Amphion One25A

Active Monitors

We put Amphion's first ever three-way design to the test.

Amphion One25A
£13,200

PROS
- Spectacular bass.
- Utterly revealing of mix detail.
- Perfect tonal balance with minimal coloration or distortion.
- Hugely enjoyable.

CONS
- Expensive, big and very heavy.

SUMMARY
The Amphion One25A eschews DSP and relies on more traditional electro-acoustic design and engineering to create a truly outstanding high-end active monitor. It ranks among the very best.

PHIL WARD

Finnish speaker and amplifier company Amphion have carved out a niche in the professional monitoring market with their much admired range of two-way nearfield speakers, such as the Two15 I reviewed back in 2017. Their reputation for thoughtful and innovative electro-acoustic engineering is well deserved, and their approach translates into highly effective monitoring. But it has always felt as though there were a couple of elements missing from the Amphion range: active drive, and a three-way speaker. Of course, Amphion have had their own range of amplifiers for a while, and subwoofers too, and these arguably fill the gaps. Now, though, they've brought everything together into the subject of this review: the three-way, active One25A.

Before you get too excited, a couple of health warnings. Firstly the One25A is not an inexpensive monitor (I'd deploy the term 'aspirational') and secondly, it is very much at the large end of the nearfield monitoring spectrum — it's a midfield, really. At 41kg, it is also outrageously heavy. So heavy, in fact, that instead of testing them in my normal garden studio and large acoustic measuring space, I had to take a different approach. My local recording and rehearsal complex, Brighton Electric, very generously offered their Studio 2 control room for listening.

First Look

The One25A's visual appearance is unmistakably Amphion, and none the worse for that. I've always admired the simplicity of the Amphion aesthetic, with its combination of dark, matte cabinet surfaces and aluminium driver diaphragms set off by the whiter-than-white tweeter waveguide. It has the look of a high-precision, professional tool, and I rather like that.

Its dimensions are 316 x 510 x 487mm (HWD). Compact, it's not. And if you want to know why it's so heavy, as well as its cabinet being constructed from 25mm thick, heavily braced MDF, the bass driver alone weighs 10kg. The chassis of the bass driver is even incorporated into the cabinet bracing. Furthermore, the One25A also incorporates numerous constructional measures designed to ensure that the midrange driver and tweeter are mechanically and acoustically isolated from the bass driver. The narrow perforated grille on the front of the enclosure, for example, terminates a foam-filled air-gap slot that runs diagonally through the cabinet from the front through to the rear side. The slot and its internal damping ensure separation between the driver elements of the One25A. Furthermore, the diagonal geometry of the slot results in the separate bass and midrange enclosures being asymmetric, which helps discourage internal standing waves. And when I asked Amphion about the weight of the One25A, the response was that it wasn't really something they considered. When you set out to make a no-compromise active monitor, it weighs what it weighs.

Bolted to the rear panel of the cabinet is a filter, EQ and three-way amplification module housed in a large folded-steel enclosure. The amplification is rated at 205W each for the mid driver and tweeter, and a generous 700W for the bass driver. So, even though Class-D technology is known for its light weight, amps supplying a total 1.11kW were never going to be featherweight. The crossover filters are all fourth-order (24dB/octave) types, and rather than employing active op-amp chips, are implemented using passive networks buffered on their inputs and outputs. The whole electronics module is removable to enable the monitors to be soffit-mounted, and Amphion are additionally planning a rackmount version of the module. On its underside are a mains power input and switch, a balanced XLR input, and a stepped knob that offers a ±8dB range of LF equalisation profiles to provide some compensation of low-frequency level depending on the monitor's installation with regard to room boundaries. The electronics module offers no other connection or configuration facilities.

The Low Down

Like the bass/mid drivers in Amphion's passive two-way monitors, the One25A bass drivers come from Norwegian specialists SEAS. The bass driver is a nominally 25cm (10-inch) unit, designed specifically for low-frequency duties alone. That's clear from the extremely generous roll-surround fitted to the driver and the fact that its motor system (magnet, pole-piece, top plate and voice coil) provide ±14mm of linear diaphragm excursion — around twice that of smaller bass/mid drivers. But the driver's motor system is not only impressive in terms »

» of diaphragm excursion: its voice-coil is also unusually large at 56mm in diameter (getting on for twice the more usual 30mm). The driver is clearly designed to generate low bass at high volume levels with minimal compression.

And if that wasn't enough, the motor system also incorporates a copper cap on its pole-piece, which functions to reduce the voice-coil inductance and the degree to which inductance changes with voice-coil movement. I'll unpack that a little more. Voice-coil inductance results in a resistance to the flow of electrical current that increases with frequency, and in many speaker drivers, the inductance changes depending on the position of the voice coil. And as voice-coil inductance influences a speaker's frequency response, having it change in response to the input signal (because it's the input signal that makes the voice coil move) means that the input signal can modulate the response — which, you probably don't need me to tell you, isn't a good thing. Making sure inductance modulation is minimised is particularly important on a driver designed for high levels of diaphragm excursion, so the copper cap of the One25A bass driver is a valuable refinement.

