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Manger Zerobox 103

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It is no exaggeration that the bending wave transducer developed by Josef W. Manger more than 20 years ago is nowadays even more than in the past one of the most fascinating sound transducers. The largest passive pedestal loudspeaker from the family company that has been managed by Daniela Manger for many years uses no less than three of these continuously optimized systems. Using the optionally available adhesive "Holoprofiles", it is claimed that the existing fantastic precision in depiction can be experienced at an even further auditory level.

It would fill volumes to provide an insight into the twenty years' history of the Manger sound transducer and the lifework of its creative genius Josef W. Manger. And the examination of the scientific aspects of this legendary transducer would necessitate just as detailed a description of the physics and acoustics, and that would also be well beyond the remit of this report. There is an important reason why I only touch on the edges of this aspect: the Zerobox 103 has captivated me to such an extent that it would be an injustice to dilute the joy and fascination experienced with this speaker with an unavoidably dry and theoretical description.

Therefore I have decided to report on the chronology of events and I hope this is not too weighed down by technical ballast. At the beginning of April we were paid a visit in Gröbenzell by Daniela Manger, who has been continuing the work of her father in the family-owned business for over ten years. In addition to the Zerobox 103, the largest passive loudspeaker in the range, the Diploma Engineer had also brought along a CD. This had been compiled by Manger at the request of many of its customers with pieces of music enjoying a common "exceptional status in recording engineering and interpretation". I scanned the intros of some of the pieces using the Zerobox 103 which had been hurriedly set up in the listening room. Ms. Manger took note of the rather casual assembly with great calm and, as is normally the case, did not attempt to praise the sound qualities of her own transducer. All that she mentioned was the development of new magnet systems for the Manger sound transducer, known as MSW for short, as well as the improved adhesive and voice coils. And also the Manger Holoprofile - a newly developed so-called sound lens made of a transparent special plastic material designed to be stuck onto the metal ring of the bending wave transducer. Before Ms. Manger returned to the company base in Mellrichstadt, she suggested I test the effect of this.

Let us have a brief look at the assembly of the Zerobox 103 before I describe my own listening impressions. The system is made up of separate modules, i.e. the subwoofer fitted with two 10" Vifa bass drivers and the unit standing on rubber feet to accommodate the three Manger sound transducers. The two bending wave transducers at the side are faded out above 1000 Hertz with a gentle six-decibel filter and compensate the sound pressure drop, which would occur at lower frequencies due to the limited cabinet size. In this way a quasi infinite baffle is generated whereby the influence on the sound can be checked by removing a plug-in jumper. Incidentally the Zerobox 103 can also be ordered with only one Manger sound transducer. Sooner or later the final version with three MSW sound transducers is recommended however as this makes the radiation characteristic more open, and at the same time the treble filter and the sound level reducer generated by series circuitry prevent irritations or interference with the main bending wave transducer on the front side.

Protected by just one high pass filter of the first degree this transduces from only 150 Hertz the complete frequency range right up to 35000 (!) Hertz. The acoustic qualities of the MSW sound transducer have been further developed over a period of more than 20 years to achieve a precision that I had never before experienced. After a rare-earth magnet had replaced the oxide magnet in 1988, a clear improvement in impulse velocity and broad-band capacity was achieved by using an extremely strong neodymium drive combined with the reduction of the coil gap to 0.95 mm and the improved adhesion bond to the twin voice coil.

It is well-known that the three-layer panel diaphragm does not have a piston-like movement, but oscillates in itself, whereby different frequencies are radiated simultaneously from the diaphragm. Here the opposing mass-and-spring forces within the diaphragm cancel each other out. The acoustic energy is led off with the sound in the material to the star-shaped absorbers and converted into heat. Sound-distorting build-up and decay phenomena are unknown in this bending wave transducer because it reproduces a frequency range of more than eight octaves at a rise time of 0.012 milliseconds!

