

Avalon Eidolon loudspeaker

After many years of development, Avalon has come of age with a loudspeaker that can lay claim to being the ultimate...

WORDS AND LAB REPORT_MARTIN COLLOMS



PRICE £25,000/pair

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It was a thought-provoking discussion with Avalon president Neil Patel on the virtues of absolute tonal accuracy in a speaker, and how to achieve it, that led to an opportunity to evaluate the Eidolon. It was to prove illuminating to discover just how closely his objectives had been realised in this design.

Based in Boulder, Colorado, and originally a sister company of Jeff Rowland Research, the noted amplifier manufacturer, Avalon was acquired by Neil Patel a decade ago. He has been developing his design skills ever since. Avalon now has a full line of speaker systems, including a smaller version of the Eidolon called the Opus Ceramique (£15,000). There is also a special version of the Eidolon called the Diamond, which, among other technical delights, includes a tweeter with a radiator of pure diamond and carries a proportionate price hike to £35,000.

The Eidolon itself is a tall, slim enclosure with prismatic, almost crystal-like, facets on the front. But appearances can be deceptive and the enclosure in fact supports sufficient volume to properly tune the full-size bass driver, to a usefully low bass frequency limit, quoted at a deep 26Hz (-1.5dB). The extended high frequency range is also worthy of attention, claimed to extend seamlessly to 34kHz (-1.5dB), sufficient for wider bandwidth sources like SACD.

A two-man lift, this 68kg box has first class build and finish. The review pair came in perfectly-matched light maple, while other premium and luxury veneers are available to order. Each enclosure stands 1.1m high on three carpet-piercing, stainless steel cone spikes; depth is 432mm, width just 305mm. The angled-profile, matching grille is integral to the acoustic design and must be left in place. Concealed beneath the enclosure are connectors for single-wire, spade-terminated speaker cable, as well as the hidden bass port or vent.

TECHNOLOGY

If we accept the claim for tonal accuracy, then its achievement, an issue of absolute sound energy versus frequency, could still be valueless unless the speaker is also very low in coloration. This is perhaps why Avalon claims 'the fastest settling times of any dynamic transducer', implying that energy storage is so low that the residual energy in the speaker quickly falls or settles to a low threshold.

All the components of a speaker are set into vibration when it is operating, but (aside from the sound-radiating diaphragms), this vibration must be rigorously controlled: one of Neil Patel's objectives was to deliver a lower noise floor than rival speakers, so that subtle low-level detail could be heard at all volume levels. Built primarily of MDF, the enclosure has bonded, multiple-layer elements up to 150mm thick with extensive bracing. The result is a singularly inert platform for the three drivers, carefully selected from specialist German

makers Theil/Accuton and Eton. All are pure piston transducers to well beyond the required operating bandwidth. Thus the 270mm die-cast frame Eton bass driver has an ultra-stiff composite or sandwich cone formed from Kevlar and Nomex, and while it is operated to a few hundred hertz, its first break-up mode is an entire decade higher at 2kHz. The 90mm Accuton concave-dome mid driver has a pure ceramic diaphragm, full-depth oxidised to pure alumina from the foil master. It has an extraordinary 100Hz to 10kHz piston range yet is only worked from about 300Hz to 3.5kHz. The ultra-light tweeter is also pure ceramic, with a 900Hz to 45kHz intrinsic bandwidth — many 'piston' metal dome types are in serious multiple resonance behaviour from as low as 20kHz — with a designed operating range of 3.5kHz to 40kHz in this system. There is no bending/break-up in these drivers anywhere near the operating range. With no diaphragm 'break-up' there is no stored energy in these drivers; their intrinsic 'speed' is, in fact, comparable to an electrostatic. The zero-stored energy approach also applies to the bass, where a chosen low operating limit minimises in-band hangover and group delay. A low-Q 'sealed-box' alignment is used, the reflex vent deliberately de-tuned to extend the extreme bass and more helpfully augment the system's low-frequency dynamic range. Thus the 75 litre enclosure is tuned to a very low 19Hz or so and is potentially completely free of subjective bass boom.

The system is aligned to correct for delay times, and the cabinet geometry and the crossover are together adjusted to provide high-accuracy impulse wave shapes



Neil Patel,
owner and chief
designer of
Avalon Acoustic



at the listener position. Finally, the very low-diffraction radiation geometry, the driver characteristics and the crossovers are claimed to be interactively adjusted for the most lifelike tonal balance at natural, not 'hi-fi', listening levels. The speaker should play sensibly loud. up to 108dBA in medium-sized rooms; the bass is tuned to match conventional rigid architectural structures rather than timber frame, open plan arrangements, where the bass may sound too tight. Free space location in well-proportioned 'solid' rooms suits it very well.

