

# UNION 6

OWNERS MANUAL [2023]



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## KEY POINTS

We know you're excited to get your new Union 6 fired up—still, we strongly recommend you study this manual. Here are a few key points:

- Burn-in is dramatic with Union 6. Please read the **Burn-In/Break-In section**.
- Remove the slip-fit full-range driver protective covers to listen. These protective disks have the sticker *remove to groove* on them.
- 60-day trial period can be extended if you email us. We're happy to open up additional time for burn-in, room tuning or trial of amps and other components as long as you are dealing fairly with us.
- We offer exceptional customer service, and the people you will talk to at Zu have a lifetime of experience and will deal honestly with you.
- Implementing the information detailed in the **Room & Speaker Acoustic Tuning** section will get your room and Union 6 working well together and without a lot of effort.
- If your Union 6 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 that you will be liable for.
- 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.
- We only issue return authorization after at least four weeks of daily play and an honest effort to follow our suggestions. We expect you to read this owner's manual and give us a call if you are running into any issues—we're here to help.



## WELCOME AND THANK YOU

Thank you for your purchase of Union 6. 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 let your family and friends know.

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 qualities 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

The latest version of the manual can be found at [www.zuaudio.com/downloads](http://www.zuaudio.com/downloads)

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## INCLUDED WITH LOUDSPEAKERS

### Included with each pair of Union 6 loudspeakers

- (2x) slip-fit hard plastic driver covers - installed
- (8x) 1" long [26 mm] 3/8-16 stainless-steel oval-end 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.

## SAFETY PRECAUTIONS TERMS

**Read and follow these precautions to use Union 6 loudspeakers safely.**

Zu Audio is not liable for any failures, damages or problems caused by the use or misuse of Union 6 loudspeakers by the purchaser or any third party.



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



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



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



**PROHIBITED** This mark signifies *prohibited* action, which must not be done to use this product safely or to prevent premature wear.



**REQUIRED** This mark signifies *required* action, which must be done to use this product safely, to get good sound or to prevent premature wear.

**DANGER - RISK OF SEVERE INJURY OR DEATH**

DANGER - avoid electrocution by making sure your amplifier is powered down (or the amp's power cable is disconnected) prior to disconnecting/connecting loudspeakers.

Electrocution through touching of bare metal amplifier output posts, bare metal loudspeaker cable connectors when connected to amplifier, or bare metal loudspeaker connectors when connected to the amplifier is possible though extremely rare. Amplifiers designed to output enough power to cause electrocution while operating will feature touch-proof contacts such as Neutrik® speakON® connectors.



DANGER - place your loudspeakers so there is little to no chance of them falling or tipping over on someone.

Union 6 loudspeakers are very stable when floor standing and footers adjusted so there are four points of contact. Nevertheless, children, and especially infants and toddlers, should not be left unsupervised near them.



DANGER - Union 6 loudspeakers are moderately heavy at about 70 pounds packaged [32 kg] and should only be handled and moved by the physically able. Those lifting and moving the Union 6 loudspeaker should practice good lifting techniques (lift with your knees and not your back—and ask a friend to assist.) While not acutely at risk of death, back injuries can and often do cause chronic pain, sometimes reaching unbearable levels.

**WARNING - RISK OF INJURY**

WARNING - potential shock hazard exists when touching of bare metal loudspeaker and loudspeaker cable contacts. To avoid this make sure your amplifier is powered down prior to connecting or disconnecting cables to your amp or loudspeaker.



WARNING - Union 6 loudspeakers are capable of extreme sound pressure levels, play responsibly—consider your neighbors and consider your hearing.



WARNING - again, when moving or lifting Union 6 loudspeakers, be careful with your back—lift with your legs, not your back, and ask a friend to assist you.



WARNING - the drivers of the Zu Union 6 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.

**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 Union 6 loudspeaker on the corner of cabinet. (Pivoting them on the installed footers or spikes is not a problem as they 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 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.

**CAUTION - RISK OF PROPERTY DAMAGE**

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 Union 6. 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 Union 6 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 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—typically 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.



CAUTION - screws fastening the full-range driver and connector plate need only be torqued to 26 inch-pounds [3 N-m].



PROTECT - when not in use, specifically when there are unsupervised animals such as cats, dogs and kids abiding near your speakers, we recommend you snap the protective driver covers on. This will also help safeguard from foreign materials.

PROTECT - when transporting Union 6, 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.




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. "This one time, at band camp, they left the slip-fit driver covers on and nobody liked it."








## 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.

 We recommend you remove rings, watches, belt buckles, anything you might be wearing that can mark or scratch the finish, or lessen your grip. Also, trade your button-up or snap shirt for a tee.

 If Union 6 loudspeakers are sent back to Zu for refund (RMA required) they must be repackaged as sent including the thin protective plastic film directly wrapping the loudspeaker. The exception is the banding and staples as we know few have convenient access to them. In place of staples please secure all cardboard edges with packing tape. In place of banding please secure all edges of the edge protectors with packing tape. If they are sent back to Zu for refund and are not packaged as outlined the purchaser is liable for damage to the loudspeaker.

1. With the box standing up, cut banding and dispose, banding is 100% polyester.  Save the thick cardboard edge protectors for future use.
2. Starting at either stapled corner, with the model/serial number label on top and facing you, lift 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 releasing and removal of staples easier.
3. Continue releasing the remaining staples so the flap is free to fold back and out of the way.

 We recommend removal of the released staples to prevent the sharp edges from accidentally snagging or scratching your clothing, skin, walls, floor or your new loudspeakers. If you are careful this is easily done with bare hands, just bend them straight and twist them out.



### Unboxing Continued

4. Remove the two loudspeaker-length cardboard sheets. There is one on the left and one on the right, sitting 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.
5. Now shimmy-slide the Union out from the main box.
6. Remove (and save) 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 when speaker is slid.
7. Leave the plastic wrap and move/slide speaker to near about where you want them. The plastic wrap protects the finish while handling and dramatically increases grip.
8. Remove the bottom foam and plastic film once you have the speaker near where you want them. 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.
9. With the speaker standing, remove the plastic film.
10. Remove the flip-fit driver covers. Keep them near as they are effective guards, quickly pressing on to protect the cone from the curious. Installing them when you're on vacation also safeguards the full-range driver from bugs and dust.



## UNION'S DESIGN OVERVIEW

### UNION 6 SUPREME

There is much in common between Union 6 and Union Supreme 6, but performance is noticeably elevated with Union Supreme 6. Both loudspeakers are based on the Soul 6 full-range driver, and both use center-mounted super-tweeters and both are rated for 99 dB/W/m efficiency. Both have amp-friendly, 8 ohms impedance. And both speakers have our new more sophisticated Zu/Griewe and scatter plate internals that eliminate the fussy floor gap and instead allow the main driver to “see” the room via a rear exit. You can place Union 6 or Union Supreme 6 as close as 2” from the wall behind it.

