



BASIC DISTRIBUTED SOUND TIME ALIGNMENT

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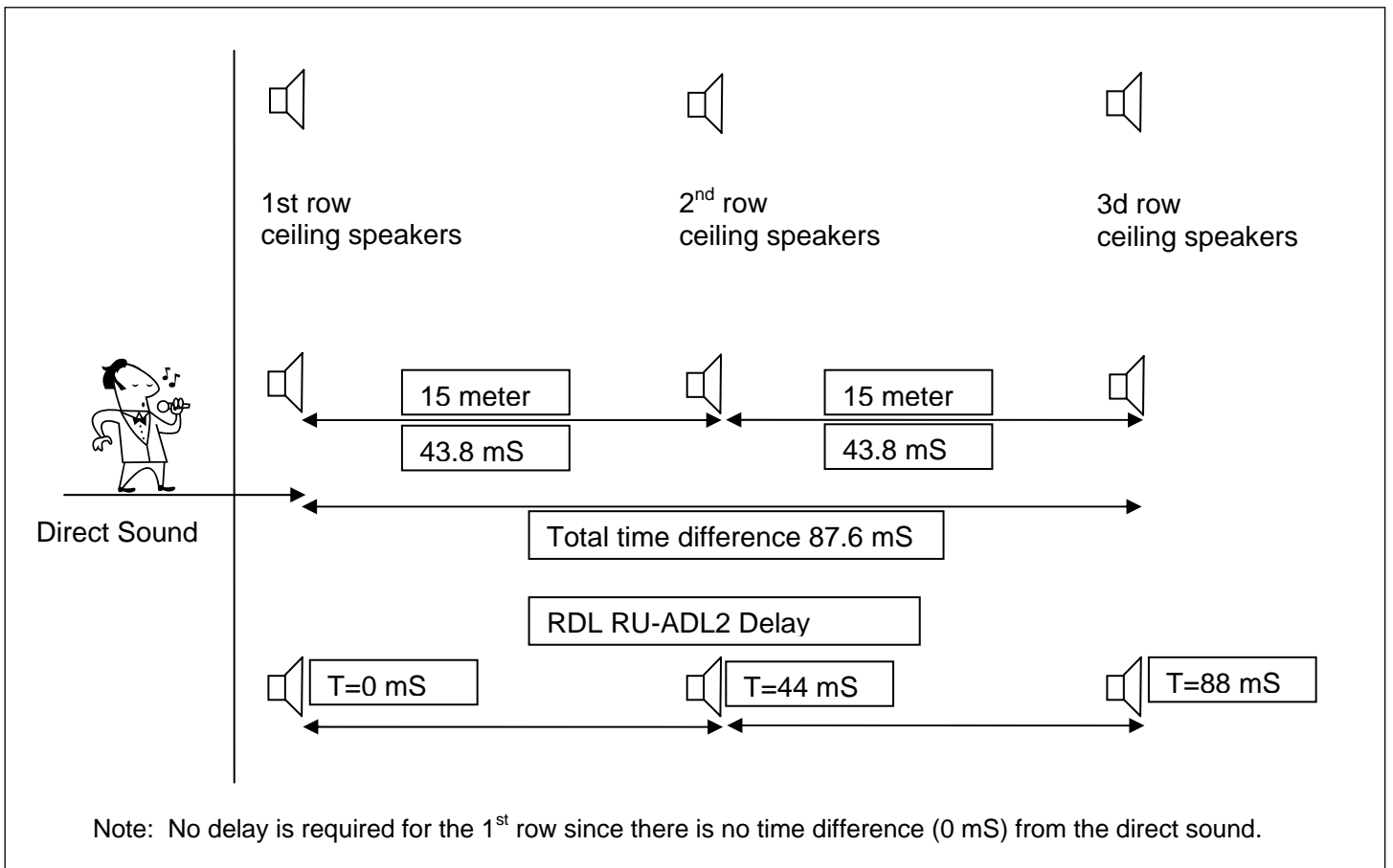
Many distributed Audio systems perform very poorly due to audio timing problems that produce poor intelligibility, muddy sound and a high reverberant field. Audio does not travel as fast through the air as it does through wire. At a listener's position, the sound from the loudspeakers arrives earlier than the direct sound and the sound of the other loudspeakers. The result is an audio system that sounds bad and is difficult to understand.

This problem is frequently encountered in small public meeting halls, meeting rooms, schools and churches. Budget constraints often prevent the addition of expensive signal processing units and the additional power amplifiers required to separate the overhead speakers into zones based on the distance from the presentation area. Economical utility power amplifiers that include built-in compressors for overload protection can be coupled with a basic high-quality line-level audio delay to provide all the audio processing needed for small to medium halls. This equipment combination is versatile, and may add little if any cost to the original design budget. In existing installations, the same approach can be applied to retrofits, producing remarkable improvement to the system at minimal cost.

An example of power amplifiers suited to such installations is the RDL FP-PA20 series. These amplifiers, available in 8 Ohm, 25V, and 70V/100V output models, provide 20 Watts RMS plus compression. The audio compressors included in these amplifiers prevent undesirable overloads, transformer saturation and clipping. They also increase the effective output level per watt, producing an unclipped sound level equivalent to a standard 50 Watt amplifier. These amplifiers are ideal for driving a row of speakers in small and many medium halls. The internal compressors eliminate the need for a signal processor to provide compression.

Time alignment can be provided by delaying the line-level inputs to the power amplifiers using the RDL RU-ADL2 AUDIO DELAY. The RU-ADL2 has two separate delayed outputs and a legible front-panel time display in milliseconds. Pushbuttons allow simple basic delay setting and fine tuning. Once adjusted, the unit can be "locked" to prevent user misadjustment.

A complete system design may include additional RDL modules. Examples include the RU-MX4 portable or fixed mic/line mixer, FP-MX4 or ST-UMX3 fixed mic/line mixers for hardwired jacks, and the ST-VCA2 and associated remote control to provide user control of the system gain. Various mounting accessories are available for rack-mounted systems; enclosures are also available for systems without an equipment rack.



In the diagram, the first row of loudspeakers is treated as direct sound. The 2nd and 3rd rows are delayed according to the traveling time of the direct sound through air.