THE SOUND

US speakers have gravitated towards a 4 ohm typical impedance and the Eidolon is no exception. Current-capable high-power amplifiers have made such speakers viable, but at the same time, this trend begins to reduce

Up to 150mm
thick in parts,
the Eidolon
cabinet is
intended to
provide a truly
inert platform
for the drive
units

the use of tube power amps. Personally, I wouldn't use less than 100W per channel, 4 ohm rated, with this speaker. Ideally, the chosen amplifier should be as capable on 4 as it is on 8 ohm loading, but very few are. I have heard the august Conrad-Johnson Premier 8 do the job with a notably mellifluous midrange, even if the bass couldn't provide total feeling of grip and authority that a top-of-the-line solid state powerhouse could give on this load.

Auditioning a product like the Eidolon is no trivial matter. Every effort has to be made to find its measure, with no stone unturned in the search for the right match of room location, cables, sources and amplification. Such investigative activity needs to be preceded by running-in; fortunately, this wasn't too prolonged in my case, as the recommended 100–200 hours had been done at the factory prior to delivery. However, the speakers audibly improved in clarity and bass speed over the first six hours or so in my room, and went on improving over several weeks of use.

First impressions were frankly disarming, even confusing, as its overall sound is rather different from what many of us have come to know and expect from a conventional 'hi-fi' speaker sound. The confusion concerned room drive and the audible lack of off-axis energy scatter delivered to the room by this speaker

system. Without a doubt, that heavy, acoustically-designed felt 'blanket' located within the grille frame and encircling the drivers has a purpose. Unfortunately, it also has the effect of making the room energy response duller and richer — at first hearing, sounding closed-in compared to the general loudspeaker expectation. The controlled 90° radiation angle of the Tannoy TD12 has a similar effect — until the super-tweeter kicks in — and it is also not unlike the sound of the dipole directivity of the Quad Electrostatic. Both these speakers, like the Avalon, need some listener acclimatisation. Regardless of this, in my opinion such speakers do not deliver the kind of enveloping, room-driven dynamics, which designs of intentionally wider directivity can provide. The latter are designed to acoustically couple to the sidewalls and others, and thus build the overall sound level in the room more strongly.

The Eidolons seek a more intimate relationship with the listener. Come closer, set the speakers fairly wide



❶ 'Faceted' design makes the speaker look less bulky

LAB REPORT

You obviously need to get the best out of a speaker of this high quality. Matching and compatibility issues are thus covered first. Sensitivity is 'average' at 87dB for an 8 ohm 'watt', while the amplifier loading is better than many, averaging 6 ohms. With a minimum impedance value of 3.8 ohms, the true sensitivity is nearer to 85.5dB/W, requiring say 10W for a normal loudness compared with 2.5W for a 91.5dB/W speaker. So the minimum recommended amplifier power is 50W. This speaker handles power well and with common-sense, non-party use, peak levels of up to 400W or even 600W/channel will give effortless replay. In addition, the impedance trend [Fig 3] is smooth enough for use with the larger tube power amps.

In return for the modest sensitivity, the Eidolon delivers low distortion and extended bass, a low 33Hz for -6dB anechoic and typically to 30Hz in my room; perhaps lower still in others. Both driver and port resonance frequencies are so low (37Hz for the drivers and 19Hz for the port) that the speaker appears free from group delay and

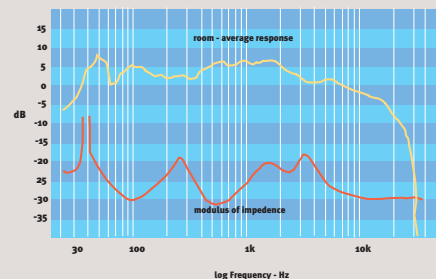
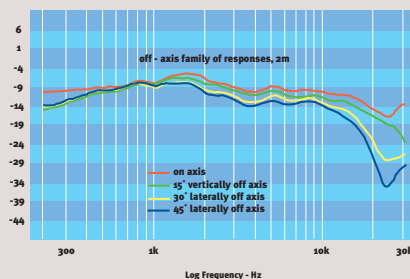
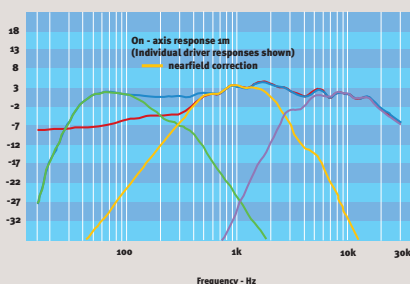
overhang in the working band. Its sheer weight precluded raising it for response measurement so the curves are presented for the best approximation based on axial, near-field and spatially-averaged data. In addition, the designed off-axis listening angle, plus diffraction controlling grille, mean that a mildly falling trend with frequency is to be expected even if axial 'reference' responses were intrinsically 'flat'. On the preferred axis, the speaker met +/-3dB limits for a wide 36Hz to 18kHz range, with a very high degree of smoothness and integration [Fig. 1]. For -6dB limits, the treble extended to beyond 35kHz without a significant peak. The treble driver alone, on axis, was flat to 40kHz, and was -10dB at 45kHz, a response of SACD standard.

