Four-way, five-driver floorstanding loudspeaker
Made by: Coherent Acoustic Systems, Pinetown, South Africa
Supplied by: Vivid Audio Ltd, West Sussex, UK
Telephone: 01403 713125
Web: www.vividaudio.com
Price: £64,000-£71,950

AUDIO FILE

Vivid Audio Giya G1 Spirit

It may not look as outrageous as the iconic B&W Nautilus, but this is its younger, and arguably superior offspring
Review: **Keith Howard** & **David Price** Lab: **Keith Howard**

When B&W introduced the Nautilus in 1993 it created what is surely the most iconic loudspeaker any of us will ever see. Its 'snail on steroids' look projected it on to countless magazine pages around the world and gave B&W the kind of PR boost company CEOs dream of. Only it wasn't a PR man that contrived the Nautilus, it was B&W's then senior design engineer Laurence Dickie. And though it looked like something created by H R Giger for the set of *Alien*, the Nautilus was actually an exemplar of the Bauhaus diktat that form follows function. It looked that way because it needed to be that way.

As much as the Nautilus was a star for B&W, its looks were considered too outlandish. So in spinning off its Nautilus technology into the 800 Nautilus series, B&W went for more conventional looks, abandoning the curved and tapered transmission line behind the bass unit that so defined the original aesthetic. But the spirit of a full-on Nautilus didn't die.

'Forget slab-side box cabinets, prone to panel resonances'

KEEPING THE SPIRIT

Laurence Dickie, who left B&W in 1997 to work in pro audio, became engineering director of Vivid Audio in 2004 and picked up where he left off, culminating in the current flagship Giya G1 Spirit reviewed here. It's yours for £64k in black or pearl white gloss, or £68k with external crossover, plus another £3950 for custom colours. It doesn't replace the existing Giya G1 but slots in above it, and while it looks very similar it's actually deeper and shorter to maintain the same internal volume while lowering the tweeter axis.

Visually distinct from the Nautilus, the Giya G1 Spirit is still another example of form following function. Forget slab-side box cabinets that are prone to panel resonances and undesirable diffraction effects: this is a curved, organic form designed to be both structurally stiff and to avoid secondary radiation from right-angle baffle edges. Stiffness is further enhanced by the cabinet's internally-braced sandwich of GRP skins with a balsa wood core.

KEYNOTE SPEAKER

Reminiscent in side view of a treble clef, the G1 Spirit lacks the G3's and G4's externally visible exponential horn absorbers behind the two dome drivers because, being taller, it is able to accommodate them out of sight within the cabinet. But they are still there, as are larger equivalents for the lower-mid cone driver and twin bass drivers, the latter of which runs upwards through the cabinet's top loop, before curling itself up like a snail shell, just like that of the Nautilus [see diagram, p33].

Unlike the Nautilus, however, which had a closed-box bass section, the G1 Spirit is reflex loaded and by combining this with a tapered rear absorber, realises the benefits of both [see interview, p33]. Reduced LF distortion is promised along with improved LF output capability and an improved trade-off of sensitivity and bass extension (courtesy of reflex loading) plus effective suppression of internal air volume resonances (thanks to the absorber).

As in the original G1, twin bass drivers, with a brace between their magnets, are used to provide force cancellation, and this principle is carried over to the reflected banana-shaped reflex ports arrayed on either side of the cabinet. All Vivid's drivers are designed and assembled in-house using bought-in diaphragms and voice coils. With the current 225mm bass units, now with larger 100mm voice coils, Dickie

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HORN ABSORBERS

In every monopole loudspeaker, rear radiation from the drive units is contained within a cabinet, but designers need to engineer that containment without audible reflections and resonances within the enclosed air space. In 1965, Arthur Bailey of the Bradford Institute of Technology tackled this with an acoustic variant of an electrical transmission line. In electronics, transmission lines are used to convey high frequency signals with minimal degradation due to inductance and capacitance. Bailey's acoustic transmission line differed as its purpose was to absorb rear radiation down to low frequencies, but like the electrical line it still aimed to eliminate reflection and resonance.

