

The Vivace logo is located in the top center of the image. It consists of the word "Vivace" in a white, elegant script font, with a small icon of a musical note above the letter 'i'. The logo is set against a dark blue background that features a faint, artistic illustration of a stage with spotlights and an orchestra pit.

Vivace

VIVACE

ARTISTIC – ACOUSTIC – PERFECTION

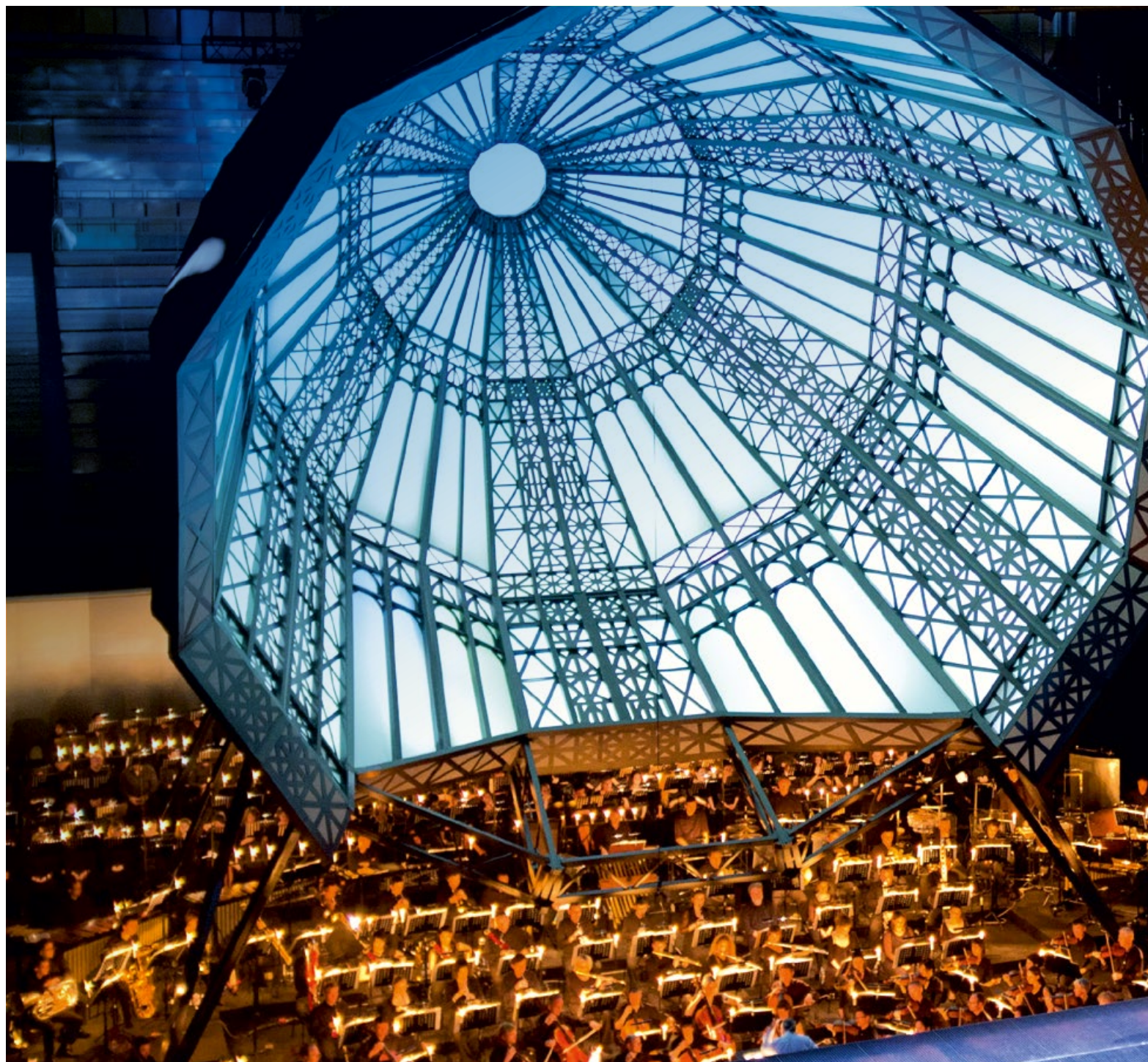
$$T_m = \sum_{i=1}^n t_i$$

*“In acoustics, the ‘one big secret’ doesn’t exist.
There are thousands.”*

Prof. Karlheinz Müller, Proprietor of Müller-BBM GmbH, world-wide renowned acoustic specialist.



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VIVACE – Artistry and technology in a multi-talented acoustic marvel

Today a sports event, tomorrow a corporate function, the day after? A trade fair. Yesterday a classical concert, the day before a theatre piece and preceding that, an election campaign event. Whatever comes through the door. Multi-purpose venues serve an astonishing variety of uses. How can a hall be versatile enough for any purpose, and yet still adequate to the acoustic demands of every situation and user?

This is where the experts from Müller-BBM Acoustic Solutions GmbH come in. The VIVACE electronic room acoustics system is the solution for the highest possible acoustic flexibility in a room designed for multi-functional usage.

VIVACE allows the creation of appropriate acoustic conditions of the highest standard for any imaginable event. A short room response keeps speech intelligible, and a longer response brings out the best in a choir. Even an orchestra can be catered for with optimal acoustic conditions. Furthermore: these different characteristics can be available at the same time. The microphone for the MC can be treated to enhance speech, and the following musical performance placed in its own ideal acoustic environment.

VIVACE is a benefit for all concerned: The Venue administration and audio staff enjoy a technical and financial advantage, and performers and public enjoy the optimum acoustic environment for every occasion.

“Supporting and nurturing culture and the arts in Basel is close to our hearts. VIVACE makes it possible for us to achieve this goal.”

