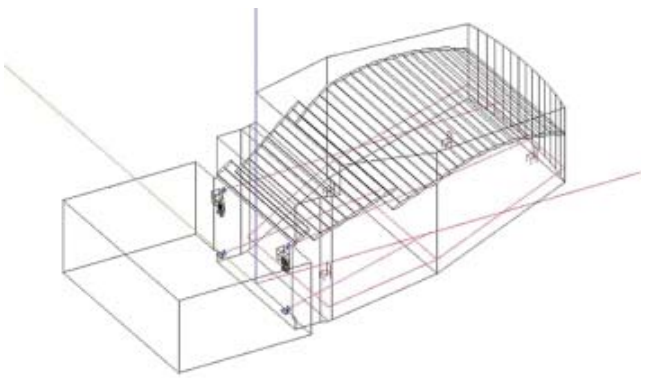
Projects for Sound Installations using EASE
By D.A.S. Audio

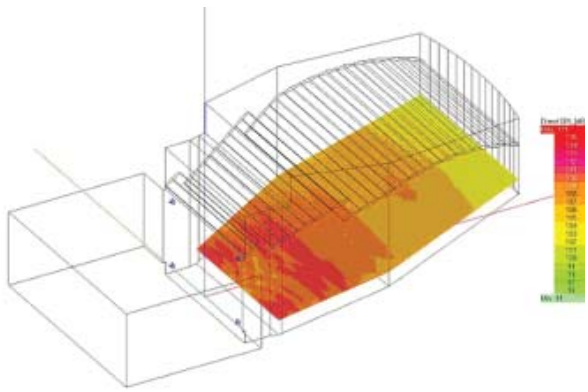
The growing demand for quality installations in all sectors requires businesses to make a continuous effort in the design and manufacturing of its products. This process of keeping up with new technologies has an effect not only on the quality of its products but also on the adaptation of features to meet the different demands of the final application. This combination of qualities makes the difference between simply a good product and a product that is best for a determined use.

In this sense, D.A.S Audio, a reference among manufacturers of professional sound systems, maintains a constant technical and technological evolution. This evolution offers clients not only a continuous product improvement, but also, analysis and advice on the different applications of its systems in all types of large installations. The Engineering and Projects Department carries out this important task. The sound design projects carried out by D.A.S. Audio's Engineering Department are a potent tool when it comes to designing an ideal audio system for a determined location optimized for the type of events that are going to take place. These projects maximize the efficiency of its systems in any type of installation and guarantee clients that the audio system proposed by the engineers will provide an appropriate level of sound pressure which insures hearing at maximum background noise level from the audience, a uniform coverage in all public areas, clear defined music and optimal intelligibility.

Main Theater of Sabadell



3D view of a theater made with EASE



SPL in the direct field calculated with EASE

For the development of these sound design projects D.A.S. Audio uses state-of-the-art programs for acoustic simulation and prediction, such as **EASE Focus** and **EASE 4.2**, both developed by the German firm **SDA** (Sotware Design Ahnert). With these programs, one is able to visualize and even hear, (with EASE 4.2) a particular audio system in a given location. In this way, we will know how "good or bad" the sound will be and therefore, know how appropriate the proposed audio system will be.

EASE Focus is a simulation and acoustic prediction program in 2D applied to the line arrays (D.A.S. Audio's Aero and Variant series). With the geometrical data of the audience area in mind and with the acoustic data of the line array systems, EASE Focus provides a quick solution that allows us to know through visualization of sound pressure level in direct field (Direct SPL), the number of line array units that are needed and the most favourable angles for the best uniform coverage.

EASE 4.2 is a much more complex and sophisticated tool. The main differences, when

compared to the EASE Focus, are its simulation programs in 3D and the fact that not only focuses on the line array type systems but also on conventional audio systems. It provides sound pressure visualization in direct field as well as other acoustic parameters of great importance such as total sound pressure level (Total SPL), and also parameters like RaSTI and AlCons that indicate the quality of word intelligibility.

Documentation needed when carrying out a sound-fitting project:
In the first place, plans of the location in an electronic format are a must. Floor or floors (if any) and sections along with a description materials or finishing's used in the hall provides us with a realistic vision of the venue. With this information the reverberation time of the hall can be calculated. The reverberation time has a direct influence on the sound quality of the hall. Using the plans provided by the architect or property owners, a 3D model is made either in the DXF format from AutoCAD and transferred later on to EASE or a model can be made directly on EASE. Once the 3D model is made, EASE offers two data bases: One for materials and another for loudspeakers. Once the materials and loudspeakers have been selected, simulation is the next step. EASE allows visualization, as stated earlier, of all the acoustic parameters that define the sound quality of the hall. The results are shown in a mapped form in a determined frequency, either in octaves or in one-third octaves. Averaged frequency range can be visualized as well.

The optimal distribution of the systems is designed to provide uniform coverage throughout the listening area. Research on the so called "acoustic shadows" helps to establish the correct distance among the different systems and their proper location. One can assume that the system is appropriate when the absolute sound pressure levels obtained in all frequencies offer perfect sound quality without having the equipment at full power. This guarantees a sufficient dynamic headroom to work with low distortion and to overcome possible background noise.

Sound design projects have become an essential tool for large scale installations with physical or structural difficulties. To be able to count on D.A.S. Audio's Engineering Department, is without doubt, of great use to the companies installation clients. Project such as the Cultural Centre of Artica in Navarra, Main Theatre of Sabadell in Barcelona, and the Metropolitan Stadium of MÈrida in Venezuela among others, are clear examples of sound system optimization in diverse settings with very different needs.
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Cultural Center of Artica in Navarra

Metropolitan Stadium of MÈrida