



VERO®

THE NEXT LEVEL OF TOUR SOUND



Vero is a large format touring sound system, which has been engineered for new levels of audio and operational performance

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Vero is a large format touring sound system, which has been engineered for new levels of audio and operational performance. It has been designed, developed and perfected over the last six years by some of the most knowledgeable and experienced audio engineers in the world.

Vero is a complete system, featuring loudspeakers, amplification, cabling, rigging, software and transportation hardware. Vero's feature set and ergonomic design ensure the user experience is straightforward, delivering outstanding results.

Vero's unique loudspeaker technology and proven touring amplification combine to present accurate sound evenly across large audience areas. Through beta testing on tours and festivals around the world, every element of the Vero system has been thoroughly refined.





THE NEXT LEVEL OF TOUR SOUND

Complete System

- > Speakers, amplifiers, cabling, rigging, transport dolly, weatherproof covers and software specified and designed to meet the Vero standard of quality.

High-Efficiency

- > Unprecedented dynamic headroom allowing vocals plenty of space in the mix, high SPL without duress, minimum enclosure count and stress free electronics. A 12-enclosure flown array is powered by only two Lab.gruppen PLM 20K44 amplifiers.

Superior Sound Quality

- > Precise, transparent, accurate and present sound. Even dynamics across the frequency spectrum. Rich, warm, intelligible vocals.

Precise Engineering

- > Meticulously crafted proprietary waveguides and driver technology produces naturally even frequency response. Uncompromised system dynamics, headroom, and phase coherency.

**Geometric Energy Summation
(GES)**

- > Precise natural tailoring of sound density and coverage pattern. Delay positions and array 'shading' not necessary. Sound focused on the audience, reducing offsite environmental impact.

Lambda Flying System

- > Quick and easy deployment. Rotational axis exactly between cabinets maintains excellent coherency between enclosures. Allows for adjustment under load and facilitates easy placement of enclosures on transport dolly.

Predictive Software

- > Easily built virtual venues and arrays. Array optimisation in 3D real time workspace. Live load information allows for safe rigging. Automatic equipment listing. Free-flowing user experience.



A vertical array like no other

Vero offers a new level of audio experience. The design of the drivers and the geometry of both the waveguides and flying system have been optimised to ensure sonic integrity. Preservation of the original audio signal through a system's component chain is a fundamental requirement for great sound. With Vero, spectral balance, directivity and level control are achieved by natural means so that transient and harmonic information remain intact. Vero presents a very spacious and realistic sound stage, meaning artists, engineers and concertgoers can enjoy unprecedented dynamic range, dimension and fidelity.

Sound density

Vero's designers have achieved amazingly coherent summation of audio energy from finely angled adjacent enclosures for high intensity projection to the far field. Enclosures can also be arrayed at greater angles to extend vertical coverage for the near field. This enables accurate physical control of sound density from a Vero array.

The natural geometry of the waveguides and their relationship with each other within the array results in a coherent addition of sound which we have named Geometric Energy Summation (GES).

(GES) enables sound density to be easily and accurately tailored whilst preserving a uniquely detailed sonic picture.

(GES)
Geometric Energy
Summation

High intensity

Increased coverage

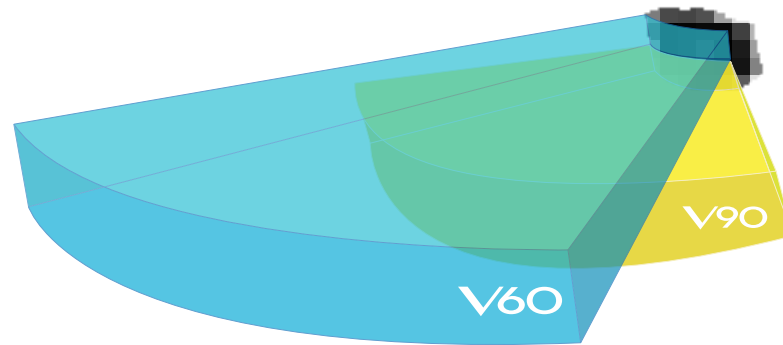


Mid-high directivities

Vero's dynamics, sensitivity, speed and presentation offer a new level of mixing engagement and audience experience

(GES) has opened a door to new thinking with regard to directivity and audio spectrum division. Typically a vertical array relies on the coupling of multiple boxes to mutually reinforce and give directivity control. Vero doesn't. In the Vero system, a single box or group of boxes are able to perform independently of each other, which means that the entire audio spectrum doesn't have to be present in the same enclosure. This allows us to dedicate enclosures to mid-bass and mid-high frequencies.

