How to
"*Fall in Love*"
with your Church Sound System

(Or why you should consider updating your sound system)

Introduction

Althar Audio is dedicated to the reproduction of High Fidelity sound possessing uncommon intelligibility. To this end, we have worked to solve many of the problems associated with the reproduction of music and speech found in most environments.

While the serviceable life of a quality, large room sound system can often exceed 20 years, it's practical life may actually be much shorter. Changes in seating layout, program material, music worship styles and congregational expectations may often necessitate a more pressing upgrade.

At the other extreme, performing a substantial upgrade on your current system for small increases in performance usually does not make financial sense.

There is also the confusion of understanding the technical differences and actual performance benefits of current offerings. To this end we will explore three sound delivery systems.
1. The Central Cluster System
2. The Multi-Speaker Delay System
3. The Lucid ULD Integrated System

Throughout the presentation of each system we will discuss the problems found in most church and large room environments and suggest a solution to create the quality sound experience you and your congregation are after, the kind of sound you can "Fall in love with!"

Please take the time to review each point which relates to the type of system you currently have to discover the many benefits of making a small investment to receive great benefits.

Thank you.

System Types

The "Central Cluster"

The central cluster was intended to provide equal sound volume (amplitude) throughout the room by being centrally located, high on the ceiling, hence it's name. In practice this ideal cannot actually be attained as distances to each listener are different so if we apply the Inverse Square Law of how sound travels, the amplitude will be different throughout the room. While the Cluster method can provide a fairly even sound level in certain rooms, they are highly dependent on the room design itself. The central cluster works best in tall rooms without balconies. If your room has a low ceiling, the Central Cluster is absolutely not the solution.

