Avantone Pro Active Mixcube

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The Avantone Pro Active Mixcube is unashamedly intended as an improved replacement for the classic Aurotone 5C Sound Cube, which has been a very popular mini reference monitor for many years. Unlike the passive 5C, the Mixcube is an active speaker and has a single 5¼ inch (133mm) pulp-coned driver, built-in amplification and a separate power supply brick. The overall dimensions of the cabinet are 165mm by 165mm by 165mm with a speaker weight of 3.5kg (the power supply weighs an additional 2kg).

As well as the provision of on-board power, Avantone Pro claims further improvements over the 5C, including a cast driver chassis, instead of the pressed steel one in the 5C and thicker 18mm cabinet walls. The built-in amplifier is specified as 60W RMS which endows the Mixcube with a claimed maximum output of 104dB SPL at 1m distance. The rear panel is mostly taken up by a relatively large heatsink alongside a combined XLR/TRS balanced input socket, a gain control, an earth-lift switch, an amplifier on/off switch and a multi-pin socket for connection to the power supply.

Figure 1 shows the on-axis frequency response of the Mixcube. In common with the Aurotone 5C, and unlike conventional monitors, the frequency response is designed not to be flat (so setting limits is not really relevant), but is instead heavily peaked in the mid frequency range to assist with some mixing decisions. Taking an eye-ball mean through the mid-range as reference, the low-frequency response is seen to have a second-order roll-off with -10dB at around 150Hz; the high frequencies are effectively limited to around 12kHz. This highly limited frequency range strongly suggests that these mini monitors are intended to be used alongside truly full-range monitors rather than as standalone references.

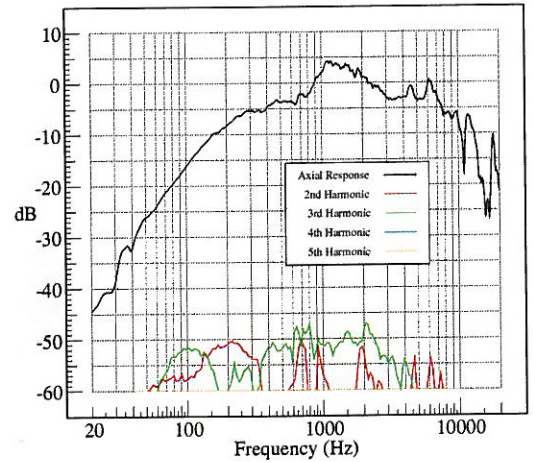

Figure 1. On-axis frequency response and harmonic distortion.

The harmonic distortion, measured at a level of 90dB at 1m distance, is also shown in Figure 1. Both 2nd and 3rd harmonics are seen to very low over the whole frequency range lying below -40dB (1%) at all frequencies above around 120Hz. This is remarkably low distortion for such a small speaker. Figure 2 shows the off-axis responses for the Mixcube. Due to symmetry, this Figure represents the directivity in the horizontal and vertical planes. The directivity is reasonably well controlled becoming gradually narrower with increasing frequency up to around 6kHz at which frequency the response is around 10dB lower at 30 degrees than it is at 0 degrees.

The time-domain performance for the Mixcube can be seen in Figures 3, 4 and 5 which show the step response, acoustic source position and power cepstrum respectively. As expected with a single

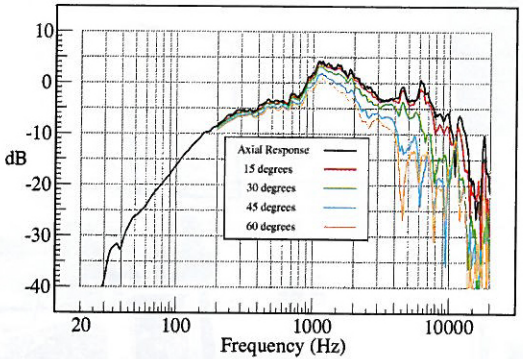

Figure 2. Horizontal directivity.

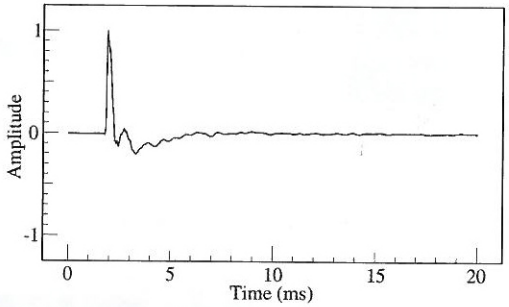

Figure 3. Step response.

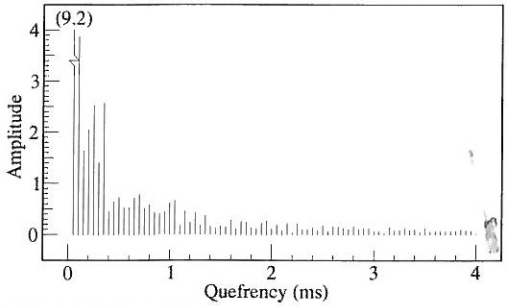

Figure 5. Power cepstrum.

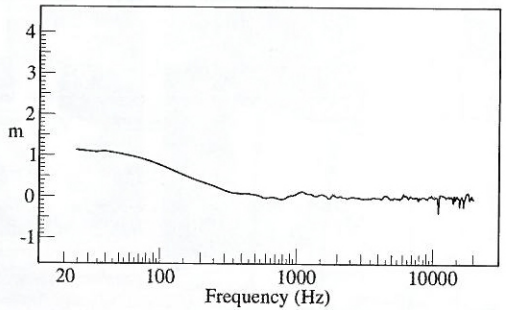

Figure 4. Acoustic source position.

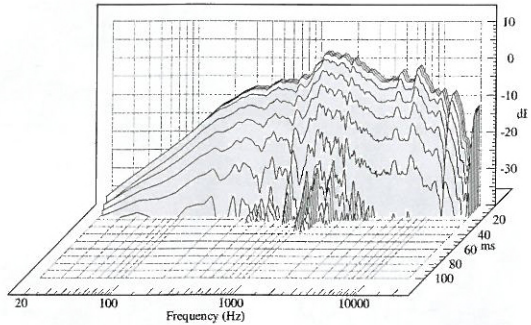

Figure 6. Waterfall plot.

driver, and hence no crossover, there is no evidence of any time-alignment issues in the step response; however, the rapid decay due to the limited low-frequency response can clearly be seen. The acoustic source position is seen to move only 1m behind the speaker at low-frequencies due to the low-order roll-off at a relatively high frequency. Due to the non-flat frequency response, the power cepstrum is quite wild at low quefrencies, exceeding the limits on the graph by a factor of more than 2!

Figure 6 shows the combined frequency/time waterfall plot for the Mixcube. There is no evidence of the slow decay at low-frequencies that is characteristic of most speakers, partly because the low frequencies are attenuated, but also due to the low-order roll-off. Some resonance activity can be seen at around 1kHz but everything has decayed to below -40dB in less than 40 milliseconds.

As a speaker that delivers clean, distortionless, phase-free sound over a limited frequency range the Active Mixcube must be viewed as highly successful and a worthwhile improvement over the classic Aurotone 5C. As intended by the designers, the lack of multiple drivers, crossovers, reflex ports and low frequencies gives rise to a very accurate transient response that should allow them to reveal much mid-range detail. However, it must be noted that as full-range references they fall way short in terms of the required accuracy and therefore should really only be used, as intended, as supplements to conventional monitors. ■

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