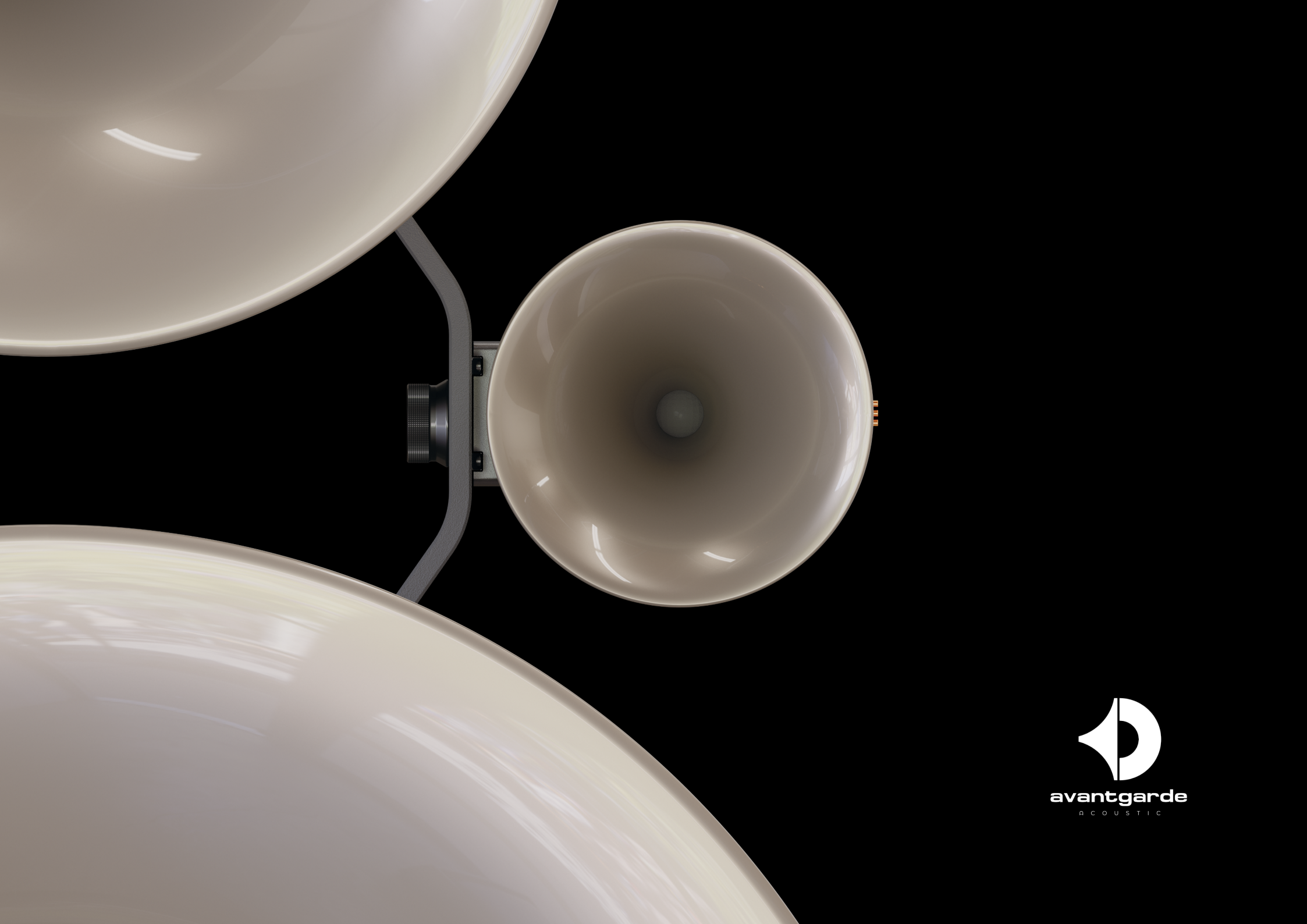

avantgarde
ACOUSTIC

Listen & Love

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Holger Fromme, Founder, owner and CEO

Foreword.

2021 marks the 30th anniversary of our company – and we are still doing the same thing we did at the very beginning: we manufacture horn loud-speakers – only better and better.

We started producing our first and best speaker model – the TRIO – in 1991. Through continuous development and our quest for perfect sound and the perfect musical experience, each generation of the TRIO design has pushed the boundaries of performance: But with the latest advances, TRIO doesn't just extend those boundaries, it redefines what is possible.

The new G3 Series sets entirely new standards: it introduces groundbreaking new technology; it refines and elevates aesthetic design; it achieves an almost perfect balance between form and function.

Built by experts – built for a lifetime and beyond.

History.

HOW IT ALL BEGAN IN 1991.

Holger Fromme, founder and managing director of Avantgarde Acoustic, had been a hi-fi and music enthusiast since his youth. In his twenties, he heard a horn loudspeaker for the first time – and was thrilled by the extraordinary sound. A dream was born.

Inventiveness and perfectionism spurred him on to develop his own horn loudspeaker. Fromme had to wait over a year to receive technical literature from the library of the University of Dresden, which provided him with the necessary mathematical basis for calculating the spherical horns.

In his parents' garden in the sleepy Odenwald, plaster moulds were used to laminate the first horns by hand.

The first prototype of an Avantgarde Acoustic horn loudspeaker was created: the TRIO Classico.

It was then that Fromme met Matthias Ruff, who took over the technical development of the loudspeaker. Enthusiastic about the sound, they decided to present their horn loudspeaker to the public at the 1991 IFA international consumer electronics exhibition in Berlin.

The two dreamers were overwhelmed by the response. That same year, Fromme decided to take the step into self-employment and founded the company Avantgarde Acoustic.

Holger Fromme and Matthias Ruff, Budapest 1997

Purpose.

We are passionate music lovers but we are also audio perfectionists. What drives us is the desire to get closer to the musical performance – through the medium of superior sound.

What is the "best sound"? For us, there can only be one answer: sound that is so realistic, so close to the original that it reaches out and envelops you, close enough to touch, powerful enough to move you.

So real that if you close your eyes, you could almost be there – live. And always in the best seat – right in the middle of the first few rows. No background noise, always the best acoustic. You can reproduce that experience, bring it into your home at any time – from anywhere – and enjoy it undisturbed: As loud or as quiet as you want, as often as you like. Whatever the music, whatever the musicians that you love.

1989, in Salzburg; you're sitting right behind Karajan at his last concert, Bruckner's 7th Symphony. Fehmarn, 1970; the Love & Peace Festival; you're standing in front of the stage, in the front row, looking Jimmy right in the eye. 1980, San Francisco, AC/DC; Angus rocks you, almost to the point of no return. Now – where do you want to go next?

At Avantgarde we want to experience music. We want to feel its impact, be moved by its message, be transported by its performance. We want it to lift us off the sofa, to head-bang with our friends, (when no one's watching), to scorch the frets on an air guitar, or to wrap our wives in our arms and tango all night.

Music should seduce and beguile, shock and occasionally stun. We should find new nuances in even familiar pieces, quiet passages should give us goose bumps. It should be an experience to be shared and passed on to future generations.

You can share this experience. Trust only your own ears. But beware the risk of addiction. One look, one listen and it's a coup de foudre – love at first listen, love for life. Once you have experienced Avantgarde, nothing else will do.

Hence our claim. Listen and love.

Vision.

Our vision is to create the perfect loudspeaker, modern yet timeless,
a statement that will last for decades.

Our aim is to give listeners goose bumps, to flood them with unforgettable musical experiences
that transcend the possibilities of mere audio.

Our goal is to reproduce music as perfectly, thrillingly and realistically as possible – and to do so with products
that are as beautifully designed and timeless as they are remarkable.

Values.

PASSION	INNOVATION	PERFECTION	QUALITY	CUSTOMER SATISFACTION
We love what we do - and want to inspire others to love it too.	We develop and utilise the most advanced technologies – our products consistently break new ground.	We are not easily satisfied – close enough is never good enough.	We don't just build speakers to perform – we build them to last for decades!	We are our customers – if our products make us smile, we know you will too.

Avantgarde office, Lautertal – Odenwald

Our manufactory.

Despite our advanced technologies, we are not located in Silicon Valley. Our manufactory is based in the Odenwald region of Hesse, in Reichenbach, near Darmstadt – not only the home of our founder, but also the birthplace of the world's finest loudspeakers.

Here we carefully handcraft horn loudspeakers and amplifiers that we ship to over 60 countries around the world.

Quality.

Our aim for the G3 Series is to provide decades of listening pleasure, at the highest level and always at the cutting edge of technology.

All components are designed to withstand extreme loads and wear. Only the highest quality materials are used and assembled with the utmost care to create an exceptional loudspeaker.

Every speaker undergoes at least 32 tests and quality checks before it leaves our premises.

Awards.

We have received numerous awards for our unique, purist designs and the consistency of our brand values and identity, including the German Brand Award and the IF Design Award.

Our products regularly redefine the benchmark for measured performance, achieving “Best in Test” and glowing reviews from the most respected, experienced, and influential audiophile reviewers and magazines.

Most importantly of all, the constant confirmation and positive feedback we receive from our customers is testament to the unique musical performance and unparalleled communicative capabilities of our speakers.

Member of Rat für Formgebung
German Design Council

Avantgarde Sound.

What do Avantgarde Acoustic loudspeakers sound like?

They sound like music: present and immediate – almost magical thrilling; dynamically live and three-dimensional; intimate and subtle; powerful and intense; gossamer, delicate and nuanced.

They can make walls tremble or lips quiver; they can bring you out in a sweat or bring tears to your eyes. And they can do it again, and again – and again. Our loudspeakers let you experience music is a uniquely different and direct way – just like the live event.

To fully realize this performance has taken years of dedicated research into clearly defined, fundamental principles. We call them:

The Six Pillars of Avantgarde's Sound Architecture.

- HDR Extreme^{AA}
- NanoTone^{AA}
- TimePerfect^{AA}
- TrueSpace^{AA}
- CustomFit^{AA}
- NaturalPlus^{AA}

HDR Extreme.

FOR NATURAL DYNAMICS THAT EXCITE AND INSPIRE.

HDR Extreme[AA] – an extreme dynamic range is about the speaker responding to jumps in level, delivering an auditory experience that mirrors what we hear in the real world. This allows us to experience both the most explosive sounds and the most delicate, the loud and the quiet.

Only horn loudspeakers can deliver this – a performance taken to the logical and practical extreme in the TRIO G3. With more than 50 times the efficiency of conventional speakers, combined with an almost silent noise floor, we set a benchmark in terms of dynamic range. For a sound that you can almost physically feel, a sound that gets right under your skin.

NanoTone.

DELICATE SOUNDS IN THE QUIETEST MOMENTS.

NanoTone[AA] describes the ability of our speakers to reproduce not only the biggest, loudest sounds, but also the finest details and most subtle textures – both at maximum and at very quiet levels.

To achieve this goal, we have had to take the most extreme technological measures in order to reduce the mass and inertia of our systems to the absolute minimum. Horn technology helps by allowing us to make the moving parts smaller and lighter. Combined with extremely powerful magnets in their motors, the drivers can react almost instantaneously to the smallest changes in the signal. The smaller structures and extreme levels of control also help to reduce distortion that masks or distorts musical detail.

Avantgarde designs and builds room-filling loudspeakers. But in terms of music, sheer size can be deceptive. Our spherical wave horns are just as comfortable at low levels as they are impressive when the volume reaches the red.

The result – goose bumps, especially in the quietest moments.

TimePerfect.

MUSIC THAT ARRIVES ON TIME.

We recognize every instrument by its fundamental tones and the pattern of its higher-frequency harmonics. These determine the timbre of each instrument and each note. The time-coherent radiation of the fundamental tones and harmonics is critical to both the natural reproduction of each instrument and fixing it in space. Designed specifically to identify and locate individual sounds, the human ear is incredibly sensitive to any error or disturbance in this pattern, heard as a shift in level or location that destroys the natural tonality and spatial qualities of a recording.

STATIC TIME RESPONSE
With the G3 Series, all three drivers are arranged (or can be adjusted) to sit in a single plane. This means that the distance between the acoustic centre of each driver and the listener is always identical. Accordingly, the signals from the respective sources (tweeter, midrange and woofer) arrive at exactly the correct time.

FREQUENCY-DEPENDENT TIME RESPONSE
Due to the design of conventional drivers, time non-linearities occur in the pass-band (working range) of each loudspeaker driver. This means that certain frequencies and tones suffer a time shift.

In developing our latest Evolution^{AA} drivers for the G3 Series, we have succeeded in virtually optimizing this phase behaviour across each driver's frequency range. All musical energy is produced at precisely the correct time, regardless of frequency. This eliminates the perception of volume steps or jumps, while the three-dimensionality of a recording is properly preserved.

POWER-DEPENDENT TIME RESPONSE
The closer a driver approaches its power limit, the more it compresses the music signal. This is partly due to the non-linear stiffness of the diaphragm suspension (which increasingly resists motion as it reaches the end of its travel) and partly due to the thermal behaviour of the voice coil. The higher the level/power, the warmer the voice coil becomes and the greater its internal resistance. Together these two effects act to limit the driver's ability to accurately track the full level of the input signal.

Our Evolution^{AA} drivers are specially developed to work with our spherical horns, allowing us to design them for much shorter excursions than conventional units. This has allowed us to engineer suspension surrounds that provide linear stiffness up to full excursion. Combined with their extreme efficiency and a dynamic headroom that exceeds conventional speakers by a factor of ten, we have practically eliminated power compression from the TRIO G3.

With the Avantgarde G3 Series, you get each and every musical detail, all at exactly the right time – to within a thousandth of a second.

The sound is natural, lively and realistic – like no other system. Free of colouration. Crystal clear. Free of distortion – regardless of volume. Harmoniously balanced frequencies, that don't clash or overlap: everything in the right place at the right time, bringing the performance vividly to life.

TrueSpace.

MUSIC THAT HAPPENS IN THE RIGHT PLACE.

Time coherence is critical to identifying the relative location of different sounds and the space in which they occur. As our primary defense mechanism, human hearing can precisely locate sounds via subtle differences in running time between the left and right ear. Preserving this timing information contained in the recording is the only way to recreate the original instrumental layout and the space that the band occupied, making you feel as if you are really there.

