

Professional audio MAGAZIN

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Test: Forssell Technologies
SMP-2 Preamp

Glasklarer
Highend-Sound
made in USA

Test: Manger MSMc1

The best studio monitor in the world

Test: Kondensator-Mikrofon
Josephson C617

Mehr Mikrofon
braucht kein Mensch





If the highest virtues of a studio monitor are signal fidelity and a pure, natural reproduction, then the Manger MSMc1 is one of the most virtuous of its kind.

by Harald Wittig

With the large number of monitor tests performed by *Professional audio Magazin* since its inception, you could be forgiven for thinking that our testers might at some point just sit, numbed and bored, in front of the speaker systems to be tested, thinking "Been here before, heard that before". But despite the feeling of having tested a thousand speakers, this is really not the case. It's always interesting to discover with your own ears what the latest studio loudspeakers have to offer in terms of sound quality. And the surprises are generally positive. For example, with the new and very reasonably priced Samson Resolv monitors that we tested in Issue 2/2009. Not to mention the excellent representatives in this field, such as the Geithain MO-2 or the current reference model at *Professional audio Magazin*, the KRK EB8 Exposé. And still we secretly dream of the ultimate transducer, that loudspeaker of-

Back to nature



fering unmatched signal fidelity, impulse behaviour, precision in time and phase to transcend the act of listening back to its natural state. A candidate possibly capable of achieving this is the Manger MSMc1, the first amplified studio monitor from this highly respected loudspeaker manufacturing company based in Mellrichstadt in Germany's Franconia. Thanks to its unique Manger sound transducer, developed by the company's founder Josef W. Manger, the MSMc1 is destined to achieve reference quality status and offer an unadulterated, scrupulously exact depiction of sound reality to the listener's ear instead of an approximate detailed blueprint. But this is a claim made by just about every loudspeaker manufacturer today and they all go their own way in trying to achieve the ideal sound of an absolutely neutral studio loudspeaker. In the case of the MSMc1 Manger relies on its own legendary patented developments, individual components of the highest quality

and manufacturing exclusively in Germany. In view of all this, at first glance, the high cost per pair of around 7500 euros seems almost moderate, as the price for top-of-the-range loudspeakers can exceed this many times over, as hi-fi enthusiasts know to their cost! But let's have a closer look at the MSMc1 and focus particularly on the special features of its technology.

It all began with the ear

The first thing that stands out when looking at the front of this rather unpretentious, but elegantly styled monitor, is the obvious trademark, the star-shaped Manger sound transducer. Almost 25 years ago, in 1985 to be exact, Josef Manger began production of the sound transducer bearing his name. This is a so-called bending-wave transducer, which in simple terms is a broadband sound transducer that reproduces

music and other sound events without any delay. The more than 30 years of research work is based on the following realization: even the most beautiful sound starts with a noise, with the so-called initial transient to be more

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Manger MSMc1

- Three-dimensional spatial representation
- Outstanding impulse behaviour
- Excellent selectivity
- Highest signal fidelity/neutrality
- First-class finishing



Summary

The Manger MSMc1 is one of the best nearfield monitors on the market. Spatial representation, impulse behaviour and the highest signal fidelity are unmatched.



The MSMc1 is an amplified two-way loudspeaker. In addition to the obvious Manger trademark, the MSW sound transducer, easily recognisable by its star-shaped damper, the speaker also has a new woofer-midrange unit that is responsible for all frequencies below 250 Hz

its own transient superimposed on the reproduced signal. Because the constant transients unavoidably generated by the piston-like movements of the drive unit trigger the listener's age-old localization reflex described above. This means that the listener initially uses this elemental reflex to recognise or localize the loudspeaker and this has two consequences. Firstly, the human ear can become tired more or less quickly as the localization reflex is constantly triggered again and again. Secondly, the listener is forced to sit in the famous

precise, which is the result of a fast change in the air pressure. As this occurs even before a frequency is generated, it is a pure acceleration process. This is registered by the human ear no later than after a few microseconds, and the signal is processed by the brainstem to a piece of directional information. In other words, we immediately localize the direction that the sound originates from. The other areas of the brain only become active after this has happened. For example, the diencephalon determines the magnitude and distance of the sound source with astonishing accuracy. Actual noise recognition and sound evaluation only happen at the end of this process, consecutively in the subordinate brain areas and in the cerebral cortex. This made Manger realise that it had to be possible to build a loudspeaker that, in contrast to conventional cone and dome drive units, did not generate

"sweet spot" with stereo reproduction, as this is the only position where the sound travel times from the right and the left loudspeakers are approximately equal, enabling the listener to compensate the localization of the loudspeakers and concentrate on the essential, i.e. on the music being played.

