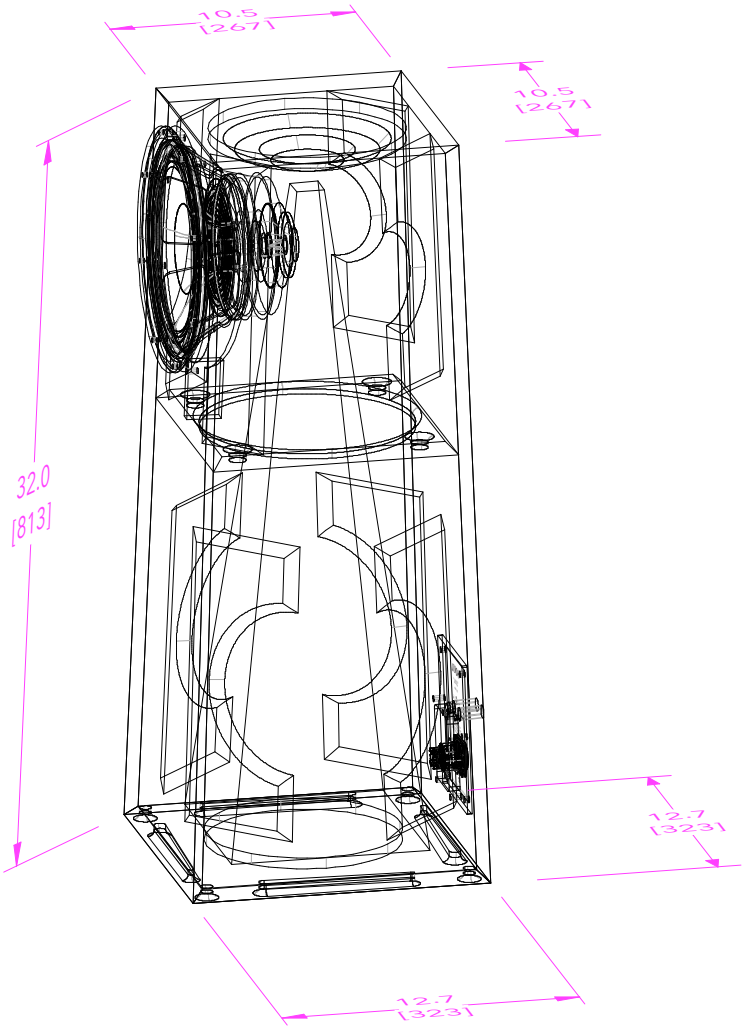


SOUL 6

OWNERS MANUAL

ZU AUDIO

CONTENTS

WELCOME AND THANK YOU

Thank you for your purchase of Soul Six. They are designed and built for a lifetime of trouble-free high-performance playback. It is our desire to exceed your expectations in product performance, quality, durability and customer service. If we have fallen short we would sincerely appreciate knowing how we may improve. If we have exceeded them we hope you will tell your family and friends (we don't mind hearing it either).

David Toop in his book *Ocean Of Sound* paints a powerful image of today's musical creativity, "...Starting with Debussy in 1889, is an erosion of categories, a peeling open of systems to make space for stimuli, new ideas, new now, this environment included sounds of the world—previously unheard musics and ambient sounds of all kinds, urban noise and bioacoustics... unfamiliar tuning system and structuring principles, improvisation and chance."

The quantity and quality of music the modern world has at its fingertips is unfathomable—we want to amplify your finds and choices and extend the time you immerse yourself in them.

Thanks again, and welcome.

–Zu Audio

MANUAL INFORMATION

Soul Six Owner's Manual [Soul-6_OM-b]
Latest version of this manual can be found at www.zuaudio.com/downloads.

Product version marks are engraved in nameplate. Revision letter is not present as there has been no revision to Soul Six.

Mark numbers (SIX in this case) denote significant design changes over its progenitor and are generally marketed. Revision letters are used to denote subtle build changes. Revision changes are engraved in nameplate beginning with "B" (Rev-B) and typically without marketing.

Products that are referred to in this document may be trademarks and/or registered trademarks of the respective owners. Zu Audio makes no claim to these trademarks.

KEY POINTS / 60-DAY SATISFACTION GUARANTEE

We know you're excited about getting your new Soul Six fired up—still, we strongly recommend you study this manual—at least notice these key points:

1. Burn-in is very dramatic with Soul Six—please read the **BURN-IN/BREAK-IN** section.

2. REMOVE the push-on driver covers to listen. These disks have the sticker *Remove to Groove* on them.

3. Soul Six loudspeakers need to have a gap between the floor and bottom side of the loudspeaker to perform as designed. Adjusting the gap height will change the bass characteristics of the Soul Six. Please see the **GAP HEIGHT** section.

4. Information outlined in the **ROOM & SPEAKER TUNING** section will give you the information you need to get your room and Soul Six playing well with each other.

5. 60-DAY TRIAL PERIOD can be extended if you are in contact with us, getting our help in reaching that sound you are looking for. Sincerely, we're happy to open up additional time for burn-in and time to try amps and other equipment, we want you happy with your purchase.

6. We strive for exceptional customer service. The Zu people you will talk to have a lifetime of focused experience. We will listen to you and give you our honest take on how to get you the sound you are searching for. Use us.

7. We only issue return authorization after at least four weeks of daily play. We hope you will find the suggestions in the manual useful, and please give us a call if you are running into any issues—we're here to help and we will do our best to be pleasant and helpful.

8. RETURN OF MATERIALS AUTHORIZATION (**RMA**) is needed if you are sending your speakers back for any reason. Failure to do so may result in refusal of the shipment. You may call or email us for an RMA number. RMAs let us more quickly coordinate and process work.

9. If your Soul Six are to be shipped or returned to Zu, you need to read and follow the instructions outlined in the **UNBOXING** section. Failure to do so may result in damages to the finish. If you are sending them back for refund, please repackage as outlined. Failure to do so will result in your liability for damages.

10. Zu Audio is **NOT LIABLE** for any failures, damages, or problems caused by the use or misuse of Soul Six loudspeakers by the purchaser or any third party.

11. There are no serviceable parts inside Soul Six.

INCLUDED WITH LOUDSPEAKER

Included with each pair of Soul Six loudspeaker
(2x) slip-fit hard plastic driver cover - installed
(8x) 1" long [26 mm] 3/8–16 stainless-steel oval-end stud-feet - installed
(8x) 9/16" [14 mm] hex 3/8–16, stainless-steel thin (jam) nuts - installed

Additional items included in package
(8x) 1-1/2" [38 mm] hardened carpet spikes
(1x) finish cleaning cloth

Packaging is double-wall cardboard with closed-cell foam frames and end-caps. Edge protectors are fitted and held in place with heavy-duty banding.

SAFETY TERMS & SYMBOLS

DANGER This mark indicates the possibility of hazardous situation—if not avoided could result in serious injury or death.

WARNING This mark indicates the possibility of hazardous situation—if not avoided could result in serious injury.

CAUTION This mark indicates the possibility of hazardous situation—if not avoided may result in minor injury or property damage.

PROHIBITED This mark signifies ***prohibited*** action—to use this product safely or to prevent premature wear.

REQUIRED This mark signifies ***required*** action—to use this product safely and to get good sound, or to prevent premature wear.

DANGER - RISK OF SEVERE INJURY OR DEATH

DANGER - avoid electrocution. Make sure your amplifier is powered down prior to disconnecting/connecting loudspeakers.

BEST PRACTICES - To avoid damage to you and your gear, power down your amp anytime you are making connections. When connecting speakers, first plug your speaker cable into the speakers. Then, connect the amp. When all connections are made, power up your amp.

WHY - While exceedingly rare, electrocution through touching of bare metal amplifier output posts when dangerous voltage and current is present can be lethal. This is generally only possible when the amplifier is malfunctioning. That hazard my be present at the loudspeaker end of the speaker cable if the other end is connected to the powered up amplifier. Therefore, bare metal cable connectors at the loudspeaker end should only be handled when the other end is disconnected from the amplifier or when the amplifier is not powered up. Amplifiers designed to output enough power to cause harm while operating generally feature touch-proof contacts such as Neutrik® speakON® connectors.

DANGER - speaker toppling and falling object hazard. The force generated from a toppled loudspeaker, or items set atop a loudspeaker that get knocked off, can cause sever injury or death especially to toddlers.

BEST PRACTICES - Mitigate the risks from tip-overs and falling objects. Adult supervision at all times around a toddler, or those that can easily cause harm to themselves, others or to property. Tip over and falling object hazards exist in most homes and spaces—mitigate those risks.

WHY - Soul Six loudspeakers are extremely stable when resting directly on the floor, and footers adjusted so there are four points of contact. Nevertheless, toddlers and children are more curious about furnishings that talk and sing, and so are much more likely to interact with them. Turn your back and a three-year-old kido is going to try to play with the speaker-driver, possibly knocking the whole thing over, maybe onto your cat sleeping near the speaker it in that patch of sun, or worse.

WARNING - RISK OF INJURY AND PROPERTY DAMAGE

WARNING - Those lifting and moving the Soul Six loudspeaker should practice good lifting techniques.

Back injuries can cause chronic pain, sometimes reaching unbearable levels.

Soul Six loudspeakers are very lightweight for their size, weighing in at just 39 pounds [18 kgs] each; 49 pounds [22 kgs] packaged. Even so, lift with your knees and not your back—and consider asking someone near to assist you.

WARNING - the drivers of the Soul Six loudspeaker create stray magnetic fields that extend beyond the boundaries of the cabinet.

We recommend you keep magnetically sensitive electronics and media at least eight inches [20 cm] from the loudspeaker.

WARNING - AVOID HEARING DAMAGE

WARNING - Soul Six loudspeakers are capable of extreme sound pressure levels. Play responsibly—consider your hearing, and maybe your neighbors.

BEST PRACTICES - Avoid damaging your hearing (and possibly staying on good terms with your neighbors) by listening at or lower than sound pressure levels (SPL) that are scientifically researched and established to not cause hearing damage. Please see sited research, as well as additional papers on this topic in the **RECOMMEND READING** section of this manual.

WHY - to avoid hearing damage. Values are derived from the U.S. Department of Health and Human Services / National Institute for Occupational Safety and Health (NIOSH) published, ***Occupational Noise Exposure - Revised Criteria 1998***

Recommend Exposure Limit (REL), assuming the balance of our day/night is pretty quiet. REL for an 8-hr period is a time weighted average (TWA) of 85 dB-A using a 3-decibel (dB) exchange rate. See study reference link in **RECOMMEND READING** for the math.

Exposure Level dB-A (slow)	Duration Hours : Minutes
80	All Day All Night
85	8 : 00
90	2 : 30
94	1 : 00
100	0 : 15
105	0 : 05

CAUTION - RISK OF MINOR INJURY OR PROPERTY DAMAGE

CAUTION - amplifier may be damaged if the loudspeaker outputs are shorted, i.e., the red (+) and black (–) contacts of a loudspeaker cable come in direct contact with each other while the amplifier is switched on.

CAUTION - corners are fragile, do not set or pivot your Soul Six loudspeaker on the corner of cabinet. Pivoting them on installed footers or spikes is not a problem as footer inserts are designed to take those forces.

CAUTION - with wood finishes we recommend you keep the loudspeakers out of prolonged and frequent direct sunlight. How long is prolonged and frequent? Well, three hours a day of direct sunlight every day will cause some color changes after a year or two. Painted finishes will not. While we use materials and top coats with the highest levels of UV resistance and absorption, some color changes to wood finish is going to happen when sitting in direct sunlight day after day.

CAUTION - turn your audio equipment off anytime you leave your home. Yeah, yeah, solid-state electronics sound better warmed up and not being turned off every time you go out. While the risk is very low there have been house fires from all forms of electronics, including the best designed audio.

CAUTION - turn your audio equipment off anytime you leave your home. Yeah, yeah, solid-state electronics sound better warmed up and not being turned off every time you go out. While the risk is very low there have been house fires from all forms of electronics, including the best designed audio.

CAUTION - turn your audio equipment off and unplug the mains power cables from the wall during a lightning storm to prevent your gear from being damaged. If lightning strikes your home, or very near it, damage to your audio gear is possible even if switched off.

If you are in an area or space that is more likely to be struck by lighting, and you do not want to unplug every time, we recommend you contact a professional. Wireless communications site engineers can design your system's ground and power to withstand lighting strike. Also, reaching out to your local stage, sound and lighting contractor usually proves fruitful. They may have staff, or can put you in touch with a certified sound lighting and power engineer. Oh, and don't overlook your local ham radio club, most have several members experienced in power, grounding and lightning strike mitigation.

CAUTION - RISK OF PROPERTY DAMAGE

REMOVE - the protective driver covers that come installed on your loudspeaker to let the sound out. They don't sound good at all when covering the driver.

CAUTION - do not use the tops of your loudspeakers as a bar table. Condensation forming on a container will pool and may cause water damage to the finish, especially wood veneer finishes.

CAUTION - do not use solvents, save water, to clean Soul Six loudspeakers. A slightly water-damp soft cloth should be all that is needed. For dusting of the driver, we recommend a can of compressed air.

CAUTION - we do not recommend storage of Soul Six in non-climate controlled spaces. DO NOT STORE THEM LONG TERM WRAPPED IN NON-BREATHABLE PLASTIC FILM AS THIS MAY CAUSE DAMAGE TO THE FINISH.

PROTECT - When storing your speakers, we recommend placing a clean, thin soft fabric such as felt or fleece between speaker and packaging. Tolerable long-term storage maximum temperature range is 20˚ F [-17˚ C] to 122˚ F [50˚ C] with a humidity average not to exceed 90%.

CAUTION - do not use tools to tighten binding posts—hand-tight (18 inch-pounds [2 N-m]) is all that is necessary. Applying high torque on posts may damage binding post and is not covered by warranty.

CAUTION - if smoke or an electric odor is emitted by the loudspeaker or any device, turn off all components. If you have tools and skill, you may troubleshoot the problem one device at a time working your way to the amplifier. Statistically the amplifier is more likely to be the source of the problem. If you do not have the tools or skills, call the brand of the amplifier or suspected component for assistance.

PROTECT - when not in use (especially when there are unsupervised animals such as cats, dogs and kids abiding near your speakers) we recommend you slip-fit the protective driver covers. This will also safeguard them from foreign materials and bugs.

PROTECT - when transporting Soul Six, wrap them with new stretch wrap film, fine felt or fleece to protect the finish from being marred by the packaging foam. Failure to do so will result in scuffing and marring of the finish.

