Understanding Column Speakers

Sound from a point source, emanates evenly in every direction.

A loudspeaker (the speaker itself, not the system that includes the mounting baffle and cabinet) has a paper cone that moves back and forth to generate sound. The back side of the cone also generates sound that unfortunately happens to be out of phase with the front.

When two sound sources interact, the phase of the sound waves causes cancellation of the sound in some places and reinforcement in others.

When more than one loudspeaker is mounted in a single line in a cabinet (know as a column), the projection pattern of the sound is such that there is wide horizontal dispersion but narrow or focused vertical dispersion.

Due to the wide horizontal dispersion, sound from a properly focused and properly placed column can be heard well to the left, center, and right of the stage.

Due to the narrow vertical dispersion, sound from a properly focused and properly placed column is concentrated on the dancers' heads, and not lost on their feet or into the ceiling. If sound were sent up toward the ceiling, it would reflect back to the dancers and could interfere with the direct sound, either cancelling it or causing an echo effect. (In an outdoor situation, it would be lost as wasted energy.)

To fully take advantage of the focused pattern of sound emanating from a column speaker:

1. Use the column vertically.

2. Do not break the speaker in two and use each half on the ends of the stage.

3. If you have a second column available to you, don't plug it in! In general its sound will interfere with the primary one.

4. Position your speaker so that there is no interference with the sound pattern coming out of the front of the speaker. This means:

a. If possible, use a stand.

b. If the speaker is on a table, move it up to the front edge of the table.

c. Don't point the speaker into the back of a basketball backboard.

d. Move the speaker forward of any cornice that may be part of the stage curtains.

e. Tilt the speaker slightly so that you do not get any direct reflection off of the back wall. If the back wall surface is a real problem, move to the side of the stage and aim the speaker toward the corner between the back wall and the far side wall.

Remember if they can't hear you, they can't dance to you.