The crossovers are set at about 275Hz and 2.7kHz. No evidence of their existence can be seen in the overall responses. The off-axis family, 15° above and below vertical, 30° lateral, 45° lateral, shows excellent integration and superb uniformity, this correlating with the pinpoint stereo focus observed [Fig. 2].

A mild broadband lift in the upper-mid is seen in the reference responses and also in the spatial average under room conditions [Fig. 3]; +/-3dB limits were nevertheless met from 30Hz to 8kHz, while the low diffraction absorbent grille provided the expected greater than average energy roll-off in the final octave and a half. Thus the perceived 'room' sound may be duller than with many speakers. For a speaker of this proportion and geometry, the response shown does correlate with the subjective view.

At typical listening levels, harmonic distortion was much better than average and essentially remained in the 0.08 to 0.12% range except at low frequencies, this an order of magnitude better than usually encountered.

Measurements of energy decay versus time, showed very good time alignment and fast settling; using the fast filter, the result was one of the best I have ever measured, showing superb alignment and very fast energy clearing. This really did correlate with the amazing transient definition demonstrated.



and with a moderate degree of 'toe in', then let these speakers drench your ears in the precisely focused soundfield created. Very evidently this performance is closely associated with the production values and specific acoustics present in the recording. The result is close to the vibrantly communicative experiences well-known with the Stax electrostatic headphones — a level of personal audio connection beyond the reach of full-size electrostatic speakers, never mind the generality of box and cone designs.

In terms of perceived tonal balance, the Eidolon is 'so right' that secondary issues such as listener height become readily audible against the obvious potential of this convincing reference. Sit just too high on an office chair and the speaker doesn't sound so focused or as coherent in the upper bass. At sofa height, the whole balance settles out. This isn't a vertical axis issue, since the acoustic output is actually remarkably insensitive to exact listener axis due to the very low diffraction form and excellent driver integration.

First impressions for some, including myself, rated the Eidolon to be perceptibly dull. In fact this isn't the case; with experience it turns out that the overall balance of bass, mid and treble is exceptionally close to perfection. Through analysing literally hundreds of hours of listening using a huge variety of recordings, I became confident in this view.

I became convinced that the Eidolon was, in fact, astonishingly neutral and revealing, a feat achieved over the entire frequency range. No single audio band was emphasised at the expense of another. Moreover, once acclimatised, I never felt the need for more treble. What treble there was remained in correct proportion, accurately placed in perspective terms.

You might suspect that a speaker with a highly natural, even restrained or unfashionable tonal balance might, in consequence, lack clarity and transparency, but that's not the case. This speaker's ability to consistently reveal inner detail turned out to be one of its most valued features, general character

notwithstanding. In fact, as the listening process continued, I became aware that I could not characterise the performance in the usual way, namely from the viewpoint of typical loudspeaker qualities and defects. The absence of the usual speaker-related defects is so extreme that its minutely subtle deviations from notional perfection are judged to be so mild that the vocabulary used for the analysis of amplifier sound quality was found to be more appropriate. In fact, in trying out several top class amps, I found that the Eidolon was happily measuring the amplifier, rather than the other way round.

Compared with typical speakers the Eidolon may be found to sound drier in the bass, particularly the mid-bass. The lower-mid is richer, the treble more restrained and more integrated than most. Such is the difference that it might be possible to peremptorily reject the Eidolon for lacking slam and overall, percussive, 'Hollywood'-style impact. But you'd be wrong to do so. As the Eidolon began to prove it was not merely delivering a version of the truth, but in fact was demonstrating a powerful approach to defining the truth, such misgivings fell rapidly away.

This speaker had no favourite material. Electronically generated sounds are the least convincing — indeed they are made to sound, well, electronic! Natural sounds present no problems at all, anywhere in the spectrum, of any complexity and at virtually any sensible loudness.