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BACKGROUND

Founded in 1824, the non-profit organisation Casino-Gesellschaft Basel has been dedicated since its inception to the facilitation and furtherance of culture and the arts. The Muiksaal in the Stadt-casino, built in 1876, is internationally renowned for its excellent acoustics. However, the entire building urgently required comprehensive structural renovation.

The search began for an alternative venue to be used during the renovation period. Finding an affordable space that would be available for the entire three years was anything but easy. The only possible solution was offered by the Musical Theater in the Messe Schweiz. “VIVACE is crucial there” according to Thomas Koeb. The essential characteristics of the reverb response in the acoustically dry auditorium must be altered to suit various situations. Acoustic changes are executed using a tablet computer and six different pre-sets, for instance for solo recitals, chamber music performances, larger ensembles, and even sacred music that was written to be performed in a large church. All at once, the room has become a concert auditorium.

“It is important to us to be able to continue with business as usual during the renovations rather than simply closing our doors. Otherwise we would have to face massive protest from the artists and our public.”

PROJECT DETAILS

Alternative venue for the Stadtcasino

Client: Casino-Gesellschaft Basel

Capacity: 1.560 seats

Project Services: Electronic room acoustics system VIVACE, Planning, Vivace system set-up, Support during performances.



AC

Thomas Koeb
» Director of the Casino-Gesellschaft Basel



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“For the opening performance, I deliberately choose a relatively poor seat for myself. But the acoustic experience was not that of a seat somewhere on the edges. I felt I was right in the middle of things.”

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BACKGROUND

Well known as a businessman in the region and beyond: Reinhold Würth, the “King of the screws”. His home is Künzelsau, Germany. Starting there, in the north-east of Baden-Württemberg, the success story of his screw and tool empire ran its course. Today, the 82 year old is most concerned with supporting the arts and culture in his home region. His newest project: a culture and congress centre in the middle of a high plain in his home region on the Hohenlohe plateau.

Thanks to an electronic room acoustics installation tailored to the auditorium, and a temporary acoustic diffuser installed for the performance, the concert was a very special acoustic experience. The intrinsic acoustic damping characteristic of the main auditorium in the Carmen Würth Forum is very high, which makes it ideal for speech and multi-media technology presentations. VIVACE modifies the room acoustics for rock, pop, and classical concerts to transform the auditorium into a perfect acoustic space such as the audience expects according to the demands of the individual concerts. VIVACE makes the auditorium a highly flexible multi-talent capable of catering for any situation.

PROJECT DETAILS

New building

Client: Adolf Würth GmbH & Co. KG, Künzelsau

Planning- / Construction period: 2006 - 2017

Capacity Reinhold Würth Saal: 600 seats

Project Services: Electronic room acoustics system VIVACE, configuration and set-up



C. Sylvia Weber
» Director for Art and Culture for the Würth Group



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“Environmental noise has slowly risen over time, creating the desire among the audience for clear, clean sound.”

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BACKGROUND

Every ten years, Oberammergau rises to its great challenge: The world-famous Passion Play, with its almost 400 years of tradition, attracts around a half a million visitors to the quiet little town in the Bavarian Alps. The townspeople depict the last 5 days in the life of Jesus Christ in a production which spans several hours.

In the years between, the 4,800 seat Passionstheater is used to stage imposing Opera and Theatre productions. However, the theatre is not without its difficulties. The open air stage is unusually large at about 40 m. wide and 15 m. deep, and the roofed over audience space produces multiple detrimental early reflections, but a weak overall reverberation level. All of this contributes to a generally poor speech intelligibility. To compensate for this, electro-acoustic sound reinforcement and electronic room acoustics have been implemented in all of the productions including and since the Passion Play in 2010. VIVACE provides natural support for actors, singers and the orchestra sound.

“Sometimes one doesn’t even notice that the sound reinforcement system is being used. I am surprised time and again when the system gets turned off for some reason. One asks oneself “where did the voice disappear to?”

PROJECT DETAILS

Temporary Installation

Producer: Passionstheater Oberammergau

Capacity: 4.800 seats

Project Services: Electronic room acoustic system VIVACE, tracking system, calibration



Christian Stückl

» Intendant Passionstheater Oberammergau,
Volkstheater München



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“VIVACE is a great improvement. We can now accommodate classical concerts, for which the acoustic characteristics of the room are very important, with aplomb.”

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BACKGROUND

The cultural centre “Rommen Skole og Kultursenter”, opened in 2010. Located in the Oslo suburb of Stovner, it is situated in the part of the city with the highest percentage of non-western immigrants in Norway. Enjoying long term support from the city and the state, the Rommen Culture Centre is a first-class cultural institution, which offers a home for local and international artists from the varied nationalities of the audience.

The Centre started using VIVACE in the summer of 2017. Since then, the system has been in almost constant use. In Scandinavia, multi-purpose venues are often built with extremely dry acoustic characteristics. Electronic room-enhancement systems often find their limits in such rooms. VIVACE, however, elegantly masters the challenge with a very natural sounding result. The sound engineer chooses the pre-set appropriate to the performance, and VIVACE provides optimum support for soloists and speakers, bands and orchestras. For concerts featuring acoustic instruments which are miked-up for sound reinforcement, VIVACE provides a superior basis for the sound reinforcement system. The mix is more alive and natural, and allows the artists to better unfold their creative potential.

“VIVACE makes us extremely flexible, and it is a joy to discover the possibilities the system offers.”