Zu's Union Supreme 6 builds on the essential agile, bursty, toneful sound of Union 6, extending its range and articulation and further focusing its acoustic output for even less cabinet dissipation. Harmonic content extends out to 29k Hz and bass digs a tad deeper than Union 6, but is noticeably harder-hitting. Locating all of the moving elements around a single axis makes for an exceedingly cohesive and unified wavefront but in this case, we use the full Soul 6 integrated mag-flux driver with main driver and super-tweeter fully conjoined. Union Supreme 6 is astonishingly vivid, yet nuanced and subtle when it needs to be. It delivers salacious slam and scale in real-world spaces without forcing you to organize your room around the speakers. With Union Supreme 6 you will discover intricacies you've missed in your music and you're likely to hear new energy in dynamic swells, too.

Union 6 Supreme taps the very best gear yet thrives with what you have (probably). For music connoisseurs craving true high end sound at an accessible price.

Union 6 Series speakers replace several recent models. Union is Zu's workhorse high fidelity loudspeakers, capable of revealing the best in well considered systems—modest to very high-end. They are also at home in dedicated two-channel systems or home theater. Compared to Zu's previous similarly priced loudspeakers Union 6 improves in the following ways:

- Raises resolution, transparency and tone across the board.
- Union are less fussy with respect to room placement.
- Removes the confusion of having 12 and 16 ohms models in a predominately 8 ohms market.
- Eliminates the traditional Zu setup task of finding the right floor-to-speaker gap for your room.

We accomplished all of that with the Union 6. We kept the funk and fun that has always attracted people to Zu, and eliminated the fuss that deterred some others. Being that Union 6 is a very high resolution speaker, burn-in changes are dramatic, and the amplifier/speaker matchup is very sensitive.



Union Supreme 6 makes no effort to gild the sound. The largest driver of fidelity within a playback system featuring Zu Union Supreme 6 speakers is the quality of the recording. Great recordings and media should sound great. Flat, lifeless and confused recordings will sound flat, lifeless and confused.

Union Supreme 6 is the same mid format tower size as Union and all prior Omen models, but with resolution and tone able to leverage associated gear well above its paygrade. Union Supreme 6 raises prosaic amps and sources to new musical heights. Union Supreme 6 is astonishingly vivid, transparent and toneful such that it can tap the potential of the best associated gear in any system, without needing the same to thrive.

## **UNION / UNION SUPREME DIFFERENCES**

Union series loudspeakers are high-efficiency home audio loudspeaker and are precision-matched in stereo pairs. They are able to recreate compellingly real sound in tone, dynamics and in stereophony. Union is also offered with the Supreme performance package. There are no drawbacks save the price to this upgrade, and the extra burn-in required. The Supreme performance additions are engineered to give the Union Supreme 6 noticeably improved resolution and smoothness without altering its great tone and killer shove. The proof of these claims we think you'll find in album after album marathon listening where you find yourself totally lost in the music.

Union and Union Supreme 6 are both 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 Zu's 10" [26 cm] coaxial, paper-cored nanotech sanctified, full-range driver. The coaxially located tweeter adds the burnish and upper treble.

## **UNION SUPREME 6 DIFFERENCES**

Internal Cable: Zu Event Mk. II harness

Union 6 [standard] uses Mission Mk. II cable

NOTE - Zu Event uses Teflon for dielectric which significantly increase the burn-in profile time frame for the Union Supreme 6.

Full-Range Driver Assembly: ZuCX-ND-8-N151M Grade-2

Union 6 [standard] uses the ZuCX-ND-8-UAPT50-3 Grade-1



Tweeter: Integrated Eminence N151M bonded mechanically and magnetic.

Union 6 [standard] uses the Eminence UAPT50-3 based tweeter.

NOTE - These driver assemblies are functionally different. Union Supreme 6 typically has a 0.5 dB higher output than Union 6.

High-Pass Network: single element mono pole filter using Jupiter Copper capacitor

Union 6 [standard] uses the ClarityCap MR capacitor

NOTE - the Jupiter Copper does need longer burn-in time over ClarityCap MR to sound its best.

Union Supreme 6 feature Grade-2 full-range drivers with integrated super tweeters. These are driver pairs that 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.

Union Supreme 6 gets Event Mk. II internal cable, improving resolution over Mission Mk. II cable. Event Mk. II internal cable features Teflon insulation and silver based conductors, within a ZuB3 format. A combination that gives a broad and uniform characteristic impedance to the cable. Conductance is on par with Mission Mk. II but the propagation velocity is higher and the noise floor is noticeably lower. Event Mk. II internal cable harness increases the resolution of the loudspeaker system to a point where Jupiter Copper capacitors combine in mesmeric ways—Union Supreme 6 features these caps.

Jupiter Copper Caps - Jupiter Copper Foil & Paper and pure silver leadout capacitors are utilized in the tweeter high-pass network of Union Supreme 6. These capacitors match up extremely well 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. Pair matched to 0.2% or better.


## **BREAK-IN/BURN-IN**


### **BURN-IN OVERVIEW**

Zu Union 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 driver's cone—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 performance profile, and there's a fine line between membrane break-in and permanent deformation. During this time other aspects are also breaking in, the drivers' suspension and also the dielectrics and electronics, but these, particularly the electronic, will continue to burn-in within typical home playback levels.



Union 6 receive a minimum of 300 hours of factory burn-in.  
 Union 6 Supreme 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 they 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. Unless specified otherwise, what follows are generalizations about burn-in specifically relating to home audio direct radiating Zu loudspeakers.


Most find Union 6 to sound a bit harsh but promising when new. Some find them amazing right out of the box. Some find them to sound strident and not so promising. In all cases users should know that they are going to change, significantly. The sound and enjoyment you will get from them after four to six weeks or so of daily evening use is going to be night and day compared when you first get them. If you have purchased Union, listened for a week or so and then hastily concluded that they are not your sonic cup of tea give us a call or email, please let us help.

The majority of potential Zu owners that we talk to feel that burn-in is a thing, but that its 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 Union 6 and Union Supreme 6 are not like normal speakers and the burn/break-in changes they go through is an interesting and not subtle phenomenon.

## **BURN-IN MAIN POINTS**

Here are some points to help inform and guide your setup, tuning and burn-in expectations. Effecting the speaker's transition from sounding new to sounding full and engaging include:

- The length of time played
- Power levels and program material played
- Temperatures they might have been subject to in shipping or storage
- Even though Union's sound will change with play, we still encourage you to follow our guidance on room tuning as performance gains made there increase your enjoyment during the burn-in phase(s).


 During the burn-in phase we don't recommend swapping of components without reason and method as burn-in is heavily impacting the sound.