There is also a further division of the mid-high enclosures into a more focused and narrower dispersion V60 long throw enclosure for the top of the array and the wider dispersion V90 for the medium to nearfield. Therefore, there are three different types of Vero enclosure, V315 mid-bass and two directivities of mid-high, V60 and V90. These may all be deployed singly or in groups within an array, enabling precise tailoring of power and directivity in accord with a venue's coverage and SPL requirements. This ensures the focus of the audio is solely on the audience, which in turn leads to a reduction in unwanted room excitement and a consequent overall improvement in audience experience.



The system's physical width has been optimised for natural control of mid-bass directivity.

Vero's outstanding sensitivity minimises the number of enclosures required and translates into a massive improvement in dynamic headroom, high SPL without duress and stress free electronics.

Further advantages of (GES) technology are its near immunity to windy conditions (a well-known shortcoming of standard systems) and elimination of inconvenient and expensive delay positions up to distances of 1,000 feet.

The dynamics, sensitivity, speed and presentation of this completely new development in loudspeakers offers a new level of mixing engagement and audience experience.



THE NEXT LEVEL OF TOUR SOUND



VERO[®]
SPEAKER SYSTEM

The Vero range features six highly-efficient, low distortion horn-loaded loudspeakers - the V60 mid-high, V90 mid-high and V315 mid-bass with a choice of V221, V124 or V132 bass. The V60s, V90s and V315s all have identical dimensions enabling them to be flown in the same vertical array. The ground stacked V221, V124 or V132 bass enclosures offer a choice of size and low frequency extension.



V60 mid-high 60° horizontal coverage / 6° vertical

The Vero V60 is a flown mid-high loudspeaker providing 60° horizontal and 6° vertical coverage with a frequency response of 200Hz to 18kHz. It comprises two 10in Neodymium mid drivers with a sensitivity of 109dB 1W@1m and three 1.4in Neodymium HF drivers with a sensitivity of 112dB 1W@1m. The V60's narrower dispersion angle projects < mid-high frequencies to the far field. Weight 120kg >

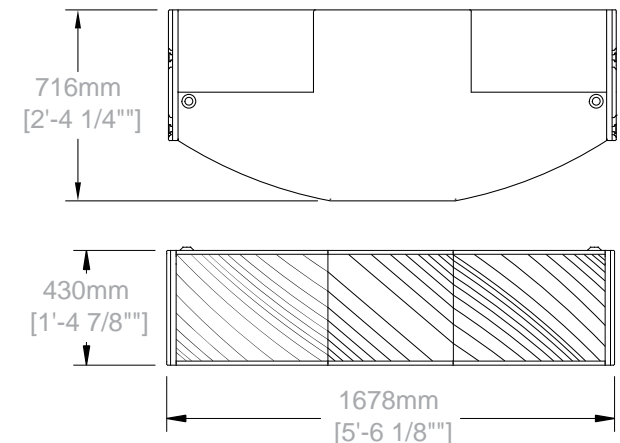
V90 mid-high 90° horizontal coverage / 12° vertical

The Vero V90 is a flown mid-high loudspeaker providing 90° horizontal and 12° vertical coverage with a frequency response of 200Hz to 18kHz. It comprises two 10in Neodymium drivers with a sensitivity of 108dB 1W@1m and two 1.4in Neodymium HF drivers with a sensitivity of 111dB 1W@1m. The V90's wider dispersion delivers mid-high frequencies to the near and medium field. Weight 112kg >