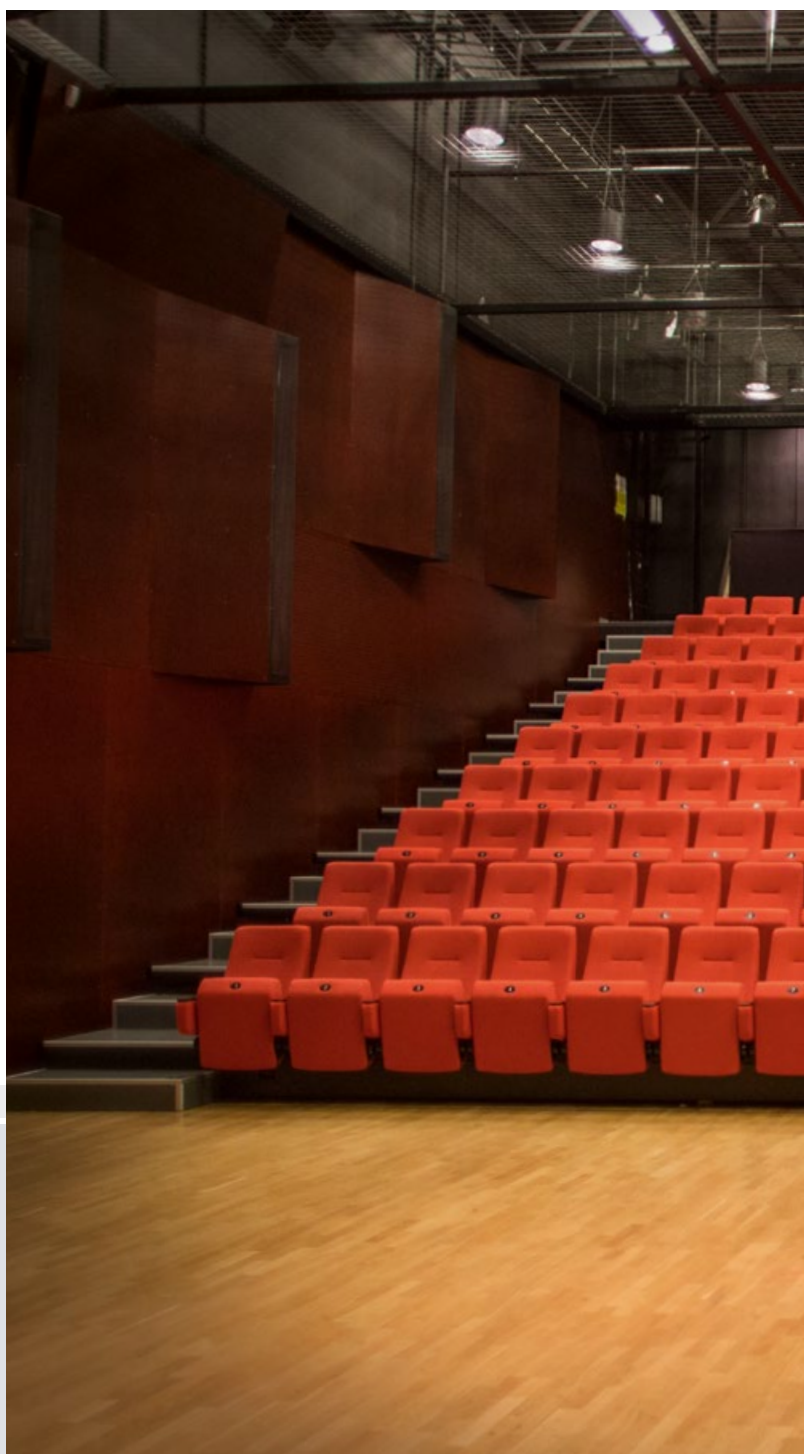
PROJECT DETAILS

Project: Renewal of an electronic room acoustics system.

Client: Rommen Skole og Kultursenter, Oslo

Capacity: 250 seats or 350 standing-room

Installation: Electronic room acoustic system VIVACE, planning, evaluation acoustic measurements, calibration, event support, recordings



Kristian Notland Harnes

» Business manager for the Rommen Kulturzentrum Oslo



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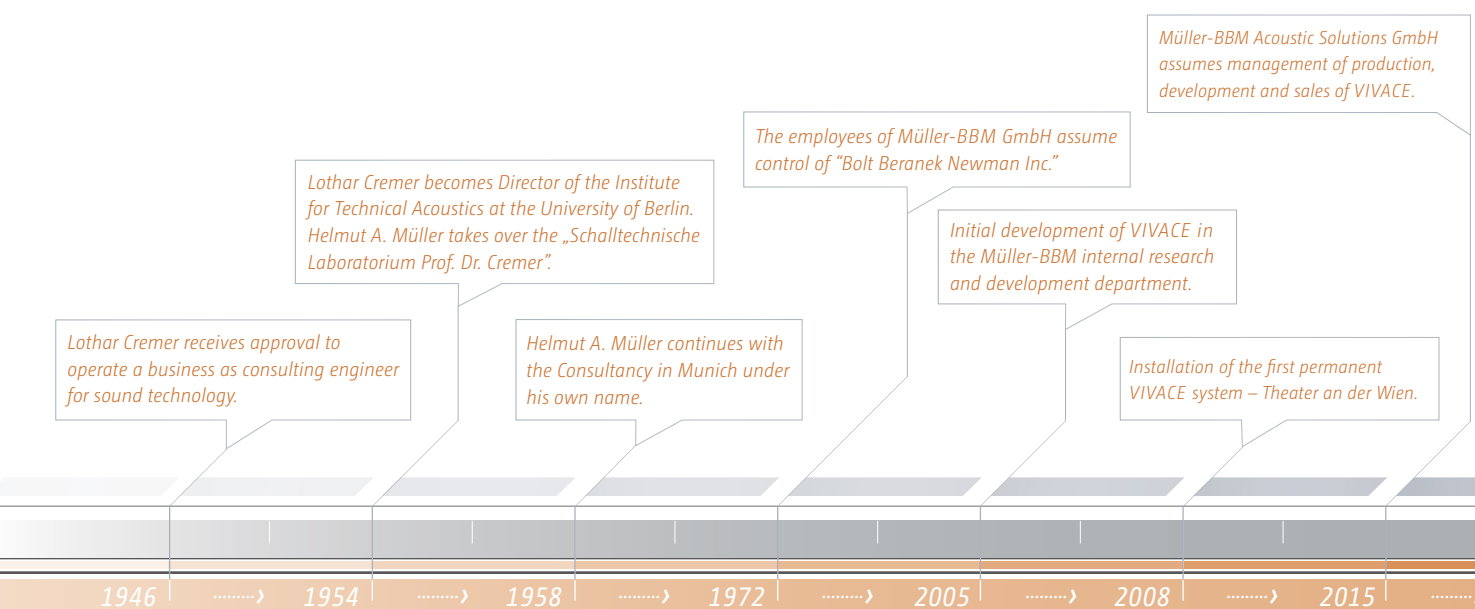
VIVACE goes round the world, and delivers unforgettable sound

