

Eve Audio SC307

KEITH HOLLAND



The SC307 from Eve Audio is a 3-way active speaker comprising two 6.5-inch woofers with composite cones and an Air Motion Transformer (AMT) tweeter. The drivers are arranged in landscape orientation with the tweeter flanked by the woofers. The SC307 could be described as a 2.5-way system as both woofers are operated at frequencies below 300Hz, while only one continues up to crossover to the tweeter at 2.8kHz. Either woofer can be configured to be



the 'bass-only' one via a rear-mounted dip switch, removing the need for 'handed' pairs of speakers. The cabinet has two generously-sized slot bass reflex ports either end of the rear panel, along with an IEC mains socket and switch, XLR and phono input sockets and a set of three dip switches. One switch controls the choice of woofer side and the other two are for locking or unlocking the volume and filter settings.

The SC307 differs from most speakers of this type in that the analogue input signal is first converted to digital so that all of the electronic filters and crossovers are implemented in the digital domain before conversion back to analogue to power the drivers. Adjustment of the gain and filtering parts of this DSP system (when not locked by the dip switches) is accomplished using a single, novel, front-mounted rotary control which, although ultimately easy to use, does require a degree

of learning by first-time users. Three filters are implemented: high-shelf (-5dB to +3dB above 3kHz), desk filter (-5dB to 0dB at 160Hz and 0dB to +3dB at 80Hz) and low-shelf (-5dB to +3dB below 300Hz), allowing for such things as different mounting conditions. Eve specifies amplifiers of 100W each for the woofers and 50W for the tweeter, which endow the SC307 with a claimed maximum SPL of 114dB at 1m. Eve doesn't specify the

conditions under which this specification is met, except that the amplifier output levels are short-term levels. Each SC307 has overall dimensions of 500mm wide by 215mm high by 310mm deep and weighs 12.4kg.

The on-axis frequency response and harmonic distortion (for an output level of 90dB at 1m, free-field) are shown in Figure 1. The response lies between respectable +/-2dB limits from 45Hz to 20kHz, with a 6th-order low-frequency roll-off with -10dB at around 35Hz, indicating the use of a high-pass electronic protection filter. The harmonic distortion performance at low frequencies is excellent, lying well below -40dB (1%) at nearly all frequencies — the 3rd harmonic is particularly low. At higher frequencies the distortion is a little higher with peaks of greater than -40dB between 1kHz and 3kHz. The off-axis response is shown in Figures 2 and 3 for the horizontal and

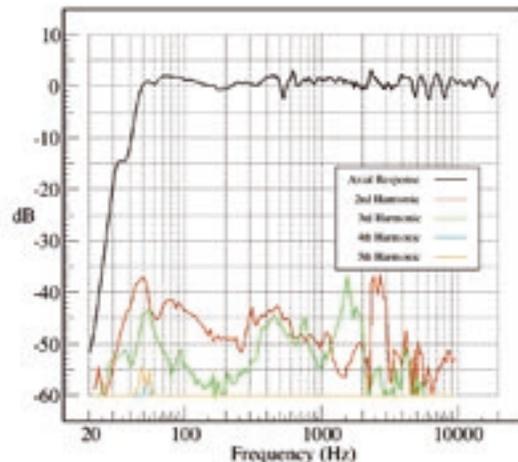


Figure 1. On-axis frequency response and harmonic distortion.

vertical planes respectively. The horizontal directivity is somewhat uneven with evidence of path-length-difference interference between the drivers' outputs, but these are only really evident at the wider angles. The vertical directivity, on the other hand, is extremely wide with almost no fall off in response at up to 30 degrees off-axis below 8kHz. The very high frequencies fall rapidly beyond 15 degrees off-axis vertically, but not horizontally.

Figure 4 shows the response to a step input signal. The high frequencies are seen to start around 500 microseconds before the mid frequencies, which is a typical result for speakers with conventional analogue crossover networks, but is perhaps surprising for digital filters. The acoustic source position (Figure 5) shows that the low-frequency parts of transient signals appear to be radiated from a position around 5m behind the speaker. This result is somewhat higher than that

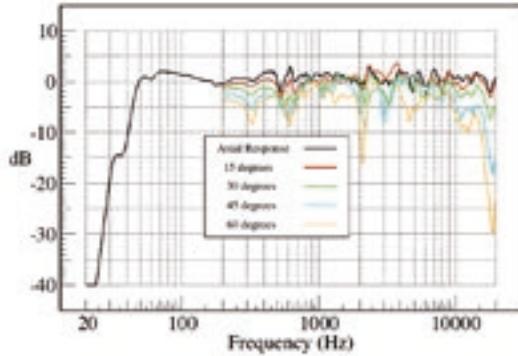


Figure 2. Horizontal directivity.