The Manger sound transducer, or MSW for short, is based on Manger's intensive study of the physiology of hearing. These bending wave transducers that incidentally have nothing at all to do with so-called bending resonators or omnidirectional radiators, for example from Meletzky in Berlin, has no mass-and-spring effect with its undesirable energy-storing forces unlike conventional drivers. The MSW has a flexible plate-like membrane that behaves like a mechanical resistor. The sound is broken up

by the different propagation speed in this three-layer sandwich-type membrane into separate frequency ranges. Here the signal spreads across the membrane surface, which has a different stiffness at the centre than at the outer rim, from the inside to the outside in the form of a travelling wave. Higher frequencies are emitted in the centre and the ever lower frequencies radiated to the rim. In this way sound radiation of the complex signal comprising many different individual frequencies is simultaneous and the phase patterns of the original are retained. This is the point where the more attentive reader sits up and takes notice. Yes, AKG developed a similar technology with its headphone membranes designed using the patented Varimotion process. (For more details see the test report on the AKG K 702 in Issue 2/2009). In Manger's case however it was actually the human ear, to be more precise the basilar membrane in the cochlea, that served as the model. Here the complex sound signal is also emitted in the form of a travelling wave. The striking star shape of the MSW is certainly not a design gag to humour people who enjoy the trappings of Christmas at their workplace. This unique shape also serves to damp long waves, i.e. the low frequencies, absorb these and ensure that no reflections can return from the rim to falsify reproduction quality. And this is why Manger refers to this jagged component of the transducer as a star-shaped damper.

Completely manufactured in Germany

Thanks to its design principle and the way the 190 millimetre plate-type membrane operates, the MSW is capable of handling a frequency range from 80 Hz to an astonishing 35 kHz while simultaneously approximating the ideal of a point sound source. In spite of this unusually large operating range and a high efficiency factor of 91dB 1 W/1 m, the MSW achieves a remarkably fast rise time of under 13 microseconds. Thirty years ago Manger designed a special voice coil to achieve this, which actually involved two mechanical moving coils switched in parallel, made from aluminium wire on an aluminium base and with pure copper wire leads. The overall result is a long, but nevertheless very light voice coil, weighing no more than 0.4 grams in

spite of a possible displacement of + 3.5 millimetres. The special arrangement of this double voice coil, patented by Manger in 1969, also provides considerable suppression of natural resonance.

The unit is driven by 15 neodymium magnets of the highest quality, arranged in a circle behind the membrane and the double voice coil. They generate a very strong magnetic field of 1.32 Tesla at an air gap of no more than 0.95 millimetres in width, thus ensuring the unusually fast rise time, meaning that the MSW can effortlessly follow even the fastest transients. Attentive readers will already have noticed that the MSW is supplemented with a conventional woofer-midrange driver. This is responsible for all frequencies below 250 Hz, above this level the Manger transducer operates on its own. According to the company's boss Daniela Manger (this university graduate engineer is the head of Manger Products and manages the company along the same lines as her father did), this cut-off frequency was necessary to exclude any increased harmonic distortion at high volume levels. It wasn't always just notorious critics of earlier Manger speakers



The MSMc1 LF Module (shown connected here) is a passive subwoofer available as an optional extra that takes the load off the fitted woofer unit, resulting in an actual increase in performance especially at high listening volumes.

who complained about a certain weakness at high volumes. In other words: it might sound great, but it can't be played loud. Be that as it may, the woofer-midrange speaker has a lightweight and torsionally rigid membrane made of a fibreglass-polyester sandwich construction and it is claimed that it features exact bass reproduction. For reasons of reproduction precision, Manger deliberately selected a sealed design in order to exclude from the outset any effective smearing that happens in some bass-reflex speakers.

