By Vance Dickason

High-End Drivers from ScanSpeak, Morel, and Eton

This month's battery of driver tests focuses on three very high-end home hi-fi drivers from Europe and Israel. From Denmark, ScanSpeak sent samples of their new ring dome AirCirc tweeter (the R3004/662010); from Israel, Morel offered a new 4″ midrange (the EM428); and from Germany, Eton provided a new 7″ midbass driver (the Eton 7-302/C8/32 HEX).

ScanSpeak AirCirc R3004/662000

ScanSpeak has been very prolific releasing new product of late. I reviewed the two new Illuminator woofers in February, three new Illuminator tweeters in the January issue, and announced six more drivers, a midrange, a woofer, and three tweeters this month. Just prior to the new CES releases I requested a sample of another new tweeter from ScanSpeak (the Illuminator R3004/662000 1″ ring dome). Basically, this device is based on the Revelator D29 ring dome using the highly effective AirCirc neodymium magnet system. While I don't often comment on the subjective nature of the products I review, I will say that the D29 AirCirc driver is absolutely excellent and on par—in terms of detail and timbre—with my two favorite high-end tweeters, the cloth dome SEAS Millennium T25CF and the aluminum dome ScanSpeak D2904/9800.

I began testing the R3004/662000 (***Photo 1***) 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 ***Fig. 1***. The tweeter resonance is 465Hz. Minimum impedance for this tweeter is 3.03Ω at 2.5kHz with a measured Re = 3.01Ω.

After completing the impedance measurements, I recess-mounted the ScanSpeak tweeter in a small enclosure that had a baffle area of about 12″ × 7″ and measured the on- and off-axis frequency response at 2.83V/1m. ***Figure 2*** depicts the on-axis response. Frequency response for the R3004/662000 is a very flat ±2.1dB from 620Hz-22.0kHz, and only ±1.7dB from 3kHz to 21kHz. ***Figure 3*** gives the on- and off-axis response. Off-axis the device is -5.3dB down at 10kHz from the on-axis response with respect to the 30° off-axis curve and -11.9dB at 45° off-axis, again with respect to the on-axis response. ***Figure 4*** illustrates the normalized version of ***Fig. 3***. In terms of production consistency, the two-sample SPL comparison is depicted in ***Figure 5***, indicating the two samples were well matched with some minor variation in the 2.5-3.5kHz region.

Next, I used the Listen Inc. SoundCheck analyzer and SCM microphone to measure the impulse response with the tweeter recess-mounted on a large 4′ × 2′ baffle.

PHOTO 1: ScanSpeak AirCirc R3004/662000.

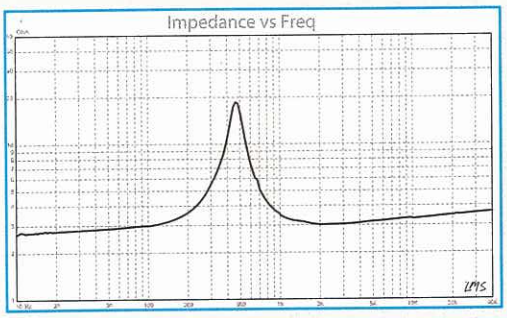

FIGURE 1: ScanSpeak R3004/662000 free-air impedance plot.

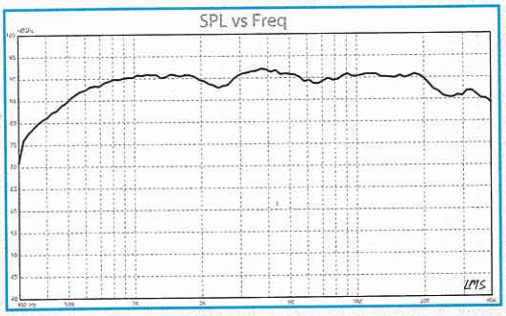

FIGURE 2: ScanSpeak R3004/662000 on-axis response.

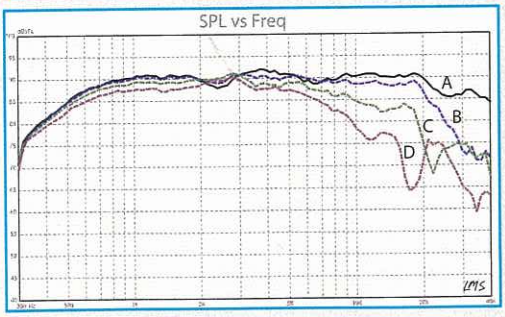

FIGURE 3: ScanSpeak R3004/662000 horizontal on- and off-axis frequency response (A = 0°; B = 15°; C = 30°; D = 45°).