V315 mid-bass

The Vero V315 is a flown mid-bass horn loaded loudspeaker. It has three 15in Neodymium drivers with a sensitivity of 107dB 1W@1m and a frequency response of 45Hz to 250Hz. > Weight 120kg





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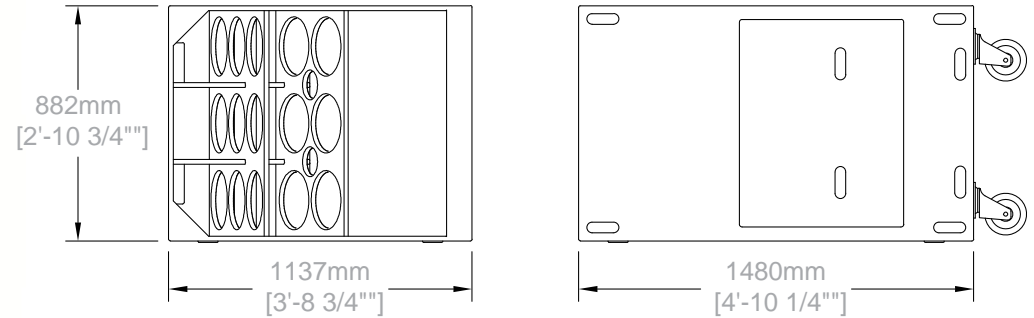
BASS RANGE

Bass range

A range of exceptionally efficient high-intensity bass loudspeaker enclosures delivering frequencies as low as 24Hz

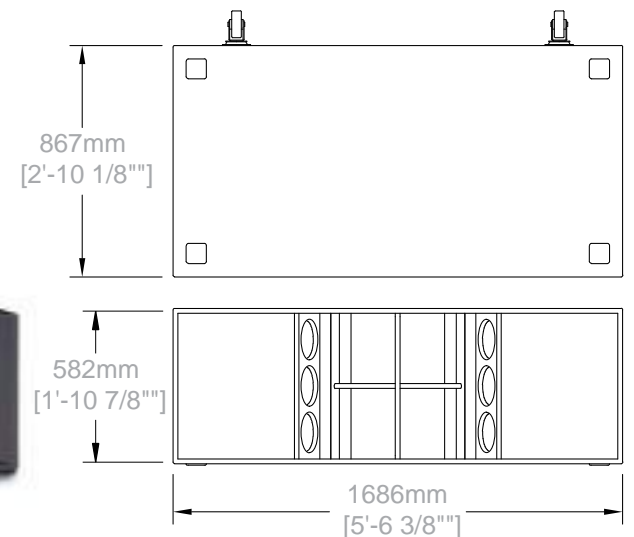
V132

The V132 is an extraordinarily powerful horn-loaded bass enclosure featuring Powersoft's 10kW linear motor and Funktion-One's cone and enclosure technology. One 32in driver gives a frequency response of 24Hz to 70Hz >



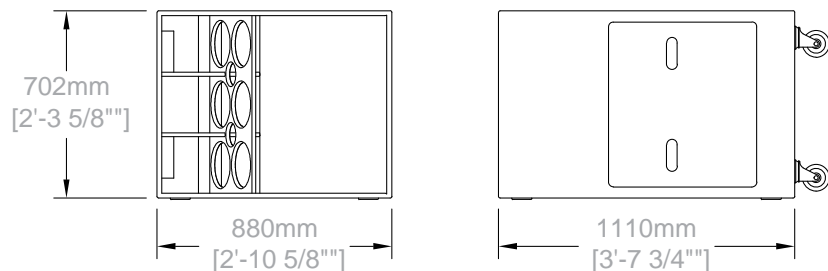
V221

The V221 is an exceptionally efficient high-intensity bass enclosure that provides fast, accurate and dynamic bass. Two 21in Neodymium drivers give frequencies down to 40Hz v



V124

The V124 is a powerful and efficient bass enclosure that provides extended and defined low frequency bass performance. One 24in Neodymium driver gives frequencies down to 30Hz v



WHAT THE EXPERTS SAY ON VERO®



"I've never heard the Manchester Arena sound so good. It's been a running theme that mixing in stereo doesn't add anything to the sound, Vero blows this theme into myth. The stereo imaging, even well off axis, is phenomenal. It's the cleanest and most precise sound I've ever had the privilege to mix on, and that was the first phase of beta testing."