- If you have amps and other components that are burned in and near-to-hand maybe give



them a try. But 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, and listening through burn-in on top of burn-in is rarely worth anything.

- If you do change an amp and notice a change for the better, you should also switch back to confirm that it is in fact the amp that made the difference. It could also be that the change was coincident with a burn-in related improvement, or some other change.
- Disconnecting and connecting gear can clean a dirty connection and improve sound. Even a clean contact that is not snug will reduce fidelity.

 Your brain is a component of the playback system. The act of swapping gear or feeling like you are doing work on your system has a powerful psychoacoustic effect and is likely to allow you to hear deeper into the sound.

- Burn-in changes during the initial ten to forty hours of in-your-home play will very likely be linear. Burn-in changes at this point will appear to plateau, but more changes are coming.
- Once they have made that very noticeable transition to sounding good, you may need to revisit how you have them placed in your room.
- If Union 6 lie dormant for three months or more, even if fully burned-in prior, they will not sound just as they did and will go through a shorter phase of the burn-in phenomenon.



## **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 declared as *efficiency*. How extensive the use of speaker-level electrical components to achieve the desired *sound* is crossover complexity.

We think the combination of very low efficiency and extensive crossover filtering are strong indicators that the design will have little change from burn-in. Conversely, Union 6 with its sonic design targets of very large dynamic range and high transient and timing resolution—through the whole of the human voice, and from as close to single-point source as practical—has resulted in a high efficiency, crossover-less design that requires extensive burn-in to sound right.

## **BURN-IN AND FATIGUE PROFILE**

In quick conversation, Zu use the terms burn-in and break-in interchangeably, to generally refer 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. Burn-in is the domain of the electric and break-in is the domain of the mechanical. 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.

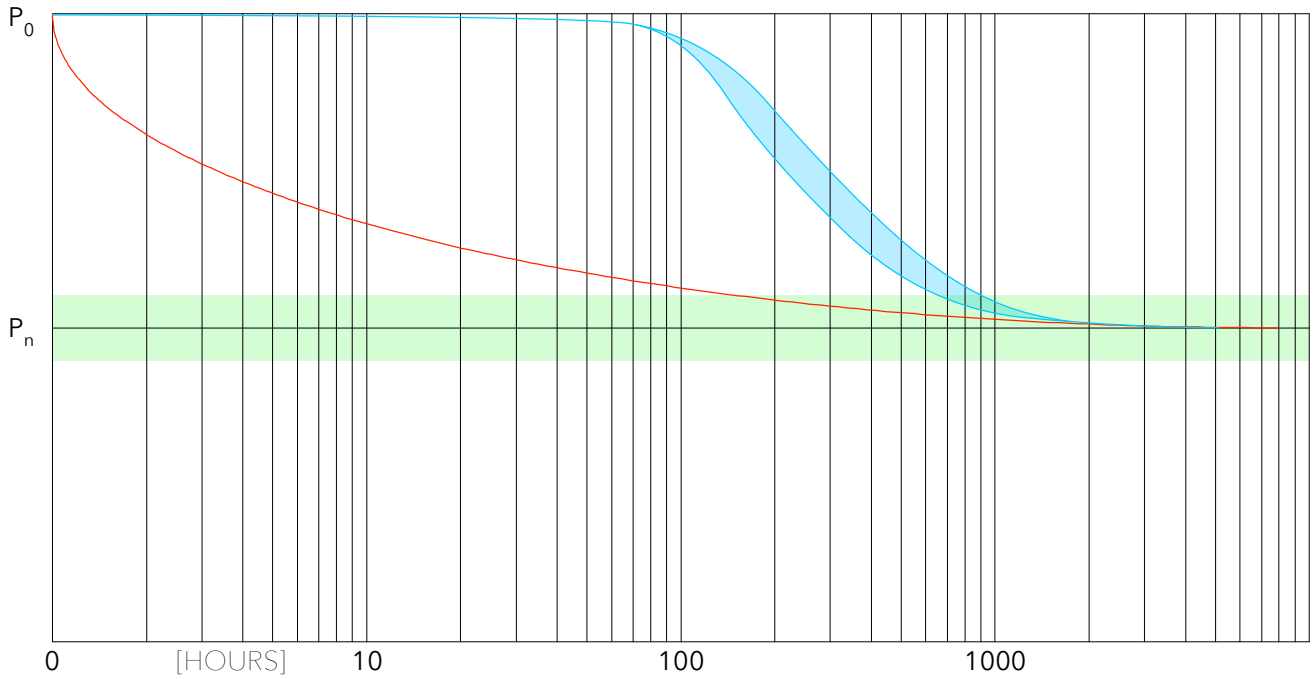
The life of a loudspeaker can be profiled in three phases: burn-in/break-in, performance, and aging-out. Union 6 loudspeakers are engineered to operate within the performance profile for a minimum of 100,000 hours of in-home use under normal living conditions and assuming loud listening levels.

In the graphs we zoom in on the burn-in profiles of both Union 6 and Union Supreme 6. The reason for the odd burn-in profile of Union Supreme 6 is largely the result of the near exclusive use of Teflon 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.