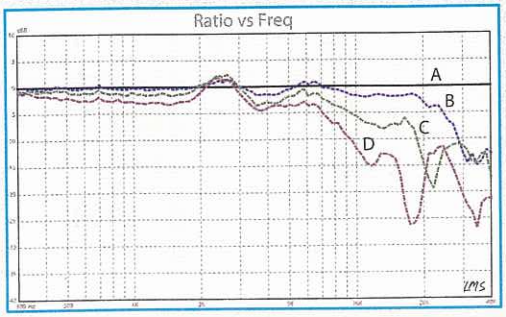

FIGURE 4: ScanSpeak R3004/662000 normalized on- and off-axis frequency response (A = 0°; B = 15°; C = 30°; D = 45°).

Importing this data in the Listen Inc. SoundMap software produced the cumulative spectral decay plot (waterfall) shown in ***Fig. 6***. While there are no major resonances indicated in this plot, it is very difficult to correlate long decay resonances with subjective performance. ***Figure 7*** gives the Short Time Fourier Transform (STFT) displayed as a surface plot. Last, I set the 1m SPL to 94dB (5.8V), and the sweep range to 2kHz-20kHz and measured the

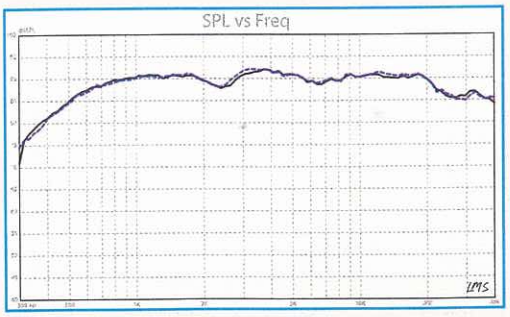

FIGURE 5: ScanSpeak R3004/662000 two-sample SPL comparison.

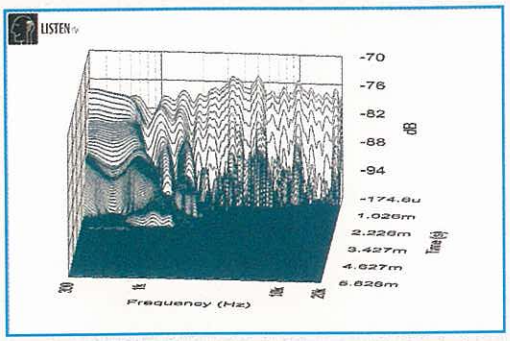

FIGURE 6: ScanSpeak R3004/662000 SoundCheck CSD waterfall plot.

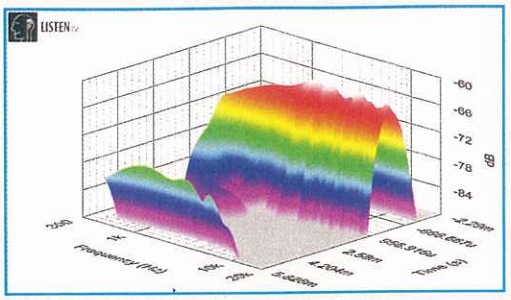

FIGURE 7: R3004/662000 SoundCheck STFT surface intensity plot.

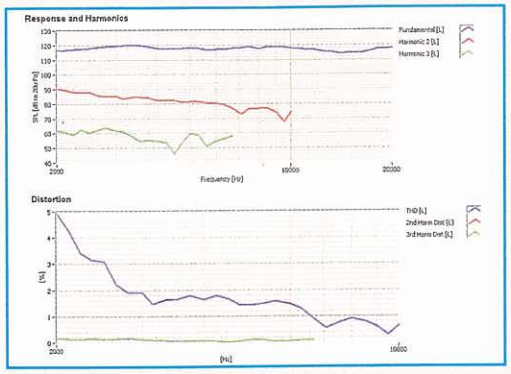

FIGURE 8: ScanSpeak R3004/662000 SoundCheck distortion plots.

2nd and 3rd harmonic distortion at 10cm (***Fig. 8***). This is shown in order to see the relationship between 2nd and 3rd harmonic distortion; however, correlation to subjective preference based on THD is not well established. For more information, go to info@scan-speak.dk.