David Swallow - FOH Engineer



"I believe I was one of the first beta users of an early version of the Vero, during a festival in Berlin with Nile Rodgers and Chic. We often work on one-offs and festivals with this artist, without a sound check and using whatever resident system is supplied, so it's not always easy to get the mix right at the first song, but once the show started I had the impression I was working on a system I already knew, with very little to correct on the system EQ and settings. I'm looking forward to using the Vero again and to listen to Tony's updates on this system."

John Ryan - FOH Engineer



"Over the past four decades, some of the most satisfying shows I have ever done have been mixed on speaker systems designed by Tony Andrews and John Newsham. It's a legendary partnership that has never deviated from the pursuit of audio excellence, regardless of passing trends. Vero embodies all the qualities that have made all their previous ground-breaking systems stand out. When I first heard the prototype in a muddy field in pouring rain, it still impressed enormously, and the finished product has lost nothing in the final translation. You may be surprised just how far large scale sound systems have advanced. Anyone can produce a 'new' system, but not everyone can produce a better sounding system. Listen with open ears and an open mind, and you may well agree with me."

Roger Lindsay - FOH Engineer



"I wanted to send you a note to tell you how much I enjoyed your new system. I wish the venue would have been better. But I feel the quality of the new system saved us from potential disaster. Even with all the challenges, I only got positive reviews on the sound. Nobody has a bad thing to say about our work or gear, only the venue acoustics. Good going and thanks. Hope to see you again in a proper place so we can make this awesome new system really rock."

Dennis Moody - FOH Engineer



"My first major contact with Vero was at 'Into the Valley' in 2015. Sound pressure versus optical impression was the best ratio I've ever experienced. Clarity and transient behaviour are amazing and it can be fed via Dante to avoid unnecessary AD/DA conversions in the signal chain. Vero requires only a tiny amount of EQ. The situation at Into the Valley was not the easiest for a sound system, as it's a bit of a Greek amphitheatre layout. I was surprised how constant the sound stayed in 50 metres and more, when I went upstairs. Combined with well-trained personnel, this system is capable of incredible results."

Johannes Krämer - FOH Engineer



"I have had experience of Vero at two major UK festivals and on both occasions achieved music noise levels in audience areas which were higher than we expected to achieve, and maintained a level at residential locations well below the noise limits. I have found the Vero system to be highly directional with limited overspill from intended coverage areas."

Warren King - Senior Acoustic Consultant, Vanguardia Consulting



LABGRUPPEN

MUTE ENABLE

METER

MENU

PLM 20K44

PLM+SERIES

EXIT

LABGRUPPEN

MUTE ENABLE

METER

MENU

PLM 20K44

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PLM+SERIES

EXIT

SUPPLY

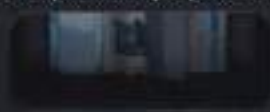
-  RL1
-  S/L2
-  T/L3

Amplifier feeds



- ON Upper
- ON Middle
- ON Lower

Rear panel auxiliary outputs on L1



ON

Front panel output on L1



ON

VERO



10A + RCD 30mA

Amplification

Vero is powered by Lab.gruppen PLM 20K44 amplifiers featuring bulletproof reliability, tremendous power from a compact package, onboard processing and the sonically superior Dante networking for signal distribution.

Three PLM 20K44 amplifiers and mains distro are fully shock mounted in an innovative, compact rack, complete with sliding doors that conveniently stow in the roof of the rack.

The speaker cabling features curl resistance, large cross section conductors and mil spec, quarter turn, multi-pin connectors. A 12-enclosure flown Vero array is powered by only two Lab.gruppen PLM 20K44s, making the system incredibly amplifier efficient. Vero has been designed and optimised without recourse to corrective EQ, preserving system headroom and transient response.



