components against defects in materials and manufacturing
- Modular construction and simple disassembly for straightforward repairs, even in field
- Miscellaneous
    - High grade polypropylene film caps
    - High grade, low resistance inductors
    - 10 mm [3/8"] thick, wool felt above and below electrostatic panels to suppress internal edge diffraction
    - 63 mm [2.5"] thick, solid hardwood baffle and plinth
    - Stainless steel rear panel, nameplate, and exterior hardware will never rust
    - Appearance options available (custom finishes/paint, custom woods)

10

Warranty

LIMITED FIVE YEAR WARRANTY

I. *Acceptance*. Acceptance of ownership of the merchandise occurs upon acceptance of delivery.

II. *Shipping damage.* The shipment should be examined for shipping damage prior to acceptance. Shipping damage will not result in cash costs to the buyer.

1. *Obvious damage*.
   - i. If such damage is discovered, delivery should be refused, so that JansZen may most credibly negotiate with the shipping company.
   - ii. JansZen shall be notified of the event ASAP.
2. *Occult damage*.
   - i. If after acceptance damage is found that was not initially noted but is attributable to handling in transit, the applicable claims procedures of the shipping/freight company apply.
   - ii. Details of the damage shall be reported to JansZen either verbally, in text, graphically, or photographically, as required to accurately convey the description.
   - iii. At JansZen's sole discretion, the damaged goods may be returned to JansZen for inspection or inspected on site, if this is in accordance with the shipping/freight company's policies.
   - iv. At JansZen's sole discretion, the damaged goods may be repaired or replaced.
3. *Time frame* – We will make every effort to return the owner's speakers within a four week period. This allows a week for the carrier to do its investigation, a week in transit each way, and a week at our plant.

III. *No defects warranty*. JansZen systems may contain both electronics and acoustical radiators, which are warranted separately.

1. The speaker elements (acoustical radiators), mechanical parts, and passive electrical parts are warranted against failure caused by manufacturing or material defects for five years.

2. Any active electronics are warranted against failure caused by manufacturing or component defects for two years.
3. Systems or components in need of repair or replacement during these periods will be repaired or replaced at no cost to the owner, or the purchase price refunded. JansZen will be the sole determiner of which action is taken.
4. This warranty covers only non-commercial use of the product.
5. This warrantee does not apply to failures that are the result of violating JansZen recommended or generally accepted maintenance or usage practices, nor to any of the following, including but not limited to: applications and uses for which this product was not intended; altered product or serial numbers; cosmetic damage or exterior finish; accidents, abuse, neglect, fire, water, lightning or other acts of nature; fluctuations and surges; failure to follow operating or maintenance instructions.
6. This warrantee applies only to JansZen products sold directly by Janszen or by an authorized JansZen reseller.
7. JansZen will be the sole determiner of whether a product is indeed defective.
8. Replaced or repaired units will assume the remaining warranty period or 90 days, whichever is longer.

IV. *Satisfaction warranty*. If the buyer wishes to return the speakers within 30 days of acceptance for any reason, they may be shipped to JansZen at the buyer's cost in its original condition and packing materials. If there is no damage traceable to the owner, the refund will be in full. If there is such damage, repair costs will be deducted. Shipping damage will be handled in accordance with the carrier’s rules and procedures and not affect the refund to the buyer.

V. *Entire agreement*.

THE FOREGOING WARRANTY IS THE ONLY WARRANTY WITH RESPECT TO THE SPEAKERS, AND WE MAKE NO OTHER WARRANTY WHATSOEVER, EXPRESS OR IMPLIED, REGARDING THE DEVICES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL JANSZEN, OR ITS AUTHORIZED RESELLERS BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, EVEN IF SUCH DAMAGES RESULT FROM NEGLIGENCE OR OTHER FAULT.

Registration for warranty.

If you have purchased your speakers directly from JansZen, YOU ARE AUTOMATICALLY REGISTERED FOR THE WARRANTY.

If you have bought them from an authorized dealer or from another owner who has a valid warranty still in effect, REGISTER YOUR PURCHASE FOR WARRANTY by visiting the following web site:
http://www.TBD.XXX/registration