High tones are released from an almost punctiform area in the centre of the diaphragm and are therefore radiated on a relatively large scale. The coincidence frequency of the "soft bending panel" with 80 kilohertz - in contrast

with the "rigid bending transducers" such as NXT, Walsh or DDD drivers - is also well outside of the audible range. At low frequencies on the other hand a transition to approximately piston-like movement takes place, whereby $\pm 3,5$ millimetres stroke and a thermally high-load voice coil weighing only 0.4 grams ensure sound pressure reserves in excess of 120 decibels. The occasional prejudices, which the Manger sound transducer is still confronted with, completely disappear into thin air as we discovered later. However the complex assembly of the driver prevents an automation of the manufacturing process, which explains the high price for the bending wave transducer, which is available separately.

Traditionally Josef Manger combines his extremely phase-linear MSW in the bass range using bass units that are installed airtight, and optimized for a low Q factor and therefore for a fast and overshoot-free response. Special units by Vifa with rigid paper/carbon fibre diaphragm together with frequency cross-over with so-called zero ohm transformer coils are used for this.

Returning to my initial impressions gathered in this magazine's own listening studio using the CD sampler available directly from Manger. The first track isn't really music as such, but an example of sound - namely the full peal of bells from the bell-tower of a church in Gütersloh. Anyone who can't hear the temporal precision and dynamics of the clapper strikes within a matter of milliseconds is either deaf or has only ever heard the world as an acoustically distorted recording. No loudspeaker sound, no individually audible loudspeaker clouds the illusion that you are sitting right in the middle of the bell-tower. The unbelievable energy and crystalline purity in the topmost treble range, combined with absolutely stress-free articulation, certainly had me immediately convinced.

The second track is an extract from an SWF radio play from 1993. The difference between stereophonic effects and the narrator's voice recorded in mono made it perfectly clear to me from the outset that I had not yet found the perfect positioning for the Zerobox 103 in the room. So I got out my inch-tape and thread to symmetrically align the position of listening location with the transducers. The result is astonishing and produces a razor-sharp localization. Note: the bending wave transducers are intended to be aligned directly towards the listener, but it is actually better to have an even more angular setting with the axes intersecting in front of the listening position. Then you find that the central localization is perfect, and the sweet spot is increased, thus guaranteeing a strikingly plastic image. And the strange thing about this is that the difference between "right" and "wrong" is dramatic with these transducers and the listener intuitively finds the ideal listening position after only a couple of tracks to enjoy the unbelievable precision.

The next track is a one-point recording by Denon with Bruno-Leonardo Gelber on a Steinway grand piano. After exactly aligning the transducers I have the feeling that I am hearing not the loudspeaker but just the instrument and the recording location in Notre Dame in Paris. I have never heard Beethoven's Sonata Opus 13 No. 8 like this before. It is practically impossible to ascertain loudspeaker properties or characterizations in the form of "dynamic bass", "transparency in the mid-tone range" or similar. The fact of the matter is that the grand piano, the striking of the piano keys and the acoustic room surrounding the instrument are presented as a unified entity. Here the striking of the piano keys and the sound-generating body of the grand piano are interlinked so that it seems that the life-sized instrument is standing in front of me in the room. To the same degree that the Zerobox 103 almost disappears as "sound-determining factor" in a chain of reproduction, the perception of music, interpretation and recording location move to the forefront. It should come as no surprise that studio engineers and musicians have always valued the unique neutrality and precision of Manger sound transducers.

The next track is with vocals by Hermann Prey, Beethoven's "Ich liebe dich". And here we find the final proof. Hardly any other loudspeaker can present a voice so uniformly and homogeneously in the room. It is utterly impossible to localize the perfectly integrated bass parts.

A change of mood: the next track on the Manger CD, Vivaldi's "Winter", 3rd movement, lives from the captivating dialogue between the solo violins and the tutti strings, from the thrilling tempo and energetic stress. In this much-praised interpretation the historical instruments create an unmistakably intensive sound experience. The following Haydn Symphony No. 67 begins considerably lighter and more carefree and takes me to the acoustics of the Gewandhaus in Leipzig. This hitherto unreleased recording offers spatiality and vividness far exceeding the limitations of the speaker arrangement. In quiet passages you can even hear individual members of the audience clearing their throat or moving a chair and the true size of the room where the recording was made is tangible. With my eyes closed the imaginary impression of the stage becomes clearer, and I can easily compose this to a unified entity thanks to the magnificent impulse precision of the sounds and noises. As I am a rare concert-goer, this was a fantastic experience for me.