SERVICE - 1/8" hex-drive screws fastening the full-range driver have their threads lightly coated with calcium light grease (NL-1) and are torqued to 26 inch-pounds [3 N-m]. 1/8" hex-drive screws fastening the nameplate are torqued 18 inch-pounds [2.0 N-m].

UNBOXING

Save all packaging except for the polyester banding and the metal staples. All other parts are needed for repackaging. Failure to repackage as they were originally is likely to result in the loudspeakers being damaged when transported.

If speakers are sent back to Zu for refund (RMA required) they must be repackaged as originally packaged including the protective plastic film. Banding and staples are the exception as few have convenient access to them. In place of staples secure cardboard edges with packing tape. In place of banding secure edge protectors (V-board) with packing tape. If sent back for refund and not packaged as outlined, you may be liable for damages.

Remove rings, watches, belt buckles or anything that can scratch the finish or lessen your grip. Also, trade your button-up or snap shirt for a tee or pull-over.

1. With the box standing up, cut banding and dispose. Banding is 100% polyester and is easily recycled. Save the thick cardboard edge protectors for future use.

2. With the model label facing up, lift the corner of the cardboard flap until the staple releases from the underlying cardboard. This is easily done without a tool but a heavy-duty staple lifter makes it easier. We recommend complete staple removal as you go.

3. Removal of the released staples prevents the sharp edges from accidently snagging or scratching your clothing, skin, walls, floor or your new speakers. If you are careful, this is safely done barehanded. Just bend them straight and twist them out.

4. Remove the two speaker-length cardboard sheets: there is one on either side, nestled between the foam frames and the main cardboard box. These reinforce the packaging, and when removed provide the space needed to shimmy your speakers out from the box. With the two sheets removed, slide speaker out from the main box.

5. Remove the top and middle foam frames. We recommend keeping the bottom foam frame in place, it makes sliding the speaker into position easy, and will prevent the installed oval-end footers from scratching your floor.

6. Leave the plastic wrap covering the speaker until you get it near where you want it. The plastic wrap protects the finish while handling and dramatically increases grip. Once you get them where you want them, remove the film.

7. Remove the bottom foam and plastic film once you have the speaker where you want it. Laying the speaker face down on the removed foam makes removal of the bottom foam easy. It also makes installing spikes or alternate footers easy.

8. Stand the speaker back up and remove the plastic film.

9. Remove the hard plastic driver covers. Keep them near as they make effective full-range driver guards—quickly pushing on to protect the cone from the curious. Slipping them on when you're on vacation also protects the full-range driver from bugs and dust.

SOUL-6 DESIGN OVERVIEW & UNION-6 COMPARISON

Soul Six is designed and built to achieve world-class sound within a form that is strongly architecturally considered. For this reason, Soul Six may be ordered with or without a Zu logo on the face of the cabinet.

Soul Six is designed to give world-class fidelity within a form and size that will esthetically compliment, not dominate, most architecturally inspired spaces. And yes, the build quality and workmanship inside and out is stunning and engineered to last more than a lifetime.

While form and size are handsome, with an unimposing mid-century modern look, the sound Soul Six are capable of creating is massive, dynamic, crystal clear and tone dense. Soul Six is about as resolving of detail, tone, texture and dynamics as any loudspeaker ever built that's similar in size. The very deep bass (below 35 Hz) performance target was removed from the design criteria in order to meet the speaker's size and widest possible bandwidth and dynamics objectives. While most good sounding amp match ups, and rooms, allow Soul Six to easily flesh out and deliver compelling fidelity down through the kick drum, going deeper may require effort—amp, room and source gear have a lot to do with that.

There are many similarities between Soul Six and Union Six Supreme, and even Union Six. (For differences between Union Six Supreme and Union Six, please see their owner's manuals.)

Union Six Supreme is the less expensive, slightly less amazing version of Soul Six. Union Six (standard) is the less expensive, slightly less amazing version of Union Six Supreme.

Soul Six and Union Six Supreme share the Soul Six full-range driver and center-mounted integrated-assembly ring-radiating super-tweeter. Both are designed and built around the critical human voice (A1, 55 Hz, through A6 and all the possible harmonics, to approximately 10k Hz). Serving this critical region of tone is the mentioned Zu 10" [26 cm] coaxial, paper-cored nanotech sanctified, full-range driver, (ZuCX-ND-8-N151M). The coaxially located tweeter adds the burnish and upper treble.

Soul Six and Union Six Supreme are both rated 99 dB/W/m @ 2.8V and have amp-friendly eight ohms impedance. In fact, all the electrical and electromechanical guts of the Soul Six and Union Six Supreme are pretty close to identical. The main difference between them is the cabinet: shape, internal structure and materials. Soul Six uses a West African tone wood known as okoume, and is internally super structured without compromise. Cabinet materials and deign noticeably elevate the performance of Soul Six over Union Six Supreme which uses MDF based material and much less extensive bracing.

High-pass network on Soul Six features a single element mono pole filter using Jupiter™ Copper capacitor. The Jupiter™ Copper capacitor does need longer burn-in compared to may other caps to sound its best. Same is true for the extensive use of FEP insulation in the cable and wiring used in Soul Six.

Soul Six's drivers are paired to the highest possible level, meaning driver pairs are match to an extremely tight deviation tolerance in magnitude and impulse response—the tighter the left/right matching the more natural and satisfying the soundfield, be it stereophonic or monophonic.

Soul Six gets Event Mk.II internal cable which increases the resolution of the loudspeaker system to a point where Jupiter™ Copper capacitors combine in mesmeric ways. Event internal cable and wires features FEP insulation and silver based conductors, within a ZuB3 electrodynamics format. This combination of engineering gives a broad and uniform characteristic impedance to the cable and extremely wide bandwidth while yielding excellent immunity from EMI, and also limiting its own radiation. While conductance is on par with the much less expensive to manufacture Mission Mk.II cable, the propagation velocity of Event-LC Mk.II is much higher and the noise floor is noticeably lower.

Jupiter™ Copper Foil & Paper capacitors used in Soul Six also feature large gauge, pure silver leadouts. These capacitors match up extremely well with the Soul Six driver assembly and with the Event Mk.II internal cable. The combination imparts a sense of grace and sexy magic to the whole of the sound, and once experienced it's hard to live without.

BURN-IN

Zu Soul Six speakers require abundant break-in and burn-in to sound their best. The changes in performance they undergo is remarkable. While there is significant heavy-handed factory break/burn-in, more is required once they are in your home. The factory break-in phase is engineered to target the full-range drivers' mechanically dynamic elements—the cones, surrounds and spider. The process that has evolved and works (play heavy, hard hitting, full-bandwidth music at levels that threaten to rip the fabric of spacetime itself) is a process that is out of reach for the vast majority of users. Breaking in the membrane requires extreme levels of shear force to set the membrane into its target performance profile, and there's a fine line between membrane break-in and permanent, undesired deformation.

During this time, other aspects are also breaking in; the drivers' suspension (spider and surround) and also the dielectrics and electronics. The electrically functioning parts need the greatest time and will continue to burn-in within typical home playback levels.

Soul Six receive a minimum of 400 hours of factory burn-in.

We discourage the use of any special burn-in specific program material—no special "tones" and no "demagnetizing" material.

Just play as often as you can, maybe a bit louder than normal, and selecting big full-scale recordings. The more the speakers play, the sooner they will sound their best.

Break-in is a fairly simple, straightforward, once-and-done thing (sarcasm eyes). Not funny? Likely not. The humor assumes you like audio-dad jokes and that this is not your first set of new Zu loudspeakers. What is to follow are generalizations about burn-in relating to home audio, direct radiating, Zu loudspeakers.

BURN-IN EXPECTATIONS

Most find Soul Six to sound great when new, but sometimes a touch harsh. Some find them amazing right out of the box, while some find them to sound strident and less than they had imagined. In all cases, users should know that they are going to change and in most cases, significantly. The sound and enjoyment you will get from them after six to eight weeks of daily evening use is going to be night and day compared to when they were brand new. Also, know that the changes are not going to be linear for the majority of listeners. And, by way of warning, know with Soul Six there's a very real chance that they will actually get worse for a period within the in-home burn-in period—patience will reward, and they will snap out of any funk they might go through. If you are now thinking, "I've been doing this my whole life and I have never had a speaker sound worse as it was breaking in..." again, patience on your part is very likely to have a very big payout. Not always, but much more so than not. We too have been doing this forever, fully immersed, most every day, with thousands of customers as data points. If you listen to your new Soul Six for a week or so, and hastily concluded that they are not your sonic cup of tea, please give us a call or email and let us help.

The majority of *potential* Zu owners that we talk to feel that burn-in is a thing, but that burn-in changes are not all that pronounced. We agree when applied to other brands—the vast majority of loudspeakers change very little, some so little that you wouldn't even know burn-in was a thing. But Zu Soul Six are not like normal speakers. The burn/break-in changes they go through is an interesting and not subtle phenomenon.

To generalize, or at least give you some statical probabilities, Soul Six burn-in changes during the initial ten to forty hours of in-your-home play will likely be linear. Burn-in changes at this point will appear to plateau, but more changes are coming.

The second phase of burn-in will likely be nonlinear. There is usually one very noticed transition where the day before you were listening and your system was sounding good and you were happy, or close to happy, say six weeks in. Then, rather unexpectedly you become aware that things are sounding more open and involving, so compelling, so good. This is the result of burn-in, mostly changes in the electronics and their dynamic behavior. This change indicates that Soul Six are now settling into their long-term performance profile.

Once Soul Six has made that very noticeable transition to sounding amazing, you may need to revisit how you have them placed in your room, to further fine tune your sound.

NOTE - If Soul Six lie dormant for three months or more, even if fully burned-in prior, they will not sound just as they did when last played, and will go through a shorter phase of the burn-in phenomenon. The duration and intensity of play needed to drive them back to full glory seems to be related to the length of their dormancy, and if they were subject to cold temperatures (42˚ F [6˚ C]).

BURN-IN MAIN POINTS

Here are some points to help inform and guide your setup time line and choices. Effecting the speakers' transition from sounding new, to sounding full and engaging include:

- The length of time the speakers are played.
- The power levels and program material played through the speakers.
- Cold temperatures the speakers might have been subject to in shipping or storage. Temps near freezing seem to cause a retrograde response within the burn-in process. Even after burn-in, cold temps can cause some backsliding in fidelity. If Soul Six are subject to temperatures below 42˚ F [6˚ C], an additional week or two may be required to get them back to their prior state.
- The unknowable relationship the speakers have with Schrödinger's cat. The burn-in phenomenon post mechanical changes is quantum mechanical.
- Even though the Soul Six's sound will be changing during break-in, we still encourage you to try room tuning. Performance gains made there will increase your enjoyment during the burn-in phase. Room tuning, even with speakers going through burn-in, is discernible, and the progress you make in getting your sound right will largely stick after the burn-in transition.
- During the in-home burn-in phase **we don't recommend swapping of components without reason and method as burn-in is heavily impacting the sound.** The in-home phase of burn-in is often erratic, almost sudden at times; changes in fidelity due to burn-in has the chance to coincide with changing of gear, which could really confuse and cloud your conclusions.

- For the first three weeks or so we would advise against purchasing new gear to solve problems that might soon evaporate. New gear is going to also go through burn-in, or warm-up related changes, and listening through burn-in on top of burn-in is rarely worth anything. That said, if you have amps and other components that are burned in and close by maybe give them a try if you're curious.

- Most of the active, solid-state electronics we like sound better after they have warmed up. This may take anywhere from a few hours to several days.

- Like active solid-state, Most vacuum tube based electronics we like sound better after they have warmed up. Unlikely solid-state this might be anywhere from ten minutes to four hours. These last two points are mentioned for your consideration.

- If you do change an amp and notice a change for the better, you should then switch back to confirm that it's in fact the amp that made the difference. It could also be that change noticed was simply coincident with a burn-in related change, or wiping clean a dirty contact.

- Disconnecting and connecting gear can clean a dirty connection and improve sound. Even a clean contact that is not snug can reduce fidelity. Sometimes the simple act of remaking connections can cause your system to sound better.

- **YOUR BRAIN IS AN ACTIVE COMPONENT OF THE PLAYBACK SYSTEM.**
  The act of swapping gear or, feeling like you are doing work on your system, has a powerful effect on your brain, and is very likely to allow you to hear deeper into the sound. Search out *psychoacoustic* for more on this, it's a broad and deep area of scientific study.

- Beware of snake oil salesman that exploit our mammalian brain, physiologic responses, and our need to be part of the successful and cool crowd. Your desire for better sound and more magic is great, just start each choice from a position of skepticism.

BURN-IN GENERAL OBSERVATIONS

Predictive speaker qualities regarding the schedule and impact of burn-in seems to be efficiency and the extent to which speaker-level electrical filtering is employed. A speaker's sensitivity to electric power inputted, and the resulting sound levels outputted, is colloquially referred to as *efficiency*. The extensive use of speaker-level electrical components used within a speakers' crossover (typically needed to achieve the desired sound) is *crossover complexity*.

We think the combination of very low efficiency and crossover complexity are strong indicators that the design will not exhibit make-or-break change in sound due to burn-in. Conversely, Soul Six with its sonic design targets has resulted in a high efficiency, crossover-less design that requires extensive burn-in to sound its best.

In quick conversation, Zu uses the terms burn-in and break-in interchangeably—referring generally to the changes a loudspeaker goes through on its way to reach its long-term performance profile. Technically however, there is a difference between them. Break-in is the domain of, statics and dynamics, and burn-in is the domain of quantum mechanics. Understanding each is interesting and might help with expectations of the loudspeaker when new, and when returning them to service after not being used for a while.

