

Acoustic Energy AE22

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THE AE22 FROM Acoustic Energy is a two-way passive loudspeaker comprising a 200mm pressed alloy cone woofer and a 25mm 'ring radiator' tweeter. These drivers are mounted non-symmetrically with the tweeter protruding beyond the top edge of the baffle, so the loudspeakers are available as handed pairs. The cabinet is a sealed box having overall external dimensions of 350mm wide by 300mm deep by 250mm high and a weight of 10kg. The passive crossover is specified as having 3rd-order Bessel filters crossing over at 2.0kHz, and Acoustic Energy recommends use with amplifiers having a power output of between 75W and 200W.

The sensitivity of the AE22 is around 87dB SPL at 1m distance for 1W input. Connection to the loudspeaker is via a pair of binding post terminals or a parallel Speakon socket.

The on-axis frequency response and harmonic distortion (for an output level of 90dB at 1m distance) for the AE22 are shown in Figure 1. The response is seen to be somewhat uneven, lying within ± 4 dB from 70Hz to 20kHz, with an under-damped 2nd-order low-frequency roll-off reaching -10dB at around 50Hz. Somewhat unusually, the harmonic distortion does not show the rise in level at low frequencies

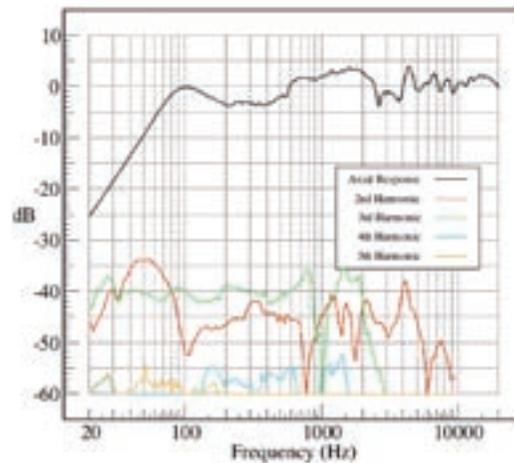


Fig. 1. On-axis frequency response and harmonic distortion.

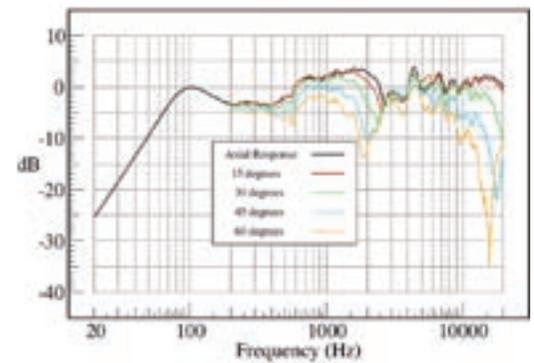


Fig. 2a. Horizontal off-axis response left.

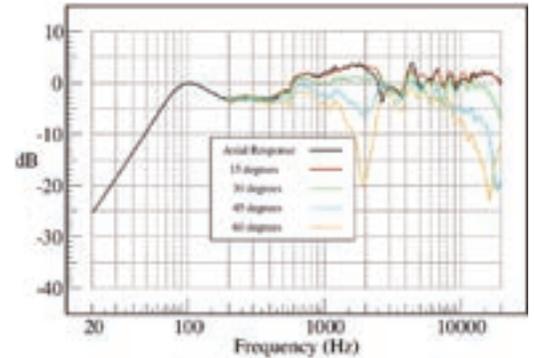


Fig. 2b. Horizontal off-axis response right.

that is characteristic of many designs, but instead remains at a reasonable level throughout most of the frequency range.

Two horizontal off-axis responses are shown in Figures 2a and 2b due to the non-symmetric driver layout and the vertical off-axis responses are shown

monitor benchtest

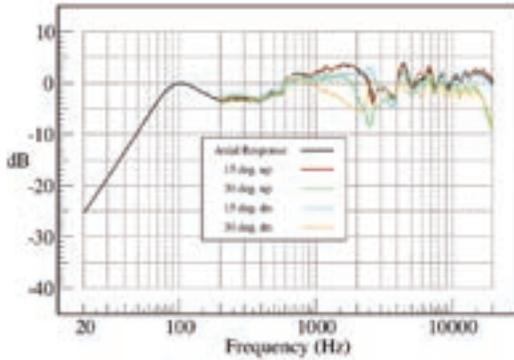


Fig. 2c. Vertical off-axis response.