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Rigging

Vero's Lambda flying system (patent pending) is designed for speed, safety and ease of use. It allows Vero arrays to be deployed accurately and efficiently. All rigging settings can be calculated using Vero's Projection software. Vero's inter-cabinet splay angles can be adjusted with the system in suspension.

The Lambda system consists of the FlyGrid with telescopic boom and enclosure FlyPlates which are integral to the V60, V90 and V315 enclosures. The FlyPlates are detachable for testing and maintenance. The FlyGrid comes complete with a pod containing an inclinometer, laser aiming guide and a rear pull tension indicator. A customised FlyGrid road-trunk makes transport and on-site assembly straightforward and provides stowage for all related hardware.



Vero's Lambda flying system is designed for geometric alignment, speed, safety and ease of use



Every detail of Vero's flying system has been developed so that its operation is as slick as possible. The indexer/angle dial is clearly marked and straightforward to set. Even the captive pip-pins that link cabinets together have been designed in-house and are flush when engaged, as are the sprung handles.

Inter-cabinet splay angles are pre-set using the indexer. The system lifts and lands as a straight hang, making rigging operations much easier. Once flown, the array is tensioned to its pre-set splay angles using a rear lever hoist and bridle. Fine adjustment of the inter-cabinet angles may be made with the system off the ground.

Crucially, the Lambda flying system keeps the audio sources in correct alignment regardless of the angle between enclosures, ensuring accurate timing and coherency.

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Transportation

Every aspect of the system's transportation has been methodically considered to make handling Vero as quick, easy and as safe as possible



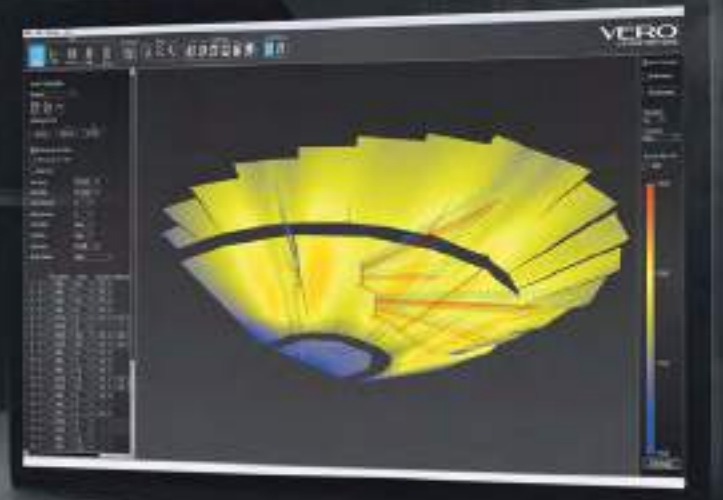
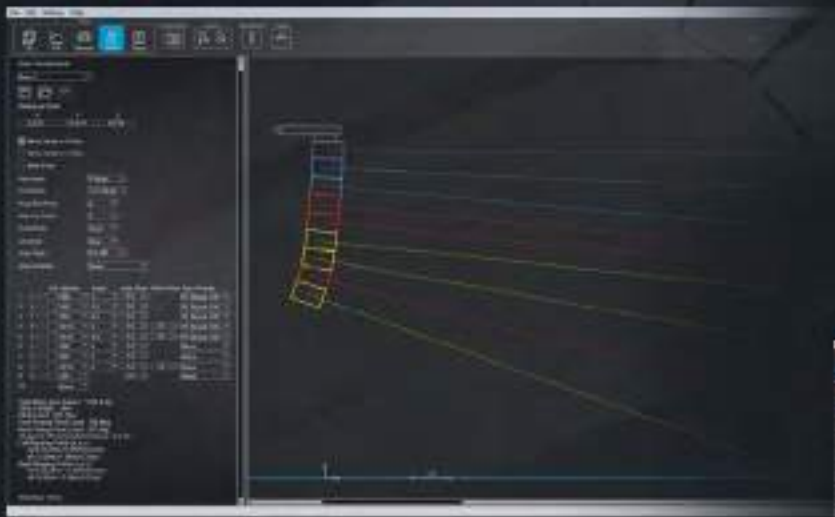
The Vero speaker system's transport dolly is specifically designed for the various challenges of live events and touring productions. The platform of the dolly is fitted with guides that ensure a Vero column settles into the correct position when landing. The guides also work as restraints, securing the load in transit.