VIVACE appeared on the market in 2008, and has been thrilling and exciting music lovers around the globe ever since. In Germany, Austria and Switzerland, in Denmark, Italy and Russia, in China, Australia and the United Arab Emirates, VIVACE improves the room acoustics of Opera Houses, Theatres and Concert Halls of the most varying natures. Every Venue offers its own new and unimagined possibilities. VIVACE exploits these possibilities to create acoustic marvels, and provide listening experiences that linger on in the hearts of all who hear them.

The birthplace of VIVACE is Müller-BBM in Planegg, a suburb of Munich, Germany. The company is one of the world's leading engineering consultancies for room acoustics, building physics and environmental protection, with a more than 60 year history. Room acoustics has been one of the core businesses since the very beginning. Starting at the end of the 1950's, alongside the continuing activity in room and building acoustics, the company branched into industrial noise control and noise protection in town planning and ship construction. Müller-BBM grew, and became known beyond the borders of Germany.



With the general increase in the importance of public address and sound reinforcement systems, the planning of high grade electro-acoustic systems developed to be a further area of expertise at Müller-BBM. The symbiosis of room acoustics and sound reinforcement systems led, some years later, to the birth of a new system: VIVACE. The collective acoustic knowledge at Müller-BBM merges with the bold, creative ideas of the developers to create a truly innovative product. Since 2015, Müller-BBM Acoustic Solutions GmbH manages the production, sales and development of the room acoustic and 3D audio system VIVACE.



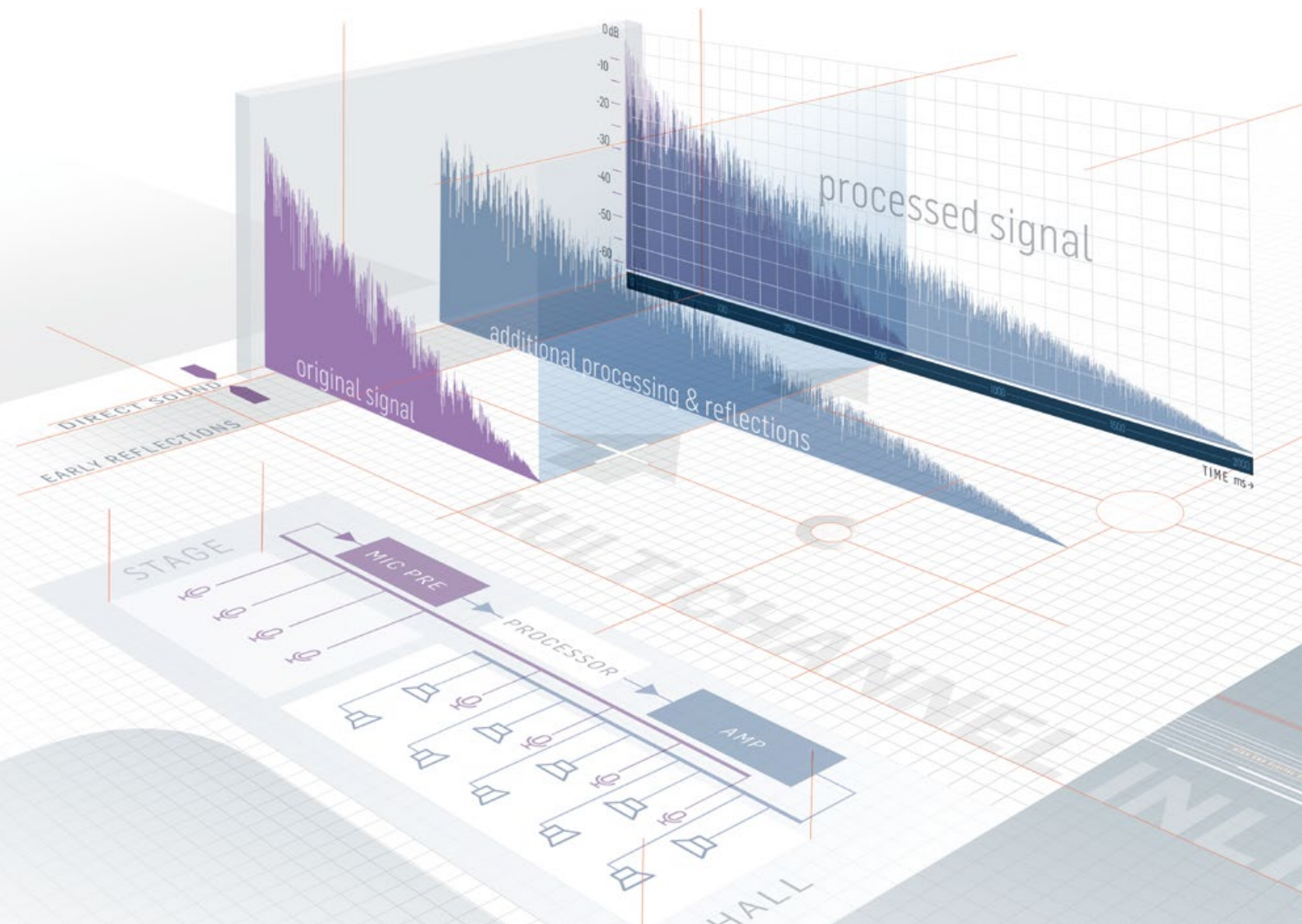
What makes VIVACE so unique.
The marvel of artistry
and technology.



