Sonodyne SM100Ak

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The SM100Ak is the mid-sized speaker in a range of three active monitors from Sonodyne. It has a 165mm woven Kevlar-coned woofer and a 26mm silk-domed tweeter mounted in a die-cast aluminium cabinet. The amplifier and crossover electronics are contained in a housing on the rear of the cabinet. The backward-sloping front panel contains the drivers along with a pair of slot bass reflex ports as well as a volume control, power switch and LED power indicator. At the rear there are balanced XLR and TRS input and IEC mains sockets, all recessed with vertical insertion, along with a gain trim (+/-6dB), bass tilt switches (-2, -4, -6dB at 80Hz) a treble tilt switch (-2dB at 15kHz) and a bass roll-off switch (80Hz, 6dB per octave). This test was carried out with all switches in the 'off' position. The built-in power amplifiers are specified as 80W for the woofer and 40W for the tweeter endowing a single speaker with a claimed maximum long-term maximum SPL of 108dB at 1m into half-space. The cabinet has overall dimensions of 230mm wide by 335mm high by 300mm deep and weighs 10.5kg.

Figure 1 shows the on-axis frequency response and harmonic distortion performance for the SM100Ak. The frequency response is not particularly flat or smooth, lying within +/-5dB limits from 60Hz to 20kHz, with some mid-range raggedness. The harmonic distortion, however, is remarkably low for a speaker of this size with both 2nd and 3rd harmonics peaking below -40dB (1%) at all frequencies within bandwidth for an output level of 90dB SPL at 1m free-field.

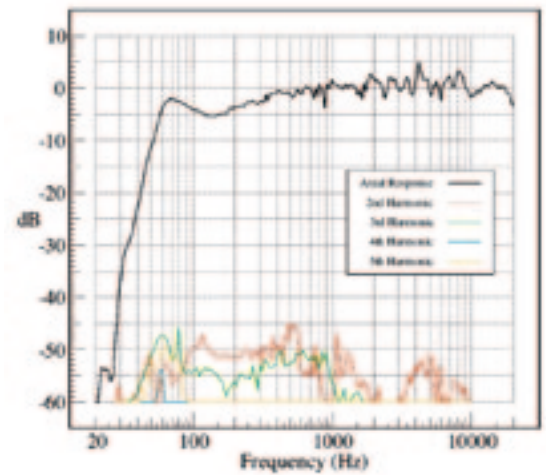

Fig. 1. On-axis frequency response and distortion.

The low-frequency roll-off is approximately 6th-order, indicating the use of a high-pass protection filter, with -10dB at around 50Hz. The horizontal directivity (Figure 2) shows a good deal of narrowing at high frequencies but the response in the mid frequencies is seen to fall off quite smoothly with increasing frequency and angle. The vertical directivity (Figure 3) shows a relatively shallow crossover interference notch in the downward direction only. The differences between the upward and downward responses at high frequencies are due to the angle of the sloping baffle.

The response to a step input signal can be seen in Figure 4. This is typical for a two-way active speaker with the high frequencies arriving about 0.5milliseconds before the mid frequencies. The power

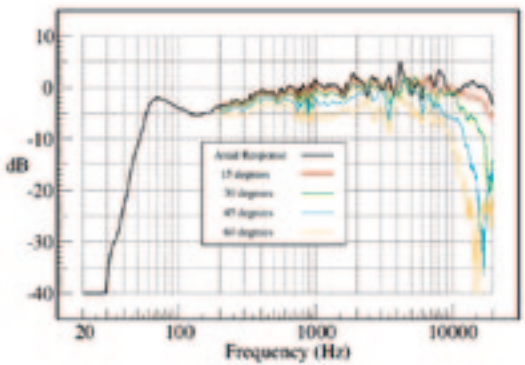

Fig. 2. Horizontal directivity.

