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A Worldwide Unique Project: the Simulation of Engine's Noise using Loudspeaker

Acoustic research programs aimed to improve the experience of airline passengers by examining noise transmission on aircraft, was till now very costly because this could only take place during a flight. Through a unique multi-channel sound system, it's now possible to simulate the authentic noise of a turbine on the ground. **Udo Borgmann**, who is the founder and chairman of Pan Acoustics, received an award of 10 000 Euros for this project from the Chamber of Industry and Commerce Braunschweig (CIC) on November 9th. »This is the first time that an entrepreneur has been awarded such a technology transfer award« said (The) CIC-President Dr. Wolf-Michael Schmid. He also pointed out that the new technology will be used by the German Centre for Aviation and Astronautics (DLR), which is also a business partner of the aircraft manufacturer Airbus.

»10 000 Watt Power Sound«

Using a 112-channel sound system with the capability of reproducing sound pressure levels of 140 decibels, Pan Acoustics has successfully simulated the external noise made by an aircraft's engine. Another simulation has also been successfully completed using a 106-channel sound system inside the aircraft cabin; this process is called interne simulation.

The simulation of external and internal noise can be carried out independently from each other.

The German Centre for Aviation and Astronautics felt a duty to explore the source of noise as well as its transmission to develop measures to significantly increase passenger's well-being by reducing external noises.

»Orders from aircraft manufacturer Airbus«

Udo Borgmann created Pan Acoustics in 2002 after a career as Development Engineer and Project Manager at Robert Bosch GmbH.

The 50 year old engineer took charge of development works for research institutes and companies and through this, he gained a great reputation for his own products and now leads a staff of 10 employees. As such, the Prince of Morocco decided to install his garden, covering some 600 square metres, with audio technology designed by Udo Borgmann.

»New Features«

The dynamic entrepreneur from Wolfenbüttel has, among other things; set up the Milan Cathedral and fitted the cruise ship



'Pride of America' with a new sound system consisting of over 10,000 loudspeakers.

In addition to this, Udo Borgmann has developed high quality Car-HiFi-Systems with a three-dimensional sound-engineering. If this wasn't enough a few weeks ago, at the police's Convention, Borgmann exhibited another innovation: a speaker, that is designed in such a way that it can withstand a bullet from a Magnum 44.

The technology transfer prize was awarded this year for the 28th time. Dr. Wolf-Michael Schmid announced that there were a total of 73 laureates, with 35 projects accepted for the transfer technology award, with an endowment of 240 000 Euros to be given to the laureates. He added that the main objective of the technology transfer award was to help enterprises to come out of their isolation and be competitive in international markets, and that this had been successfully achieved. *jh*

Earthquake in the conference room of Chamber of Industry and Commerce (CIC)

What people are mostly afraid of when an earthquake is happening is the fact that they cannot say exactly where the noise is coming from. The same happened, when at a conference room at CIC, Udo Borgmann simulated an earthquake with his loudspeaker, which sounded so incredibly realistic.

wirtschaft: Mr. Borgmann, your reference list is not only long but filled with the best addresses. From the Paris City Hall, over to the famous Cabaret Lido Moulin Rouge, and from the Venice Biennale up to the King Palace Fez in Morocco. Which project are you working on now?

Borgmann: In order to avoid that the liturgical music as well as the Pope's homily disappear in

the crowd, we recently have equipped the Milan Cathedral with 120 speakers that are digitally steerable, so that the »acoustic beam« can be vertically and horizontally steered. As result we have delivered an outstanding sound quality. Through »acoustic beam« technology it's possible to clearly hear people speaking over a distance of two kilometres. This capability might be of great importance in case of an accident that may happen at a nuclear power station.

wirtschaft: How could you describe the cooperation with the DLR?

Borgmann: I really enjoyed it for several reasons, firstly, the DLR is one of the best companies worldwide, and secondly we could discuss all aspects of our project without being only focused on profit, which is specific to large companies.

»Further application area: High Speed Trains«

wirtschaft: Are there any further scope of application, where noise researches can be applied to, apart from the simulation of engine's noise?

Borgmann: Yes, I refer to high speed trains, where the air noise and its successful containment have played a crucial role in the comfort and well-being of train travellers.

wirtschaft: You're considered as a passionate supporter of the label »Made in Germany«

Borgmann: That's right. I am an advocate of high quality outright. Nowadays, many companies are ready to sacrifice good quality just to save a couple of cents. I just don't believe in that approach. According to my philosophy, manufacturing quality products leads to a value both for my company but also creates a value that

»Chopin after Work«

remains in Germany. Quality is one of our oldest virtues, new jobs can arise through quality and therefore a long term benefit for the local economy.

wirtschaft: Have you ever thought, with any of your products to enter into the mass market?

Borgmann: It never crossed my mind. So because of the previous reasons.

The awarded Udo Borgmann (m.), Professor Martin Wiedemann (r.), Director of DLR for Composite structures and adaptive systems and CIC-President Dr. Wolf-Michael Schmid.

Pictures: Peter Pohl



»Is Innovation something Supernatural?«

Professor John Collins, member of the Jury at the award ceremony has answered this question arguing by referring to participant's masterpieces on the one hand and analysing successful companies on the other hand.

Example: Apple. According to John Collins, success is possible by making a mix between taking heed of known technologies, identifying the needs of consumers, having a strict corporate governance and an aggressive defence of own patents.

Germany is known as a land providing one of the best educational systems in the world. But the existence of the risk aversion puts a limit on financial investments.



wirtschaft: When and where do you get your best ideas?

Borgmann: On the motorway, when I get stuck in a traffic jam.

wirtschaft: How would you describe your living room? Like a paradise for HiFi fanatic?

Borgmann: (Laughs) Quite the reverse! My living room is the place, where I can relax the

best, playing music of my favourite composer Chopin on my piano. My second passion is motorcycling. While riding I always enjoy the view through the Harz's Mountains. It's very relaxing and I can let my mind wander. *jh*

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