APS Aether

Active Monitors

There's much more to APS's new studio speakers than meets the eye.

PHIL WARD

I've written about a couple of active monitors from Polish company APS over the past few years, and have been generally impressed with their performance. The entry-level Klasik 2020 model I reviewed in December 2020 was especially noteworthy and, as I wrote at the time, "quite a find!". APS have recently updated their active monitor range, and at the top of said range sits the subject of this review, the Aether.

While the Aether appears in photographs to be of conventional nearfield monitor proportions, APS describe it as a "medium-field" monitor, and now that I have a pair sitting in my studio, I can see why: the Aether is significantly larger and heavier than the typical nearfield product. At 20kg and measuring 44 x 25 x 47cm, it really is quite a significant chunk of monitoring.

In terms of appearance and industrial design, the Aether, sadly, isn't going to win any prizes. Fundamentally, it's a black veneer-finished and internally braced MDF box. Of course, the Aether is first and foremost a professional tool designed to do a job rather than to look attractive (much the same has been said about me), but it's also the case that plain rectilinear boxes are relatively easy to manufacture without a huge investment in tooling. The kind of extravagantly curved die-cast enclosures that, for example, Genelec often employ, are made possible thanks to commercial scale. Smaller manufacturers simply can't stretch to the kind of tooling budget that the likes of Genelec are able to support.

The Aether is a two-way active monitor with drivers that comprise a 220mm-diameter bass/mid unit and a 19mm dome tweeter. The tweeter is an OEM device sourced from one of Europe's longest established and technically most capable manufacturers, and features an aluminium/magnesium dome with a notably generous soft polymer surround that helps ensure that the dome's resonant frequency is kept reasonably low: in this case, more than an octave below the system's 2.8kHz crossover frequency. The generous surround also contributes significantly to the tweeter's radiating area. A quick

APS Aether
£3150

PROS
- Good, uncoloured overall balance.
- Highly informative throughout the entire audio band.
- Great bass.

CONS
- None (if you can get past the plain looks).

SUMMARY
APS tend to fly under the radar of big-name monitoring, but the Aether shows again that successful monitor design and manufacturing is sometimes as much about electro-acoustic skill as it is about big R&D budgets and advanced technologies.

measure of the surround and dome dimensions to illustrate this reveals that, while the radiating area of the tweeter dome alone is around 94mm squared, the surround is only just behind at about 70mm squared. This is not specifically a problem, but it illustrates that when a monitor manufacturer describes a driver dome or cone being manufactured from one material or another, it could be that other moving elements are almost as significant in terms of their acoustic contribution.

Iron Helps Us Play

The Aether tweeter incorporates ferro-fluid within its magnet gap, which serves both to damp its fundamental resonance (the mass of the dome and voice coil bouncing on its suspension) and to increase its thermal power handling (and reduce thermal compression) by providing a thermally conductive path for heat to leave the voice coil and be dissipated in the metallic mass of the the motor system. Ferro-fluid is typically a mixture of an organic solvent with surfactant-coated, nano-scale ferro-magnetic particles — think of it as a magnetic oil. When employed in a tweeter motor system it's injected, usually by syringe, into the gap either side of the voice coil, where it remains, held in place by the flux of the magnet. I've illustrated this in Diagram 1.

The benefits of ferro-fluid sound like a free lunch, but among speaker engineers it has a whiff of Marmite — some love it, some don't. The advantages, as I mentioned above, are damping and thermal control, but the naysayers will argue that ferro-fluid damping introduces non-linearity so is undesirable, and that, if thermal power handling is an issue, it's better to use a larger tweeter. There's sometimes also a concern that ferro-fluid has a finite life; it's said to degrade over a decade or two, leaving the tweeter not performing as intended. But even if degrading ferro-fluid is a genuine concern, a decade or two is a long time for a studio and its monitors, so I'm not sure I'd lose too much sleep over it.

