



# International Noise Awareness Day

## Noise reduction in modern telecommunication systems

Date: Wednesday, April 30, 2014  
Time: 15.00 – 18.00  
Place: Sennheiser Communications  
Industriparken 27  
DK-2750 Ballerup  
Price: Free

**Registering:** Send a mail to Kim Larsen at [kil@senncom.com](mailto:kil@senncom.com) no later than **Monday 28 April 2014** with name and company/student/other in order to join event (Minimum participants: 15).

**Introduction:** The technical committee of psycho-acoustics, part of the Acoustical Society of Denmark proudly presents our next event in connection with the 19<sup>th</sup> International Noise Awareness Day, April 30, 2014. The purpose of the day is to promote awareness of exposure to noise and together with Sennheiser Communications, DELTA and Oticon/DTU CAHR we have made a very exciting program where we would like to present the implementation of noise reduction technologies in modern telecommunication systems.

### PROGRAM:

- 15.00 - 15.15 **Registrering**
- 15.15 - 15.20 **Welcome**  
Kim Larsen, Sennheiser Communications
- 15.20 - 15.30 **Introduction to Sennheiser Communications**  
Torben Christiansen, Sennheiser Communications
- 15.30 - 16.00 **'Noise reduction and its impact on speech intelligibility in telecommunication'**  
Søren Jørgensen, Oticon and DTU CAHR

Noise reduction is a common part of the signal path in modern telecommunication, and may contribute to reducing the noise of the transmitted signal. However, an effective noise reduction system does not necessarily lead to improved speech intelligibility. This study takes a closer look at the relationship between noise reduction processing and speech intelligibility using a model inspired by auditory signal processing. The results indicate that there is still room for improvement of noise reduction algorithms that aim to improve speech intelligibility.

- 16.00 - 16.25 **'Sennheiser Presence – Noise reduction vs. speech quality in a professional Bluetooth headset'**  
Kim Larsen, Sennheiser Communications

Awareness of noise and especially reducing noise is always a major part in the development process of a modern telecom headset. This talk will give you an introduction to that process and the newly developed 'Sennheiser Presence' headset minded for professional use will be used as case story. For this customer segment there are strong demands for massive noise reduction but at the same time also strong demands for clear and natural speech quality! How such a compromise can end up will be demonstrated via sound demos.

- 16.25 - 16.40 **Break**
- 16.40 - 17.10 **'Subjective evaluation of noise suppressor technologies'**  
Søren Vase Legarth, DELTA SenseLab

Telecommunication systems of today all have some level of noise suppressor technology to reduce the intrusion of surrounding noise sources on the communication signal. As the unwanted noise from surrounding sources often mixes up with the target signal, it is a tradeoff to find the balance between noise reduction and preservation of target source sound quality. Methods for perceptual evaluation of noise suppressor performance will be presented and results from both telecoms and headphone studies will be shown.

- 17.10 - 17.35 **Active Noise Cancellation in headphones**  
Morten Kjær Petersen, Sennheiser Communications

Headphones have become the most widespread application for active noise cancellation. This is due to the fact that with the closed and controlled acoustics of a headphone, very good noise damping can be achieved at an attractive cost for commercial products. In this short presentation I will look into the possibilities for personal noise cancellation (noise cancellation for one person only). Emphasis will be on active noise cancellation in headphones, where I will dig into the technical solution and try to answer why the popularity of this type of headphone is growing.

- 17.35 - 17.45 **'The EN50332-standard – protection of our/your ears'**  
Kim Larsen, Sennheiser Communications

This standard deals with the sound pressure levels from headphones when used with mobile players. Here it is determined that a mobile player must not produce a sound pressure louder than 100 dB(A) on a headphone connected. This talk presents a very quick talk about this standard as one step in the right direction in order to protect our ears for high sound exposure.

- 17.45 - 18.00 **Thank you for today.**