



## The D2008/2010 Revised Classic Dome Tweeter from Scan-Speak

By Vance Dickason

In 2009 Scan-Speak regained its ownership from Tymphany HK, Ltd. No longer a part of Danish Sound Technology (DST) and Tymphany, and now under Eastech ownership, Scan-Speak continues to introduce more new Danish designed and crafted transducers for the high-end home audio and studio monitor market. Founded in 1970, Scan-Speak is still working out of the same address in Videbaek, Denmark, and with the same “no compromise” philosophy that was always a part of the Scan-Speak mission. This month, Scan-Speak sent me two revised classic Scan-Speak 19mm soft dome tweeters that started out more than 35 years ago, the D2010 and the D2008.

Scan-Speak basically discontinued production of the original 19mm ferrite magnet soft dome D2008 models (the D2008/851100 and D2008/851200 Ferrofluid version) and the similar D2010 models (the D2010/851100 and D2010/851300 Ferrofluid version) and replaced them with the new 19mm textile dome neodymium motor versions, the D2008/852100 and the D2010/852100 (Photo 1).



Photo 1: Scan-Speak recently released new 19mm textile dome neodymium motor versions of its old classics, the D2008/852100 and the D2010/852100.

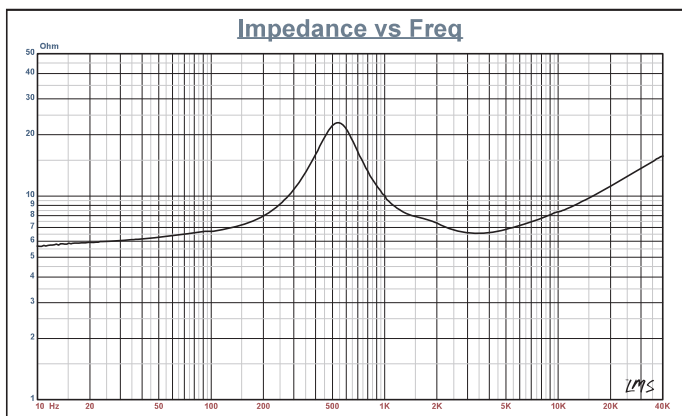


Figure 1: Scan-Speak D2010/852100 free-air impedance plot

Both revised versions of the original highly praised designs are virtually identical except for the faceplates. The new D2008 has a solid plastic 92mm diameter faceplate), while the D2010 has a 98mm diameter plastic faceplate with an acoustic damping rubber insert. (The original D2010 had a foam insert, plus there is no separate Ferrofluid model available.)

The feature set for the Scan-Speak D2008/D2010 tweeters include a 19mm coated cloth dome, a low resonance dual rear chamber (Fs=550Hz), a vented pole piece, long-term maximum power handling of 150W (using a second-order 4kHz high-pass filter), 89dB sensitivity, plus gold-plated terminals.