How is a new room acoustic created?

Acoustically excellent concert halls and opera houses represent a desirable ideal for VIVACE, which can be transposed onto other rooms in the form of their impulse responses. These impulse responses are recorded for the purpose of further processing, as they represent the total characteristic of optimal sound spaces with all their acoustic nuances – much like the acoustic fingerprint of a space. VIVACE combines these impulse responses with

microphone signals collected in the auditorium and creates a harmonious and perfect concert hall and opera house acoustic. The built-in adjustment and processing possibilities allow a very free and yet precise realisation of all your creative wishes.

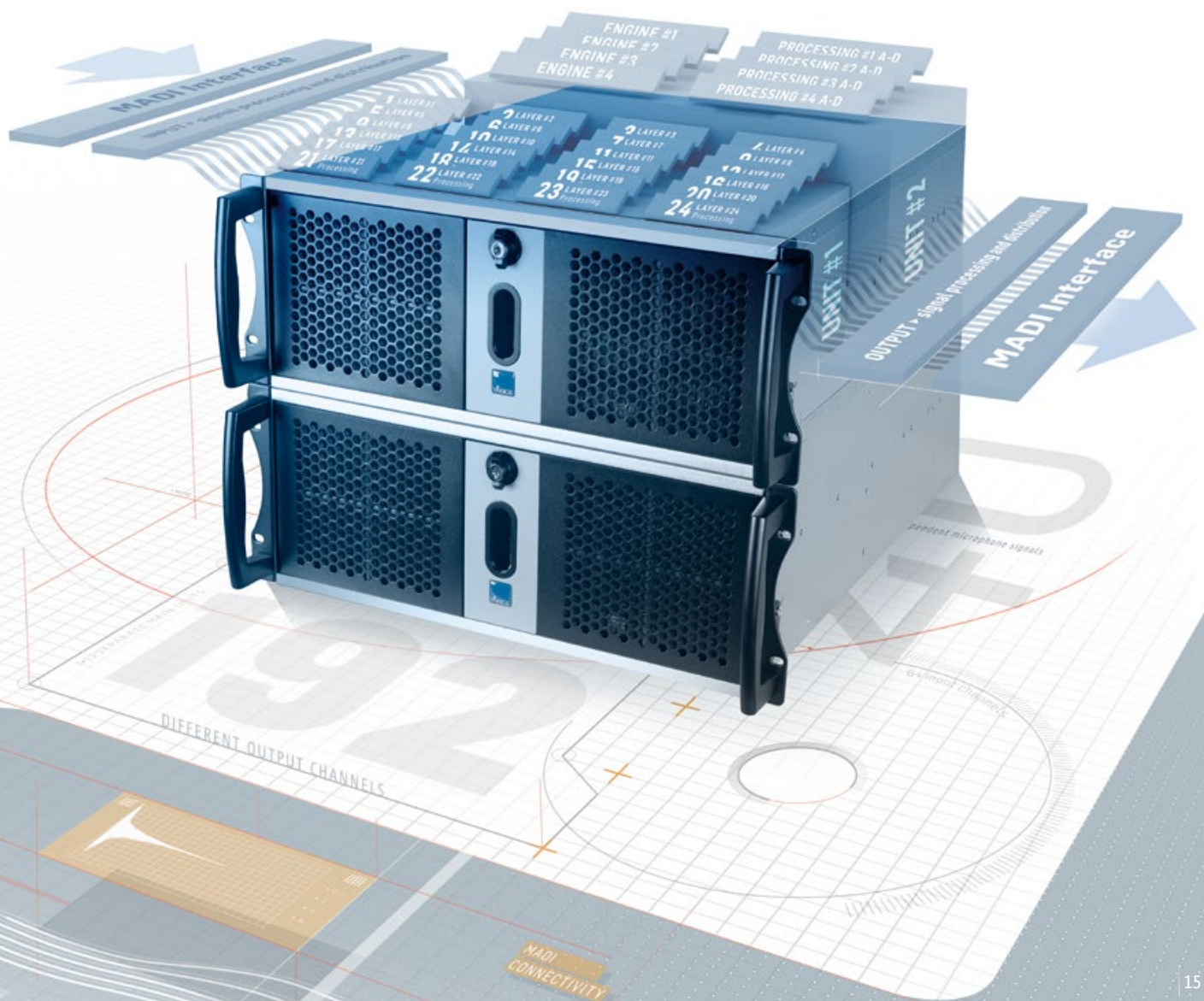


The VIVACE Processor

The heart of the room acoustic system is the VIVACE processor. It consists of two redundant units, which are monitored and controlled via Ethernet. The patented internal signal processing can handle up to 40 microphone signals on multiple independent processing layers. Convolution algorithms running in four main processors and 32 supplementary engines create natural sound fields with up to 192 different output signals based on the incorporated high resolution impulse responses. The composition of each of the 192 output signals can be adjusted in detail. High processing capacity and efficient implementation of the algorithms makes it possible for VIVACE to simultaneously generate up to four acoustic spaces with independent characteristics. With these four variations, it is possible to acoustically treat different areas of the concert hall or opera house according to artistic requirements, or blend different acoustic situations into one another.

