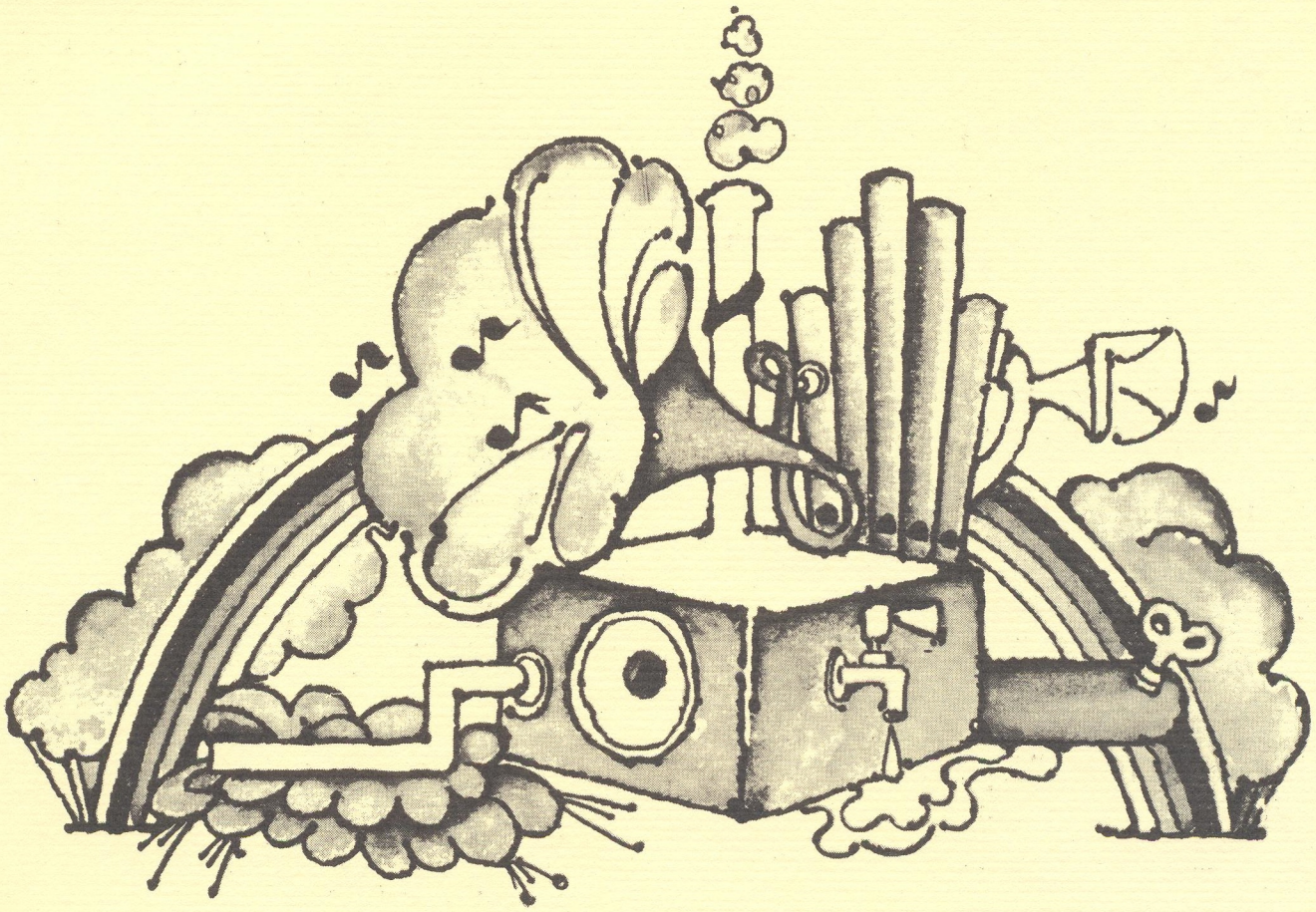


HO HUM

Another major breakthrough

Oh No! Not Again! Yes it seems that every year someone "re-invents" one of the discarded speaker designs of the past. Or they purport to modify the laws of physics by miniaturizing a 32-foot wavelength. They may even write a "technical" article on their revolutionary discovery and succeed in getting it published.

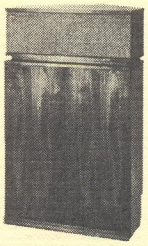
We customarily make an optimistic estimate that these speakers will survive five years. Some make it. Some even get re-invented all over again after a subsequent five years. In the meantime they sell. Because they sound different. Different from all other speakers. Different from the live performance.

We'd sort of miss them if they failed to show up. After all, what would spring be without a new major breakthrough? And would it really be fall without the letter edged in black? Pity!

