



Cabasse

Cabasse

A FEW WORDS ABOUT SOUND

Rediscover the full sound of an instrument and all the nuances which make it unique. Appraise the differences between two concert pianos, like tasting two vintage Bordeaux wines, and identify details in the way the performers play.

Let yourself be swept away by big band swing, its power and wide range of timbres, the cohesion of the rhythm instruments and solos that truly soar. Actually feel the close workings of a group and the way they bonded at the time of recording.

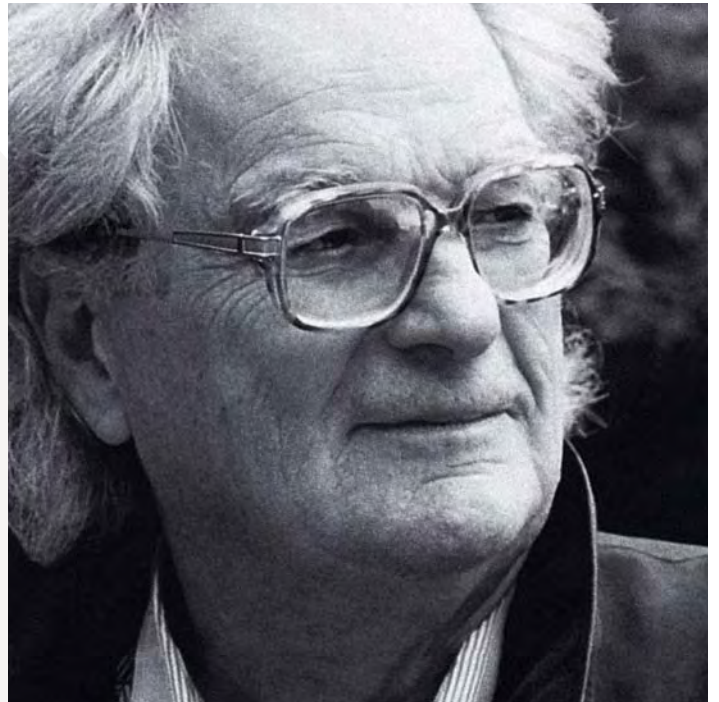
Identify the detail behind the magic of one of your favorite tracks. Situate the dialogues and actions in space, feel the tensions, the stress of explosions, the fullness of wide open spaces, the intimacy of an instant, the unity of image and sound.

Like taste, hearing is a sense that grows sharper in contact with quality, bringing ever increasing sensations and constantly demanding more realism, authenticity and variety.

Today, audio technology lets you recreate a 3D sound image at home that will fill the entire room.

This image must be transparent and clear, with contrast but no alteration in shape and color, so that each listener can catch the details behind the thrill.

For more than 50 years, we have been constantly innovating so that you can experience and share at home the joys of music and sound - every kind of music and every type of sound.



Georges Cabasse

Cabasse. The name has a nice ring, but where does it come from?

Founded in 1950 by Georges Cabasse, the Cabasse firm inherited not only its creator's name, but also his genius.

Georges Cabasse is from the world of music, and he is gifted with a special talent. He has a unique memory for sounds. Probably a gift from his ancestors, hailing back to a stringed instrument maker who crafted the first violin signed Cabasse in 1740 at Mirecourt in the Vosges Mountains. Five generations of craftsmen followed him, pursuing the tradition and supplying Europe with violins, violas and cellos, most of which are still being played in orchestras today.

The fact remains that Georges Cabasse's obsession is to perfectly reproduce the concerts he loves, without any alteration, coloration or distortion in the sound. This boundless passion has led him to relentlessly innovate, transmit and share his exacting requirements with the rest of the Cabasse team, so that all ears can enjoy the essence and thrill of pure sound.



Cabasse
Golf Club

THE CABASSE ACOUSTIC CENTER

Baltic, Riva, eOle... all Cabasse's products come into being right on the Atlantic seafront. It is at the tip of Brittany in western France, a land of sailors, research scientists and musicians attuned to different worlds and universes.