Don Beck, Stow, Massachusetts September 11, 1992

Column Speaker Design

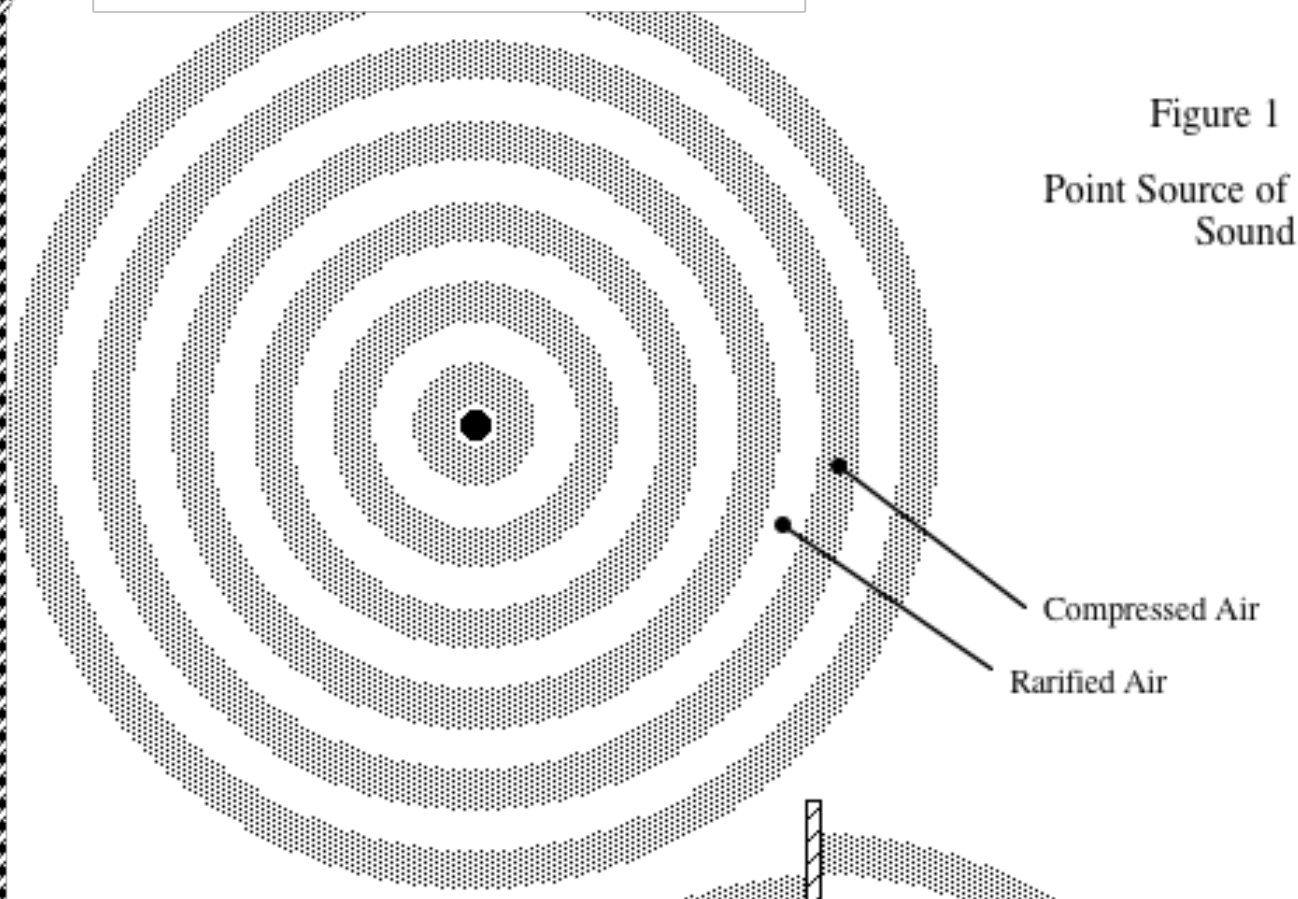

Figure 1

Point Source of Sound

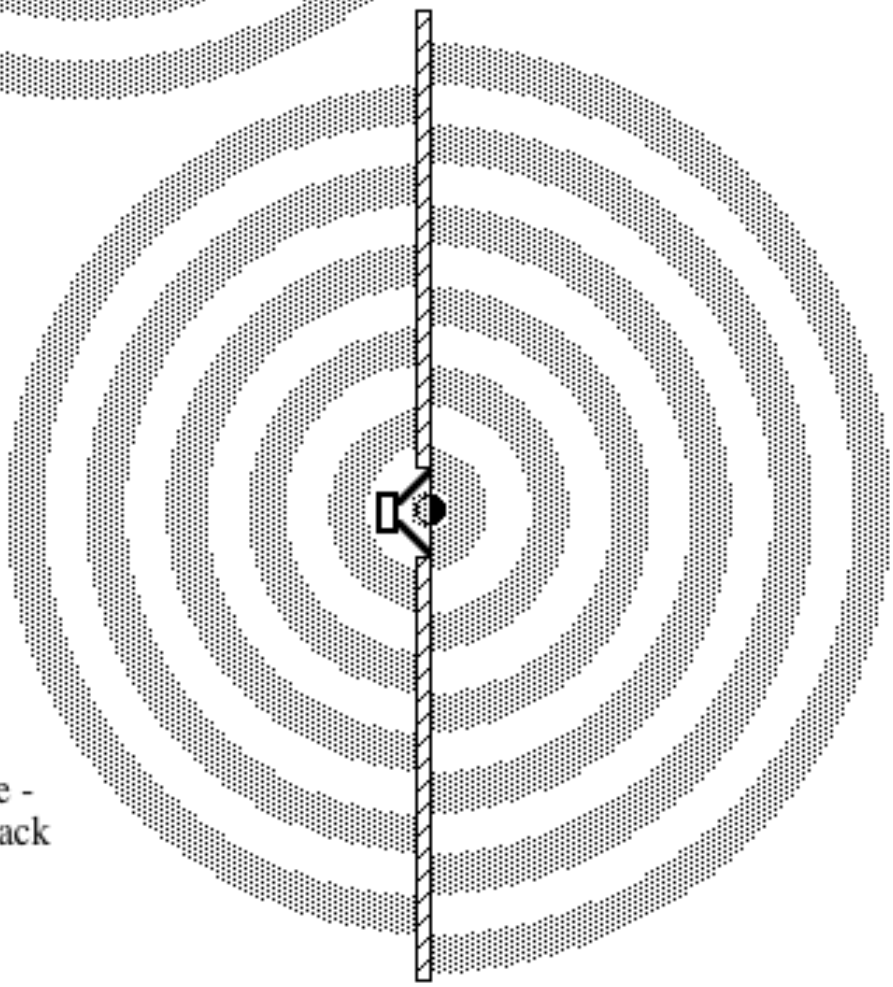

Figure 2