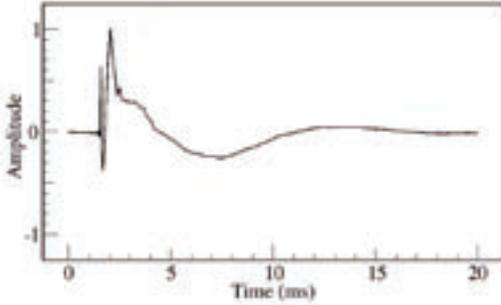


Fig. 3. Step response.

in Figure 2c. Both horizontal plots show a dip at the crossover frequency due to the spatial separation of the drivers, although this is only really a problem at 60 degrees to the right. The layout does, however, allow the drivers to be closer in the vertical plane than with the more usually vertically-aligned driver layout, and this can be seen by the absence of a crossover frequency dip in the vertical plane. The plots show

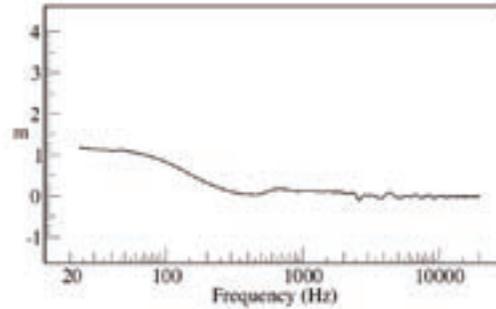


Fig. 4. Acoustic source position.

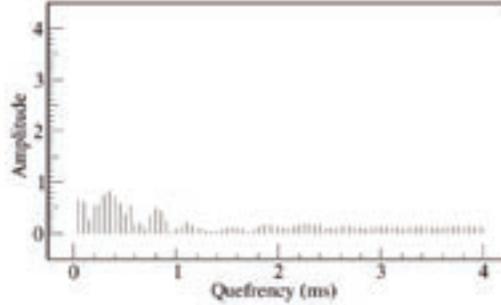


Fig. 5. Power cepstrum.

that the tweeter has very wide dispersion between 2kHz and 7kHz, but that this narrows significantly at higher frequencies.

The step response for the AE22 (Figure 3) shows the tweeter responding around 0.5ms before the woofer. A rapid rise time is evident although the decay demonstrates some unevenness. Figure 4 shows that the acoustic source position shifts to only a little over 1m behind the loudspeaker at low frequencies. This is an excellent result that can be attributed to the gentle, 2nd-order low-frequency roll-off.

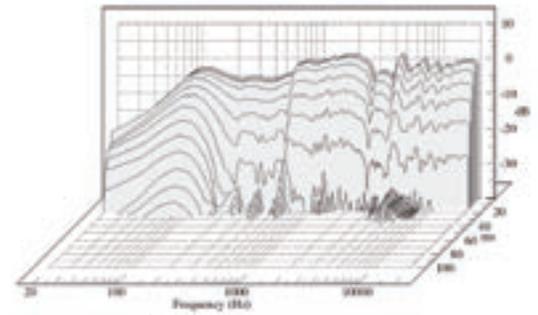


Fig. 6. Waterfall plot.

The power cepstrum for this loudspeaker, shown in Figure 5, does not have any significant features. The waterfall plot, shown in Figure 6, demonstrates a very rapid decay throughout the entire frequency range, with -40dB reached in less than 40ms at all frequencies. Considering this rapid decay of the low frequencies along with the small initial delay demonstrated by the acoustic source position plot, it is clear that this loudspeaker should reproduce low-frequency transient signals very accurately.

The Acoustic Energy AE22 appears to fulfil its apparent intended role, as a meter-bridge mounted near-field monitor, very well. The raised mid-frequency response is a characteristic of many popular loudspeakers of this type, indeed there is some evidence to show that this response is equalised in practice by the presence of the mixing desk. The very accurate low-frequency transient response is a great asset for this application. Of some concern, however, must be the unevenness of the frequency response. ■

Contact

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