

Small, but perfectly formed

THE AE 500 IS THE COMPACT STAND/SHELF -MOUNT DESIGN FROM ACOUSTIC ENERGY'S FLAGSHIP 500 SERIES, AND CLAIMS A SIGNIFICANT STEP UP IN SOUND QUALITY, TECHNOLOGY AND FINISH. MARTIN COLLOMS TAKES A LISTEN.

As the smallest member of the upmarket Acoustic Energy 500 series, the little AE 500 shares with the other models in that line-up the use of bonded woven carbon fibre in various selected densities and thicknesses to form the drive-unit diaphragms, both for the mid/bass and high frequency drivers. With an exceptional stiffness to mass ratio this custom diaphragm material may also be formed into a variety of profiles to help fine tune the acoustic output to suit the designer's objectives: surprisingly, here the tweeter element is wholly pistonic, free of breakup/bending, to beyond 20kHz.

Following on from the award-winning AE 100 and AE 300 aluminium diaphragm predecessors, AE 500 designer and company MD Mat Spandl claims a significant step up with the use of an innovative, newly-developed 'CF' carbon fibre tweeter dome to partner the same material in the mid/bass driver. The aim, he says, was to match the pistonic accuracy of the company's long-established ceramic-reinforced aluminium drivers with increased internal damping for 'smoother, more transparent sound'. Mat has a varied background, ranging from automobile mechatronics design to stadium sound systems, and yet has a personal obsession with the neutral reproduction of violin and piano.

The AE 500 sells for £1050 a pair, in black or white in piano gloss, or the American Walnut satin finish of the review sample. In format and size it follows the original AE1, a well-regarded nearfield professional studio monitor designed as the company's launch product back in 1997 by company co-founder Phil Jones, and which was later revised for 'free field' use while retaining the designation.

Power handling is a claimed 120W, presumably peak program, though 50W would be more than enough for most situations. Both drivers employ high stiffness die-cast alloy chassis: 5in/12.5cm for the mid/bass, while the tweeter is the usual nominal 1in/25mm, its strong, stiff carbon fibre dome contrasting with those delicate 'no touch' aluminium-dome radiators of past ranges.

The new mid/bass driver features a larger 35mm voice coil for reduced thermal compression and increased force factor, combined with optimised electromagnetic damping to match the low frequency tuning. Its motor and suspension system are designed for maximum linearity and distortion control, thus improving mid-frequency definition, whilst the lightweight carbon fibre cone has a useful measure of internal damping for cleaner transients.

I'd surmised that the first tweeter resonance might appear at a lower frequency than for the usual metal constructions, but this isn't the case: it runs virtually flat to 20kHz, with no precursor dip in response, and places the remaining primary resonance at an inaudibly high 31kHz. High quality polypropylene film capacitors are used in the audiophile grade crossover network, together with high power low-loss inductors.

Seamless integration

Acoustic Energy has been researching higher frequency waveguides or ultra-shallow horns for some years now, and has included one here, cast in aluminium, to better shape the sound power transition from mid-to-treble. Right away I noticed the seamless transition of acoustic power from mid to treble in the crossover range largely due to this design detail. Sensitivity is 'about right' for the size at 87dB/W, it is rated at 6ohms impedance, an average amplifier load, the nominal crossover is at 2.8kHz, and the claimed maximum sound output level is an improbable 114dB (presumably with very little bass input and very short duty cycle!)

The beautifully veneered enclosure has rounded edges for a reduced diffraction signature, thus improving image focus, and – weighing just 8kg apiece and a mere 31cm tall – the speakers are easy to unpack and place with their compact 18.5cm wide by 26cm deep footprint. Connections are via well-spaced heavy duty gold-plated combination 4mm socket/binding posts, while the slender anti-reflective grille is retained magnetically, the speaker looking equally well-finished with it on or off. The drivers are physically tough so the grilles could well be discarded most of the time for extra clarity.

The enclosure seems well damped, nicely inert, almost dead to a knuckle rap, and resonance-control measures include tri-wall construction with a vibration



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The system

Townshend Allegri Reference control unit, Naim NAP250DR power amplifier, Naim Super Line-Supercap DR phono pre, with Linn LP12 player and Keel sub-chassis, Karousel main bearing and Radikal motor control, Naim ARO arm, Lyra Delos cartridge, Naim UnitiCore network server and S/PDIF source, Roon Nucleus Plus server control with Qobuz; Linn Klimax DSM streamer-DAC, Naim ND555 Streamer-DAC, 555 PS x2 (DR), Wilson Audio Sabrina X, Magico S-5II, FinkTeam KIM, BBC LS3/5a (15ohm), loudspeakers, Naim 4 tier Fraim racks; Transparent XL MM2, Naim NAC A5 speaker cables, Naim Super Lumina, Transparent XL MM2 and Van den Hul Carbon TFU interconnect cables.

absorbing interlayer, combined with strategic bracing. Low frequency 'reflex' augmentation is via a slot-like, well-streamlined rear duct, for good bass output.

Sound Quality

Heavy-duty 45cm steel stands from Atacama, spiked and iron chip-loaded, worked well with the '500, set up for an axis between the mid/bass and high frequency drivers aiming at a seated listener ear-height while mild toe-in was set, such that so the listener could just see down the side panels of the enclosures. When that was done there was a rewarding further crystallization of both image focus and soundstage depth.

