

VOICE COIL

THE PERIODICAL FOR THE LOUDSPEAKER INDUSTRY

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Industry News & Developments

By Vance Dickason

Happy 28th Birthday *Voice Coil*

November 2014 marks the beginning of *Voice Coil*'s 28th year as an information resource for the loudspeaker industry. *Voice Coil* magazine resulted from a conversation I had with the late Ed Dell following Audio Amateur's publication of the 3rd edition of the *Loudspeaker Design Cookbook* (now in its 7th edition). Ed related his concept of a publication that would become the loudspeaker industry's "information super highway." Needless to say, I considered it not only an outstanding concept for a new publication, but something I felt the industry greatly needed and would happily support. Obviously, after 27 years, we were right to move forward with the publication. Ed came up with the *Voice Coil* name, and the rest is history.

From the first issue in November 1987 until June of 1995, *Voice Coil* was a monthly subscription-based black-and-white four-page newsletter that I wrote with no additional contributors and no advertising. In 1995, the June issue jumped to 20 pages of four-color print. (*Voice Coil* is currently 32–48 pages each month!) The magazine is now advertiser driven and is free for qualified subscribers. *Voice Coil* is also available as an Internet-delivered subscription.

In addition to the change in printing, distribution, and digital delivery, *Voice Coil* features guest contributors including James Croft, Charlie Hughes, Mike Klasco, Wolfgang Klippel, Steve Mowry, Steve Temme, Pat Turnmire, and many others.

Support has come from some of the industry's finest engineers and through the generosity of analyzer/software manufacturers Klippel GmbH, LinearX, and Listen, which currently supply *Voice Coil* with some of the best test equipment available. In previous years, DRA Labs and Audiomatica supplied *Voice Coil* with superior test equipment.

Although the loudspeaker industry magazine has grown and matured, *Voice Coil* has stayed true to its original concept as a world-class clearing-house of information for loudspeaker engineers, manufacturers, marketing specialists, and OEM suppliers. Evidenced by the participation of writers, advertisers, and readers, *Voice Coil* continues to be well received by the loudspeaker industry. Each year brings increased circulation as more engineers, technicians, and marketing experts discover what we have to offer.

On behalf of *Voice Coil*'s new owner Steve Ciarcia, as well as Vance Dickason, editor; Hugo Van haecke, publisher; Shannon Becker, editorial coordinator; João Martins, international editor; and all the staff who make this publication possible, we would like to thank our readers and advertisers for their continued enthusiasm and support.

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Hill Acoustics Mini Anechoic Chambers

According to the Hill Acoustics, much time goes into measuring loudspeakers only for the customer to repeat the same measurements, as they cannot always trust the data received from the suppliers.

This is not due to the equipment as hardware, software, and microphones are not significant sources of errors. Rather, Geoff Hill believes that it is the lack of consistent environment and measurement geometry that is the reason for the inconsistencies.

There are standards for making loudspeaker measurements from the International Electrotechnical Commission (IEC) and the Japanese Industrial Standards (JIS). Unfortunately, both of these standards are relatively old and do not really suit the ways modern loudspeaker drivers are produced or tested. For this reason, Hill Acoustics has developed the Tetrahedral Test Chamber (TTC), a mini anechoic chamber that produces consistently accurate results.

The TTC eliminates standing waves and utilizes acoustic foam to eliminate any remaining high-frequency issues. It's acoustically stable, structurally strong, and robust design ensures that measurements are made in exactly the same way each and every time. The simple freely interchangeable measurement baffles ensure consistently repeatable and reliable measurements are quickly and easily made, without requiring high skill levels. Accurate careful set up of the measurement microphone together with tight dimensional control and individual chamber calibration ensure the highest accuracy and repeatable results.

Hill Acoustics produced an e-Brief titled "Consistently Stable Loudspeaker Measurements using a Tetrahedral



Photo 4: The Hill Acoustics Tetrahedral Test Chamber (TTC) 350 is a mini anechoic chamber that is said to produce consistently accurate results.

Enclosure," that explains the process. It was presented at the 135th International Audio Engineering Society (AES) Convention. However, the White Paper, which is available on the Hill Acoustics website (<http://hillacoustics.com>), is even more illuminating.

