

CJS Labs

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Lab Notes



Electroacoustics & Audio

- Consulting
- Design / Testing
- Training

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Training Services

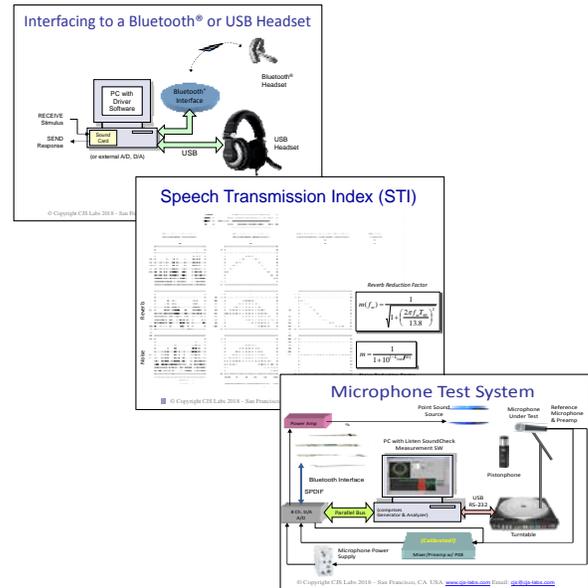
CJS Labs offers customized in-house training. Our design experience, proven processes, and measurement expertise will make your product development more efficient. Learn how to optimize both your designs and test routines. Having a thorough understanding of fundamentals, correct terminology, and proper techniques will also enable you to make more informed decisions and communicate more effectively with your customers and vendors as well as within your own organization. Understand why certain failure modes are problematic, even if they are not obvious or audible. Sample course outlines and details are available on our website:

http://www.cjs-labs.com/training_seminars.html

Contact us to schedule a training course for your organization.

New & Updated Training Seminar Materials

Several of the classic CJS Labs training seminar modules have been updated with new material in order to keep up with emerging technology trends, including “Microphone Measurements” and “Headset Testing”. In addition, we are now offering a seminar module for “Introduction to Speech Intelligibility Measurements” featuring all new material and focused on the IEC 60268-16 Speech Transmission Index (STI) method. Contact us for details.



News and Upcoming Events

ASA 175th Meeting in Minneapolis

The Acoustical Society of America will meet in Minneapolis 7-11 May 2018. ASACOS and the ASA Standards committees will meet on Monday and Tuesday.

I'm chairing a Special Interdisciplinary Session on Thursday, 10 May entitled **“Acoustical Standards In Action: Realization, Application, and Evolution”**, Session 4a1D.

In this session, I will also be presenting *“An overview of*

the Standards Program of the Acoustical Society of America”.

The session is 8:00 - 11:40 CDT and will be live streamed and recorded. Go to the ASA website for more information.

If you plan on attending the ASA Meeting in Minneapolis and would like to set up a time to meet, please contact us.

Please contact us to discuss your projects and let us know how we can be of service to you.

Christopher J. Struck
CEO & Chief Scientist

CJS Labs





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CJS Labs is a consulting firm based in San Francisco, CA. We specialize in audio and electroacoustics applications. With over 30 years of industry experience in engineering and technology management, our areas of expertise include transducers, acoustics, system design, instrumentation, measurement and analysis techniques, hearing science, speech intelligibility, telephony, and perceptual coding. We also offer project management, technology strategy, patent & IP evaluation, and training services

Back issues of Lab Notes are available on our website at:
http://www.cjs-labs.com/lab_notes_links.html

Equalization of Sound Sources for Microphone Measurements

The response of a sound source used for microphone testing is not generally flat at all frequencies. Therefore, measurements must ensure that the response of the source does not appear in the response of the device under test. The most straightforward method is to perform a 2-channel measurement that simultaneously measures the output of the sound source and the output of the device under test. The desired frequency response is then the sound source channel divided by the reference microphone channel.

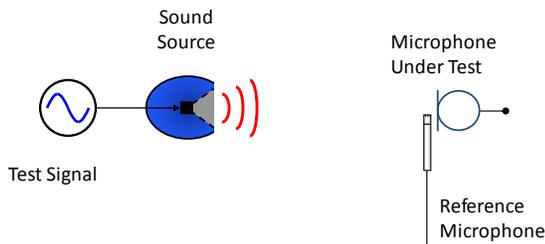


Fig. 1. Simultaneous 2-ch. comparison method.

This works with any signal, and handles changes in the source response. However, the test spectrum is not controlled and the reference mic and mic under test cannot occupy the same position. An alternative is to measure the response of the source and store it, substitute the device under test, and then divide the reference measurement out using post-processing.

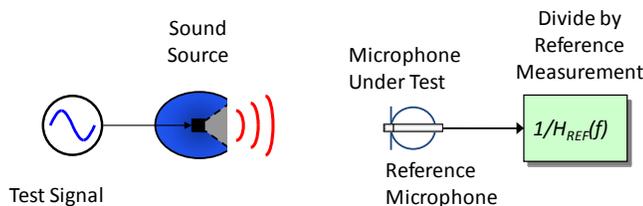


Fig. 2. Two-pass substitution method.

The same point in sound field is used for measure-

ment and calibration, but again the test spectrum is not controlled and the calibration may need to be performed frequently if the source is not stable. The most common method of regulating the sound source response is to perform a serial point-by-point measurement of the sound source and then use this data (inverted) to adjust its response during the measurement of the test object.

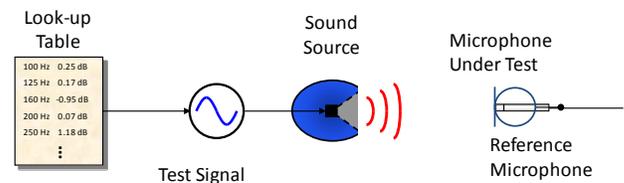


Fig. 3. Serial point-by-point compensation method.

This method only works for sinusoidal signals, but otherwise is the same as the substitution technique, except that the test spectrum is controlled. If it is necessary to keep sound pressure constant, a compensating equalization (EQ) network with the inverse response of the sound source can be used.

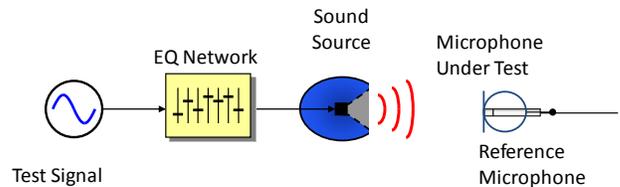


Fig. 4. Inverse filter method.

This method controls the test spectrum and can be used with any other technique, but the EQ may need to be adjusted if the source is unstable.

Please contact us for more information.