

Ole Brøsted Sørensen

The man behind the technology of DPA brand microphones and the individual largely responsible for the reawakening of acceptance of the omni in studios talks diaphragm size, the electronics package and the whole quality issue.

ZENON SCHOEPE



yet, giving theatre engineers mics that were small enough to be mounted almost invisibly onto a performer and rugged enough to withstand the rigours of life on stage without sacrificing sound quality.

Unsurprisingly, out of working hours Sørensen's abiding passion is music. He's a keen pianist, both as a solo musician and accompanist, and he recently upgraded his sound system at home with the latest B&W speakers.

Astronomy is also close to his heart. 'If you ever need to feel humble, take a look into deep space through a good telescope,' he advises. 'It's worth remembering that many of the molecules that are part of you were created by super novas a long, long time ago!'

What is special about DPA's approach to microphones?

We at DPA have an extensive history of working with measurement microphones, and have long concerned ourselves with the issue of maximum SPL handling with the lowest possible distortion, both harmonic and non-harmonic. However, both my co-director Morten Støve and myself are musicians — we play saxophone and piano respectively — and through working and playing music together we have learnt to use our ears and realised that hearing is believing. The professional user obviously agrees.

We also learned that rotational symmetry and a certain shape in the mechanical design, resulting in minimal disturbance of the original sound field, is very important for the objective and subjective result.

OLE BRØSTED SØRENSEN cut his teeth on microphone design working for the Danish test and measurement equipment supplier Bruel & Kjaer. B&K had made microphones purely for testing purposes for many years, but until Sørensen became involved with direct-to-disc recording for the cartridge manufacturer Ortofon in the late 1970s, the company had never produced anything specifically for pro audio. His success on the Ortofon direct-to-disc sessions were the catalyst for the design of B&K's 4006 and 4007 mics, which were introduced in 1982. In designing them, he hoped to combine the high accuracy and exacting tolerances of B&K's test and measurement hardware with the sonic characteristics required by sound engineers. His designs were immediately successful, and within a few years the Series 4000 had become an industry standard in professional studios around the world.

In 1992, B&K took the decision to spin off its pro audio division. Sales and service of the Series 4000 microphones were outsourced to two former employees, Sørensen and Morten Støve, who formed Danish Pro Audio, now DPA, owning the exclusive rights to the microphones that bear this name.

In 1994 DPA released its first products designed by Sørensen — a series of compact cardioid and omnidirectional mics that put the sound quality of the original Series 4000 in a lighter and more discreet package. Two years later the 4060 series of miniature mic capsules put DPA quality into its smallest package



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What are the common misconceptions about large diaphragm and small diaphragm mics and what are the realities and limitations?

The typical misconceptions are that such a tiny microphone will not be able to capture my big voice, and a microphone with such a small diaphragm will not be able to capture or handle the low frequencies. In other words, the general perception is that the larger the diaphragm the better the bass response. This is really a misconception, at least regarding omnidirectional microphones. Imagine a barometer. A microphone is likened to a very fast electronic barometer and it does not matter if the moving or moveable part is big or small. Even a small barometer measures the correct pressure in the air.

DPA has been big on the Omni from the beginning but now produces a variety of pattern mics, what are the relative practical and technical advantages of the main polar patterns?

The omni microphone is a perfect choice if the acoustic environment is ideal and you want to include that in the recording. The cardioid microphone is a useful tool if you want to reject the acoustic response of the recording room and/or if you want to manipulate it in the mixing process. It is very important that all off-axis responses are smooth so as not to colour the sound picture. If you merely want a mild rejection of the surrounding room, the wide cardioid is the solution.

Some would have us believe the secret is in the diaphragm, what are your thoughts on the influence of the preamp and the interface to the outside world in the total package?

It's partly true that the secret is in the diaphragm. But of more importance are the constructions just behind the diaphragm, where air motion and airflow is vital in order to keep self noise very low and maximum SPL very high. The preamp should be constructed

to comply with the capsule capacity and be able to handle even very high voltage since the polarisation voltage of our mics is between 200 and 400 volts, depending on the type. The preamp is essentially a very sophisticated impedance convertor facing the ultra high impedance on the capsule side and a conveniently low output impedance to match the studio environment.

Miniatures are increasingly visible in the DPA portfolio, what are the technical issues that need to be addressed in producing these and does their use extend beyond the obvious applications?

One big issue is to produce to a high quality. The microphones are put through a high number of processes during production and we test them numerous times so the yield can be as high as possible. The environmental durability of the mics is equally as important as the acoustic specifications.



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We are very happy with the miniatures and the more we try them in different situations, the more markets we see opening up for them. We have been delighted to discover that musicians are so very constructive and innovative to work with, as previously we thought they would be most reluctant to place microphones directly onto their delicate instruments. On the contrary, they show a surprising eagerness to use instrument microphones. One big market for the miniatures that has opened up outside of music recording is the security and surveillance industry in their search for better sound quality. In Danish bank robberies, for example, a suspect can be convicted if an audio forensic expert can match recordings to the voice of the bank robber.

What is your opinion on the wide range of affordable Chinese mics that are now available in the market?

The Chinese competition has to be taken seriously, and they certainly keep us on our toes. Up until now we have not seen any really serious competition according to the specifications. As long as the users rely on their ears and are able to distinguish quality,



we can survive in the market, but if it came down to cost only, we could be in trouble.

Has the emphasis on cheap large condensers reduced the variety of mics available and has the end-user lost out in terms of choice?

Every microphone has its place, but I think that the users have to be careful not to economise too much on mics as this can be expensive in the long run. The time saved in postproduction and mixing can often easily pay for the extra cost of a good mic. Furthermore you have to remember that if any part of the signal is lost at the diaphragm, then you can never regain it. No piece of outboard equipment can recreate what was there if the microphone has not picked it up. If I were a professional musician having spent a lot of money on a good instrument and a lot of time practicing, I would be somewhat disappointed if the engineer put up a cheap, but often beautiful microphone, to capture my instrument.

Can an end-user evaluate a mic from its specifications alone and how can he know if he's buying a quality product?

Although high specifications reveal a lot about the

microphone, the listening test is the ultimate test. Fortunately all our research has shown a very good correlation between supreme specifications and the highest scores in listening tests. Most microphones sound pretty good on axis, but step back and walk around the mic when you test it. This is when you can find out a lot about the mic. The maximum SPL handling and the self-noise let you know if the mic's dynamic range is suited to the application.

Where are the limitations of current mic technology and what will represent the next technological leap?

The achievements of the best microphones are still superior to the electronics further down the audio chain. At DPA we never rest on our achievements, but steadily work on achieving better noise, distortion and level handling specifications. In the future it seems that silicon microphones will be introduced, especially when the self-noise problem they suffer from is solved. I also predict that we will see some kind of array microphones, representing something new in microphone technology, with a previously-unseen set of specifications. This is, however, so secret that I would have to... ■