The company has been a pioneer in the electronics sector in Brest.

In 2003, it built the new Cabasse Acoustic Center at the core of a unique network of enterprises, prestigious engineering schools and universities specializing in state-of-the-art telecommunications, underwater acoustics and electronics technologies.

The Cabasse Acoustic Center has all the Research and Development skills and expertise required to study new materials, create new membranes and drivers, design and manufacture prototypes, take measurements in anechoic rooms and run reliability tests, listen to and perfect equipment with top sound professionals, etc.

The center is also a site for industrialization and specialized production of coaxial technologies. Whether music lovers or musicians, cinema buffs, sailors or landlubbers who love open spaces, all the men and women on the Cabasse team share the taste for genuine perfection, nature's force and resources, the emotions of "live" sound.



Photo: B. Trutmann / Photonostop - Architect: Adrien Feinsilber

SOUND AND IMAGE LIKE NO OTHERS IN THE WORLD

The Géode was inaugurated in 1986 and remains the only 12-channel Omnimax cinema anywhere in the world. It is equipped with 4-way clusters and active filters specially developed by Cabasse. Even at the time, this 12.1 system already surpassed today's 7.2 standard, by adding a zenithal dimension thanks to sound sources placed above and below the spectators.

It should be noted that all the channels have the same integral bandwidth of 20 to 20,000 Hz. For special low frequency effects, 4 giant subwoofers fitted with 2 x 55 cm honeycomb membranes complement the system.

And the sensation lives up to expectations.

The compliance with timbre and phase, the stability and depth of image inherent to the SCS range of coaxial drivers have clearly appealed to the top professionals in stereo and multi-channel sound.

France's biggest TV stations have all been won over (TF1, France 2, France 3, Canal +).

Being chosen by professionals is the best compliment you can receive.

INNOVATION DYNAMICS



Full respect of natural sound

60 years of research and comparative listening sessions confirm the importance of the criteria imposed by our founder from the outset:

- high sensitivity and power handling capability to reproduce the orchestra's dynamic nuances;
- faithful reproduction of attacks, thanks to the speakers' great acceleration capacity and absence of inertia;
- natural spectral balance, high definition and clarity to keep the timbres true;
- accuracy and depth of the sound image.

Our commitment is to an unchanged acoustic signature that lets you experience all the emotions of a concert, and all the effects and atmospheres of your favorite films.

Unparalleled technical exactingness

Since 1950, Cabasse has always been involved in basic and experimental acoustic research, striving to support its technological innovations with a true scientific approach and constantly challenge what is taken for granted.

Knowledge of acoustics and sound-wave transmission, and the way we experience and interpret them, is fundamental in developing high quality reproduction systems.

Acoustics is a complex science and its applications are often combinations of parameters which are very complicated to optimize.

Unmatched know-how in electro-acoustics

It is based on three research orientations:

- basic research, for instance, in studying the propagation of sound signals and acoustic and psycho-acoustic phenomena;
- experimental research, with direct comparisons between an orchestra and its reproduction (testing each link in the chain, from the recording to the acoustic speakers);
- applied research, especially in signal measurement software and digital processing, the principles of Spatial Coherence Source, and the use of new materials.

Creating models that set the standard

Developing exceptional and uncompromising models containing all of our brand's know-how inside makes it possible in turn to validate current technological advances by comparing them to the previous reference. They are then made available in all our ranges. And naturally, these in-house benchmarks have all become external references.

1968

The German Institute for High Fidelity selected a pair of Cabasse Brigantin 3VT speakers for a live comparison with a string quartet to inaugurate the 1st German High Fidelity festival.

1974

Brigantin VTA and Galion 3VTA were the first active 3-way speakers with dual servo-controlled bass, used to equip the studios of the national broadcasting corporation, Radio-France.

1981

The 4-way servo models called Albatros were dubbed the absolute new reference by the German magazine Stereoplay.