But why does the One25A need a bass driver that offers very high diaphragm excursion potential? There's two related reasons. The first is that the One25A's specified low-frequency bandwidth is -3dB at 22Hz. 22Hz is subwoofer territory, and without the help of reflex loading (the One25A is a closed-box monitor) the bass driver is very much on its own. The context here is that the driver excursion required to generate a constant sound pressure level increases rapidly as frequency falls. For example, all other things being equal, 90dB (at 1m) at 100Hz requires around ±1mm of excursion from a nominally 25cm diameter diaphragm, but the same 90dB at 20Hz requires around ±4mm.

The second reason for the generous excursion capability is that its 22Hz low-frequency cutoff isn't achieved simply by mounting in the cabinet; it requires equalisation. By my rough calculations, without low-frequency EQ, the One25A would display a -3dB cutoff at around 50Hz, with a 12dB/octave fall in output below that. So, to reach a -3dB point at 22Hz, nearly an octave lower, the One25A needs around 10dB of gain below 50Hz, and that will put very significant demands on both diaphragm excursion and amplifier power. This explains why the One15A needs an LF amplifier rated at 700W: it provides headroom for the 10dB of LF EQ (and the further +8dB available from the user EQ). Finally, I rather glossed over the closed-box loading, but of course this is hugely significant in terms of its low-frequency behaviour in the time domain. Group delay (low-frequency latency) will be low (probably around 5ms), and low-frequency transient signals will stop when they are supposed to, rather than being effectively extended by the reflex port resonance. There's also no reflex port to introduce compression, distortion or noise as volume levels rise or to impart uncertainty to low-frequency pitch.

State Of Flux

The midrange driver is also sourced from SEAS in Norway, and is closely related to the drivers employed in Amphion's well known two-way passive monitors. It's a nominally 130mm-diameter driver with an aluminium diaphragm and, like the One25A bass driver, has a sophisticated motor system designed to minimise the distortions inherent to moving-coil drivers. Again, a copper element is employed to counter a modulation effect but, in this case, it's a copper ring around the pole piece rather than a copper cap, and its job is to suppress a phenomenon known as flux modulation (conducting rings in driver motor systems are sometimes known as 'shorting' or Faraday rings). Flux modulation describes a phenomenon in which the input signal creates its own magnetic field that modulates the fixed field of the driver magnet. As with inductance modulation, flux modulation will be imprinted on the driver output as distortion, so measures taken to stop it happening, such as the midrange driver's copper ring, are of significant benefit.

One respect in which the One25A midrange driver is slightly atypical is that it employs a large roll surround, of dimensions that would normally suggest bass duties. And that's because the One25A employs an unusually low (100Hz) bass/midrange crossover frequency. This is getting on for two octaves below that of a typical three-way monitor crossover. I referred earlier to the One25A's subwoofer credentials, and with its bass driver low-pass filter set at only 100Hz, 'subwoofer' is the appropriate description! This also means that the midrange driver's role is more towards bass/midrange duties because, despite its relatively steep high-pass active filter slope of 24dB/octave, its output will only be around 12dB down at 75Hz.

The reason Amphion employ such a low bass/mid crossover frequency has to do with managing system directivity, in effect configuring the three drivers of the system to work as a point source. I'll describe how this works in terms of the midrange and tweeter a bit further down, but in terms of the bass and midrange drivers, the low crossover frequency ensures that in the region where the output of the drivers overlap significantly (let's say an octave either side of 100Hz), the wavelength remains much longer than the physical distance between the drivers. In this particular case, the wavelength at 200Hz is 1.7m and the drivers are around 0.3m apart. Those numbers taken together mean that off-axis path length differences from the drivers to the listener (or a measuring mic) don't diverge by any significant portion of a wavelength, so the off-axis frequency response doesn't suffer from interference dips. If the drivers were further apart, or the crossover was significantly higher, path length differences would result in destructive interference between the drivers and consequent dips in the near off-axis frequency response.

"It's as if the One25A reveals the story of how sounds have been treated by the recording and mix process."

Prime Directive

Moving up the band to the midrange-to-tweeter crossover, the same kind of principles apply. The crossover frequency is 2kHz (wavelength 17cm) and the drivers are around 12cm apart. So although the equation isn't quite as clear-cut, the driver outputs probably remain reasonably in phase to around 30 degrees off-axis vertically. But there's another directivity factor that comes into play around the mid/high crossover, and that's the naturally narrowing dispersion of the mid driver towards the upper end of its band. This is primarily a function of the mid driver's

diaphragm diameter. Drivers naturally begin to become noticeably directional above the frequency at which their diaphragm dimensions are comparable to the radiated wavelength, and for the One25A midrange driver, that will be at around 1.5kHz. So, ideally, the midrange driver should hand over to the tweeter at around that frequency or a little higher, and that's the case with the One25A — its mid-to-tweeter crossover is at 2kHz. However, operating down to 2kHz would potentially be a power handling and distortion challenge for the relatively small (25mm) titanium-dome tweeter of the One25A, and that's where Amphion's signature UDD (Uniformly Directive Diffusion) waveguide comes into play.