The Aether bass/mid driver is sourced from the same European manufacturer as the tweeter. It incorporates a pressed-paper diaphragm and dust cap paired with a generous rubber roll-surround. APS describe the diaphragm as a 'DKM' item; originally

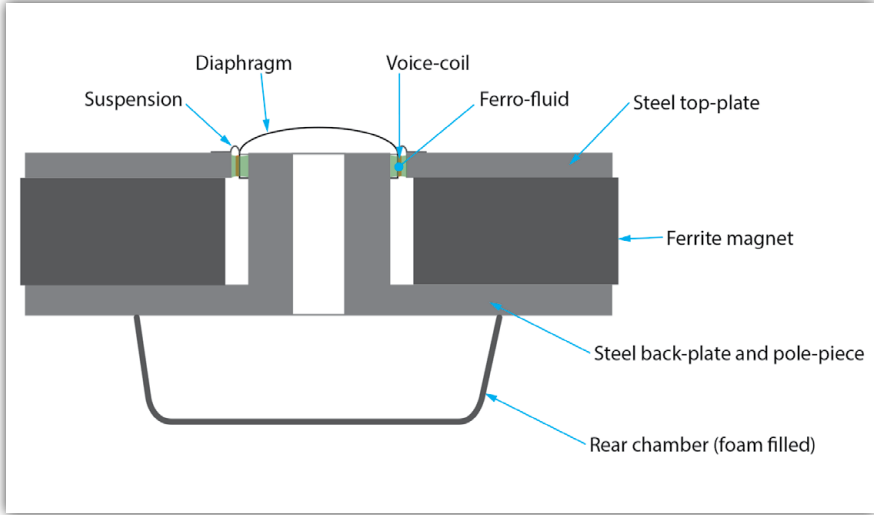

Diagram 1: A cross-section of a tweeter with ferro-fluid cooling and damping.

founded in Berlin in 1938, Dr Kurt Müller, with manufacturing in both Germany and the UK, are almost certainly the world's longest established specialist suppliers of diaphragm and suspension components to the speaker industry. Among European speaker engineers in particular, DKM have become more of an institution than simply a component supplier. If you're designing a driver and not making the diaphragms in-house, DKM will likely be first on your list of potential suppliers, not just for components but also for immense expertise and know-how.

Behind the Aether bass/mid driver diaphragm is a 39mm-diameter voice coil driven by a large ferrite-magnet motor system. The motor system incorporates two copper shorting rings around the pole piece that serve to suppress the distortions that result from magnetic flux and inductance modulation as the voice coil moves in response to the input signal. These kinds of measures taken to reduce driver distortion at source are, I believe, often very significant in terms of a monitor's subjective clarity and ability to play the role of a useful mix tool.

Panel's Labyrinth

Around the back of the Aether enclosure, there's the usual mix of connection sockets and configuration controls, a finned amplifier heatsink, and an extravagantly flared reflex port that APS describe as a "damped bass reflex with APS horn bass reflex technology", of which more in a moment.

The Aether is a fully analogue monitor and its input connections comprise just a balanced XLR/TRS jack combi socket. An XLR output is also provided for downstream daisy-chaining of a subwoofer if required. Aether configuration controls comprise a precision stepped 'volume' control spanning 0dB to -10.5dB, a stepped low-frequency cutoff control offering settings from 30Hz to 120Hz, a tweeter level switch that offers -1.5dB, 0dB and +1.5dB choices, a ground-lift switch, and an unusual approach to room optimisation. Downstream of the input and configuration electronics, the Aether incorporates power amplification rated at 195 Watts for the bass/mid driver and 130 Watts for the tweeter.

The room optimisation functions comprise a frequency control, running from 30Hz to 100Hz in 10Hz divisions, and a stepped level control spanning +3dB to -12dB. The concept behind the optimisation function is that it enables the low-frequency standing wave mode that is the most troublesome at the listening position to be, to some extent, equalised. In the absence of any DSP power within the Aether that might enable digital room optimisation (Sonarworks, for example), I think it's in principle quite a neat idea. I'll report on how well it works a little further down.

Measuring Up

I took one of the APS Aethers to my usual monitor measuring location and fired up FuzzMeasure to see what I could discover. Diagram 2 illustrates the Aether's axial frequency response at one metre, along with its associated second- and third-harmonic distortion. The frequency response is nicely linear »

» — it's neither the flattest nor the lumpiest frequency response I've ever measured, but somewhere towards typical. The distortion performance, at 90dB output level, is pretty good except for an isolated peak around 700Hz — although, even then, the third harmonic level is still less than 1% (there was a time when 1% distortion across the full bandwidth of a speaker was competitive), so the distortion peak in reality is probably relatively benign in subjective terms. The rest of the distortion performance is impressive, the very low level of third harmonic from the tweeter (above 3kHz) especially so.

Diagram 3 illustrates the Aether frequency response variation in the vertical plane. The usual interference dip, where the two drivers go out of phase in their overlap region, is apparent but it is reasonably well controlled and the general similarity of response shape above and below the axial suggests a well sorted crossover design. Also revealed in the vertical off-axis response curve is the expected drop in tweeter level, although this is reasonably gentle thanks to the tweeter's relatively small 19mm diaphragm.

