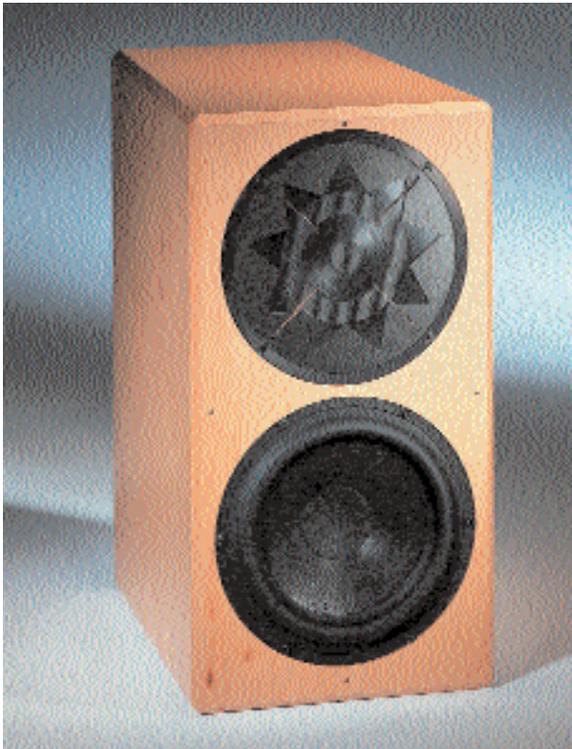


THE LANDING

Manger Zerobox 109 Loudspeaker



The Fountain of Youth, the Philosopher's Stone, the Elixir of Life, the Seven Cities of Cibola, the one-driver, full-range, point-source speaker. Obsessive dreams – the last a vision that sooner or later seizes the imagination of everyone in audio. I should know: Back in my teenaged do-it-yourself period, I attempted to build such a speaker using a 12-inch Philips driver that was supposed to handle high frequencies via a “whizzer cone.” Of course there really weren't any high frequencies. My full-range speaker was mostly midrange. Even the legendary Lowther driver, which represents an all-out assault on the problem of one driver for all frequencies via powerful magnets, still fails by contemporary standards to have a clean and extended top (see Scot Markwell on the Horning Alkibiades' super-tweeter in Issue 126).

The single-driver speaker becomes more plausible with the realization that, in listening terms, the single driver need not go down into the deep bass to get all the virtues a one-driver speaker ought to have. A crossover at 100 Hz or 150, or even 200, has hopes of an inaudibility denied those further up, simply because the waves are so long, down there, com-

pared to the size and separation of the drivers. It's the mid-to-tweeter crossover that comes a cropper. The usual approach to making a single driver cover frequencies from 100 Hz up has been to use woofers plus ribbon or quasi-ribbon line sources. The Carver Amazing (in its original all-dipole version) really was “amazingly” coherent. And the Wisdom speakers carry on the tradition. But aside from the Lowthers, there have been few one-driver point-source designs. Coaxial drivers abound that cover this range, but not true single drivers.

Enter the Manger driver, brainchild of distinguished German designer Josef Manger: listed response from 80 Hz to 35 kHz, -3 dB at 24 kHz. In the Zerobox 109, it is combined with a sealed-box woofer, crossover at 140 Hz, in a medium-size box for response from 40 Hz to 24 kHz, +/-3 dB. This speaker really functions acoustically as a point source.

The Zerobox 109 is the smallest speaker in the Manger line. The company's magnum opus has three of the Mangers combined in a single large box, with woofers to give full bass extension and the effect of an infinite baffle by careful configuring of the three higher-frequency drivers. This is similar to the later Audio Physic Medea, which used the Manger drivers, as commented on briefly by HP in Issue 109.

The Manger driver belongs to the family of “bending-wave” transducers. Instead of moving a diaphragm as a rigid unit, as conventional cone drivers do, a bending-wave unit activates a flexible diaphragm, usually at one central point, and allows the mechanical activation to travel as a wave in the diaphragm out to the edge. Thus the activation of the air occurs first at the driving point and later at points closer to the edge. You might expect time smear, but analysis using the classical Huygens' Principle, formulated by Christian Huygens in 1678(!), shows that the acoustic effect is of a time-coherent point source some distance behind the diaphragm. Quad uses this idea in the ESL-63 and its successors, the 988 and 989, except that the time delay is arranged electrically, not mechanically.