Sound waves that are reflected from the walls travel a longer path than those that reach the listener directly, arriving out of step, overlapping and distorting the musical information. Interference occurs. Some frequencies combine, others cancel each other out, destroying the intricate pattern on which the human ear depends.

Once again, the spherical horns employed by Avantgarde enjoy a natural advantage. Instead of the uncontrolled radiation whose pattern varies with frequency that characterizes conventional box speakers, each horn guides the sound waves into the room in an identical and focused pattern. The musical energy is concentrated more effectively, and interference caused by unwanted reflections from the room walls is avoided.

The sound is natural and impressively three-dimensional, just as if you were listening live, sitting in the middle of the front row, hearing exactly where each musician is placed. Beautifully scaled and layered, you'll discover new facets and details with every listen, allowing you to experience and enjoy even your favourite and most familiar pieces over and over again.

CustomFit.

PERFECTLY MATCHING ROOM & SOUND.

We have already defined what good sound means for us. But good sound also depends on individual preferences, on where you position the speakers in the room and on the room itself.

We have developed elegant solutions to accommodate both individual tastes and circumstances. With Avantgarde G3 speaker systems, the subwoofers are always actively controlled via a digital circuit. This gives precise control of all critical parameters, with a precision and accuracy that cannot be achieved with analogue technology.

ROOM FITTING.
Achieving great sound will always depend on your room. Unless you've designed and constructed your house around the speakers (which does happen), structural conditions and the placement of the speakers in the room will influence and can significantly affect the sound. Both the level of the bass and individual frequency bands can be digitally controlled to combat intrusive room resonance and bass reinforcement. The cleaner low frequencies that result are crucial for the clarity, detail and communication of the entire musical range, creating a solid foundation on which the all-important midrange can rest.

SOUND FITTING.
Your own preferred sound balance is something that's very personal. Every person is unique in this respect. Just as different listeners prefer different concert seats, so preferences in system balance also vary, especially at low frequencies. Some people prefer a more restrained bass response, some simply can't get enough – like us.

With Avantgarde, you can adjust the low frequencies relative to the rest of the range.
your ears, your bass, your party – bassta.

NaturalPlus.

IN THE HEART OF NATURE.

When we say Natural Plus, we are referring to the process or point where the artificial artefacts of a loudspeaker are reduced to the absolute minimum.

Avantgarde loudspeakers have the lowest distortion technologically possible due to the horn principle and their original driver design. At the same time, the iTRON^{AA} technology (see page 66ff) makes the control of the diaphragm movements much more precise than with conventional voltage amplifiers.

No artificial artefacts are added to or overlay the music. The technology disappears. The performance lives and breathes, independent of the loudspeakers. Music sounds natural and pure.

Just like live music, recordings have the same ability to touch our hearts.

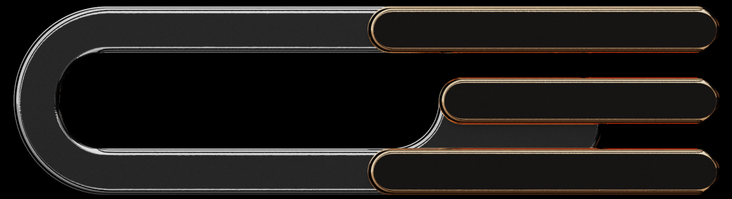
The Avantgarde Experience Centre.

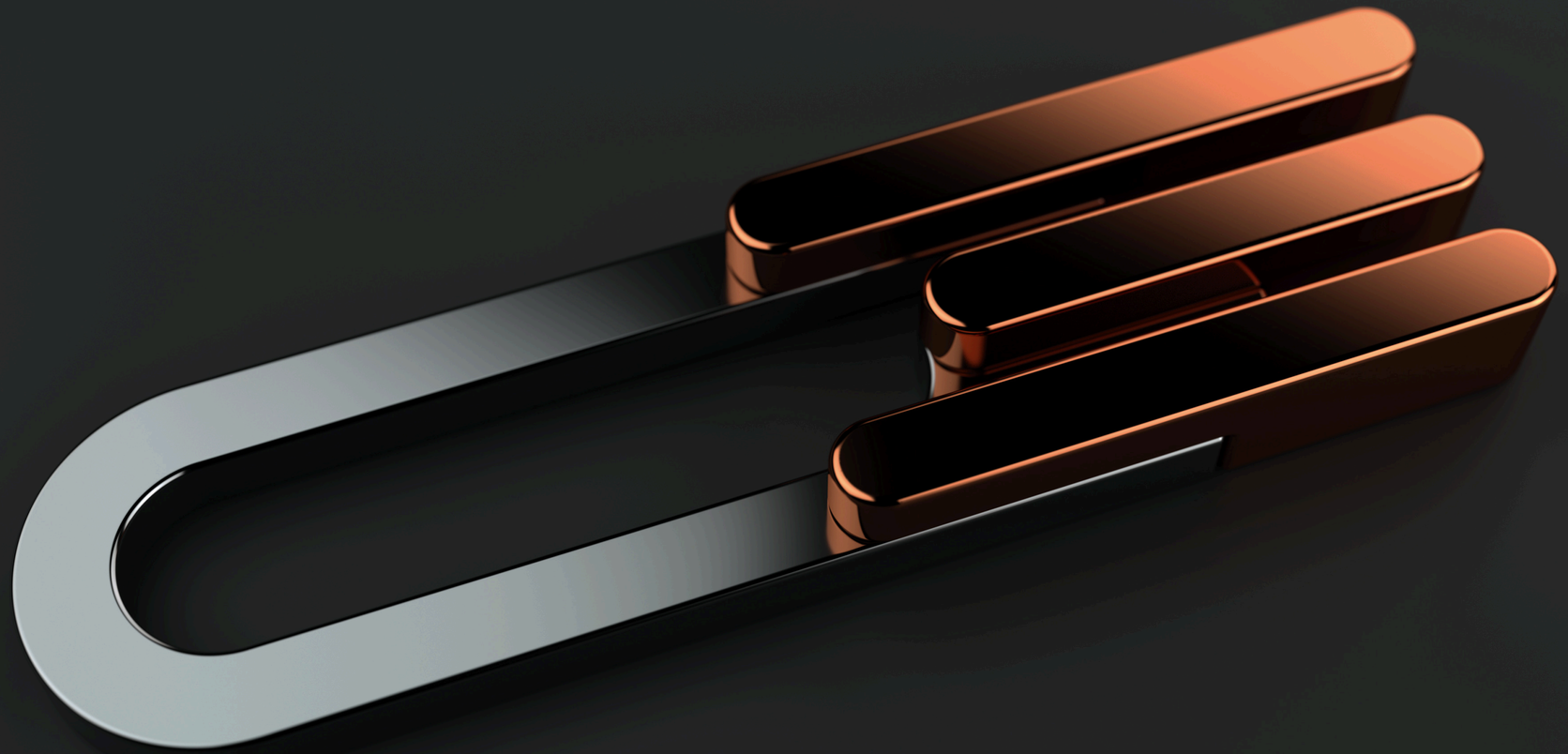
A PLACE TO LOVE LIFE AND MUSIC.

Rod Stewart's song "First cut is the deepest" sums it all up. The "first time" always remains unforgettable. Hence our brand claim – Listen & Love. And to provide a perfect place for this first encounter of sound and love for you, we have created the Avantgarde Experience Centre in Lautertal, located in the beautiful Odenwald. Probably the best place in the world to experience the unique Avantgarde sound live for the very first time.

All our loudspeakers are ready for demonstration and can be heard in direct comparison. Operated with classic voltage amplifiers or also via our switching console in direct comparison with the unique iTRON^{AA} electronics. Let us surprise you, let us advise you competently. Arrange your personal listening appointment. Since we want to take the time you deserve, please confirm your appointment in advance. Our sound specialists look forward to your visit. Our promise: you will not forget your experience with us.

G3 Series.





Excellence reinvented.

G3 stands for "Generation 3", the successor and next step up from our acclaimed XD series. Starting with the original Generation 1 models in 1993, this is the second time in 30 years that our technologies and product platforms have been completely renewed.

The G3 Series takes nature horn principle to its (il-)logical extreme: sheer musical power unleashed using unbridled efficiency coupled to an extended frequency range. Combing the TRIO G3 with the SpaceHorn[AA] bass units – the state-of-the-art development of our legendary BassHorn – delivers a unique and totally immersive musical experience.

Optional with the iTRON[AA] fully active modules our patented GameChanger technology, with which we directly control the acceleration of the membranes through a perfectly orchestrated current flow. For a perfect, distortion-free, crystalline, and natural sound that almost sounds like live.

Incredible detail, stunning dynamic range – both loud and soft – fabulous spaciousness and huge, customisable bass performance – that's the G3 Series.

Highlights.

- New generation Evolution[AA] drivers for increased dynamics, lower distortion and even purer sound.
- Innovative XT3 tweeter with new ‘Long Throw’ Horn, extended super tweeter frequency range and record-breaking low distortion values.
- Coplanar arrangement for the acoustic centre of all drivers, for stunning musical and spatial coherence.
- NatureCap[AA], Avantgarde’s unique, proprietary super-capacitor, with outstanding specs and incredibly delicate sound.
- Optional patented and fully active iTRON[AA] Current Drive, for perfect control of driver output and the ultimate sound.
- Iconic and instantly recognizable design language, combined with future–proof modular technology for easy, future electronic upgrades.
- SpaceHorn, the state-of-the-art evolution of our legendary BassHorn for even greater musical clarity and accuracy.
- New elegant colour and design options for an even more individual configuration of your dream loudspeaker.

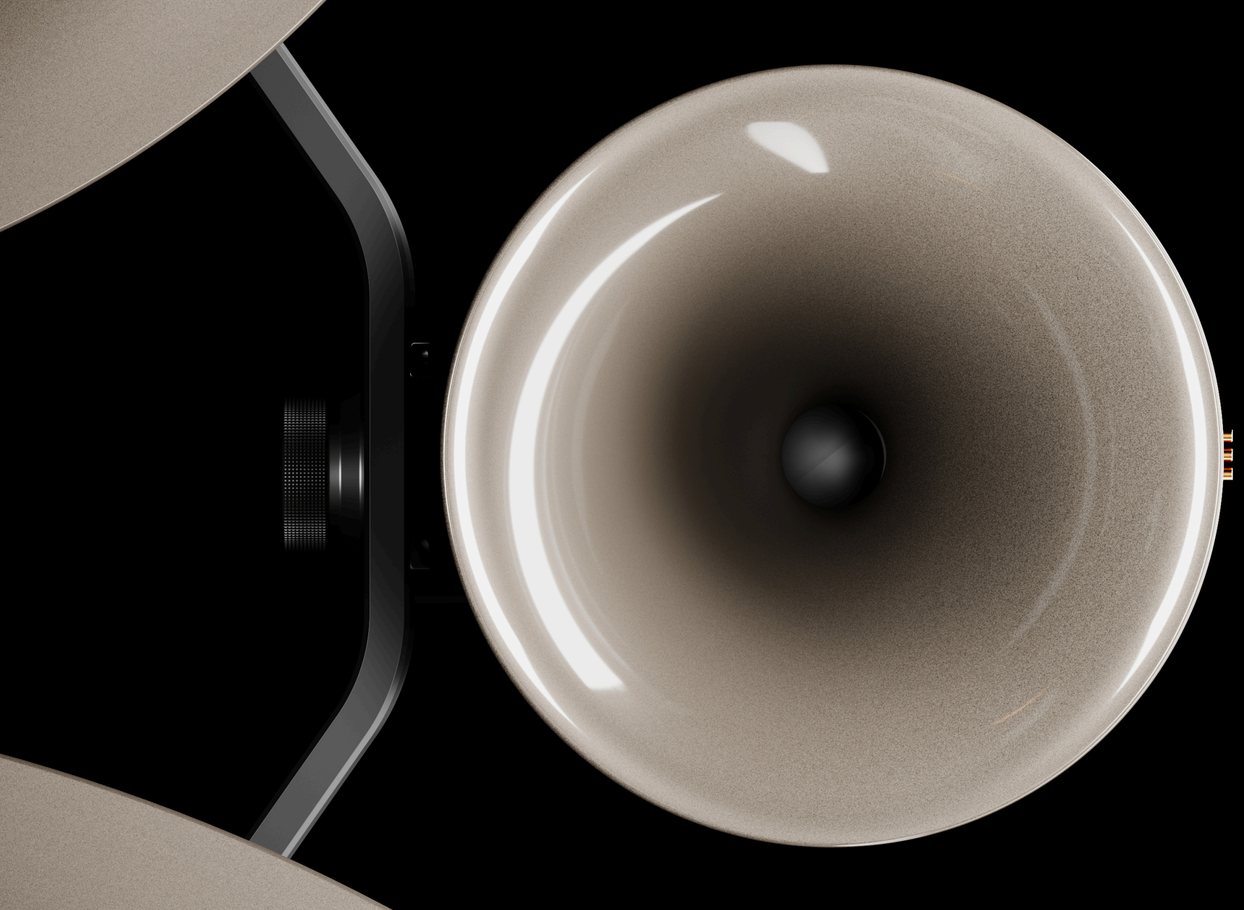
Design.

THE STYLE ICON AMONG THE SUPER LOUDSPEAKERS.

The aesthetic continuity of TRIO design is something extraordinary in the field of consumer electronics. No other loudspeaker system is so instantly recognizable. No other loudspeaker system has kept its unique identity for so long.

The first TRIO established that look in 1991, with its characteristic arrangement of the three spherical wave horns, open construction, seemingly free-floating driver housings, minimalist frame with its two square and one round upright and the lateral of-axis arrangement of the tweeter.

Here, clear lines and right angles contrast with the strong symmetry and dynamic curves of the spherical horns.



Design.

THE STYLE ICON AMONG THE SUPERLOUDSPEAKERS.

The G3 Series opens a new passage in the TRIO story, after 30-years a third iteration, a third chapter of the legend. The new TRIO G3 – as ultra-modern and functional as it is timeless in design. A loudspeaker that communicates its brand identity and performance promise through its appearance: "Listen & Love". A loudspeaker that sounds like it looks. A loudspeaker that looks as good as it sounds!