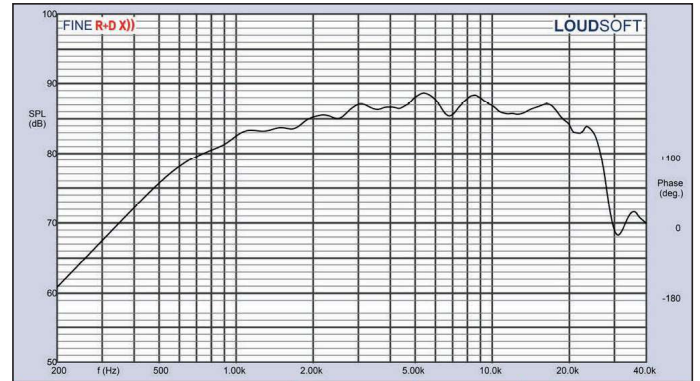


Figure 2: Scan-Speak D2010/852100 on-axis response

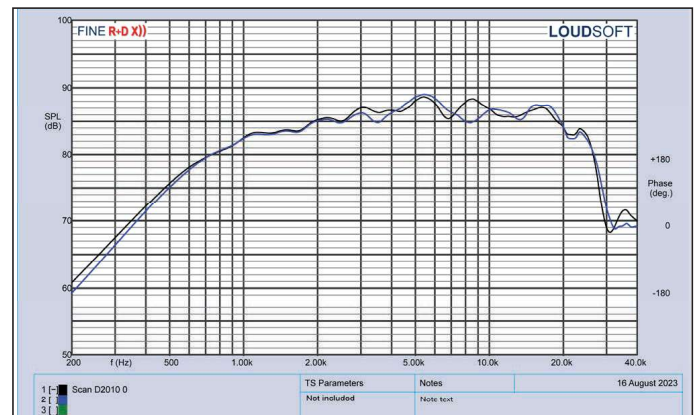


Figure 3: Scan-Speak D2010/852100 on-axis response (black curve) compared to the D2008/852100 on-axis response (blue curve)

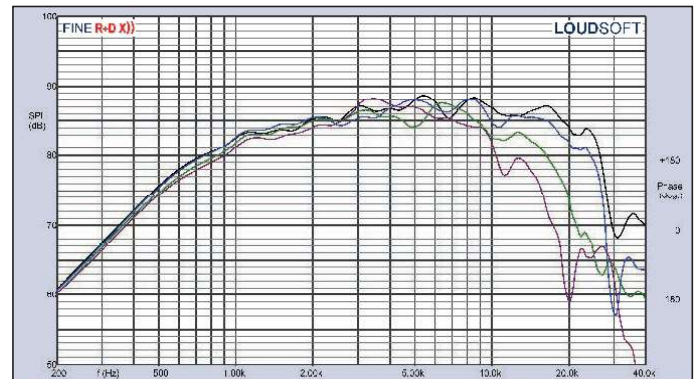


Figure 4: Scan-Speak D2010/852100 on- and off-axis frequency response (0° = black; 15° = blue; 30° = green; 45° = purple)



Figure 5: Scan-Speak D2010/852100 normalized on- and off-axis frequency response (0° = black; 15° = blue; 30° = green; 45° = purple)

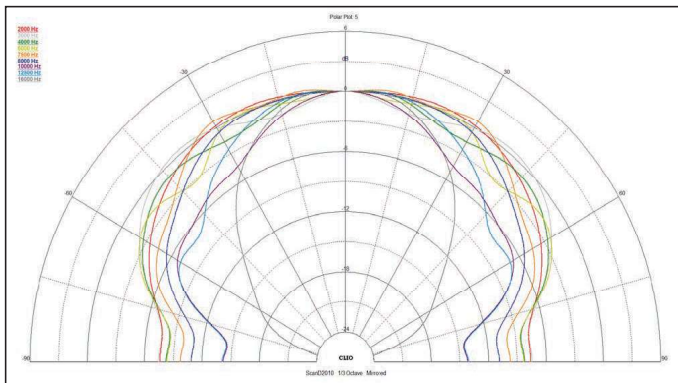


Figure 6: Scan-Speak D2010/852100 0° to 180° polar plot (in 10° increments)

I began testing the new Scan-Speak D2010 tweeter by generating a stepped sine wave impedance plot using the LinearX LMS analyzer. The result of the LMS 300-point impedance sine wave sweep is given in **Figure 1**. The resonance of the D2010 tweeter is 545Hz ( $Q_{ts}=0.49$ ). Minimum impedance for the D2010 is 6.55Ω at 3.39kHz, with a 6.20Ω DCR.

After completing the impedance measurements, I recess mounted the Scan-Speak D2010 tweeter in a bookshelf-size enclosure that had a baffle area of about 14"×6" and measured the horizontal on- and off-axis at 2.0V/0.5m (normalized to 2.83V/1m) from 0° on-axis to 45° off-axis using the Loudsoft FINE R+D analyzer and the GRAS 46BE microphone (supplied courtesy of Loudsoft and GRAS Sound & Vibration).

**Figure 2** shows the on-axis response for the D2010, which exhibited a ±1.5dB response from the 4kHz recommended crossover frequency to about 18.5kHz. **Figure 3** shows an on-axis comparison of the D2010 and the nearly identical D2008.