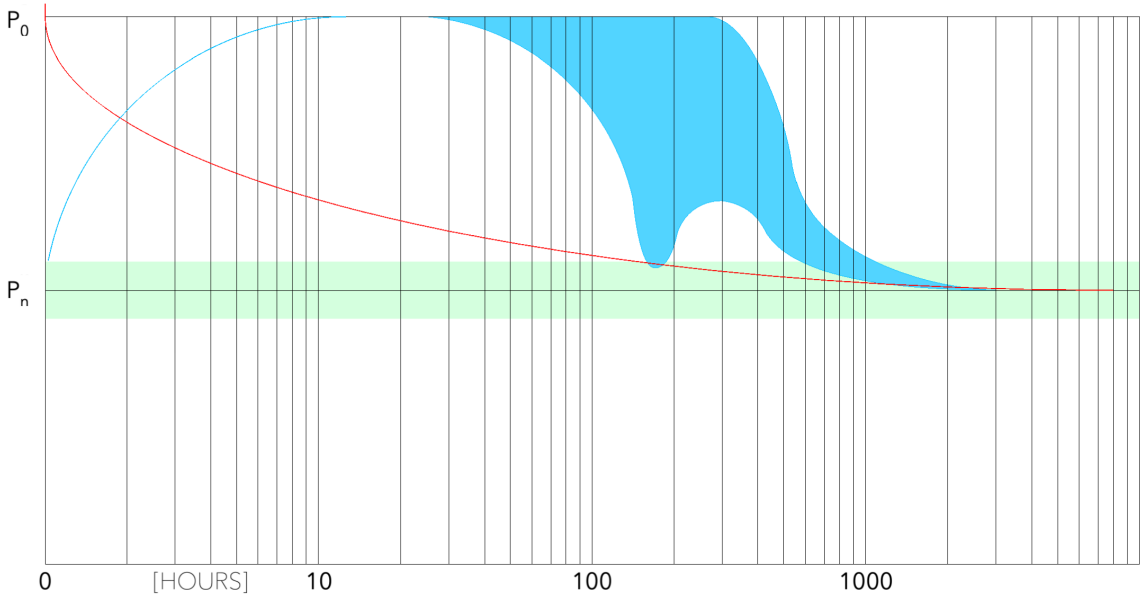
The life of a loudspeaker can be profiled in three phases: break-in/burn-in, performance, and aging-out. Soul Six loudspeakers are engineered to operate within the performance profile for a minimum of 100,000 hours of in-home use under normal living conditions and assuming loud listening levels (80 dB-C @ the listener).

In the graphs we zoom in on the burn-in profiles. The reason for the odd burn-in profile of Soul Six is largely the result of the near exclusive us of FEP as a dielectric in the cable harness and leads. The Jupiter Copper capacitors also take considerable time to sound their best and so contribute to the long burn-in schedule.

Please see the Burn-In and Fatigue Profiles Infographic on the following page.

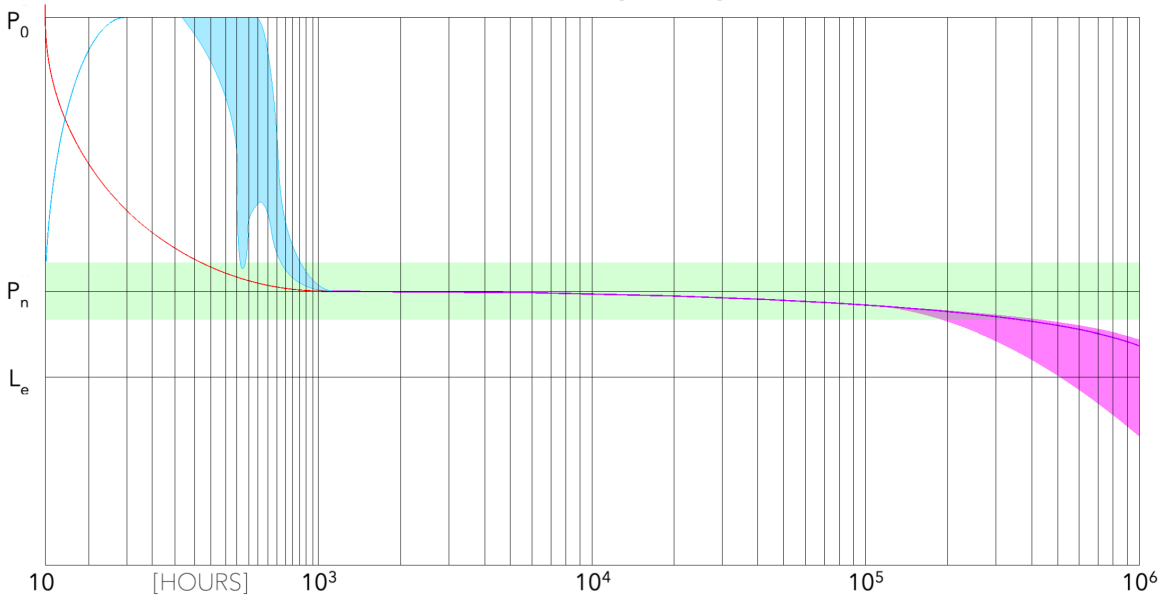
BURN-IN AND FATIGUE PROFILE

SOUL SIX BURN/BREAK-IN PROFILE [12/2023]



- Dynamics break-in profile average (driver's suspension and membrane)
- Electronic break-in profile average (capacitor, dielectric/cable harness)
- Electronic variability
- Performance profile, targeted butter zone
- Fatigue profile
- Variability in fade-out from performance to half life (permanent magnet fade, membrane fiber shear, suspension breakdown)

SOUL SIX LOUDSPEAKER SYSTEM FATIGUE PROFILE [12/2023]



INITIAL PLACEMENT

This is an overview, to get your new speakers up and running and sounding good enough. An expanded speaker / room tuning section is further in the manual.

Start with the Soul Six speakers placed where you've visualized them, likely flanking that rack or casework you have. Soul Six are not overly sensitive to being in just the right place—bass integration may prove otherwise. Bass wavelengths are very large, and moving the speaker a few inches this way or that is not likely to make a meaningful impact in the bass region.

From centerline, Soul Six should be equidistant, with matching toe (horizontal splay).

From the main listening chair (sweet spot) the angle formed by the speakers should be between 40 and 90 degrees (see graphic on the next page). Wider is usually better for stereo and home theater, 60˚ (equilateral triangle) is a great starting point.

Soul Six pairs are very tightly matched, one of the reasons why you can have a wider than normal stereo spread and not have the middle fall out. If the middle of the stereo soundfield collapses, scoot them in and/or mess with toe-in.

TOE - Start with Soul Six speakers pointing (shining) right at the main listening chair, listen. Then splay them out so they are pointed a few feet [0.8 m] behind, listen. Then try wider still. Then back to pointing right at you, and then try having them pointing in front of you. Experiment and let listening and your own mind be your guide.

NOTE - We all hear differently. Even those with functionally near-identical hearing have considerable variants in what each thinks sounds good.

Use the installed oval-end stud-type footers for whatever the flooring. Coasters or coins may be placed between floor and footers to keep your flooring mark free. If you are using Soul Six on carpet or a rug consider using the supplied spikes, but after you have them positioned and sounding good—spikes make moving them around difficult.

Contrary to much of what is reasoned regarding spikes as feet for your loudspeakers, spikes cut through the rug or carpet and more tightly couple the loudspeaker to the floor. Spikes do not decouple your speakers.

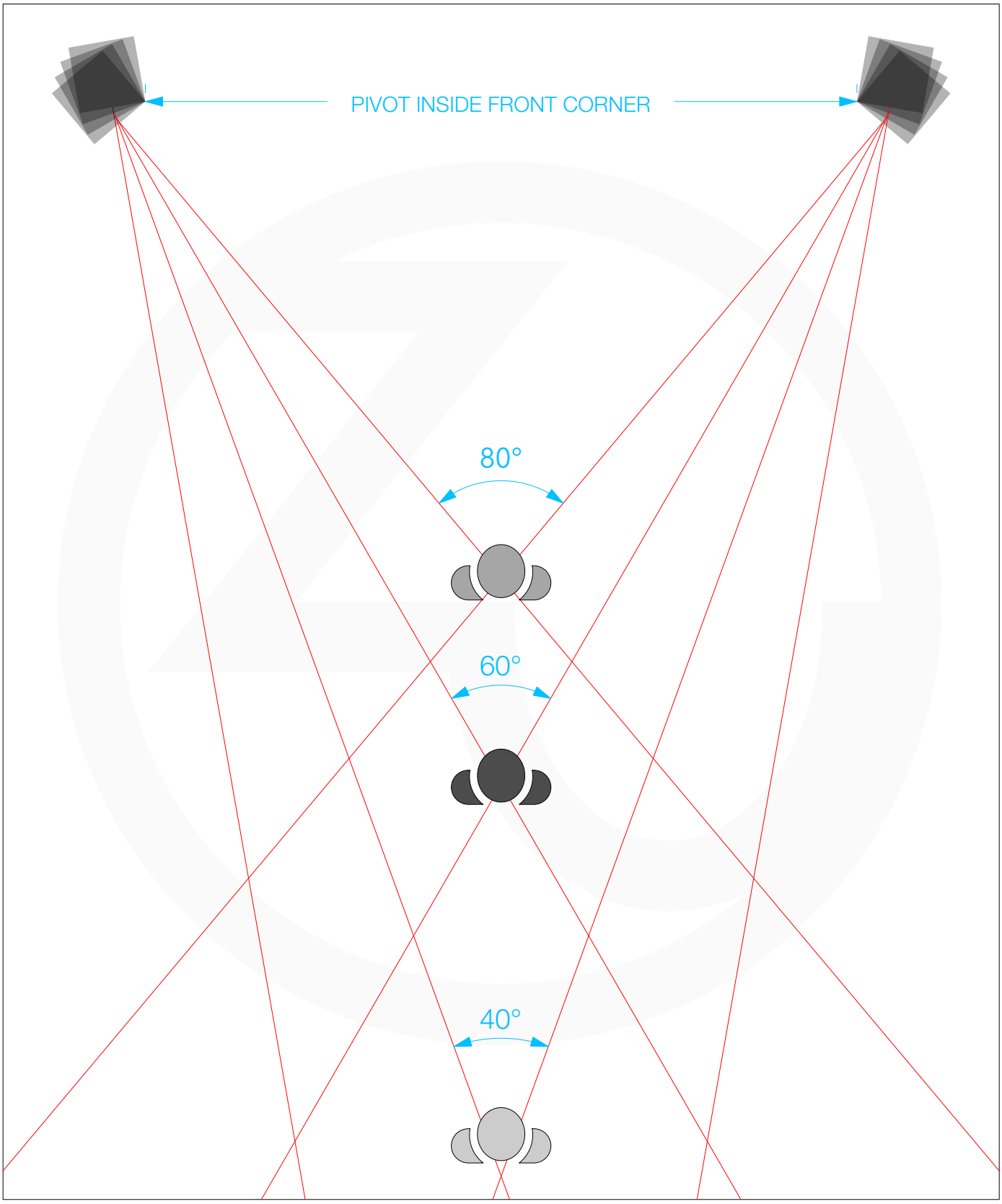
Soul Six, with it's two degree all-side rake already projects a nice open sound. Still, consider leaning them back a bit, especially if you would like them to better play to very large spaces, or sound bigger and fuller when you are standing or working about.

Generally, Soul speakers should be placed no closer than about half a foot [≈10 cm] from the speaker's closest corner to the side wall. But they can be placed as close as an inch [2.6 cm] to the front wall—space between the speakers closest corner and wall/baseboard behind it.

If at 60º and toed so they are pointed right at you, they are still not presenting a seamless soundfield something is wrong. The speaker cable on one of them might be flipped (red to black, black to red) or one of the amp channels is going sideways... time to troubleshoot.

Note, there is a small chance of some odd room acoustic interaction and your system is fine. Troubleshooting this entails disconnecting one of the speakers, listening to just one, making a mental map, then doing the same to the other channel. Listening to just one speaker at a time is insightful, so much so that we developed a whole process of placement tuning around it.

SPEAKER / LISTENER TRIANGLE



GAP HEIGHT

Soul Six features a technology that improves sound and allows you to adjust the bass characteristics. This involves setting the gap height—the space between the bottom of the Soul and your floor. Getting the best performance involves a bit of fuss—getting down on your knees, running the footers up or down, making sure all four are solid... it gets old. Hold off fine tuning the gap height until you get the speakers placed and sounding good-ish in your room.

We recommend you start with a 3/8" [10 mm] gap between the bottom of the speakers and the floor (see illustration). The gap height allows you to tailer the sound, particularly the bass region. Each amplifier and interaction with the room will change the sound of Soul Six. Depending on the variables, and your preferences, you will find the gap height you like.

The finger ports on the bottom side of the speaker are part of the Zu-Griewe box loading technology as implemented in Soul Six. They are not ports as used in a bass-reflex designs—Helmholtz resonators—but the finger ports do need to see the acoustic space of the room. Blocking them turns the Soul Six into an interesting sealed-type design. No damage will result with blocking them, so feel free to experiment.

Your preferred gap height will likely change from amp to amp. Minimum / maximum measures for effective gap height are:

Minimum: 1/24" [1 mm]
Maximum: 5/8" [16 mm]

More gap typically results in increased bass weight in kick drum and wood timbre region, but it nearly always results in less output in deep bass and adds thickness/woolliness. Less gap height typically increases bass articulation and depth but at the expense of shove around the kick drum. This is general guidance.

Again, each amp will respond differently as the gap height changes. Gap height influences the load impedance that the connected amplifier electrically sees. Good, because you can now better match amp and speaker, and room—but *damn*, because there's one more thing you can fiddle with. Here's a great time saving technique for adjusting gap height....

(Continued on next page)

SHIM THE GAP

Likely your sound is making you happy, even so, you should mess with the gap height, with some amps it makes a huge difference. While getting down on your knees and running the footers in and out, making sure all four are solid is not that hard, it is a hassle.

