



# Constellation<sup>®</sup>

Acoustic System

## **Key Features**

## MEYER SOUND CONSTELLATION – PERFORMANCE

The Meyer Sound Constellation system is a revolutionary and holistic approach to electroacoustic architecture providing natural sounding acoustic solutions for challenging environments. Constellation is a versatile technology allowing complete flexibility for office environments, boardrooms, corporate theatres, educational spaces, multipurpose rooms and performance spaces.

Constellation *Performance* is one of the most groundbreaking functions available with the Meyer Sound Constellation system. Performance active acoustics provide the optimum acoustic in a space regardless of the type of music or event. If a space is designed for a single type of performance, physical acoustics can be developed to support that singular performance type. For example, if a concert hall is being designed specifically for symphonic performance, a target reverberation time between 1.8 and 2.2 seconds will be perfect. However, if the venue attempts to host an amplified pop music event in this space, the results could be disastrous.

One of the most challenging aspects for the architect and acoustician is to design a space with optimum acoustics for a wide range of performances. If the customer requires proper cinema playback a reverberation time of around 0.5 seconds is desired.... amplified music with jazz or pop bands around 1.0 second ..... for opera or symphony 1.8 to 2.2 seconds work best. Chorus and pipe organ require even longer reverberation times. This range of reverberation times is impossible to create with physical acoustics without being financially prohibitive.

It is with these multi-purpose venue applications where Constellation Performance shines. Constellation can do what physical acoustics cannot and with a high degree of acoustic flexibility allowing the fine-tuning of reverberation and early reflections to perfect the acoustic space.

Constellation Performance is not a sound system...it is an acoustic system and thus needs to be considered with the same base building architectural design principles as physical acoustics such as walls and ceilings. Constellation utilizes strict technical guidelines based on proven scientific principles and implemented with patented “VRAS” algorithms.

Constellation Performance can also provide a very powerful creative element to the customer or user group by allowing creators to change the acoustic settings within a single composition or for different compositions throughout the performance.

The Constellation system is deployed with an array of Meyer Sound overhead microphones / loudspeakers, lateral loudspeakers and low frequency loudspeakers in a well-behaved acoustic space. Acousticians are key to designing the well-behaved space. Constellation cannot correct a poorly designed acoustic space.

Each loudspeaker and microphone is typically provided a discrete audio connection to the Meyer Sound D-Mitri digital audio processing system. D-Mitri provides the microphone inputs, loudspeaker outputs and complex signal processing required to implement Constellation Performance active acoustics.

A team of designers and technical support personnel at Meyer Sound with very specialized skillsets work closely with the architect, acoustician, audio-visual consultant and installer on the project from conception to final commissioning providing guaranteed and measureable results.

In the end Constellation allows control of the system by providing the customer a simple interface such as an iPad or webpage to select the range of acoustic settings for the type of performance happening at that time.

## MEYER SOUND CONSTELLATION – VOICE LIFT

The Meyer Sound Constellation system is a revolutionary and holistic approach to electroacoustic architecture providing natural sounding acoustic solutions for challenging environments. Constellation is a versatile technology allowing complete flexibility for office environments, boardrooms, corporate theatres, educational spaces, multipurpose rooms and performance spaces. Constellation can also provides variable acoustic settings within a space to provide the proper acoustic for different users.

Voice Lift is one of the innovative functions available with the Meyer Sound Constellation system. Voice Lift is designed to optimise the acoustic in spaces used for lectures, group discussions and education.

Voice Lift works in two basic modes:

In Presentation mode, the system captures signals from microphones near the presenter, processes them through our D-Mitri digital audio platform and patented VRAS processors before reproducing them through compact loudspeakers in the listener area. This creates the voice lift. In this mode, questions from the audience are also lifted but the emphasis stays with the presenter.

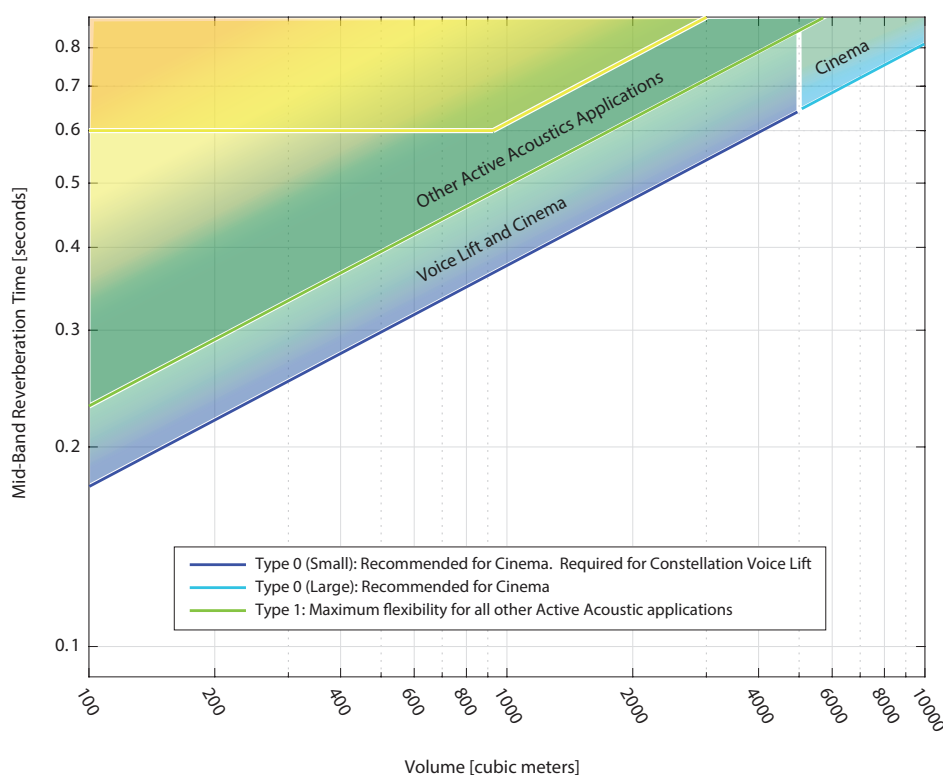
In Question and Answer mode, the voices are lifted consistently throughout the room so all may participate in discussion and be heard easily, with no need for close microphones or raised speech levels.