The MDF cabinet accommodates two analog power amps producing more than enough power, made in Germany just like all of the other MSMc1 components. An impressive 250 watts for the woofer and 180 watts for the tweeter pack a hefty performance punch. The large toroidal transformers are a special design, the power amps are installed discreetly and all components are of the highest quality according to Manger.

This volume of performance calls for large transformers and results in a fair weight. Coming in at 30 kilograms, the MSMc1 is a bit of a heavyweight that is



The MSMc1 LF Module is connected to the monitor by Speakon cable. A slide switch on the back panel of the MSMc1 reduces the bass level by 6 decibels.

The back of the Manger sound transducer is also available separately. 15 neodymium magnets of the highest quality generate a very strong magnetic field of 1.32 Tesla at an air gap no more than 0.95 millimetre wide. This is the reason for the very fast rise time of the MSW.

best placed on a solid pedestal base. As an alternative Manger also offers the MSMc1 stand, made of aluminium, that can be rolled into position to achieve optimum alignment of a pair of monitors. Priced at around 1300 euros per pair this is not exactly a low-cost solution, but we very quickly came to appreciate the benefits during the course of the test. The fine adjustment of the loudspeakers is no problem, as Daniela Manger demonstrated to us during her visit to the studio, exactly aligning the two MSMc1 speakers to our listening position using a laser pointer and laser spirit level (see photo on page 78). The basic model of the stand offers a fixed height of 88 centimetres, measured from the base to the underside of the loudspeaker, but Manger Products can also supply special heights at no extra cost.

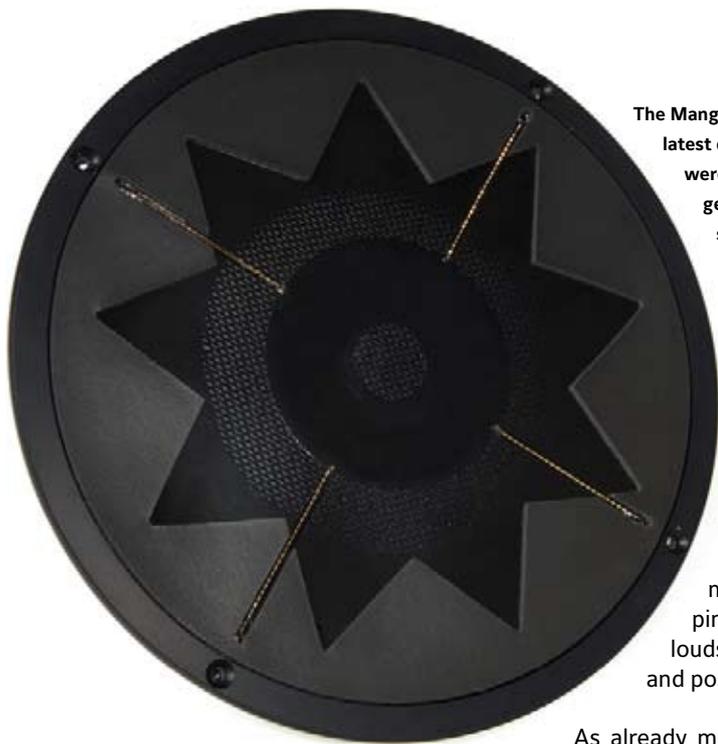
Those of you looking for the comfort of an adjustable-height function, where money is not an issue, can go for the MSMc1 Lift model. The stand height can be hydraulically adjusted by gas pressure to any height between 780 and 1080 millimetres. However, this feature will cost you around 3270 euros per pair of stands.

Turning now to other equipment features, namely the connections, and the controls for volume and sound levels. The MSMc1 has an XLR socket on the input side, and above the heat sink there is a connection socket for a Speakon cable. You can also connect the so-called MSMc1

LF Module, which is an additional passive woofer (Price per pair 1520 euros) to take the load off the installed woofer. The LF Module is not a subwoofer to expand the lower bass range, but shares the bass load with the installed woofer. In practice this results in a performance increase particularly at high volume levels, as the deflection amplitude of the installed woofer is halved and this subsequently goes into the limiter. As long as the MSMc1 is used as a nearfield monitor in small productions, there is really no need for the LF Module. According to Manger, the MSMc1 can however be used in larger rooms, but then more as a midfield monitor. Here the extra passive woofer proves to be a sensible investment to avoid having to tolerate minor impairments in sound quality when higher volume levels are unavoidable. A slide switch is fitted to the back of the monitor for adapting to the extra subwoofer and this allows the bass level to be reduced by six decibels.