1993

L'Atlantis, flagship model for the new SCS technology, became the standard to judge by in France, Germany and England.

2007

La Sphère, called the reference in France by the Haute-Fidélité magazine and in Germany by Stereoplay magazine, the very same month it was launched.



Albatros VIIIC



THE ANECHOIC CHAMBER

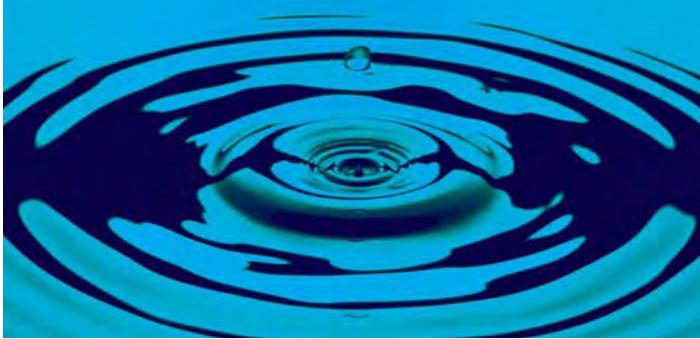


In the center of our R&D department, this tool requiring a height of 3 stories guarantees the accuracy of the measurements and the relevance of our technical choices.



*Karissima
SCS 4-way system.*

SPATIALLY COHERENT SYSTEM (SCS), CABASSE'S KEY PRINCIPLE FOR MANY INNOVATIONS



Multi-way systems with concentrated sources for the coherence of direct sounds

Sound is formed by a series of waves of variable length (frequency) and height (intensity), just like waves on the surface of water.

To get wide, high waves, you need big stones displacing a lot of water, whereas very light pebbles will make small waves or ripples which are very short and close to each other.

Likewise, in air, you need a loudspeaker with a large diameter for bass frequencies and a small one for treble.

In music, you need a large, heavy cord for the deep tones of a double bass and a small light one for the high notes of a violin.

To faithfully reproduce a sound field from the deepest sounds to the highest notes, the most obvious solution is to use several drivers, each one designed for its own range of use (treble, midrange, bass).

However a note produced by a piano, for instance, is not made up of a pure frequency, but of the note's own fundamental frequency (440 Hz for the A used to bring an orchestra into tune) and a host of other multiple frequencies of varying intensities. The fundamental determines the note, and the other related frequencies the instrument's timbre. This is what makes it possible to distinguish between a piano and a trumpet, for starters, then a Stradivarius and a student violin, and finally, a Steinway and its twin. This note, recorded at a single point in space by a microphone, should come to your ear via an acoustic speaker without being distorted.

If some of the harmonics making up this note are delayed because they are coming from another drive unit within the loudspeaker's enclosure located further away from your ear, the note will be modified.

If the harmonic is located in the range of frequencies common to both sources, it may vary in intensity due to the time delay.

In the first case, the positioning in space and the filtering will make it possible to sufficiently reduce the delay, at least at a given listening distance. In the second case, the distance between the axes of the two sources must be very small, and all the more so when they share a wide frequency range. In the case of 2-channel stereo, two sets of sources must make the same set of frequencies reach the ears of one or several listeners in order to respect the timbres of each instrument.

This homogeneity of direct sound will also influence the quality of the stereophonic image, since the positioning of the instrument in space is determined by the difference in sound levels and the time delay between the left and right speakers.

The better the differences present in the recording are respected in the reproduction, the finer and more accurate the sound image will be.

The purest direct sound requires loudspeakers which are specially designed for each frequency range. The transducers reproducing the low-midrange, midrange and high frequencies form the most focused sound point source possible.