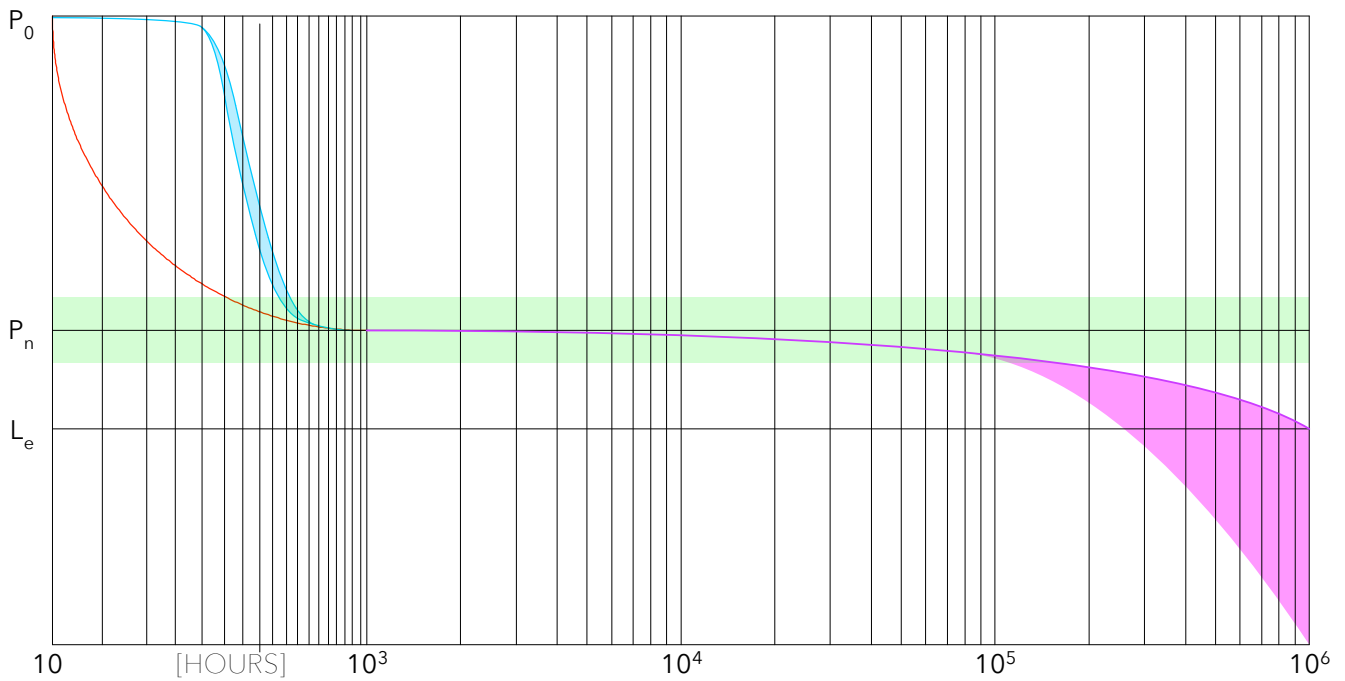


UNION-6 BURN/BREAK-IN PROFILE [2/2023]



- 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

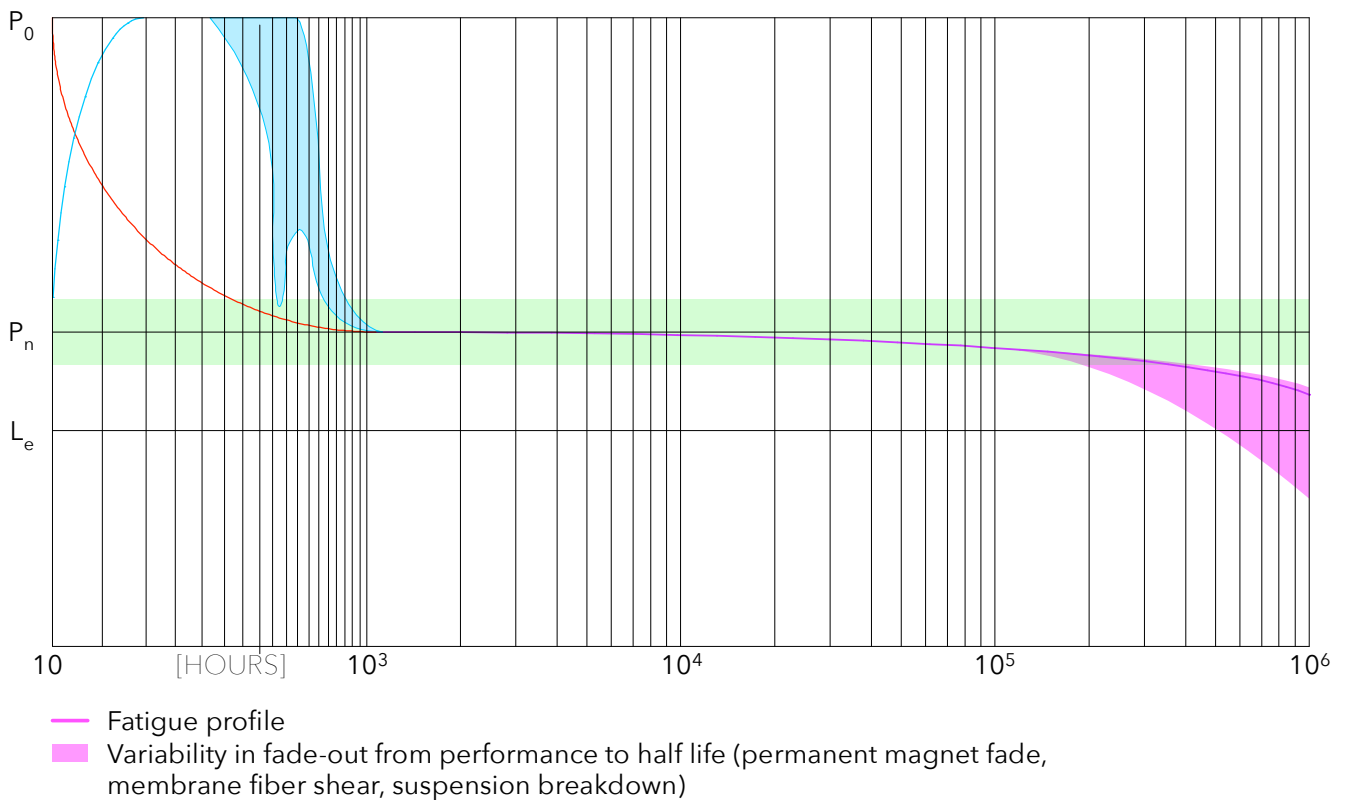
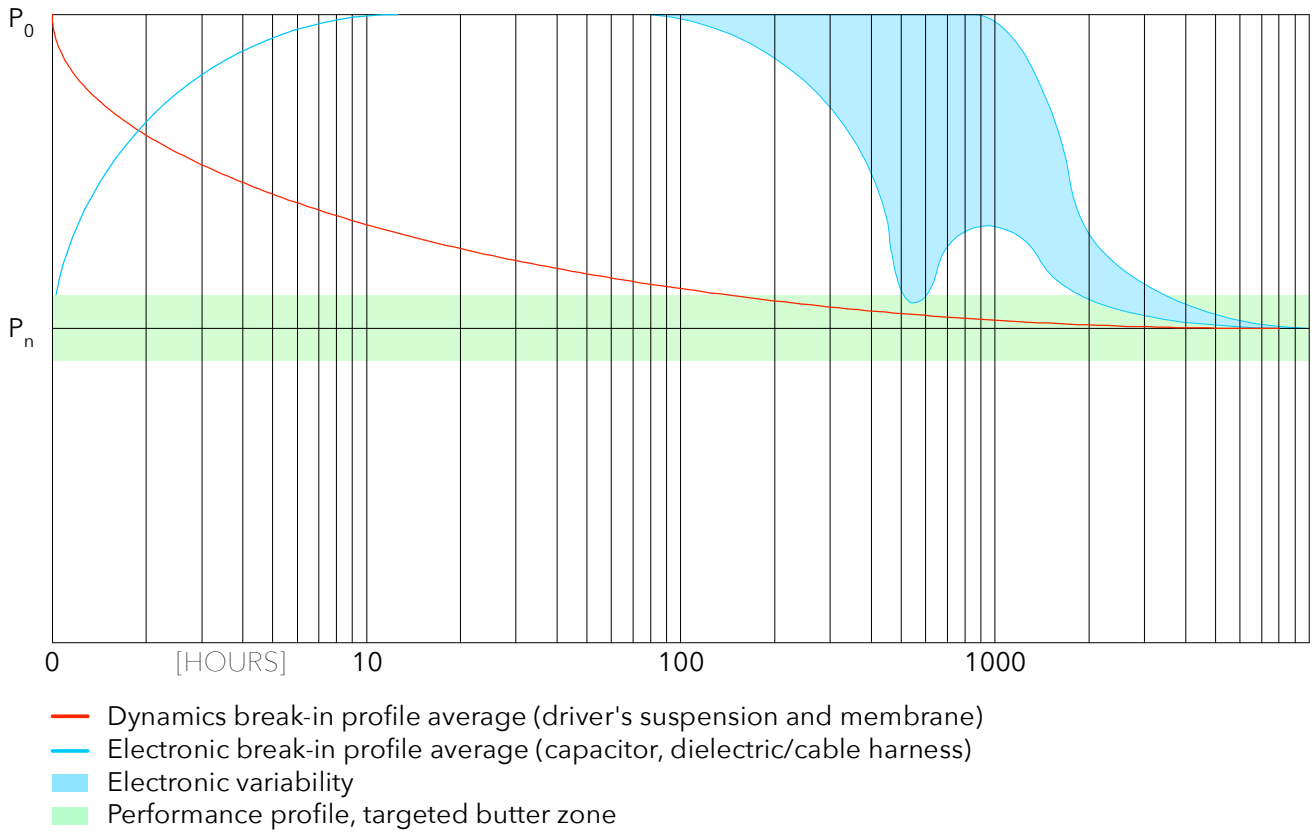
UNION-6 LOUDSPEAKER SYSTEM FATIGUE PROFILE [2/2023]