Each dolly is designed to carry four pre-rigged Vero V60, V90 or V315 cabinets. The eight-inch, polyurethane wheels resist deformation and their castor bearings are able to handle high levels of lateral force, while sealed wheel bearings ensure smooth operation. Dollies can be stacked one on top of the other for tidy storage during events. They are robustly constructed from steel and are powder coated black. Each corner of the dolly has a reinforced section that neatly accommodates a hand-operated jack, allowing the user to level the system when flying it from uneven ground. Finally there is a 1000 denier Cordura nylon waterproof padded cover to protect four Vero enclosures while stacked on a dolly, with windows for enclosure identification.

Every aspect of the system's transportation has been methodically considered to make handling Vero as quick, easy and as safe as possible.

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PROJECTION SOFTWARE



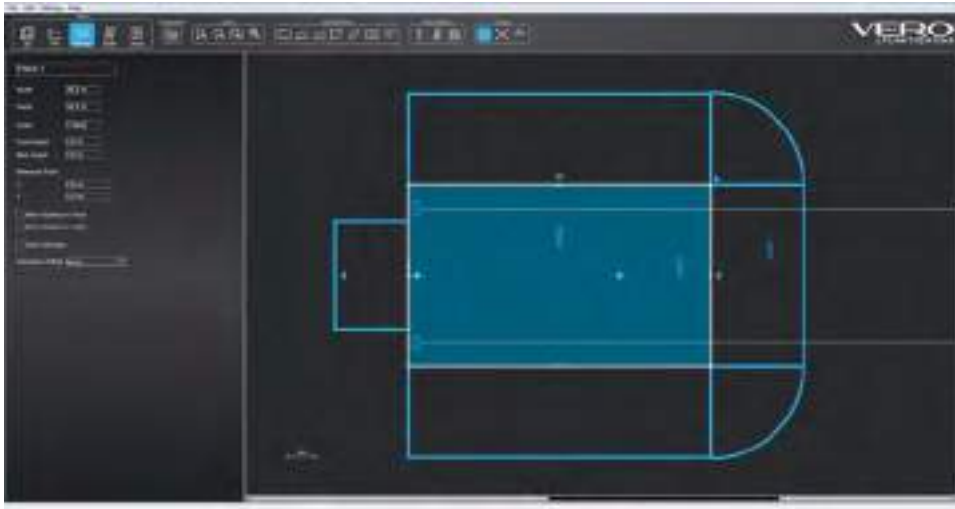
Projection has been designed to make the user experience as free flowing as possible.



Projection Software - System design

Array adjustments can be fine-tuned and the resulting SPL changes seen in real time

Projection design and prediction software allows Vero users to optimise array designs for smooth audience coverage and generate detailed venue specific system information. Projection presents a user friendly interface with many features that make deploying Vero on events and tours straightforward.



