

INTERVIEW - Peter Gansterer of Vienna Acoustics

by Roy Gregory

RG. When did you start Vienna Acoustics?

PG. The company was founded in '89. I was playing around with loudspeakers, had a background in acoustical engineering from university I started together with a partner, and we jumped right in. We bought ground and built the factory. Right from the start I felt that it was important to have on the complete process. We took products to CES in '91 and there was some interest from international distributors, but most importantly from the best US distributor in my opinion, and that is Sumiko. In '98 the previous company was bought out by the present one, Vienna Acoustics GmbH, which brought us a new director, and that has been vital to the growth of the last three years. She looks after marketing and business for the whole world, and now I only have to worry about research and development. Project strategy, product development, trying things out, trying to develop better drivers and better matching crossover components.

Loudspeakers seem to be pretty easy and in theory they are, but when it comes to sound they are a very complex thing consisting of so many influential parts. Every resistor, every capacitor, every brace, where it is placed in the cabinet has a huge influence on the sound. In a three way speaker in particular, the crossover has a huge effect.

It's something we really concentrate on, judging the natural sound of a component. You can get the same capacitor from three different suppliers - same type, same material, same value, same voltage - but switching between them you sometimes think that one tweeter has been switched off! It's unbelievable, but easy to demonstrate. There is something that is very important here. What a designer develops in this hi-fi world often has very little to do with what the customer ends up buying. What the customer buys is often no better than a lottery. The designer might refine his product over several years, refining it and refining it. Then it goes to series production. If the crossover is outsourced then if the components are even a little bit different the result is a totally different sound. The drivers that are ordered are just the same. Drivers are finely tuned mechanical devices so that in an order of 1000 pieces you have huge tolerances. The designer works with tiny changes in crossover values. 0.1 or 0.2 dB, that make huge differences in the sound of the speaker. Then you get drivers in that are + 2 dB. This is what really costs money. It's not the driver itself that is expensive, it's all the work that goes into matching it to the proper specification so that the customer actually receives the product as it should be.

RG. So is it fair to say that consistency is the root of what you are trying to achieve?

PG. What we do is that when I have finished my development of the speaker I make an absolutely 100% copy of it and this then goes to the production facility. Whatever leaves the factory has to match that a within very close tolerances, and we have closely defined standards for this. So if we have a production run of sixty pieces of a particular model, first we take out the Reference and measure it. That eliminates environmental variation such as temperature, humidity any variation in the driving amplifier. Each new speaker then has to match it. How do achieve this? In a number of ways. First we measure each and every driver and categorize them: -1 dB, +0.5 dB, 0 dB, and we have the crossovers built to correct them. Initially about 30% of the new speakers will not meet tolerances. By looking at their measurements, waterfall plot etc. we can then adjust these so that their performance is corrected. What we are looking for is an absolutely parallel frequency response to the Reference. We don't mind if it is 0.3 dB louder so long as it is perfectly parallel. Of course, the two speakers in a pair must match.

RG. Where do you source your drivers from?

PG. The drivers are sourced from a number of companies, but mainly Scanspeak followed by SEAS. Together with them I have done a lot of development work.

RG. And do you have preferred materials for drivers?

PG. Yes. For midrange drivers we have developed our own material which is XPP The material we use is KPE from Japan, the lightest of all the thermoplastics. It has good inner damping but we add a little more by adding a certain percentage of polypropylene. That's why our cones are transparent.

The second material we use is paper: air-dried paper cones, usually filled with carbon fibres. That's where the rippled surface on our drivers comes from. They are also good for midrange. I absolutely do not like metal and you'll never find metal drivers in our speakers - at any frequency, tweeters or bass drivers. For bass drivers we adapt the way we use the materials that I like, because for bass drivers one thing is vital - the stiffness of the cone. So we can use stiffer versions of the paper cones with carbon fibres, and we also use a sandwich of carbon, honeycomb, carbon which is self damping. It has a resonance, but only in the mid-band, so it's not a movement resonance - you can't hear it. In the Mahler we cross over at 70 Hz.

We only produce two-way systems and what we call two-way systems with integrated sub-woofers: The bass drivers are always filtered out by 100 or 110 Hz. - This is the highest frequency at which they ever work. Otherwise they mess up the midrange. Now what we are doing is developing our own bass-driver, absolutely unique to us. We use XPP for the cone, but reinforced with moulded radial ribs. This cone is produced from our own tool here in Austria, and then sent to SEAS who build it into drivers. These ribs prevent bending and ensure that the driver behaves like a piston. Computer analysis also showed us the importance of the two ring ribs as well. The final structure is really incredibly rigid.