- Fatigue profile
- Variability in fade-out from performance to half life (permanent magnet fade, membrane fiber shear, suspension breakdown)



UNION-6 **SUPREME** BURN/BREAK-IN PROFILE [2/2023]





## INITIAL UNION 6 PLACEMENT

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

Start with the Union speakers placed where you've visualized them, likely flanking that rack or casework you have, and hopefully symmetrical.

Union 6 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 will not make a meaningful impact in the bass region.

- From centerline, Union 6 should be equidistant, with matching toe (horizontal splay) and lean-back.
- From the main listening chair (sweet spot) the angle formed by the speakers should be between 40 and 90 degrees. Wider is usually better for stereo and home theater, 60° (equilateral triangle) is a great starting point.
- Union 6 pairs are very tightly matched which is one of the reasons 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 Union 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. Then try wider still. Then back to pointing right at you (toe in) and then try having them pointing in front of you. Experiment and let listening be your guide.



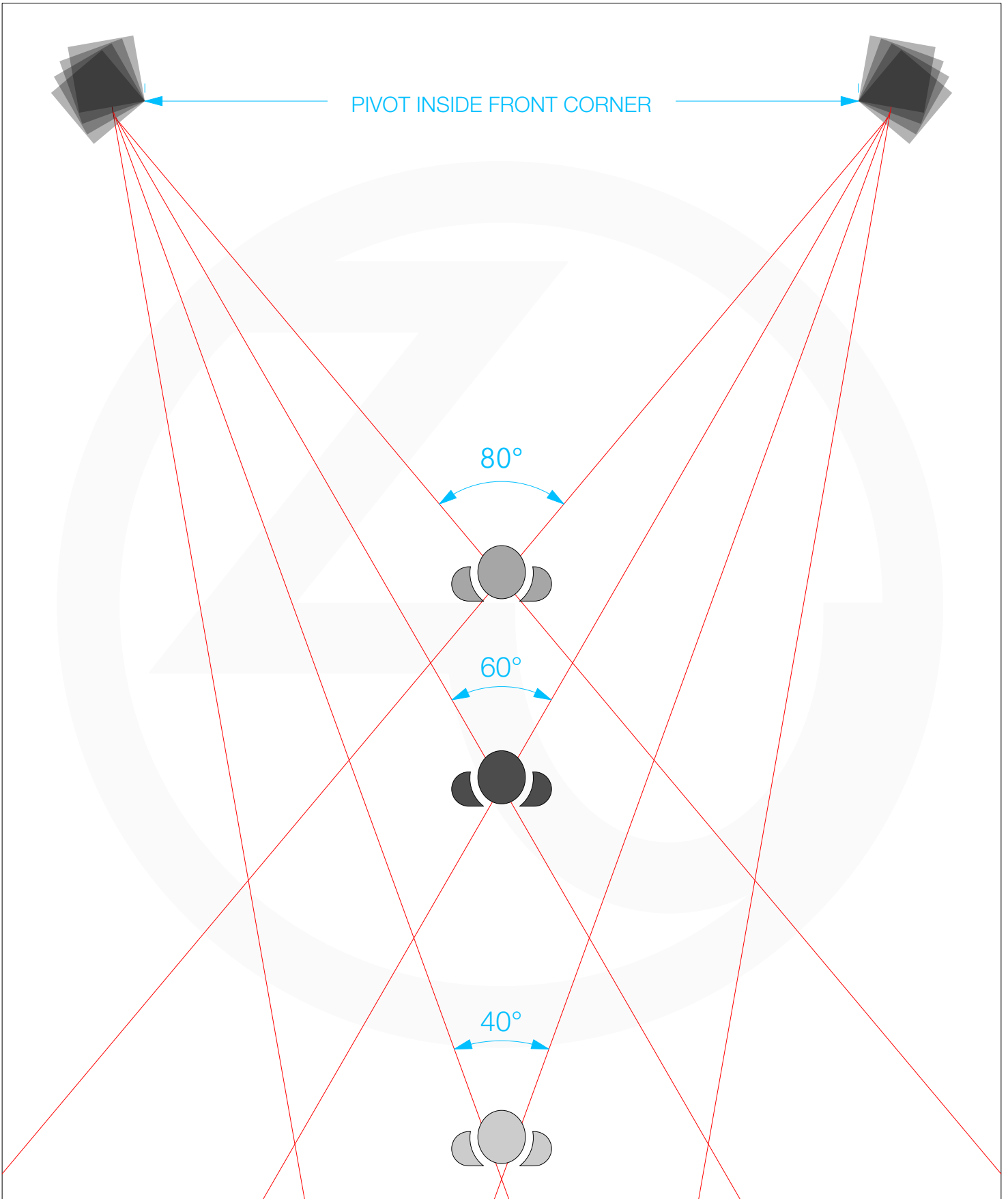
We all hear differently. Even those with functionally near-identical hearing have considerable variants in what each thinks sounds good.