TECHNICAL DATA OVERVIEW:

- two redundant parallel processor units
- 64 input channels, 192 output channels (via MADI or Dante interface)
- height 266mm, width 482 mm, depth 538 mm
- 19" rack format (6 RU)
- no restrictions to a specific manufacturer regarding external hardware (Microphones, Loudspeakers, Interfaces, Amplifiers)



VIVACE captivates audiences

The expectations of a modern audience are very high. In a world of brilliant CD recordings and surround systems in the home, the listener is already fully aware of the sound possibilities of a piece of music even before they enter the concert hall.

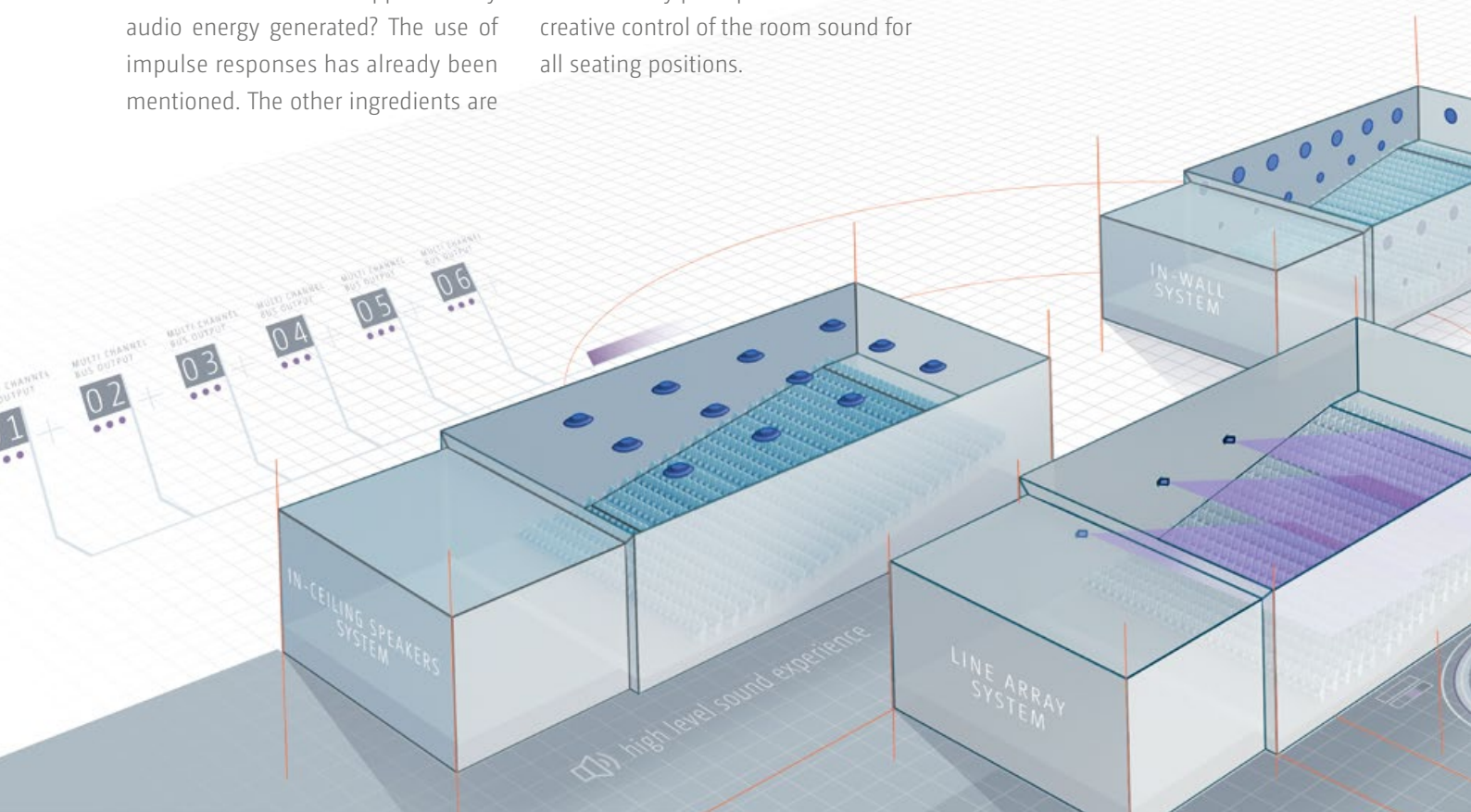
The measure of this progress poses a huge challenge for modern musical performance in the practice. On one hand, the listener is seeking a natural, authentic sound, on the other hand they expect a perfect, three dimensional audio image that can stand up against sophisticated modern recording techniques.

There are many possible reasons why the natural acoustics of a space may meet their limits under these conditions. That is where VIVACE comes into play. A large number of loudspeakers all around the auditorium serve to enhance the existing acoustics with supplementary room reflections. But how is this supplementary audio energy generated? The use of impulse responses has already been mentioned. The other ingredients are

input signals collected by precisely adjusted high quality microphones. The microphone set-up for a VIVACE system consists of multiple main microphones to collect a perfect orchestra sound, and a number of ambience microphones to collect the existing room sound. These components are then both integrated into the system processing. The loudspeaker set-up consists of wide-angle, constant directivity conventional loudspeakers installed around the walls and ceiling of the auditorium, as well as line-array sources in the walls, whose directionality can be electronically steered. The precise focussing and minimal loss of level over distance provided by the line-array principle allows for free creative control of the room sound for all seating positions.

SIX FACTORS FOR OPTIMAL NATURAL ACOUSTICS

1. Primary studio microphones in the stage area
2. Secondary condenser microphones in the auditorium
3. Recorded impulse responses from acoustically excellent rooms
4. Patented internal signal processing
5. Loudspeakers all around the audience
6. Last but not least, the expertise of our sound engineers, to create the perfect mix for the room



3D sound effects reveal the emotional side of VIVACE

In the creation of natural room acoustics, VIVACE remains as much as possible unobtrusively in the background. In the creation of 3D effects, however, VIVACE can come to the fore and define acoustic spaces, which electrify the audience and carry them away to another world. The infrastructure of processing system, amplifiers and loudspeakers is already available, so it is no great problem to use it, and would almost be a shame not to.

