

Sound System Optimization and Measurement

Training

This 2-day seminar is both for beginners as well as for advanced system engineers and sound technicians. After the first day participants will be able to make basic measurements and have a general understanding of the tools and techniques used in measurement of sound systems. The second day will then explore more advanced techniques using specific examples of sound systems. Advanced features like windowing, intelligibility, or reverberation time will be included in the topics to explore.

Day 1

1. Introduction & Housekeeping

- 1.1. Introduction of Participants
- 1.2. Class Objectives

2. Digital Measurement Fundamentals

- 2.1. FFT Measurement Basics

3. SysTune Setup

- 3.1. Select Soundcard
- 3.2. Verify Signal Distribution

4. Measurement Setup *Hands-on*

- 4.1. Selecting the FFT Size and Number of Averages
- 4.2. Selecting the Test Signal
- 4.3. Selecting Signal & Reference Channels

5. Saving Setup Files *Hands-on*

6. Making Measurements *Hands-on*

- 6.1. Arrival Time
- 6.2. Gain
- 6.3. Capturing a Measurement

7. Looking at a Measurement *Hands-on*

- 7.1. Input
- 7.2. Transfer Function
- 7.3. Display Limits and Views
- 7.4. Smoothing
- 7.5. Cursors

8. Evaluating a Measurement *Hands-on*

- 8.1. Time Domain
- 8.2. Frequency Domain

9. Applying EQ to the Mains *Hands-on*

- 9.1.1. Where to Measure (Mic location)
- 9.1.2. Minimizing Reflections (IR Windows)
- 9.2. How Much of the Room to Let In?

10. Windowing *Hands-on*

- 10.1. Signal Acquisition Windowing
- 10.2. Impulse Response Windowing

11. Minimizing Noise Contamination *Hands-on*

- 11.1. Number of Averages
- 11.2. FFT Length and IR Window
- 11.3. Band Pass Filter & Skip Pauses
- 11.4. SSA Filter

12. Multi-Channel Measurements *Hands-on*

- 12.1. Multi-Measurement Averaging with Multiple Mics
- 12.2. Multi-Measurement Averaging with a Single Mic

Day 2

13. Recap / Questions & Answers

14. Installation and Licensing *Hands-on*

- 14.1. User Files
- 14.2. AFMG License Manager

15. System Alignment - Timing and Tuning *Hands-on*

- 15.1. Why we are Making Measurement
- 15.2. Subwoofers and Mains
- 15.3. Mains and Fills
- 15.4. Differences for Front Fills & Other Fill Systems

16. Monitoring Signals *Hands-on*

- 16.1. SPL
- 16.2. Leq (A-Weighted)
- 16.3. History
- 16.4. Spectrum & Spectrogram

17. Plug-ins *Hands-on*

17.1. Web Interface

17.2. Health Regulations

18. Measurements *Hands-on*

18.1. Measure 3 Systems

19. Recap / Questions & Answers