Central Cluster

Direct sound

Reflected sound

A   B   C

Reflections
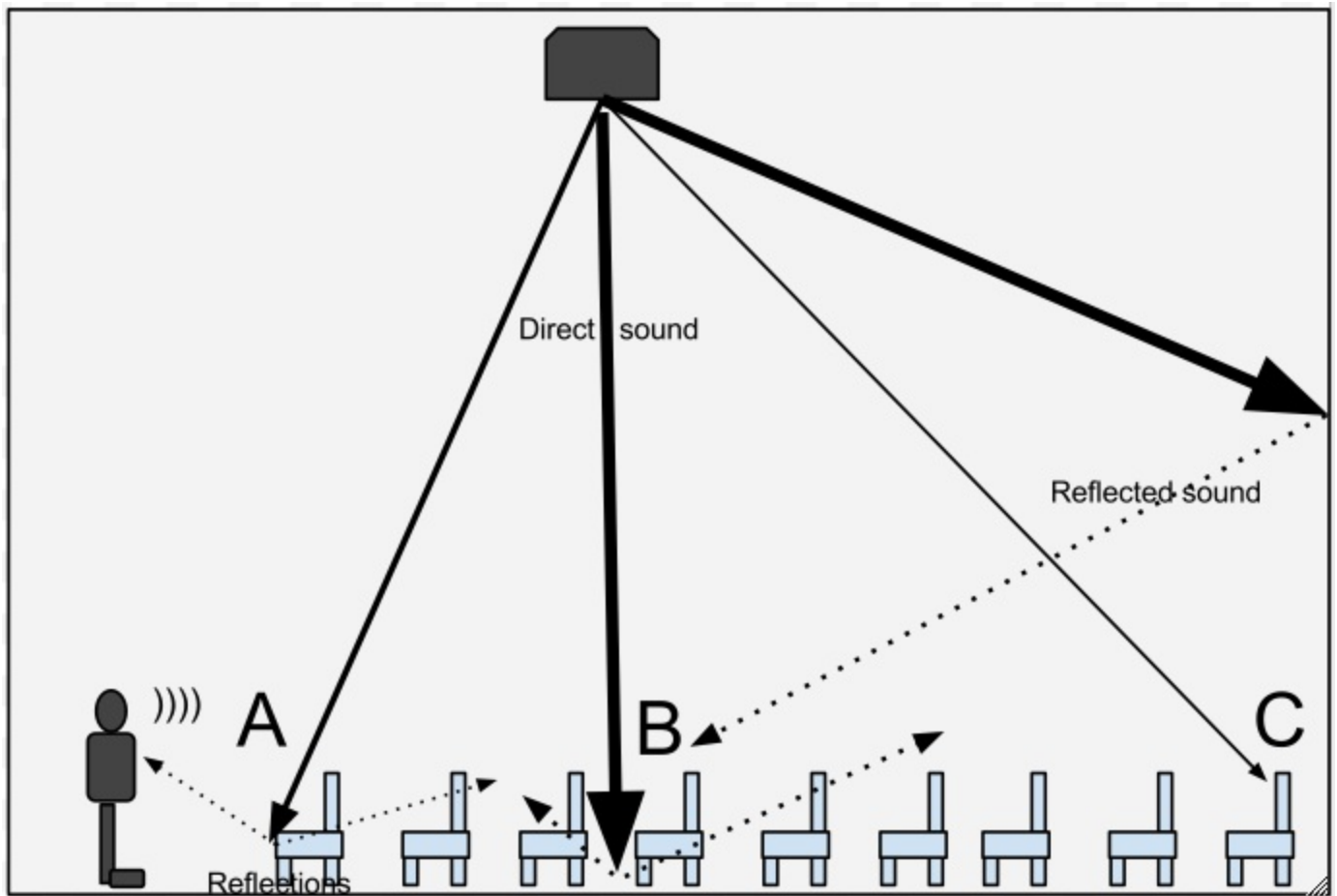
Front Central Cluster
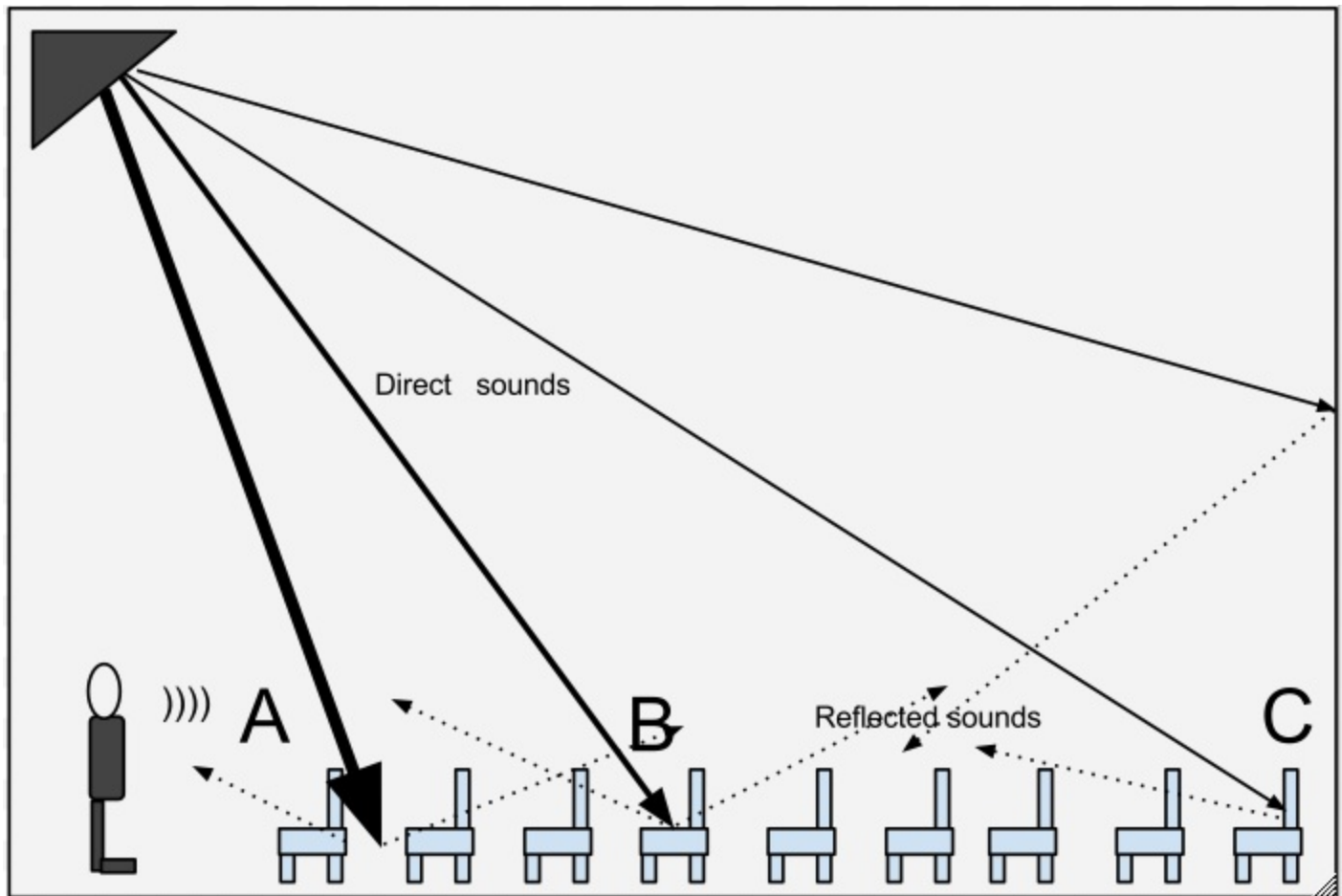
One can see that distances to each listener are not equal so sound amplitude will not be equal. Sound levels will vary greatly in the room.