*Baltic Evolution
3-way coaxial for perfect
coherence of direct sounds
and reflected sounds.*

Ultimate control of directivity for coherence of direct sounds and reflected sounds

Under home listening conditionings, the sound field in the listening area is made up of only 20 to 30% of the sounds coming directly from the speakers and of 70 to 80% of sounds reflected by the room and its furnishings (indirect sound). Therefore, indirect sounds play an important role in the quality of reproduction. When you move speakers around a room to find the best spot for them, you can vary the distribution of direct sounds and reflected sounds, in order to obtain the best spectral balance and best stereophonic image at the listening point. Reflected sounds are mainly emitted by loudspeakers outside of their axis all around the speaker's cabinet. Depending on the frequencies, the distribution of the power emitted over 360° by any type of transducer will vary.

To make indirect sounds as coherent as possible, you must find off-axis the same lack of delay between sounds emitted by the acoustic speaker's various transducers, whether these sounds are reflected laterally by the walls or vertically by the floor and ceiling. The balance between direct sounds and reflected sounds must also strike the right proportions, since too many indirect sounds will create extreme spatialization with an image which is unstable and inaccurate. If there is too much directivity, the timbres may be right, but the image will be flat, with neither substance nor depth at its center. This is where we reach the limits of the analogy with waves or ripples on water, since the role of the speaker is to recreate the wave-front emitted by the orchestra towards the listener, without artificially increasing the waves reflected by the wall behind the speakers. At Cabasse, in fact, we validate the speakers we produce in several rooms, including a soft room which has been treated to produce minimal reverberation and a modern living room with picture windows and modern furniture, enabling us to correctly check the coherency between direct and reflected sounds in different acoustic situations. For a precise, stable and three-dimensional sound picture, a loudspeaker system must diffuse coherently both in axis and in all other directions.



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*Floorstanding, on wall, in wall,
in the living room or
in a broadcasting studio, the
coherence of SCS co-axiality.*

Coinciding sources to make sounds coherent

Reproducing a sound signal is the equivalent, limiting the problem to a 2D model, of trying to create waves of different lengths and amplitudes on the water by striking the surface with stones of different sizes.

The conventional solution strikes the surface at several points, creating a message that quickly becomes garbled.

By transmitting waves from a single point, however, the integral message is fully conserved.

In the same way, coinciding sound sources respect the recording, without adding defects due to the lack of coherency between direct sounds and reflected ones.

This is shown in the diagrams comparing the spectral balance of a conventional speaker and a Cabasse speaker at the listening point.

Coaxial coincidence

The Cabasse team wagered they could put all the drivers on the same axis, or even at a single point, so that they form a portion of pulsing sphere, without getting in each other's way.

They succeeded in doing so in 1992 with the tri-axial TC21 speaker, which was replaced 10 years later by the TC22, and in 2006 by the TC23.

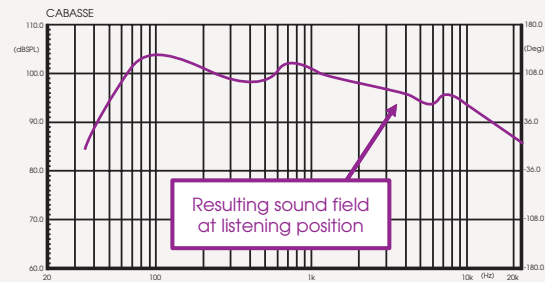
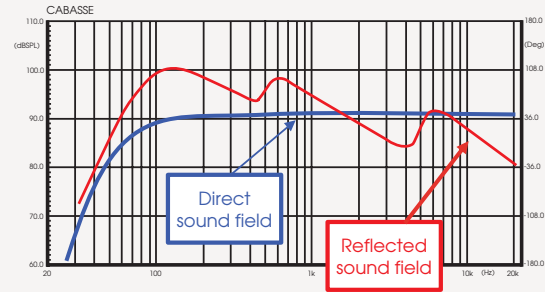
This transducer in the up-market Artis range has regular directivity from 80 to 22,000 Hz, with no irregularities in the overlapping zones between the midrange-woofer, midrange and tweeter channels.

It is also a vital tool for developing and perfecting measurement protocols and verifying that the principles of spatial coincidence are applied without compromising the quality of Cabasse's own characteristics.

