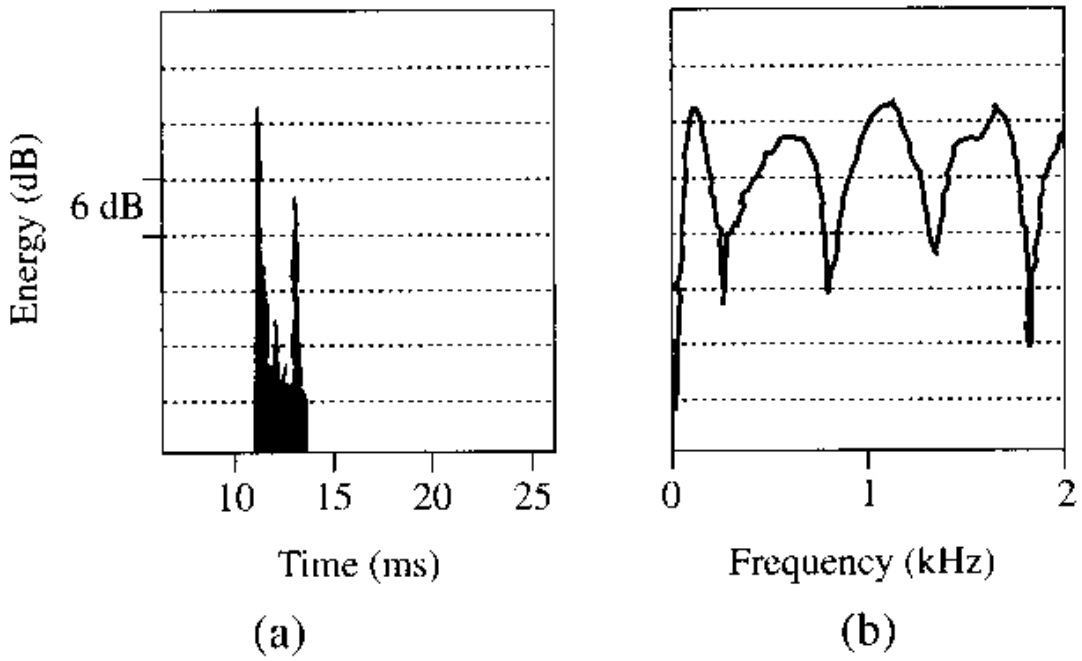

An intimately related interference effect is known as speaker boundary interference - the coherent interference between the direct sound emanating from a reference monitor loudspeaker and the reflections from the room it is in, in particular, usually from the corner immediately next to the loudspeaker. This type of audio distortion, like comb-filtering, can also occur over the entire frequency spectrum, but is usually more problematic at lower frequencies.

The control room's boundaries – walls, floor, ceiling if highly acoustically reflecting, mirror the sound coming from the loudspeaker, forming virtual sound sources behind these room surfaces. These first-reflection virtual sound sources then interfere constructively/destructively to varying degrees with the direct sound from the loudspeaker, depending on the amplitude and phase relationship between the direct sound *vs*. reflected sound(s) at the listening position. If *e.g*. a loudspeaker is located ~ 1 *m* from each surface in the corner in the control room, then there will be a total of 11 virtual images of the loudspeaker formed in the room! Subsequent reflections of the sound will produce even more virtual images, located behind the first 11. If the walls of the sound room were perfectly reflecting, in the steady-state, there would be an infinite number of images of the loudspeaker formed in each corner of the room, each fading off into the distance, just as in the case of light, for a real room of mirrors. Moving the loudspeaker farther away from the nearest adjacent corner will lower the frequency of the first destructive interference notch, and if far enough away, hopefully it will be below the lower cutoff frequency of the loudspeaker. However, *e.g*. for a cutoff frequency of 20 *Hz* this distance is ~ 5 *m*!

The nature of the reverberant sound field associated with a recording studio's control room is also critical. It is best that the {frequency-dependent} reverberation time of the control room be relatively short – shorter than that of the reverberation time of the recording studio itself, so that the natural reverberation effects of the recording studio can be clearly heard by the recording engineer.