Single Speaker Mounted on Baffle - Note Front and Back Are Out of Phase With Each Other.

Don Beck - Apr '90

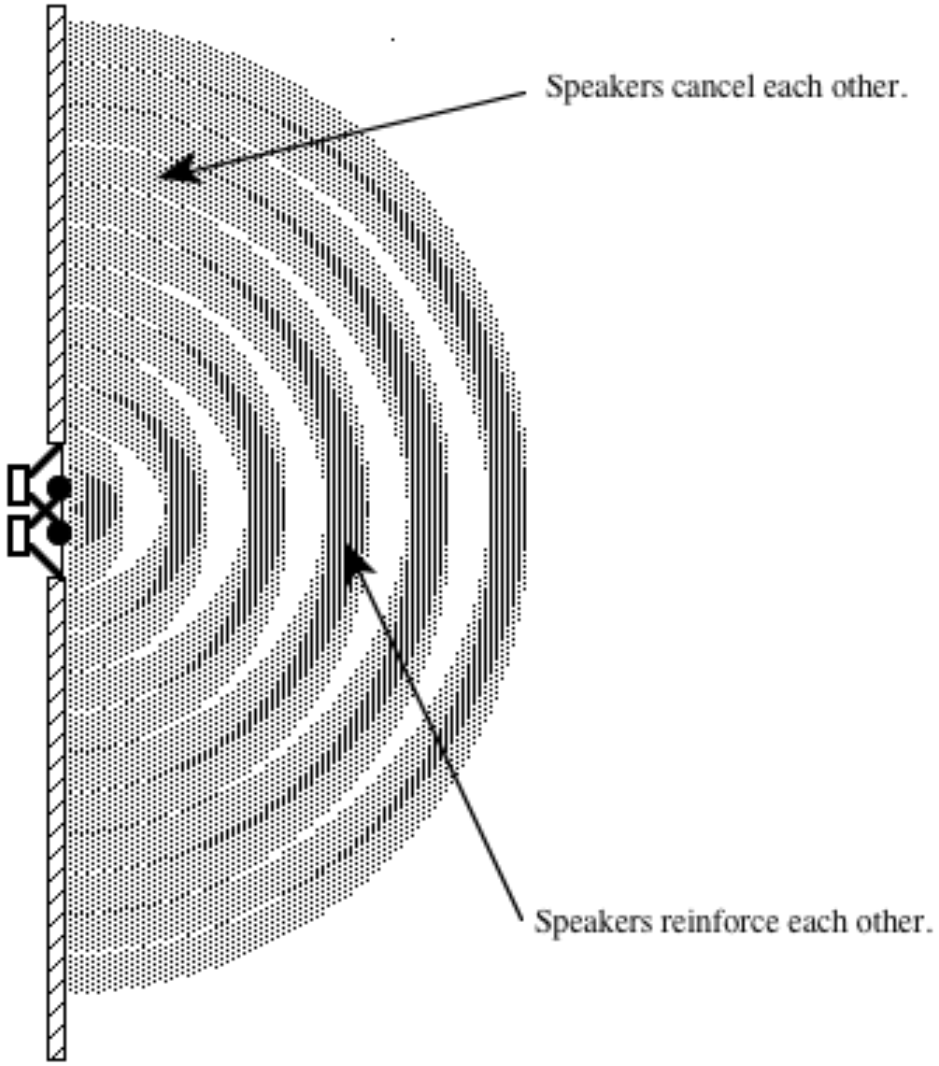

Figure 3

Short Column of Two Speakers,
Showing Pattern of Sound Reinforcement