In addition to the the amplitude issues mentioned above, 3 further concerns are associated with a Central Cluster installation.

High installation costs
High maintenance costs
Program Delay

High installation costs stem from the need to mount the units against a ceiling which is often 50 feet or higher. This affects maintenance costs as well due to the requirement of bringing in specialized equipment for adjustment, removal or repair. Long, large gage wire runs, associated mounting costs, wire routing issues and lack of use during installation are other considerations.

Central clusters can also exhibit delay since the speakers are mounted high overhead. When a Talker begins speaking it takes a split second for the amplified sound to arrive at the talkers ears. This delay, however short, can impact the presentation of all but the most experienced talkers since the delayed sound of the talkers own voice disturbs the human psychoacoustic system.

The above points aside, this still does not take into account the 2 most detrimental sonic problems in a Central Cluster installation.

1. Localization
2. Reflection

Localization

Localization is the ability to identify the origin of sounds.

As can easily be understood by viewing the above images, the lack of localization produced by a Central Cluster is caused by the sound appearing to originate from the ceiling overhead and not from the talker. This is especially true of the Design #1 above with the Cluster in the center of the room.

Just as intimacy is created by looking into another's eyes when we speak, sound creates intimacy when the words appear to emanate from the speakers lips. The lack of localization in a overhead Cluster system de-couples the listener from the experience and is destructive to immersion.

Reflection

Reflection, depicted in the images above by the sound waves represented by the dotted lines is a sound which is softer than the direct source but it is arriving later at the listeners ear since it has traveled a further distance. This causes 2 problems, blurring and volume changes. All the reflected waves arrive late so this blur or slight echo is unavoidable. The second problem is the the reflected wave is not in phase with the direct signal so it might make some sounds louder, (which causes feedback) and some sounds will be decreased and lost.
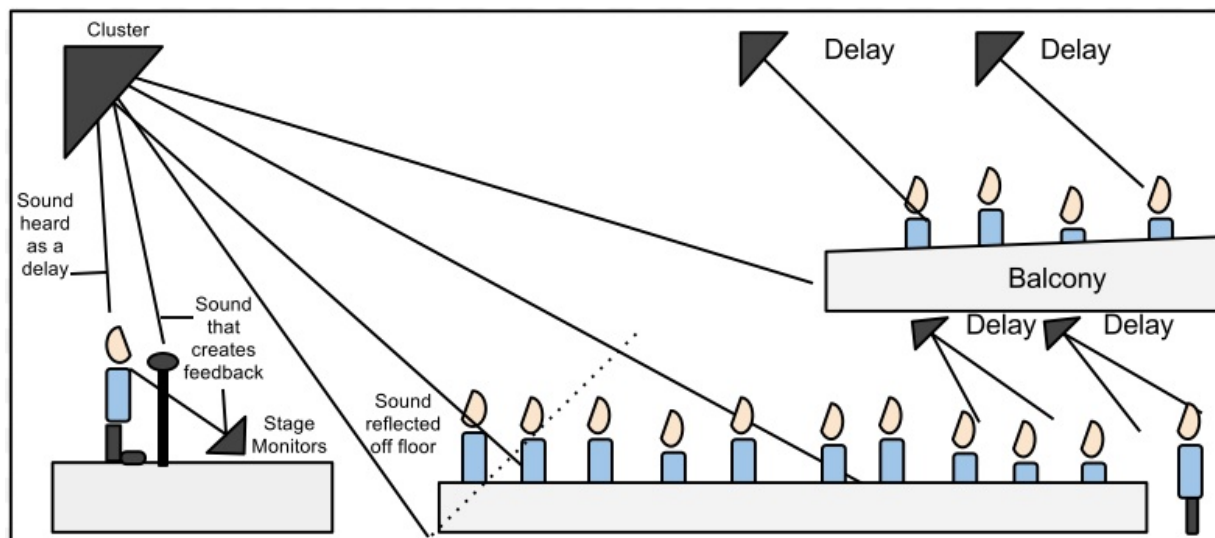
To summarize the Central Cluster design issues:
Amplitude differences
Sound delay
Poor localization
Reflected/blurred sound.
High Installation and maintenance costs

The "Multi-Speaker Delay System"

In the Multi-speaker delay system, speakers are placed on the ceiling and as sound amplitude drops with distance, additional speakers are added. Since an echo would occur if all speakers are fed the same signal, a delay has to be introduced to correct each speaker mounted further back in the room.