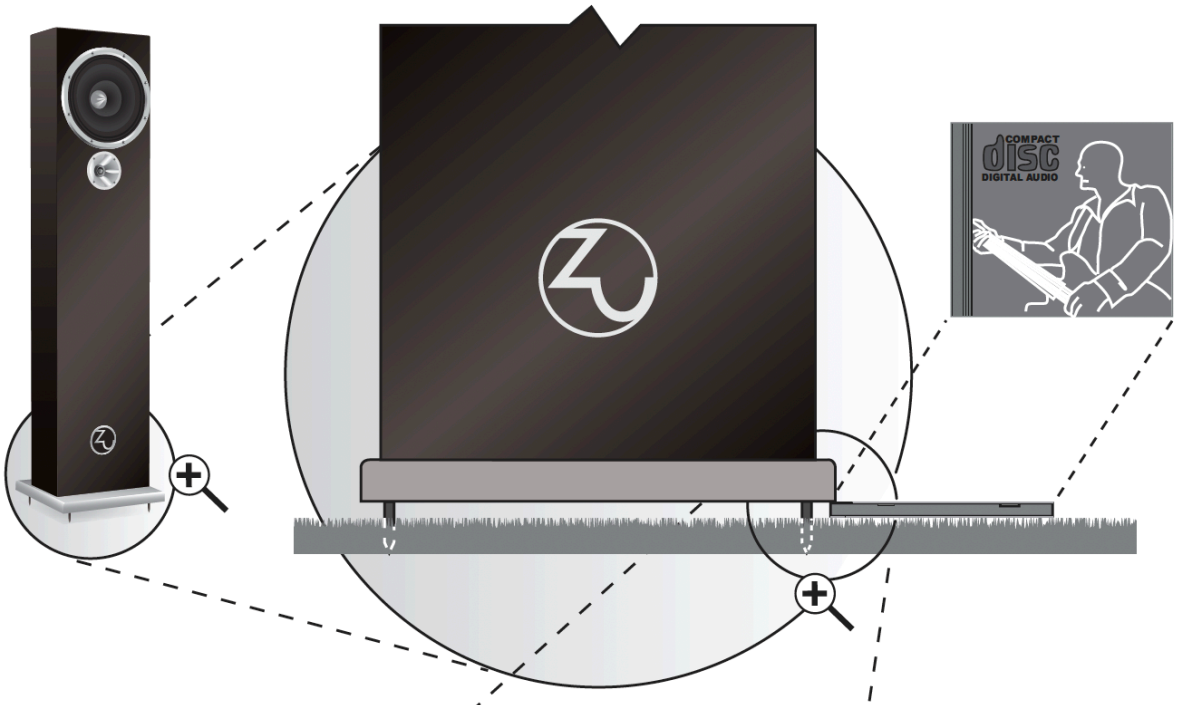
Shimming the gap with thick paper, or something similar, to set your gap height makes this process quick and easy.

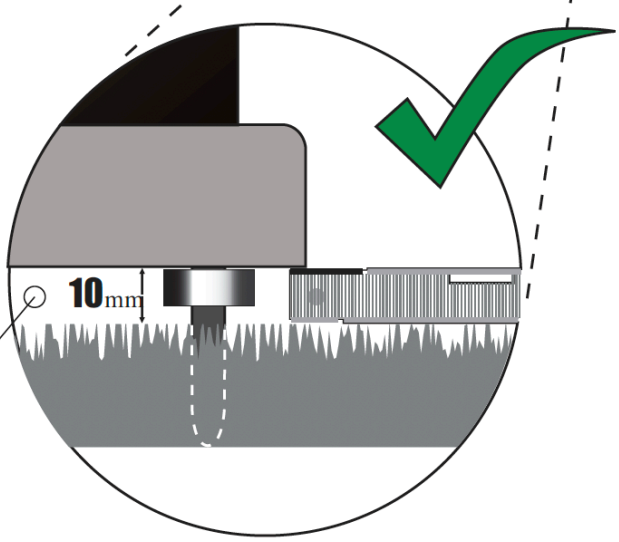
Once you get your speakers where you like them (making sure the left and right channels are mirrored on the listener's centerline, that they have the same toe-in, and so on) set the gap height to roughly 3/8" [10 mm].

Shimming the gap to make the gap height smaller is made easy using 9 x 12" [23 x 30.5 cm] cut sheet. Chipboard paper works well for this, it's .022" [0.56 mm] thick, so heavy enough to not fly around and thin enough to allow for fine increment changes. It's also in stock at every print shop. Alternating between front and side, slide the sheeting between the footers. This will reducing the gap with each sheet added. Again, sliding in a few from the front, then a few from the side.

GAP HEIGHT ILLUSTRATION

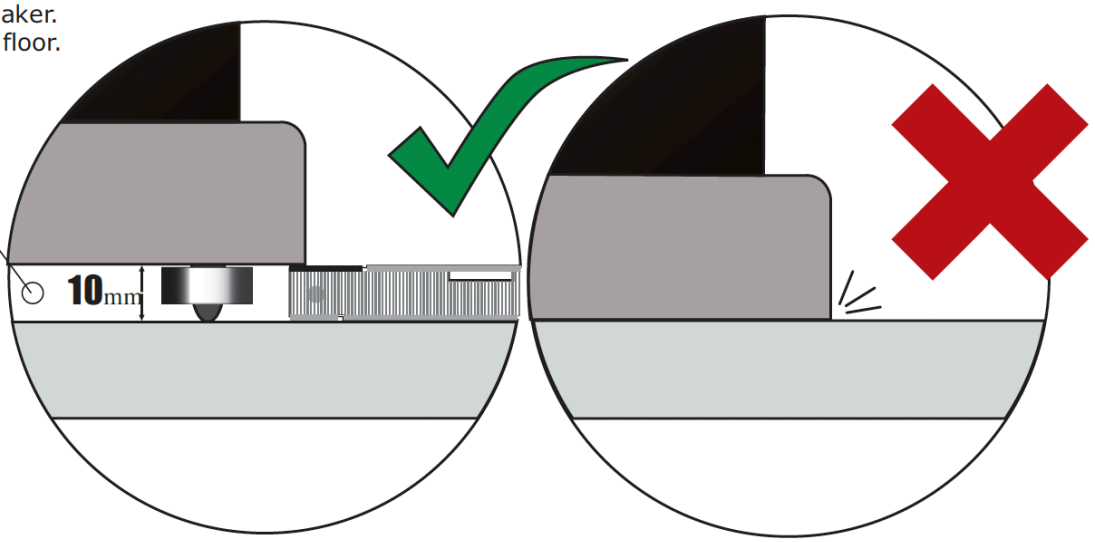
Graphic on the following page shows the Druid Mk.III speaker, and a CD jewel case as a gap height gage. Concept works without change for Soul Six.





Paper shim here

Shim between floor and speaker.
Spikes continues to contact floor.



CONNECTING YOUR AMP AND SPEAKERS

DANGER - Turn your amp off to reduce the risk of damage to your amp or yourself.

Soul Six feature 5-way binding posts and ZuB3 via speakON™ NL8 connectors. ZuB3 refers to both an electromagnetic design and a connection format. The connector we use for the ZuB3 EM design is the Neutrik™ speakON™ NL8. ZuB3 via speakON™ NL8 connection maintains the functional electromagnetic characteristics of ZuB3 cable and lowers contact resistance.

There are also usage advantages to this format, it's locking and keyed. It's also touchless, making it amplifier and people safe—no possibility of short-circuiting the amp when making connections and no shock hazard to you.

5-way binding posts are connected in parallel with the ZuB3.

5-way binding posts used on Soul Six are machined from high copper content brass and have the Faston male blade machined from the same billet to keep fidelity as high as possible. They accept the following speaker cable ends:

- bare wire
- pins
- banana plugs
- 1/4" [6.3 mm] standard spades [forks] and ring lugs
- 5/16" [8 mm] oversized spades and rings
- 3/8" [10 mm] super-oversized spades and rings

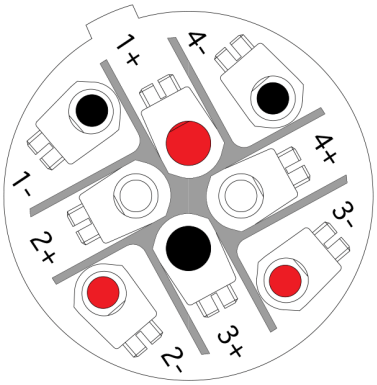
ZUB3 FEATURES AND BENEFITS

- ZuB3 via speakON™ NL8 lowers contact resistance over banana plugs or spades
- Maintains Zu speaker cable and Zu internal speaker cable's ZuB3 electromagnetic characteristics through the wall of the speaker
- Connector is a cylindrical type and houses all contacts (easy and simple interconnection)
- Connector prevents shorting of amp and removes a shock hazard
- Connector is indexed (clocked) so it ensures correct connection and phase
- Connector twist locks with "click" to provide confident user experience and ensures proper contact until disconnection is desired
- Contacts are self cleaning—if there is a question of tarnish just disconnect and reconnect to wipe contacts clean

We strongly recommend factory termination/retermination of your Zu loudspeaker cable. Nevertheless, ZuB3 via Neutrik™ speakON™ termination convention is outlined for your DIY reference.

ZUB3 PINOUTS

ZUB3 VIA SPEAKON NL8 PIN-OUT CONVENTION

ZuB3 via Neutrik speakON 8-pole / standard single channel speaker input (not biwire)	
SPEAKER + (RED)	SPEAKER – (BLACK)
speakon 1+ speakon 2– speakon 3–	speakon 1– speakon 3+ speakon 4–
unused: 2+, 4+	
sp+ = 1+ sp+ = 2– sp+ = 3– sp– = 1– sp– = 3+ sp– = 4–	
Neutrik 8-pole speakON cable-end connectors feature pozidriv #1 setscrews	

AMPLIFICATION GUIDANCE

An often asked question is, which amp should I match up with the Soul Six. This is not a simple question as you need to factor in the rest of the system—room, the sound qualities you value and how loud you play, or how loud you would like to play. Sound levels are the easy part, and for more than 90% of Soul owners, ten to twenty good sounding watts is plenty.

Zu loudspeakers are efficient—*efficienc*y being the conversion of electrical input from the amp to the sound output of the speaker. For this reason much less electrical power is needed compared to the vast majority of home audio speakers. Lets start with how loud first, In an average sized US home:

2 - 8 watt / channel rated amps are what you need for low to moderate sound pressure levels.
8 - 32 watts for moderate to very loud sound pressure levels.
32 - 150 watts for very loud to ear damagingly loud SPLs.

Max Power: 150 watts (full bandwidth)
Max Power LLF: 400 watts RMS (80 Hz high-pass, 12 dB/octave. Assumes power is unclipped, amp rated at 500 or more watts @ 8 ohms)

WARNING - Soul Six loudspeakers are capable of extreme sound pressure levels, play responsibly—consider your neighbors and consider your hearing. We recommend you see the READING LIST section of this manual and read the linked NIOSH and WHO papers regarding hearing damage.

The amplifier/loudspeaker relationship contributes significantly to the sound of the system, we encourage you sample some amps. Start with what you have, dust off any amps or receivers you might have tucked away. Borrow some kit from your buddy, and his buddy, or befriend your local audiophile society. Try stuff, see what you like, and don't be afraid to try some old gear. Don't be too quick to judge when you swap amps, most amps need several hours or days of warm-up to sound their best. Tube amps warm up more quickly, some solid-state can take days. And if you are using stand alone amps realize that the pre-amp feeding them can have a pretty big impact on sound as well. Oh, and what you like, in your rig, with your room and your ears and brain, might be totally different than others—trust yourself.

Another aspect of Zu Soul Six speakers to bear in mind is their lack of dynamic compression, you can just keep ramping up the volume and they just sound better and better, staying clean and in control to the point the amp gives way to distortion or your ears protest. Over the years we have found that the majority of new Zu speaker owners in our medium floor-standing range listen twice to four times louder (3 ~ 6 dB) on average than they did with their less efficient speakers. Dynamic compression in speakers is typically perceived as louder, and less efficiency speakers dynamically compress much more than high efficiency speakers. Also consider, as you increase the volume of the speaker you disproportionately increase the room's contribution to the sound. If you are unhappy with the sound at loud levels it could be the amp or it could be your room, or it could be that you are listening way louder than you realize and your ears are pushing back. Poor loud-level listening performance is rarely due to the Soul Six.

TUBES VS. SOLID-STATE

We think this is just dumb, the concept and the question. *Tubes* can sound all over the map, and the same is true with solid-state. There are plenty of unbearable sounding tube amps and there are plenty of unbearable sounding solid-state. *Tubes* is just too broad a term to have any meaning, as is *solid-state* in reference to how they might sound matched up to Soul Six.

The loudspeaker/amplifier relationship has a profound effect on the sound you get. The sound of the amp has a lot to do with the sound and match of the loudspeaker, and vice versa.

More regarding amplification needs to be written.

LOUDSPEAKER CABLE GUIDANCE

- Start with what you have. Owned and close at hand is a good place to begin.
- Shorter speaker cables are better than longer, but don't short yourself. Having a bit of extra cable so you can put the speakers where they sound best within your room is a bigger factor, usually a much bigger factor.
- Keep left and right speaker cable the same length. Different length cables of the same model will also have different measures, and when the left and right cables have different measures it will distort the stereophonic aspects of the soundfield. There is also a slight effect on tone and texture, but because these aspects of sound have very little to do with the stereoscopic interplay, they are not under a sonic magnifying glass the way stereo is.
- Don't use cable as tone control—a common abuse in hi-fi. Doing so usually leads to frustration and further loss of fidelity. When cable affects timbre it usually affects timing, phase and so on. Timbre problems are usually solved with loudspeaker placement, burn-in time, and better system matching and engineering.

- The speaker cable is part of the amplifier/loudspeaker relationship, and changes to the resistance, capacitance, impedance, characteristic impedance, propagation velocity..., affect the sound.

- Those that say cables do not influence sound are generally wrong. Maybe they lack experience or their bias is hindering their listening, or the systems they have used them in are lacking the resolution necessary to notice the differences.

DANGER - Turn your amp off to reduce the risk of damage to your amp or yourself.

Connect up Soul Six with whatever you have. You own it, the cable is sitting there, and hopefully it's not some exotic hi-fi cable—simple cable can be quite good. If you don't have something close, just use some home electrical wire, Romex 2/14 or 2/12, likely you have some in the garage or stuffed in a cupboard. No? It's not expensive and on the spool at the hardware store. Strip the ends and connect it up. Don't use the center bare ground wire, just cut it back on both ends. It doesn't matter if you use the white or the black insulated wire for the (+) or (–) just be consistent so both speakers are "in phase". If you want to try Zu cable, we would be happy to have you audition them.

Improvements that will be noticed from quality, well engineered speaker cables which match your amplifier/loudspeaker needs include bass depth and resolution, reduced noise, harmonic structure and timbre, attack, stereophony, and ease of listening.

As different length cables of the same model will have different measures, we strongly recommend your left and right cable lengths be the same. If you have one side that has a lot of extra cable just rats-nest it under the shelf—don't coil it as that would add inductance that would not be added to the other and you reduce the quality of stereophonic recordings and their playback. If you would like it neat instead of a nest, you can coil it in a figure-eight pattern, that will not add inductance.

