

VOICE COIL

THE PERIODICAL FOR THE LOUDSPEAKER INDUSTRY

Scan-Speak R2004/602000

The last Scan-Speak tweeter to be analyzed this month was the 3/4" R2004/602000 ring radiator, a 0.75" compact textile dome tweeter, which looks primarily like a ring radiator version of the Scan-Speak D2004 0.75" soft dome tweeter (featured in the January 2009 issue of *Voice Coil*). Features include a large roll surround (again, like the D29 Revelator tweeter), aluminum phase plug, cast aluminum faceplate, coated cloth dome, an aluminum die cast back chamber that also functions as a heatsink, neodymium ring magnet, and standard terminals.

Following the same measurement protocol as the D3004 tweeter, the first measurement was to produce an impedance plot using a LMS 300-point impedance sine wave sweep as given in **Fig. 25**. The tweeter resonance with this smaller cavity was 667Hz, a minimum impedance of 2.93Ω at 2.98kHz and with a measured $R_e = 2.82$.

Next I recess-mounted the 0.75" R2004 in a small enclosure that had a baffle area of about 9" x 4" and measured the on- and off-axis frequency response at 2.83V/1m with a 100-point gated sine wave sweep from 300Hz to 40kHz. **Figure**

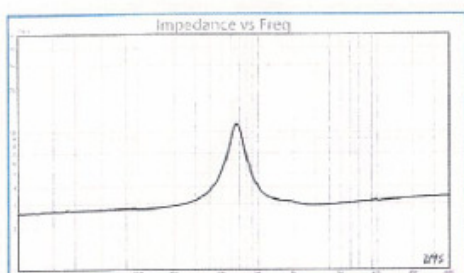


FIGURE 25: Scan-Speak R2004/602000 free-air impedance plot.

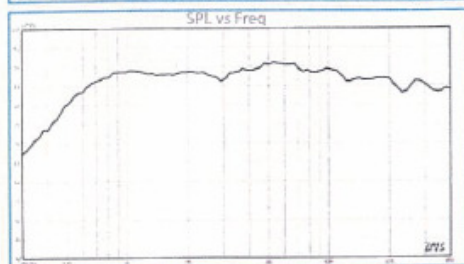


FIGURE 26: Scan-Speak R2004/602000 on-axis response.

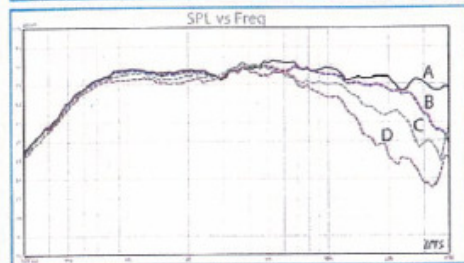


FIGURE 27: Scan-Speak R2004/602000 horizontal on- and off-axis frequency response (A = 0°; B = 15°; C = 30°; D = 45°).

26 shows the on-axis response. The D3004 frequency response is a very flat and smooth ± 1.68 dB from 990Hz-13.5kHz and ± 2 dB from 695Hz to 21.5kHz. **Figure 27** illustrates the on- and off-axis response for the Scan-Speak neo tweeter. Off-axis the device is -4.5dB down at 10kHz from the on-axis response with respect to the 30° off-axis curve and -7.9dB at 45° off-axis, again with respect to the on-axis response. **Figure 28** illustrates the normalized version of **Fig. 27**. In terms of production consistency, the two-sample SPL comparison is depicted in **Fig. 29**, indicating the two samples were well matched with only minor midband variations.

After I finished the LMS set of measurements, I then once more set up the SoundCheck analyzer and measured the impulse response with the tweeter. Importing this data in the SoundMap software yielded the cumulative spectral decay plot (waterfall) shown in **Fig. 30**. **Figure 31** gives the STFT displayed as a multi-color surface plot. Last, I set the 1m SPL to 94dB (7.4V), and the analyzer range to 2kHz-20kHz and measured the 2nd and 3rd harmonic distortion at 10cm, shown in **Fig. 32**.

In an era where a good portion of the population thinks hi-fi comes from an iPod with earbuds, it feels good to know that companies such as Scan-Speak are still alive and well and moving the state-of-the-art forward in transducer design. For more information on the two excellent new Illuminator tweeters and the rest of the Illuminator line, visit www.scan-speak.dk.