Bailey's transmission line was like a folded horn in reverse, with the mouth immediately behind the driver and the narrower throat some distance away – at least a quarter of the acoustic wavelength of the lowest frequency handled. Long-fibre wool within the line gradually absorbed the rear-directed sound. When Laurence Dickie refined this idea for the B&W Nautilus, using continuously tapered horn absorbers of appropriate length behind each drive unit, B&W hoped to patent the idea. But they'd been beaten to it in 1976 by two (French and American) inventors whose patent, US3997020, describes something similar, albeit not in the context of loudspeakers. KH

LEFT: The latest D26 and D50 treble and midrange domes are fitted with integral screens (grilles). All five units have alloy diaphragms, the lower-mid's now stiffened with carbon rings

has incorporated a lesson learnt in his days working with pro speakers, which he found delivered tighter-sounding bass as a result of being 'over-shoved', *ie*, having greater motor force than necessary for a classically optimal bass alignment.

Like B&W's Nautilus the G1 Spirit is a four-way design, the twin bass drivers handing over to an improved 125mm cone lower-mid unit, 50mm dome upper-mid and 26mm dome tweeter at 220Hz, 800Hz and 3.5kHz respectively. Fitment of a larger, 75mm voice coil to the lower-mid driver has increased power handling, and carbon fibre composite stiffening rings added to the neck and outer diameter of the diaphragm have raised the first breakup frequency from 4.3kHz to 10.5kHz.

In the two dome drivers, carbon fibre rings complement the unique dome shape. Whereas dome diaphragms typically take the form of a spherical cap, so that their cross-section is an arc of a circle, Vivid's finite element optimisation process identified the optimal dome cross-section to be a catenary – the shape that a slack chain adopts under the force of gravity. In the larger dome, as an example, the first breakup mode occurs above 21kHz.

All three upper drivers also have rear-mounted exponential horn absorbers. Their annular motor assemblies use radially-polarised magnets (as opposed to the more usual, and cheaper, axially-polarised type) to provide large-diameter vents behind the dome diaphragms. The motor's smaller external diameter also allows the drivers to be closely spaced, ensuring good vertical off-axis behaviour through crossover.

The external crossover option (supplied for review) might suggest it's intended to further improve sound quality, by removing vibration-sensitive passive crossover components from the cabinet. But Dickie says he has compared internal and external crossovers and hears no difference. Instead, with the passive crossover removed from the cabinet, there's always the possibility of an active (third party) crossover being used with the Giya G1 Spirit. Connection from the external crossover is via a thick, captive cable, terminated in a twist-to-lock connector that locates in the speaker base.

OPEN SESAME

This is a dramatic sounding design and no mistake, but not in the sense of embellishment or other added colour. Rather, the Giya G1 Spirit is one of the few loudspeakers able to convey the majesty and scale of whatever music you choose to play – with all its delicious texture and detail intact. So, despite having a multitude of drive units, there's no sense of listening to several speakers in one as you're offered a seamless sound from bottom to top.

Every aspect of a recording issues forth in an engrossing way. AIR's 'La Femme D'Argent' [from *Moon Safari*; Virgin CDV 2848] is a case in point; it's a winsome slice of synthesiser pop with a big, tuneful bassline and gentle washes of synthesiser and vibrant electric organ stabs. The big Vivid conveyed every last dot and comma

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ABOVE: The Spirit's cabinet is fashioned from a rigid but lightweight sandwich of balsa between layers of GRP. It is internally reinforced by a series of carbon-skinned composite grids

of the mix – throwing out vast amounts of detail, yet still managing to deliver the song in a lilting and carefree way.

Although able to handle vast amounts of power – such is its grace under pressure when the volume is cranked north – it is still wonderfully delicate at low listening levels, and never lets one part of the frequency range dominate. *Moon Safari*'s mix is underpinned by funky bass guitar playing, and it was conveyed here in a lithe and snappy way with absolutely no sense of the cabinet joining in the fun. Indeed the bass melts into the midband, which is itself highly translucent. It's as if you're peering through a magic window; the dreamy keyboard sound sitting behind a soft but lively rhythm track while the drum machine's hi-hat cymbals glint away at the back of the mix.