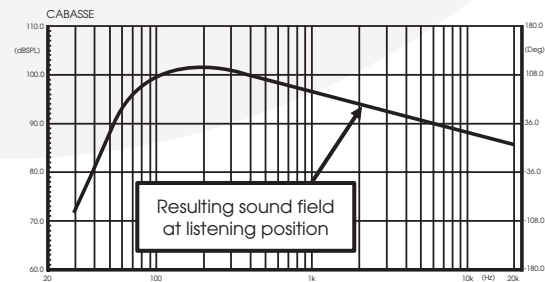
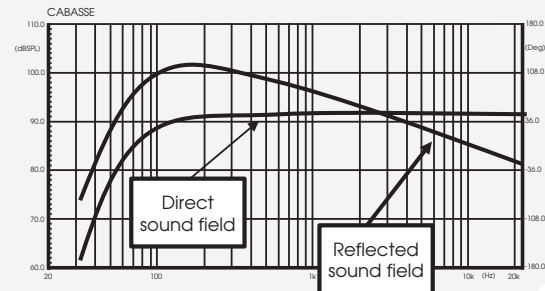
This has enabled our laboratory to create a whole range of satellites with coaxial coincidence, from the big Baltic sphere to the tiny eOle.

This coaxial technique is the optimal solution to comply with source coincidence criteria, and is now represented by the QC55 transducer fitting La Sphère.

Frequency response at listening position in a room



Conventional 3-way loudspeaker system



SCS based 3-way loudspeaker system

The coaxial coincidence designed and manufactured by Cabasse is today the one and only technology guaranteeing coherence of direct and reflected sounds over the entire audible bandwidth.



La **S**phère



THE REFERENCE POINT SOURCE

A legacy of 60 years of technological innovation

Pioneer of multi-amping and active filters since the late 50s when they introduced 3-way loudspeaker systems with built-in valve amplifiers and filters, Cabasse has always offered audio enthusiasts and audio professionals legendary reference active systems, including the Galion 3VTA for Radio-France studios in 1974 and the 7 versions of the flagship 4-way Albatros in the 80s and early 90s.

These extraordinary systems include the latest innovations in both mechanical and electronic terms.

They have increased our R&D team's wealth of theoretical and experimental knowledge, enabling us to propose genuine technological progress throughout our product range.

This quest for perfection, along with our unique experience in active systems, led Cabasse to begin working in digital signal processing well before the micro-computer age, by creating digital devices and measurement protocols and conducting basic and applied research in electronics and mechanics alike.

In 1993, Cabasse unveiled Atlantis, the 1st 4-way speaker fitted with the tri-coaxial TC21, to the public.

This revolutionary system was used as an experimental calibration standard to develop the Spatially Coherent Source concept.

It has become a global benchmark for both amateurs and sound professionals.

Equipped with the latest generation of analog electronics designed by our brand, for 12 years it continued to surpass several generations of digital prototypes in listening quality.

In late 2005, digital technology finally made it possible to take account of all the signal management parameters fully mastered by our research scientists.

This has led to the creation of La Sphère, the first point source speaker which goes far beyond all known references, thanks to its optimized 4-way coaxials and its integral digital signal management system.

An uncompromising acoustic masterpiece

La Sphère was created to fulfill every requirement for any type of music and satisfy all users in search of the absolute. All Cabasse's values are heightened for absolute fidelity from 20 to 25,000 Hz:

- high efficiency for sensitive reproduction of nuances;
- good power handling for the vividness of attacks;
- balanced spectrum for clearness of timbres;
- perfect coherency of direct and reflected sounds for a deep, stable and realistic image, whatever the type and number of instruments being reproduced.

La Sphère is a subtle mix of technologies, design and human passions for music and sound, as well as acoustic and mechanical sciences. A journey to the center of La Sphère will tell you what Cabasse is all about.