**Figure 4** depicts the on- and off-axis (0° to 45°) response of Scan-Speak D2010 19mm soft dome neo version, with the off-axis curves normalized to the on-axis response shown in **Figure 5**.

**Figure 6** shows the 180° horizontal polar plot (in 10° increments with 1/3 octave smoothing applied), generated by the CLIO Pocket analyzer and accompanying microphone (courtesy of Audiomatica SRL). Last, **Figure 7** gives

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the two-sample SPL comparison showing the two Scan-Speak D2010 samples to be closely matched within  $\leq 1\text{dB}$  throughout the drivers operating range from 4kHz to 20kHz.

The next test procedure was to again use the Listen SoundCheck V21 software and AudioConnect analyzer and SCM 1/4" microphone to measure the impulse response with the tweeter recess mounted on the same test baffle. Importing this data for the Scan-Speak D2010 into the Listen SoundMap software produced the cumulative spectral decay (CSD) waterfall plot shown in **Figure 8**. **Figure 9** depicts the Short Time Fourier Transform (STFT) displayed as a color variegated surface plot.

For the final test procedure, I set the 1m SPL to 94dB (6.4V for the D2010) using a pink noise stimulus and

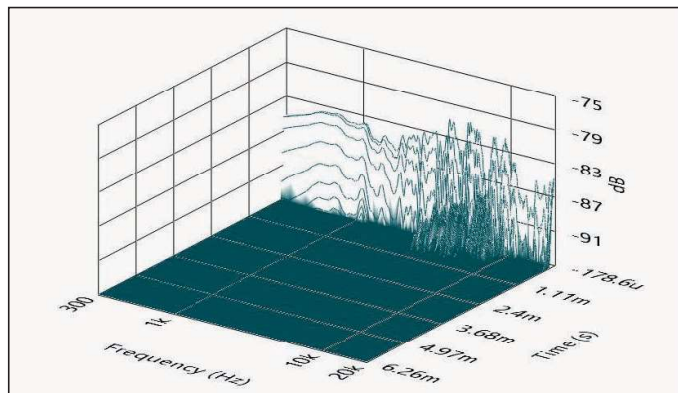


Figure 8: Scan-Speak D2010/852100 SoundCheck CSD waterfall plot

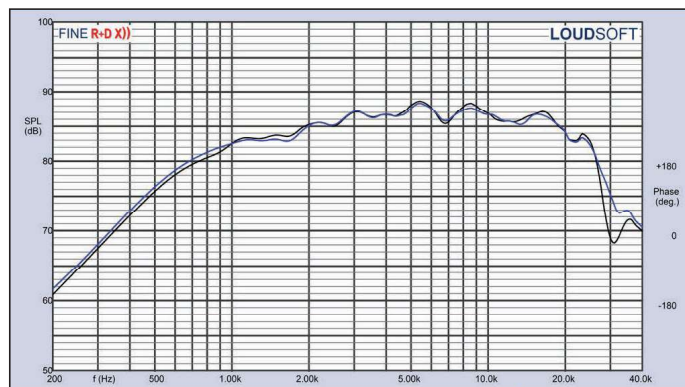


Figure 7: Scan-Speak D2010/852100 two-sample SPL comparison

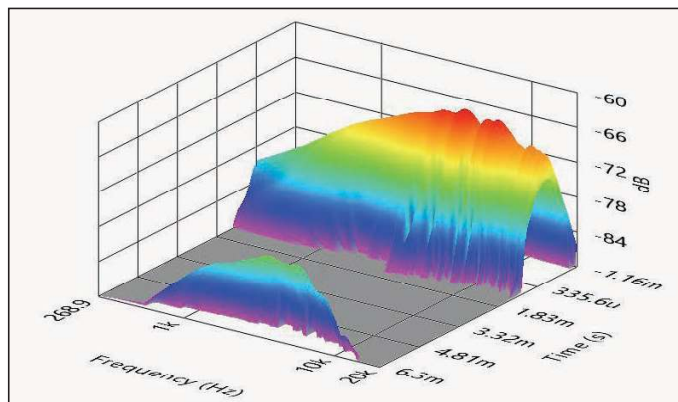

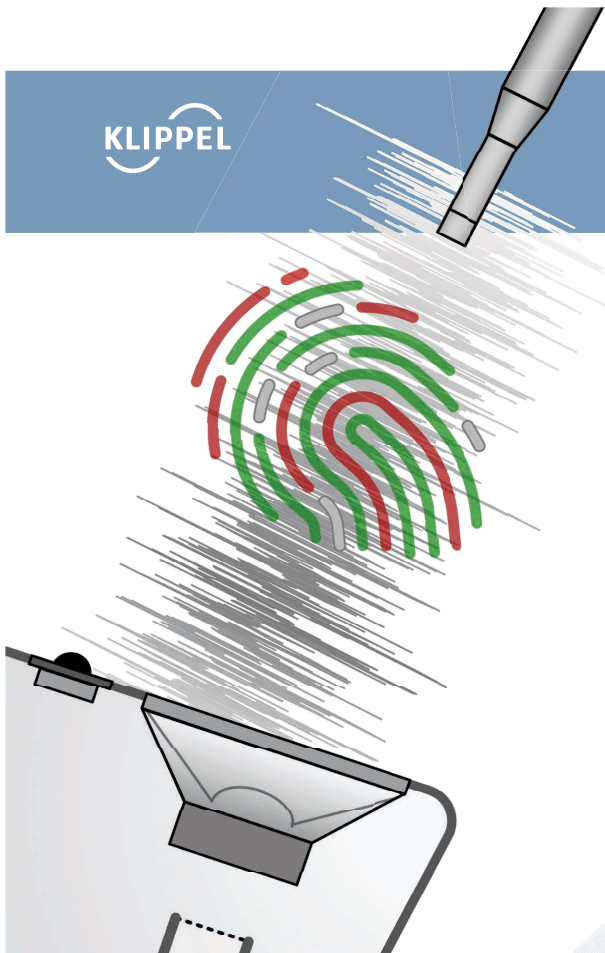


Figure 9: Scan-Speak D2010/852100 SoundCheck STFT surface intensity plot



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measured the second and third harmonic distortion at 10cm, which is depicted in **Figure 10**. The data again demonstrates very low third harmonic content.

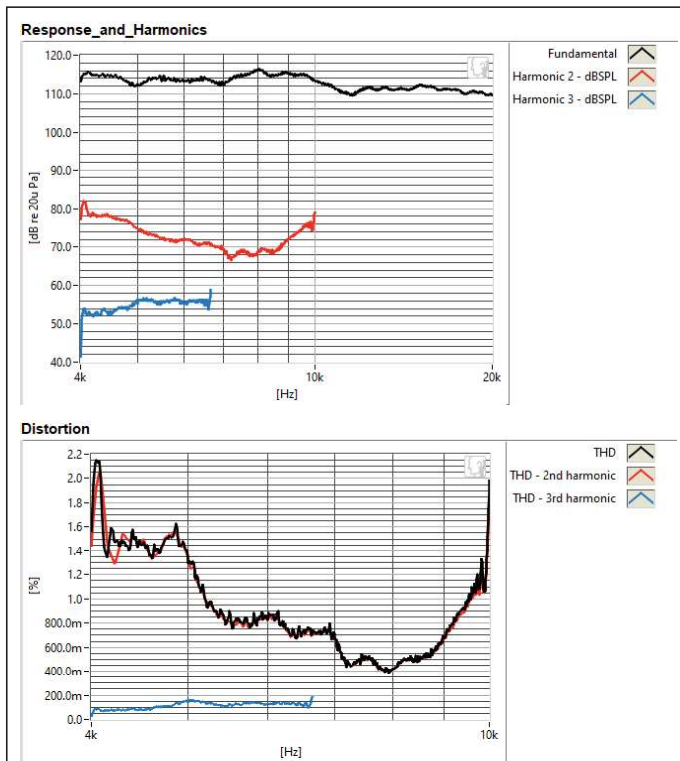


Figure 10: Scan-Speak D2010/852100 SoundCheck distortion plots

I can recall designing products with the original D2010 more years ago than I care to remember, and it was an outstanding ¾" dome back then, so I suspect that given all the above data, that the new versions are at least as good as the originals.