In designing the TRIO G3, we faced the challenge of combining our new horn profiles and adjustable, phase-coherent alignment with the TRIO's powerfully established aesthetic identity. Then we had to incorporate the modular, upgradable electronics package – all without diluting the clean lines and aesthetic purity of the original design.

We really like the strong, masculine look of the electronics module – technical, powerful, linear, monolithic – the discrete cooling fins reinforcing the vertical lines of the frame, subtly suggesting the latent power present.

Then there's the aesthetic tension between the solid, straight-edged rigour of the electronics module on the inside and the dynamic flow of the tweeter's angled and cantilevered mounting on the outside: a beautiful contrast between the closed surface on the one side and the open structure on the other.

The striking lines of the tweeter frame are formed from a continuous aluminium profile, with concealed, internal cable routing. The 35-degree cantilever breaks the vertical lines and draws the eye, balancing the whole by emphasizing and focusing attention on the smallest of the three spherical horns.

It's definitely an eye-catcher – just as dynamic, exciting and striking visually as it is musically.

Design.

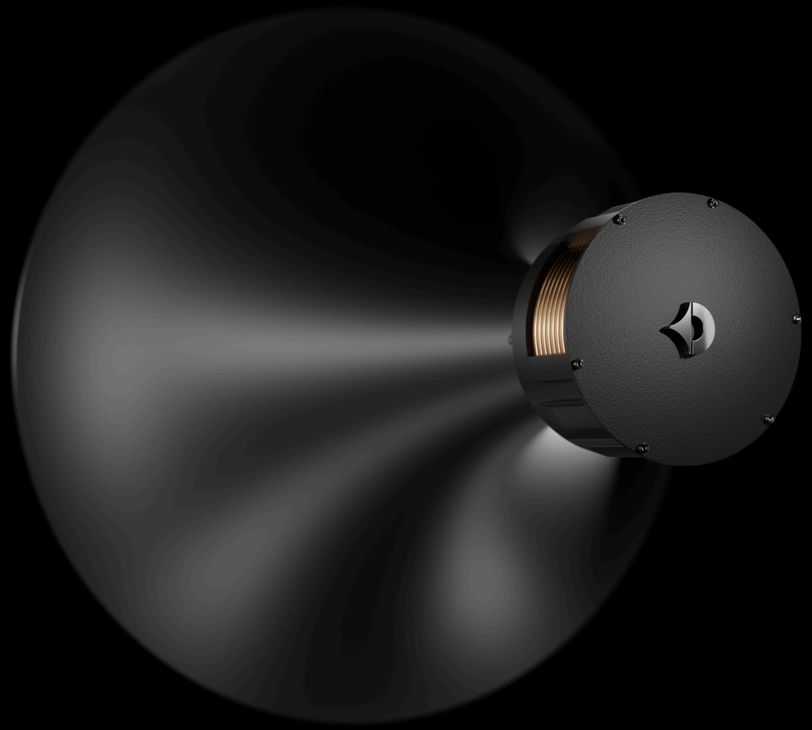
THE STYLE ICON AMONG THE SUPERLOUDSPEAKERS.

The vertical surfaces of the frame find their aesthetic foundation in the new, wide-stance base element. The vertical is seamlessly transferred to the horizontal at floor level, via the three-part plinth. The sloping out-rigger feet echo the 35-degree angle of the tweeter mount, lifting the speaker so that it almost seems to float above the floor – solid and stable, yet light and elegant.

Adjustable feet are concealed beneath the base element, mounted in stepped aluminium castings that clamp against the underside, creating a stable, composite structure that eliminates vibration.

The TRIO G3 is the result of 30-years accumulated experience, working with the most sophisticated and demanding loudspeaker technology available. It incorporates three decades of feedback from the most critical audience there is - our customers. It combines the most innovative state-of-the-art technologies available with the irrefutable power of natural acoustic principles. It is – quite simply – the best speaker system we have ever built.

But unlike most audio components, you don't need to suffer for your art! Thanks to its modular, tuneable design, it can be adapted to virtually any customer requirement. Future upgrades, new technologies or new digital standards are already part of the G3 structural DNA. Durable, sustainable, innovative. For your lifetime – and beyond.



Spherical horns.

LOUDSPEAKER ROYALTY – PERFECTED BY AVANTGARDE.

More than 30-years ago, we transformed a fundamental natural principle into a unique product portfolio, using precise mathematical algorithms. Superior horn technology using the most precisely calculated spherical wave horns ever made. With the G3 Series, the basic physical laws of sound conversion have become indivisible from the process of design. Form follows function. Natural efficiency generates engineering and artistic elegance.

SETTING LIMITS TO OVERCOME LIMITATIONS.
Instead of uncontrolled radiation in all directions, our spherical horns emit sound waves with perfectly controlled directivity. This acts to both concentrate the sound – improving perceived efficiency, presence and energy – and reduce unwanted sidewall reflections that muddle and distort the music.

LESS LOSS, MORE MUSIC.
A horn mounted on the front of the speaker is the most effective way to amplify sound and increase the efficiency of the system. The moving parts of the loudspeaker – voice coil and diaphragm – can be made much more compact. Smaller moving parts mean less weight and greater mechanical control.

This reduced size and weight of the moving parts results in a significant reduction in moment of inertia, increasing the sensitivity and responsiveness of the system. The diaphragm in a horn loudspeaker not only accelerates much faster, but also comes to rest more quickly, if and when the audio signal demands it.

The reduction in diaphragm area also increases the mechanical stability of the assembly. The improved mechanical behaviour of the diaphragm combined with its smaller excursion significantly reduces distortion.

‘SURGICAL’-QUALITY HORNS.
The driver is one half of the equation. The spherical horn is the other. Its surface must be almost surgically smooth, its profile calculated with micro-millimetre accuracy, so that the sound waves do not ripple or refract within the horn, causing reflections and thus interference and distortion.

Avantgarde’s spherical horns are not just incredibly complex in design and development, their manufacturing requires incredible accuracy and consistency, involving massive steel tooling and the sort of clean surfaces normally only found in operating theatres.

SQUARING THE CIRCLE.
Did you ever see a trumpet with a square mouth? To take full advantage of the natural laws that govern horn performance, the horn itself must be circular.

The sound waves thus propagate linearly from the circular diaphragm of the driver over the course of the horn and on into the room, completely free of diffraction or interference.

SCIENTIFICALLY PROVEN.
We have subjected our horn speakers to the most exacting, independent scientific testing. The results from the university laboratory tests even impressed the researchers!

- 8x greater dynamic range
- 90% less distortion
- 10x more resolution

What do those results mean in musical terms? This range from the softest sound to the loudest is 8x greater with an Avantgarde speaker.

At the same time, due to the much lower distortion and higher resolution, our horn systems are able to clearly and accurately reproduce musical sounds and textures, the tiny details that bring recordings to life, that are finer by a factor of ten than with conventional loudspeakers in a box design.

Driver.

A PERFECT HORN NEEDS A PERFECT DRIVER.

Behind every beautiful horn there should be a beautiful driver. At Avantgarde Acoustic, every drive unit is developed specifically and alongside its corresponding horn element. Since spherical wave horns place special technological demands on the driver and, at the same time magnify inaccuracies by a factor of ten – just like an acoustic magnifying glass – we must take extreme care in our driver development. It has taken more than five years of refining, experimenting, improving, measuring, and listening to create the new Evolution^{AA} driver series. Horn and driver have been perfectly matched and merge to form a single, coherent unit of outstanding quality and performance.

THE IDEAL FREQUENCY RESPONSE FOR THE PERFECT SOUND.
A horn amplifies more efficiently the lower the frequency. For a perfectly balanced sound, our drivers must thus reproduce higher tones at a correspondingly louder level. That's why conventional drivers simply won't work in a horn speaker, meaning that not only do we design every driver ourselves, each Evolution^{AA} driver is painstakingly designed for and matched to a single, specific purpose.

LIMITLESS POWER.
The column of air in the horn imposes a greater resistance and is more closely coupled to the movement of the driver than in speakers without a horn. To overcome this initial mechanical impedance, our drivers have to be equipped with much more powerful magnet assemblies and motors.

Compare our Evolution^{AA} horn drivers to conventional drive units of similar size and you'll discover that they generate vastly greater power. To achieve this we must use the most sophisticated design, technology and construction, combined with superior, cost-no-object magnetic materials: U-Yokes made of 0.05% low carbon steel, Y40 classified ferrites and exotic rare earths like Cobalt and Alnico.

PRECISION IS THE PRODUCT OF ATTENTION TO DETAIL.
Because horns amplify sound with such extraordinary efficiency, any distortion or non-linearities in the driver are also amplified accordingly. For this reason, our Evolution^{AA} Series drivers have to meet performance, consistency and quality control standards that are ten times higher than conventional design and manufacturing processes.

OUR HITEC DIAPHRAGMS. – STABLE, LIKE A ROCK IN THE SURF.
Spare a thought for the diaphragms in our drivers. Positioned between the air mass in the horn and the power of the magnetic motor, they exist in a world where an apparently immovable object is constantly assaulted by an irresistible force.

Helped by their smaller dimensions, our diaphragm and suspension systems are also specially designed to resist torsional forces, while our triple layer material sandwiches a stiff core material between two anti-resonant coatings. The result is an incredibly stiff component which still exhibits the best self-damping in its class.

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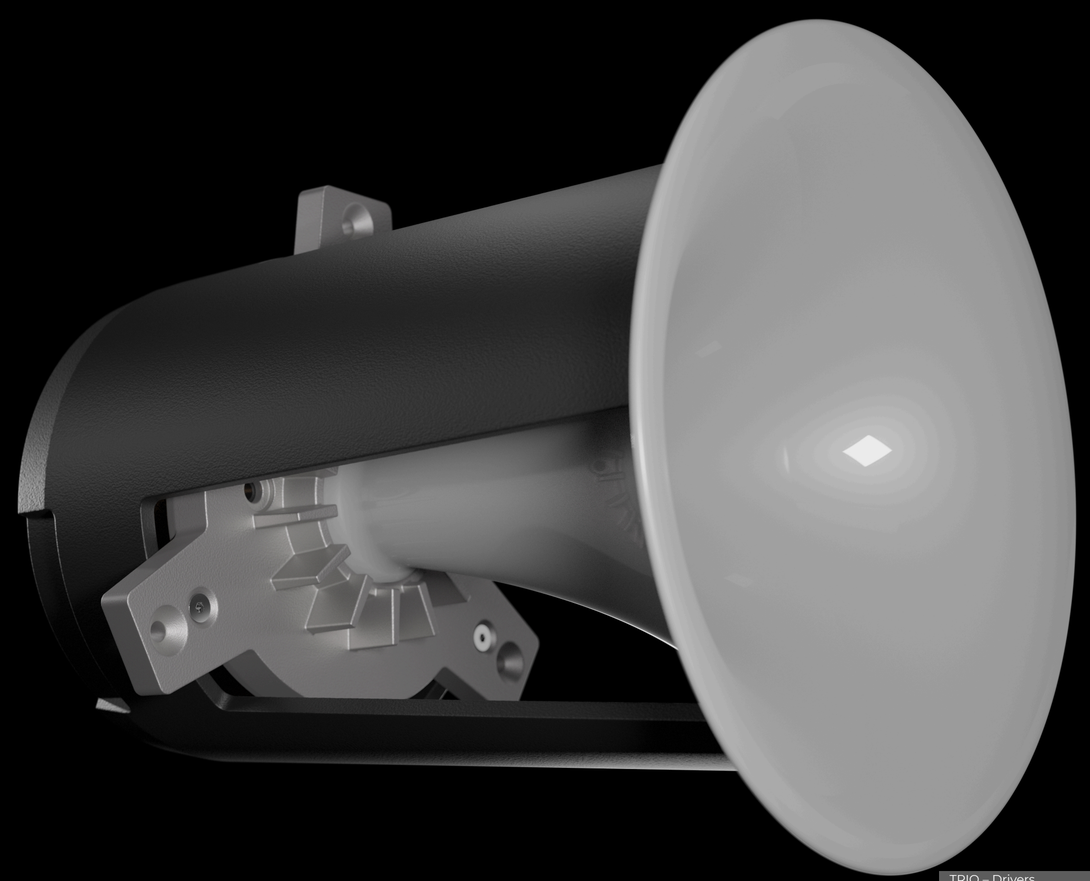


Driver.

A PERFECT HORN NEEDS A PERFECT DRIVER.

SPHERICDOME[AA] MEMBRANE.
The spherical-dome geometry used for the diaphragms in our Evolution[AA] drivers is precisely matched to the corresponding horn element to ensure a phase-coherent sound pressure curve within the horn. The perfect radiation of the sound waves is crucial for the final performance.

AIRGATE[AA] TECHNOLOGY.
By precisely controlling the chamber that couples the driver diaphragm to the horn mouth we can filter high-frequency distortions, reducing them by a factor of four, a natural phenomenon that sees distortion literally vanish into thin air.

MORE RESISTANCE FOR MORE CONTROL.
Our Omega voice-coil technology used in the G3 Series Evolution[AA] drivers, gives them extremely high electrical impedance, making them very easy to drive. That effortless drive characteristic allows amplifiers to perform at their best and speaker cables to sound better than ever. The speaker has more authority, less distortion, and more control, for a more precise response.

SINGLEFRAME[AA].
The new G3 Series SingleFrame[AA] drivers employ robust, cast baskets that also enclose the motor elements, creating a totally stable mechanical foundation for the moving components of the Evolution[AA] drivers.

LINEAR FORCE SUSPENSION.
Conventional drivers are designed for multiple applications in a wide range of different designs. Normally, the stiffness of such a driver's suspension increases as it approaches the limits of its travel. In an Avantgarde system, because we can precisely define the operating range and physical characteristics of each and every driver, we can also develop special suspension elements with linear stiffness throughout their travel, avoiding compression and limited dynamic response.

INPHASE RESPONSE.
In redesigning the Evolution[AA] drivers, we have succeeded in significantly improving the phase response of the drivers over their respective frequency ranges. With phase-coherent output, all frequencies are emitted at the same time, avoiding frequency related steps or jumps in volume and preserving the spatial relationships within the recording.

Aligning the drivers.

ENGINEERING A COPLANAR DRIVER ARRAY.

