Dynaudio Acoustics Air 12

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The Dynaudio Air 12 is one component in a range of intelligent 'Air' equipment that communicates via a network to form a 2-channel or multichannel monitoring environment. The system consists of a master speaker and a number of slaves; the master has 2-channel analogue as well as either 2-channel or 6-channel AES digital inputs and the slaves are connected to this via TC-Link connections. The network, which distributes control information along with the audio, is controlled by either a dedicated hardware remote or software running on a PC or Mac, and provides things like preset storage and recall, calibrated levels, integrated bass management, EQ, and so on. However, it is beyond the bounds of this bench test to delve too far into these aspects of the system (although as speakers become more and more 'digital' I may soon have to!), instead, in line with other reviews in this series, it will concentrate on the electroacoustic performance of a single speaker.

The review speaker is a 'master' with two analogue and two digital inputs. It is a 2-way active speaker consisting of an 8-inch (200mm) woofer and a 1.1-inch (28mm) soft dome tweeter mounted in a cabinet of dimensions 238mm wide by 385mm high by 378mm deep. The electronics are all built-in and there is a heat sink on the rear panel which has vertical fins, indicating that this speaker is intended to be used in the upright, portrait orientation. Also on the back panel is a large, flared bass reflex port and the input, output and mains sockets. The analogue inputs are via balanced XLR-type sockets and the three TC-Link connections use RJ45 sockets. The power amplifiers are specified as having 200W each for the woofer and the tweeter, which endows a pair of 12s with a claimed peak SPL of 128dB. The crossover has 1st order slopes and crosses over at 2.1kHz. The review was conducted via the analogue input with all equalisation switched out.

Figure 1 shows the on-axis frequency response and harmonic distortion performance for the Air 12. The response is commendably smooth and lies between ±3dB from 55Hz to 19kHz. Low-frequency roll-off is 4th order with -10dB at about 35Hz. The levels of 2nd and 3rd harmonic distortion, measured at 90dB SPL at 1m, are also respectable, lying below -40dB (1%) for all frequencies above 100Hz and less than -30dB (3%) for all frequencies above 30Hz. The off-axis frequency responses in the horizontal and vertical planes are shown in Figures 2 and 3. The horizontal directivity is well controlled with little evidence of mid-range narrowing and no high-frequency lobing. The vertical directivity is less well controlled, however, due to the spacing between the woofer and tweeter; the gentle 6dB per octave crossover filters mean that the frequency range over which the driver outputs interfere is wider than designs using higher-order filters. Figure 4 shows the response of the speaker to a simulated transient, step input signal. It is clear to see that there is almost no delay between the output from the tweeter and that from the woofer (most comparable speakers demonstrate as much as half of a millisecond delay here) and this can be attributed, partly, to the same 1st order crossover that gives rise to the widened off-axis interference notch noted above. The power

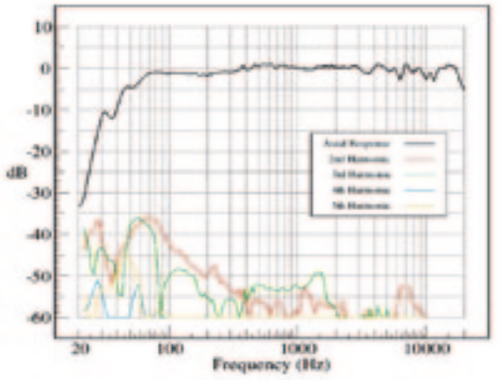

Fig. 1. On-axis frequency response and harmonic distortion.

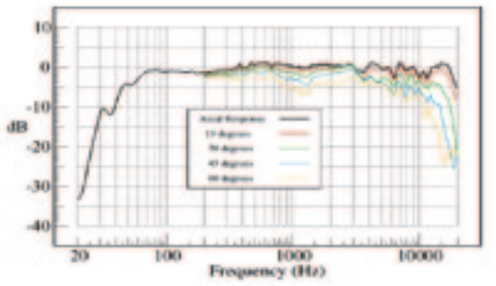

Fig. 2. Horizontal off-axis response.

