Creating Multipurpose Spaces

Schouwburg Amphion,
Doetinchem, The Netherlands

figure 1

Two years in a row the Amphion has earned the award for being 'The best theater in the Netherlands'. The Amphion has two halls, a larger 860-seat proscenium theater, shown on the picture above and a 300-seat black box theater.
Both halls are equipped with an ACS system making the acoustics variable and the halls useable for a wide range of applications, from rock shows to symphony orchestras and choirs.

Both halls have well balanced and relatively dry natural acoustics, however because of the different size and lay-out, the implementation of ACS needed a totally different approach.

The Proscenium Theatre
Here we differentiate between two area's: the stage, a room with a stage tower, theater equipment and drapes and the audience area, the open space with balconies and seats. Acoustically these are only coupled by the proscenium opening.

Recording sound
In a room, sounds will arrive from many directions and be absorbed or reflected by the surfaces present.
In performance halls the materials and positions/ distances of these surfaces are chosen with great care to be able to create the desired room acoustics.
ACS will use loudspeakers to virtually influence the position and the reflectiveness of surfaces.
Similar to nature this is a multi-channel process and to achieve the genuine natural sound ACS is known for, it is therfore essential that sound is recorded at a high resolution. For this purpose a total of 24 microphones mounted in 2 arrays are used. *Figure 2 (blue)*

One array higher in the proscenium opening will record sound from the stage, the other will record sound from the forestage/orchestra pit and also record the audience, (applause etc.) for the overall acoustical experience.

Processing Acoustics
The ACS processor generates sound reflections with the correct composition, level, timing and frequency-spectrum. Each loudspeaker will receive a different signal, dependent on the loudspeaker position in the hall. All loudspeakers together will render the desired change of acoustics. Several acoustics presets are programmed that the user can simply select with a remote control.

ACS processing distinguishes between early reflections and reverberation. Early reflections are the first sound reflections from surfaces in a room and important for a good transfer of sound within a room. They will also influence the perception of spaciousness and improve clarity. Music for example, will become more "present" and more details can be perceived.
Within the room the early sound reflections will be re-reflected, this will then become reverberation.

Amphion Proscenium Theater

- **Acoustics presets for a wide variety of performances**
  Simply select the correct acoustics for chamber music, opera, operetta, symphony orchestra's etc. Choirs can perform in Church acoustics
  Reverberation times ranging from 1 to 5.2 seconds
- **Voice Lift**
  Address the audience without the use of a dedicated microphone
- **Orchestra Shell Extension**
  Excellent ensemble playing conditions for musicians on stage. A lightweight solution, little labor required, easy set-up
- **External access**
  Loudspeakers can be used for sound effects/surround sound, microphone signals for recordings and sound distribution

Reverberation can really "carry" the sound and many performances will benifit from a particular amount (length) of reverberation.
The diffuse character of reverberation however doesn't add to the clarity of sound and therefore a correct balance between early reflections and reverberation is of major importance.

Acoustics for the audience

58 loudspeakers are used for early reflections and reverberation for the audience. *Figure 2* The loudspeakers *(green)*, mounted in the ceiling and balcony parapets are used for enveloping acoustics, they also make sure area's under the balconies are well covered.
6 loudspeakers *(yellow)* form a virtual forestage reflector, they are mainly used for early reflections, improving the transfer and clarity of sound from the stage towards the hall. All loudspeakers are designed into the interior.