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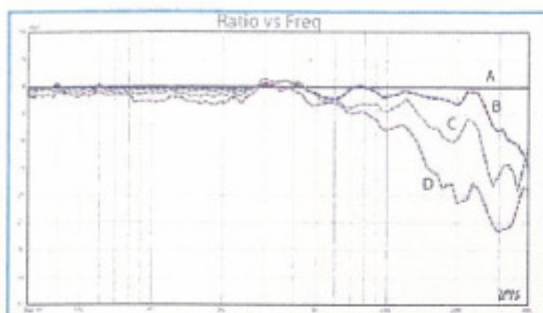


FIGURE 28:
Scan-Speak
R2004/602000
normalized on and
off-axis frequency
response (A = 0°;
B = 15°; C = 30°;
D = 45°).

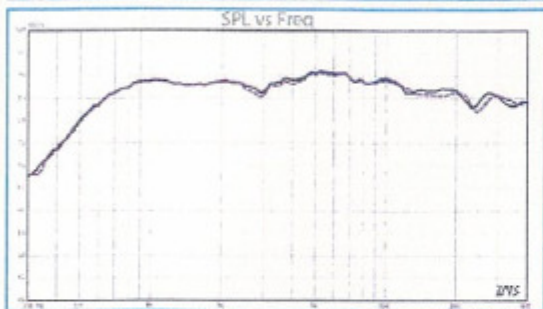


FIGURE 29:
Scan-Speak
R2004/602000
two-sample SPL
comparison.

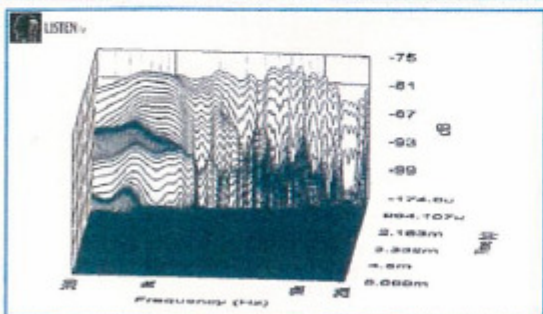


FIGURE 30:
Scan-Speak
R2004/602000
SoundCheck CSD
waterfall plot.

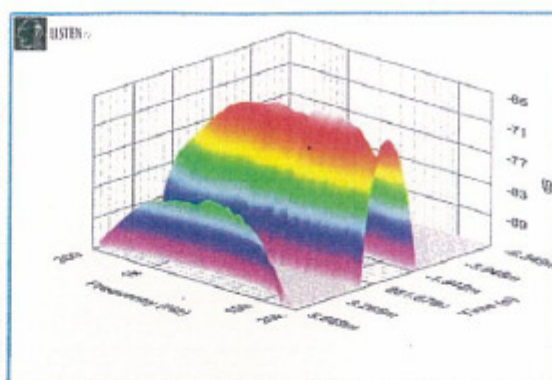


FIGURE 31:
R2004/602000
SoundCheck
STFT surface
intensity plot.

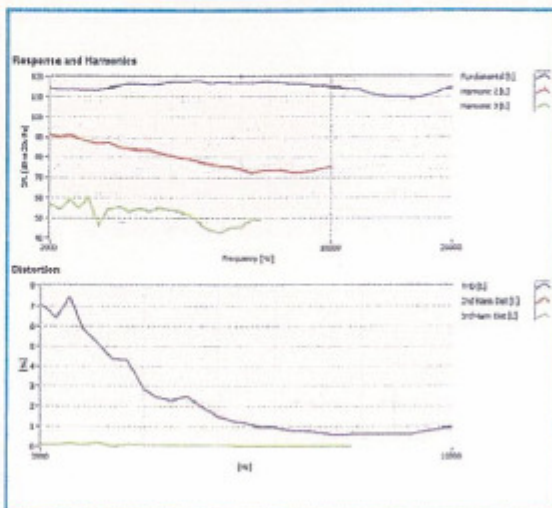


FIGURE 32:
Scan-Speak
R2004/602000
SoundCheck distortion
plots.