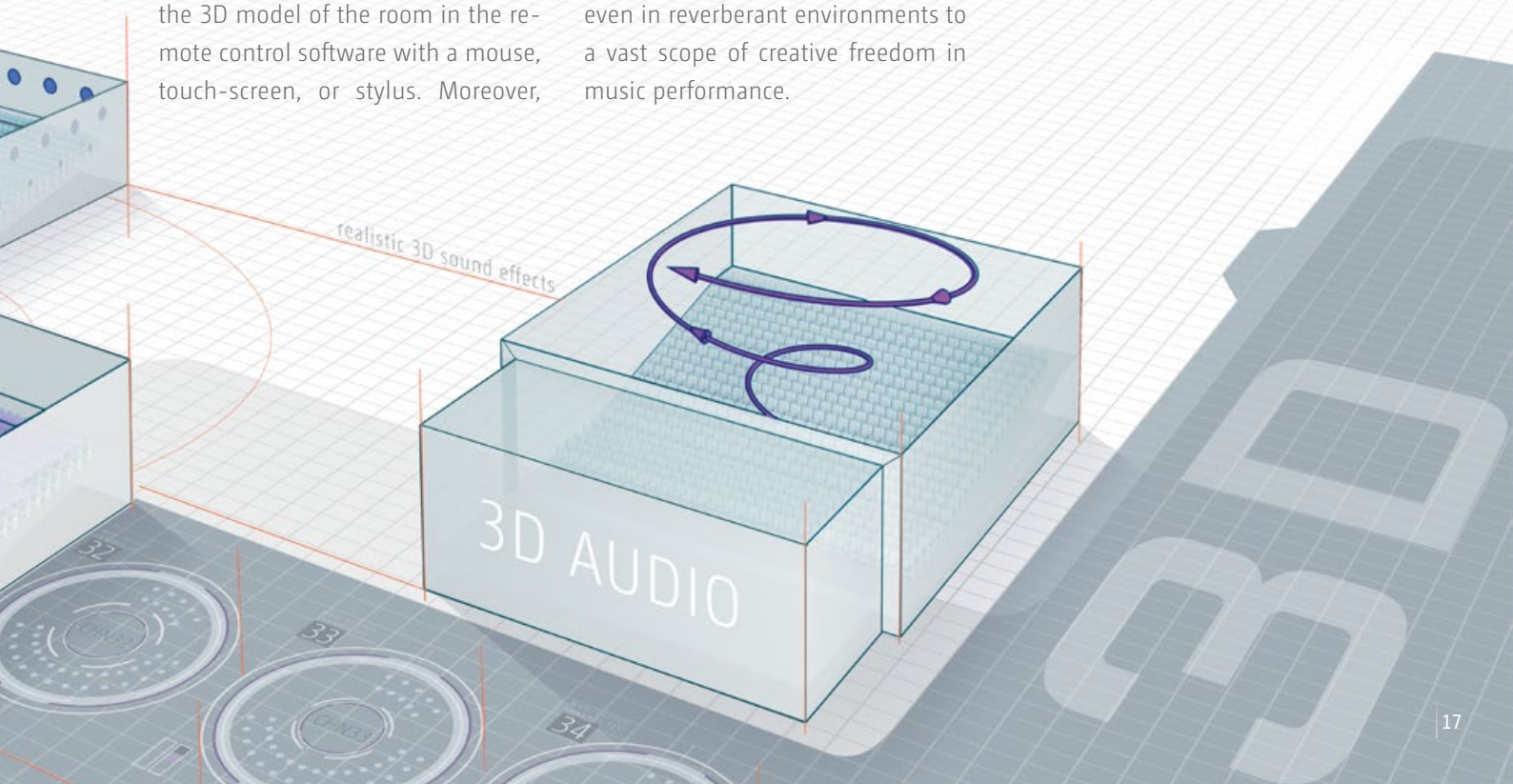
VIVACE imparts sound objects with a precise localisation, be it on the stage or around the audience. The source can be controlled and programmed in terms of direction, size, and perceived distance from the listener. As a modern 3D audio system, VIVACE offers heretofore undreamt of qualities of transparency and natural reproduction. The technology, developed to meet the high standards demanded by classical music, benefits all genres, from speech theatre through to musical productions. Objects can be moved around the 3D model of the room in the remote control software with a mouse, touch-screen, or stylus. Moreover,

VIVACE can embed these objects in an environment-specific acoustic (e.g. a forest, a cave, a mountaintop, a street between high buildings), creating a three-dimensionality which enfolds the listener like an acoustic hemisphere, and leaves an enduring impression on the listener's conscious and unconscious perception.

VIVACE draws on the results of state-of-the-art research in room acoustics and psychoacoustics, opening fascinating and diverse possibilities, from optimal speech intelligibility even in reverberant environments to a vast scope of creative freedom in music performance.