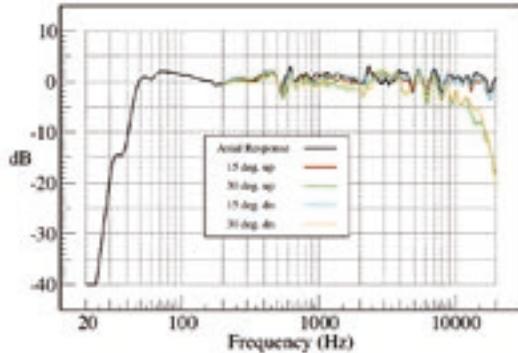


Figure 3. Vertical directivity.

for most speakers of this type and can probably be attributed to the high-pass protection filter (see note about digital filters above). Given the smooth on-axis frequency response, it is unsurprising that the power cepstrum (Figure 6) shows very little evidence of diffraction or echo problems. The final figure, Figure 7, is the waterfall plot, which shows a long decay time at

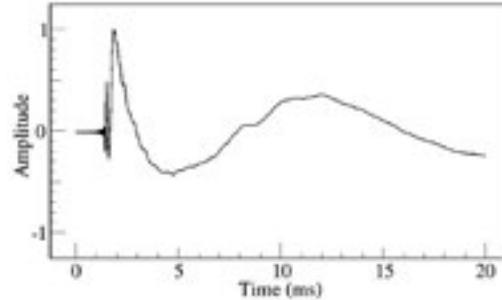


Figure 4. Step response.

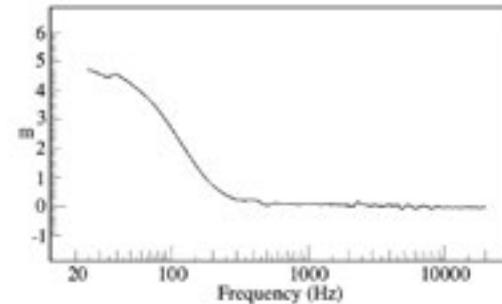


Figure 5. Acoustic source position.

low frequencies due to the 6th-order roll-off and some mid-frequency resonances. Lastly, it should be noted that the use of a DSP system adds a delay of around 3 milliseconds to the signal, which is equivalent to moving the speakers back by about 1m — this will only be important if these speakers are used with other speaker types, in a surround-sound setup, for example.

Overall the SC307 has a mixture of attributes. The smooth frequency response and excellent low frequency distortion performance are compromised

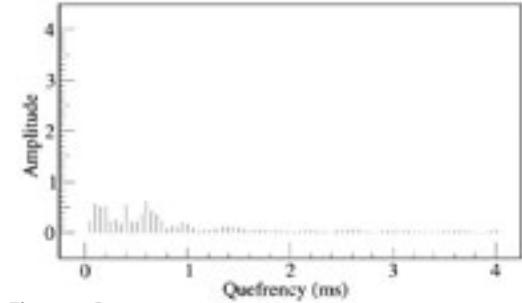


Figure 6. Power cepstrum.

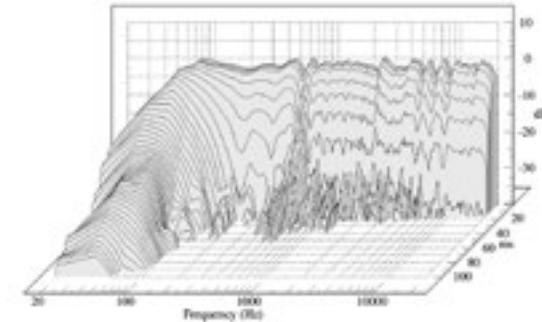


Figure 7. Waterfall plot.

somewhat by the time-domain response. It is perhaps surprising given the use of digital signal processing, which can relieve some of the restrictions that are inherent in conventional analogue filters. However, Eve has produced a very good speaker using technology that will surely become much more commonplace. ■

Contact

EVE AUDIO, GERMANY
 Web: www.eve-audio.com