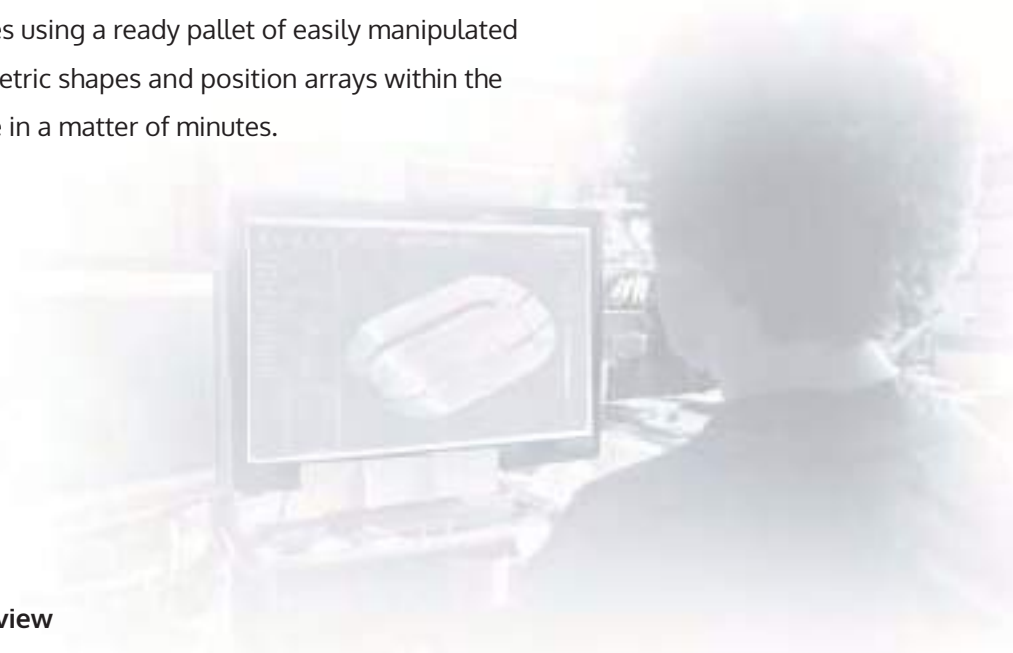
< Venue view

In the Venue plan view, it is possible to build virtual venues using a ready pallet of easily manipulated geometric shapes and position arrays within the venue in a matter of minutes.



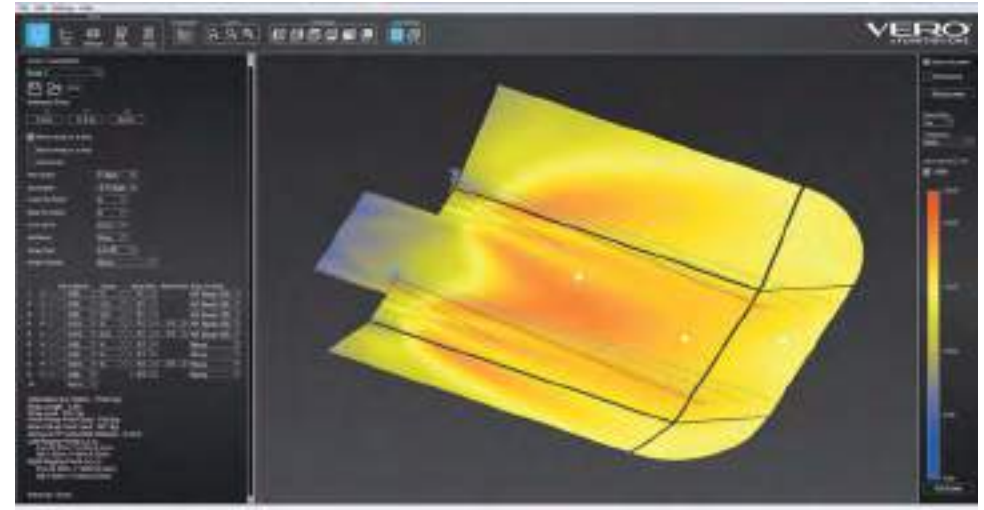
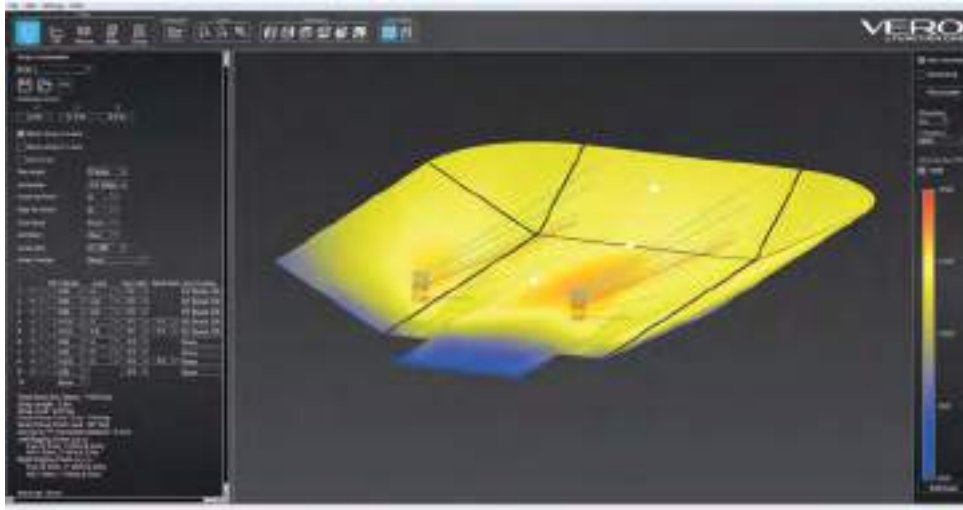
< Side view