While this is the smallest of the three speakers I've assessed for this issue, with several music excerpts you wouldn't have guessed its compact dimensions unsighted. The designer has 'voiced' this design to have a highly neutral timbre and there's no sign of that common 'small box' audible signature: for almost all music material except that with really heavy basslines. Very little gives away the compact dimensions, save perhaps from the excellent image focus it delivers. For its size and price, it offers exceptional transparency, and despite a touch of nasality and a hint of a boxy coloration in the mid-bass, it sets a consistently high standard.

Neither were any concessions required for its compact dimensions when rendering most convincingly the Vivaldi No.8 Allegro, with Julian Chawin on Naïve OP7546, while grand piano was also impressive, sounding suitably expansive even when heard in the hall outside my studio room.

Fleetwood Mac's 'Dreams', from *Rumors*, sounded atmospheric and powerful with very good image focus: understandably, these bass-heavy tunes played at high loudness will eventually tax the speaker's compact woofers, which will begin to show some mild limiting. However, the AE500s remained pretty convincing with MJQ's *Pyramid*, the classic jazz forces playing really well on this uncompressed recording from the beginning of the 1960s

Stereo images are first class when the enclosures are toed-in a little, creating an overall acoustic so well-blended you really can forget the workings of the loudspeaker and drift away on the generously-dimensioned neutral and natural sounding soundscapes it generates, while remaining entertainingly musical on all kinds of programme.

Conclusion

This compact speaker is surprisingly sophisticated, beautifully made and highly musical on all kinds of programme, winning a HIFICRITIC BEST BUY award.



Specifications

Acoustic Energy AE 500

Type	Two-way ported standmount speaker
Price	£1050/pr
Drivers	25mm carbon fibre dome pure piston tweeter, 12.5cm carbon fibre cone mid/bass
Frequency range	45Hz – 28kHz (+/- 6dB)
Sensitivity	87dB/1W/m
Max Level/Power	113dB/120W
Crossover	2.8kHz
Impedance	6ohms
Dimensions (HxWxD)	31x18.5x260cm
Weight	8kg (each)

acoustic-energy.co.uk

Lab Test Results

Sensitivity: The running average for the 1m 1W axial sensitivity is 85.5dB W, 8ohm referenced: a good result for the size and impedance. With a 100W power-handling, a pair in a typical room should generate a 100dBA maximum sound level, decent enough, if not for loud heavy rock parties.

Impedance/Amplifier loading: With sensible 5.5ohm resistive minima (black trace) and better than average phase angles denoting the reactive content (green), this speaker is close to 8ohms impedance and is thus a favourable amplifier load. The port is tuned to 53 Hz, sensible for this compact volume, approximating to quasi third order for better transient behaviour.

Frequency response: With good bass weight for its size, the AE500 delivered a very good 55Hz to 18kHz

+/- 2.5dB frequency response. At the inaudible extreme 20kHz was +5dB and the final dome resonance peak was moderate at 21kHz, rising 12dB, and then only evident when exactly on axis, whereas some metal dome units peak by 25dB.

Pair-matching was excellent to 4kHz, the tolerance widening to a moderate +/-1.5dB for 5kHz–12kHz. Some output remains at 30kHz, here -6dB.

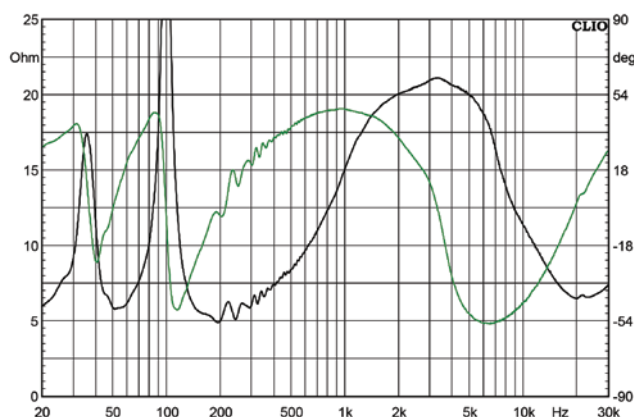
Off Axis output: A design win, the output through the crossover frequency at 3.2kHz is nearly perfectly symmetrical, with only a mild trough of 5.5dB centred on the crossover frequency for above and below axis. In part thanks to that waveguide, the integration is first-class laterally off axis, up to 60 degrees, making these speakers good enough to use as a compact studio monitor. This also contributes to that observed highly neutral in-room sound quality.

Room Averaged Response: The fine crossover design is reflected in room averaged output, which is well extended to 15kHz, but smoothly so. There's also useful output down to 45Hz in the bass, which is very good for speakers of this size, while the handover from mid to treble is hardly visible showing excellent crossover design.

Bass response: The output remained stable and quite uniform down to 50 Hz and is well matched to the average room gain at lower frequencies – a fine result for the size. The port was well behaved with little extraneous noise.

Waterfall decay results: Reflecting the low coloration and transparent sound we heard, the decay response results are first class, with fine time alignment for the drivers. Energy decay is commendably rapid, supporting the clean quick transient response heard on test, especially for that little musical bonfire of a tweeter.

AE 500 Impedance (black, phase (green)



AE 500 Time frequency analysis - CSD