The hallmark of a great speaker is the ability to sound well balanced, realistically distant and yet well resolved when playing at really low levels. The Eidolon passes this test with ease. Unlike some competitors, there is not just one particular level at which the sound appears to be 'right'. Its inner balance is extraordinarily independent of level. For me it is essential to convey just what this means to the reproduction. A singer should soar up the scale, and be able to sing louder and louder, yet not overload your ears or the speaker. This is rarely achieved, but the Eidolon simply wings it. You become

🔊 The big Eton bass unit, working with a 75 litre enclosure volume, gives a very extended low-frequency performance



aware that dynamics are very well judged, and that this speaker adds very little which could get in the way. I thought singing voices were the best yet from a cone speaker, rivalling the Quad in its finest region and rendered with substantially greater dynamics, air and transparency.

That midrange alone would score an ace for any speaker and yet the Eidolon's seamless presentation carries that quality down to the upper bass and then on into the deep bass. This very high quality also continues through the treble to the edge of audibility and, by my lab measurement, well beyond.

You don't realise how much self-generated noise is present in so many speakers until hearing an electrostatic, and now also the Eidolon, a moving coil. Its noise floor — that present when audio is being reproduced — is orders of magnitude lower than usual and provides a special degree of aural contrast, almost perfectly rendering transients.

The finely judged balance gives a great sense of poise and foundation, allied to very good coherence and integration. There are also near inaudible levels of resonance and colouration overhang, which result in very good musical timing — it is, in fact, state of the art for a three-way design such as this. The Eidolon is upbeat, involving and highly rhythmic, all achieved without a trace of emphasis or exaggeration.

Rounding out the story, this speaker will play loud and clean, if not to wholly deafening levels. Used sensibly, 400W per channel input is possible while prolonged abuse is not recommended by the designer; treat this speaker as you would a musical instrument. So please disconnect it for parties!

Subjective distortion is very low. The speaker remained sweet and clean even in the low bass throughout the test period, despite using very demanding material.

Its bandwidth is wide, subjectively at least 30Hz to 20kHz in my room. Its superb bass speed, definition and tune playing would be damaged by the addition of even the finest subwoofers, and in my view, these would never be required or preferred.

Finally, we come to another great strength. Stable, sharply focused, deep and spacious stereo images go hand in hand with very good design and low cabinet diffraction. The Eidolon excels in its delivery of stereo images, which are simply state of the art. The technical issues for good stereo also rely on low coloration and natural balance. In this speaker they come together to create superbly resolved perspectives with the soundstages nicely illuminated way back into the far field. My experiences indicate that, aside from the programme quality, soundstage, depth and transparency limitations will generally be imposed by the matching electronics and not by the Eidolon itself.

Does all this make for a good sounding speaker? Yes. I believe the Eidolon to be a towering achievement in



Grille-off shots reveal ceramic mid and treble drivers; underside view connecting terminals and bass vent


the art of speaker engineering. Its wholly musical performance rings true again and again.

CONCLUSION

I thoroughly enjoyed reviewing this speaker. It repeatedly challenged what I knew about sound reproduction and enhanced my knowledge of discs I thought I knew well. Designer/entrepreneur Neil Patel has demonstrated an uncompromising attitude to the essence of recorded performance and musical expression. His Eidolon could have been bigger, louder, with more slam, attack and more room energy fill, but it couldn't have simultaneously demonstrated the most serious approach to perfection we've heard.

Summarising the technical performance, as costly speakers go, this floorstander has a moderate footprint, superb finish, average sensitivity and amplifier loading, but very good power handling. It delivered a very smooth, very extended frequency range with superb off-axis consistency and low distortion. Its build and technologies are essentially of the highest quality while self-noise and stored energy are at an all-time low.

The sound is highly persuasive by virtue of its sheer naturalness, subtlety, speed, delicacy, resolution, pinpoint focus, depth, strong rhythms and excellent timing plus wholly natural macro and micro dynamics. Highly analytical, this speaker was able to ruthlessly reveal the character of reference system components. It marries the speed and transient definition of top class electrostatics with the tailored directivity and fine dynamics of a moving coil design.

I rate the Eidolon as a landmark achievement in the evolution of loudspeaker system design, and I am inexorably compelled to recommend it very highly. 

THE SYSTEM

For this review, the analogue system was Linn LP12/Armageddon/Naim Aro/Audio Note Io II and 4S transformer, plus Audio Research REF2 phono equaliser. Digital sources were: Naim CDS1 II, Krell KPS25sc and Marantz CD-7. Pre-amplification included Conrad-Johnson ART and Krell KPS25sc, while power amplifiers were Krell FPB 700cx and 400cx, Karan and Naim NAP250. Comparison speakers included Tannoy TD12, Quad ESL63, BBC LS3/5A (15 ohm), Spendor BC1, Wilson System 7, System 6 and Sophia, as well as Epos ES14