'We were greeted by a lush Hammond organ sound'

MELLOW YELLOW

Continuing the mellow musical mood, the Lou Donaldson Quintet's *Aligator Bogaloo* [TOCJ-9103] proved that a 1967 recording can sound just as, well, vivid as it modern counterparts. The big Giya 1S Spirits sitting at one end of editor PM's listening room ensured this vintage mix shone with a wonderfully engaging and lustrous sound – typical of that era of classic BlueNote jazz. What greeted us was a fulsome, lush Hammond organ sound – tightly syncopated with some great guitar playing from a young George Benson. The superb transient speed of the G1 Spirit was there for all to hear; the drum work was superbly carried, with fast spinning ride cymbals, loose snares and deliciously deep, funky double-bass. Around this, Donaldson's alto sax let rip in a dramatic way, with this loudspeaker conveying its rich, reedy sound in all its glory.

It was a mightily impressive performance from a speaker that was clearly not designed for any one particular genre of music – its innate speed and transparency making it an ace for whatever you care to play. Arguably, that new D26k tweeter still lacks the last drop of delicacy and sweetness that might be achieved by the best ribbon transducers but, by dome standards, its treble sounds as airy and crisp as I might have wished for.

It certainly didn't hinder my enjoyment of REM's 'Welcome To The Occupation' [from *Document*; CBS/Sony CSCS 6085], which sounded nigh-on faultless. This late '80s slice of indy-rock is quite compressed, and packed with multiple guitar overdubs, but I was struck by just how well the big Vivid picked its way through – like a hot knife through butter, it got right into the heart of the song and imparted that trademark raunchy Rickenbacker guitar sound with great skill.

There was also far more detail than expected, and it was all strung together in a wonderfully coherent and orderly way. The Giya 1S Spirit is also in its element with powerful, bass heavy music with strong ⇨

LAURENCE DICKIE

Asked about the evolution of Vivid Audio's distinctive cabinet designs, Engineering Director Laurence Dickie explained, 'Our original Oval series used tapered tube absorbers on the mids and highs but the bass loading, despite the cabinet shape, was still just a simple reflex box and susceptible to internal resonances.

'You can stuff the box with fibre absorbent but this also nobbles the port output. For reflex loading to work, the air in the port has to bounce on the springiness of the air in the enclosure but fibre filling adds losses across the audioband, including the port frequency.

'I really wanted to see if I could add an exponential absorber tube while maintaining the port output. If you just put a driver on the end of a tube, Nautilus style, and add a port, the result is poor because the absorber does a very good job of taking away all the spring of the air. The winning combination is a regular enclosure plus an absorber tube with a cut-off frequency about four times that of the port resonance. Then it absorbs internal resonances very effectively while leaving the port output unaffected.

'The over-shoved bass driver idea was a lesson I learned during my 14 years working in pro sound. They frequently use light cones and high shove for efficiency, but I also noticed there was often a subjective tightness to the bottom end which wasn't found in the supposedly ideal tunings of many hi-fi speakers. Effectively we're shifting some part of the mechanical system into the better-behaved filter components.'

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LEFT: The mid/treble driver's individual chambers are bolted through the back of the cabinet. External crossover connects via a four-way terminal at the base

dynamics; here the integrity and inertness of the cabinet is most evident, along with the quality of the drive units. The Congos' 'Days Chasing Days' [from *Congo Ashanti*; Congos CD 21522] is a classic slice of late '70s reggae – and a veritable virility test for a large loudspeaker, on account of the incredible tracts of bass that lock into a great groove with the drummer.

This speaker was able to mix it with the best of them, and even at very high volumes in PM's listening room it coped heroically. Indeed I was more worried about the fate of the Ed's double-glazing than the Spirit's low frequency drivers. They grumbled and growled, yet showed no signs of strain, serving up a great groove that supported some prodigious dynamic contrasts.

A GRAND ACOUSTIC

The depth of the musical soundstage developed by the G1 Spirit is also very impressive. So when the recording has a deep and spacious acoustic, this loudspeaker can effortlessly convey the 'architecture' of the venue. For example, the opening movement from Mahler's Symphony No 4 [Miah Persson/Ivan Fischer/Budapest Festival Orchestra; Channel Classics CCS SA 26109] did, indeed, sound cathedral-like in its scale and scope.