The White Paper, titled "Measurements on a SEAS H1207 Bass/MidDriver: Comparison of results between an IEC Baffle and a Small Tetrahedral Test Chamber," compares the measurements of a SEAS H1207 (L12RCY/P) 4.5" woofer performed on an IEC baffle in the SEAS anechoic chamber (see **Photo 3**) with



Photo 3: A SEAS anechoic chamber is used to take a comparative International Electrotechnical Commission (IEC) baffle measurement.

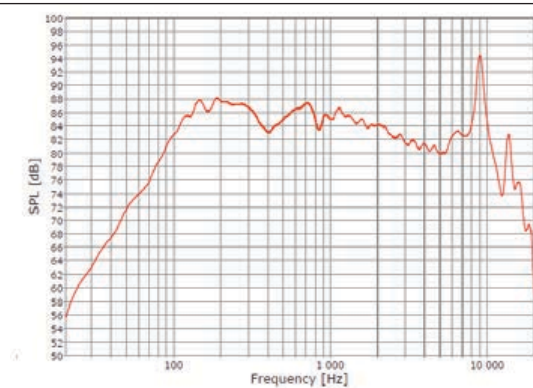


Figure 1: The IEC baffle measurement of the SEAS 4" driver is shown.

Internal, Correction and Final Response curves below:

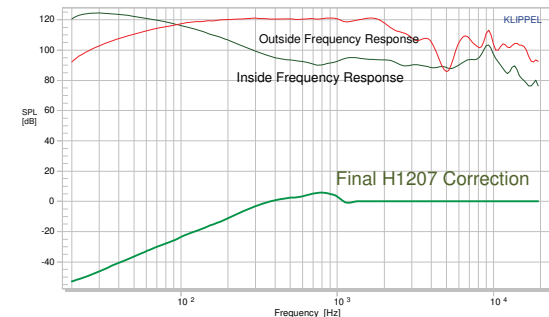


Figure 2: This illustrates a comparison of TTC 350's internal measurement, "outside" near-field measurement, and correction curve for the TTC 350.

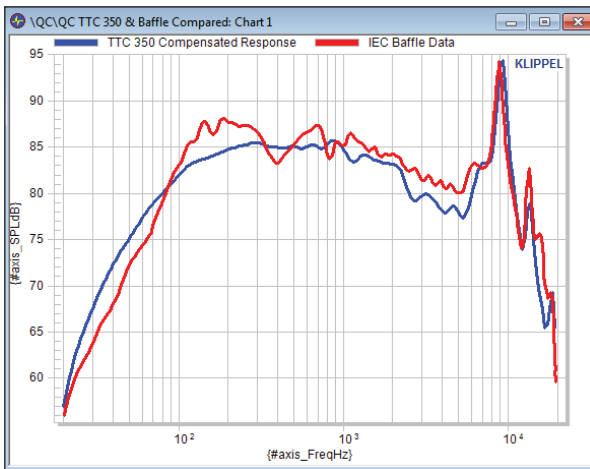


Figure 3: A comparison of the SEAS H1207 4" driver on an IEC baffle is shown with the same driver mounted in the Hill Acoustics TTC 350.

the results using the Hill Acoustics TTC 350 chamber (see **Photo 4**). The White Paper details the process of developing the correction curve used with the TTC 350 mini chamber.

Figure 1 shows the frequency-response curve from the L12RCY/P with the test setup shown in **Photo 3**. The correction curve was developed by creating a difference curve between the internal measurement from the TTC 350 chamber and the near-field measurement on the back of the driver (see **Figure 2**). And finally, the comparison between the corrected TTC 350 curve and



Photo 5: This is a close up view of the microphone mounting location in the Hill Acoustics TTC 350.

the SEAS IEC baffle curve is shown in **Figure 3**.

Hill Acoustics produces four TTC chamber sizes—the TTC 350, for up to 4" diameter drivers; the TTC 750, for up to 8" diameter drivers; the TTC 900, for up to 12" diameter drivers; and the TTC 1500, for up to 21" diameter drivers. Each chamber has a measurement microphone mounting system that can be adjusted to fit 0.25"-to-0.5"-diameter microphones. **Photo 5** shows a Listen SCM 0.25" microphone.

Next month, I'll compare the Hill Acoustics TTC 350 using my Test Bench protocol. For more information about this interesting new addition to measurement tools, visit <http://hillacoustics.com>. **VC**