1993 Atlantis



2006 La Sphère

JOURNEY TO THE CENTER OF LA SPHÈRE

A quest for the absolute

Acoustic engineers have been seeking a point source which can reproduce the entire audio bandwidth without compromising quality like the Holy Grail, since the first speaker was created in the late 19th century. Thanks to their mastery of 3-way coaxial technology and their experience of out of the ordinary acoustic projects and digital filtering, the Cabasse team has succeeded in orchestrating and concurrently developing the components of the La Sphère speaker, its digital filter and related software.

QC-55 4-way driver

This is La Sphère's key element, made up of the subtle association of the TC23 unit for the upper range and the 55cm 55ND46 for the bass.

TC23 3-way coaxial driver



By forming part of the pulsating sphere, the directivity index of the TC23's 3 coaxial transducers is constant, since the smaller speakers' membranes are not affected by the larger ones in terms of directivity. In order to obtain this result without compromising the

linearity, efficiency and power handling parameters of each way, all our engineers' know-how and experience have been devoted to this exclusive combination of leading edge technologies.

The TC23 is mounted in a lens made of a composite material sandwich with high damping capacities, and reproduces the signal in the 80 to 22,000 Hz bandwidth. This 3rd generation unit is fitted with a new tweeter whose exclusive diaphragm is made of top-of-the-range polyether. The diaphragm is made by Cabasse's automated machines, employing a very slow process that prevents any alteration of the basic quality of the material used. It gives the tweeter exceptional linearity of the response curve up to 25,000 Hz, with excellent power handling and stability over time.

The material was also chosen for its excellent rigidity/weight ratio and the way its mechanical performance fits that of the ring membrane of the midrange unit.

Always equipped with a very rigid and lightweight Duocell diaphragm produced using the exclusive Rohacell foam thermoforming process, the low-midrange transducer has been redesigned with an extended stroke and improved power handling.

55ND46, 22" (55 cm) honeycomb dome woofer



To achieve linear reproduction down to 20 Hz and lower, our engineers have created a special version of the 22" unit 55ND46 developed for the Saturn 55 reference subwoofer that is specially

designed to work in a closed volume. With its extra-rigid but lightweight Nomex honeycomb dome structure of the membrane, the long stroke powerful magnet gap and the double spider, the combination provides high levels, speed and acceleration, while dispensing with a huge loading enclosure, in spite of its very large emission surface area.

QC55, the 4-way coaxial unit

Perfecting the lens which holds the TC23 in front of the 22" woofer on the same axis and thus forms a 4-way point source required lengthy theoretical and experimental studies. Several versions and various filter modules were tested. The shape was designed to create a portion of the pulsating sphere with minimal diffraction effects. The arms' shape and the lens' front panel extend the quality of high and midrange frequencies, and the shape and damping of its back panel meet low-midrange specifications.



A spherical enclosure

The spherical shape of the woofer's loading cabinet offers numerous advantages, like:

- the inherent rigidity of the shape: this is an essential aspect in avoiding any low frequency vibration that could create unwanted noises or fuzzy imaging. Thanks to its extremely good resistance to pressure, it can use a very small volume to load a 22" (55 cm) woofer whose efficiency is 96 dB and whose linear

response reaches 20 Hz in anechoic room conditions. All the other upscale systems on the market promising comparable performance in the low frequency range need at least 4 to 6 times as much space for their woofer(s).

- no standing waves: since there are no parallel surfaces, there is no need to fill the enclosure with large amounts of damping material and internal bracing, which reduce the volume of internal air available to the woofer.

LA SPHÈRE



In order to optimize the benefits conferred by the spherical shape for low frequencies, the outer part of the enclosure is made of a cast sandwich of composite materials and a damping elastomer which was initially designed by the European aeronautics and space industry to reduce vibrations on equipment that has to be as compact and lightweight as possible.

The sphere's structure is reinforced by thin, arched

ribs and damped inside by a layer of acoustically absorbant felt.

It is then stiffened through compression when the QC55 assembly is tightened from behind.

The technique is used on all our models presented below.

- Perfect symmetry in every direction and no diffraction effects for all 4 coaxial channels: the very essence of spatial coherency.