In the G3 Series, all drivers occupy precisely the same plane. This means that their acoustic centres are perfectly aligned, creating an identical distance from each sound source to the listener. The signals from each source (tweeter, midrange and woofer) arrive at exactly the right time and with the proper musical relationship.

But if you angle the speaker relative to the listening seat, you will destroy that carefully calculated alignment. When the speaker is angled in, the distance of the tweeter to the listener would decrease due to the lateral offset, when angled out it would increase accordingly. To compensate for this, the tweeters can slide forwards or backwards on precision ball bearing guides. Users can thus precisely tune the coplanar alignment, to preserve this critical performance parameter, regardless of set up or circumstances.

Coplanar driver array.

XT3 – the super tweeter.

AVANTGARDE'S FASTEST TWEETER EVER

Although the sensitivity of human hearing decreases above 5,000 Hertz, musical overtones and harmonics are crucial to individual instrumental timbre. Accurately reproduced upper registers are vital for identifying specific voices or instruments, creating an airy, open sound stage and precisely locating individual sounds in space.

The TRIO G3 uses the all-new XT3 tweeter. A radical change from our previous designs, every aspect of driver and horn has been revised. We have developed a completely new horn profile with a far longer throat, along with a totally new driver to match it,producing fantastic measurement results and superior sound performance.

200MM 'LONG-THROW' HORN.
Improving high-frequency performance meant redesigning the horn and driver from scratch. The result is a completely new tweeter horn. At 200mm in diameter, it is 20mm wider than the old XD horn, with a 25% increase in radiating area. At the same time, we have increased the length from 85mm to an enormous 176mm. As a result, we have a lower cut-off frequency with significantly increased acoustic power. This makes it possible to drive the horn with a much smaller diaphragm.

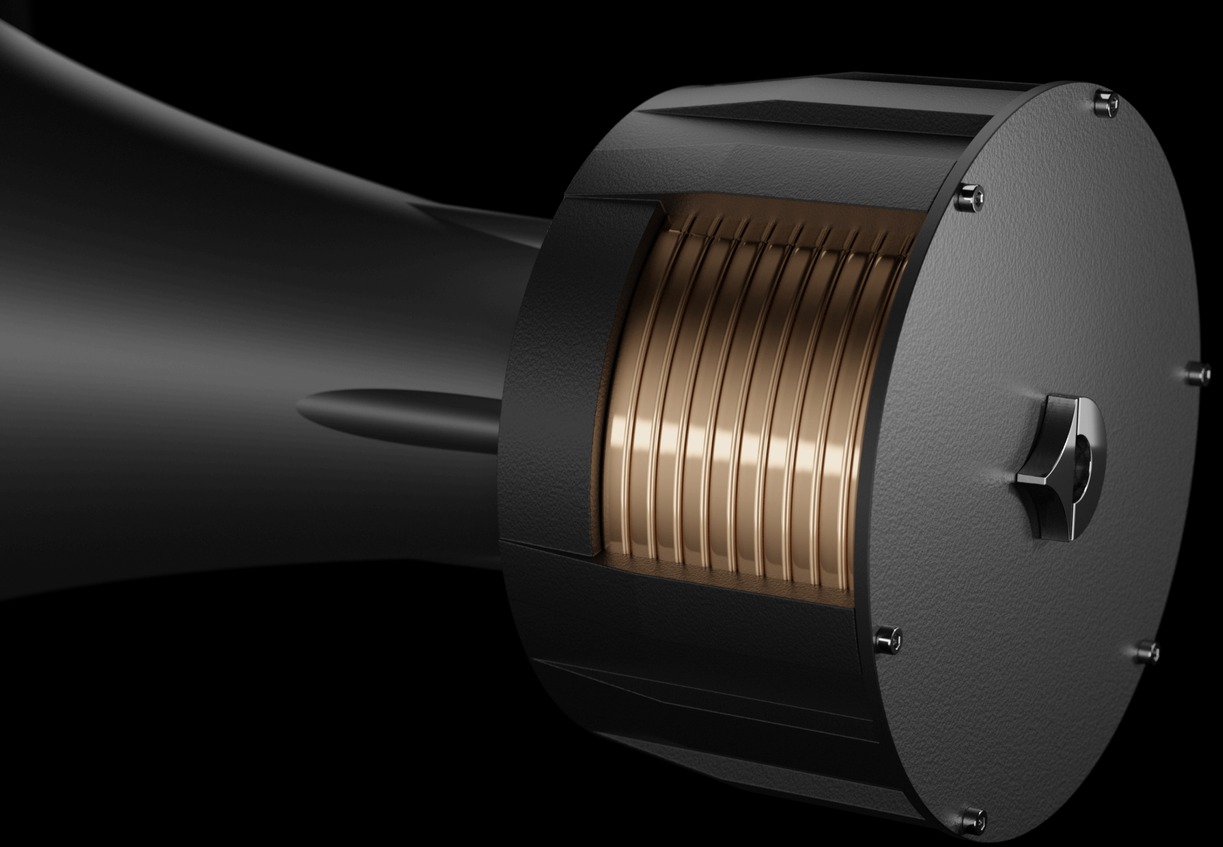
ANNULAR DIAPHRAGM & DUPLEX SUSPENSION.
In contrast to the dome shape of the XD tweeter, the new Evolution^{AA} H3 tweeter uses a completely new geometry. Its annular diaphragm, with duplex guides on the inner and outer rims, is lighter and at the same time mechanically more stable, ideally suited to withstand the higher back pressure of the new 200mm horn.

RECORD LOW DISTORTION VALUES.
With the new Evolution^{AA} XT3 high-frequency driver, THD values are 10dB lower than with the XD tweeter, 50dB lower than the actual music signal. Distortion values have been reduced from 1% to a record-breaking 0.32% compared to its predecessor.

HIGHER EFFICIENCY. PURE SOUND.
With the new tweeter horn, we have managed to squeeze even more sound pressure out of a smaller and lighter diaphragm. In the lower frequency range we achieve a record-breaking 115dB with a clean upward sloping frequency response. This enables us to use a higher frequency for the high pass filter to improve power handling and headroom of the Evolution^{AA} XT3 compared to the previous model.

PERFECT TIMING AND NO PHASE SHIFTS.
The new Evolution^{AA} XT3 high-frequency driver achieves reference values when it comes to the measurements of temporal offset across the frequency range. With a linear phase progression of less than 50 degrees (4,000 – 20,000 Hz), this exceptional driver is in a league of its own, capable of reproducing even the highest frequencies without timing errors.

28,000 VIBRATIONS PER SECOND.
The Evolution^{AA} H3 tweeter's lighter, annular diaphragm can vibrate much faster than anything we have done before. That extends its frequency range up to 28,000 Hz, ensuring greater clarity, focus and harmonic resolution, a fuller and more natural sound.



XM3 – the midrange unit.

OUR REFERENCE IN MIDRANGE PERFORMANCE.

When people talk about high-end sound, they talk a lot about treble and even more about bass. But nobody talks about the midrange. Yet this is not just the area where our ear is most sensitive, it's the range in which you find both the human voice and most instruments. More than 70% of our auditory perception (and musical appreciation) happens in this area.

Therefore, for us – no matter how high the treble or how low the bass – it is the quality of the midrange that really defines the quality of any high-end audio system. That midrange carries the essence, the very "soul" of the music. So, it should be no surprise that the XM3 midrange unit is in a class of its own.

NO COMPRESSION. NO DISTORTION.
We developed the unusual design principles of this reference driver over 30 years ago, continually refining and perfecting that original concept – a driver that might appear essentially unchanged – for nearly three decades. Unlike conventional compression drivers, the Evolution[AA] XM3 midrange unit uses a special dispersion geometry with a diaphragm dimension that almost matches the horn mouth. The necessary energy for the lower midrange is generated through a longer, linear excursion, rather than through extreme compression. This topology contributes directly to the exceptional transparency and clarity of the midrange, especially at extreme power levels.

THE STRONTIUM FERRITE MAGNET.
The Evolution[AA] XM3 midrange diaphragm is driven by a motor that's as elegant in design as it is technically advanced. The concentrated power of the strontium ferrite magnet acts directly on the omega voice coil via a wafer-thin air gap, ensuring lightning-fast power transmission, delivering what is probably the fastest and highest-resolution midrange in the world.

WORLD-BEATING 27 OHM IMPEDANCE.
The Evolution[AA] XM3 midrange driver uses a unique Omega voice coil that offers an incredible 27 Ohm impedance. Extremely easy to drive, it provides for unparalleled control and musical authority, lower distortion, and a more precise response.

570MM SPHERICAL HORN.
The spherical-dome diaphragm of the Evolution[AA] XM3 midrange driver ensures phase-coherent radiation into the 570mm midrange horn. For even lower distortion, we have incorporated our ingenious AirGate[AA] filter technology.

Other speakers can only dream about the way the Evolution[AA] XM3 midrange unit projects musical energy, generating 109dB sound pressure levels from just one, tiny watt. There is no competition.

The XM3 simply delivers the best midrange – bar none.

XL3 – the fundamental tones.

EVEN MORE HORN. EVEN MORE EMOTION.

The upper bass (or fundamental range) extends from approx. 100 – 600 Hz. It's where you find the fundamental frequency of the human voice and the lowest fundamental frequencies of various important instruments, such as the saxophone and violin.

It is very difficult to realize a lightning-fast reproduction in this range with horns, which is why this is where the high-end wheat is separated from the audio chaff. Here the sound transforms from good to "out-of-this-world". Get this range right and the sound is transformed, perceived as warmer and fuller. At the same time, the dynamics of the bass harmonics give the music an undreamt-of energy, precision and presence from low frequencies right up through the midrange.

950–650–100. DREAMY VITAL STATISTICS!
The spherical wave horn of the XL3 bass unit has a diameter of 950mm, a length of 650mm and a horn neck opening of 100mm. That's not just pretty big, but also pretty unique and, let's face it – just downright pretty.

A PRODUCT THAT'S PURE MADNESS.
In order to be able to produce this almost 1 meter diameter horn requires steel tooling that weighs over 8 tonnes. It takes that massive tool and over 2,500 tonnes of pressure to create the largest and most precise spherical horn in the world – and to do it with an accuracy and series consistency that sets standards in horn loudspeaker construction.

109dB AT 100HZ. INSANE!
With our new Evolution^{AA} XL3 horn driver, we have taken the previous model even further. The large 200mm driver with the new SingleFrame^{AA} chassis effortlessly generates 109dB (1 Watt/1m) down to 100Hz. That's pretty incredible – and probably the best figure ever achieved by a series production loudspeaker.

AN EXTRAORDINARY ENGINE.
To achieve low-frequency performance levels that push the limits of what's technically possible, you need one thing above all: power. That's why we have equipped the new Evolution^{AA} XL3 horn driver with the best rare-earth magnets available. For an even stronger magnetic field, we have also added InnerCore^{AA} magnets to the space inside the voice coil former. Pure power for pure, explosive sounds.

LEAVE NO STONE UNTURNED – REGARDLESS OF COST.
In designing the Evolution^{AA} XL3 horn driver, we've used every technique and every material available to us: TripleLayerCompound^{AA} diaphragm, AirGate^{AA} filter, SphericDome^{AA} architecture etc. etc. Superior technologies based on over 30 years of experience, combined with a manufacturing precision that is second to none.

Our XL3 base unit – extending the unmistakable, phenomenal sound that has made the TRIO a legend.

Filter.

THE PERFECT CROSSOVER.

The purpose of a crossover in any multi-way loudspeaker is to prevent the same frequencies being produced by different drivers simultaneously. If that happens, the tones can overlap, resonate, or cancel each other out. This interference must be avoided at all costs for credible, high-quality musical reproduction – reproduced music that sounds like life. If the horns are the soul of our speakers, the crossover is the beating heart.

It's a challenge on which many loudspeaker designs come to grief, a challenge our designers have taken seriously indeed, developing components and entire, unique technologies to deal with this critical issue.

SPHERICLOWCUT^{AA} TECHNOLOGY.
Each of our spherical horns can only reproduce low tones down to a certain, clearly defined frequency. If the wavelength of the notes becomes larger than the dimensions of the horn, those notes cannot properly propagate and are automatically filtered. Through careful calculation and without any additional componentry, Avantgarde horn drivers use SphericLowCut^{AA} technology to achieve perfect, perfectly natural low-frequency roll-off, the most efficient possible filter, based entirely on physical laws and devoid of any artificial artefacts.

AIRGATE^{AA} TECHNOLOGY.
With AirGate^{AA}, we have developed an innovative passive technology that filters high frequencies without placing a single component in the signal path. Unique, innovative and without the typical, negative side effects.

NATURECAP^{AA}.
Despite the AirGate^{AA} and SphericLowCut^{AA} technologies, there are still situations in which additional electronic filters are indispensable, often outside the driver's pass-band: for example, to protect tweeters from low-frequency impulses or to prevent thermal overload of the driver.

For these applications we have developed the NatureCap^{AA}. An extremely elaborate capacitor, hand-built in Germany, instead of wafer-thinly coated plastic foils, the electrodes of the NatureCap^{AA} are made of solid, rolled aluminium. We use a cellulose fibre compound impregnated with biological oils as the dielectric. It is an extremely complex and expensive process, but due to the much higher weight of the solid aluminium and the damping properties of the oils, it is also much less susceptible to high-frequency vibrations.

The newly developed NatureCaps^{AA} are approx. 25 times larger and considerably heavier than the capacitors from the XA Series. Just achieving stable attachment to the circuit board requires specially manufactured brackets. It might be difficult to build and difficult to employ, but the NatureCap^{AA} sounds simply wonderful.

POLARISATIONPLUS^{AA} CIRCUIT.
To prevent the dielectric field of our NatureCap^{AA} from oscillating with the changing polarity of the musical signal, we fix the magnetic alignment of each capacitor with a small DC circuit. This unique PolarisationPlus^{AA} circuitry renders the polarity absolutely stable, enabling cleaner processing of incremental signal changes.

Innovation that revolutionizes sound.
The amplifier that is not an amplifier.

iTRON

OHM'S LAW

$$I = U/R$$

Current Voltage Resistance

iTRON.

