

## “Calibration & Design Techniques for Modern Sound Systems”

This seminar is intended to remove the "magic" surrounding sound systems. It provides the means and physical insight to create predictable and repeatable sound system designs, regardless of brand and type of speaker and verify the results using the dual channel FFT analyzer (SIM 3, SMAART v7, SysTune, etc.). The complete transmission path from source to receiver will be thoroughly investigated in the acoustical, electrical and psycho-acoustical domains. Allowing the participant to have real expectations on which they can act. Topics will be among others:

- sound in general
  - frequency, period & wavelength
  - speed of sound
  - polarity
  - phase / group delay
  - decibel
  - RMS
  - loudness perception
  - inverse square law
  - coverage shapes
    - coverage angle
    - isobaric charts
    - Forward Aspect Ratio
    - Lateral Aspect Ratio
  - directivity factor
  - directivity index
  - comb filter
  - ground floor measurement
- dual-channel FFT analyzer
  - Fast Fourier Transform
  - time domain
  - frequency domain
  - spectrum
  - transfer function
  - impulse response
- RTA
- acoustics
  - Schroeder frequency
  - room modes
  - Mean Free Path
  - Sabine equation
  - $RT_{60}$
  - critical distance
  - Intelligibility
    - %ALCons
    - STI
  - air absorption
  - temperature
- psycho-acoustics
  - critical bandwidth
  - echo perception
  - Haas effect
  - Source localization
- filters
  - graphic (constant vs. proportional Q)
  - parametric
  - single slope
    - low & high-pass
- speaker array configurations
  - coupled point source
    - symmetrical
    - asymmetrically
  - uncoupled line source
  - uncoupled point destination