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SOUND; TWO NEW APPROACHES TO OLD LOUDSPEAKER PROBLEMS

By HANS FANTEL

Reinventing the wheel has become a metaphor for redundancy. Reinventing the loudspeaker, by contrast, occasionally leads to valid innovation.

The reason, I suppose, is that the wheel - assuming it is really round - can't be much improved. Loudspeakers can, and lately a few venturesome engineers have made a stab at it.

Such attempts may involve imaginative departures from established norms, as in the case of the Acoustic Research MGC-1 and the dbx Soundfield 10 - two new models that were sounding forth with notable éclat at last month's Consumer Electronics Show in Chicago. Both designs represent new ways of dealing with one of the oldest and most recalcitrant problems in sound reproduction -the question of ambiance.

The problem is fundamental and arises from the fact that playing orchestral music in the living room is obviously unnatural. Orchestral sound is conceived with the aura of large spaces for the simple reason that no other kind of space could accommodate a hundred musicians plus their audience. The reverberant character of the concert hall is therefore implicit in symphonic music - an inseparable aspect of the sound imagined by the composer as he wrote the score. When such music is played via records or radio within the narrow confines of the living room, a contradiction develops between sonic and architectural dimensions. These new speakers - each in its own way - try to resolve this contradiction.

In the case of the Acoustic Research MGC-1 - a design developed by the former M.I.T. psychoacoustics researcher Ken Kantor - a sizable enclosure (25 inches high by 26 inches wide by 16 inches deep) actually houses two separate speaker systems. One projects the sound toward the listener while the other, set at an obtuse angle, directs the sound toward the nearest side wall. The speakers aimed at the listener are quite narrowly focused. You might say that they "shine" the sound at the hearer the way an automobile headlight points the light directly ahead in a tight beam. This pattern of sound radiation conveys a precisely defined aural image of the musicians' various locations on the imaginary stereo stage.

Such narrow sound projection normally entails a major drawback: It yields a hard, tight, even strident sound, bereft of the feeling of ambiance. But when supplemented by the speakers aiming at the wall, this liability dissolves, and the sound assumes a natural spaciousness, without losing the precise definition of the player's location. In the past, spaciousness of sound and precise stereo imaging have been mutually exclusive design options. Now Acoustic Research appears to have found a way to have the acoustic cake

and eat it, too.

One striking effect of this unique speaker is the apparent enlargement of one's living room. As the music starts, the walls of the room seem to recede to form an aural environment as capacious as a concert hall. This is not done by wall reflection alone. The trick is accomplished by a special delay circuit, which holds back the sound for the sideways speakers by about 0.02 second - roughly the time it would take for the sound in a fair-sized hall to reach a listener near the center after bouncing off the side walls. In other words, this speaker contains integrally the kind of ambiance-enhancement that is usually available only as a separate add-on device for highly elaborate sound systems. The result is an uncanny trompe l'oreille which transforms a residence into an auditorium, especially if you close your eyes.

Initial impressions gained at the Chicago show left no doubt that the Acoustic Research MGC-1 - quite aside from its ability to suggest ample aural space while maintaining precise stereo imaging - is a speaker of splendid fidelity, capable of doing full justice to any kind of music. And so it should, what with a price tag of \$3,600 per pair for the walnut version, or \$7,100 if your taste runs to rosewood.

The Massachusetts Institute of Technology appears to be a fertile breeding ground for adventurous acousticians. Another former M.I.T. researcher, Mark Davis, has joined the ranks of loudspeaker designers and developed an alternative approach to the problem of ambiance for dbx, a resolutely lower-case company located in Newton, Mass. Their Soundfield 10 speaker, which made its debut at Chicago last month, embodies the same principles pioneered in the Soundfield 1 (reviewed in this column last September) in a simpler and far less expensive version.

The speaker projects an omnidirectional sound pattern, spreading evenly in a full circle. This, of course, has been done before and invariably creates a pleasing sense of spaciousness, though often at the sacrifice of precise stereo imaging. Again, the aim here is to combine two formerly contradictory virtues and obviate the sacrifice. The dbx design manages to do this by means of a carefully calculated relation between the intensity of sound and its exact time of arrival from either of the two speakers, and by optimizing this relation for almost any point of the listening room.

This takes complex control circuitry and an array of precisely angled tweeters. But the approach works. You can walk or sit anywhere in the listening room and find the spatial aspects of the music rendered with striking veracity. For example, in a concerto recording, the soloist appeared to be located in front of the orchestra, just slightly left of the conductor. Surprisingly, this perceived position stays the same as you walk about the room - just as it would if you had walked about the concert hall during the performance.

Quite aside from its spatial aspects, the sound was remarkably rich and true, ample in the lower register and inobtrusively lifelike in timbre. At \$1,250 per pair, the dbx Soundfield 10 - to be available by early fall - will surely intrigue serious listeners leaning toward the cleverly unconventional.