CURRENT DRIVE – DELIVERING PERFECT CONTROL.

iTRON^{AA} is a revolutionary electronic circuit from Avantgarde that, for the first time ever, allows perfect control of the driver's diaphragm, achieving an incredibly detailed, pristine and crystal-clear sound. The difference to conventional amplifiers is so great that we call it our game-changer technology.

iTRON^{AA} is based on the current convertor circuit principle. Our patented development is based on the concept of an ideal voltage-current converter being the perfect driver for a dynamic loudspeaker. Innovative, stringent and, above all, electro-physically correct. iTRON^{AA} is not an amplifier, but "the most sophisticated driver engine in the world". To better understand this logic, we would like to take you on a short excursion into the basics of electro-physics.

HOW A LOUDSPEAKER WORKS.
A loudspeaker converts electrical energy into acoustic signals (sound). The functional principle is based on current flowing through a coil suspended in a magnetic field. It is important to understand that the acceleration of the diaphragm is caused by the magnitude of the current flow – and not by the magnitude of the electrical voltage.

HOW AMPLIFIERS WORK.
Paradoxically, however, practically all commercially available audio amplifiers work on the principle of voltage amplification. This means that an amplified voltage, which varies with and tracks the music signal, is fed to the loudspeakers. Strictly speaking, the voice coil is supplied with the wrong signal – a current flow is needed to generate sound, not a voltage. The fact that this sub-optimal system nevertheless works is due to the electro-physical relationships between voltage, current and resistance.

OHM'S LAW.
Ohm's law states: the strength of the electric current flowing through an object is proportional to the electric voltage at constant resistance. This means that if the voltage increases at a loudspeaker voice coil with constant impedance (e.g. 8 Ohms), the current flow increases proportionally and the diaphragm is accelerated in a linear fashion, tracking the input signal.

Conversely, Ohm's law also states: for the same voltage, the current flow depends on the resistance. The greater the resistance, the smaller the current flow and vice versa. The diagram below with the water containers illustrates these relationships.

In the case of a real-world loudspeaker, with constantly changing impedance, this means that the diaphragm's acceleration is no longer linear compared to the input signal, introducing significant distortion.

It is therefore crucial to understand the actual impedance characteristics of any loudspeaker.

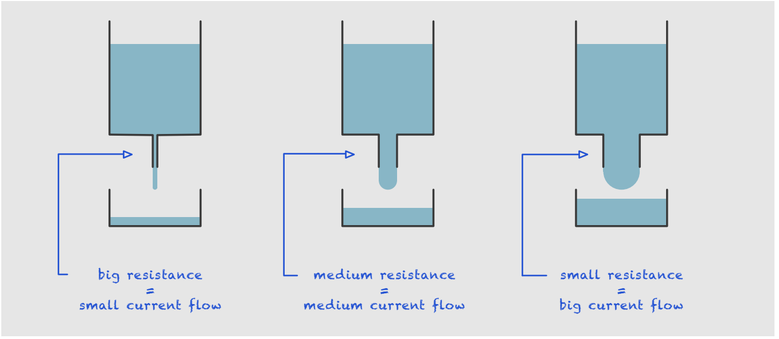


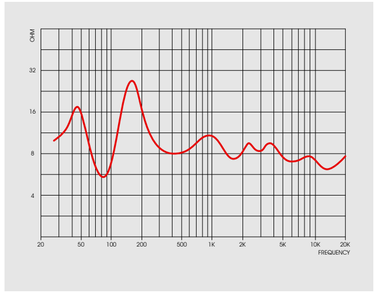
Fig. 3 Water tank with identical water level or pressure (= voltage).

Loudspeaker impedance.

THE ORIGIN OF THE SINGLE BIGGEST ERROR IN AMPLIFIER DESIGN.

A dynamic loudspeaker is a complex electro-physical system whose resistance, i.e. impedance, is influenced by a multitude of factors. Difficult to control, these factors constantly change during operation.

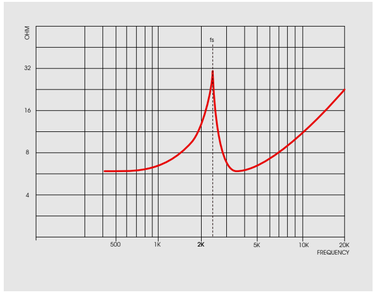
FREQUENCY-DEPENDENT IMPEDANCE CURVE.
The impedance curve of any drive unit varies but is highest in the range of its resonant frequency. A voltage amplifier reacts to this changing impedance, reproducing certain frequency ranges too loudly or too softly, distorting the music signal.



Impedance curve of a multi–way loudspeaker

INDUCTIVE REACTANCE OF THE VOICE COIL.
The inductive reactance of the voice coil causes increasing impedance at high frequencies. With a voltage amplifier, this causes a drop in level at higher frequencies, especially with tweeters.

POSITION-DEPENDENT INDUCTANCE.
The inductance of a voice coil depends on its distance from the pole core. When oscillating in and out, this distance changes and thus automatically changes the electrical inductance. Operated with a voltage amplifier, a driver thus produces



Impedance curve of a tweeter

continuous distortion that can be up to 20%, depending on the driver's stroke. Dynamic music impulses are thus distorted.

BACK EMF.
A voice coil with current flowing through it generates a negative voltage when it swings out, which is fed back into the loudspeaker cable. This so-called counter-electromotive force (back EMF) reduces the incoming voltage, voltage that is actually required for a voltage amplifier to track the music signal. Music impulses are reproduced too softly, and dynamics are compressed.

THERMAL COMPRESSION.
During operation, a voice coil carrying current heats up, sometimes considerably. Heat increases its internal resistance and under full load the impedance of the driver can increase by up to 40%. Musical impulses are strongly compressed and there is a considerable reduction in dynamics.

THE INERTIA OF AN ACCELERATED MASS.
In physics, inertia is the tendency of moving bodies to remain in their state of motion. In relation to the loudspeaker, Newton's 1st law means that the accelerated diaphragm tries to maintain its direction of movement, independent of the music signal. The magnitude of this force, which directly counteracts the music signal, depends on the moving mass of the driver and the speed of the diaphragm's movement. In practice, this means that loudspeakers with a high moving mass cause considerable non-linearities at high volumes.

Fig. Resistor

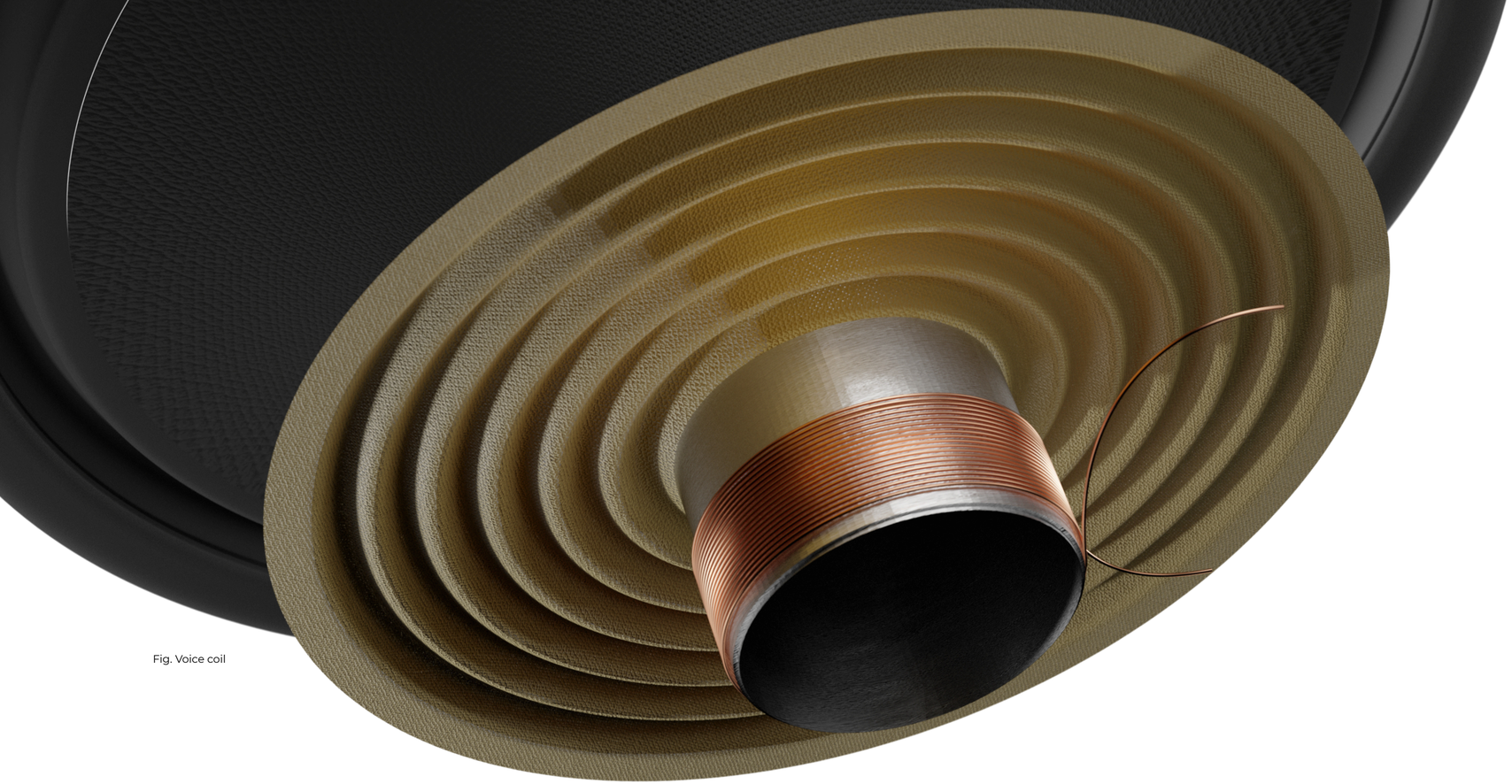


Fig. Voice coil

The challenges facing current amplification.

OR, WHY CURRENT DRIVE IS NOT COMPATIBLE WITH EVERY LOUDSPEAKER.

As explained in detail, a loudspeaker is an extremely complex load and impossible to operate without distortion, at least with a voltage amplifier. Nevertheless, virtually all, audio amplifiers are based on this principle. Why voltage amplifiers? Why are there practically no current amplifiers on the market? The reasons lie in a basic incompatibility between current drive and conventional passive loudspeaker cabinets and in the enormous complexity of current amplifier technology.

CURRENT DRIVE RESTRICTIONS.
A current amplifier cannot control a drive unit in the range of its resonant frequency. This is the range at which any loudspeaker is loudest and at the same time has its impedance maximum. The iTRON^{AA} circuit would try to compensate for the peak and "pump" ever more energy into this range. The electronics would be overloaded and the loudspeaker would therefore inevitably boom at this frequency.

To further complicate matters, the principle of the current amplifier does not work with passive cross-overs. Instead of precisely controlling the current flow in the voice coil, parts of the current would flow unhindered through and flood the passive crossover.

So, current drive technology cannot be used in the drivers' resonant frequency range and cannot be used on a passive speaker.

Since practically all loudspeakers are based on these principles, only voltage amplifiers can be used in these applications.

THE AVANTGARDE WAY.
But we are so convinced of the clear superiority of our iTRON^{AA} current drive technology, that we developed a system topology just to exploit it. By moving to a fully active system, in which each individual drive unit has its own iTRON^{AA} electronics, we can ensure that each driver is operated outside its resonant frequency range and that there are no passive crossover components in the signal path.

iTRON- the greatest technological challenge.

THE PUREST VOLTAGE-CURRENT CONVERTER EVER.

iTRON^{AA} is the greatest technological test we have ever faced. Theoretical knowledge is one thing, but its implementation is the real challenge. As with any fundamental innovation, it demanded extensive basic research.

We developed the most diverse circuit concepts and extensively tested them on the widest range of drivers, with technical measurement and comparative listening, the entire development programme taking over five years. The result: A patented circuit that outclasses every voltage amplifier known to us and puts all previous current amplifier concepts in the shade.

Established current amplifier circuits work either as a voltage amplifier with current feedback or as a current amplifier with feedback. In both variants, the negative feedback turned out to be too sluggish for the requirements of a high-end audio amplifier.

The iTRON^{AA} circuit, which we have patented, is a symmetrical, single-ended circuit without any negative feedback. The output is a perfectly controlled current that exactly follows the voltage at the input. Strictly speaking, therefore, the iTRON^{AA} circuit is not really an amplifier at all, but a sophisticated voltage/current converter, an engine that directly controls movement of the driver diaphragm.

LABORATORY TESTS.

To demonstrate the dramatic advantages of the iTRON^{AA} circuit, we can simulate its behaviour compared to a voltage amplifier using laboratory modelling techniques. The two graphs show a simulation of both concepts using a 2-way box loudspeaker. The curves for input voltage (blue), output voltage (green) and output current (red) are slightly shifted relative to each other for greater clarity.

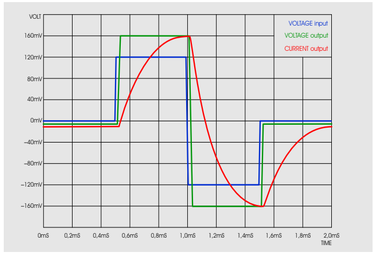


Fig. 1: Voltage amplifier simulation

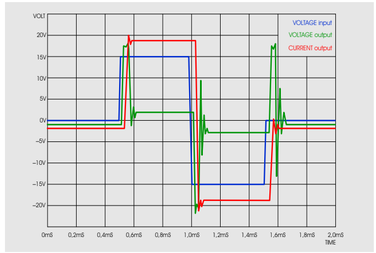


Fig.. 2: iTRON^{AA} current amplifier simulation

With the voltage amplifier (Fig. 1), the input voltage is amplified perfectly to the output voltage. In this circuit, the current (red curve), which accelerates the diaphragm, builds up only slowly due to the inductance of the voice coil and runs sluggishly behind the input voltage. Pulses of musical energy are inevitably slowed down and reproduced with a time delay.

The simulation of the iTRON^{AA} current amplifier (Fig. 2) shows the completely different way in which this circuit functions: the output voltage (green curve) does not follow the input voltage, but peaks dramatically (approx. 20V) at the beginning of the input pulse. The current amplifier circuit thus generates a short max. voltage so that the inductance of the voice coil is overcome, and the current starts to flow immediately. In this case, the output voltage peak runs ahead of the output current, but the output current is a time-correct, practically perfect 1:1 copy of the input voltage.

