

Intelligibility

Music Is Great But Announcements Are Hard To Understand

This complaint is not unique. Many buildings with acoustical problems will lack in speech intelligibility. Lack of Intelligibility is mainly caused by long reverberation times. Long reverberation times are caused by buildings that have interior walls, floors, and ceilings consisting of materials that are hard and non-porous in nature. For example: Concrete block, metal, painted wood, hard plastic, and glass. Buildings utilizing the same or similar materials can have reverberation times of 6 to 12 seconds. (Reverberation time is the time it takes for sound energy in a building to reduce to a tolerable level.)

A three second reverberation time is considered to be within tolerable limits that permits "intelligibility" without critically dampening the characteristics of the building. It would not be desirable to have a building primarily designed for recreational activities to take on the atmosphere of a library.

The amount of Intelligibility capable of being achieved will always depend on the following:

(A) The reverberation time of the building.

Acoustical treatment is the only solution to lowering the reverberation time of a building. Acoustical treatment however can be very expensive. KDM has always expressed the following when involved with a poor acoustical environment. "You can double the price of the sound system and get a 5% improvement. Unfortunately unless the basic problem of poor acoustics is addressed, 100% intelligibility can never be obtained.

(B) The announcer that is using the system.

Intelligibility can never exist if the announcer does not talk slowly and articulate properly. "Mumble in, Amplified Mumble Out." To this date no one has developed a "Magic Microphone" to solve annunciation problems. The worst announcer for this environment has always been the local radio announcer. He is the only person that can squeeze a one minute ad into a 15 second time slot.

(C) The Design and Location of The Speaker.

KDM's 360° x 180° Central Speaker Systems are designed to be the most economical approach to maximize intelligibility in reverberant buildings. KDM's 180° x 120° Multi-Location Speakers are designed to compliment the Central Speaker when the acoustics in the building are exceptionally poor due to abnormally high reverberation times. These type of designs are more expensive than the single Central Speaker System approach since many speakers are required, however this approach can provide exceptional results.

The best way to understand why the Central Speaker is the most economical design, one must visualize the building from a lighting point of view.

Objective: Provide the most economical light source that will produce the required coverage within a building where the ceiling, floor, and walls are mirrors. (Analogous to a reverberant room).

Solution: The obvious solution is a single light installed in the center of the room. Again, the distributed sound system is comparable to installing many light sources (similar to spot lights), which would be more expensive to purchase and install than a single light source, but may be required when the reflectivity within the building is extremely high. The same basic principles apply when designing a sound system to operate within an exceptionally high reverberant room.

KDM's Central Speaker System are the most meaningful and economical approach to this type of problem. If the building is highly reverberant, 100% intelligibility can never be obtained unless the acoustical problem is addressed. The result that can be achieved in a poor acoustical environment is normally expressed as follows: 75 to 85%* of the people will be satisfied with the intelligibility 75 to 85%* of the time providing the announcer talks slowly, articulates perfectly, and is experienced in using a microphone."

*The actual reverberation time of the building could vary the percentages as stated.



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