For connecting to a true subwoofer, the MSMc1 naturally has a high-pass filter that kicks in at 80 Hz with a reduction of 12 dB per octave. Three further filters are available to adapt to the conditions in the listening room or production environment. The first is a high-pass filter, strictly speaking a shelving filter, that is triggered at 100 Hz and allows a reduction/increase in the range of +3 to -6 dB. Above the slide switch that activates it, this filter is helpfully labelled





The Manger sound transducer in its latest design. The first versions were made by Josef W. Manger 25 years ago. The striking star-shaped panel on the 190 millimetre plate-type membrane serves to damp long-wave, i.e. low frequencies to prevent any distorting reflections from the membrane rim.

speakers on their stands or take them down without any imminent danger of dropping these top-quality loudspeakers on the floor and possibly damaging them.

As already mentioned Daniela Manger personally brought the pair of MSMc1 speakers to our studio and carried out the set-up and alignment pretty much on her own. As with all Manger systems it is essential that the MSW is aligned directly to the listener, and the recommended optimum position is a more acute angle inwards so that the theoretical axes intersect directly in front of the listener. This results in outstanding central localization with a simultaneous increase in the size of the sweet spot. In our experi-

ence it is certainly well worth the effort to get the set-up just right.

A precision sound instrument

After the pair of MSMc1s were perfectly set up, Daniela Manger advised us that she wasn't going to say any more, and that we should simply listen as impartially as possible. We started out with a Sonar project and played this mix. The first spontaneous reaction of our collective editorial team was "Amazing!" The spatiality and the precision of the point-source localization of the instruments involved in the musical arrangement are quite simply impressive. There is also an extraordinarily high selectivity that only the best monitors can offer.

But let's look at these aspects in turn. Firstly, the MSMc1 stands out with a spatial representation that we have previously hardly ever encountered in this confident magnitude. Even the reigning champion in this discipline, the Geithain MO-2, has to take a bit of a back seat here, as the Manger monitor does not only open up the spaces and create

"Room Acoustics Correction" and serves to adapt to the listening environment. In a way this also applies to the so-called Nearfield/Cinema Screen filter, which is a bell filter with two applications. When the MSMc1 is used in nearfield the higher sensitivity of the human ear to higher volumes in nearfield can be compensated for by lowering the filter level and this has been adapted to the Fletcher-Munson curve. When the MSMc1 is being used for cinema sound mixing and positioned behind a perforated screen, then increasing the filter level can compensate for sound losses. The third filter is again a shelving filter to influence the high frequency range beyond 10 kHz allowing an increase or reduction by a maximum of + 2 dB. In practice, this high frequency control, will be used primarily to adapt the sound to personal preferences. During the test in the *Professional audio Magazin* studio this control as well as the others were set to neutral. Even in this position the sound was very impressive – just as a small foretaste of the listening test.

Before we get down to the nitty-gritty, i.e. to the actual sound qualities of the MSMc1, just a brief comment on the finishing. This is absolutely top class, the Manger monitor is a premium loudspeaker with unobtrusive elegance through and through. The two rubber-clad carrying handles are a great help when setting up as it's not a simple task to lift 30 kilograms just like that. The handles make it easy to place the loud-



Graduate engineer Daniela Manger, head of Manger Products, during the fine adjustment of the pair of MSMc1 in the studio of Professional audio Magazin.

a three-dimensional image of the actual room dimensions for the listener's ear, but also manages to reproduce those peculiar tonal changes or sound modulations typical of concert halls. For example the Altverb 6 impulse response of the great hall of the Babelsberg film orchestra is one of our declared favourites at *Professional audio Magazin* for concert guitar recordings. The reason for this becomes immediately apparent with the Manger. This virtual reverberant chamber offers a certain softness and has a subtle reverberation, which is clearly audible with a top-class reproduction unit such as this. The trebles in particular are smoothed and the sound is very silky and sleek. Even new-style guitar players with their crystal-clear touch sound more lyrical in a post-romantic style. It is truly amazing how the sound develops in the room, although it is a pure DAW mix. Particularly sound engineers specialising in audiophile classical recordings will come to love the MSMc1 as they can hear exactly what they have recorded: the instrument, the room and their own favourite microphones – no more and no less.