SUMMARY.

In terms of both operational principle and measured performance, the iTRON^{AA} current drive circuit is superior to any voltage amplifier on a compatible loudspeaker. No other amplifier concept is able to drive and control the voice coil so perfectly: innovative, stringent and, above all, electro-physically correct.

The iTRON Module.

THE BEST AUDIO CURRENT AMPLIFIER OF ALL TIME.

The iTRON[AA] circuit (patented) combines the innovative direct voice coil drive technology of the current amplifier principle with a state-of-the-art circuit topology of uncompromising high-end technology.

The iTRON[AA] module of the TRIO G3 includes three analogue crossovers and three completely autonomous current amplifier circuits.

The active crossovers limit the operating range of the amplifiers to the exact frequency range of the respective driver. This ensures that the current amplifier does not operate within the resonant frequency of the drivers. In the signal path of the circuit, we use the superior sounding NatureCap[AA] components. Extremely intricately designed capacitors, handmade in Germany.

The iTRON[AA] circuitry is fully balanced. The circuits operate exactly differentially and any interference that may occur thus neutralizes each other.

The current amplifier is designed as a single-ended amplifier. With this circuit design, the operating current is always larger than the actual music signal and thus has by far the lowest distortion and the purest sound.

The limited slew rate of multiple amplifier stages results in a certain delay time between the input and output signal when using negative feedback. This adds up accumulatively over several amplifier elements and leads to audible sonic degradation. iTRON[AA] is consequently a pure zero-feedback circuit that operates without any negative feedback in the signal path.

The generously dimensioned power is provided by modern power supply technology of the latest generation. All electronics are protected by a state-of-the-art E-Fuse circuit. This is not only faster and thus safer than conventional fuses, but also much better in terms of sound quality.

The iTRON[AA] active module is connected via a balanced XLR input. For the balanced connection to the SpaceHorn, an XLR daisy-chain output is available.

With the power mode switch 4 different power on/off modes can be selected. A 12V trigger input is available for automatic remote power on.

Via GAIN switches the input sensitivity can be adjusted. To avoid sound degrading potentiometers in the signal path, three precision switches in an additive stepped arrangement are used for this purpose.

The volume of the three TRIO horns can be adjusted in adjusted in +/- 1.5dB steps. The settings can be made according to personal taste, to match the sonic "tonality" of the connected source devices or to slightly correct room acoustic influences.

The place where paradise caresses music.

HORN TECHNOLOGY AND CURRENT DRIVE – THE PERFECT PARTNERSHIP.

The speed and dynamics of our horns combined with the control and resolution of the iTRON^{AA} circuitry is an audiophile marriage made in heaven – a perfect combination – a seamless junction between the world of acoustics and the world of electronics. It is the place where paradise caresses music.

What does iTRON^{AA} sound like? Fantastic, phenomenal, audibly invisible, unforgettable, beyond our wildest dreams or simply super awesome? We are happy to leave the struggle for an adequate description to you: music – live music – means different things to different people. But we would like to point out a few attributes that distinguish the performance of our iTRON^{AA} current drive from that of the very best and most highly regarded voltage amplifiers.

SUBSTANTIALLY BETTER DYNAMICS.
iTRON^{AA} delivers much wider and more natural dynamics because the impedance fluctuations in the loudspeaker are effectively eliminated, the current output (and thus the acceleration of the diaphragm) perfectly tracking the input signal. The power in the musical performance is unleashed. Like live. Like an audio system on steroids.

ETHEREAL RESOLUTION AT LOW VOLUMES.
The iTRON^{AA} circuitry is able to compensate perfectly for inductance effects, especially at very low volumes and with the most delicate electrical signals. Even the quietest sounds have a presence and intimacy, delicate texture and attack, dimensionality, tonal shading and luminous harmonics. Even the quietest passages come to life...

UNRESTRAINED HIGH FREQUENCIES.
iTRON^{AA} has tremendous high-frequency resolution because it compensates perfectly for the increasing inductance in the tweeter. Combined with the extended frequency response of the new XT3 super tweeter, this means fabulously delicate reproduction right up to the highest frequencies, without the level drop otherwise inherent in other systems.

THE MOST PRECISE TIMING THERE IS.
With the iTRON^{AA} circuit, the output current does not lag behind the input signal as it does with a voltage amplifier. Leading edges start at precisely the right moment and rise to exactly the right level. The diaphragm starts to accelerate at the correct time and moves just the right distance. With iTRON^{AA} every detail, every facet of the sound happens in the moment – the right moment. Temporal accuracy to within one thousandth of a second – separate sounds (so, separate instruments) in perfect harmony.

EXTRAORDINARY DIMENSIONALITY.
iTRON^{AA} delivers outstanding impulse response from your TRIO G3 loudspeakers (see Fig. 2). Even the smallest time differences in music are reproduced with crystal clarity, recreating the three-dimensional space in which the recording was made, sitting you in the middle of the front row at the live event.

NO DISTORTION FOR EVEN PURER SOUND.
Let's cut to the chase: there's no amplifier that sounds anywhere near as natural as iTRON^{AA} The artificial artefacts that bedevil voltage amplification, overlaying, smearing and distorting the musical signal are entirely eliminated. This technology disappears. The sound detaches itself from the loudspeakers, simply existing in your space. The music has a natural clarity and purity – and because of that it has the power to touch our heart.

CONCLUSIONS.
As you can see, we are quite excited. We see iTRON^{AA} as a technological step-change, a game-changer that establishes a completely new level of audio and musical performance. Sound that simply sounds like music. Its superiority to conventional technology is so marked that once experienced, you'd rather listen to iTRON^{AA} in mono than stereo with a voltage amplifier. Suddenly, eliminating losses in the amplifier/speaker chain means that even an MP3 music file can sound more impressive than the best high-res playback on a conventional system! You probably think that we are exaggerating? Go to your dealer and find out for yourself. Listen to our iTRON^{AA} current drive technology on the new TRIO G3. Be sure to compare it with the best voltage amplifiers the market has to offer. More than surprised, you will be shocked. We were ...
Our customers have always been the final judges, our most demanding audience. We have never awaited that judgment with greater confidence.

Modular technology for adaptability and longevity.

EVERYTHING IS POSSIBLE. EVERYTHING IS SIMPLE.
AND FUTURE PROOF.

We have the right technology for every situation. The TRIO G3 offers the optimal solution for a wide variety of customer needs and is available in two versions:

- SEMI-ACTIVE
  Requires a conventional, external amplifier

- FULLY ACTIVE with iTRON^{AA} current drive
  Operation without external power amplification, directly from a pre-amplifier or DAC.

EASY TO UPDATE AND UPGRADE.
The electronics module supplied with the TRIO G3 is modular to provide maximum flexibility. Each model has an exchangeable technology module that is connected to the loudspeaker via a multi-pin connector. Pull out the plug and integrate the module with the new technology. That's it!

This means that you can convert or update one version into another at any time: A SEMI-ACTIVE version into a FULLY ACTIVE – or vice versa. This allows the loudspeakers to be easily and quickly upgraded or adapted according to the customer's wishes and needs:

SEMI-ACTIVE for owners of a favourite conventional amplifier. FULLY ACTIVE with the new iTRON^{AA} technology for the best available sound and the uncompromising audio and musical perfectionist.

It makes the TRIO G3 versatile and accessible. It means that not only can the entry level for initial investment be lower, but the electronics modules can be kept constantly up to date, incorporating the latest technology or new digital standards, even after many years, extending the longevity of your speakers, keeping it at the cutting edge of performance and protecting the value of your purchase.

Protecting your investment and for generations to come.

Best bass ever.

SPACEHORN

SpaceHorn.

THE LEGENDARY BASSHORN RE-BOOTED.

Bass horns are the pinnacle of loudspeaker design. No other sub-woofer system is remotely comparable.

For the music connoisseur no other solution comes close and every audiophile dreams of experiencing a big, horn-loaded bass system at least once in their life.

For loudspeaker designers, the development of a bass horn is the greatest possible technological challenge. As Harry F. Olson, the audio pioneer par excellence, warned: "The design of a horn loud-speaker is usually a long and tedious task".

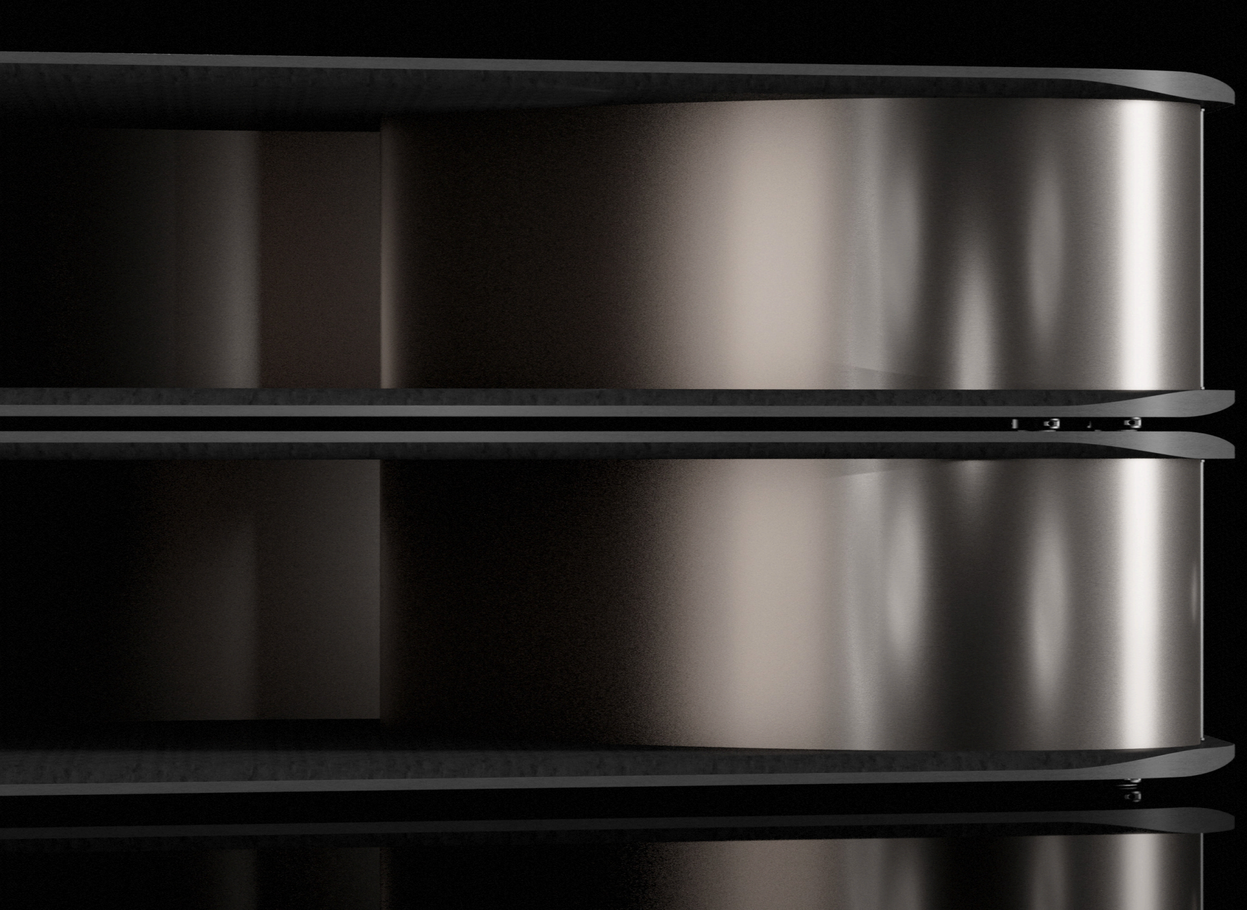
When we launched our original Avantgarde BassHorn more than 20-years ago, we created a legend – an overnight sensation: A horn-loaded bass system that, with its radical design, eclipsed everything that had been available until then.

A bass unit that finally matched the TRIO System's iconic status, catapulting it beyond state-of-the-art.

Since 2001, we have had the pleasure of installing BassHorn systems all over the world. We have been able to analyse the frequency response measurements, we have received feedback from our customers, and we have learned. And so, over time, we have accumulated a unique store of experience and know-how.

Time then – in our opinion – to take the next step and further perfect the concept. As the second generation, the SpaceHorn^{AA} embodies all the knowledge and experience gathered through developing and working with the BassHorn system for over 20 years.

Technology inspired by the past but still ahead of its time.



Designed for Homes.

YOUR HOME TRANSFORMED – INTO A GIGANTIC HORN.

The change from BassHorn to SpaceHorn^{AA} is about more than just the name. The natural laws that govern the way in which horns work also govern the way the sound they generate interacts with the room in which you place them. Through careful re-design, we have made the floor, rear and side walls of that room an extension of the SpaceHorn itself, a step that delivers not just deeper, but also better low frequency performance.

With the SpaceHorn^{AA}, we have repositioned the drivers and optimised the horn's flare to deliver more gradual and linear expansion at the mouth. We have increased the length of the horn by around 40% – to an impressive 1,898mm – without significantly increasing its external dimensions.

The result is deeper, more powerful bass that couples far more tightly to the air in the room. Efficiency in the critical 40 – 150Hz range has been increased by 5dB – equating to a six-fold increase in sound pressure level. All of which sounds impressive on paper, but what does it mean to you, the listener?

It means that your XB12 bass units have to move far less to achieve the same listening level. That means more control, clarity, and quality at low-frequencies – and that means music that sounds significantly more like life!

Our goal has always been to perfect the reality of perfect bass reproduction. We have never before been closer to that goal.

XB12 – Voice Coil 153mm.

RADICAL HORN – RADICAL DRIVER.

We have developed a completely new driver for the SpaceHorn[AA] – what is probably the most powerful driver that has ever been developed for a large, horn-loaded bass system.

Compared to the driver in the BassHorn, we have increased the voice coil from 100mm to 153mm. This gigantic 6-inch diameter motor structure achieves astonishing levels for force factor and power handling, while at the same time significantly reducing thermal compression.