While insulation, jacket materials, pigments, conductor shape, metallurgy and structure are important, those elements should be designed to serve the primary design of the cable, the electromagnetic. The final cable EM field geometry combined with conductors largely determines measured attributes. Different cables have different measures. Connections also make a difference, usually due to contact resistance, but characteristic impedance can also play a role—yes, even in the audible bandwidth. Try some stuff, just like amps, see what works for you and what doesn't. Experiment.

TUNING - LOUDSPEAKER / ROOM

Most of what you will do in room tuning is about timbre—the frequency domain. Knowing what you can affect and what you can't, or shouldn't, will help you make quick and sound choices. Before we get into the recommended ways to room tune, we need to understand where in the note we're working. And we're going to use a piano for reference, to help keep things clear, zoned into the three main phases of a note. In the future we'll add color, when there's more time to write, read and consider.

TUNING - ATTACK » SUSTAIN » DECAY

Most of what you will do in room tuning is about tone and the frequency domain and not attack. Knowing what you can affect and what you can't, or shouldn't, will help you make good choices. Before you spend a lot of time chasing the room-tune-timbre around the room, understand where in the note you're listening. Okay, piano for reference and keeping it simple but still useful—attack, sustain, decay.

When a piano key is struck, three main characteristics of a note are set in motion—attack, sustain, and the decay. The attack of a struck piano note is the impinging hammer, initial string motion and moment of coupling of piano body—the first few milliseconds of the yet-to-form note. The attack contains the detail to process sound prominence—direction, amplitude, character, intelligence. Attack gets our attention, both conscience and non-conscience, and seems to be processed in the primitive part of our brain much more so than the frontal lobes. While attack is almost just an impulse, it informs much of the emotional reaction to what comes next. To really hear what is going on in the attack seems to require the dialing back of our voluntary thinking, allowing the back of our brain to lead.

To recreate the attack is solely a function of the playback system, mostly the loudspeakers, and has little to do with the room. You might scab something together that's close to a cure but you cannot fix attack problems with room tuning. To fix or change the attack is the domain of the temporal, ideally improvements to the loudspeaker, but sometimes with dynamic compressors and other transient and timing based in-the-box processing.

ATTACK GIVING WAY TO SUSTAIN - Related to the attack but carrying into the sustain are the secondary transients, here is where the note takes form, and this is where those that can't turn off their thinking brain start to hear differences. If you have electrically equalized your system (cables included) and have not taken into consideration attack characteristics, or you've used acoustic objects in your room to unwittingly tune attack issues, your playback system is very likely sounding weird.

SUSTAIN & DECAY - The vast majority of people are highly sensitive to the sustain and decay of a note and music generally, sustain is the body that gives attack context (or is it the other way around). With steady-state or semi steady-state music or signal, the room's influence is huge. Nearly all of the musical power is contained in this region, and the room really amplifies it. In fact, most of the sound you hear is the result of the room.

Without realizing, people usually tweak things to get the steady-state, the sustain, tonally correct which inadvertently kills the life in the attack, and sometimes the decay. This is a reason why cables as tone control, digital room correction, parametric equalizers and the like don't fix fundamental time and dynamic range problems. When the sustain runs out of power there is the transition into the decay. How your room sounds and how the speakers work within it dominate the front-side of decay, sometimes swamping the sublets that flourish in the quiet shadows.

TUNING - ZU MONO & MIRROR METHOD

The Zu Mono and Mirror speaker position tuning method is efficient, yielding excellent results without days of fiddling. With speaker placement tuning you are affecting how the wavefronts initially hit the primary listening position, and also how the room's acoustic properties affect and interplay with the sound sources, the speakers. Though the guidance is geared for two-channel rigs, it is also useful for multi-channel as the front left/right are the foundation on which the other channels hinge. This method assumes your room and layout accommodate a symmetric left/right speaker placement. Key points are:

- Tune just one speaker, then mirror its mate
- Use mono recordings, or punch-in that mono button, you need to hear the whole of the recording
- Tune largest wavelengths first - BASS
- Tune MIDRANGE after bass has been tuned
- Tune TREBLE after the mids have been tuned

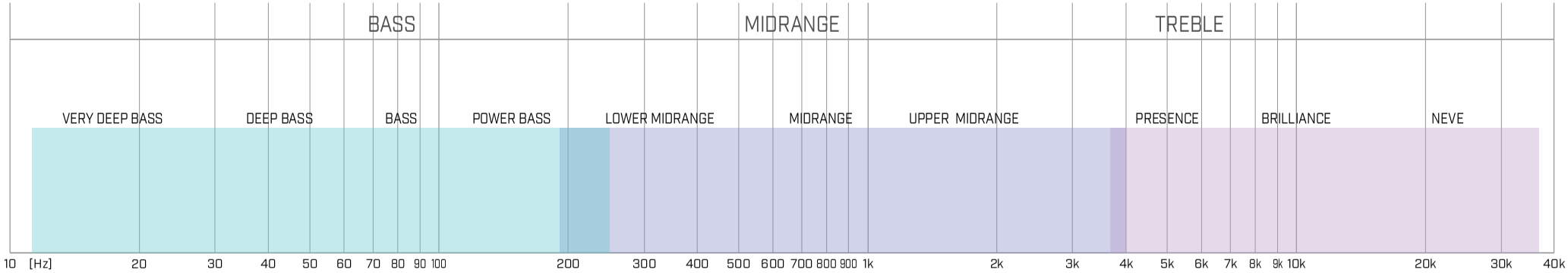
In most rooms there's one loudspeaker position that is framed with more wall space, this is the loudspeaker you will tune. Once tuned you will simply measure and mirror the other. If your room is symmetrical start with the left.

DANGER - If you cannot mute your amp's left and right channels independently, either by menu, key, or balance knob, POWER DOWN YOUR AMP and then disconnect the speaker that is not being tuned. If disconnecting, do so on the amp-side to reduce the chance of shorting the connectors, or safeguard the speaker-side bare contacts from touching if disconnecting them at the speaker. ZuB3 connector users need not worry, your free to hot-swap.

First, tune for bass. No matter how good you get the midrange and treble sounding, if you don't get the bass right there's little foundation to anchor the rest—assuming you don't exclusively listen to trumpet played in a vacuum. Bass tuning is big strokes, moving the speaker a foot or three [0.3 ~ 1.0 m] with each position sample.

FREQUENCY SPECTRUM TERMS

MUSICAL TERMS OVER FREQUENCY AS USED IN THIS MANUAL

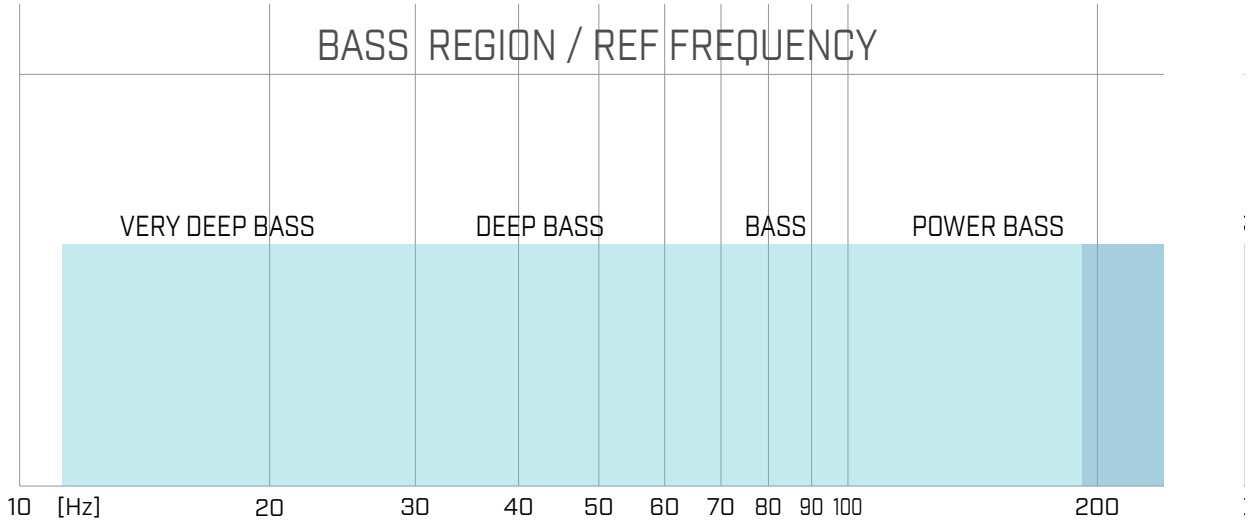


Second is tuning of midrange where you are working with smaller moves, six inches [15 cm] this way or that, then three inches [8 cm], then an inch [3 cm] or so.

Third is tuning the treble, where it's more about toe and lean-back, maybe with some subtle nudging of the position, half inches and less [≤13 mm].

Move listen, move listen... taking mental note of changes in sound. Note that moving the sound source also changes how the room reacts. You should only have to move the loudspeaker three or four times to get the bass dialed in, half dozen moves on the mids, and maybe the same for treble. If you are struggling start over with bass. If still struggling, give up on that side and try the other side. Take note of the differences.

Oh, and did you know, *the devil's triangle* is not a drinking game? Anyway, experiment with your speaker placement, your room, where you sit… the changes and improvements to be had are not subtle.



BASE TUNING

Select recordings with large amounts of low frequency information; dramatic pipe organ and dance music work as do test recordings that have warbled low frequency tracks (20 - 100 Hz range). But do not use test tones exclusively, your brain needs some transients for contexts to do its best work. Test tones can and often do play a roll, but that steady-state sine, triangle and square-wave signal prove difficult for human brains to interpret without some transient counterpoise. If you don't have time for several cuts and types of bass, select some modern disco track with a drone influence to make fast work of long wavelength (bass) tuning.

Here we go. Loudspeaker is where it is, pointing into the room perpendicular to the front wall, playing at a moderate level (only the one loudspeaker should be on); walk over and kneel down next to it. Kneeling will put your head in the seated listening horizontal plane and allow you to hear how the loudspeaker is influencing, and influenced by, the room. In nearly all rooms, the two positions, i.e., loudspeaker and sweet spot, have reciprocal acoustic properties, listening in both zones will help you better map the room/speaker relationship and resulting sound qualities.

You're kneeling next to the playing loudspeaker, now move your head to either side and back and forth of it, say a foot or two [30 - 100 cm] in each axis. Listen to the qualities of the bass, does it sound woolly and muddy behind the loudspeaker? Is the bass more defined a bit to the left or right? If the bass sounds better a bit to the left, move the loudspeaker to that position, and then listen again. Remember, moving the sound source also changes how the room reacts. With each move you should again move your head about. You should also walk back and sit or kneel in your listening position, listen for the changes there, swiveling your head about as you did at the speaker, listening to the broader sweet-spot zone.

You should get the bass sounding pretty good with two, three or four speaker position changes. When it sounds pretty good call it and move on to midrange tuning. Good enough in this case is usually way better than you realize. Listening to just one speaker seems to focus our hearing powers, and reveals issues in the room, loudspeaker, system, recording... that evaporate, or nearly so, when you mirror the mating speaker and light things up in stereo.

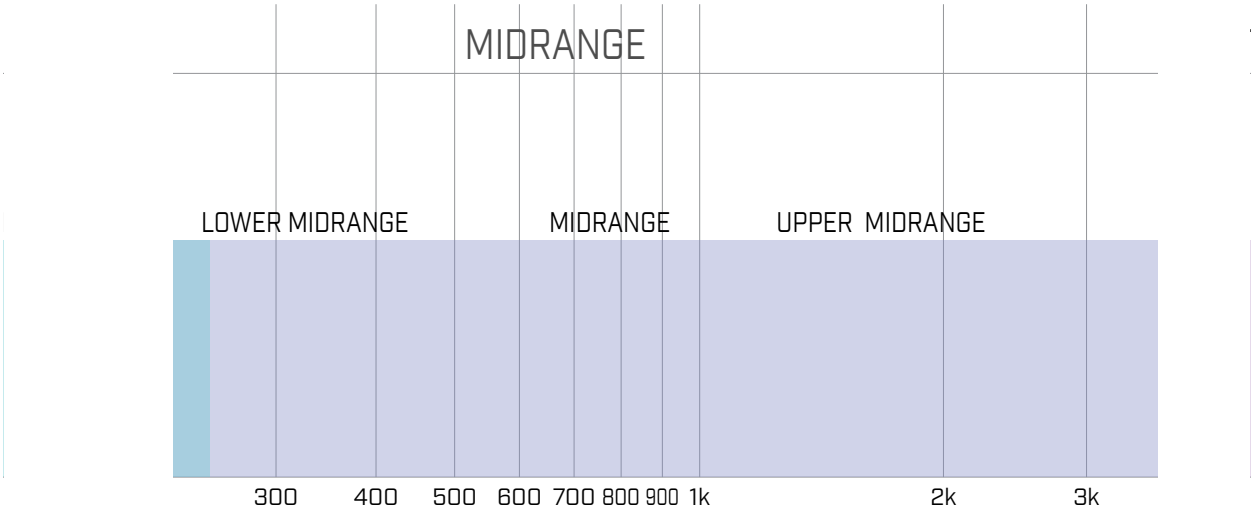
MIDRANGE TUNING

Now that the lower octaves (bass decade) are sounding good, turn your attention to getting natural and vibrant midrange. Remember midrange tuning is a dance of inches [decimeters and centimeters], somewhat similar to what we did tuning the bass but finer strokes, and we also begin messing with directivity aspects of the wavefront—the firing axis. Also different from the bass tuning is how we listen for midrange changes—while changes in midrange can be heard at the speaker it may prove useful to solicit some help. Invite a family member or friend to position the speaker while you listen at the chair. This in addition to the on-your-knees wobblehead thing. Also, your recording selection changes. To help your brain focus select cuts that are less bass heavy—jazz, singer-songwriter, violin solos, guitar, stuff with good overtone color... bass and kick drum free. If you're more sensitive to midbass and power bass then

midrange tune in two steps, first select cuts from Bootsy Collins, Mike Watt, Kim Deal, Tony Levin, Jah Wobble....

First step will be pivoting (rotate on vertical axis) the speaker. The inside-front footer is the pivot, i.e., the footer nearest the captain's chair. Staying with the same loudspeaker room-tuned for bass (you're still only playing the one speaker) and with your midrange-centric recording playing, pivot-rotate the speaker. Initial firing position is straight into the room, orthogonal the front wall. Pivot-rotate slowly moving the firing path—first straight into the room, rotating toward then right at the listener-on-chair, then falling away and finally shining down the hall or whatever. Do this a few times to help the mental map you are making resolve and stick. Most of the time the final position is the speaker shinning right at the listening chair, give or take. Rotating the face of the speaker like this makes massive differences, and the dramatic arc will help you better understand and mentally map the speaker and the room, and their interactions.

