



Application Note

Designing with R - D L S I S

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Concepts behind R-DLSIS:

When designing a speaker solution for a project, there are many criteria to steer your product selection methodology. We offer you a straight-forward approach to assisting your SLS design solutions, maximizing their effectiveness by showing criteria to consider in your designs. By following this systematic approach, your SLS designs can be done more efficiently, effectively and profitably.

The Engineering staff at SLS

Room-DLSIS

➡ **Measure RT60**

A measured RT60 time greater than 3 seconds will probably benefit from a line array design

➡ **Broadband Reflection**

Parallel side walls more than 60ft apart will produce excessively delayed reflections. If they are more than 30ft high it will become more pronounced. This flutter echo can be reduced by carefully choosing speaker locations and considering room treatment options.

➡ **Rear Wall Reflections**

Large back walls can cause slapback issues especially on stages. Use sufficient down angles on speakers and consider acoustically treating the wall.

➡ **Ceilings**

Flown line arrays need adequate mounting heights (mainly for aesthetics). 25ft to 30ft are typical minimum heights to optimize aesthetics and performance (by not limiting the length of the line array).

➡ **Design Approach**

Make sure that ample speaker locations are possible for the customer and your expectations of coverage i.e. central, exploded mono, stereo or LCR.



R-D Direct Sound LSIS

- ➔ **Use LASS & EASE**
Using these tools together is a solid approach to good designs. We suggest a target deviation in EASE of +/- 1.5db at 2500Hz averaged 3 octaves wide. You can view this by clicking on "Utilities" (after the direct field calculation is done) and clicking on "Average and RMS". For LASS, look at the optimization window. LASS shows the SPL deviation across the listening plane. At 8000Hz it should read at a maximum +/- 1.5db
- ➔ **Direct to Reverberant Ratios**
Pay close attention to the ratio of the two towards the rear of the coverage areas. Direct sound should never decrease to below 50%.
- ➔ **Tonal Balance**
Look at the distribution of energy from low to high frequencies across the coverage areas keeping in mind the smoothing effect of low frequency room gain towards the rear of the venue.

R-D Localization SIS

- ➔ **Room Design**
The goal of localization is to merge the input of the eyes and ears into a natural state. Where you look should be from where you hear. The principle criteria molding your solution is seating layout, location(s) of source(s) and available speaker locations.
- ➔ **Permanent or Portable Installation**
Portable designs will sometime compromise localization due to excessive distance between speakers. Permanent designs should not compromise in this area without the client knowing that they are trading localization for aesthetics.

R-D Sound Pressure IS

- ➔ **Design to SPL Requirement**
Do your research and find out what the customer really requires.
- ➔ **Understand Requirement**
Some of your clients won't really know just how loud 110db is. Setup a demonstration with an SPL meter if necessary.
- ➔ **Headroom**
A good rule of thumb is to design your system with some capabilities above its normal operating SPL, as much as 10dB if possible. Your target headroom will really depend upon your comfort level of the research done for the customers SPL requirement and the budget constraints.

R-DLS Intelligibility S

- ➔ **High Customer Expectations**
Really concentrate on direct to reverberant ratios and the tonal balance (distribution) of your design.
- ➔ **Consider Line Arrays**
They do an excellent job of lowering the *apparent* reverb times thereby increasing intelligibility.

R-DLSI Sub-Bass

- ➔ **Cost verses expectations**
How much can the client afford? Break it down by dividing the subwoofer(s) and amplifier(s) cost by the volume of the room in square feet. If your client desires the same feel as a high-end home audio installation or a car stereo installation, your client will find that the cost of this kind of performance in a large room will be very high based on the above formula used in both spaces.