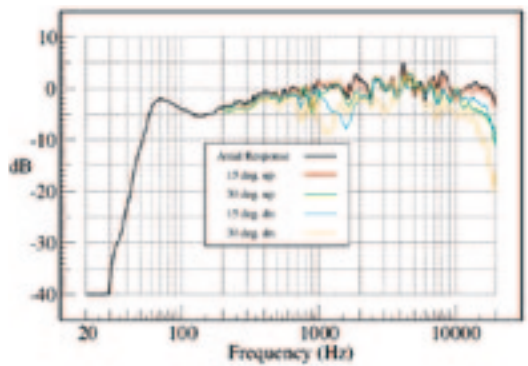

Fig. 3. Vertical directivity.

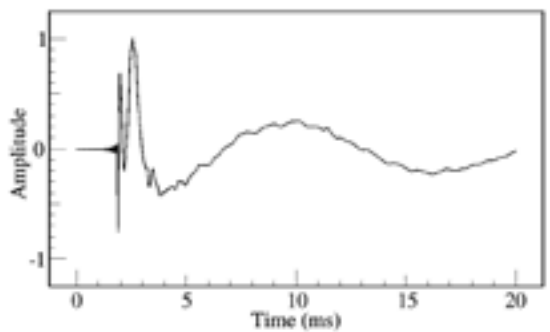

Fig. 4. Step response.

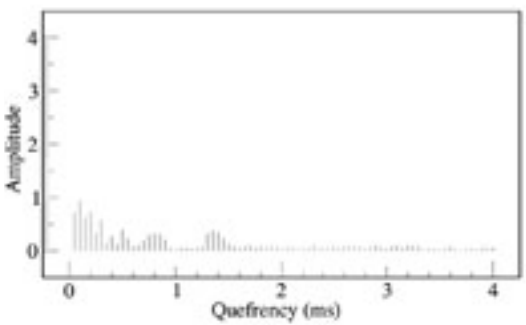

Fig. 5. Power cepstrum.

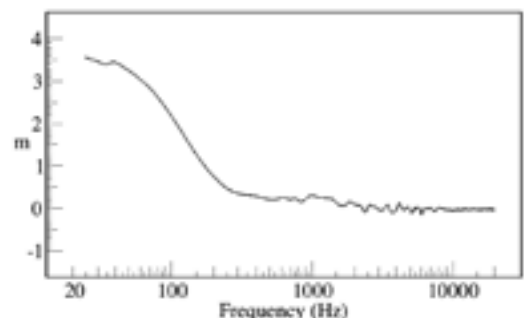

Fig. 6. Acoustic centre.

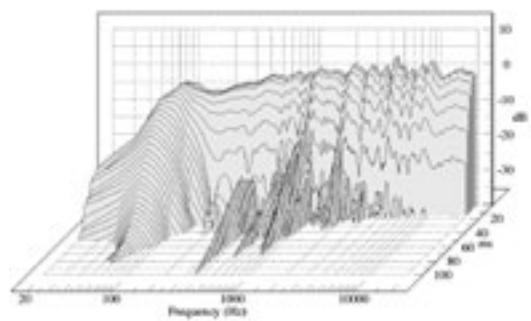

Fig. 7. Waterfall plot.

Cepstrum (Figure 5) shows little evidence of early echoes or diffraction problems, but there is some quite strong activity after around 0.8milliseconds and again after 1.4milliseconds that may be responsible for the uneven frequency response noted above.

The acoustic source position shown in Figure 6 is typical for a 6th-order roll-off with the low frequency parts of transient signals being delayed to a position about 3.5m behind the speaker. The waterfall performance (Figure 7) is a mixed bag, with the low frequencies decaying much faster than many speakers in this class, but there is strong evidence of a number of slowly-decaying sharp resonances in the mid-frequency range, many of which correspond with peaks and troughs in the frequency response.

Overall, the SM100Ak is a reasonable performer with a curious mix of excellent and not-so-strong aspects to its performance. The on-axis frequency response is a little disappointing; even if the 'inverted-V' shape, which is often preferred for nearfield monitoring, is taken into account the response is just not as smooth as many speakers in this class. On the plus side, however, the harmonic distortion performance and low-frequency decay characteristics are excellent. ■