By pivoting from that inside front corner, it's easy to make changes to the left and right loudspeaker at some point down the road without having to wonder, are they still mirrored? What will mess up the symmetry is if you pivot one speaker on the front inside corner and then the other from the center of the cabinet, or the outside corner. Drilling down on the desired toe (that's what we are doing here) midrange color will transition from low-presence and masked to open and intimate. Set that angle where you like it. You are pretty close to great here, but additional gains can be had by going back to nudging the speaker. Listen first (kneeling and wobbling your head) at the speaker and see if you find better sound a bit to the side or front/back from where it sits. If you can't tell kneeling next to the speaker, return to the listening chair and have your buddy move the speaker an inch or two [3 - 5 cm] left, then right, forward, back, all while keeping that same toe-in angle. If no difference, great, let your choices stand, time move to treble tuning.



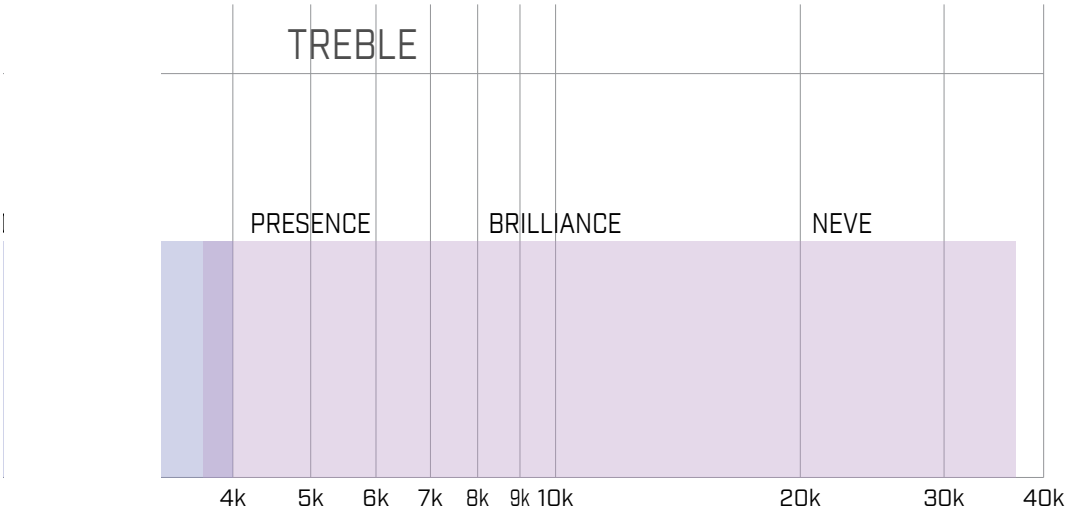
TREBLE TUNING

At this point you are done nudging the speakers position, treble tuning is mostly about the speakers firing axis, the toe (inside corner pivoting) and cant (lean-back) and elevation (height from floor). The experience you gained with toe when tuning midrange will help you hear the more subtle aspects of treble tuning. Start with toe, try a degree or two inside of where you got midrange tuning. Then try a degree or two outside. Drill down and call it good after a handful of changes. Next move to the lean-back phase. For smaller rooms with low-slung seats no lean-back, or very little, is typical. But for tall chairs, big rooms or listeners that prefer food prep or dancing, lean-back will very likely improve overall sound.

Have a friend lean the playing speaker back, hinging on the back two footers. Two things are happening here. You are changing the firing axis, angling the wavefront, and you are also elevating your drivers a bit further from the floor. Okay, there are other things going on when you lean the speaker back, but these are the two primary. If you find you like the Soul Six leaned back further than the say the angle that puts an inch or so [4 cm] of space between the lifted front footers and the floor, you're likely to prefer the sound with them on risers. If you start messing with risers you might need to retune for midrange.

RISERS

Measure and note the distance from that speakers inside front corner to the side wall and front wall, and measure the toe angle. Now, turn your amp off, remove the speaker cable and move the speaker out of the way. Place the butcher block you grabbed from the kitchen, approximately where the speaker was. Then place the speaker atop the block. Reposition the speaker to your measures. Reconnect, and while playing have your buddy again lean the speaker back. If you find you like the sound with a lot of lean-back still, grab more blocks or bricks. You have the idea. Once you are happy enough, mirror what you did to the playing speaker to its mate, perfectly mirrored. Now mirrored and connected, fire things up in stereo. Expect to be impressed. If not, make sure your speaker cables are both connected, and both in the same polarity - red to red and black to black. Yes, materials used for risers also influence sound, but not as much as the elevation is.



CARE & MAINTENANCE

Soul Six are designed for in-home use. Under normal daily use in an average home you can expect a life-time (100+ years) of trouble-free, high-performance playback. Soul Six do not require any special care aside from keeping them free of being splashed on or misted with airborne materials or impacted by falling artwork, the chain saw over your mantle that might soon vibrate off, snowboards, waterskis, your rough-and-tumble dog.... Occasional dusting is also recommended.

⚠ CAUTION - with wood finishes we recommend you keep the loudspeakers out of prolonged and frequent direct sunlight. How long is prolonged and frequent? Well, three hours a day of direct sunlight every day will cause some color changes after a year or two. Painted finishes will not. While we use materials and top coats with the highest levels of UV resistance and absorption, some color changes to wood finish is going to happen when sitting in direct sunlight day after day.

⚠ There are no serviceable parts such as fusses used in Soul Six speakers. Connectors are plated and do not require cleaning or maintenance unless they are contaminated by grease, dirt, salt, or some other abnormal substance. Capacitors used are Jupiter Copper and as used are good for the life of the loudspeaker. Ceramic and metal alloy magnets used in the driver are likewise good for life.

CABINET FINISH CARE

⚠ Soul Six are finished in real wood veneers or painted surfaces. All Soul Six finishes are very durable. To clean and dust them we recommend a lightly water-damp clean and soft cotton or micro-fiber cloth. You are able to wipe down all surfaces save the full-range driver cone. Care of the FRD is outlined below.

⚠ Note, once a micro-fiber cloth becomes soiled it will hold grit and dirt even when washed aggressively—only used clean cloths. If you have a mirror gloss finish we recommend that you use a new micro-fiber cloth with each dusting or washed and clean soft cotton cloth. If there is excessive fingerprints and grime on the speaker you may use a window cleaner or Meguiar's Final Inspect in place of water, spritzing the cloth and not the loudspeaker directly.

Zu's favorite general purpose loudspeaker finish cleaner is Meguiar's Final Inspection #34, misted onto a soft cotton or new micro-fiber cloth. This is a non-bonding, silicone-free detailing fluid that has been proven safe for all finishes and materials that you are likely to have in your hi-fi rig.

⚠ While the finishes are water resistant, you should not set drinks or plants on top of your

speakers without safeguarding against water-ring stains—condensation pooling at the bottom of the cup or pot will possibly cause damage.

FULL-RANGE DRIVER CARE

Remove the hard plastic driver covers when using Soul Six. Keep them near as they are effective guards, quickly slipping on to protect the cone from the curious. Also, slipping them on when you're headed out on vacation safeguards the full-range driver from bugs and dust.

To clean Soul's full-range driver we recommend just using a can of compressed air. If the cone become soiled for any reason we recommend that you call for assistance. The paper cone assembly is tougher than it looks, even so, place the push-on protective plastic disks over the drives when they are not in use to keep fingers elbows and noses (dog) from messing them up. If your cone does get impacted in a way that deforms the cone we recommend you send us photos so we can advise on how to DIY-repair the damage.

While the paper-based cone can withstand the occasional misting by basic window and surface cleaners, we recommend you prevent this from happening. Full-range driver should be protected against being spritzed by cleaners and should not be splashed on or misted. If the driver cone accumulates enough contamination, and depending on the chemistry, there is the possibility of damage to the fibers and binders and makes possible the growth of mold. In over twenty years, and with thousands of customers, we have only seen mold on a cone but one time. This instance was when the loudspeaker was used in a kitchen area, with very high humidity, temperatures and cooking-stuff occasionally flung and frequently hanging in the air.

CONNECTOR CARE

No cleaning is required of the connectors unless they have been contaminated. Top of list is animal urine. This is discussed as its own thing. For most everything else, we recommend you clean the five-way binding post with a damp cloth, spritzed with window cleaner. Remove the locking nuts from the binding posts to allow you to clean the connection's mating surface. The ZuB3 connector is not likely to need any service—the contacts are inset quite a ways and thus protected from most splashes and aerosol fallout. The connectors used to facilitate the ZuB3 interface self clean when the plug is inserted for service.

CLEANING ANIMAL URINE

⚠ NOTE - Urine may permanently stain or damage the speaker's finish. Also, the chemical compounds in urine can corrode the connections. If the connectors of the speaker get peed on, remove the speaker cable and clean immediately. To clean urine the speaker's connectors and finish you need:

- 1x of your favorite foaming urine remover
- 2x ounces or more of distilled water in a spritz bottle
- 1x aerosol can of compressed air
- 1x aerosol can of quick dry electronics connector cleaner
  Example: CRC® QD Electronics Cleaner
- Several clean cloths or rags

1. Remove the speaker cables from the loudspeaker.

   You should clean the speaker cable too, likely this method works for whatever speaker cable brand you have but you should confirm with the brand/maker. Some designs are susceptible to water ingress, which is likely to cause issues as the cable ages. Zu cables do not have such issues.
2. Remove the nuts from the binding posts.
3. Directly, but lightly, spray your favorite foaming urine remover onto the connections including the removed nuts. The binding posts and the ZuB3 connection (Supreme and Superfly versions) are sealed and can be directly cleaned in this case. Let stand for a minute or two, but not longer than three. The foaming sprays work better for working loose and neutralizing the pee from the connections.
4. After the urine remover has sat for a few minutes, wipe clean and dry with a cloth.
5. Now directly spritz the connectors with distilled water, including the inside of the ZuB3 connector.
6. With the can of compressed air, blow the connections out to displace the distilled water and mostly dry the connectors.
7. Then immediately spray the cleaned area with quick dry electronics cleaner. This will displace any remaining moisture and give he contacts a final cleaning.
8. Let sit for a minute or two to allow the quick dry electronics cleaner to mostly evaporate, then, using the can of compressed air, blow the connections out one last time.
9. Reconnect and play.

RECOMMENDED READING ON ACOUSTICS AND HEARING

Sure, all this is a bit mathy, but if you want to know and corollate sounds and your hearing, and how to preserve it, here's your short list:

www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss
www.cdc.gov/niosh/topics/noise/noise.html
www.cdc.gov/niosh/topics/noise/surveillance/statistics.html

DHHS (NIOSH) PUBLICATION NUMBER 98-126
DHHS (NIOSH) PUBLICATION NUMBER 2018-124
DHHS (NIOSH) PUBLICATION NUMBER 96-110

BOOKS ON ACOUSTICS

Whatever the reason, the current consumer playback world is a bit lost in its conception of acoustics and the nature of sound—much has been written in the hi-fi world but little of it is genuine. Here's a short list of recommended works:

Modern reference - math and model driven:
Kinsler, Frey, Coppens, and Sanderds, Fundamentals of Acoustics, 4th ed, Wiley, 2000)

Instruments and there acoustics, mostly words:
Benade, Arthur H., Fundamentals of Musical Acoustics, 2nd ed. (Dover, 1976, 1990)

Classic "The Bible"
Olson, Harry F., Music, Physics and Engineering (Musical Engineering), 2nd ed. (Dover, 1967. Original 1952 & 1967)

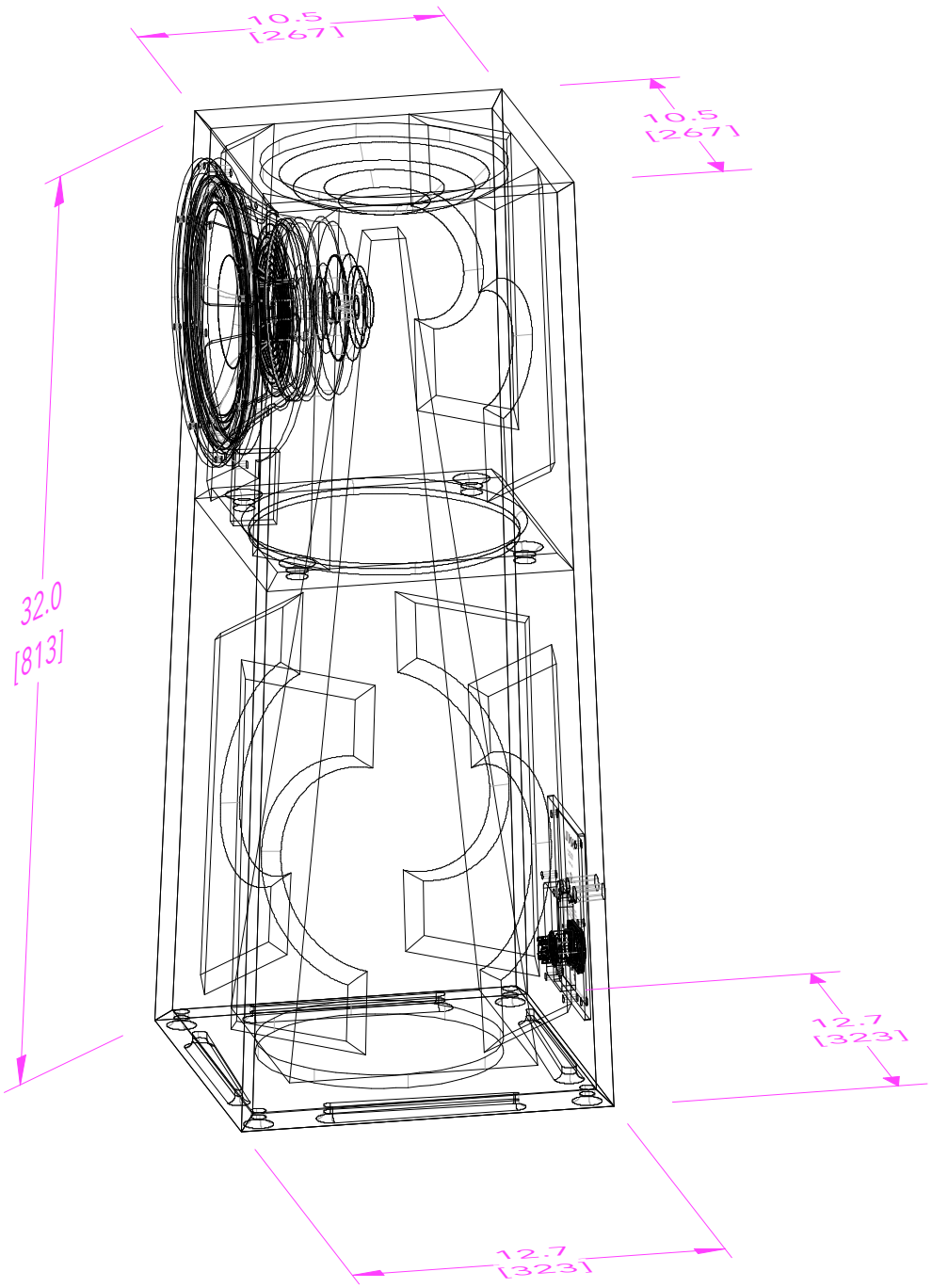
What this guy did in his free time, a great foundation for modern acoustics:
Jeans, James, Sir, Science & Music, (Dover. Original 1937)