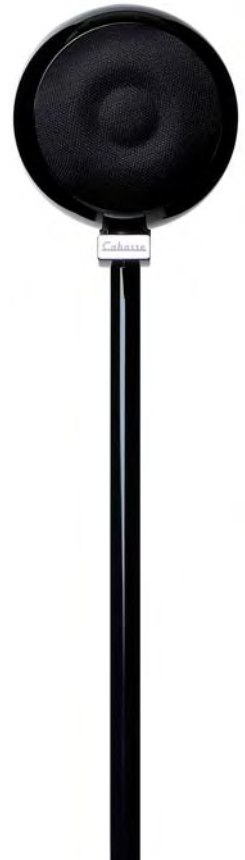
BALTIC



iO2



EOLE





The La Sphère's stand: functional beauty

The spherical enclosure presented quite a challenge, which we met through long term collaboration with the French designer Sylvain Dubuisson, who is famous for his work based on spheres and circles.

The question was how a stand could both position the tweeter at optimal height and ensure uncompromising stability of the system even at the lowest frequencies, without creating any measurable diffraction effects which could spoil the coherency of the response out of axis. Looking at La Sphère, the answer seems beautifully, if deceptively, simple. The pure lines of the design mask the asymmetry of the shape, which of course is ideal for avoiding diffractions. The choice of materials ensured rigidity, like die-cast aluminum for the stand, and damping (a loaded composite for the bottom plate, aluminum and elastomer sandwich structure for the absorbers and the cones).

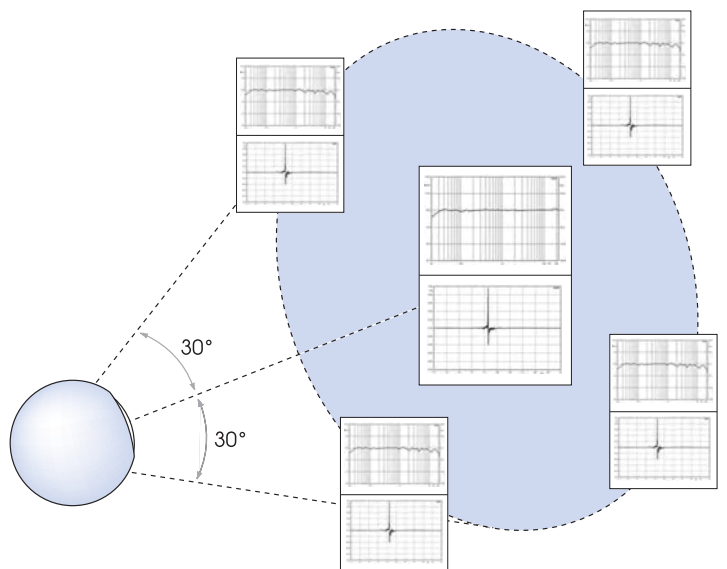
An outstanding digital sound processor

La Sphère's filtering module and signal processing software use digital delays from all the acoustic centers of the coaxial units focusing into a single point. Optimizing the filtering with variable slopes from 24 to 70 dB results in a steady 60° diffusion cone that gives full coherency between direct and reflected sounds at the listening spot.

This digital processing has only become possible with the recent arrival of high-performance computers that can give a better sound than the analog active filters that have been a Cabasse specialty for decades. Three years of basic research studies were