I wrote earlier that I'd investigate and describe the Aether low-frequency loading technique, and I'll start that with Diagram 4. The two curves of Diagram 4 illustrate the result of placing a measuring microphone very close to the bass/mid driver diaphragm (blue curve: ignore the suck-out at 700Hz, it's a measuring artefact) and at the throat of the Aether's reflex horn (red curve). Now, in a conventionally configured and tuned reflex system, the driver close-mic curve would typically show a sharp reduction at the port tuning frequency (usually between, say, 35Hz for large monitors and 75Hz for small monitors). This is the frequency at which the port does most of the heavy lifting in terms of the output of the system. But there is no such reduction revealed on the Aether bass/mid driver curve, just a shallow dip centred around 24Hz. This suggests a heavily damped system with a very low reflex tuning frequency, and this was confirmed to me by APS designer Grzegorz (Greg) Matusiak. Similarly, the red curve of Diagram 4 shows a notably low-Q port resonance that peaks between 20Hz and 30Hz. A close-mic port frequency response curve will typically display a much higher Q.

The red curve also shows a complete absence of any resonant features above the port tuning frequency until the output degrades into the noise floor (the noise is the output of the driver — you can't work the port without also working the driver). This is a very good result, because it means little or no undesirable resonant midrange energy escapes through the Aether port.

Tuning a reflex port as low as 24Hz is unusual, and has implications for the Aether generally. A more conventionally tuned port significantly reduces driver diaphragm movement in what is a musically very demanding frequency range, and that doesn't occur here. It means the Aether's bass/mid driver has to work harder. However, the low port tuning frequency, especially in combination with its high level of damping, also means that time-domain errors, in the form of both increased low-frequency latency (technically known as group delay) and resonant overhang, are suppressed. To illustrate this, some further FuzzMeasure analysis revealed that the Aether displays group delay at 40Hz of around 7ms. »

The generously flared port exit is mirrored on the inside of the cabinet, and this contributes to its low tuning frequency and unusually good time-domain response.

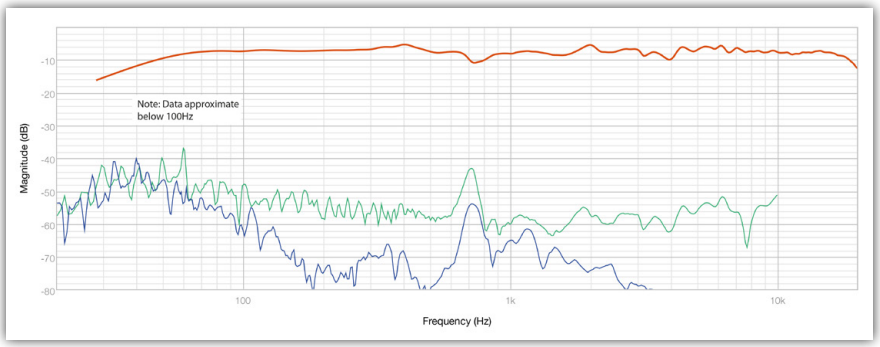

Diagram 2: The Aether's on-axis frequency response, measured at one metre (red trace). The green and blue traces show second- and third-harmonic distortion, respectively.

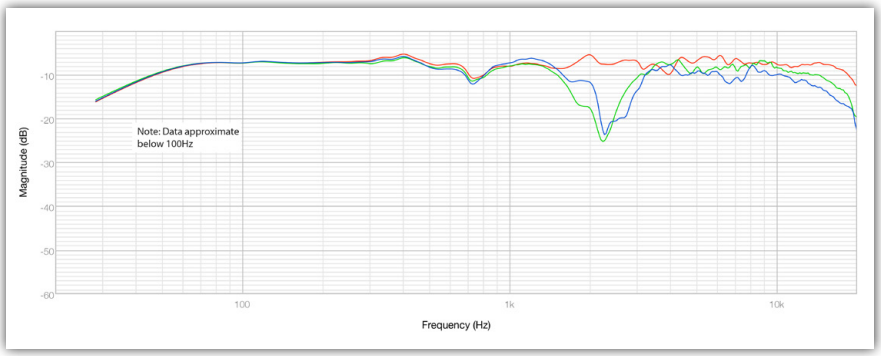

Diagram 3: Comparing the on-axis response (red trace) with that measured 30 degrees above and below (green and blue traces, respectively).