Another great, spinning this out in passing - set the stage for Jeans:
Rayleigh, J.W.S. Baron, The Theory of Sound, 2nd ed. Vol. 1 & 2, (Dover, 1945. Original 1894)

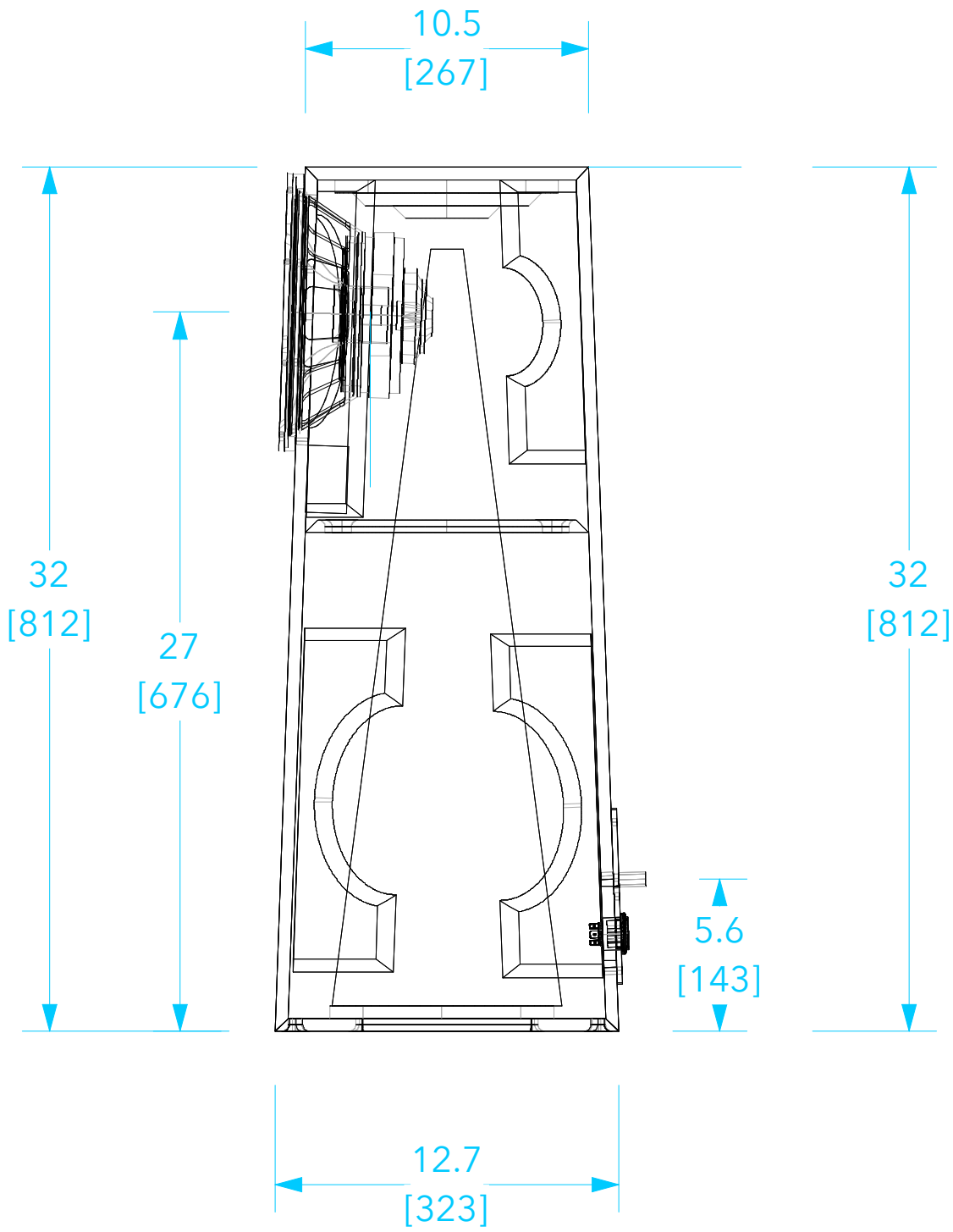
Read after you have the above under your belt:
Lamb, Horace, Sir, The Dynamical Theory of Sound, 2nd ed. (Dover, 1960. Original 1925)

The beginning of modeled acoustics:
Helmholtz, Hermann L. F., On The Sensations of Tone, 4th ed. trans. Alexander J. Ellis (Dover, 1954. Original 1885-77)