Even the effect of sound-creating plugins, not to mention hardware effects, are depicted by the monitor with a precision that reveals even the finest nuances. For example, the Twin Tube plug-in from SPL (tested in this Issue, Page 82) can demonstrate its full potential. On the whole the effect actually provides one of our arrangements with the promised tube

The end of the stereo triangle

The thirst for development is apparently never satisfied at Manger. There is no other reasonable explanation for the development of the so-called Holoprofil, a transparent synthetic cover for the MSW sound transducer. Basically this inconspicuous accessory costing around 400 euros per pair is designed to create a "hologram-type reproduction", irrespective of the listening position even outside of the famous sweet spot. It is claimed that the Holoprofil solves the age-old problem of the stereo triangle. As soon as the listener moves away from the ideal listening position at the peak of the stereo triangle, where the zero axes of the loudspeakers intersect, the stereophonic spatiality effect deteriorates, localization becomes more and more indistinct and the phantom centre seems more and more instable. After comprehensive tests and investigations, Josef W. Manger discovered an explanation for this phenomenon, claiming that it was caused by a design fault in the driver of every loudspeaker. All information obtained from the input signal was already completely depicted by just one half of the membrane surface area. The other half of the membrane simply provides a repetition of the input signal. Manger calls this a "shadowy counterimage". This peculiarity means that not only two loudspeakers have to be brought into alignment at the listening position, but four auditory images (two per speaker driver), which is apparently a physical impossibility. The listener, moving away from the peak of the stereo triangle, would cause repeated displacement of these auditory images and the result would be a continual blurring of the spatiality.

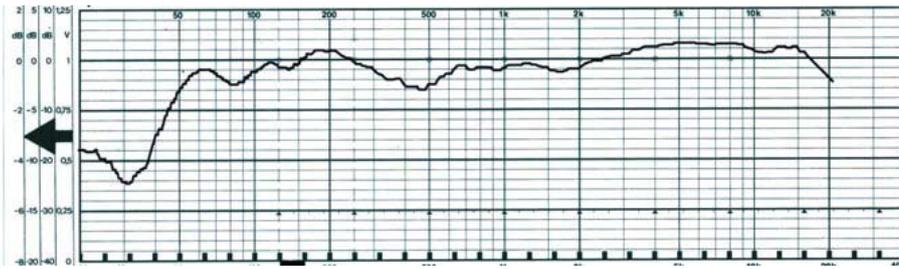
The Holoprofil that Manger supplies together with an alignment template (see photo), claims to offer a solution to this phenomenon. Fitted directly on top of the MSW, it covers around a half of the membrane surface. The

complete membrane diameter remains available to generate the sound pressure, but at the same time the "shadowy counterimage" is removed.

But does this, not exactly inexpensive accessory, actually work? After long and full discussions we believe that this plastic cover has rather a delicate effect on the reproduction behaviour of the MSW. The treble range, but also medium frequencies, appear to be slightly less colourful. This effect however only becomes apparent when the listener moves his listening position sideways. If he remains sitting in his usual position, the one used for the alignment of the Manger monitors, then the effect is negligible. A minimum increase in spatiality and a further improvement in selectivity could certainly be determined. Anyone with a particular interest, especially in view of the fact that the MSMc1 is already outstanding in spatial representation and in differentiating sound events, could certainly consider buying or testing them.



The Holoprofil is aligned to the MSW exactly using a template that is fitted with a spirit level for fine adjustment.



In the measured frequency response, measured in a not completely soundproof room under practical conditions, the slight drop at 500 Hz and the slight increase above three kHz can be seen. However this does not have any effect on the sound.

warmth without the need for any extreme settings. Admittedly it is doubtful whether such finesses would still be audible on audio equipment of lesser quality. But anyone intending to make or mix recordings for playing on absolutely top-class equipment with magnificent sound would certainly have to seriously consider such a top-class sound transducer.