Bending-wave transduction can also be used along cones, with the cone mounted vertically and driven at its apex to produce a cylindrical wave-front, an idea pioneered by Walsh in the Ohm speakers and taken up by others since (see Dan Sweeney's German Physiks reviews, Issues 113, 120). But planar bending-wave drivers are rare. The Sumo Aria (review Issue 62) used this principle with a flexible plastic diaphragm, with acoustic damping toward the edges to terminate the traveling wave. The Manger driver uses a thin proprietary “plastic-like” diaphragm with three layers driven by a ring-shaped motor about half the diameter of the driver. The interior part of the ring covers primarily the high fre-

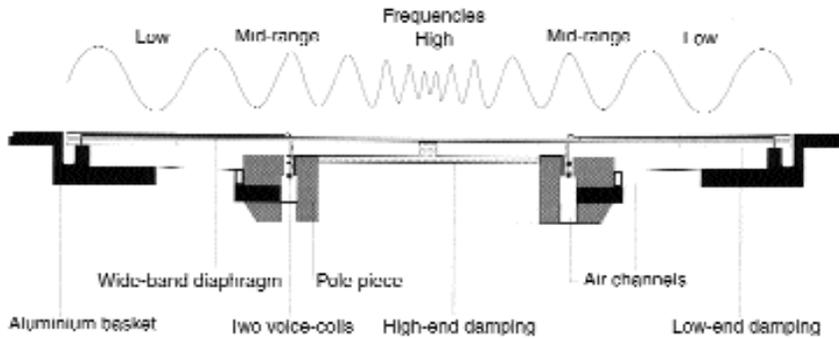


Figure 1: The structure and operating principle of the Manger driver.

quencies, while the lower frequencies propagate as a bending wave over the whole driver, with the wave mechanically terminated at the edge (see illustration).

This may sound straightforward, and the theoretical idea was formulated long ago. But it is anything but easy to execute. The bending wave has to be carefully controlled and carefully terminated at the edges. Otherwise it reflects back and interferes either with the direct wave, producing irregular response and ringing.

The Manger driver arranges all this very well, indeed. It has uniform frequency response over most of its operating range, with little ringing. But very well is not perfect. There is a glitch in response (both audible and measurable) between 1 kHz and 4 kHz, with a peak at a little above 1k followed by a narrow-band dip and then another peak somewhat higher up. The higher treble is somewhat elevated and not terribly smooth by contemporary standards, though the general elevation is alleviated by angling the speakers away from the listening position. The treble rolls off as it should, off axis, and the room sound is overall well balanced. (Drivers that do not beam the higher frequencies, to some extent, put too much high-frequency energy in the reverberant field to be consistent with the ear's increased response to highs in a diffuse soundfield.)

The peaks above 1 and 3 kHz can be pulled down by equalization, an improvement, to my ears. Peaks and dips from delayed energy are likely to be non-minimum-phase, and attempts to eliminate them by minimum-phase EQ have to be made cautiously. The attempted curve may be worse than the disease; aggressive "high Q" filters especially can lead to ringing. In particular, the dip at around 2 kHz in the Mangers had better be left largely alone. However, the Mangers with peaks pulled gently down and treble tamed sounded closer to neutral balance without negative side effects, though the Mangers were still not as silky smooth as, say, the Harbeth Monitor 40s. Many people are unperturbed by midrange projection; some even find it attractive. But to me, the uncorrected Manger is too forward and too lightweight., and oddly colored in the upper midrange/lower treble (see Figure 2a and the manufacturer's measurements on the Manger website www.manger-msw.de). Ella Fitzgerald's famous Verve recordings sounded too close and the consonants were considerably over-enunciated. Water Lily's recording of Arturo Delmoni's unaccompanied violin exhibited some alterations of tonal color, with the relative prominence of each note's harmonics varying with the pitch of the note (this variation occurs in reality but not in this particular way.)

The Mangers were otherwise outstanding, even stunning. Their coherence is total. Almost no other speaker

comes close in this regard. The Quad ESL 63/988/989 and various Dunlavy models, at a distance, are also ultra-coherent, but the distance is required, whereas the Mangers are like that even in the "near field," down to a foot or so! We are worlds away from the isolated-tweeter effect of most 24-dB-per-octave crossover speakers flooding the market nowadays. With Manger, we are in the universe of unified sound.