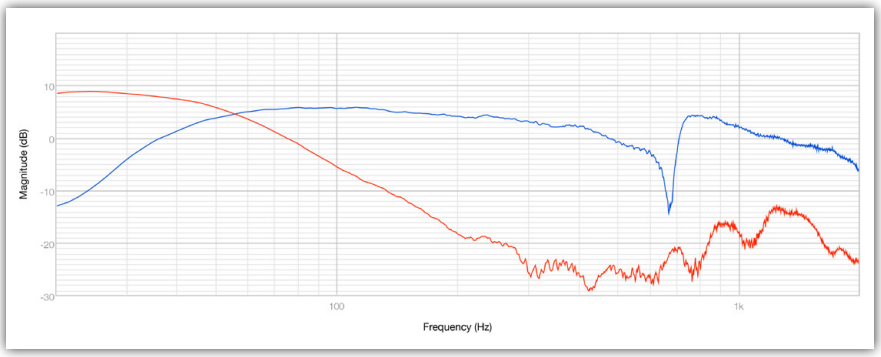

Diagram 4: Close-mic measurements of the bass/mid driver (blue) and the port exit (red), revealing the low Q of the port's resonant frequency.

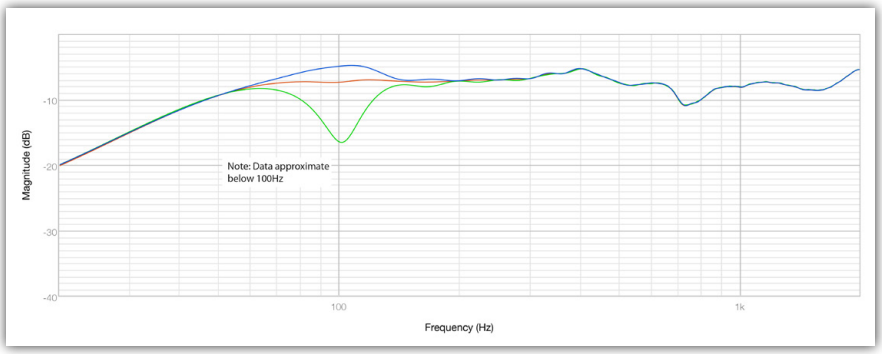

Diagram 5: Comparing the Aether in 'flat' mode (red) and with its EQ set to 100Hz, with a 3dB boost (blue) and 12dB cut (green).

» This is between a quarter and half of the figure I'd expect of a typical reflex-loaded monitor — although my recent experience of the Neumann KH150, with its 27ms group delay yet extremely satisfying bass, shows that minimising group delay isn't everything.

But what, I hear you ask, is the extravagant "horn loading" of the Aether reflex port about? I enquired of Greg at APS and he explained that it's designed to achieve three things. To begin with, it turns out that the horn visible at the rear of the Aether isn't the only one. There's another similarly generous horn component on the inner mouth of the port. The two horns firstly act together to maximise linear airflow volume and delay the point at which flow turbulence and noise occurs. Secondly, the horns modify the reflex port's coupling impedance at its entrance and exit to recover some of the output level lost through the high level of damping. And thirdly, the horns minimise any possibility of organ-pipe mode resonance along the length of the port.

It seems to me, though, that there's another advantage: it enables such a low tuning frequency to be achieved without hitting the usual snag of running out of space in the enclosure for a port of the necessary length and diameter. The "APS horn bass reflex technology" in the Aether is an interesting approach to the implementation of reflex loading that I've genuinely not seen before — and things I've not seen before in speaker design are, these days, few and far between.

The final tyre-kicking measurement in Diagram 6 illustrates the behaviour of the Aether's room equalisation function. The red curve shows the Aether's frequency response in my studio room at the listening position. The two major low-frequency discontinuities potentially amenable to equalisation are the room-mode-induced peaks at 35Hz and 90Hz, but with only a single band of EQ available on the Aether I had to decide which one to take on. It's no contest, really: the 90Hz peak is much more likely to be significant in mix terms than that at 35Hz, so I dialled in a 6dB dip at 90Hz using the rear-panel controls. The green curve of Diagram 6 was the result, and it looks to me like an improvement. I also tried using the Aether LF equalisation function to suppress the 35Hz peak, but the EQ's roll-off is too gradual to provide any kind of targeted room correction.