So – aren't you glad you own KLIPSCHORNS®?

Paul

Paul W. Klipsch
Klipsch and Associates, Inc.
P.O. Box 280
Hope, Arkansas 71801



P. S. We have a list of over 20 major breakthroughs that have appeared, died and were interred. Your Klipsch dealer will be glad to show it to you. We know some more good prospects for this list. You can't see those names — until next year.

KLIPSCH & ASSOCIATES
Box 280
Hope, Arkansas 71801

Please send me complete information on Klipsch speakers and Klipsch Wide Stage Stereo. Also include the name of my nearest Klipsch Authorized Audio Expert.

Name _____

Address _____

City _____ **State** _____ **Zip** _____

Occupation _____ **Age** _____

KLIPSCH AND ASSOCIATES HOPE ARKANSAS

MAJOR BREAKTHROUGHS

1. L. E. E. Catenoid
2. deMars
3. Gatley
4. Georgian
5. Patrician 400
6. Centurian
7. F. A. S. Air Coupler
8. Transcendent
9. Dean
10. Classic
11. Hartsfield
12. Ionovac
13. Aristocrat
14. Imperial
15. Orthophase
16. Omnisonic
17. Royal
18. R. J.
19. Quadraflex
20. Fold-A-Flex
21. Pickering
22. Isotone
23. Stan White
24. Intergrand
25. Laguna
26. Integral Space Transducer
27. Orchestrad
28. Shorthorn by Klipsch (Yup we did it too)

There are a lot more, most of which we remember only by design not by name, like any number of stove-pipe (Helmholtz resonator) designs. One was a speaker in a plastic bag filled with freon, the heavy gas was supposed to give an extra ½ octave bass. It worked too, but only if the listener was also in this gas filled bag. Myriad coffee tables, end tables, lampshades, paintings, vibrating boards and panels —

Now aren't you glad you own KLIPSCHORNS?

THE GREAT MAJOR BREAK THROUGH No. 29

or

"Reverberant Field Speakers"

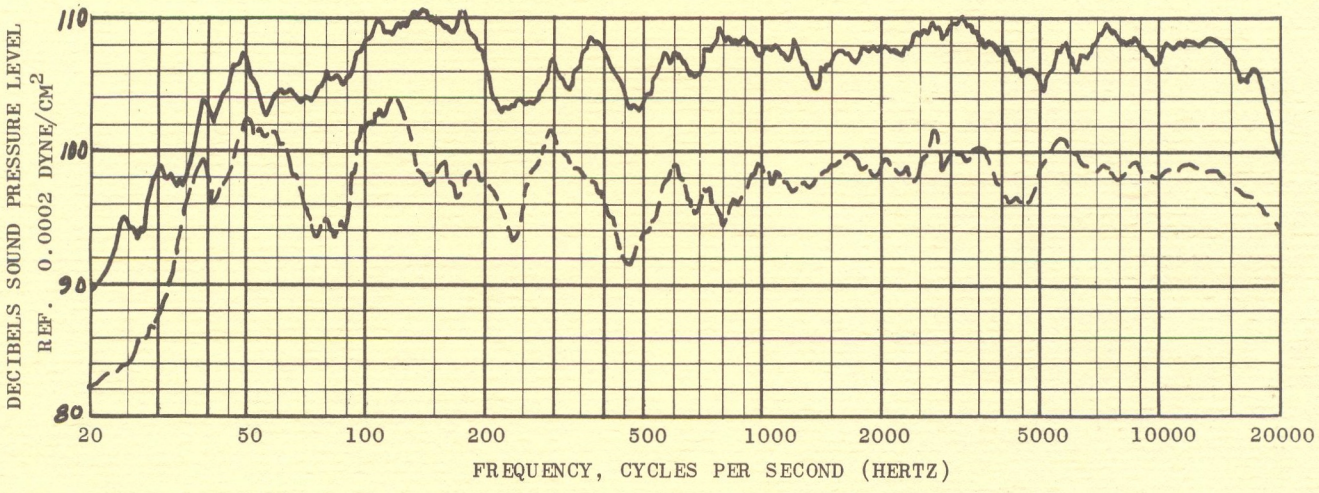
by

Paul W. Klipsch

The current "Major Breakthrough" in speakers seems to aim at creation of a "reverberant field". Advertisements for 360° speakers date at least as far back as 1964. Various people recall seeing such speakers as early as 1962.

Such loudspeakers are located with several feet of spacing from the room walls, and sound radiated in all directions from the speaker will be heard partly direct and partly reflected from the walls.