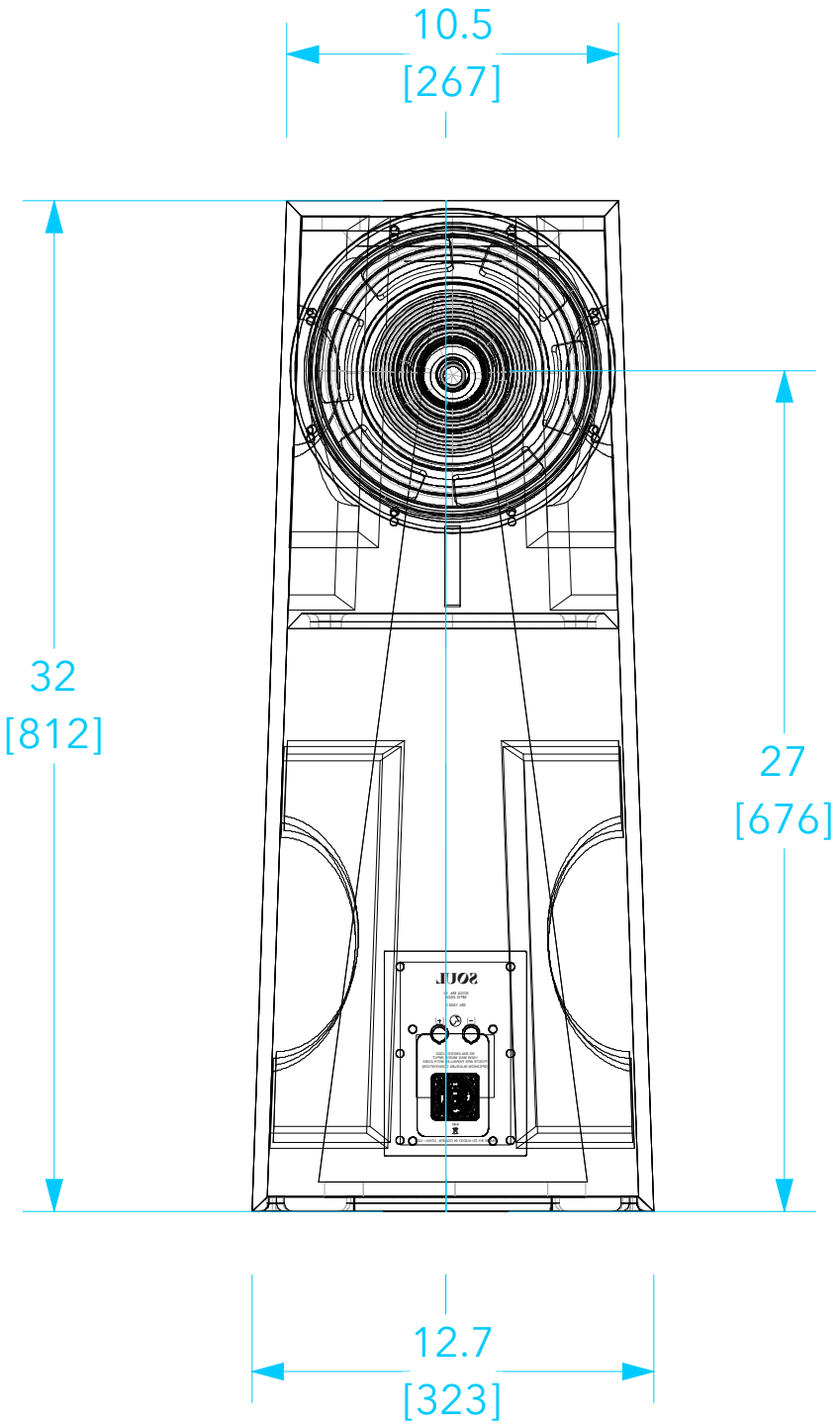
DIMENSIONS - ISOMETRIC



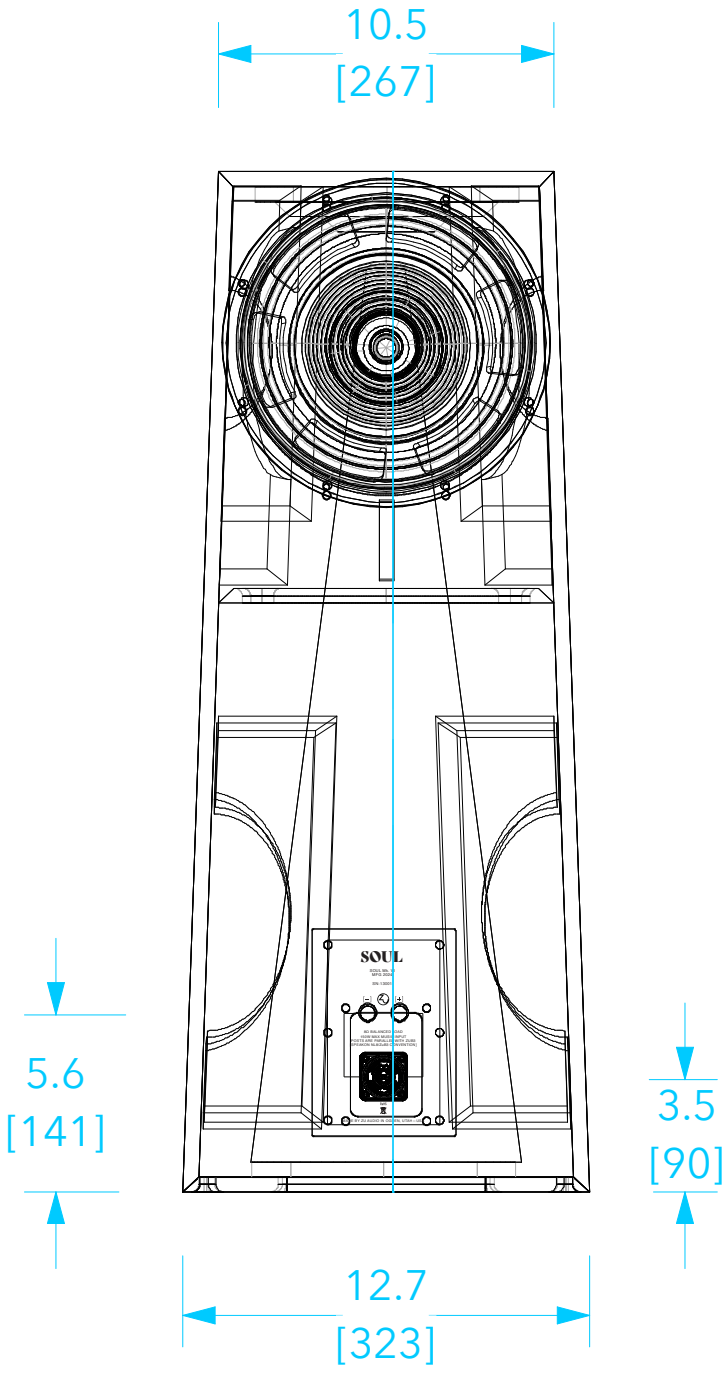
DIMENSIONS - SIDE VIEW



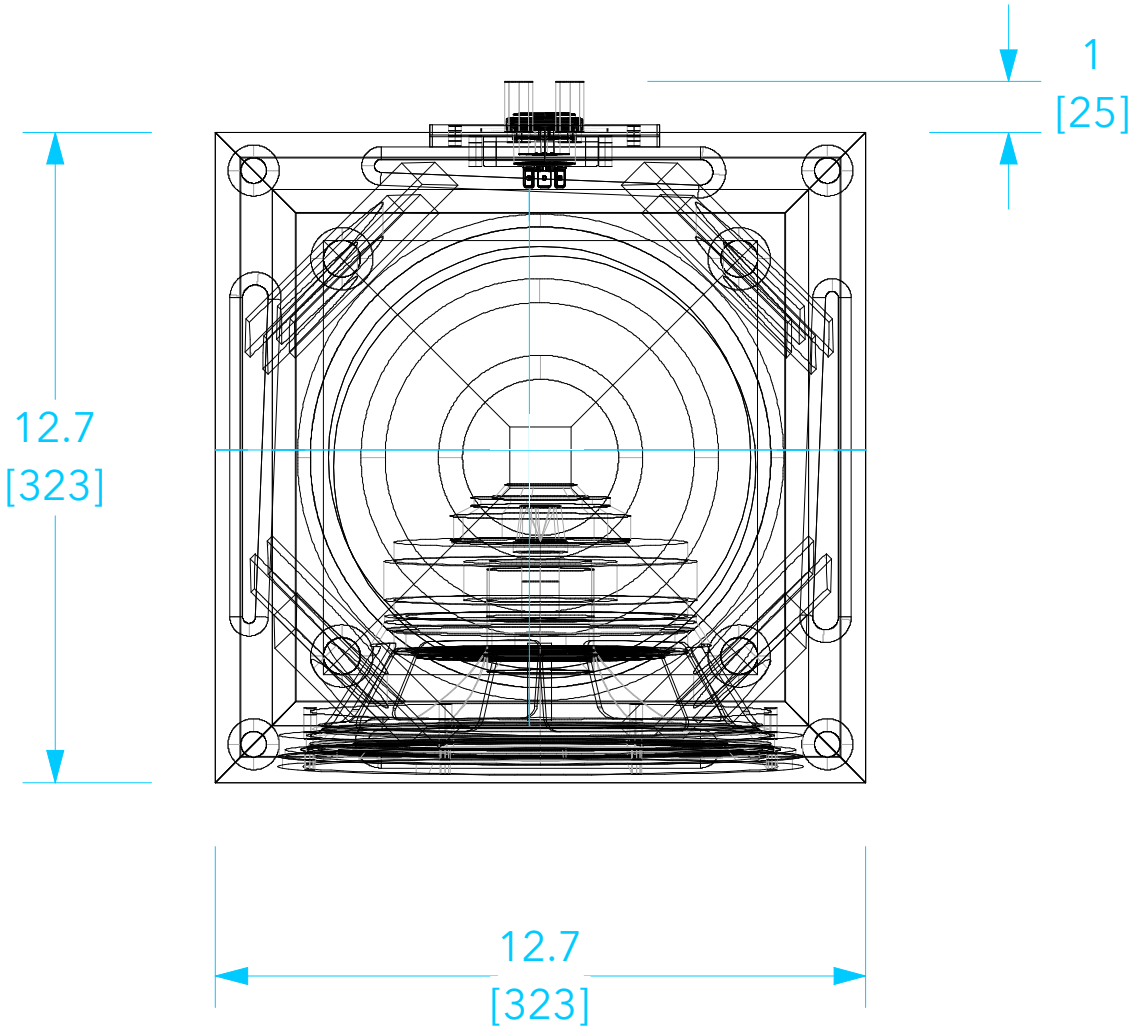
DIMENSIONS - FRONT VIEW



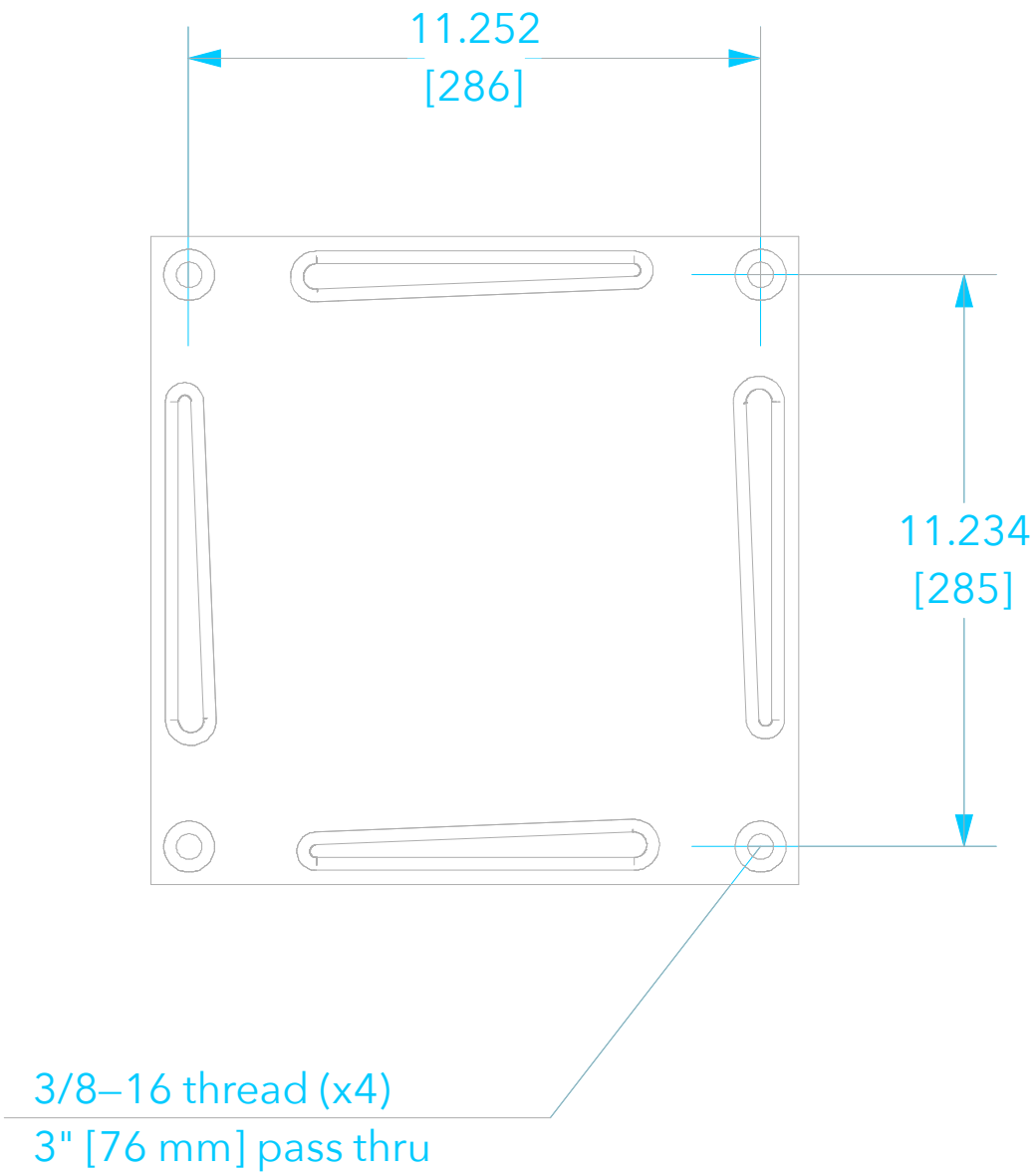
DIMENSIONS - BACK VIEW



DIMENSIONS - TOP VIEW



DIMENSIONS - BOTTOM INSERT PATTERN



SPECIFICATIONS - FASTENER DETAIL AND TORQUE VALUES

Full-Range Driver Fasteners

Screw Thread: 10–24
Screw Drive Size: 1/8" hex (Allen)

Torque: 26 inch-pounds [3 N-m] in three stages, in crisscross pattern
» first, torque all to 9 inch-pounds [1.0 N-m]
» second, torque all to 18 inch-pounds [2.0 N-m]
» final, torque 26 inch-pounds [3 N-m]

Anti-Seize: required - OE is Slickoleum™
Substitute: clear silicone grease

N151M-8 Tweeter Driver (only service if tweeter voice-coil needs inspection/replacement)

Screw Drive Size: #2 Phillips
Torque: 9 inch-pounds [1.0 N-m] in two stages, cross cross pattern
Thread Lock: Loctite® 242 or 243 (just coat first two or three threads)

Internal Assembly / Service Adhesive

N151M-8 Interface: Loctite® SI-5900 (substitute: Permatex® The Right Stuff)
High-Pass Coil/Cap Mount: Loctite® SI-5900 (substitute: Permatex® The Right Stuff)

Nameplate Fasteners

Screw Thread: 10–24
Screw Drive Size: 1/8" hex (Allen)

Torque: 18 inch-pounds [2 N-m]
Anti-Seize: required - OE is Slickoleum™
Substitute: clear silicone grease

Footer Fasteners

Screw Thread: 3/8–16
Nut Drive Size: thin nut (jam) 9/16" [14 mm]
Zu Leveling Footers: if you have them, there hex drive size is 5/8" [16 mm]

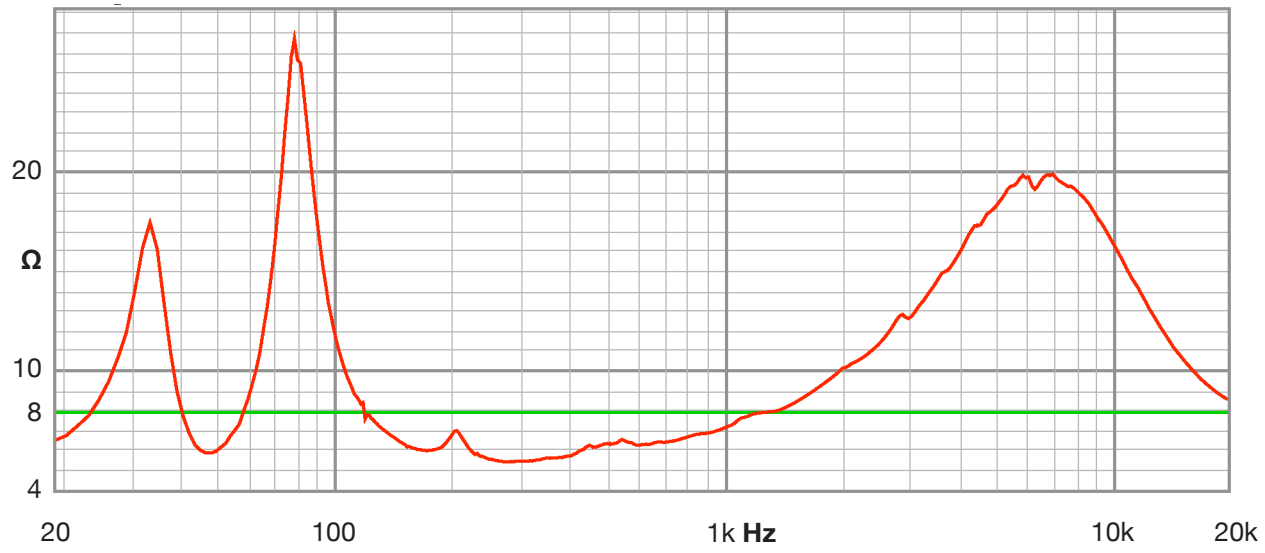
Torque: 44 inch-pounds [5 N-m]
Anti-Seize: recommended - OE is Slickoleum™
Substitute: clear silicone grease

SPECIFICATIONS - GENERAL LOUDSPEAKER DETAIL

Dimensions H x W x D	32 inches [81.5 cm] tall without footers 12.75" [32.5 cm] square footprint 10.5" [26.7 cm] square top
Weight	39 pounds [18 kg]
Packaged Weight	49 pounds [22 kg]
Bandwidth	30 - 29k Hz (typical in-room response)
Voltage Sensitivity	99 dB-SPL @ 2.8V, 1m
Impedance	8 Ω (5-1/2 Ω Min @ 290 Hz, see curve)
Wavefront	virtual point source
Max SPL Program	120 dB-Z (slow)
Horizontal Listening Window	45˚
Vertical Listening Window	45˚
Listening Distance	2 feet [50 cm] or more
Accepted Connectors	see detail on connection page
Internal Cabling	Zu Event internal cable
Full-Range Driver	ZuCX-ND-8-N151M
High-Pass Filter Detail	mono-pole bessel @ 18k Hz (12k Hz acoustic) Jupiter Copper 1.0 µF
Max Power Input	150 watts (full bandwidth) Max Power LLF: 400 watts RMS (80 Hz high-pass, 12 dB/octave. Assumes power is unclipped, amp rated at 500 or more watts @ 8 ohms)
Recommended Amp Power	2 - 8 watts for low to moderate sound pressure levels 8 - 32 watts for moderate to very loud SPLs 32 - 500 watts for very loud to ear damagingly loud SPLs
Left/Right Pair Matching	0.25% on drivers and 0.1% on all other components
Cabinet	okoume plywood, marine grade BS1088 certified
Feet Insert Thread	3/8–16 TPI, 9/16" hex nut (14 mm wrench can be used)
Life Expectancy	100 years in-home use
Compliances	RoHS | WEEE
CE Compliance	yes, if insulating boots over binding posts are installed
Manufacturers Country Of Origin	U.S.A. all parts and labor excluding just a few small parts

CURVES - IMPEDANCE + IMPULSE

Example of Zu Soul Six impedance curve (no filters, no smoothing)



Zu Soul Six complete electromechanical impulse response raw (no filters, no smoothing)

WARRANTY

Zu Soul Six loudspeakers have a five year limited warranty from the date of purchase to the original owner. If under normal home use there becomes a problem with drivers, cabinet or other parts Zu will assist in fixing or replacing the product.

For warranty eligibility the owner needs to email or call Zu to arrange support. This provides an opportunity to assist in diagnosing the problem and helps coordinate for rapid turnaround. Final warranty eligibility will be determined upon inspection of parts or product. Service options, parts availability and response times vary.

Loudspeaker service can frequently be performed by the owner, known as DIY service. In such cases Zu will provide parts and technical support. DIY service provides faster repair of product and minimizes handling costs and damage potential to both Zu and the owner. Disassembly for inspection does not void warranty but must be disclosed.

Soul Six loudspeakers are designed to be used in controlled environments, namely your home, office or studio. Warranty does not cover loudspeaker finish damage caused by the extremes of an uncontrolled environment, nor does it cover damage from misuse, impact and abrasion. While the highest quality UV protecting topcoat finishes are used, Zu cannot guarantee against fading and the owner should keep them out of direct sunlight.

In the highly unlikely event that a Zu product arrives dead on arrival (DOA), and after discussing it with a Zu tech who can assist in the troubleshooting, Zu will assist with DIY repair or ship another of the same product at Zu's expense and arrange for the DOA product to be collected. If after inspection it is found that the problem or situation was misrepresented, or the loudspeaker was improperly handled or used, Zu may decline the warranty claim and charge for all damaged parts, labor, shipping and handling.

Warranty does not apply to damage caused by operating the product outside the intended use, accident, another product, misuse, abuse, flood, fire, earthquake or any other external causes. Warranty does not cover damage caused by modification or service performed outside of Zu's direction. Warranty is also void if any part of the serial number has been defaced or altered.

When a product or part is exchanged the replacement becomes the property of the user and the suspect or damaged part becomes Zu's property. Parts provided by Zu must be used in products for which the warranty service is claimed.

When the shipping of a product or a part is required, repackage the complete product, or part, in its original packaging. If there are questions about packaging please call or email. Product damage caused from incorrect repackaging is not eligible for refund or warranty and the freight company may also reject your insurance claim. Until the product is back and the warranty claim is accepted, the product is still the property of the owner.

Zu will comply with all applicable domestic and foreign trade laws and regulations; the owner may be responsible for custom duties, taxes, broker fees, freight, and other charges.

ZU AUDIO
Ogden Commercial Industrial Park
3350 S. 1500 W.
Ogden, UT 84401 — U.S.A.

DESIGNED AND MADE BY US