Listening In

Moving on to playing some old favourite reference tracks and Pro Tools sessions, the Aether immediately revealed itself to be a very capable and well sorted monitor. My current reference is the Neumann KH150, but despite the Aether's contrasting design philosophies and technologies, it lives very much in a similar ballpark in terms of inherent capabilities as a mix tool. The first thing I think a monitor needs is a consistent and neutral tonal balance across its bandwidth, and the Aether has that nailed. It sounds slightly more upper-mid emphasised than the Neumann KH150, but the difference is marginal and there's no pervasive coloration associated with the characteristic, so it's easily learned. I also found the Aether a little bright at the top end, but knocking back the tweeter by 1.5dB using the rear-panel switch effectively brought the balance back into my subjectively preferred window.

"The Aether immediately revealed itself to be a very capable and well sorted monitor."

The Aether's simple room optimisation function also worked well to compensate for the 90Hz room mode at the listening position. It left the Aether sounding a little bass-light at other listening positions, however.

The Aether's tweeter is clear and detailed, but it is also one that just gets on with the job without particularly drawing attention to itself, and its integration with the bass/mid driver through the crossover region is clearly well managed. In theory, the relatively large-diameter bass/mid driver and the relatively high crossover frequency of the Aether could result in a crossover dispersion discontinuity (narrowing

ALTERNATIVES

In terms of price, the Aether sits in a highly competitive sector in the monitor market, with multiple exceptional products pitching for customers. Monitors such as the **Neumann KH150**, **Genelec 8340A**, **ADAM S2V** and **Dynaudio Core 7** would all be worth comparing to the Aether.

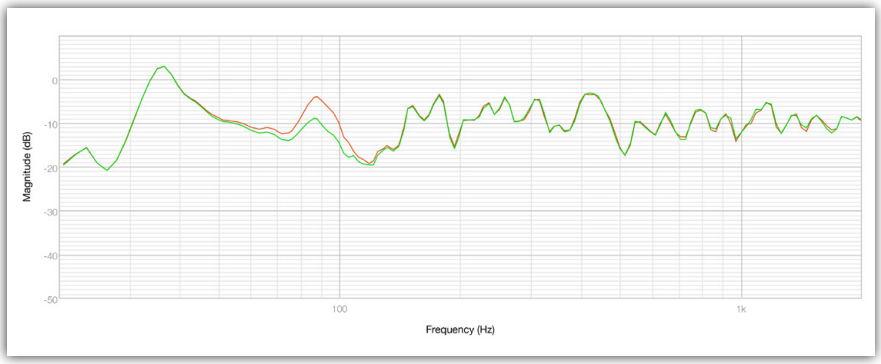

Diagram 6: The Aether's in-room response in 'flat' mode (red trace), and with its LF EQ set to -6dB at 90Hz (green).

bass/mid dispersion marrying with wide tweeter dispersion), but in practice there's no obvious signature of such a phenomenon.

The unusual low-frequency design of the Aether works well. The low-frequency bandwidth is very extended, and although I don't have the measurement facilities to confirm the Aether's published specification of -2dB at 32Hz, I wouldn't be surprised to find the reality not far off. And along with being extended in bandwidth, the Aether's bass sounds impressively dynamic and revealing of pitch and timing. It sounds more 'closed-box' in character than reflex. It's able to play at genuinely loud midfield monitoring levels without apparent strain or any obvious changes in character.

Moving up to the midrange, the Aether is highly revealing of mix detail and convincing in terms of balance. I'd have had no problem jumping straight into a mix with the Aether and feeling comfortable with the way it presents the all important voice band. Midrange stereo image focus is impressive too, with a fine corresponding ability to resolve reverb tails and the scale of acoustic spaces, whether real or plug-in generated.

To deploy an easy cliché, the Aether is something of a wolf in sheep's clothing. It's almost unbearably plain to look at, and apart from an unusual bass loading technique, it is, when stripped down to its fundamental elements, an entirely conventional two-way active speaker with an aesthetic that might have been born in the 1980s. However, to my ears it is clearly a monitor developed by somebody who genuinely knows their way around speaker design and how to optimise the parts to offer more than their sum. The Aether may look uninspiring, but it is genuinely able to do a really exceptional job of monitoring.

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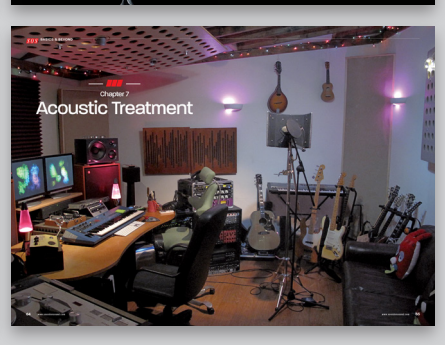

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This article was originally published in Sound On Sound magazine, **August 2023 edition**

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