Departamento de Ingeniería de Comunicaciones

CONFERENCIA

Loudspeaker Crossover Design (from analog to digital)

impartida por

Gottfried Behler

Institute of Technical Acoustics RWTH Aachen University

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Contenido:

Loudspeaker systems are quite complex devices and considered 'musical instruments' for many HiFi-enthusiasts. However, from the technical point of view the description of an optimal loudspeaker seems to be simple: the reproduction of any electrical input signal in such a way that the acoustical output looks the same with respect to the waveform. Unfortunately, the demands to reach this task are manifold and very often when fulfilling one requirement problems arise with other demands. A typical one is that with only one transducer it is rather impossible to reproduce the entire frequency spectrum in a satisfying manner and with sufficient output. Therefore several transducers may be used with specific capabilities in low mid or high frequency range. In consequence the frequency content of the input signal needs to be distributed in a correct way so to insure that the overall output of the loudspeaker system fulfills the above mentioned requirement. The technical solution for this is the so-called crossover network.

Since several years audio goes digital and the possibilities in creating crossover networks have become more flexible with digital filter design. Digital IIR and FIR filter design is well established, but a simple treatment of analog filter concepts in digital domain would not help to improve the reproduction of a loudspeaker. Therefore new concepts with digital filters are required.

In this talk we will firstly discuss the general filter strategies (either analog or digital) for loudspeakers. Then we will introduce both methods – IIR and FIR filter - for loudspeaker crossover design in digital domain. The advantages and some disadvantages will be addressed as well. A real word example will finally show what is possible when making the optimum use of the system.