And of course the Manger monitors don't gloss over any weaknesses. If the starting material isn't up to standard, then the Manger is unforgiving. The attention to detail also uncovers all of the accompanying sound events feared by both vocalists and instrumentalists, and especially by sound engineers: breathing noises, the scratching of the violin bow stroke, noisy shifts, and so on. All of this unwanted ambient noise however

is a guarantee of a certain liveliness of a recording. To put it another way: Experiencing music outside of a concert hall from a recording is given a new realism, it sounds more authentic and somehow more inspired, more like a live experience. And microphone testers will find an absolutely reliable partner in the Manger monitors. If you want to catch the partly subtle differences between microphones optimised for signal fidelity, then the MSMc1 operates with the precision of a measuring instrument. It helped to considerably shorten our test of the Josephson C617. (The results can be read on Page 68 of this Issue.)

Anyone who now believes that the MSMc1 is a loudspeaker for acoustic, preferably classical music would be wrong. As with every good monitor the

Manger is not choosy about the material it has to reproduce. For example a fusion electric guitar solo, recorded with an Engl Fireball and the SPL transducer, sounds clearly more direct and lively, as the transients of the plectrum touch or the movement of the fingers during a vibrato almost appear as a three-dimensional, photo-realistic depiction. The delicate smoothing of the touches using the new Transient Designer plug-in in the Sonar 8 can be done by ear alone, because the Mangers readily provide information on the effect caused by a particular control setting on the sound.

The exemplary impulse behaviour of the MSW and of the equally high standard subwoofer benefits good percussion recordings. If you ever wanted to know what your overheads can actually do and just how crisp a natural, well-tuned and microphoned snare can sound, then the MSMc1 provides you with the exact information you require. Playing, recording and listening are an enjoyable experience, and it is totally unnecessary to use loud volume levels. Even at a very moderate, kind-to-the-ears volume all of the qualities described above are present. Anyone working in an environment calling for an acoustic irradiation of the production at high volumes is welcome to do this. The Manger can also handle high volumes. However our experience shows that use of the LF Module is recommended, as according to our admittedly subjective listening impression, the Manger monitor retains the same composure it displays at low to medium volumes.

Summary

The Manger MSMc1 is an absolutely top-class monitor loudspeaker. The hard-to-beat, almost three-dimensional spatial representation, the extraordinarily high selectivity and the completely neutral, practically unadulterated reproduction are unrivalled.

Technical Profile	
Model	MSMc1
Manufacturer	Manger
Distribution	Manger Products, Industriestr. 17, 97638 Mellrichstadt T +49 9776 9816, F +49 9776 5925 info@manger-pro.de www.manger-pro.de
Type	Amplified two-way speakers
Dimensions W x D x H (mm)	270 x 424 x 495
Weight (kg)	30
Price (recommended retail price, euros)	3707
Features	
Loudspeakers	2
Dia. woofer membrane (mm)	200
Dia. tweeter membrane (mm)	Manger sound transducer
Output woofer channel	250/400 (with connected LF module)
Output tweeter channel	180
Limiter	
Indicator	LED (green = ready, green/red = limiter)
Control switches	
Volume/Input sensitivity	0° (11 settings [-2.5 to +2.5 dB] / 2 settings [6dBu/0dBu])
AV filter	High pass filter (80 Hz, 12 dB reduction)
LF-Module switch	for optional woofer boost module (-6 dB reduction)
Room acoustics correction switch	High pass filter at 100 Hz (+3, 0, -3, -6 dB)
Nearfield/Cinema Screen Correction switch	Bell filter at 3.2 kHz, 1 octave (+3, 0, -1.5, -3 dB)
High Frequency Trim switch	Shelving filter at 10 kHz (+2, +1, 0, -1, -2 dB)
Input and output connectors	
Input connectors	1 x symmetrical XLR
Accessories	
Instruction manual, mains cable, optional: LF-Module (1520 euros per pair), MSMc1 stand / c1 Lift (1360/1366 euros per pair), Holoprofil (400 euros)	
Special features	
Manger MSW sound transducer	
Rating	
Finishing	Very good
Features	Good
Operation	Very good
Measured values	Very good
Sound	Very good to Outstanding
Overall rating	Top-class Very good to Outstanding
Price-performance ratio	Very good