For more information about these and other well-crafted high-end transducers from Scan-Speak, visit [www.scan-speak.dk](http://www.scan-speak.dk). **VC**

### Submit Samples to Test Bench

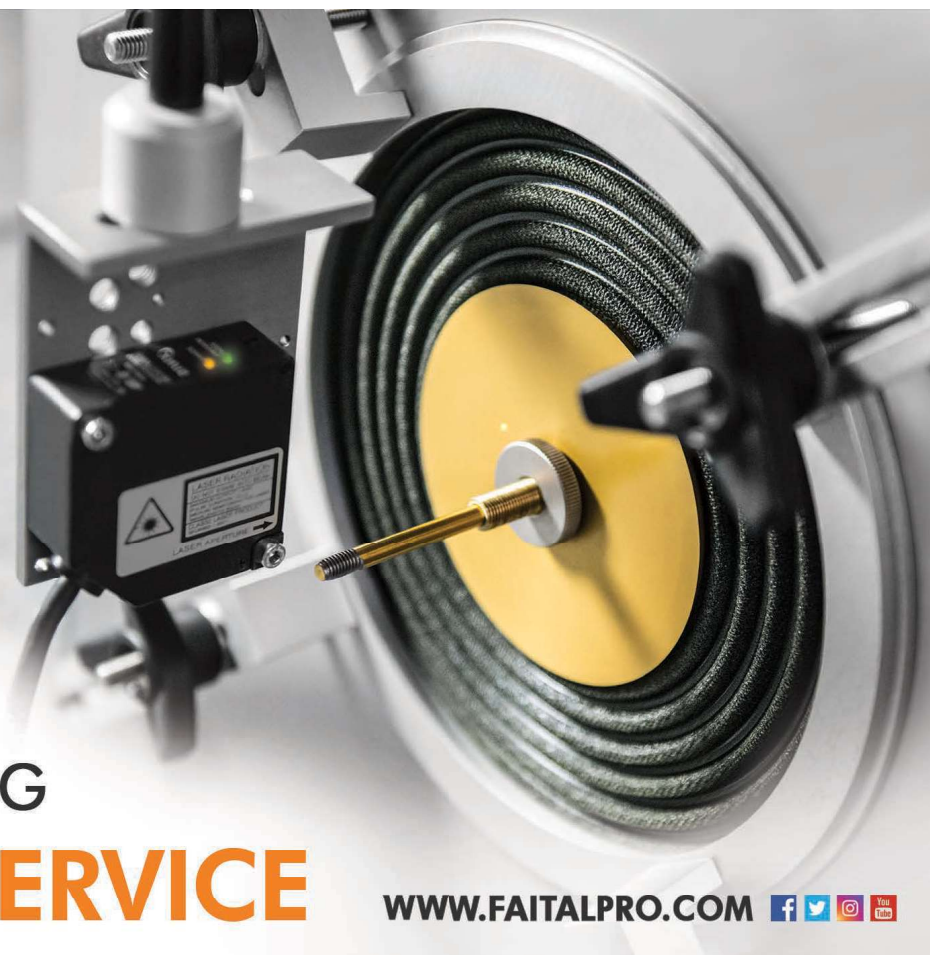
Test Bench is an open forum for OEM driver manufacturers in the loudspeaker industry. OEMs are invited to submit samples to *Voice Coil* for inclusion in the monthly Test Bench column. Driver samples can include transducers for home audio, car audio, pro sound, multimedia, or musical instrument applications. While many of the drivers featured in *Voice Coil* come from OEMs that have a stable catalog of products, this is not a necessary criterion. Any woofer, midrange, or tweeter an OEM manufacturer feels is representative of its work, is welcome to send samples. However, contact *Voice Coil* Editor Vance Dickason, prior to submission to discuss which drivers are being submitted. Send samples in pairs and addressed to:

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All samples must include any published data on the product, patent information, or any special information necessary to explain the functioning of the transducer.



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