- Use the installed oval-end 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 Union on carpet or a rug consider 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.

- Union 6 do not require a gap between floor and speaker bottom. You can rest them directly on the floor or you can raise them up, experiment.





- Consider leaning them back, 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, Union speakers should be placed no closer than a foot [ $\approx 25$  cm] to the side wall—that is the space between speaker and wall. But they can be placed as close as a few inches [50 cm] to the front wall (space between rear of speaker and front wall).
- If at  $60^\circ$  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 the channels 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.

## CONNECTING YOUR AMP AND SPEAKERS



*Turn your amp off to reduce the chance of shorting the connectors and damaging it.*

Union 6 feature 5-way binding posts and ZuB3 via speakON NL8 connectors.

ZuB3 via speakON NL8 connectors maintains the functional electromagnetic characteristics of ZuB3 cable designs and lowers contact resistance. For best results we recommend ZuB3 terminated Zu cable. ZuB3 is an electromagnetic design, Neutrik speakON NL8 are connectors which facilitate ZuB3.

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

5-way binding posts used on Union 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 CONNECTOR DETAIL

### FEATURES AND BENEFITS OF ZUB3 VIA SPEAKON NL8

- ZuB3 via NL8 lowers contact resistance and maintains the cable's ZuB3 electromagnetic characteristics through the wall of the speaker, both of which significantly improve sound.
- Connector is clocked so ensures correct channel phase.
- Design is a single body connector, housing all contacts, and is clocked to ensure correct channel phase: SP+ to SP+, SP- to SP-, e.g., red to red, black to black.
- Design is also locking and touchless, so no possibility of short-circuiting the amplifier when making connections, no possibility for connections to wiggle or vibrate loose, and no risk of shock or worse.
- Contacts are self cleaning, if there is a question of tarnish just unplug and plug back in.

**!** 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 VIA SPEAKON NL8 8-POLE TERMINATION CONVENTION

Pin-outs for ZuB3 via Neutrik® speakON® 8-pole / single channel	
<b>SPEAKER + (red)</b>	<b>SPEAKER - (Black)</b>
speakon 1+	speakon 1-
speakon 2-	speakon 3+
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

### AMPLIFICATION MATCHING WITH UNION

An often asked question is which amp should I match up with the Union. 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 would like to be able to play. Sound levels are the easy part, and for more than 90% of Union owners ten to twenty good sounding watts is enough.

Zu loudspeakers are efficient—*efficiency* 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:

2 - 10 watt / channel rated amps are what you need for low to moderate sound pressure levels.

10 - 50 watts for moderate to very loud sound pressure levels.

50 - 500 watts for very loud to ear damagingly loud SPLs.



**WARNING** - Union loudspeakers are capable of extreme sound pressure levels, play responsibly—consider your neighbors and consider your hearing.

Another aspect of Zu Union 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 perceived as louder by most and less efficiency speakers dynamically compress much more than high efficiency. And 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 Union.

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 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.



## TUBES VS SOLID-STATE

We think this is just dumb. Tubes generally 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 Union.

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 to be written.

## LOUDSPEAKER CABLE GUIDANCE

### KEY POINTS ABOUT SPEAKER CABLE FOR YOUR UNION 6

- 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.
- Keep the left and right speaker cable the same length. Different length cables of the same model will also have different measures and distort the stereophonic aspects.
- 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, and burn-in time.
- The speaker cable is part of the amplifier/loudspeaker relationship, and changes to the resistance, capacitance, impedance, propagation velocity, characteristic impedance... affect the sound.
- Those that say cables do not influence sound are wrong. 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 in the stereo.





Connect up Union with whatever you have. You own it, it's 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 the stereo. 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 and what doesn't. Experiment.



## LOUDSPEAKER/ROOM TUNING

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.

### ATTACK - SUSTAIN - DECAY

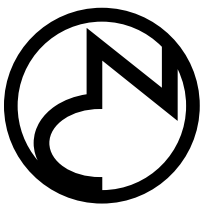
Most of what you will do in room tuning is about tone and the frequency domain and not attack. Knowing what you can affect and what you can't, or shouldn't, will help you make good choices. Before you spend a lot of time chasing the room-tune-timbre around the room, understand where in the note you're 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.

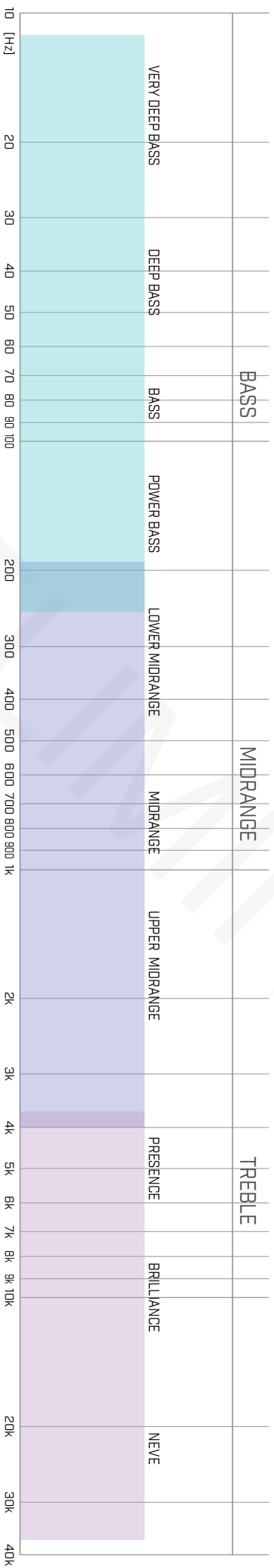
ATTACK GIVING WAY TO SUSTAIN - Related to the attack but carrying into the sustain are the secondary transients, here is where the note takes form, and this is where those that can't turn off their thinking brain start to hear differences. If you have electrically equalized your system (cables included) 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.



# FREQUENCY SPECTRUM TERMS

MUSICAL TERMS OVER FREQUENCY AS USED IN THIS MANUAL





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 subtleties that flourish in the quiet shadows.


*(One Day I'll Get It Right by Cracker playing in the background)*

## **TUNING / PLACEMENT OF UNION IN YOUR HOME - ZU MONO-AND-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 2-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.