The point-source character of the Mangers creates stereo imaging that is almost unique.

This may be misunderstood by

people used to the over-sized images produced by large, incoherent radiators or the vague images produced by wide-dispersion speakers in narrow rooms at large listening distances. The Mangers do the real thing: They produce the exact images of theoretical stereo – with recordings that offer the possibility. The Paula recording of the Roskilde Cathedral organ, for instance, gives a precise recreation of the actual experience of hearing that organ in that place, with both the direct sound and the discrete wall reflections perfectly resolved. The effect is almost uncanny. [Paula PACD 72].

The Mangers do produce a large "soundstage" when that is present on the recording. They just do not produce an artificially enlarged spatial sense. One school of thought minimizes the importance of point-source character in stereo, and claims that correct tonal balance and reasonable off-axis behavior will make stereo perfect. Don't believe it until you try the Mangers. If a speaker does not sound like a point source, then its geometric extension will reflect itself in a distortion of the stereo presentation. I discussed this in detail in my Soundwave review, Issue 97. With the Soundwaves no longer with us, the Mangers are nearly unique in their ability to do this kind of stereo in close-up listening – where stereo produces the most precision by suppressing room effects.

The Mangers also have an extraordinary transparency, clarity, and resolution. On Ofra Harnoy's recording of the Schubert "Arpeggione" Sonata, the cello retained the warmth and beauty it should have on this recording. Though the Mangers lack deep bass, which smaller speakers naturally do, they have fullness in the middle bass regions with proper set-up. (The Mangers are small box speakers and have a fairly high -3 dB point of 40 Hz, but because of the slow roll-off of sealed boxes and the "room gain" effect, there is some response at least down into the 30s – not much; the speaker needs a subwoofer for full orchestral bass effect.) The integration of woofer and the Manger driver was flawless. The Manger really does deliver what should be possible in principle in this regard. The crossover is inaudible for all practical purposes. Maybe you could find some inter-driver effect with test signals and changing listening position, but on music the integration seemed complete to me. And in addition, the Mangers revealed the inner structure and micro-detail of the sound on the Schubert recording in a way few other speakers have equaled. This fine detail and resolution were not attached to any fatiguing exaggeration; indeed, the sound seemed simply to have the fine structure of music itself. This feeling occurred with all recordings, a point not to be obscured by the TAS convention of discussing specific

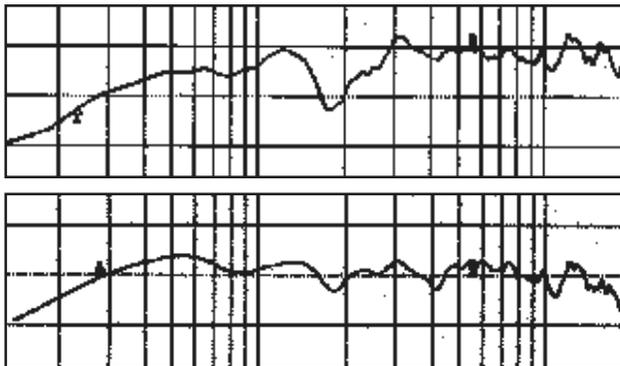


Figure 2a (top): “Quasi-anechoic” (early arrival, direct sound only) response of Manger Zerobox 109. Roll-off below 500 Hz is an artifact of the measurement technique.

Figure 2b: Response measured as in Figure 2a, after correction using Z-Systems rdp-1 digital equalizer/preamp.

ones. Orchestral brass, to take another example, on the Dallas Symphony’s recording of the Rachmaninoff *Symphonic Dances* (the ambient one on Audio + CDD 477, not the dry-as-dust Turnabout) had its natural complexity. And string tremolos sounded flawless in a way that seldom happens – they usually turn to mush. And instruments such as the banjo, which have distinctive, emphatic initial transients, had an extraordinarily lifelike character. These resolution effects are real, not attached to treble peaks, and indeed the perceived resolution persisted when the upper frequencies were flattened by digital EQ, as it did, too, off axis where the treble rolls down a good bit.