The next tracks with discreet-virtuoso guitar-playing from the 19th century or the deep flageolet tones from the *Oriental Bass* piece allow the soloists to be present in addition to continuously variable precision in sound depiction and true representation of magnitude. Each breath and every effort of the musicians are an integral part of a stage presence that can scarcely be surpassed in authenticity.

Even jazz music, something I seldom listen to, gains in fascination in the recording of the Treya Quartet made at Divox Jazz. Surprising tempo changes, rising tension arches which then fall almost into the meditative in conjunction with the sound fidelity of the individual instruments which can be precisely localized will be enjoyed not only by jazz fans.

In contrast to this the track *The Cost of Freedom* with Marla Glen is clearly too powerful in the bass range. It is unbelievable what sound pressure levels and depth are possible. However the comparison with the recording *Jazz Variants* by The O-zone Percussion Group clearly illustrates that the percussion and the powerful Kondo drums are captured absolutely perfectly, and even the three-dimensionality of the live recording cannot be compared to the previously heard studio recording. The fact is that rarely has a transducer demonstrated to me more clearly the qualities of the recording.

These experiences were confirmed in my home. This time however I listened to the Zerobox 103 with the optional Holoprofile, costing extra. In my view this attachment improves primarily the radiation behaviour in the harmonic spectrum, which had been previously typified by a drop in treble outside of the sweet spot. The effect with the Holoprofile is absolutely comprehensible. Now the treble notes are more strongly scattered not only laterally, but also vertically, and at the same time mid-frequencies seem even more vibrant and steady with minimum attenuation of the upper peaks. The most striking factor however is the almost unbelievable gain in spatiality and tonal uniformity, even outside of the ideal position.

Incidentally the Holoprofile does not negatively influence the pulse accuracy, and a decisive strength of the time-true Zerobox 103 freed from intrinsic sound remains, namely a precision in sound that can also be experienced in critical rooms enabling the use of fast and high-resolution electronics without impairing the homogeneity and stress-freedom of the sound pattern. This quality is achieved by only a handful of sound transducers in the world.

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High efficiency factor, tonal broad-band capacity together with enormous level stability are the self-evident qualities of the Zerobox 103. The unbelievable impulse fidelity and precision of depiction of the Manger sound transducer make the Zerobox 103 an excellent transducer that offers emotion and authenticity in abundance.

Manger loudspeaker

Principle:	2 1/2 way, enclosed with 3 MSW sound transducers
Efficiency:	91 dB/1W/1m
Rated impedance:	4 ohms
Finish:	silk matt black; high-grade wood veneer and polyester high gloss black at additional cost
Accessories:	Holoprofile
Dimensions (WxHxD):	31/121/38 cm
Weight:	57 kg
Warranty:	60 months

Components in the test unit

CD player:	T+A CD 1220R, Linn Sondek CD12
Drive:	Kuzma Stabi S
Tone arm:	Kuzma Stogi S
Pick-up:	Benz MC Gold
Phono pre-amp:	EAR 834 P
Preamps:	Cello Palette, Shindo Monbrison, NAD S100
Power amps:	Crimson CS 620D, NAD S200
Cables:	Audio Tools, HMS Phonosophie, Sunwire
Accessories:	Sun Leiste mains connection

Caption page 3:

Powerful bass units from Vifa with paper/carbon-fibre diaphragm. The overall Q of the airtight drivers is clearly below 0.7 and guarantees a dry impulse reproduction

Since the discus model introduced in 1978 the Manger sound transducer has been continuously developed. The efficiency, rise time and level stability have profited from this.

The frequency cross-over impedance linearization for the bass units is fitted with low-loss transformer coils. The front MSW sound transducer is filtered using only one high-pass filter of the 1st order.

Caption page 4:

The triangular stencil with water-level defines the exact position of the Holoprofile, which is affixed to the metal ring of the MSW using double-sided adhesive strips.

Caption page 5:

The side transducers can be disconnected by unplugging the upper jumper. The cables for the terminal are included.