FIVE FACTORS FOR 3-DIMENSIONAL SOUND

1. *Precise localisation*
2. *Definition of the size of the source, and distance from the listener*
3. *Manual or automatic positioning, in real-time or pre-programmed*
4. *Generation of natural sound backgrounds (rain, crowd noise, etc.)*
5. *Reproduction of any multi-channel format*



The calibration: VIVACE comes to life

Commissioning a VIVACE system consists of between two and four days of basic set-up, and then fine adjustments during rehearsals. During the basic set-up, the frequency response, level and required delay is measured for each loudspeaker, and the system as a whole is tuned to harmonise with the auditorium. Then the microphones on stage are set and tuned. The aim is to create a homogeneous acoustic in all parts of the auditorium. The familiar criterion reverb time is very important, but not alone the deciding factor in this. Particularly the early reflections are very significant in how we perceive the characteristics of a room. Accordingly, we pay great attention to the composition and energy level of this component of the room acoustics. The final stage occurs during rehearsals with the orchestra, singers or actors. The room acoustics are fine tuned to appropriately enhance the real sources on the stage, and to fulfil creative requirements and wishes. During this final stage, the end-users are intensively involved in the process. This is always an exciting time: the Artistic Director, the Musical Director, orchestra musicians and sound engineers get to hear the VIVACE system in their own house and experience directly its acoustic characteristics in their familiar setting.

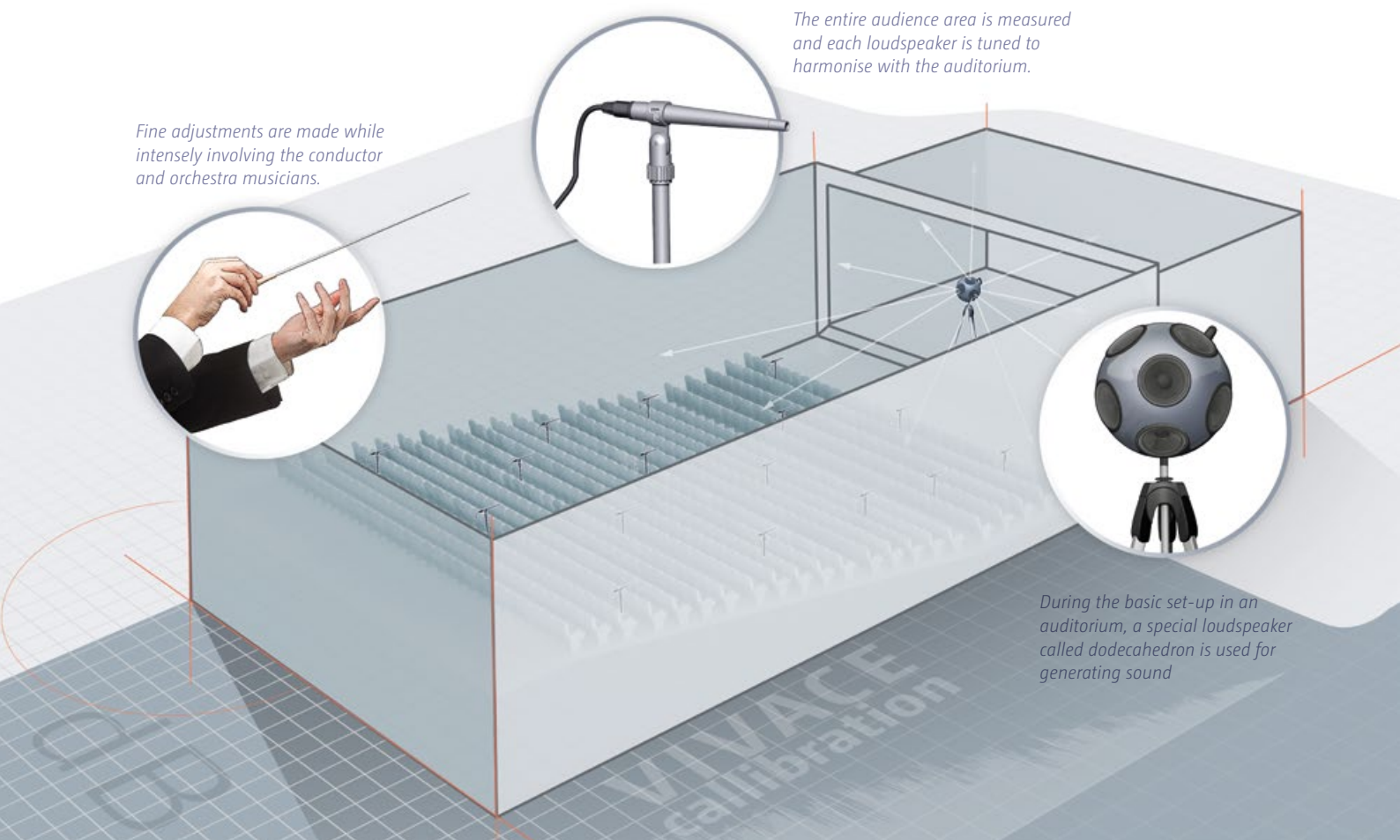
USING VIVACE – INTUITIVE AND VERSATILE

- Presets for varying uses of the space recallable via Touchscreen
- Remote control software for the creation of new presets, automation of moving sources and control of 3D sound effects
- Remote control possible from external devices e.g. the audio console (MIDI, OSC) play-back systems (MIDI-Timecode, MMC) media control systems (Ethernet, MIDI), tracking systems
- Remote monitoring of the processor via router connection and internet is possible

Fine adjustments are made while intensely involving the conductor and orchestra musicians.

The entire audience area is measured and each loudspeaker is tuned to harmonise with the auditorium.

During the basic set-up in an auditorium, a special loudspeaker called dodecahedron is used for generating sound



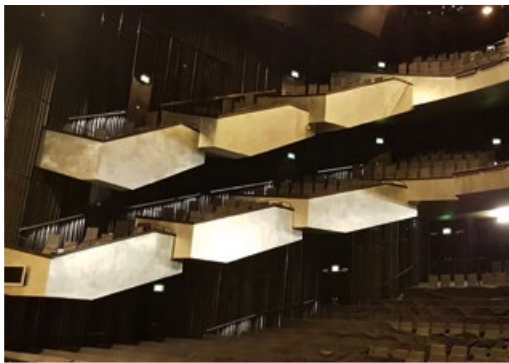


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