



The Subjective Qualities of Wide-Dispersion Acoustic Lens Technology Loudspeakers

by David Moulton

Note: This was originally written in 1996, and has been updated in 2007

Over the years that we have been studying and working with high-frequency loudspeaker dispersion, we have come to a number of conclusions about the subjective differences and improvements to the sound quality that occur with wide-dispersion flat-frequency-response designs, particularly our proprietary Acoustic Lens Technology (ALT).

The primary benefit of ALT is also the most obvious: the loudspeaker sounds essentially the same in all directions in front of it. While most loudspeakers have significantly degraded high-frequency response by the time the listener is more than 20 degrees off axis (a very typical listening condition), ALT speakers maintain unchanged frequency response to approximately 80° off-axis, which is to say idealized response across the entire listening area. (In advertising terms, we might say: “No more cheap seats!”)

Beyond that obvious benefit, in stereophony we have noted a number of sonic qualities imparted by ALT speakers, in all types of rooms and in direct comparison to conventional direct radiator speakers of similar quality. Most striking is that the phantom images generated by ALT stereo or surround arrays are strikingly realistic, palpable and convincing. Further, ALT speakers are generally less dependent on specialized room design and placement to achieve superb stereophonic performance.

In addition, the phantom direct and reverberant images exhibit much greater depth of field, usually appearing to originate from an imaginary stage somewhat behind the wall that is behind any pair of loudspeakers. There is an enhanced sense of spaciousness, width and stability of phantom images that yields a comparatively large and comfortable “sweet spot” for the listeners. The stereophonic quality of the playback is well-maintained off the median plane as well, supported of course by the idealized off-axis high-frequency response.

Because the phantom images appear from beyond the speakers, the apparent loudness can be increased significantly. This “virtual loudness” quality is quite substantial when the speakers are placed comparatively close to the listener while the far wall is distant. The apparent loudness of the distant images is subjectively much greater than the measured sound level would suggest.



Another desirable quality is that the reverberant and ambient detail of recordings is quite clearly revealed, permitting the listener to “hear into” the recorded layers with great definition and detail. Ambient and 3-D effects such as Q-Sound are extraordinarily effective.

Finally, ALT loudspeakers tend to “disappear” from the musical illusion. Almost regardless of placement, sound appears to emit from beyond the speakers in a very live and airy way. This quality is evident and compatible with all musical styles, proving to be extremely compelling for minimalist classical recordings, mainstream multitrack pop, rock and jazz, as well as alternative and rap recordings.

When used for surround recordings, both discrete live 5-channel recordings and “produced” surround (multitrack or stereo source recordings with ambient and delayed feeds to the rear, plus a “derived” center channel), ALT speakers in a surround array seamlessly fill the room, yielding an extremely strong quality of envelopment and space, with an unusually powerful sense of presence of performers. There is no need for dipole rear speakers to obtain the desired surround ambience – ALT yields better results.

ALT speakers in home theatre arrays work wonderfully well, for both front and surround channels. ALT also yields a wonderful center channel with very clear and crisp intelligibility but no harshness. All the stereophonic benefits and consistency of response that are attractive in music playback yield even greater dramatic and spatial benefits for surround video and film presentations.

In summary, ALT loudspeakers generally yield a more pleasurable, entertaining and enveloping subjective experience for listeners than other speakers of similar quality, with fewer constraints.