In this design, stage monitor speakers are necessary for stage performers to be able to hear their instruments. The Delayed System is usually used in longer rooms and rooms with under balcony areas.

Some sound issues associated with the Central Cluster design are present in the Multi-Speaker Delay Systems as well.

The equipment required for this installation	Problems with this installation
Large Overhead Cluster	Delayed sound heard by Talkers
Auxiliary Speakers	Sound that creates feedback
Multiple Amplifiers	Sound energy wasted on floor
Stage monitors	Sound reflected off floor
Delay Control Electronics	Costly and complex installation

Installation of multiple overhead speakers, stage monitors extra mixing capability complex delay circuitry, multiple, long wiring runs and all the associated amplifiers present a high cost and long installation time with often poor results at a much higher cost.

The Lucid, Uniform Loudness Distribution System.

The New Lucid ULD (Uniform Loudness Distribution© System is the only system of its type built upon our exclusive FAB© design. Our FAB or Frequency/Amplitude Beaming engine breaks the distance sound barrier by allowing sounds to travel further distances without losing loudness as traditional speakers do. A single pair of Lucids fulfill the needs of most church sanctuary designs with a minimum of cost and complexity. Often, a single Lucid ULD can fill a smaller sanctuary. There is also less need for additional stage monitors.

"Lucid Breaks the Sound Barrier" due to its unique new "Beam Forming" design. Unlike conventional speakers Lucid ULD's treat sound in a completely different manner, arranging sounds into a tightly focussed beam much like the way a laser transmits light. Sound levels remain very similar over long distances due our Uniform Loudness Distribution design.

When our tightly controlled beam enters a space, sounds no longer hit the floor or are wasted near the ceiling. Associated reflections and echos simply disappear.
In addition, since the speakers are located at the height of the talkers and performers there is great localization and the sound produced is very well controlled, practically eliminating feedback and greatly reducing amplifier requirements and total system complexity.
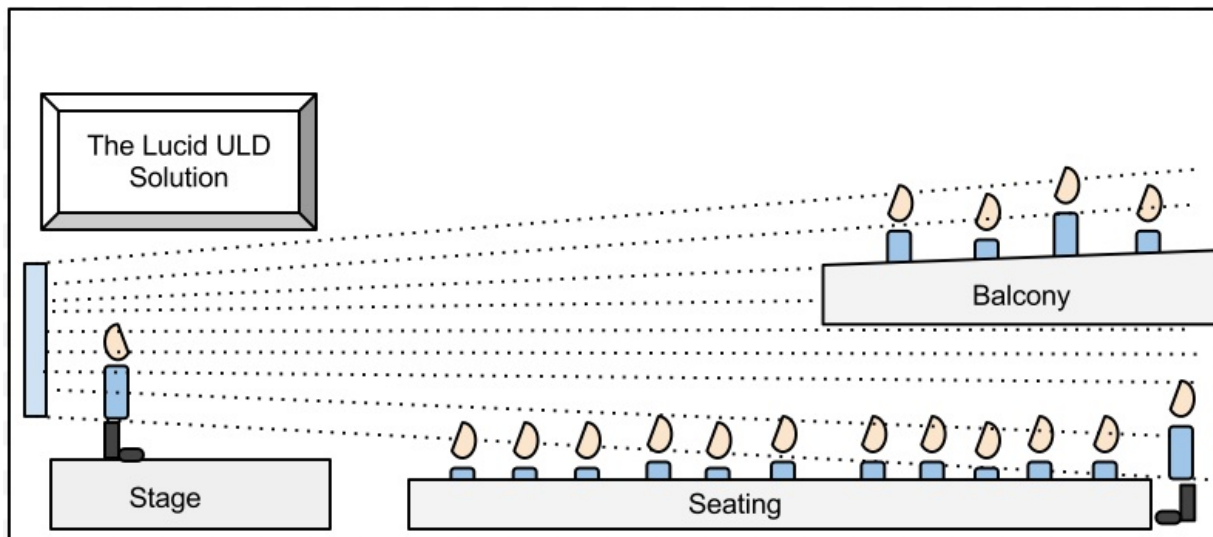
Traditional speaker installations projecting sound just 100 feet can lose over 20 dB.
Lucid Transducers with the FAB© engine can project sound *1000 feet* with just a **19dB** loss!
I invite you to experience the Lucid ULD difference and hear all the sound you've been missing.