The Manger literature makes much of a claimed absence of “transient noise,” which I gather is the noise conventional drivers make from overshoot. While this surely exists, I have seen no scientific evidence that it is a serious source of loss of clarity. I do recall a speaker years ago from Bennett Sound Corporation that cancelled this noise electrically and seemed to offer exceptional clarity. Still, the Mangers do indeed have a remarkable clarity and a certain ease in listening that arises, I find, from experiencing unmasked details. One feels that there is a lower noise floor, as if one were in a quieter concert hall or listening room, except that the “missing” noise is signal related, not background. I talked about the importance of this musically in my Mordaunt Short review, Issue 103; with the Manger this virtue appears in full glory. Part of the beauty of music is embodied in this kind of purity. What use is a pure electronic signal if the speaker doesn’t preserve it? If the “spectral noise,” in Jensen’s terminology, of your speaker is only 40 or 50 dB down, what use is the 144 dB of dynamic range of DVD-A? This subject is too seldom considered: It really counts in listening. Among other things, it gives liveliness and clarity to well-recorded concert-hall music at the surprisingly low levels that concert hall music has in reality.

In recent years, the rhetoric of speaker reviews has been inflated. Progress does occur, but not every speaker can be a landmark or free of obvious defects. I do not subscribe to the idea that all alternative “presentations” have equal validity. There is something actually on recordings, and I would like to know what it is. This concept of high fidelity is under attack, in some quarters, and fence-straddling about the differences between speakers is passed off as open-mindedness. This puts me in a quandary about the Mangers. On the one hand, they are clearly not without some problems in midrange and treble frequency response. On the other hand, the Mangers do some other important things – clarity, stereo imaging, coherence –

almost incomparably well. The driver seems to me a landmark, approaching the ideal of a true point source.

If you are seriously interested in speaker design and the possibilities implicit in total coherence, you must listen to this speaker. If you can afterwards go back to one with even a hint of isolated tweeter, I’ll be surprised. The Manger shows us things we need to know, and it offers a remarkable musical experience.

ROBERT E. GREENE

DISTRIBUTOR INFORMATION

Manger USA

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MangerUSA@MangerUSA.com

Source: Distributor loan

Price: \$5,000-5,600 depending on finish

ASSOCIATED EQUIPMENT

Bryston 4B amplifier; Dunlavy cables; Promethean Bandpass II interconnects; Plinius M7 preamplifier; Classé CD transport and DAC; Z-Systems rdp-1 digital preamp and equalization device; SigTech Timefield 2000 digital room-correction device; Liberty Audio Suite audio measurement software

SPECS

Drivers: One Manger sound transducer, one 8” Scanspeaker woofer

Dimensions: 19 x 10 x 14 inches

Impedance: 4 ohms

Weight: 38 pounds

Cabinet: The 109’s footprint is trapezoidal and all cabinet edges are chamfered with a 3/8-inch bevel cut. Inside, the cabinet is layered with a proprietary material normally used in the aviation industry to eliminate the effects of structure-borne sound. The cabinet is available in black or exotic wood veneers with Manger’s “UltraGlo” high-gloss piano finish.

Crossover: 140 Hz. Selected metalized polypropylene conductors are used in the first-order high-pass. Vacuum-soaked transformer coils, manufactured in Germany, are used in the third-order low-pass. High- and low-pass circuitboards are separated from each other to address the effects of “cross-talk” and are insulated (fixed) on the inner wall of the cabinet. WBT posts offer single- or bi-wire configuring. Internal wiring is custom-made to exacting specifications.

MANUFACTURER RESPONSE

We would like to thank Robert Greene for his review, and for his description of the Zerobox 109’s musical characteristics. REG also did an excellent job of describing the technology of the Manger sound transducer and its electrical and mechanical behavior.

Interestingly, the Manger transducer works in the same manner as the basal membrane of the human ear, and this, in combination with an absence of energy storing, leads to sound reproduction in its most natural form.

Not only is the Manger a true point-source transducer, it has the rare combination of time, frequency, and spatial accuracy. If you analyze a system with measuring devices, as REG did, you may find a possibility of making a perfect system even more perfect – like adding a dot to an “i.” But as REG pointed out, the graduation from a conventional driver to the Manger transducer will transcend you to “a different world” of musicality.

DANIELA MANGER, CHIEF ENGINEER
MANGER PRODUCTS, INC.