The magnetic structure is built around two high-grade magnets that have to be created in Europe's largest 200,000-volt facility. The resulting 1.15 Tesla magnetic flux density acts on a voice coil of 480mm circumference – more than 50% longer than the previous model.

We use low-carbon steel for pole plates that were specially developed for the XB12. To ensure high linearity even at maximum excursion, the suspension spider has a patented dynamic profile with progressive behaviour of its surround. The surround itself is made of low-loss NBR (acrylonitrile butadiene rubber) to achieve a fast and clean transient response.

The diaphragm comprises a composite of long-fibre paper and carbon fibre – extremely stable and torsion-resistant for a precise piston movement.

The XB12's new SingleFrame[AA] chassis has robust die-cast aluminium outriggers that also enclose the magnet, to ensure the total mechanical stability of the motor structure's moving parts.

Implementing our AirGate[AA] acoustic filter technology between the driver and the mouth of the horn has achieved an additional 6dB reduction in distortion, compared to its predecessor.

The XB12 is the absolute reference in terms of bass driver technology and performance. It underlines the unique, uncompromising nature of the G3 series.

Bass amplifier.

POWER TO ROCK & ROLL.

The active subwoofer of the TRIO is driven by the G3-1000 power module in the Twin version, consisting of 2x 500-watt amplifiers, and the G3-500 power module in the Single version, consisting of a 1x 500-watt amplifier. Thus, each bass driver is powered by a separate amplifier providing for ample headroom even in complex EQ settings.
A 12 Volt switching voltage input allows the subwoofer to be powered on remotely.

Direct connection to integrated amps, power amplifiers or receivers is done via speaker-level input terminals. Line level inputs via XLR terminals are available alternatively. The signal take-off is not only at high impedance but is also balanced and transformer coupled. This floats the circuit ground, avoiding hum loops and easing connection to balanced and bridged amplifier designs.

The entire electronic unit is protected by a state-of-the-art E-Fuse circuit. This is not only much faster and thus safer than conventional fuses, but also superior in terms of sound.

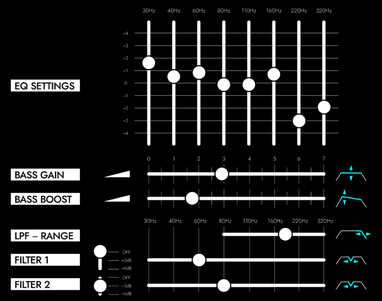
Digital crossover.

EVERYTHING UNDER CONTROL.

The bass power amplifier is equipped with an advanced digital sound processor.

With a precision and accuracy that cannot be achieved with analogue technology, the digital crossover eliminates all passive filter elements in the signal path.

The subwoofer volume is adjusted via two buttons beside the DSP display.



Numerous additional settings (e.g. high and low pass filters, equalizers, etc.) can be programmed with the Avantgarde Control software. For this purpose, the DSP has two LAN sockets, which allow daisy-chaining and thus programming of several subwoofers simultaneously. A USB port is provided for servicing.

The user interface has been completely revised and now allows a very simple intuitive use by the customer. Thus, all parameters can be easily adjusted to the room acoustics or listening habits.

The BASS-BOOST fader can be used to boost the low frequency response below 45 Hz and thus adjust the bass response from "linear" to "fat".

For individual frequency adjustments, the DSP has an 8-band equalizer. Each of the eight bands can be boosted or cut by up to 4 dB. This way the bass response can be adjusted to specific sounds (linear, techno, disco, pop, etc.) or some broad-band room resonances can be reduced.

The LPF-RANGE slider adjusts the upper crossover frequency of the subwoofer and thus the "tonal balance" of the system.

With higher frequency the subwoofer partly overlaps with the frequency response of the midrange horn. This makes the sound character of voices / instruments "warmer" and "fuller".

When the crossover frequency is set to a lower frequency, the subwoofer and midrange frequency response have a small gap. The tonal balance of the system shifts towards a more "dynamic & punchy" sound.

FILTER 1 & 2 are narrow band "notch" filters with a level cut of –3dB or –6dB. These filters can be used to eliminate/reduce unwanted narrowband resonant frequencies of the room.

Single & twin drive.

TWO OPTIONS – MULTIPLE CHOICES.

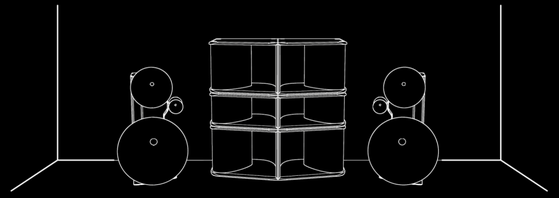
The SpaceHorn^{AA} is available in two, different sized versions.

The Single-Drive version uses a single XB12 bass driver. The cabinet has the same dimensions in width and depth as the Twin-Drive version, but with a reduced height of 492mm.

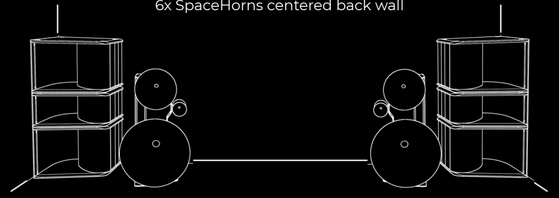
Due to its flatter design, the Single-Drive version is particularly suitable for upright installation on the rear or side-wall (see installation options on the next page).

In the Twin-Drive version the SpaceHorn^{AA} is equipped with two XB12 bass drivers and is driven by dual-mono XD-1000 amplifiers, delivering 2x 500 Watt. The height of this version is 748mm making it more suitable for horizontal placement or the stacking of modules in larger installations (see placement options on the next page).

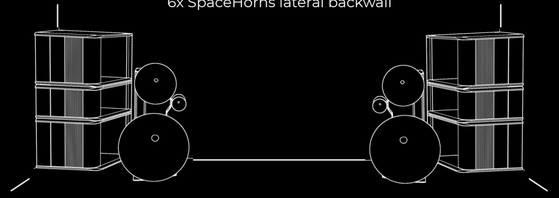
Both versions are completely compatible with each other and can be used in combination, in a single system. That makes it possible to start out with two Single-Drive SpaceHorn^{AA} modules in an upright position, expanding the system at a later stage with two or more Twin-Drive modules in a central arrangement.



6x SpaceHorns centered back wall



6x SpaceHorns lateral backwall



6x SpaceHorns lateral sidewall

Room placement.

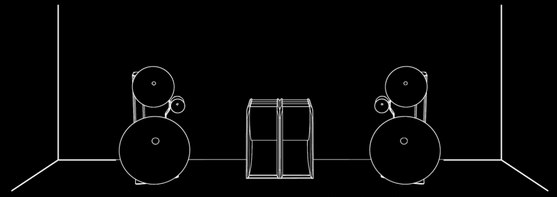
ALMOST ANYTHING IS POSSIBLE.

The extraordinary performance of the Space-Horn^{AA} modules results in a necessarily large footprint. Simple practical considerations mean that installation is normally dictated by the available space.

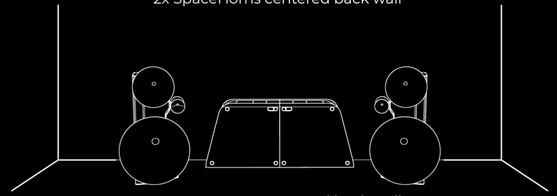
For a system with two Single-Drive SpaceHorn^{AA}, we recommend upright installation on the rear or side-wall. This presents a narrow frontal aspect to combines optimum performance and minimum visual impact. Each SpaceHorn^{AA} can be placed up to 50cm from the corner of the room.

The Twin-Drive SpaceHorn^{AA} frontal dimension is almost twice as tall/wide as the Single-Drive version, making it equally suitable for operation in a vertical or horizontal placement. You can even place them side-by-side or stacked one above the other.

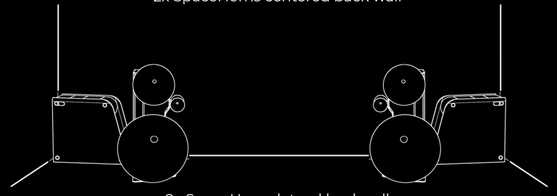
The diagrams illustrate typical set-up situations. You are also welcome to ask our engineers for specific advice regarding your particular situation. We look forward to your call.



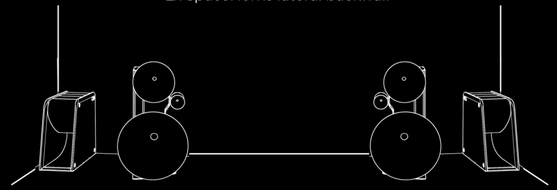
2x SpaceHorns centered back wall



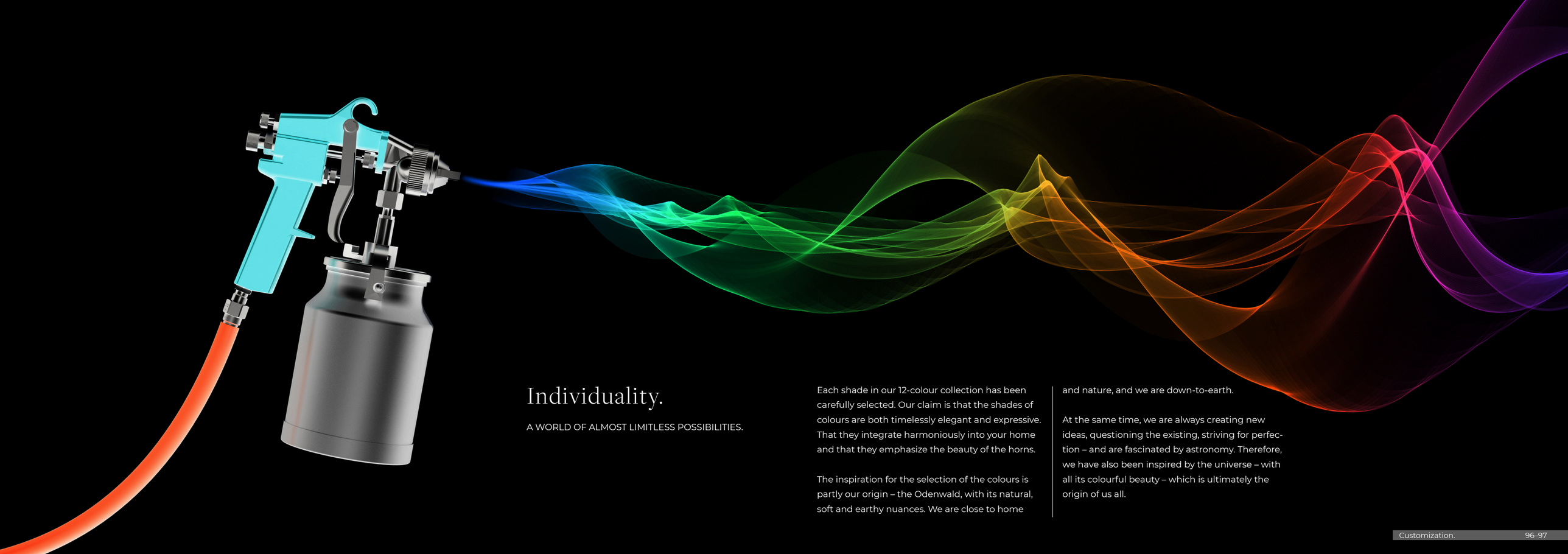
2x SpaceHorns centered back wall



2x SpaceHorns lateral backwall



2x SpaceHorns lateral sidewall



Individuality.

A WORLD OF ALMOST LIMITLESS POSSIBILITIES.

Each shade in our 12-colour collection has been carefully selected. Our claim is that the shades of colours are both timelessly elegant and expressive. That they integrate harmoniously into your home and that they emphasize the beauty of the horns.

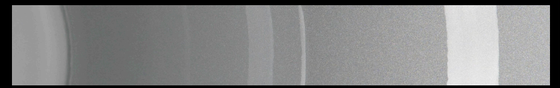
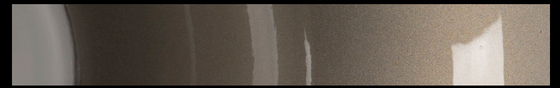
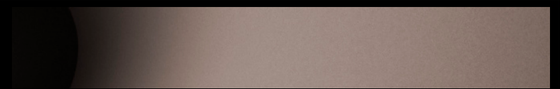
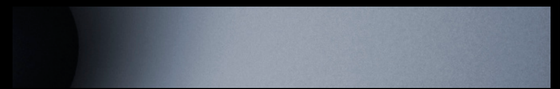
The inspiration for the selection of the colours is partly our origin – the Odenwald, with its natural, soft and earthy nuances. We are close to home and nature, and we are down-to-earth.

At the same time, we are always creating new ideas, questioning the existing, striving for perfection – and are fascinated by astronomy. Therefore, we have also been inspired by the universe – with all its colourful beauty – which is ultimately the origin of us all.

Horn Colours.