As if the boundaries of the listening room had been totally redrawn, this speaker drew images to the far left and right, and hung the acoustic way back into the distance beyond the plane of the loudspeakers. Simultaneously, the foreground bristled with the sound of the orchestra's lead instruments, the ensemble sounding vibrant and natural, unsullied by driver or cabinet coloration.

The extended harmonics of brass and strings were left completely intact and possessed of a body and richness rarely experienced from loudspeakers at any price, while the rich timbre of the woodwind was a delight to behold. The Vivid Audio Giya G1 Spirit is surely one the most 'complete' loudspeakers ever to grace the hi-fi scene.

HI-FI NEWS VERDICT

This unusual looking loudspeaker is exceptionally accomplished in respect of power handling, dynamics, midrange transparency and stereo imaging while also knitting everything together in a wonderfully cohesive and natural way. The result is a delightful sound that yields so much more than the sum of its not inconsiderable parts. It is surely one of the greatest speakers currently on sale, at any price.

Sound Quality: 90%

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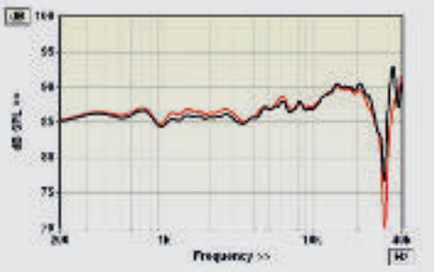
LAB REPORT

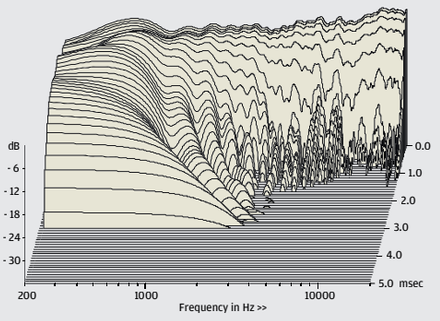
VIVID AUDIO GIYA G1 SPIRIT

You'd expect a speaker the size of the Giya G1 Spirit to have high sensitivity, and that is reinforced by Vivid's 92dB specification. But we recorded a pink noise figure all of 5dB lower at 86.9dB. In part this reflects the fact that Vivid has declined to eek out maximum sensitivity through punishingly low impedance. Although the minimum of 3.1ohm doesn't square well with the 6ohm nominal figure, this occurs at low frequency and, as Vivid claims, where the impedance phase angle is low (we measured just 5.5°). As a result the minimum EPDR (equivalent peak dissipation resistance) of 1.9ohm occurs above the bass range at 261Hz and is higher than that of many high-end speakers, giving the partnering amplifier an easier time.

The forward frequency response, measured at 1m on the axis of the upper tweeter [Graph 1, below] demonstrates an essentially flat trend to 4kHz, beyond which a gentle rise to a shelf at 14kHz has the effect of increasing the response errors to ±3.0dB and ±2.8dB respectively – but these are good figures which will be further improved by listening a little off-axis. Pair matching over the same 200Hz-20kHz is good at ±0.8dB. Measuring its bass response using the nearfield method was complicated by two factors: the banana-like shape of the reflex ports (which makes it more difficult to determine their area) and the curvaceous cabinet (which makes our diffraction correction less certain). So our measured bass extension of 56Hz (–6dB re. 200Hz) is subject to some uncertainty. More important is that the roll-off below 70Hz is slow and easy to correct with a little boundary gain. Finally, the CSD waterfall [Graph 2, below] reveals some mild treble resonances. **KH**



ABOVE: The Spirit's forward response is flat through bass and mid but shows a mild presence/treble lift



ABOVE: Lightweight sandwich cabinet looks fairly inert but some mild treble resonances are visible

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	88.3dB/86.9dB/86.5dB
Impedance modulus min/max (20Hz–20kHz)	3.1ohm @ 20Hz 18.4ohm @ 1.6kHz
Impedance phase min/max (20Hz–20kHz)	–11° @ 11.2kHz 51° @ 457Hz
Pair matching/Response Error (200Hz–20kHz)	±0.8dB/ ±3.0dB/±2.8dB
LF/HF extension (–6dB ref 200Hz/10kHz)	56Hz / >40kHz/28.1kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.2% / 0.2% / 0.1%
Dimensions (HWD)	1600x440x820mm

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