For tweeters we still try a lot of things. The latest unit we tried was a pure carbon tweeter which was very promising, with extension to 60 kHz. In these days of DVD-A and SACD this is an issue, although I have to say that I'm very disappointed by the pricing of the discs. It's killing the new formats. Even at the recent hi-end show in Frankfurt almost nobody talked to me about it. I see the potential in SACD for example, but when I talk to the public who buy high-end audio, it's no issue. For the present we still haven't found anything that we prefer to silk dome tweeters, hand coated in a special way, and with careful shaping of the air gap behind the dome. And we've also developed our own neodymium tweeter, which is very good.

Crossovers, we use the finest components, but everyone will tell you that!

RG. And cabinets?

PG. Ah, cabinets. When I develop a speaker design I am only concerned with sound quality. But we have to realize that if we are to deliver that quality to the customer then our products will always have to be at a certain price. Because of that we have to be concerned about the cosmetics. It's not enough to simply convince the customer with the sound. They have also to see a difference, and that means using nicely proportioned cabinets with a range of really well finished real wood veneers. We also use ten layers of lacquer, and have a special technique which only we use, for wrapping the veneer around curved cabinet edges, which makes a really big difference to the appearance. Much more like solid wood. People like the finish of our speakers very much and we have achieved very high consistency with it.

But more important for us is how they are constructed, which is with massive front and rear baffles. We never go under 40 mm of thickness. With the bigger models it's 50 mm. And the carcass is very heavily damped and braced, using finite element analysis and an accelerometer. That defines where we place the braces, which is actually much more important for the side panels than massive construction. The bracing also comes from our policy of separate enclosures for the mid-range drivers.

RG. So you use internal baffles that double as braces?

PG. Exactly Also, extensive listening tests that we conducted when we started the company demonstrated the importance of keeping the front baffle narrow. If you want to develop good sound-stage depth then it's important to avoid early reflections, and that includes diffraction from the baffle edge.

RG. If I was to characterize your speakers then I'd have to say that you've built your reputation on essentially traditional designs, but incredibly carefully executed. Yet the latest model, the Schönberg seems like a complete departure.

PG. Yes and no. We feel that we have some highly innovative thinking in our existing range, but that it doesn't necessarily show. In marketing and management meetings we are always talking about the future and the new designs really come from the emergence of multi-channel. Over 50% of our speakers in the US go into home-theatre systems, so we started to think, if you have two Mahlers or Beethovens at the front, a center speaker and two Haydns for the rear, isn't that a bit much for a living room. Fine for hi-fi enthusiasts but what are women going to say to that? So our conclusion was that the first thing that we could do to help was get the speakers out of the room space and back closer to the wall. That's something that we could do that would really help. The first product we did like this was called Waltz, a shallow speaker that could be placed in a number of ways with a very simple mounting bracket. It was very successful.

But it also presented a technical problem. We use very thick MDF so it is impossible to get internal volume from a slim enclosure. This made me consider what other material we might use. Aluminium is ideal. Extremely rigid even when it's thin. The problem is that it rings, especially when you have a cabinet that's shaped almost like a bell! We counteracted this by splitting the cabinet in two. We joined the two halves with MDF which will already damp them, but we covered each contact surface between the Aluminium and the MDF with a special rubber, for even greater damping. The result is really good. Very dead. You'll never find a wooden cabinet that behaves this well.

So this was the technical solution, but we still needed to develop more bass. In order to do this we looked at the interaction between the crossover and the drive unit. You can model any driver as a composite of resistors, capacitors and inductors. By combining these values with the values of a filter contained in the crossover, you can alter the performance parameters of the driver to the ones you want. This means that we can trick the speaker into producing more bandwidth. So the little Berg surround speaker works down to about 80Hz.

The next thing to do was develop a small tweeter. Most neodymium tweeters are so small that there's almost no air gap behind the diaphragm. By using a three part magnet and small mechanical dampers, we are able to both vent the diaphragm and roll off the tweeter's lower output smoothly and quickly making for a far simpler cross-over. To do this needs a very long throw, so the tweeter is a very special driver, but also a very expensive one as it has to be built to incredibly tight tolerances.

The Schönberg floorstander is the only model in the range that's reflex loaded. It uses arrangement, so each driver is individually ported, with the ports hidden in the edge of the 'wing'. The system can be built up using any combination of the models, even five Bergs and the sub-woofer, because of the symmetry of the smaller designs they can all be used horizontally or vertically, and have the brackets included to let you do this. It makes a very versatile and domestically acceptable product line, both in terms of price and placement.