 *Turn off or 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.)*

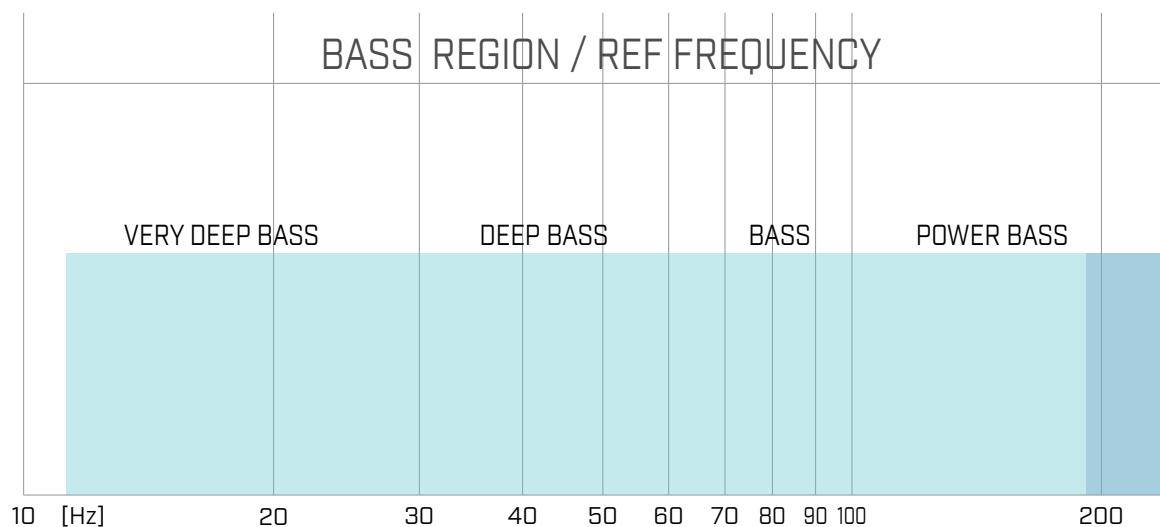
First, tune for bass. No matter how good you get the midrange and treble sounding, if you don't get the bass right there's little foundation to anchor the rest—assuming you don't exclusively listen to trumpet played in a vacuum. Bass tuning is big strokes, moving the speaker a foot or three [0.3 ~ 1.0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



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 [ $\leq 13$  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. The devil's triangle is not a drinking game. Experiment with your speaker placement, your room, where you sit... the changes and improvements to be had are not subtle.





## BASS 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 [0.3 ~ 1.0 m] 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

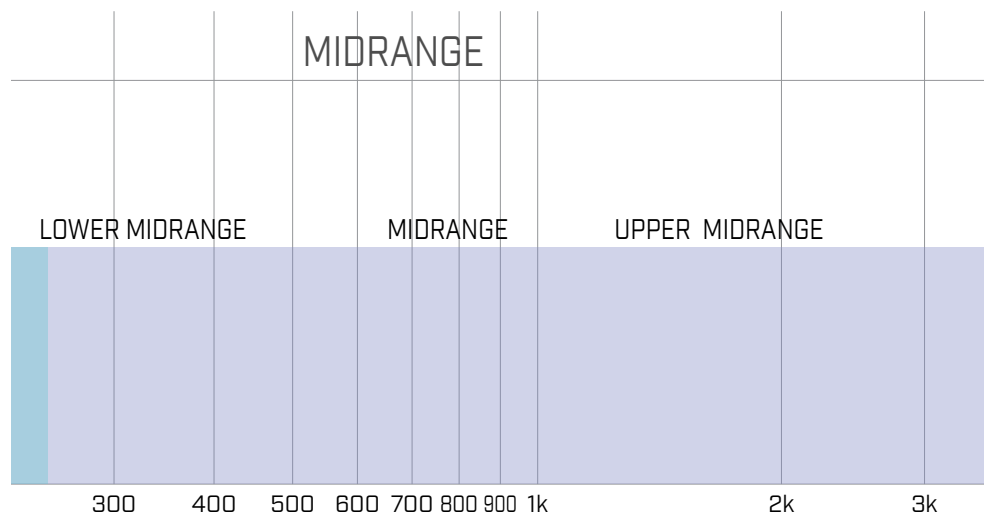
Now that the lower octaves (bass decade) are sounding good, turn your attention to getting natural and vibrant midrange. Remember midrange tuning is a dance of inches [decimeters and centimeters], somewhat similar to what we did tuning the bass but finer strokes, and we also begin messing with directivity 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 resolve and stick. Most of the time the final position is right at the listening chair give or take five, maybe ten degrees. Rotating the face of the speaker like this makes massive differences, and the dramatic arc will help you better understand the speaker and the room.

By pivot-rotating from that inside front footer, 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? 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 and move to treble tuning.





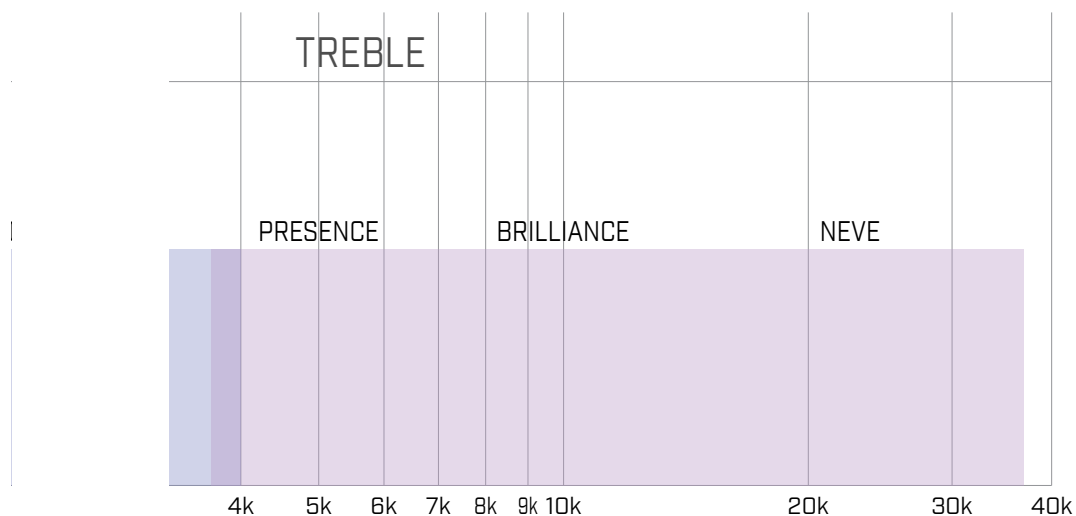
## TREBLE TUNING

At this point you are done nudging the speakers position, treble tuning is mostly about the speakers firing axis, the toe and cant (lean-back) and elevation. 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 is typical. But for tall chairs, big rooms or listeners that prefer food prep or dancing, lean-back will 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 Union 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 AND MAINTENANCE


Union 6 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. Union 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, elbows, 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 fuses used in Union loudspeakers. Connectors are plated and do not require cleaning or maintenance unless they are contaminated by grease, dirt, salt, or some other substance. Capacitors used are ClarityCap MR and as used are good for the life of the loudspeaker. Ceramic magnets used in the driver are likewise good for life.