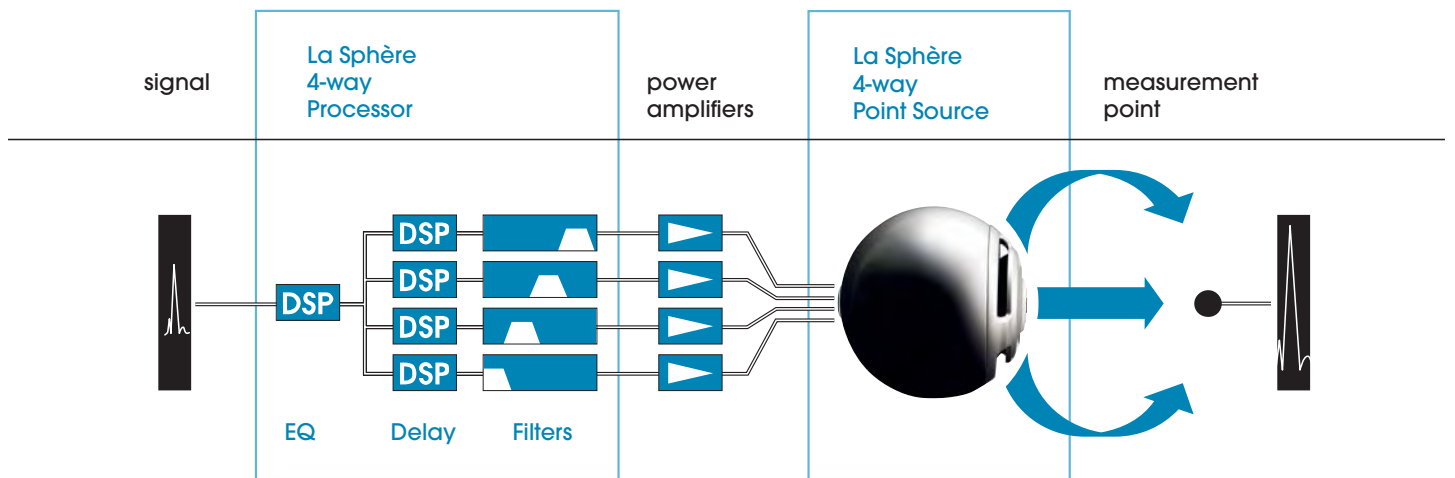
devoted to developing the module, its software and the related measurement protocol. Then development was pursued in steps, going back and forth between measuring and listening to the full Sphère system in different rooms, leading to the final version. This meticulous approach entailed entirely redesigning the TC23's lens, changing its position with respect to the 55ND46, modifying its shape, in both width and depth, replacing the damping material used on the side, adding waves on the front panel to avoid diffraction and, finally, modifying the arms holding the lens.

Each La Sphère unit is carefully adjusted by calibration of the digital processor in Cabasse's anechoic chamber. The system will then be adapted to the acoustics of the final user's listening room. This means that phase linearity is ensured all along the chain, and the spatial coherency is perfect.



Powerful and coherent amplification

The 300 W and 1000 W digital amplifiers that can drive La Sphère were developed using highly innovative technologies ensuring power and refinement in a very compact unit. Power means keeping the dynamics in play, coherency between the low, low-midrange, midrange and tweeter units ensures refined timbres and the compact size is esthetically pleasing.



La Sphère, the smallest of the big systems

All the acoustic laws are taken into account. No fundamental parameter has been sacrificed in favor of a technical option.

Along with its peerless technical specifications, La Sphère is so small that it can be positioned anywhere, whatever the available space or esthetic considerations, in a recording studio or a living room. Likewise, the coaxial technology and the application of the SCS principles give a very wide sweet spot, whatever the listening distance.

All our brand's speakers, whether spherical, coaxial or more traditional styles, have benefited from know-how acquired in developing La Sphère.



All the Cabasse ranges and models are presented in detail in our catalogues and specific technical sheets available from your approved dealer. The documents can also be consulted and downloaded from our websites: www.cabasse.com and www.cabasse-usa.com

Booklet designed by OPERA agency

DOC0222 – Photos: J. Bauer, Stuttgart; R. Frémont, Paris; GPO Morlaix; C.Rérat, Brest - All Cabasse speaker cabinets are equipped with loudspeakers designed by Cabasse. Because the techniques we implement for accrued reliability evolve over time, in a constant quest for optimal quality, Cabasse reserves the right to modify, in any way, the models presented in the catalogues, spec sheets and promotional material - Printed in Italy.