	**NO. C1**	**Andromeda.** High Gloss Grey.	
	**NO. C2**	**Black Hole.** High Gloss Black.	
	**NO. C3**	**Genuine Red.** High Gloss Racing Red.	
	**NO. C4**	**Total Eclipse.** Metallic High Gloss Orange.	custom colour
	**NO. C5**	**Red Giant.** Metallic High Gloss Dark Red.	custom colour
	**NO. C6**	**White Dwarf.** Metallic Pearlescent White. (ex Akoya Pearl White)	custom colour

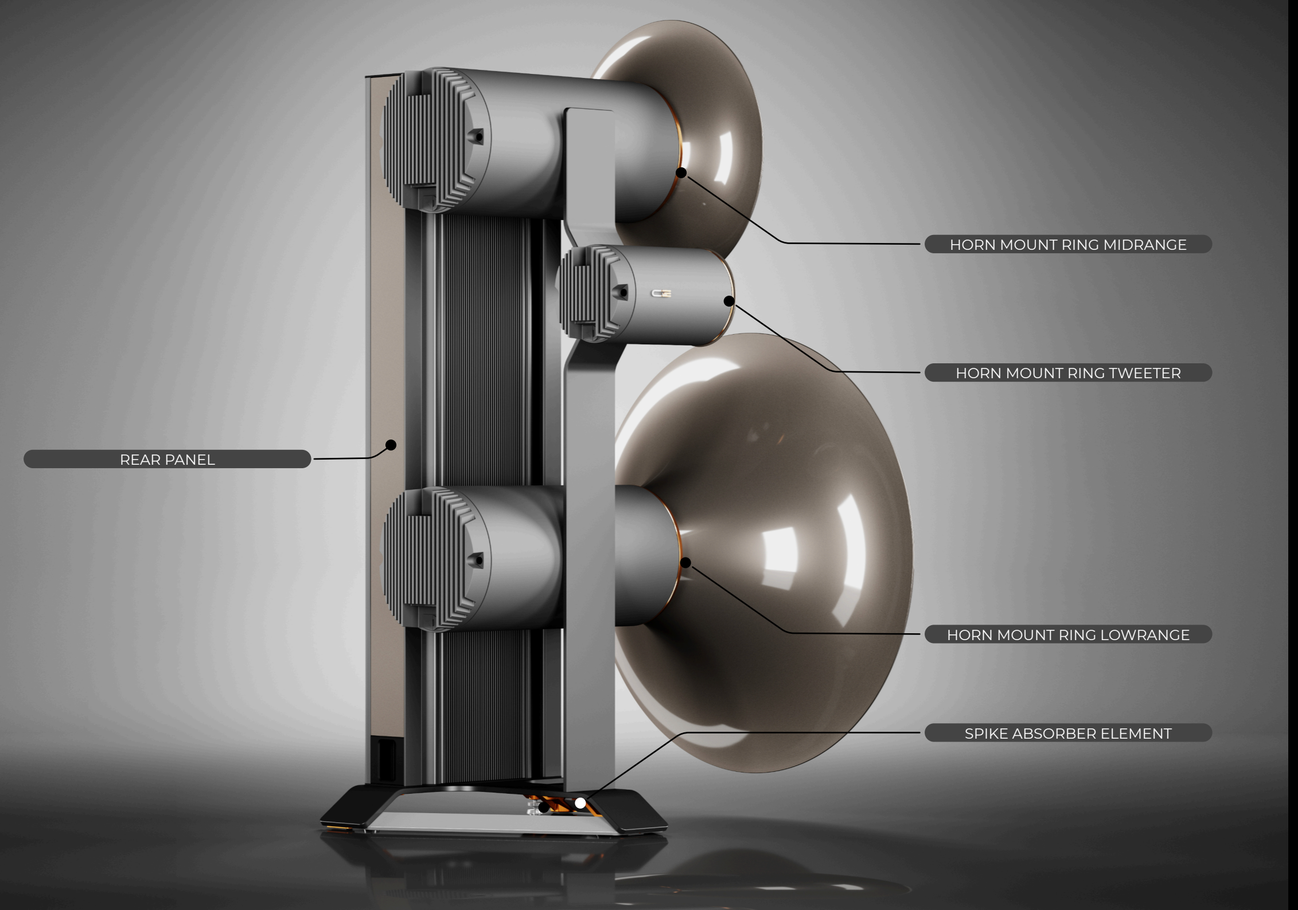
Horn Colours.

	**NO. C7**	**My Milky Way.** Metallic High Gloss Silver.	custom colour
	**NO. C8**	**Very Venus.** Metallic High Gloss Light Brown.	custom colour
	**NO. C9**	**Galactic Glow.** Metallic High Gloss Blue.	custom colour
	**NO. C10**	**Nocturne Grey.** Ultra Matte Light Grey.	custom colour
	**NO. C11**	**Goose Bump.** Ultra Matte Light Brown.	custom colour
	**NO. C12**	**Audiophile Heaven.** Ultra Matte Blue.	custom colour

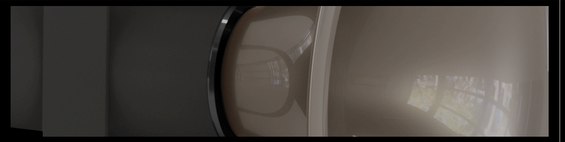
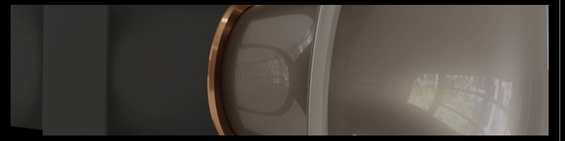
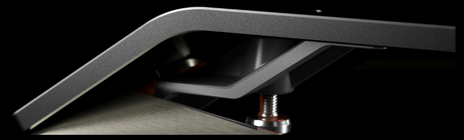
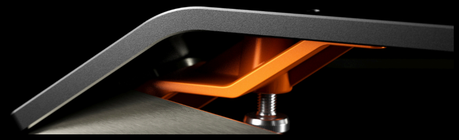
FRONT & REAR PANELS.

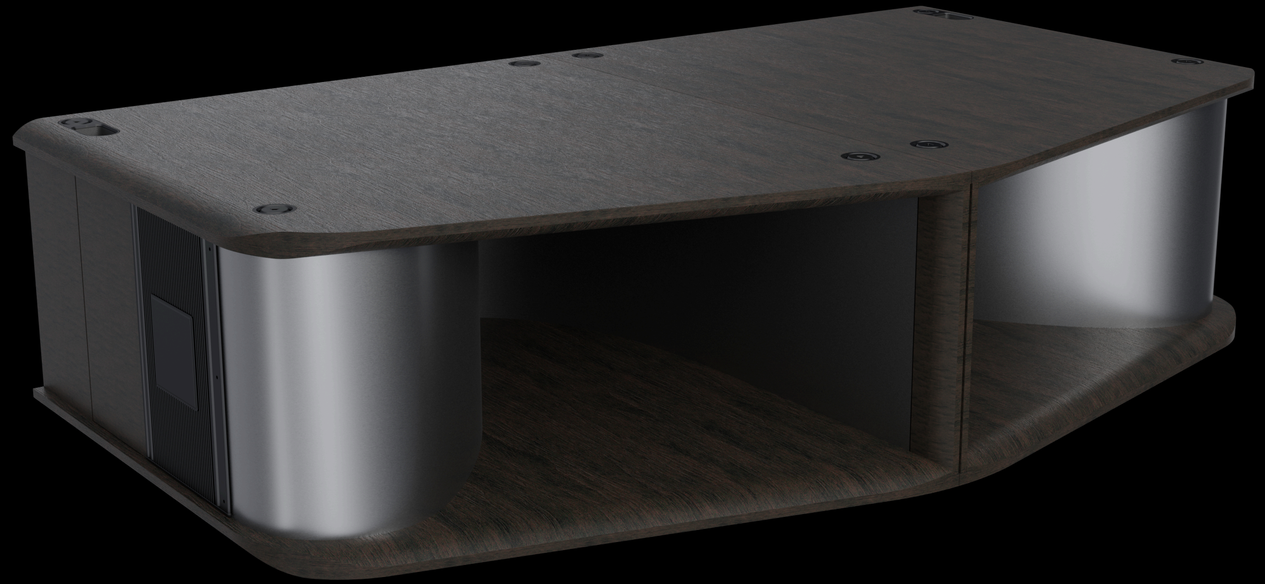
	NO. V1	**Black Wenge.** silk matte wood veneer
	NO. V2	**American Walnut.** silk matte wood veneer
	NO. V3	**Cherrywood.** silk matte wood veneer
	NO. V4	**German Oak.** silk matte wood veneer
Fig. only illustrative example	**No. C1 - 3**	**High Gloss Colour**. see overview of horn colours C1 to C3 on the previous page
Fig. only illustrative example	**NO. C4 - 12**	**Metallic High Gloss & Ultra Matte Colour.** see overview of horn colours C4 to C12 on the previous page

custom colour

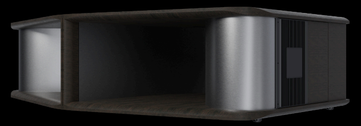
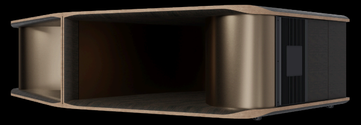


DESIGN ELEMENTS.

	**HORN MOUNT RING – BLACK FINISH.** CNC precision mounting ring in black anodised finish for low-midrange horn, midrange horn and tweeter horn	
	**HORN MOUNT RING – COPPER FINISH.** CNC precision mounting ring in copper anodised finish for low-midrange horn, midrange horn and tweeter horn.	custom colour
	**SPIKE ABSORBER ELEMENT – BLACK FINISH.** Aluminium die casting element with black powder coating finish.	
	**SPIKE ABSORBER ELEMENT – ORANGE/RED FINISH.** Aluminium die casting element with orange/red powder coating finish.	custom colour



DESIGN ELEMENTS.

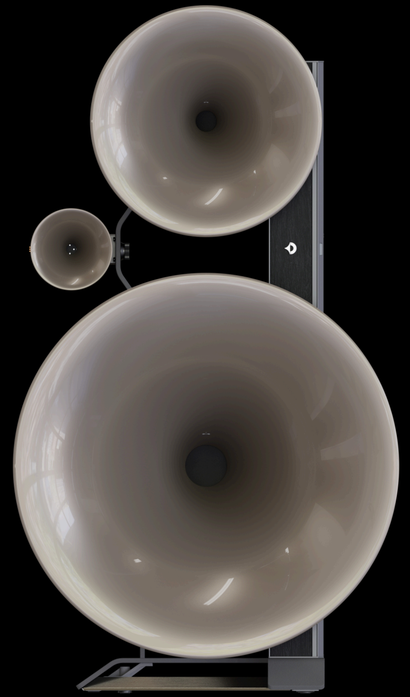
	**TOP AND BOTTOM PLATE – BLACK WENGE FINISH.** Top and bottom plate in black wenge veneer. Forward facing CNC edge in black wenge finish.	
	**TOP AND BOTTOM PLATE – CONTRAST FINISH.** Top and bottom plate in black wenge veneer. Forward facing CNC edge in contrast wooden finish. Optional: American walnut, cherrywood honey or German oak veneer.	custom finish
	**HORN FLARE – BRUSHED STAINLESS STEEL FINISH.** Acoustic horn flare in the inner side of the SpaceHorn in brushed stainless steel finish.	
	**HORN FLARE – BRUSHED COPPER-GOLD FINISH.** Acoustic horn flare in the inner side of the SpaceHorn in brushed gold/copper finish.	custom finish

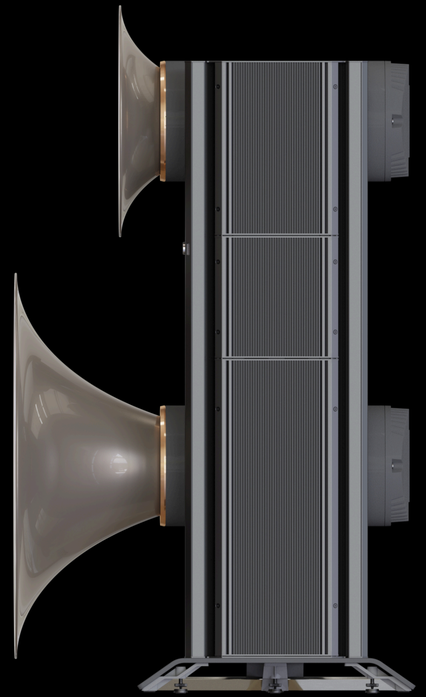
Individualization.

JAGUAR-GREEN TODAY, LAMBORGHINI-ORANGE TOMORROW, THE DAY AFTER TOMORROW . . .

We are happy to fulfil individual colour requests upon request. For this we only need a colour code or a colour sample.

Technical data.





TRIO G3

SYSTEM DATA

Frequency range	100 – 28,000 Hz
Power handling	150 Watt
Sensitivity (1 Watt/1 m)	> 109 dB
Crossover frequencies	100/600/4,000 Hz
Nominal impedance	19 Ohm
Recommended amplifier power	> 2 Watt
Recommended room size	> 25 m²
Coplanar driver alignment	yes
OmegaDrive[AA]	yes
AirGate[AA]	yes
NatureCap[AA] incl. PolarisationPlus[AA] Circuitry	yes

HORN

Horn type		spherical horn
Horn aperture angle		180 degrees
Horn diameter	low-mid range	950 mm
	midrange	570 mm
	tweeter	200 mm

DRIVER

Diameter	low-mid range	200 mm / 8 inches
	midrange	50 mm / 2 inches
	tweeter	25 mm / 1 inch

DIMENSIONS/WEIGHT

Dimensions	width	950 mm
	depth	986 mm
	height	1,694 mm
Weight		140 kg / 309 lbs

MODULAR STRUCTURE

High Performance Multi Contact Connector	yes
Semi-active version	yes
Fully active version with iTRON[AA] amplifier	yes

iTRON[AA] ELECTRONICS (option)

iTRON[AA] voltage/current converter technology	patented
Fully balanced circuit	yes
Single-ended circuit	yes
Zero feedback	yes
Without negative feedback	yes
Power	3 x 100 Watt

Technical data.

SPACEHORN

SYSTEM DATA

Frequency range		20 – 200 Hz
Crossover frequencies active crossover		40 – 400 Hz
Recommended room size		>25 m²

HORN

Horn type		expo-spherical horn
Horn aperture angle		180 degrees
Horn length		1,898 mm
Horn mouth size	Single-Drive	0.650 m²
	Twin-Drive	0.850 m²

DRIVER

Driver type		XB12
Driver size		300 mm / 12 inches
Number of drivers	Single-Drive	1 x XB12
	Twin-Drive	2 x XB12
Voice coil diameter		153 mm
Flux density		1.15 Tesla / 480 mm
Pole plate		low carbon steel
Membrane Material		Paper/carbon fibre compound
AirGate^{AA}		yes

DIMENSIONS/WEIGHT

Width		1,018 mm
Depth		1,165 mm
Height (including feet)	Single-Drive	492 mm
	Twin-Drive	748 mm
Weight	Single-Drive	110 kg / 243 lbs
	Twin-Drive	150 kg / 331 lbs

SUBWOOFER AMPLIFIER

Output power (RMS)	Single-Drive	1 x 500 Watt
	Twin-Drive	2 x 500 Watt
Digital crossover		DSP
Parametric equalizer		8 Band EQ
Digital room adjustment		yes
Inputs		1 x SPKR
		1 x XLR

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