## CABINET FINISH CARE

 Union are finished in real wood veneers or painted surfaces. All Union 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 of Union 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 use 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 slip-fit plastic driver covers when using Union. Keep them near as they are effective guards, quickly snapping on to protect the cone from the curious. Snapping them on when you're on vacation safeguards the full-range driver from bugs and dust.

To clean Union'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 snap-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 possibly 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 and temperatures.

## **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 below. 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 FROM CONNECTIONS

 NOTE - Urine may permanently stain or damage the Union's finish. Also, the chemical compounds in urine can corrode the connections. If the connectors of Union get peed on, remove the speaker cable and clean immediately. To clean urine from Union'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 can of compressed air
- 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 we should confirm with the 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 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. Cat pee is bad for connections, human too, you need to clean it as soon as you can.
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 thoroughly.
7. Reconnect and play.



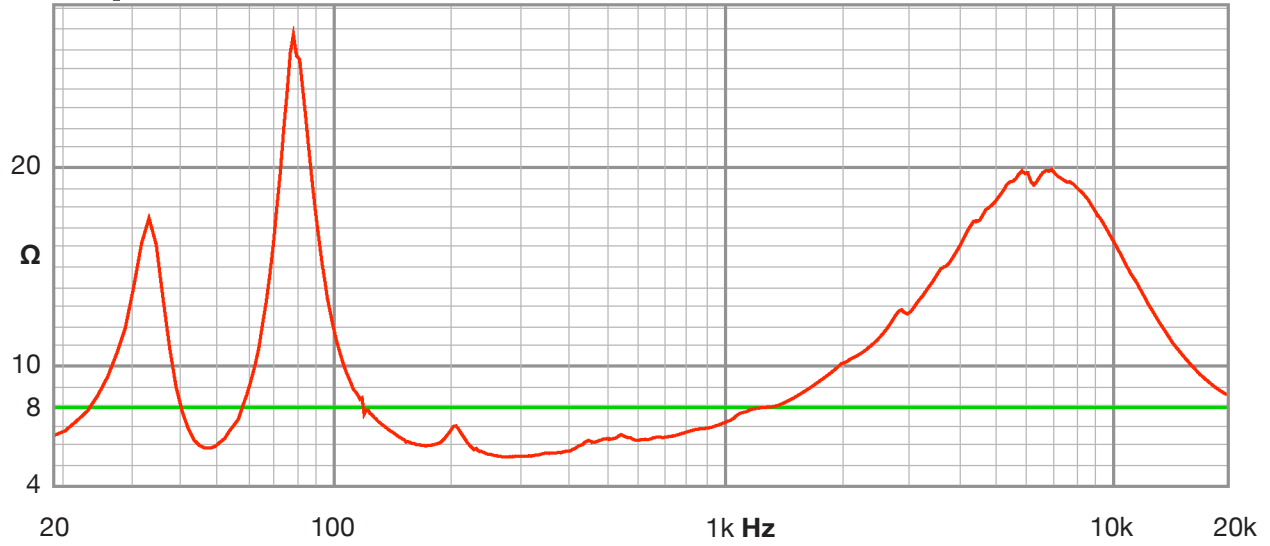
## UNION 6 LOUDSPEAKER SPECIFICATIONS

Dimensions H x W x D	12 x 12 x 36 inches [30.5 x 30.5 x 91.5 cm]
Weights & Packaged Dlms	60 pounds [27 kg] 70 pounds [32 kg] 17 x 18 x 41 inches [43 x 46 x 104 cm] packaged
Bandwidth	30 - 22k Hz (typical in-room response)
Voltage Sensitivity	99 dB-SPL @ 2.8V, 1m
Impedance	8 $\Omega$ (5-1/2 $\Omega$ Min @ 290 Hz, see curve)
Wavefront	virtual point source
Max SPL Program	120 dB-Z (slow)
Acoustic Center	30" [75 cm]
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 Mission Internal cable
Full-Range Driver	ZuCX-ND-8-UAPT50-3
High-Pass Filter Detail	mono-pole besel @ 18k Hz (12k Hz acoustic) ClarityCap MR 1.0 $\mu$ F
Max Power Input	150 W (300 W with high-pass at 50 Hz, 12 dB/octave)
Recommended Amp Power	2 - 10 watts for low to moderate sound pressure levels 10 - 50 watts for moderate to very loud SPLs 50 - 500 watts for very loud to ear damagingly loud SPLs
Left/Right Pair Matching	0.5% on drivers and 0.2% on all other components
Cabinet	real wood veneer or custom finish, composite medium density core
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

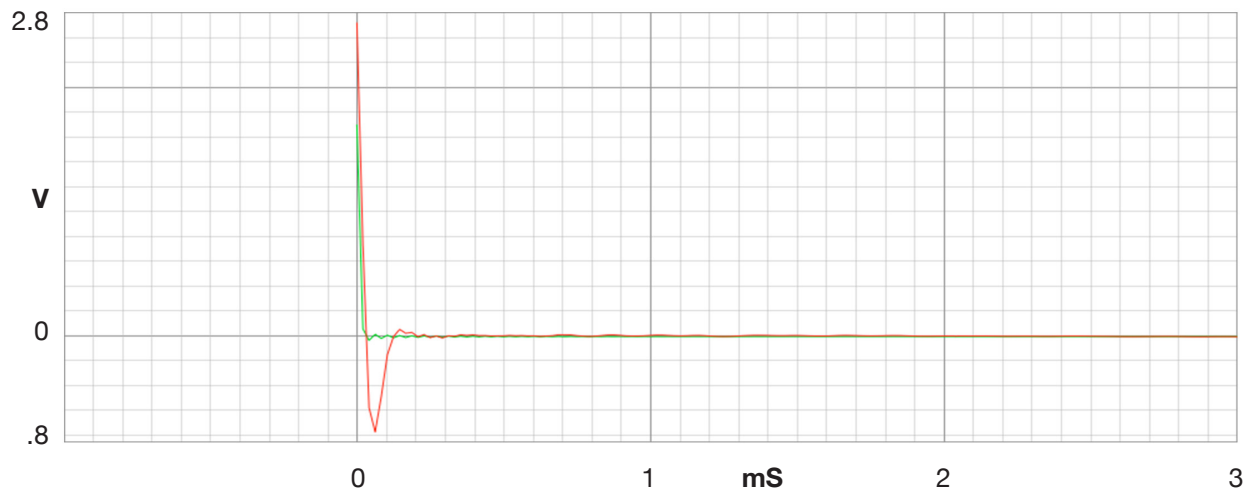


## UNION-6 LOUDSPEAKER SPECIFICATIONS

Zu Union-6 Impedance Curve Raw (No Filters, No Smoothing)



Zu Union-6 Complete Electromechanical Impulse Response Raw (No Filters, No Smoothing)





## WARRANTY

Zu Union 6 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.

Union 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.



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DESIGNED AND MADE BY US