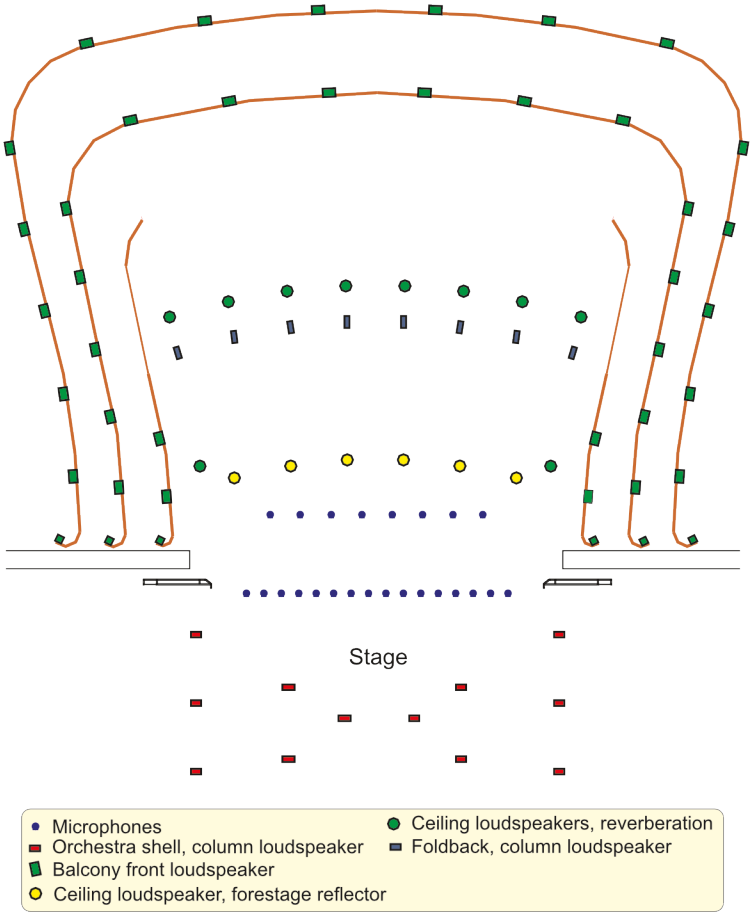

Figure 2, schematic floor plan, proscenium theater

Acoustics on Stage

On stage 12 loudspeakers *(red)* are used for the ACS Orchestra Shell Extension.
6 loudspeakers, hung on fly bars form a virtual reflective ceiling, 6 further loudspeakers are also hung on fly bars but lower, using thin cables, such that these can act as reflective wall pieces. The loudspeakers are mainly used for early reflections and improve the "cross connection" of sound on stage, musicians can better hear each other and therefore the ensemble playing conditions are improved.
8 loudspeakers *(blue)* are mounted on the lighting bridge in the hall and aimed to the stage. These are used for the ACS Foldback extension and are projecting an image of the acoustics in the hall back to stage such that musician will be performing in the same acoustics. Reverberation projected back to the stage will carry the sound musicians produce, enabling them to play or sing with less effort and therefore it is also enabling them to put more detail in their music.

The Black Box Theater

Contrary to the larger proscenium theater, in the black box theater audience and performers are much more in the same space. *Figure 3*
This, together with the limited size of room, allows for a much smaller system configuration.

Figure 3, black box theater

12 microphones *(blue)* hang on the catwalks and provide the required high resolution pick up of sound. 16 loudspeakers *(red)* are mounted in an U-shape around the hall and provide both Early Reflections and Reverberation. *Figure 4*
Although the configuration is small it allows for a dramatic change of the acoustics, making it a multipurpose room suited for almost any kind of musical performance. The black box theater can also be used as a rehearsal hall for the larger proscenium theater because similar acoustics can be selected.

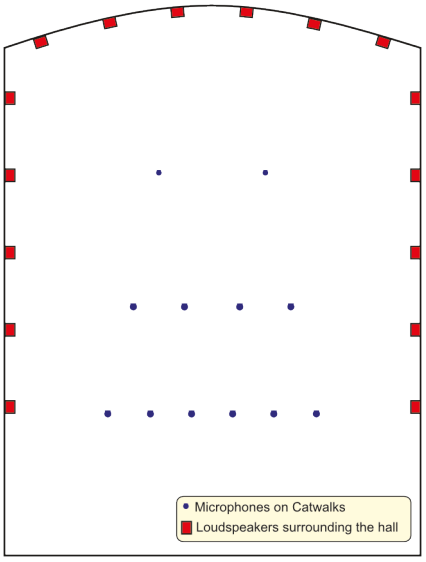

Figure 4, schematic floor plan, black box theater

Amphion, black box theater

- **Acoustics presets for a wide variety of musical performances or rehearsals.**
  From soloists, small ensembles through choral music.
  8 presets with reverberation times ranging from 0.75 to 3.2 seconds

- **Inputs for surround sound of sound effects, outputs to make sound recordings etc.**

A PAN ACOUSTICS COMPANY
ACS Acoustic Control Systems

Like to know more? Please get in touch!

Speulderweg 31
3886 LA Garderen
The Netherlands

Phone +31 (0)577 46 22 51
Fax +31 (0)577 46 22 68
e-mail sales@acs.eu

www.acs.eu