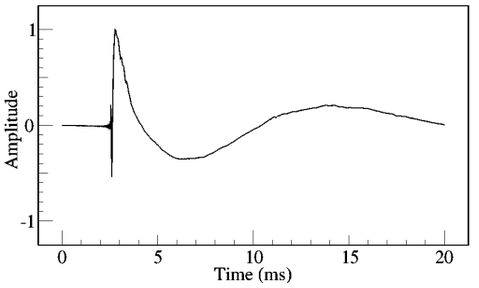

Fig. 4. Step response.

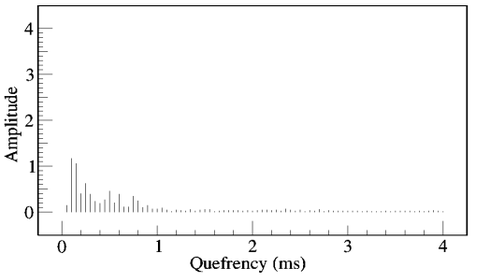

Fig. 6. Power cepstrum.

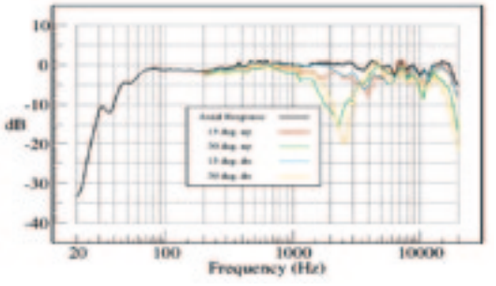

Fig. 3. Vertical off-axis response.

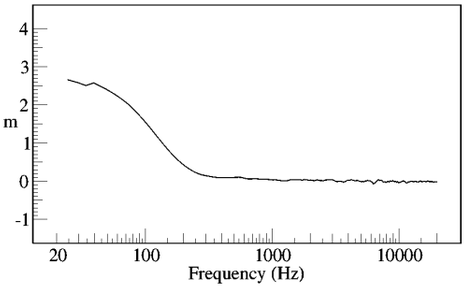

Fig. 5. Acoustic source position.

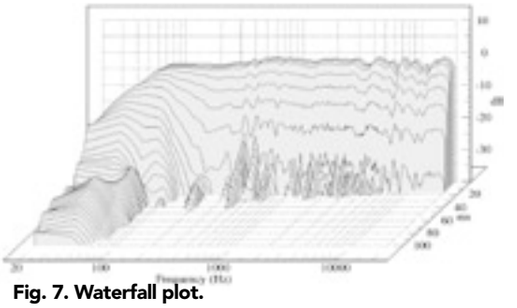

Fig. 7. Waterfall plot.

cepstrum (Figure 5) shows very little activity due to the smooth, even frequency response. The position of the acoustic source position as a function of frequency can be seen in Figure 6. This result, with the low-frequency parts of transient signals apparently starting 2.5m behind the higher-frequency parts, is typical for a ported speaker. Finally, Figure 7 is the waterfall plot for the speaker which shows that, although the low-frequencies do decay quite quickly initially, there is some evidence of some lower-level resonant ringing at a couple of low frequencies. There is some evidence of other resonances at 200Hz and 400Hz.

Overall the Dynaudio Air 12 is a very good loudspeaker. The on-axis and horizontal off-axis responses are smooth and extended and harmonic distortion levels are low throughout. A compromise between vertical off-axis behaviour and transient response has clearly been chosen in favour of the latter with the step response showing driver time-alignment that is considerably better than most comparable speakers. The low frequency alignment has been chosen to lie somewhere between the fast, low output of non-ported designs and the high output but ringing higher-order designs, so this may represent a good compromise too.

Contact

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