Square-law variation of sound pressure level in a free-field would dictate a 6 dB reduction in level for each doubling of distance, thus for 4, 8, and 16 feet the level should have decreased 6, 12 and 18 dB. The average difference in level of the 2 curves is about 8 or 9 dB. Thus the sound pressure level at the listener is about 9 or 10 dB higher than it would have been in "free field". This indicates that the increased level, 9 or 10 dB, or



Response curves of a loudspeaker: Top, close microphone placement to minimize reverberant effect; Bottom, microphone placement in normal listening area, 16 feet from speaker.

Actually it would be difficult to avoid a "reverberant field" regardless of where the speakers are placed as long as they are several feet from the listener.

The figure shows 2 response curves made on the same loudspeaker in the same room. The difference is in microphone placement. The speaker was of the corner type and located in a corner. The top curve was with microphone placement 2 feet from the speaker. The lower curve was with microphone placement close to a listener's normal ear location about 16 feet from the speaker.

increased power at the ear, is 10 times what it would have been in free space such as outdoors. The only conclusion is that what the listener would hear is about nine tenths reverberant sound.

If reflected sound amounts to 9/10 of the total sound, how can there be a stereo effect? The "precedence effect" is used to explain that. The sound which reaches the ear first is the clue which the brain sorts out and uses to determine direction from which the sound arrives.

Fidelity and stereo are both dependent on speaker placement. The late W. B. Snow in "Basic Principles of Stereophonic Sound" (Jour. Soc. Mot. Pict. TV Engrs., 61, pp 567-589, Nov. 1953) wrote that sound cannot be made to appear to come from beyond the flanking speakers; the flanking speakers thus determine the stage width. No recognition can be accorded the numerous expedients involving reflecting beams of sound off the wall as the frequency response and spatial response would be dependent on the character of the walls, room shape and other imponderables.

Wide speaker spacing thus is needed for "wide stage stereo", and at the same time permits a small group or a soloist to be properly located spatially on the "reproduced stage". This is done by varying the amplitude of a bridged center speaker relative to the flanking speakers, provided that the speakers are properly placed.

My own paper, "Stereo Geometry Tests" (IRE Trans. on Audio, Vol. AU-10, pp 174-176, Nov.-Dec. 1962) lays down the rules for good stereo, and the speaker placement for good stereo geometry coincides with placement for good audio tonality. The tests were conducted in the same room in which the response curves of Fig. 1 were made. It was found that "Live" sound could be located within one or two degrees of horizontal angle. Reproduced sound over 3 channel stereo or 2 channels with a bridged center speaker were localized within about 10 degrees. Errors doubled or trebled when only 2 speakers were used, and increased further with non-corner speaker placement and with non-toe-in of flanking speakers. The accuracy of localization was satisfactory in spite of the fact that 90% of the sound was reverberant.

So there is nothing wrong with a reverberant field. It would be difficult to avoid a reverberant field in a room that would be considered tolerable for listening. And this reverberant field will occur regardless of speaker location.

So why not put the speaker in the corner? I urge you to try this with any speaker of any make, type or size. There will be a gain of 5 to 6dB in sound pressure level as heard by the listener at an ordinary listening location. This means less driving power and less distortion for a given sound pressure level. It also means an extension of bass range for a given input. It means less bass boost for correction if needed for a deficient speaker response. It will probably result in more nearly flat overall response. It would be like substituting a 100 watt amplifier for a 25 watt amplifier without having to pay for the extra power in either dollars or increased distortion.

One of the small speakers recommended for placement "several" feet from a wall was tested as recommended, and then again in a corner with its sides actually in wall contact. The improved frequency response was plainly evident to the listeners present, and the peak-trough limits in the response curve decreased. Since for a given sound pressure level it was possible to reduce the power input, total distortion including modulation distortion dropped from over 10% to about 5%.

"Major Breakthroughs" come at the rate of one or two a year, and the average life may appear to be about 5 years. Some money is made on them, some ears habituated to false sounds (we are still talking about loudspeakers) and in 2 or 6 or 14 years most people will have forgotten the great event. The present reverberant field fad aims to sell loudspeakers. It would be impossible to avoid the reverbant field with any loudspeaker. Stereo geometry results from proper speaker placing and spacing; improved tonality and reduced distortion results from corner placement. Again I urge you to try it, with any speaker of any size or any make. Put it in a corner and see the improvement with your own ears. And something to keep in mind: the margin of improvement, or better said, the ratio of improvement, is as great when you start with a good speaker as with a poor one.

Why not start with OURS and save by avoiding future trade-ins!

For further information write:

KLIPSCH ***and Associates, Inc.*** **TELEPHONE PRospect 7-6751**

POST OFFICE BOX 280 • HOPE, ARKANSAS 71801

. . . The mark of integrity in loudspeakers!