Arrays are designed in the Side elevation view where FlyGrid trim height and declination are set and enclosures added and aimed. Rigging information, motor positions and weight loadings can be seen and FlyGrid and jib settings adjusted for optimum weight distribution with clear warnings if design loading is exceeded.



3D views ▾

The coverage and SPL can be seen in the 3D View which can be zoomed and rotated to any viewpoint. Most array adjustments can be fine-tuned and the resulting SPL changes seen in real time at third octave frequency intervals.



< Equipment list

The equipment list compiles the total quantity of loudspeakers, flygear, amplifiers, cables and transportation equipment specified in a project and cross-checks this with a list of available equipment. Any shortages are clearly flagged.



< Amplifier configuration

In this screen, amplifiers are added and assigned to the loudspeakers.

Microphone function

Provides the frequency response at any position within the venue with an optional A-weighted filter.

PDF Export / Projection specific files

Projection allows users to export detailed design information in PDF form. The Array PDF includes all the rigging and set up information required to fly the PA. Parameters include: Rigging point positions; FlyGrid settings; Array pan angle and inclination; Enclosure type, order and inter-cabinet angle settings; Amplifier gain adjustments; Load information. Further PDF exports include truck list, equipment list and detailed amplifier configurations. Venue, array and truck lists can also be saved as Projection specific files and used in other projects.

FINAL WORD

Though the seeds of Vero were sewn many years ago, its development started out like many of our projects, with a determination to create something better and to push frontiers. Something that sounds better, that gives a new level of audio experience and is easy to use. After six years of painstaking work, I truly believe we have produced a system that is capable of shifting the paradigms of audio performance and audience enjoyment.

Throughout nearly five decades working in audio, I have always been intent on pure, unadulterated sound. Preservation of the fragile original audio signal through the component chain is a fundamental requirement for natural sound. If the signal is over processed with, for example, extreme amounts of EQ or beam steering delay, then it will sound processed and substandard. With Funktion-One and with Turbosound before that, we have gone to great lengths to achieve directivity and level control by natural means, thus preserving transient information and allowing full realisation of the sonic image.

Good audio is an art. It isn't plant hire. The part it plays in people's enjoyment of music is severely underestimated.

The overall result with Vero is industry leading coherence and accuracy, resulting in a big sound of dimension and intimacy. Vero presents a very spacious and realistic sound stage, meaning that artists, engineers and concertgoers can enjoy unprecedented dynamic range and fidelity, which is how audio should be.

It is very concerning that despite all the technological advances of the last 25 years, audio standards have actually declined, resulting in a somewhat corrupted communal appreciation of what good sound is. This is often characterised by an overemphasis of high mid and neglect of mid bass. Vero offers high mids that are very smooth yet fast and detailed, with mid bass that is rich, warm and transparent, allowing greater use of these powerful frequencies. With Vero, we hope to turn the tide and enable people to embrace the spectrally-even dynamic and exhilarating possibilities it presents.

I truly believe that the dynamics, transient, sensitivity and presentation of the audio spectrum of this completely new development in loudspeakers offers a new level of mixing engagement.

Tony Andrews

VERO[®]
by FUNKTION-ONE



Good audio is an art



T H E N E X T L E V E L O F T O U R S O U N D



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by FUNKTION-ONE

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