The sound from tabletop and hand-held microphones can vary dramatically with the orientation and distance to the person talking. Tabletop microphones often end up closer to distracting sounds (like rustling papers and clinking glasses) than to the people they're meant to pick up. Even clip-on microphones can vary significantly in level when someone turns their head. With Constellation Voice Lift people don't have to be aware of their distance and orientation to the microphones. People can speak comfortably as if there are no microphones, but still be confident they can be heard. A common practice within lecture spaces is to pass around portable wireless microphones for audience members to ask questions. This distraction would be eliminated in a space with Voice Lift.

Environments where the speech of all participants is easily understood in a natural manner are known to aid learning, and Constellation Voice Lift systems contribute to this process.

## ACOUSTIC REQUIREMENTS FOR CONSTELLATION VOICE LIFT

The appropriate reverb time for different purposes depends on the cubic volume of the room, as detailed in the following graph.



For Voice Lift the measured noise floor must be less than NCB 30. The target noise floor for new construction must be less than NCB 25. The background noise must be free of tones and felt vibration. It is recommended the background noise be free of rumble and hiss.

Constellation cannot cancel sound, rather it controls the time and level that sound is added to a room just like reflected sound. Increasing reflected sound (removing absorption) from a room will result in an increase of the noise floor.

If an especially low noise floor is desired, such as for an acoustical laboratory or recording studio, please notify Meyer Sound so the system can be designed accordingly.

For Voice Lift, microphone heights must be 10 ft. or less in rooms with flat audience seating, and 15 ft or less in rooms with raked audience seating.

Exceptions may be made to these requirements at Meyer Sound's discretion if additional information about a venue's properties and purpose are provided.

## MEYER SOUND CONSTELLATION – ACTIVE ACOUSTIC BLURRING

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Active Acoustic Blurring is one of the innovative functions available with the Meyer Sound Constellation system. Active Acoustic Blurring is a quantum leap in traditional “sound masking” technology as it can optimise the sonic work environment in the open office space making it a more relaxing and comfortable place from which to function. The technology required to implement Active Acoustic Blurring has only become available in recent years.

Traditional sound masking functions by injecting a steady volume of unnatural “noise” into the workspace. This steady noise masks conversations occurring elsewhere in the office.

Constellation Active Acoustic Blurring functions not by injecting unnatural “noise” into the office space but rather by using the existing sounds of the environment and digitally manipulating them to “mask” or “blur” the sounds of conversations occurring around you. One of the principals behind the system is to leverage two fundamental laws of physics, namely that acoustic clarity is inversely proportional to reverberation time and time delays. Two parameters that we can discretely and subtly control with Active Acoustic Blurring.

Active Acoustic Blurring is achieved by using an array of high quality microphones and loudspeakers connected to a complex state of the art D-Mitri digital processing system that can create multiple discrete zones of control. These discrete zones allow us to process the sound so that conversations in your immediate area are clear and natural but conversations from outside of your zone become unintelligible.

The design of the system is such that conversations taking place in small areas will be clearly audible to people in that area, but the clarity will quickly degrade when moving away from the area, providing greater acoustic isolation between adjacent groups. This will not only improve privacy, but conversations taking place elsewhere on the floor will be masked.

## MEYER SOUND SERVICES

Meyer Sound *Services* are an integral part of our holistic approach to system design and the system delivery process. Our *Services* guarantee our industry leading quality control standards and ensure customer satisfaction. Meyer Sound employs highly educated and highly experienced engineering and technical support staff that are unique to, and very specialized within the professional audio industry. Many are known leaders in their fields.

Our staff supports our projects by providing the specialized engineering and technical expertise required to deliver the most advanced and highest quality audio and acoustic experiences in the world. Due to highly specialized nature of this support the integrator/installer cannot provide these *Services*.

Meyer Sound *Services* include but are not limited to, all daily fees, travel, accommodation and per-diem for system design, documents, data analysis, system inspection, programming, calibration and voicing.

In further detail Meyer Sound *Services* include:

Project Management  
System Designs / (Off-site)  
System Design Changes / (Off-site)  
Document Preparation / (Off-site)

Site Measurement / Meyer Sound Acousticians measure the acoustics of existing spaces / (On-site)

Installation Site Inspection / Meyer Sound Technical Support inspects the installation progress and verifies component locations and installation quality / (On-Site)

Post Installation Site Inspection / Meyer Sound Technical Support inspects the installation to verify the system is complete and ready for "Calibration". Technical Support will also capture data from the system for analysis by the acousticians. / (On-Site)

System Data Analysis / Meyer Sound Acousticians analyze the captured system data, calculate delays and Pre-Programming of the System / (Off-site)

System Programming / (Off-site)

System Calibration – Meyer Sound Acousticians and Technical Support provide proprietary system calibration of all loudspeakers and microphones involving parameters such as delays, equalization, zoning, etc.. This process readies the system for Voicing / (On-Site)

System Voicing – Meyer Sound Acousticians and Technical Support provide proprietary system voicing and tuning. This is the final phase of delivering a well performing and great sounding Constellation system. Technical methods as well as the reliance on the expert ears of our voicing specialists are employed. / (On-Site)