The waveguide offers two really significant benefits. First, it provides an element of acoustic impedance matching for the tweeter that significantly increases its sensitivity, especially at the lower end of its operating band, and in doing so it neatly solves the 2kHz power handling and distortion challenge. I'd estimate that the waveguide results in an extra 6dB at least of tweeter sensitivity in exactly the frequency band where it's needed, and that's vital. The second benefit of the waveguide is that its diameter predominantly defines the directivity of the tweeter at the lower end of its operating band. So it's no coincidence that the tweeter waveguide and the midrange driver are of similar diameter. It means their directivity in the band where one hands over to the other is similar. When I talk of Amphion's "thoughtful and innovative electro-acoustic engineering", this is a perfect example.

Before I move on to my listening experience, there's one last element of the monitor to describe. Or rather, not describe, because in a world full of monitors defined by their DSP, the One25A remains free of digital intervention (at least in its signal path — its overload protection circuits are DSP-based). It is in many ways an 'old school' speaker, where performance is defined by the drivers and the skill with which they are integrated. Amphion's founder Anssi Hyvönen says he is not in principle against DSP in monitors, but he does believe that it ought to be subordinate to the electro-acoustics. He argues that the best performance is most likely to come from ensuring the electro-acoustics are optimised and that DSP is employed only for functions that can't be done otherwise. I guess the proof of that comes from listening...

ALTERNATIVES

If you're in the fortunate position where the One25A is a realistic aspiration, then you probably also ought to hear monitors such as the **Kii Three**, **Dutch & Dutch 8C**, **PSI A25M**, **PMC8-2**, **Genelec 8361**, **ATC SCM45A**, **ADAM S5V** and **Barefoot Sound MM26**.

Studio Time

Before listening to the One25As at Brighton Electric, I spent some time familiarising myself with the space by listening to the monitors already installed. Coincidentally, the monitors in Studio 2 are of a design and size not hugely dissimilar to the One25A. They would probably even be seen as a competitor. They sounded great — both in terms of enjoyment and their likely use as an analytical mix tool. I spent an hour or so with them, playing a whole bunch of well-known pieces, then took them down and installed the One25As in their place.

The first thing that impressed, perhaps unsurprisingly, was the bass. I began playing one of my regular reference tracks, 'Sycamore' from John Metcalf's *Appearance Of Colour*, and almost immediately forgot that I was supposed to be listening critically and became drawn into simply enjoying, and appreciating anew, Ali Friend's wonderfully sinuous and inventive double bass lines. One25A bass is hugely extended in terms of bandwidth and massively powerful, but simultaneously very fast and dynamic, without the slightest hint of pitch uncertainty or resonant overhang. And it doesn't really seem to care about volume level; sensible or really quite loud, the One25A remains consistent and able to resolve and make audible the smallest low-frequency detail. The One25A's low end provides an utterly secure foundation for everything above, and I can't really imagine a scenario where I'd want any more bass extension or quality from a nearfield or midfield monitor.

It's a similar story further up the frequency band. Mid-band voices and instruments are handled with an unforced, neutral tonality that somehow makes irrelevant any thoughts of "too bright" or "too dull" in monitoring balance terms. Simply recorded voices just materialise in space, fully formed and focused, sounding convincing such that any mix artefacts of compression or reverb are explicitly revealed — they sound almost separate to the voice. It's as if the One25A reveals the story of how sounds have been treated by the recording and mix process. You don't just hear the final result, you hear how it came to be.

The tweeter just continues the work of the midrange driver, delivering an integrated whole with masses of easy high-frequency detail and clarity. One of my regular listening techniques is to evaluate the balance in naturally recorded voices between vowels and consonants. Does it sound natural? Is it believable? Is the balance obviously modified by compression or EQ? If a monitor's mid and high bands are well balanced, and well integrated in terms of timing and directivity, the vowel/consonant balance should sound convincing if the recording is natural, or symptomatic if it's been messed with. Presenting this balance accurately is, to my mind, both a vital ability and a good indicator of useful performance in a monitor, and the One25A possesses the ability to a level that is right up with the best.

Conclusion

I spent rather longer listening to the One25As than I really needed to establish its credentials — in truth, it was obviously something special from the first few bars. But listening was such a pleasure, and I had the loan of Brighton Electric's control room right through to the end of the day, so I even went back in the evening to listen some more. The One25A does that: draws you in and doesn't let you go. Of course, just because a monitor is enjoyable, that doesn't always make it an effective mix tool — sometimes flawed speakers are the most fun — but that isn't the case with the One25A. It's an incredibly accurate, revealing and capable mix tool over a massively wide bandwidth and at pretty much any volume level. It really does perform up to, and perhaps beyond, the level you'd hope for at the price.

Thanks to Brighton Electric for the loan of their Studio 2 control room for this review.

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